

WHAT IS IT?

Cement-modified soil (CMS) is a subbase solution that blends cement and water with native (in-situ) soils to improve undesirable soil properties. The engineered mix forms a weather-resistant work platform for construction operations and a stronger, permanent subgrade for enhanced pavement support and capacity. Silt and clay soils, particularly when they are wet, can lead to construction problems. These soils can be soft, plastic, and difficult to compact. Cement-modified soil is used to improve the engineered properties and construction characteristics of silt and clay soils by reducing this plasticity and enhancing the compaction and strength of the treated soil.

The Process

The amount of cement content needed to modify the in-situ soils is based on the specified level of modification, which is expressed in terms of plasticity, bearing capacity, or other criteria. Portland cement provides all of the compounds and chemistry necessary to improve soils. Cement application rates typically vary from 2 to 5 percent by dry weight of the soil being modified.

Once the cement content has been established, the construction steps are simple and quick:

- Shape the area to the correct crown and grade
- If necessary, pre-wet dry soils to aid pulverization or dry wet soils by aeration
- Spread the cement in either dry form or by slurry method
- Mix with pulverizer, adding water, if necessary, until a homogenous, friable mixture is obtained
- Compact mixed soil to proper density
- Finish by shaping area to final crown and grade

The entire process is mixed in place. A major advantage with cement-modification over lime is that CMS does not require a mellowing period. Once the cement is added it can be immediately compacted and finished. For typical projects, the entire process can be completed in one day. CMS must be surfaced if intended for traffic use.

When to Use it

CMS can be used as a subbase for both rigid and flexible pavement systems.

- Mainline highways and embankments
- Airport runways, taxiways and aprons
- High-volume streets and local roads
- Parking lots
- Residential streets
- Building sites and floors
- Heavy industrial/intermodal/military facilities



Solutions Provided

- **Reduces costs** - Improves soil without replacement and hauling expenses
- **Eliminates waste** - No removal or replacement of inferior soils is necessary

CEMENT-MODIFIED SOIL

- **Reduces plasticity/cohesiveness** - Improved constructability of marginal on-site soils
- **Improves strength** - Treated soils are stronger than native soils
- **Improves performance** - Better support and bearing capacity
- **Resists leaching** - Chemical and physical improvements of the soil are permanent
- **Decreases volume change characteristics**
- **Adaptable to any type of soil** - Improves strength and durability from poorly graded sands to highly plastic clays

Features

- Economical, long-lasting pavement foundation
- Strong and durable
- Value-engineered: Low first costs and easy to construct
- Modifications are permanent
- Stands up to many cycles/years of weathering and service
- Less susceptible to damaging effect of water
- An all-weather work platform
- No mellowing period required



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