soil / gravel stabilizers

Stabilized Aggregate and Soil (other than surfacing)

6.0

Traffic Range:

No limitations on traffic when used for base or subgrade stabilization. These stabilized soils/aggregates are not used as a surfacing material.

Life Expectancy:

Typically more than 20 years and may last for the lifetime of the roadway.

Unit Price:

Material and installation costs can vary by region due to the relative availability of the stabilizer.

Appearance:

Does not significantly alter the appearance of soil/aggregate materials.

Pros:

Increases soil strength; Reduces shrink/swell; Construction expedient for wet soil conditions.

Cons:

Not used as roadway surfacing.

Product Description: Fly ash, lime, and Portland cement are commonly used to stabilize subgrade, subbase, or base materials. These stabilizers can be used to lower the water content of soils, reduce shrink-swell potential, increase workability, and increase soil strength and stiffness.

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Fly Ash

6.1

Spreading fly ash for soil treatment.

Photo Source: Lafarge North America

Traffic Range:

No limitations on traffic when used for subgrade or subbase stabilization. Fly ash-stabilized soils/aggregates are not used as a surfacing material.

Life Expectancy:

Fly ash-stabilized subgrades and base materials will generally last for the lifetime of the roadway.

Unit Price:

Material & Installation: \$2.50 to \$4.50/m^2 (\$2.10 to \$3.80/yd^2) for 200 mm (8 in.) treatment depth. Unit price does not include aggregate/soil cost.

Appearance:

Fly ash does not significantly alter the appearance of soil/aggregate materials.

Pros:

Effective use of a waste byproduct of the coal combustion power industry.

Cons:

Potential leaching of heavy metals; Limited availability in some areas.

Product Description: Fly ash is a residue of coal combustion that occurs at power generation plants throughout the United States. Fly ash can be used to lower the water content of soils, reduce shrink-swell potential, increase workability, and increase soil strength and stiffness.

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Lime

Lime stabilized subgrade material.

Photo Source: FHWA-CFLHD

Traffic Range:

No limitations on traffic when used for subgrade or subbase stabilization. Lime-stabilized soils/aggregates are not used as a surfacing material.

Life Expectancy:

5 to 12 years for low application rates. More than 20 years for higher application rates.

Unit Price:

Material & Installation: \$1.60 to \$2.40/m^2 (\$1.30 to \$2.00/yd^2) for mixing depth of 200 mm (8 in.). Unit price does not include aggregate/soil price.

Appearance:

Lime treatment does not significantly alter the appearance of soil/aggregate materials.

Pros:

Increases soil strength, workability; Construction expedient for wet soil conditions; Widely available.

Cons:

Clay particles required in soil/aggregate; Quicklime is highly reactive.

Product Description: Lime can be obtained in the form of quicklime or hydrated lime. Lime can be used to stabilize clay soils and submarginal base materials. Lime stabilization will increase soil workability and can increase the soil strength and stiffness.

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Lime

Spreading lime treatment on subgrade.

Photo Source: Slurry Pavers Inc.

Mixing lime into subgrade material.

Photo Source: Slurry Pavers Inc.

Portland Cement

Portland cement stabilized base material.

Photo Courtesy of: Golder Associates Inc.

Traffic Range:

No limitations on traffic when used for subgrade or subbase stabilization. Portland cement-stabilized soils/aggregates are not used as a surfacing material.

Life Expectancy:

More than 20 years when used for subgrade or base stabilization.

Unit Price:

Material & Installation: $3.30 to $4.10/$m^2$ ($2.80 to $3.40/$yd^2$) for mixing depth of 150 mm (6 in.).

Appearance:

Cement stabilization does not significantly alter the appearance of soil/aggregate materials.

Pros:

Increases strength of soil/aggregate layer; Widely available.

Cons:

Higher initial cost; Cracking.

Product Description: Portland cement stabilization creates a hard, bound, impermeable layer. Cement-stabilized materials are rarely used as a surfacing material because they can become brittle and crack under traffic loads. Cement-treated soils are most frequently used as a stabilized subgrade or road base.

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