



LAFARGE

TerraCem™

An Engineered Solution for
Revitalizing Roads and Highways



What is TerraCem™?

TerraCem is a specialized blend of cementitious and other construction materials that allows for more efficient and cost effective stabilization of the road base and subgrade. It is often custom blended for a given project based upon a geotechnical engineer's recommendation.

Benefits of TerraCem:

- Increases energy cost savings through the use of in-situ material
- Strengthens weakened sub-structure layer
- Reshapes roads
- Optimizes use/reuse of material already in place; up to 99% recycled in-situ road and cementitious by-product materials
- Conserves aggregate resources
- Results in up to 40% potential savings compared to conventional "cut-and-fill" methods
- Pre-blended before arriving on site promotes maximum working efficiency
- Blend proportions vary according to specific geotechnical requirements as determined by preliminary testing
- Saves energy and natural resources



Road prior to TerraCem application



Road after TerraCem application

The TerraCem™ Application Process

A typical road rehabilitation



1 Pre-milling / pulverizing the existing road



2 Spreading TerraCem



3 A close look at the spreader spout



7 Vibratory pad-foot compactor followed by the pneumatic version to achieve a smooth top surface



8 Smooth drum compactor for the final finish of the subgrade



9 Finished subgrade now ready for surfacing

The TerraCem™ Advantage

Typical cost comparison

Method	Rate of Production	Capital Cost
Conventional + Chip Seal	1 mile / 11 days	*100%
TerraCem + Chip Seal	1 mile / 1.5 days	50 ~ 60% of Conventional

*Typical local road construction cost as baseline; based upon 3 years of monitored data

Typical maintenance comparison

Method (over design life of 10 years)	Maintenance Costs
Conventional + Chip Seal	*100%
TerraCem + Chip Seal	30% of Conventional

*Typical local road maintenance cost as baseline; based upon 3 years of monitored data



4 A second pass with the reclaimer to blend TerraCem into the soil



5 A grader follows the pulverizer to achieve homogenous mixing



6 Addition of moisture to start the hydration process



10 Oiling down a prime coat to keep the fines



11 Chip sealing



12 Finished surface

TerraCem™ Application Tips

To ensure a successful project

Strengthening and stabilizing subgrade soil with TerraCem

Stabilizing with TerraCem is a simple process whereby a controlled amount of engineered product is applied and then thoroughly blended into the soil. The entire material blend is subsequently graded and compacted. This stabilized section is then ready for the desired wearing surface application, such as an emulsion seal, a chip coat seal, asphalt or concrete.

What primary benefits does TerraCem stabilization bring?

It improves structural integrity and durability. It also provides road dust control and soil drying.

What types of equipment are required?

Essential pieces of equipment include a spreader truck, a reclaimer for blending, a grader, a pad-foot roller, a pneumatic roller, a smooth drum roller and a water truck.

Who controls the work activities?

Ideally, the contractor is in charge of TerraCem application and grading operations, controlling the workflow. Others involved include the material supplier, engineers and other contractors in charge of subsequent surface finishing.

Is the process difficult?

Stabilizing material with TerraCem is easy, however there are some key elements in the process.

Is the sequence of work activities important?

The success of any stabilizing project depends upon having the component activities planned and closely controlled throughout the process. The preferred sequence is as follows:

- Pre-mill the existing surface prior to spreading.
- Spread TerraCem in a predetermined concentration on the pre-milled surface.
- Blend TerraCem and the in-situ material with the reclaimer.
- Add a predetermined amount of water to the mixture to achieve optimum moisture for compactability.
- Compact the blended material with a pad-foot roller in vibratory mode followed by a pneumatic roller and grade the surface to comply with design requirements.

- Complete the final grading and rolling with a steel drum roller.
- The surface is then ready for paving or sealing.

Are there any considerations?

Plan the work and layout for the site before starting. Make sure all equipment operators understand the importance of maintaining control of the operation. Be sure to have an adequate supply of TerraCem on site and en route to the site.

It is important to keep trucks and equipment from running through the newly placed TerraCem. Preserving environmental integrity is crucial. TerraCem will not typically become airborne if left undisturbed once it has been spread.

Since TerraCem undergoes a hydration process when water is added, it is very important to begin the grading operation and compaction as soon as possible. Optimum grading and compaction completion time during warm weather is 3 to 4 hours from the time of optimizing moisture (water application). Beyond this timeframe, achieving good surface results becomes more difficult due to the potential for flocculation.

The contractor should carefully watch the yield of TerraCem during distribution. Pace or measure the remaining work area and estimate volume requirements. It is important to avoid over- or under-treating any of the work areas.

The reclaimer operator must ensure that all areas where TerraCem is distributed are properly mixed or blended. Care must be taken to keep TerraCem out of roadside ditches and off private property. Upon subsequent finish grading and compaction, caution should be taken to ensure that no organic materials, such as grasses or weeds from the roadside, are incorporated into the final blend of TerraCem stabilized subgrade soil.

The information in this document is not intended to be a replacement for a consultation with a Lafarge Cement representative prior to the start of any project.

Please contact your Lafarge Cement representative for specific product information, availability and ordering.

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