



NEWSLETTER



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Cement Shortage Alters Site Stabilization Approach

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Due to the huge increase in central Ohio construction and limited cement availability nationwide, the cement products used for site stabilization are projected to be in short supply throughout 2023.

Developers that typically rely on cement stabilization to obtain stable subgrades and retain stability throughout construction during wet seasons, will need to consider other options.

[Four options to achieve appropriate subgrade stabilization.](#)

Various subgrade stabilization techniques were used for many years before soil stabilization with cement became such a popular solution. These approaches to achieving appropriate soil stability and compaction will likely be counted on more frequently until cement shortages resolve.

1. Remove and replace:

- Soils with excessive moisture content are excavated and replaced with controlled fill material, commonly imported stone.
- While this works well for small areas, there are usually more cost-effective strategies for larger areas.





2. Mechanical aeration and re-compaction:

- This non-chemical approach involves aerating site soils with excavation or tillage equipment then allowing the soil to naturally air-dry to “optimum” moisture conditions prior to compacting.
- Opportunity to control the project schedule is limited by weather conditions and humidity.

3. Chemical drying:

When air drying is not feasible, the addition of materials such as lime and LKD (lime-kiln-dust) is used to speed up the soil drying process and improve the workability and constructability of the soils.

- **Soil modification** is the term used to describe the use of lime and LKD in relatively low percentages.
 - ▶ Soil modification typically utilizes between 1% and 4% chemicals (by dry weight of soil); it normally takes less lime than LKD to realize similar moisture content and textural changes. A good rule of thumb is 1% lime for each 2% moisture change desired.
 - ▶ It provides an economical solution to dealing with wet site conditions to allow construction to stay on track during traditionally wet seasons.



Soil modification typically adds lime or LKD to speed up the soil drying process.



The option to use soil stabilization is limited due to current cement shortages.

- Note that **soil stabilization** uses the same construction process as soil modification and some of the same additives in higher concentrations, but the applications are quite different.
 - ▶ Soil stabilization creates a structurally enhanced layer which is an engineered product that is designed to meet exact specifications.
 - ▶ While soil modification can be used as a solution for wet soils, the use of soil stabilization must be determined early in the design process so appropriate specifications are developed.



4. Geogrids and geofabrics to bridge over or reinforce soft soils.

When working to stabilize or compact wet soils, geofabrics or geogrids are synthetic materials used to enhance soil separation and stabilization qualities.

- **Separation** – geogrid material placed between excessively wet or soft subgrade soils and the base course of stone will preserve the integrity of the separate layers.
- **Stabilization** – high-strength geogrids can help bridge wet or soft subgrade soils and allow compacted fill placement by spreading out the stresses.



Geogrids enhance soil separation and stabilization qualities.

What to expect this year:

1. Product availability will determine what options are available.

Developers and contractors will need to make decisions based on the cost and availability of:

- Cement
- LKD, lime and other chemical additives
- Geogrids or geofabrics suitable for the project's specifications and site conditions

2. Budget and schedule impacts vary with each approach.

A contractor accustomed to achieving and maintaining a stable building pad and parking areas throughout construction by using soil stabilization, may not have that option due to cement shortages. Depending on the site, moisture, and time of year, switching to alternative methods could result in:

- A lot more fixing of soft spots during wet times
- Less cost in the front end, but much more cost for fixes later in the project
- More time needed later in the project schedule, as crews repairing the pad will have to work around walls, utilities, and other completed construction





3. GCI has the tools to help expedite decision-making.

New software and testing developments have made it easier to manage the variabilities of alternative methods.

- GCI's in-house soils lab's testing program determines the actual amount of cement, lime or LKD needed to reach specified strength/stability based on the exact soil on a particular site. This specificity provides developers with more accurate budget numbers.
- The leading geosynthetic manufacturers provide GCI's engineers with software that tracks product availability and helps perform an economic analysis to determine which approach is more cost effective. Now instead of waiting days to track down info, GCI's engineers can provide clients with same-day answers.
- GCI's technicians provide in situ testing in the field to test the subgrade strength's starting point. Basing calculations on actual field conditions means budgets and schedules are built on more accurate assumptions.

Soft, muddy soils make it very difficult to achieve proper compaction requirements, construct building pads and paved areas to grade, or improve subgrades. Achieving stable subgrades without the use of cement is even more challenging, but alternatives are available.

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