

mechanical equipment, or areas of 1,000 square yards or less and variable width.

Form the grooves in the concrete at an appropriate time while the concrete is still in a plastic state, so that in the hardened concrete, the grooves will be between 0.09 and 0.13 inches in width, and between 0.12 and 0.19 inches in depth. Space the grooves at random intervals between 0.3 and 1.0 inches.

Regardless of the method used to form the grooves, ensure that the grooves are relatively smooth and uniform, and are formed without excessive tearing of the surface and without bringing pieces of the coarse aggregate to the top of the surface.

If the equipment breaks down or experiences mechanical failure, the Contractor may use manual tools for grooving, provided all mixing and placing operations cease until proper repairs are made.

Correct, at no expense to the Department, all individual areas of 50 square yards or larger of the hardened grooved concrete that do not conform to these requirements, by cutting acceptable grooves in the hardened surface with an approved cutting machine or by other approved methods.

H. Edging at Forms and Joints

After the final finish, but while the concrete is still in a plastic state, round the outside edges of the pavement to a 3/4-inch radius. When pavement is formed along a lane line, round the edges to a 1/4-inch radius. Round the edges of the pavement on each side of transverse expansion joints, formed joints, and transverse construction joints to a 1/4-inch radius. Perform edging with an approved edging tool that will produce a well-defined and continuous radius. Eliminate all tool marks formed by the edging tool by brushing to form a texture similar to the burlap drag finish.

501.17 Surface Testing, Pay Factors and Corrective Action

All surface testing and any required corrective work shall be performed as soon as practicable and before sealing joints and opening to traffic.

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A. Surface Testing

As soon as the concrete has hardened sufficiently, the Department will test the pavement surface with a 12-foot straightedge. When the straightedge is placed parallel to the centerline of the pavement, the surface deviation from the lower edge of the straightedge shall not exceed 1/8 inch for mainline and auxiliary lanes and 1/4 inch for ramps.

In addition to the straightedge test, Rainhart Profilograph tests or Roadway Profiler tests of the pavement surface using a 0.1-inch blanking band will be performed on the following pavements:

1. Mainline pavement
2. Auxiliary lanes
3. Ramp sections where the design speed is greater than 40 miles per hour.
 - (a) Test sections shall terminate 100 feet from a stop or slow speed yield condition
 - (b) Test sections shall terminate at the beginning of a superelevation transition into a section not meeting the greater than 40-miles per hour criteria

B. Pay Factors and Required Corrective Action

Payment factors and required corrective actions relative to profile indexes for mainline roadways, auxiliary lanes and high speed ramps shall conform to Table 501.17-1.

Table 501.17-1: Pay Factors & Corrective Action for Mainline Roadways, Auxiliary Lanes, and High Speed Ramps

Profile Indexes	Pay Factor	Corrective Action
<5 inch per mile	105%	None
5 to 9 inch per mile	100%	None
>9 to <12 inches per mile	98%	Grind to 9 inches per mile
12 plus inches per mile	93%	Grind to 9 inches per mile

Payment factors and required corrective actions relative to profile indexes for ramps with posted speeds of 40 MPH or less shall conform to Table 501.17-2.

Table 501.17-2: Pay Factors & Corrective Action for Ramps with Posted Speeds of 40 mph

Profile Indexes	Pay Factor	Corrective Action
<10 inches per mile	105%	None
10 to < 20 inches per mile	100%	None
20 to < 23 inches per mile	98%	Grind to 20 inches per mile
23 plus inches per mile	95%	Grind to 20 inches per mile

Consider high speed ramps between freeways that do not have stop or yield conditions to be mainline pavement.

When the pavement being constructed longitudinally abuts an adjacent pavement constructed under a previous contract, the Department will test the adjacent pavement for smoothness. If the profile index of the existing pavement surface exceeds the above limits, the Department will increase the allowable profile index of the pavement surface being constructed by half the difference between the profile index of the existing pavement surface and the requirements specified in the tables above.

To determine pavement sections where corrective work or pay adjustments will be necessary, the Department will evaluate the pavement in 0.1-mile sections. Correct all areas represented by high points having deviations in excess of 0.4 inch in 25 feet or less and all sections having a Profile Index greater than the threshold for Corrective Action in Tables 501.17-1 and 501.17-2.

After corrective action is complete, the Department will retest and evaluate the pavement.

Perform required corrective work with approved grinding equipment or by removing and replacing the pavement as directed by the Engineer. Any area or section removed shall be no less than 10 feet in length and no less than the full width of the lane involved. When it is necessary to remove and replace a section of pavement, also remove and replace all remaining portions of the slab adjacent to the joints that are less than

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10 feet in length. Perform all corrective work at no cost to the Department.

After the Contractor performs corrective grinding, the Department will test the affected pavement for thickness in accordance with **501.24**.

Establish positive means to remove grinding and grooving residue. Remove solid residue from pavement surfaces before it gets blown by traffic action or wind. Do not allow residue to flow across lanes used by public traffic or into gutters or drainage facilities. Dispose of residue in a manner that will prevent residue, whether in solid or slurry form, from reaching any waterway in a concentrated state.

The Contractor may allow residue to continuously discharge on adjacent roadway slopes or ditches if the Engineer determines that there is sufficient vegetative cover to adequately filter the residue. However, if the Engineer determines that there is not sufficient vegetative cover on the adjacent roadway slopes and ditches to adequately filter the residue, then collect the residue in approved storage tanks and deposit in settling basins, spread over flat vegetated areas, or filter by other means approved by the Engineer.

501.18 Curing

Immediately after completing the finishing operations and as soon as marring of the concrete will not occur, cover and cure the entire surface of the newly placed concrete.

Where curing requires the use of water, ensure that sufficient water is available. Failure to provide a sufficient quantity of one of the curing materials specified in **913**, or lack of water for wet-curing methods, shall be cause for immediate suspension of concreting operations. Do not leave the concrete exposed for more than 30 minutes between stages of curing or during the curing period.

Perform curing according to one of the following methods:

A. Cotton or Burlap Mats

Entirely cover the surface of the pavement with cotton or burlap mats. The mats used shall be of such length (or width) that, as laid, they will extend at least twice the thickness of the pavement beyond the edges of the slab. Place the mats so that the entire surface and both edges of the