

Subgrade Preparation Type A (Shoulders)	Mile or Station
Aggregate for Subgrade Repair (Class 3)	Ton or Cubic Yard
Common Excavation, Subgrade Repair	Cubic Yard
Water	"M" Gallon

Full compensation for excavation, removal, and disposal of undesirable subgrade material will be paid according to Section 104.03 D. If the Contractor is directed to use backfill material other than "Common Excavation, Subgrade Repair," the backfill material will be paid for at the Contract Unit Price bid for that material.

Excavation and hauling of material from one point to another on the roadbed to adjust the grade line will be paid according to Section 104.03 D.

The cost of removing, stockpiling, and replacing topsoil along the reshaped inslopes will be included in the prices bid for the reshaping and subgrade preparation items.

This payment will be full compensation for all labor, equipment, and materials necessary to complete the work.

## **SECTION 234 STABILIZED SUBGRADE**

### **234.01 DESCRIPTION.**

This work consists of treating the top layer of subgrade with lime or lime-fly ash.

### **234.02 MATERIALS.**

Materials shall meet the following:

<b>Item</b>	<b>Section</b>
Lime	804.02
Fly Ash	820
Water	812

### **234.03 EQUIPMENT.**

Equipment shall meet the following:

<b>Item</b>	<b>Section</b>
General	151.01
Material Hauling Equipment	151.03 B
Water-Hauling Equipment	151.03 A
Tow-Type Pneumatic-Tired Rollers	151.02 A
Self-Propelled Pneumatic-Tired Rollers	151.02 B

### 234.04 CONSTRUCTION REQUIREMENTS.

The roadbed shall be shaped to the cross section shown on the Plans. The roadbed material shall be scarified or disked to a depth of 6 inches, 12 inches, 18 inches, 24 inches, or more as required. Any work that the Engineer requires to be done below a 24-inch depth will be paid according to Section 104.03 D. The bottom 6 inches of the scarified or disked depth shall remain on the roadway, mixed with lime, and worked in place. The subgrade shall be replaced in 6 inch lifts, aerated, mixed with lime or lime-fly ash, and recompact as directed by the Engineer. Section 104.03 B will not apply to lime or lime-fly ash. Any wet or unstable materials below the scarified section shall be corrected as directed by the Engineer.

- A. **Spreading.** The lime or lime-fly ash shall be spread by dry application or slurry at the rates shown on the Plans. The lime and fly ash may be applied together or separately, provided the lime is applied before the fly ash. Both lime and fly ash shall be distributed uniformly without loss of material by wind or other causes. Lime or fly ash shall not be applied by dry application when the wind is 15 mph or greater.

Slurry shall be used in areas adjacent to residential or other developed areas so the lime or lime-fly ash does not damage, discomfort, or be an inconvenience to public or private property. The lime or lime-fly ash shall be premixed with water in approved agitating equipment in proportions so that the "Dry-Solids Content" is at least 30% by weight. Lime or lime-fly ash and water may be similarly proportioned in distributing equipment, provided the equipment contains approved metering devices which accurately meters the quantity of water, lime, or lime-fly ash into the distributing tank to provide positive controls for proper proportioning of the mixture.

All distributing equipment shall provide continuous and adequate agitation until the slurry is applied to the roadbed. The slurry shall be applied through pressurized distributing spray bars. Adequate means of accurately determining distribution of lime or lime-fly ash on each area shall be provided. Each distributing unit shall be provided with a metering device which accurately determine the "Dry-Solids Content" applied to any area, based on the percentage of lime or lime-fly ash in the slurry. The application of lime or lime-fly ash may also be controlled by weight or by measuring and converting to weight each load or partial load applied, and basing the dry-solids content on the percentage of lime or lime-fly ash in the slurry.

The total application of lime or lime-fly ash ordered shall be attained by successive passes of the distributing equipment over a measured area.

The slurry may be applied directly to the scarified or disked subgrade, provided no loss of lime or lime-fly ash slurry is evident and uniform distribution into the soil can be made.

- B. **Mixing.** The lime or lime-fly ash shall be thoroughly mixed with the material to be processed with enough water added to the mixture to maintain not less than optimum moisture content. Mixing shall be accomplished by the use of a rotary mixer. It shall be mixed so that 100% of the material passes a one inch sieve. If the material does not readily mix with the lime or lime-fly ash, it shall be thoroughly mixed, brought to the proper moisture content, and left to cure 24 to 48 hours.

- C. **Compacting and Finishing.** Compaction shall begin immediately after the material has been spread to the specified section. The stabilized subgrade shall be compacted to the density specified in the Plans.

If 6 inches are scarified or disked, the 6 inches shall be compacted until a uniform specified density is obtained. If more than 6 inches are scarified or disked, the top 12 inches shall be compacted until a uniform specified density is obtained.

Subgrade material that can not be compacted to the required stability shall be removed and replaced with approved material. Rocks, roots, and any other material that may interfere with compaction and shaping to grade and cross section shall be removed and disposed of under Section 203.02 D. If the required stability cannot be achieved through manipulation and drying after the subgrade is scarified to the required depth, the Engineer will determine what further subgrade work is necessary.

When imprints from equipment are left in the finished surface, the surface shall be lightly scarified and recompacted. The moisture content of the surface material must be maintained at its specified optimum during all finishing operations.

The Engineer may suspend the work if instability of the subgrade is caused by frost or excess moisture. A suspension for these reasons shall not constitute a basis for a claim for payment of any Contractor losses.

Mixing shall not be performed after October 1 and shall not be resumed in the spring until the ground is frost free.

- D. **Curing.** The completed surface of the treated subgrade shall be kept in a continuously moist condition until an application of bitumen is applied to the surface as a protective cover to prevent moisture loss.

Liquid Asphalt for curing shall be applied according to Section 401.

#### **234.05 METHOD OF MEASUREMENT.**

- A. **Lime or Lime-Fly Ash Treated Subgrade.** Lime Treated Subgrade or Lime-Fly Ash Treated Subgrade will be measured by the Square Yard or Mile. At any given area, only one of the Treated Subgrade bid items will be paid, unless a second depth is specified by the Engineer. When a second depth of treatment is ordered, payment will be made for both the first and the second depth of "Lime or Lime-Fly Ash Treated Subgrade" at the price bid.

Cost associated with scarification and recompaction of the subgrade will not be paid separately but shall be included in the price bid for "Lime or Lime-Fly Ash Treated Subgrade."

- B. **Lime.** Lime will be measured by the Ton.
- C. **Water.** Water will be measured under Section 216.
- D. **Liquid Asphalt.** Liquid Asphalt will be measured under Section 109.
- E. **Fly Ash.** Fly Ash will be measured by the Ton.

**234.06 BASIS OF PAYMENT.**

Payment will be made at the Contract Unit Price for the following:

<b>Pay Item</b>	<b>Pay Unit</b>
Lime Treated Subgrade ____ inches	Square Yard or Mile
Lime-Fly Ash Treated Subgrade ____ inches	Square Yard or Mile
Hydrated Lime	Ton
Fly Ash	Ton
Water	M. Gallons
Liquid Asphalt for Curing	Gallons

This payment will be full compensation for all labor, equipment, and materials necessary to complete the work.