

burlap drag, the surface shall be textured by the formation of transverse grooves. The transverse grooves shall be formed by mechanical equipment using a comb made of steel tines, vibrating beam roller, or other approved device. Manual tools such as rakes with spring steel tines may be used on areas inaccessible to mechanical equipment, or 1,000 s.y.(m<sup>2</sup>) or less and variable width.

The grooves shall be formed in the concrete at an appropriate time during the setting of the concrete mixture, so that in the hardened concrete, the grooves will be between 0.09 and 0.13 in.(2 and 3 mm) in width, between 0.12 and 0.19 in.(3 and 5 mm) in depth, and will be spaced at random intervals between 0.3 and 1.0 in.(8 and 25 mm).

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

In the event of mechanical failure or equipment breakdown, manual tools may be used for grooving, provided all mixing and placing operations cease until proper repairs are made.

Any individual areas of 50 s.y.(m<sup>2</sup>) or larger of the hardened grooved concrete which do not conform to these requirements shall be corrected at the Contractor's expense, by the cutting of acceptable grooves in the hardened surface with an approved cutting machine, or by other approved methods.

No direct payment will be made for this work, as all costs necessary to acceptably groove the pavement will be considered incidental to the Contract unit price bid for Portland Cement Concrete Pavement.

(h) Edging at Forms and Joints.

After the final finish, but before the concrete has taken its initial set, the outside edges of the pavement shall be rounded to a 3/4 in.(19 mm ) radius. When pavement is formed along a lane line, the edges shall be rounded to a 1/4 in.(6 mm) radius. The edges of the pavement on each side of transverse expansion joints, formed joints and transverse construction joints shall be rounded to a 1/4 in.(6 mm) radius. Edging shall be performed with a approved edging tool which will produce a well defined and continuous radius. All tool marks formed by the edging tool shall be eliminated by brushing to form a texture similar to the burlap drag finish.

**501.17-Surface Testing, Pay Factors and Corrective Action .** As soon as the concrete has hardened sufficiently, the pavement surface shall be tested with a 12 ft.(3.6 m) 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 in.(3 mm) for mainline and auxiliary lanes or 1/4 in.(6 mm) for ramps.

In addition to the straightedge test, Rainhart Profilograph tests or Roadway Profiler tests of the pavement surface using a 0.1 in.(2.5 mm) blanking band shall be performed on the following pavements:

1. Mainline pavement
2. Auxiliary lanes
3. Ramp sections where the design speed is greater than 40 mph(65 kph).
  - (a) Test sections shall terminate 100 ft.(30 m) 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 mph(65 kph) criteria

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

### **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 the following chart:

<b>Profile Indexes</b>	<b>Pay Factor</b>	<b>Corrective Action</b>
<b>&lt;5 in. per mile(80 mm/km)</b>	105%	None
<b>5 to 9 in. per mile(80 to 144 mm/km)</b>	100%	None
<b>&gt;9 to &lt;12 in. per mile(144 to 192 mm/km)</b>	98%	Grind to 9 in. per mile(230 mm/km)
<b>12 plus in. per mile(192 mm/km)</b>	93%	Grind to 9 in. per mile(230 mm/km)

Payment factors and required corrective actions relative to profile indexes for **ramps with posted speeds of 40 MPH(65 kph) or less** shall conform to the following chart:

<b>Profile Indexes</b>	<b>Pay Factor</b>	<b>Corrective Action</b>
<b>&lt;10 in./mile(160 mm/km)</b>	105%	None
<b>10 to &gt;20 in./mile(160 to &gt;315 mm/km)</b>	100%	None
<b>20 to &gt;23 in./mile(315 to &gt;360 mm/km)</b>	98%	Grind to 20 in./mile(315 mm/km)
<b>23 plus in./mile(360 mm/km)</b>	95%	Grind to 20 in./mile(315 mm/km)

High speed ramps between freeways that do not have stop or yield conditions will be considered mainline pavement. For determining pavement sections where corrective work or pay adjustments will be necessary, the pavement will be evaluated in 0.1 mile(km) sections. All areas represented by high points having deviations in excess of 0.4 in.(10 mm) in 25 ft.(8 m) or less shall be corrected.

After corrective action is taken, the pavement will be retested and evaluated.

When the pavement being constructed abuts an adjacent pavement constructed under a previous contract, the adjacent pavement will be tested for smoothness. If the profile index of the existing pavement surface exceeds the above limits, the allowable profile index of the pavement surface being constructed will be increased by 1/2 the difference between the profile index of the existing pavement surface and the above requirements.

Any required correction shall be performed with approved grinding equipment or by removing and replacing the pavement as directed by the Engineer. Any area or section removed shall not be less than 10 ft(3 m) in length nor less than the full width of the lane involved. When it is necessary to remove and replace a section of pavement, any remaining portion of the slab adjacent to the joints that is less than 10 ft(3 m) in length shall also be removed and replaced. All corrective work shall be performed at the Contractor's expense.

Pavement that requires corrective grinding will be tested for thickness in accordance with **Subsection 501.24** after grinding.

The Contractor shall establish positive means for removal of grinding and/or grooving residue. Solid residue shall be removed from pavement surfaces before being blown by traffic action or wind. Residue shall not be permitted to flow across lanes used by public traffic or into gutters or drainage facilities. Residue shall be disposed of in a manner that will prevent residue, whether in solid or slurry form, from reaching any waterway in a concentrated state.

Residue may be continuously discharged 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 the residue shall be collected in approved storage tanks and deposited in settling basins, spread over flat vegetated areas, or filtered by other means approved by the Engineer.

**501.18-Curing.** In all cases in which curing requires the use of water, the curing shall have prior right to all water supply or supplies. Failure to provide a sufficient quantity of one of the curing materials described under **Section 913**, or lack of water to adequately take care of both curing and other requirements shall be cause for immediate suspension of concreting operations. The concrete shall not be left exposed for more than 1/2 hour between stages of curing or during the curing period. Immediately after the finishing operations have been completed and as soon as marring of the