



# LIME APPLICATION METHODS

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## Introduction

High calcium lime is widely used for the modification and stabilization of subgrades composed of fine-grained soils. Lime is available in a variety of forms and may be applied using several methods.

## Project Objective

This report contains the results of a study on the mixing of different forms of lime with two soils in a laboratory and field settings.

## Project Description

The forms of lime used in the lab were quicklime, dry hydrated lime, and slurries made from each of these dry products. For the field evaluation two sites with two different soils were selected. At each site quicklime was applied using a vane spreader (best technology) and spreading of a windrow of dumped lime with a blade (oldest technology). Slurry produced on site from slaked quicklime was used for the third subsection.

## Project Results

Results from the laboratory evaluation showed the form of lime added to the soil appears to have little effect on the moisture-density relationship under completely mixed conditions. Swelling was minimal for all lime treated samples however pH testing showed the amount of lime added to the Paola South test section was too low to achieve true stabilization, based on low unconfined strengths and pH testing. This is likely a result of the use of a single statewide specification for the amount of lime to be used.

Field results showed that changes in the lime application method appeared to have a limited to negligible affect on the strength of the subgrades. Proper control of moisture and mixing, and adding sufficient lime for stabilization, had a greater impact on subgrade properties. The results suggest that long term strengths are similar, if not greater for lime treated soils compacted well above optimum than those soils compacted at or near optimum moisture.

The number of passes made over the subgrade during the mixing process made a substantial difference in the unconfined compressive strength of the samples, even after four passes. Remixing and re-compaction after mellowing also resulted in a significant improvement in strength and contributed to the breakdown of remaining soil lumps.

During application and mixing of the quicklime it was observed that significant amounts of lime dust were blown into the surrounding environment. Blowing lime presents some health and visibility risks to construction personnel and nearby traffic, and represents the loss of some product. No blowing dust was produced during the application of slurry. Due to the potential hazards presented by blowing lime dust, it is recommended that slurry be specified for projects in sensitive areas.

## Report Information

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