

SECTION 24

LIME TREATMENT

Lime treatment shall conform to the requirements of Section 24 of the Caltrans Standard Specifications and these City Standard Specifications.

24-1.04 Mixing. - Mixing lime shall be added to the material to be treated at the rate of 3 to 7 percent of lime by weight of dry material. Lime slurry shall not be used.

24-1.05 Spreading and Compacting. - The finished thickness of the lime treated material shall not vary more than 0.05-foot from the thickness shown on the plans at any point. The finished surface shall not vary from the planned grade more than 0.02-foot for base grade when tested with a 12-foot straight edge applied parallel with and at right angles to the center line or base of the section.

Unless otherwise specified the lime-treated base shall be constructed on a Class 'A' Subgrade. If approved by the Engineer, the Class 'A' Subgrade may be waived, when at the Contractors expense, the thickness of the lime-treated base section is increased a minimum of 3" from the originally specified lime-treated base section.

When California Test Method 216 Part II is used to determine the relative compaction, the sample of lime-treated soil used to determine the maximum wet density will be taken during all initial and final compaction testing with California Test Method 231, or as directed by the Engineer.

The lime-treated soil shall be compacted to a relative compaction of not less than 95%. At the option of the Engineer the relative compaction may be reduced to 93% if the lime content is increased by 0.5%, at the Contractor's expense.

Initial compaction shall begin within 24 hours of final mixing, unless otherwise permitted by the Engineer.

Trimings will not be used to fill low grade locations, or be used for other items of work, unless as permitted by the Engineer. Submittals to the Engineer shall include proposed methods of handling, and tests results conducted by an independent laboratory showing conformance with the project specifications, and all design test requirements.

Delete Paragraph 5 in Section 24-1.05 of the Caltrans Standard Specifications.

24.1.06 Curing. - In keeping the lime treated material moist, it shall be sprinkled, not flooded. If washing away of the lime is evident as tested by phenolphthalein, additional lime and remixing of the top 6" of the section will be required to compensate for the washout.

24-1.07 Measurement. - Lime treatment will be paid for based on square yardage. Lime quantity for treatment will be included in this bid item, unless otherwise provided.

When separate payment for lime is specified, it will be measured by the ton in accordance with the provisions in Section 24, "Measurement of Quantities," except that if the minimum relative compaction is reduced to 93 percent, the quantity of lime to be paid for will be the weight of lime used multiplied by the

factor $L/(L+.5)$ where L equals the percent of lime ordered by the Engineer as shown in the schedule of quantities for the project.

SECTION 25

AGGREGATE SUBBASES

25-1.01 Description. - Aggregate subbases shall conform to the requirements of Section 25 of the Caltrans Standard Specifications and these City Standard Specifications.

25-1.02 Materials. - The use of recycled Portland cement concrete or asphalt concrete materials will be permitted, provided that the Contractor submits to the Engineer, laboratory test data that the proposed materials meet all the quality requirements of this section and the Engineer approves its use in writing. Data shall be submitted at least 30 days prior to expected use of the proposed materials in the work. Samples of proposed materials shall be submitted if requested by the Engineer.

25-1.02A Class 1, Class 2, and Class 3 Aggregate Subbases. - Delete the last 4 paragraphs of this subsection.

If no class is specified on the plans or in the special provisions, Class 1 shall be used.

25-1.03 Subgrade. - Delete this subsection. Subgrade preparation shall be as specified in Section 21 of these City Standard Specifications.

25-1.05 Compacting. - Relative compaction shall be determined in accordance with California Tests 216, Part II and 231.

The surface of the finished subbase shall not vary more than 0.08-foot above or below the planned grade at any point and the thickness shall not vary more than 0.08 foot from the thickness shown on the plans at any point. Surfaces will be tested by a 16-foot straight edge applied parallel with and at right angles to the roadway centerline. The Contractor shall furnish the straight edge for the Engineer's use, and it shall be of a type and in a condition approved by the Engineer.

25-1.06 Measurement. - Quantities of aggregate subbase to be paid for by the square yard will be calculated on the basis of the dimensions shown on the plans adjusted by the quantity of any change ordered. No allowance will be made for aggregate subbase placed outside such dimensions unless ordered by the Engineer.

25-1.07 Payment. - Quantities of aggregate subbase will be paid for at the contract price per appropriate unit of measurement, whichever unit is designated in the contract item, for the class or classes involved.

SECTION 26

AGGREGATE BASES

Aggregate bases shall conform to the requirements of Section 26 of the Caltrans Standard Specifications and these City Standard Specifications.

26-1.01 Description. - Aggregate base classes are 1, 2, and 3 as specified in Subsection 26-1.02. The classes of aggregate base to be used in the work will be designated on the plans or in the special provisions.

26-1.02 Materials. - The use of recycled asphalt concrete and Portland cement concrete materials will be permitted provided that the Contractor submits to the Engineer certified test data that the proposed material meets all the quality requirements of this section and the Engineer approves its use in writing. Data shall be submitted at least 30 days prior to expected use of the proposed material in the work. Samples of proposed materials shall be submitted if requested by the Engineer.

26-1.02A Quality Requirements. - All classes of aggregate base shall be clean and free from vegetable matter and other deleterious substances, and shall be of such nature that it can be compacted readily under watering and rolling to form a firm, stable base.

Aggregate base shall conform to the quality requirements as specified in Table 1 for classes indicated. All classes of aggregate base shall have a maximum percentage of wear of 50 as determined by California Test 211, and a minimum Durability Index of 25 as determined by California Test 229 (see Note (c)).

Table 1
Quality Requirements

Class	R-Value Calif. Test 301		Sand Equivalent Calif. Test 217		Crushed Particles % Calif. Test 205	
	Operating Range	Indiv. Test	Operating Range	Indiv. Test	Operating Range	Indiv. Test
1	-	78	50	45	(a)90	(a)87
2	-	78	30	28(d)	(b)25	(b)23
3	70	68	25	23	-	-

- (a) Percent by weight
- (b) Material retained on the No. 4 USA Standard sieve shall consist of material of which at least 25%, by weight, shall be crushed particles.
- (c) For Class 3 Aggregate Base, the Durability Index requirement of 25 may be waived provided the material is lime treated with not less than 1% high calcium quicklime and has a minimum unconfined compressive strength of 200 psi when tested in accordance with California Test 373 and all other quality requirements met. Method of lime treatment must be approved by the Engineer.

- (d) With the approval of the Engineer, minimum sand equivalent may be reduced to 25 provided, the aggregate base is treated with not less than one half of one percent high calcium quicklime.

26-1.02B Gradation. - The percentage composition of aggregate base shall conform to the gradations as shown in Table 2 for the maximum size as specified on the plans or special provisions, when determined by California Test 202. When there is a difference in specific gravity of 0.2 or more, between the coarse and fine portion of the aggregate or blends of different aggregate, California Test 202 will be modified by California Test 905.

Table 2

USA Std. Sieve Size	Percentage Passing Sieves					
	1-1/2" Max.		1" Max.		3/4" Max.	
	Operating Range	Indiv. Test	Operating Range	Indiv. Test	Operating Range	Indiv. Test
2"	100	100	----	----	----	----
1-1/2"	90-100	88-100	100	----	----	----
1"	----	----	85-100	88-100	100	100
3/4"	50- 85	48- 88	60- 90	58- 93	90-100	88-100
No. 4	25- 45	23- 47	30- 50	28- 53	35- 55	33- 57
No. 30	10- 25	8- 28	10- 28	8- 30	10- 30	8- 32
No. 200	2- 9	1- 10	2- 9	1- 10	3- 9	1- 10

26-1.03 Subgrade. - Delete this subsection. Subgrade preparation shall be as specified in Section 21 of these City Standard Specifications.

26-1.05 Compacting. - Relative compaction shall be determined in accordance with California Tests 216, Part II and 231.

The finished grade of aggregate base, where not controlled by adjacent structures or features, shall not exceed 0.05 foot above or below the planned grade, provided it is uniform and free from sharp breaks. The cross-section of the finished base shall be free from ridges or valleys and be within 0.05 foot above or below the theoretical section shown on the plans at any point on the cross-section. Surfaces will be tested by a 16-foot straight edge applied parallel with and at right angles to the roadway center line. The Contractor shall furnish the straight edge for the Engineer's use, and it shall be of a type and in a condition approved by the Engineer.

Segmented or sheepfoot compactors will not be allowed.

26-1.06 Measurement. - Quantities of aggregate base to be paid for by the square yard will be calculated on the basis of the dimensions shown on the plans adjusted by the quantity of any change ordered. No allowance will be made for aggregate base placed outside such dimensions unless ordered by the Engineer.

26-1.07 Payment. - Quantities of aggregate base will be paid for at the contract price per appropriate unit of measurement, whichever unit is designated in the contract item, for the class or classes involved.

SECTION 27

CEMENT TREATED BASES

Cement treated bases shall conform to the requirements of Section 27 of the Caltrans Standard Specifications. Cement treated bases shall be produced by the plant-mixed method, unless otherwise specified.

SECTION 28

LEAN CONCRETE BASE

28-1.01 Description. - Lean concrete base shall conform to Section 28 of the Caltrans Standard Specifications and these City Standard Specifications.

28-1.06 Spreading, Compacting and Shaping. - Finished surfaces will be tested by a 16-foot straight edge applied parallel with and at right angles to the roadway centerline. The Contractor shall furnish the straight edge for the Engineer's use, and it shall be of a type and in a condition approved by the Engineer.

SECTION 29

TREATED PERMEABLE BASES

29-1.01 Description. - Treated permeable bases shall conform to Section 29 of the Caltrans Standard Specifications and these City Standard Specifications.

29-1.05 Spreading and Compacting Asphalt Treated Permeable Base. - Finished surfaces will be tested by a 16-foot straight edge applied parallel with and at right angles to the roadway centerline. The Contractor shall furnish the straight edge for the Engineer's use, and it shall be of a type and in a condition approved by the Engineer.

29-1.06 Placing, Spreading, Compacting, and Shaping Cement Treated Permeable Base. - Finished surfaces will be tested by a 16-foot straight edge applied parallel with and at right angles to the roadway centerline. The Contractor shall furnish the straight edge for the Engineer's use, and it shall be of a type and in a condition approved by the Engineer.

SECTION 30

DEEP LIFT ASPHALT BASE

30-1.01 Description. - This work shall consist of constructing an asphalt concrete base specified as "deep lift asphalt base" to the lines, grades, and dimensions shown on the plans and in accordance with these City standard specifications.

Deep lift asphalt base is classified by grade as follows:

Grade A - High quality asphalt concrete produced in a batch or drier-drum mixing plant.

Grade B - Asphaltic base mixture as specified in the special provisions.

30-1.02 Materials. -

30-1.02A Grade A. - Grade A deep lift asphalt base shall be Type B 3/4" maximum, medium grading asphalt concrete produced by batch mixing or drier-drum mixing conforming to the provisions of Section 39, "Asphalt Concrete" of these standard specifications.

30-1.02B Grade B. - Grade B deep lift asphalt base shall be of a composition specified in the special provisions, and produced in a mixing plant conforming to the provisions of Section 39, "Asphalt Concrete" of these standard specifications or mixed in place on the roadbed as specified in the special provisions. Grade B may contain Recycled Asphalt Pavement (RAP) that meets the requirements of the special provisions.

30-1.03 Equipment. - Proportioning, mixing, spreading, and compacting equipment shall conform to the provisions of Section 39, "Asphalt Concrete" of these standard specifications and as specified herein.

On contracts where the total amount of asphalt base is 350 tons or less, towed-type pavers may be used with the approval of the Engineer.

All equipment used for spreading and placing base material shall be equipped with a 12-foot straightedge.

30-1.04 Placing. - Deep lift asphalt base shall not be placed when the atmospheric temperature is 50°F or below or when the weather is foggy or rainy unless otherwise allowed by the Engineer. Deep lift asphalt base shall be placed only when the surface is dry and in satisfactory condition. In case of sudden rain, the Engineer may permit the placement of base then in transit from the plant, provided that the subgrade is free from pools of water, and the mixture is laid and compacted at the proper temperature.

Immediately prior to application of prime coat, the subgrade of the area to receive deep lift asphalt base shall conform to the compaction requirements and grade tolerance of Section 21, "Subgrade Preparation," unless otherwise permitted by the Engineer.

Prime coat, tack coat or paint binder shall be applied to the areas to receive deep lift asphalt base in accordance with the provisions of Section 36, "Penetration Treatment" of the standard specifications. Sand cover, where required, shall be

spread over primed areas designated by the Engineer. All loose sand shall be completely removed from the primed grade before placing any additional material thereon.

Deep lift asphalt base shall be spread at a temperature of not less than 260°F nor greater than 310°F and all initial rolling or tamping shall be performed when the sum of the air temperature and the temperature of the mixture is between 300°F and 375°F. Intermediate rolling shall be accomplished while the mix temperature is at or above 180°F. No layer shall be placed over a layer which exceeds 0.25-foot in compacted thickness until the temperature at mid depth, of the layer which exceeds 0.25-foot in compacted thickness, is not more than 160°F.

Deep lift asphalt base course mixtures shall be spread and struck off with approved spreading and placement equipment in accordance with the provisions of Section 39-5 "Spreading and Compacting" of Caltrans Standard Specifications.

Blading equipment, if approved by the Engineer to place deep lift asphalt base course mixtures, shall be operated by only skilled and experienced operators and a qualified grade checker shall accompany each blade.

Towed-type pavers and spreaders, if approved to place deep lift asphalt base course mixtures, shall be towed at a uniform speed for any given setting of the screed or strike-off gate. The hopper shall be kept full of material during paving operation to assure a full, even spread.

In unconfined areas, deep lift asphalt base shall be 0.25 foot minimum and 0.42 foot maximum in compacted thickness. In confined, narrow areas, the thickness may be increased to 0.75 foot, provided the density and surface tolerance of the base is obtained.

30-1.05 Compacting. - After spreading, deep lift asphalt base course mixtures shall be compacted in accordance with the provisions of Section 39-6.03, "Compacting" of these standard specifications.

The completed deep lift asphalt base course shall have an average density of at least 98 percent of the laboratory density, based on the Job-Mix Formula for the asphalt mixture when tested in accordance with California Test 304 and ASTM D1188, California Test 308, or California test 375. The laboratory compacted specimens will be composed of the same materials in like proportions as the job-mix formula.

30-1.06 Surface Tolerance. - The surface of the completed deep lift asphalt base shall be true to line, grade, and cross section and shall be free of ridges, ruts or depressions. The finished surface shall not deviate at any point more than 0.03-foot from the bottom of a 12-foot straightedge applied parallel with, or at right angles to the centerline or base line. Each lift, except base surface lift, placed by a motor grader shall be true to cross section for that lift with a tolerance of not more than 0.05-foot when tested with a 12-foot straightedge in any direction.

30-1.07 Measurement. - Deep lift asphalt base will be measured by the ton of the combined weight of the mixture actually used in the work. The weight of the completed mixture shall be determined as provided for in Section 9-1.01, "Measurement of Quantities" of these standard specifications.

30-1.08 Payment. - Deep lift asphalt base course mixtures will be paid for at the contract unit price per ton.

The above contract price and payment shall be full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing deep lift asphalt base complete in place, as shown on the plans, as specified in these specifications and as directed by the Engineer.