SECTION 9
LIME STABILIZATION

9.01 DESCRIPTION

Lime stabilization shall conform to Section 24 of the State Standard Specifications except as noted herein.

9.02 MATERIALS

Materials to be lime stabilized shall be clayey soils free of rubble, rubbish, and vegetation and shall be tested by the Contractor at his expense and approved by the City Engineer prior to commencement of lime treatment operations.

Lime shall be high-calcium or dolomitic quicklime conforming to the definitions in ASTM Designation C51. When sampled by the City Engineer from the lime spreader or during the spreading operations, the sample of lime shall conform to the following requirements:

High-calcium quicklime shall contain not less than one hundred and thirteen percent (113%) calcium hydroxide $Ca(OH)_2$, as determined by California Test Method 414.

Dolomitic quicklime shall contain less than fifty-seven percent (57%) calcium oxide, CaO, and not less than ninety-five percent (95%) combined calcium oxide, CaO, and magnesium oxide, MgO, as determined by California Test 404.

A Certificate of Compliance in accordance with the provisions in Section 6-107 of the State Standard Specifications shall be furnished with each delivery of lime and shall be submitted to the City Engineer with a certificate copy of the weight of each delivery.

Water for use in subgrade stabilization shall be clean and potable and shall be added during mixing, remixing and compaction operations, and during the curing period to keep the cured material moist until covered.

9.03 PREPARING MATERIAL

The minimum depth of lime treatment shall be twelve (12) inches. The material to be treated shall contain no rocks or solids larger than one and one-half inches (1-1/2" inches) in maximum dimension. Removing and disposing of rocks or solids larger than 1-1/2 inches in maximum dimension shall be the sole responsibility of the Contractor.

9.04 MIXING

The rate of spread per linear foot of blanket shall not vary more than five percent (5%) from the designated rate.

Mixing equipment shall be equipped with a visual depth indicator showing mixing depth, an odometer, or foot meter to indicate travel speed and a controllable water additive system for regulating water added to the mixture.

Mixing equipment shall be the type that can mix the full depth of the treatment specified and leave a relatively smooth bottom of the treated section.

Mixing and re-mixing, regardless of equipment used, will continue until the material is uniformly mixed (free of streaks or pockets of lime), moisture is at least two percent (2%) over optimum and the mixture complies with the following requirements:

Sieve Size	Minimum Percent Passing
1-1/2" inches	100
1" inch	95
No. 4	60

The entire mixing operation shall be completed within seventy-two (72) hours of the initial spreading of lime, unless otherwise approved by the City Engineer.

9.05 SPREADING AND COMPACTING

In lieu of construction joints, the Contractor may mix three (3") inches into the previous day's work to assure a good bond to the adjoining work provided that the lime treatment operation is being performed using cross shaft rotary mixers as determined by the City Engineer.

The lime treated soil shall be compacted to a relative compaction of not less than 95%, unless otherwise approved by the City Engineer.

9.06 CURING

The surface of each compacted layer of lime-treated material shall be kept moist until covered by a subsequent layer of lime-treated or other material for a period not to exceed three (3) days or by applying a curing seal immediately following final trimming and rolling of the lime-treated layer.

Curing seal shall be applied at a rate of 0.15 gallons per square yard of surface.

No traffic of any kind will be allowed on the grade for a minimum of 3 days (72) hours following application of the curing seal.

Asphalt concrete shall not be placed within seven (7) days following application of the curing seal, unless otherwise approved by the City Engineer.

9.07 TESTING AND OBSERVATION

All lime-treatment of the subgrades shall be tested and observed by the Geotechnical Engineer serving as the representative of the City Engineer. This does not preclude testing by the design Engineer and shall be at the City Engineers discretion. Field density tests shall be made by the Geotechnical Engineer after the completion of the final compaction of the treated soils, prior to application of the curing seal.

Lime-treatment shall not be performed without the notification or approval of the City. The Contractor shall notify the City in writing at least two (2) working days prior to commencement of lime treatment.

No deviations from the specifications shall be made except upon written approval from the City Engineer.

9.08 PAYMENT OF FEES AND RELATED COSTS

The Developer/Contractor shall pay all fees incurred by the City in the retaining of a Geotechnical Engineer and/or City staff time related to lime treatment design and/or inspection requirements.