

SECTION 5 SLURRY SEAL

5-01 GENERAL

This work shall consist of mixing and spreading of slurry seal on existing pavement or surface. Slurry seal shall conform to the requirements of Section 37-2, "Slurry Seal," of the Caltrans Specifications, except as modified herein.

5-02 MATERIALS

Slurry seal shall be State Standard Type II.

5-02.01 Asphalt Emulsion

Asphalt emulsion shall be cationic "quick setting" CQS1h grade and conform to Section 94, "Asphaltic Emulsions," of the Caltrans Specifications.

5-02.02 Aggregate

Aggregate shall meet the requirements of a Type II grading and conform to Section 37-2.02C, "Aggregate," of the Caltrans Specifications except as modified herein. Aggregate shall be of sound, durable crushed stone with no round particles, and shall be of volcanic in origin. The percentage composition by weight of the aggregate shall conform to the following gradings:

<u>Sieve Sizes</u>	<u>Percentage Passing</u>
3/8"	100
No. 4	90-100
No. 8	65-90
No. 16	40-70
No. 30	25-50
No. 200	5-15

The composition of dry aggregate in the slurry seal shall be 13% to 18% by weight of the theoretical asphalt content. Rate of application shall be 14 lb. to 16 lb. per square yard.

5-02.03 Additive

Slurry seal shall contain carboxylated polymer latex such as poly-chloroprene-methacrylic acid latex with polyvinyl alcohol or approved equivalent. The amount of latex shall be between two percent (2%) and three percent (3%) by weight of the asphalt residue content. Poly-chloroprene-methacrylic acid latex shall meet the following requirements:

<u>Test</u>	<u>Requirement</u>
Total Solid, % Min.	47
Average Particle Size, μm	0.30
pH at 77°F (25°C)	7
Brookfield Viscosity at 77°F (25°C)	350-500
Mechanical Stability, Min	650

5-03 CONSTRUCTION

5-03.01 Mixing and Spreading Equipment

Mixing and spreading equipment shall be in accordance with Section 37-2.05, "Mixing and Spreading Equipment," of the Caltrans Specifications, and as specified herein.

The slurry seal spreading and mixing equipment shall be equipped with the following:

A burlap drag not shorter than 18 inches or longer than 24 inches in length. The drag shall be replaced when it loses its flexibility.

A calibrated emulsion tank with a stick gauge or other measuring device that allows for quick accurate measurement of the volume.

Gauges or approved means of measurement shall be provided on the equipment so that the proportional rates of aggregate, water and asphalt emulsion can be checked at intervals determined by the Engineer.

5-03.02 Calibration/Demonstration

The Contractor shall calibrate the spreader vehicle(s) to be used on the project to the approved mix design prior to their arrival at the job site, and shall furnish the Engineer a copy of the calibration settings for each vehicle. Thereafter, no adjustments in the aggregate and emulsion settings shall be made without the approval of the Engineer.

The Contractor shall demonstrate the ability to mix and apply slurry in a satisfactory manner and to the approved mix design with each spreader vehicle. The Contractor may not begin work until the ability to apply slurry as specified is demonstrated to the Engineer.

5-03.03 Surface Preparation

Surface to receive slurry seal shall be prepared in accordance with the requirements specified for preparing surfaces to receive asphaltic emulsion as specified in Section 37-2.06, "Placing," of the Caltrans Specifications.

Power sweepers shall be required to sweep from face of curb to face of curb or, for those streets without curbs, between the edges of street pavement. This shall involve a minimum of three passes with a power broom street sweeper (Mobile or equivalent).

Pavement missed by or inaccessible to broom sweepers shall be swept clean by other approved methods. Contractor shall provide whatever compressed air or other approved cleaning methods necessary to remove all dirt and loose material from the pavement.

All existing raised pavement markers and thermoplastic markings shall be removed and disposed of by the Contractor. Said removal shall not occur sooner than 2 days prior to the day that the sealing is performed.

5-03.04 Application and Workmanship

The slurry seal shall be mixed, spread, and placed in accordance with the provisions of Section 37-2, "Slurry Seal," of the Caltrans Specifications, with the following exceptions and additions:

- A. The slurry seal shall not be applied when either atmospheric or pavement temperature is 55 degrees Fahrenheit and falling but may be applied when either the atmospheric or pavement is 45 degrees Fahrenheit and rising. The slurry seal shall not be applied during periods of abnormally high relative humidity. Slurry seal shall not be applied when raining or foggy.
- B. The slurry seal mixture shall not be applied prior to 8:00 A.M. Also, the slurry seal mixture shall not be applied after 1:00 P.M. unless approved by the Engineer. Approval of applications after 1:00 P.M. will only be for the purpose of completing the section of work then underway. Beginning a new section of work after 1:00 P.M. will not be permitted.
- C. The surface shall be fogged with water directly preceding the spreader. The slurry mixture shall be of the desired consistency when deposited on the surface. Total time of mixing shall not exceed four (4) minutes. A sufficient amount of slurry shall be carried in all parts of the spreader at all times so that complete coverage is obtained. No lumping, balling or unmixed aggregate shall be permitted. No segregation of the emulsion and aggregate fines from the coarse aggregate will be permitted. If coarse aggregate settles to the bottom of the mix, the slurry will be removed from the pavement. No excessive breaking of the emulsion will be allowed in the spreader box. No streaks such as caused by oversize aggregate will be left in the finished pavement. Ridges (especially at existing raised pavement markers) and wash-boarding in the finished product will not be allowed.
- D. The slurry seal shall be placed at a rate to produce 14 to 16 pounds of aggregate per square yard for Type II slurry, unless approved by the Engineer prior to start of work. The completed mixture shall be such that the slurry seal mixture has proper workability and will permit traffic flow within one hour after placement without the occurrence of bleeding, raveling, polishing, separation or other distress, and prevent the development of bleeding, raveling, polishing, separation, or other distress within 30 days after its placement.

E. Asphaltic emulsion shall be added at a rate of between 13 to 18 percent by weight of the dry aggregate. The quality of asphaltic emulsion to be used in the slurry seal mixture will be determined from the design asphalt binder content, as approved by the Engineer, and the asphalt solids content of the asphaltic emulsion finished.

F. The slurry seal mixture shall be applied to overlap the lip of gutter; this overlap is not to exceed beyond two inches (2") from the lip of gutter toward the face of curb. On streets that have no concrete curb and gutter, the slurry seal shall extend to the edge of street as designated by the Engineer. Any application or spillage beyond this two-inch limit shall be removed or cleaned up by the Contractor to the satisfaction of the Engineer. Gutter spills shall be cleaned immediately.

G. Longitudinal joints shall be at the crown of the street or at the edge of travel lanes.

H. Neither excessive buildup nor unsightly appearance shall be permitted on longitudinal or transverse joints. Burlap drags shall be used.

I. Approved squeegees shall be used to spread slurry in non-accessible areas to the slurry mixer. Care shall be exercised in leaving no unsightly appearance from handwork.

J. At any time the quality of the mix or workmanship is not to the satisfaction of the Engineer, the job shall be discontinued until a correction is made which is satisfactory to the Engineer.

K. A sand blotter shall be spread at selected intersections and where required by the Engineer, to accommodate pedestrian or vehicular traffic until slurry sets. Sand blotter shall be placed by broadcasting slurry aggregate lightly so not to cause any displacement of wet slurry seal. Sand blotters at intersections shall be swept within 24 hours of placement or sooner if directed by the Engineer.

L. Any traffic control devices (barricades, cones, or signs), which are moved in the process of applying the slurry, are to be returned to a proper position by the Contractor as soon as possible.

M. All areas shall be rolled by a self-propelled, 10-ton pneumatic roller with a tire pressure of 50 psi, equipped with a water spray system. The surfaced areas shall be subjected to a minimum of two (2) full coverage passes by the roller. Rolling should not commence until the slurry has cured enough so that it will not pick up on the tires of the roller but before the slurry has set up.

N. Wheel tracks, footprints, and other undesired markings in the slurry seal shall be repaired to the satisfaction of the Engineer.

O. Treated areas will be allowed to cure until such time as the Engineer permits their opening to traffic.

5-03.05 Finishing and Sweeping

Loose aggregate remaining after the slurry seal has set shall be swept up and disposed of the day after it was placed. All streets shall be reswept two weeks and again six weeks after the completion of the slurry seal to remove any loose aggregate.

5-03.06 Preservation of Property

Immediately preceding the slurry seal application, the Contractor shall cover all grates, slotted manholes, and other appurtenances on and adjacent to the pavement that would allow the entry of the sealing materials; mask with roofing paper, all closed manhole covers, water and gas valve box covers, monuments, monument boxes, etc.; and remove all existing raised pavement markers, thermoplastic pavement markings.

Drainage inlets shall be uncovered and cleaned to the satisfaction of the Engineer as soon as the slurry seal sets. The other surface utilities shall be uncovered and cleaned the following day after completion of the slurry seal at each location. If they are not uncovered within this time frame, no additional seal shall be placed until they are uncovered.

Gutters, curbs, sidewalks, driveways, shoulders and other structures adjacent to the pavement to be slurry sealed shall be cleaned of excess seal to the satisfaction of the Engineer.

5-04 TESTING

Samples of the slurry seal will be taken directly from the slurry unit(s) at a minimum rate of one sample per mixing unit per each day's use. Consistency and residual asphalt content tests shall be made on the samples and compared to the specifications. Tests will be run by the Contractor and at the expense of the Contractor. If any two successive tests on the mix from the same machine fail, the use of the machine shall be suspended. It will be the responsibility of the Contractor, at his own expense, to prove to the Engineer that the problems have been corrected and that the machine is working properly.

When tests for an area indicate that the application is outside the specified limits, then one of the following remedies shall be applied unless approved otherwise by the Engineer:

- A. A deduction shall be made from the bid amount paid per foot yard for the area, or;
- B. The area shall receive an additional slurry seal at the Contractor's expense.