

4.9 Subgrade Stabilization Management

Material Control

Description: Lime and other chemicals are used extensively in the North Central Texas region to stabilize pavement subgrades for roadways, parking lots, and other paved surfaces, and as a subgrade amendment for building pad sites. These chemicals are applied to the soil and mixed through disking and other techniques, and then allowed to cure. The objective of subgrade stabilization management is to reduce the potential for runoff to carry the chemicals offsite, where they may impact aquatic life in streams, ponds, and other water bodies.

<p style="text-align: center;"><u>KEY CONSIDERATIONS</u></p> <p>DESIGN CRITERIA:</p> <ul style="list-style-type: none"> • Educate employees on proper procedures • Include procedural controls in stabilization specifications • Limit stabilization operations to that which can be thoroughly mixed and compacted by the end of each workday • Prohibit vehicle traffic, other than water trucks and mixing equipment, from passing over the area being stabilized until mixing is completed • Avoid applications when there is a significant probability of rain that will produce runoff • Roughen areas adjacent and downstream of stabilized areas to intercept lime from runoff • Provide secondary containment according to Section 4.1 Chemical Management for stabilizers stored onsite <p>LIMITATIONS:</p> <ul style="list-style-type: none"> • Prevention of contamination is only effective method • Does not address spill response when discharge occurs <p>MAINTENANCE REQUIREMENTS:</p> <ul style="list-style-type: none"> • Inspect down slope perimeters and outfalls regularly during stabilization operations • Immediately halt operations if a discharge is found and modify procedures to prevent future discharges 	<p style="text-align: center;"><u>APPLICATIONS</u></p> <p>Perimeter Control</p> <p>Slope Protection</p> <p>Sediment Barrier</p> <p>Channel Protection</p> <p>Temporary Stabilization</p> <p>Final Stabilization</p> <p>Waste Management</p> <div style="border: 1px solid black; padding: 2px; text-align: center;">Housekeeping Practices</div>
<p style="text-align: center;"><u>TARGETED POLLUTANTS</u></p> <ul style="list-style-type: none"> ○ Sediment ● Nutrients & Toxic Materials ○ Oil & Grease ○ Floatable Materials ○ Other Construction Wastes 	<p style="text-align: center;"><u>IMPLEMENTATION CONSIDERATIONS</u></p> <ul style="list-style-type: none"> ○ Capital Costs ● Maintenance ● Training ○ Suitability for Slopes > 5% <p>Other Considerations:</p> <ul style="list-style-type: none"> • <i>Chemical management controls for onsite storage of stabilization chemicals</i>

4.9.1 Primary Use

This measure should be implemented when chemicals are required for soil stabilization. Lime is the most commonly used for stabilization and is considered a chemical. Other agents may also be used for subgrade stabilization depending on the soil and site conditions.

4.9.2 Applications

Chemical stabilization can be used under a variety of conditions. The engineer should determine the applicability of chemical stabilization based on site conditions such as available open space, quantity of area to be stabilized, proximity of nearby water courses and other measures employed at the site. The use of diversion dikes and interceptor swales (see appropriate sections) to divert runoff away from areas to be stabilized can be used in conjunction with these techniques to reduce the potential impact of discharges from chemical stabilization.

Management of stabilization chemicals is based on implementing procedures to prevent a discharge. If a discharge occurs, it shall be considered a spill and handled according to the criteria in [Section 4.8 Spill and Leak Response Procedures](#).

4.9.3 Design Criteria

- Construction plan notes or stabilization shall include procedural controls to minimize the discharge of chemical stabilizers.
- The contractor shall limit the amount of stabilizing agent onsite to that which can be thoroughly mixed and compacted by the end of each workday.
- Stabilizers shall be applied at rates that result in no runoff.
- Stabilization shall not occur immediately before and during rainfall events.
- No traffic other than water trucks and mixing equipment shall be allowed to pass over the area being stabilized until after completion of mixing the chemical.
- Areas adjacent and downstream of stabilized areas shall be roughened to intercept chemical runoff and reduce runoff velocity.
- Geotextile fabrics such as those used for silt fence should not be used to treat chemical runoff, because the chemicals are dissolved in the water and won't be affected by a barrier and the suspended solids are significantly smaller than the apparent opening size of the fabric.
- For areas in which phasing of chemical stabilization is impractical, a curing seal (such as Liquid Asphalt, Grace MC-250, or MC-800) applied at a rate of 0.15 gallons per square yard of surface can be used to protect the base.
- Use of sediment basins with a significant (>36 hour) drawdown time is encouraged to capture any accidental lime or chemical overflows when large areas are being stabilized ([Section 3.9 Sediment Basin](#)).
- Provide containment around chemical storage, loading and dispensing areas.
- If soil stabilizers are stored onsite, they shall be considered hazardous material and shall be managed according to the criteria in [Section 4.1 Chemical Management](#) to capture any accidental lime or chemical overflow.

4.9.4 Design Guidance and Specifications

No specification for subgrade stabilization management is currently available in the Standard Specifications for Public Works Construction – North Central Texas Council of Governments.

4.9.5 Inspection and Maintenance Requirements

Subgrade stabilization operation should be observed frequently as the operations proceed for evidence of discharges. Inspect the down slope perimeter and all outfalls for evidence of discharges. Pay particular attention to the outfall of drainage pipes connected to inlets within the area being stabilized. If a discharge is found, immediately halt stabilization operations until additional controls can be implemented.

4.9.6 Example Schematic

The following schematic is an example application of the construction control. It is intended to assist in understanding the control's design and function.

The schematic is **not for construction**. It may serve as a starting point for creating a construction detail, but it must be site adapted by the designer. In addition, dimensions and notes appropriate for the application must be added by the designer.

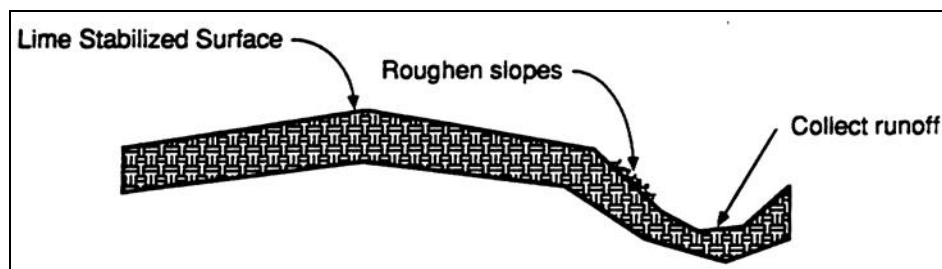


Figure 4.2 Schematic of Controls for Subgrade Stabilization