

Lime to Dry and Improve Construction Site Soil



Quick

Practical

Economical

Highly Effective

Are You Stuck in the

MUD



**Lime to dry and improve
construction site soil:**

1. Moisture control and soil drying
2. Soil workability and compaction
3. Reduction in soil plasticity
4. Reduction in soil swelling
5. Solid working platform for heavy equipment
6. Engineered fills and embankments
7. Extended construction season

Mud is the Problem -- Lime is the Solution

Dealing with a Common Construction Site Problem

Wet site conditions can prove to be a major challenge for commercial and residential building contractors. Spring thaws and recurring rain can cause the soil to become soft and muddy, posing problems and delays to workers, equipment and material deliveries. The challenge increases when site-soil is used as structural fill, placed in layers to raise the grade elevation of building pads and paved areas. It's difficult to reach the soil moisture content and compaction requirements established by the project civil or geotechnical engineer in the job specifications. Natural drying takes too long and is often hampered by unpredictable and uncontrollable rain showers. Site work is continually delayed. The owner, general contractor and site-grading contractor all lose TIME and MONEY.

Lime is a Proven Solution.

Lime is a proven solution for drying, modifying and improving construction site soils. Lime effectively and quickly dries wet clays and silt soils and forms a working table that provides a solid base for construction equipment traffic. Lime reduces the plasticity of clay soils, making it more friable and improving compaction characteristics. Additionally, lime modified soils continue to resist moisture and softening throughout the construction process.

Applying Lime --Three Basic Steps

1) Spreading

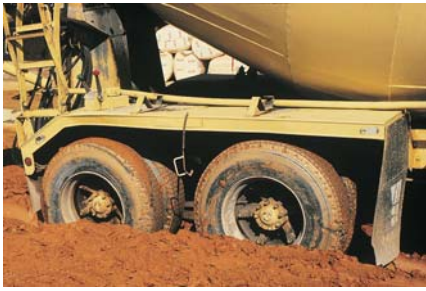
The lime is typically delivered to the job site in pneumatic tankers and transferred into the spreader vehicles. The spreader vehicles (trucks or trailers) have mechanisms to control the amount of lime spread onto the soil. In some regions, specially equipped pneumatic tankers are used to spread hydrated lime. On smaller jobs a crawler dozer-loader can be used to sprinkle quicklime fines or pebble lime. The amount of lime is determined from previous laboratory tests or prior experience and can be adjusted as needed.

2) Mixing Lime and Soil

The lime and soil are thoroughly mixed with a rotary mixer, typically to a depth or layer of 12 inches. Deeper mixing depths are required in cases where excessive wetness and spongy areas occur. In some cases, additional water is added to initiate lime hydration. The lime is allowed time to act on the soil – absorbing soil moisture and breaking down larger pieces of clay. This “mellowing” period is typically between 4 and 24 hours, depending on soil characteristics and the type of lime. In some cases, after the mellowing period, a second pass of the rotary mixer ensures that the lime is thoroughly mixed and larger clumps of clay are broken apart.

3) Compaction

Compaction is generally done with a sheepsfoot roller of sufficient weight to achieve the specified compaction requirements. A steel drum roller is later used to compact the surface of the soil. Proper compaction is essential to soil strength and moisture resistance.



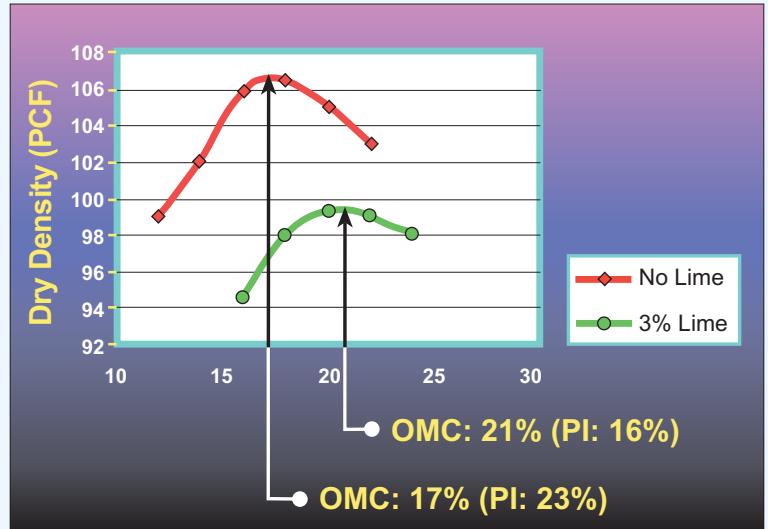
How Lime Dries and Improves Soil

Technical Information

Lime can have three effects on soil – drying, modification and stabilization. While all are beneficial, soil drying and modification are generally most important to building site work contractors.

When the soil is too moist for good compaction, adding quicklime causes four distinct and beneficial things to happen:

1. Water is absorbed as quicklime hydrates -- CaO becomes Ca(OH)_2 . Quicklime absorbs 40% of its weight in water.
2. Hydration lets off heat, driving off water through increased evaporation.
3. Lime changes the soil characteristics so that more moisture is needed for compaction – the *optimum moisture* increases and the *maximum dry density* decreases.
4. Lime lowers the soil's plastic index (PI), an aid to compaction.



For example, a laboratory study at Carmeuse Technology Center, Pittsburgh, PA was made on a lean clay soil from Indiana.

Adding 3% quicklime (by dry weight of soil) decreased the soil moisture content by about 3%. The quicklime also increased the standard proctor density optimum moisture content by 4% - from 17% without lime to 21% with lime. The effective change – a 7% decrease in moisture content.

Carmeuse Lime Plant Locations: Eastern and Central US and Canada

For more information about a Carmeuse Lime plant near you call:

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