

**ITEM 205 CHEMICALLY STABILIZED EMBANKMENT**

**205.01 Description**

**205.02 Materials**

**205.03 Submittals**

**205.04 Construction**

**205.05 Mixture Design for Chemically Stabilized Soils**

**205.06 Method of Measurement**

**205.07 Basis of Payment**

**205.01 Description.** This work consists of constructing a chemically stabilized embankment by mixing cement, lime, or lime kiln dust into the embankment soil using the method for the specified chemical.

The Contract Documents include an estimated quantity for the specified chemical.

**205.02 Materials.** Furnish materials conforming to:

Portland cement.....	701.04
Lime (quick lime).....	712.04.B
Lime kiln dust .....	712.04.C

Furnish water conforming to 499.02. Furnish suitable natural soil, from on or off the project site, conforming to 703.16 and 203.03.

**205.03 Submittals.** Submit, for the Engineer’s acceptance, a report that lists the type of equipment to be used, speed of the intended equipment usage, rate of application of the chemical, and calculations that demonstrate how the required percentage of chemical will be applied. Submit the report to the Engineer for acceptance at least 2 workdays before the stabilization work begins.

If the pay item for Mixture Design for Chemically Stabilized Soils is included in the Contract Documents, prepare and submit reports according to City Supplement 1120 and as approved by the Engineer. The testing and verification sampling frequencies in City Supplement 1120 may be modified as directed by the Engineer.

**205.04 Construction.** Perform chemically stabilized embankment work when the air temperature is 40 °F (5 °C) or above and when the soil is not frozen.

Do not perform this work during wet or unsuitable weather.

Drain and maintain the work according to 203.04.A.

**A. Spreading.** If the pay item for Mixture Design for Chemically Stabilized Soils is not included in the Contract Documents, use the following spreading percentage rate for the chemical specified by a City approved geotechnical consultant. The percentage is based on a dry density for soil of 110 pounds per cubic foot (1760 kg/m<sup>3</sup>):

**TABLE 205.04-1**

<b>Chemical</b>	<b>Spreading Rate</b>
Cement	6 %
Lime	4 %
Lime Kiln Dust	8 %

Spread the chemical uniformly on the surface using a mechanical spreader at the approved rate and at a constant slow rate of speed.

Use a distribution bar with a maximum height of 3 feet (1 meter) above the ground surface. Use a canvas shroud that surrounds the distribution bar and extends to the ground surface.

Minimize dusting when spreading the chemical. Control dust according to 107.23. Do not spread chemical when wind conditions create blowing dust that exceeds the limits in 107.23.

Do not spread the chemical on standing water.

**B. Mixing.** Immediately after spreading the chemical, mix the soil and chemical by using a power driven rotary type mixer. If necessary, add water to bring the mixed material to at least optimum moisture content for cement and lime kiln dust, and to at least 3 percent above optimum moisture content for lime. Continue mixing until the chemical is thoroughly incorporated into the soil, all soil clods are reduced to a maximum size of 2 inches (50 mm), and the mixture is a uniform color.

For areas not under pavements or paved shoulders, the Contractor may use a spring tooth or disk harrow in place of the power-driven rotary type mixer by modifying the above procedure as follows:

1. Open the soil with a spring tooth or disc harrow before spreading.
2. Spread the chemical.
3. Use a minimum disc harrow coverage of ten passes in one direction and ten passes in the perpendicular direction to thoroughly incorporate the chemical into the soil. Continue mixing until all soil clods are reduced to a maximum size of 1 inch (25 mm) and the mixture is a uniform color.

**C. Compacting.** Construct and compact chemically stabilized embankment according to 203.07, except the Engineer will use 98 percent of the maximum dry density for acceptance.

The Engineer will obtain the maximum dry density for acceptance by using the Ohio Typical Moisture Density Curves, the moisture density curves from the Contractor's mixture design submittal, or the maximum dry density obtained by test section method.

**205.05 Mixture Design for Chemically Stabilized Soils.** When included in the plans, perform a mixture design for chemically stabilized soils according to City Supplement 1120 and as approved by the Engineer.

**205.06 Method of Measurement.** The City will measure chemically stabilized embankment by the number of cubic yards (cubic meters) used in the complete and accepted work, as determined by Item 203.

The City will measure cement, lime, and lime kiln dust by the number of tons (metric tons) incorporated in the complete and accepted work.

**205.07 Basis of Payment.** The City will pay lump sum for all work, labor, and equipment described in 205.05. The City will pay two-thirds of the lump sum amount bid when the sampling and testing is complete and the report is accepted by the City.

**205.07**

The City will pay one-third of the lump sum amount bid when the chemically stabilized embankment is completed and accepted by the City, and the field verification test results are all submitted.

The City will pay for accepted quantities at the contract prices as follows:

<b>Item</b>	<b>Unit</b>	<b>Description</b>
205	Cubic Yard (Cubic Meter)	Cement Stabilized Embankment
205	Cubic Yard (Cubic Meter)	Lime Stabilized Embankment
205	Cubic Yard (Cubic Meter)	Lime Kiln Dust Stabilized Embankment
205	Ton (Metric Ton)	Cement
205	Ton (Metric Ton)	Lime
205	Ton (Metric Ton)	Lime Kiln Dust
205	Lump Sum	Mixture Design for Chemically Stabilized Soils