

217-R-617 SOILS DRYING WITH CHEMICAL MODIFIERS

(Adopted 07-17-14)

The Standard Specifications are revised as follows:

SECTION 217, BEGIN LINE 1, INSERT AS FOLLOWS:

**SECTION 217 - SOILS DRYING WITH CHEMICAL MODIFIERS**

**217.01 Description**

*This work shall consist of drying soils by uniformly mixing fly ash or lime with soil to aid in achieving the workability of soils having moisture over 2 % above optimum moisture content.*

**MATERIALS**

**217.02 Materials**

*Materials shall be in accordance with the following:*

<i>Fly ash</i> .....	901.02
<i>Lime</i> .....	913.04(b)
<i>Water</i> .....	913.01

*Soils containing greater than 6% by dry weight calcium, magnesium carbonate or organic material, or having a maximum dry density of less than 95 pcf, or with soluble sulfate content greater than 1,000 ppm shall not be used. The density shall be determined in accordance with AASHTO T 99, the loss on ignition shall be determined in accordance with AASHTO T 267, calcium carbonate/magnesium carbonate content shall be determined in accordance with ITM 507, and the sulfate content shall be determined in accordance with ITM 510.*

**CONSTRUCTION REQUIREMENTS**

**217.03 Testing and Mix Design**

*The Contractor shall be responsible for all tests required to determine the chemical modifier type and the relationship between the soils, chemical modifier, and moisture content. The modifier selection, laboratory testing, and mix design shall be performed by an approved geotechnical consultant in accordance with the Department’s Design Procedures for Soil Modification or Stabilization.*

*Chemical modifier, mix design, test results, and the geotechnical consultant recommendations shall be submitted to the Engineer and to the Office of Geotechnical Services for approval at least five business days prior to use. Fly ash and lime shall be from the Department’s list of approved sources.*

*The quantity of chemical modifier may be adjusted for different soil types and moisture content.*

**217.04 Storage and Handling**

*The chemical modifier shall be stored and handled in accordance with 215.04.*

**217.05 Weather Limitations**

*The chemical soil modification shall be performed when the soil has a minimum temperature of 35°F, measured 4 in. below the surface, and with the air temperature rising. The chemical modifier shall not be mixed with frozen soils or with soil containing frost. When the soil temperature is expected to fall below 35°F prior to the next lift being placed, chemically treated soils shall be protected from freezing by placing a minimum of 12 in. thick soil.*

**217.06 Preparation of Soils**

*The preparation of the soil shall be in accordance with 215.06. The maximum loose lift shall be no more than 12 in.*

**217.07 Spreading of Chemical Modifiers**

*The specified quantity of chemical modifier shall be spread on the surface. The chemical modifier shall be distributed uniformly by a cyclone, screw-type, or pressure manifold type distributor. Where type A-7 soils are encountered, the soil shall be scarified prior to spreading the chemical modifier. The chemical modifier shall not be applied when wind conditions create problems in adjacent areas or create a hazard to traffic on any adjacent roadway. The spreading of the chemical modifier shall be limited to an amount which can be incorporated into the soil within the same work day. The chemical modifier spreading rate shall be adjusted to the current soil moisture content. If weather causes stoppage of work or exposes the chemical modifier to washing or blowing, additional chemical modifier may be spread when the work resumes. Any materials wasted or disturbed by the Contractor's actions shall be repaired or replaced at no additional cost.*

**217.08 Mixing**

*The chemical modifier, soil, and water when necessary, shall be thoroughly mixed by rotary speed mixers. The mixing shall continue until a homogenous layer of the required thickness has been obtained. One hundred percent of the material, exclusive of rock particles, shall pass a 1 in. (25 mm) sieve and at least 60% shall pass a No. 4 (4.75 mm) sieve. The mixing depth shall not exceed 12 inches.*

**217.09 Compaction**

*The moisture content of the mixture shall be at the optimum moisture content or above the optimum moisture content as determined by the mix design in accordance with 215.03. Moisture content will be determined in accordance with ITM 506. Aeration or drying by further mixing may be done to obtain the required moisture content. Compaction of the mixture shall begin as soon as practical. The Contractor shall perform moisture tests during the day to verify the spread rate application. Compaction shall be in accordance with 203 or 207.03, as applicable.*

*Acceptance of chemically modified soils will be performed on the finished grade with a Dynamic Cone Penetrometer, DCP, in accordance with ITM 509. The chemically modified soil lift shall meet the following requirements for compaction:*

- (a) *A minimum DCP blow count of 20 for 12 in. of in place modification. A minimum DCP blow count of 8 for the top 6 in. is required.*
- (b) *A minimum of one passing DCP test for each 1,000 lft of chemically modified soil for each 2-lane pavement section.*
- (c) *A minimum of one gradation test will be performed every 2,500 lft for each 2-lane pavement section.*
- (d) *A minimum of one moisture test will be performed for every 4 h of lime soils mixing.*

*Construction traffic or equipment will be allowed after the minimum DCP blow count is obtained. Construction traffic or equipment shall be routed in one direction so that the chemically modified soil does not pump or rut.*

**217.10 Method of Measurement**

*The accepted quantity for drying soils will be measured by the ton of chemical modifier complete in place. Soils required to construct the fill will be measured in accordance with 203.*

**217.11 Basis of Payment**

*The accepted quantity of chemically modified soils will be paid for by the ton of chemical modifier used for drying. Soils required to construct the fill will be paid for in accordance with 203.*

*Payment will be made under:*

<b>Pay Item</b>	<b>Pay Unit Symbol</b>
<i>Drying Soils for Embankment .....</i>	<i>TON</i>

*The cost of performing the laboratory tests, providing an approved geotechnical consultant, scarification of in-situ soil, spreading, pulverization, mixing of the chemical modifier and soil, moisture compaction of the resultant mixture, shaping the grade, work required due to adjustments of modifier proportioning, correction of deficient areas, water required for the modification process, and all operations needed to meet the requirements of this specification shall be included in the cost of the pay item of this section.*