

**STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION**

**SPECIAL PROVISION
FOR
PCC PAVEMENT GRINDING
WITH INCENTIVE**

JANUARY 20, 2001

I. DESCRIPTION

This work consists of grinding existing concrete pavement to provide a skid resistant surface meeting the specified smoothness requirements.

II. MATERIALS (None Required)

III. CONSTRUCTION REQUIREMENTS

A. GRINDING

- 1. Equipment:** Grinding shall be done utilizing diamond blades mounted on a self-propelled machine designed for grinding and texturing pavement. The equipment shall be such that it will not strain or damage the underlying pavement surface. Grinding equipment that causes ravels, aggregate fractures, spalls, or disturbance of the transverse or longitudinal joints shall not be permitted. Vacuuming equipment for removal of residue and excess water shall be used. Residue and wastewater shall not be expelled on the roadway or shoulder surface.
- 2. Methods and Procedures:** Substantially, the entire surface of the pavement shall be ground and textured until the surface of both sides of the transverse joints and cracks are in the same plane and meet the smoothness required. The finished texture shall be uniform. Extra depth grinding to eliminate minor depressions in order to provide texturing of all the pavement surface is not required. Structures shall not be ground.

The grinding shall be performed in a longitudinal direction. The grinding shall begin and end at lines normal to the pavement centerline within any one ground area. The area ground shall not be left smooth or polished.

The grinding shall result in a parallel corduroy texture consisting of grooves between 0.090 and 0.130 inches wide. The distance between the grooves shall be between 0.060 and 0.125 inches. The peaks of the ridges shall be approximately 1/16 inch higher than the bottom of the grooves.

Adequate cross slope drainage shall be maintained.

The transverse slope of the pavement shall be uniform to the degree that no depressions or misalignment of slope greater than 1/4 inch in ten feet exist when tested with a ten foot straightedge. Straightedge requirements do not apply across longitudinal joints or outside the ground areas.

The Contractor shall establish a positive means for the removal of the grinding and/or grooving residue. Solid residue shall be removed from the pavement surfaces before being blown by traffic action or wind. Residue shall not be permitted to flow across lanes used by public traffic. 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.

The Contractor shall satisfactorily remove grinding material or wastes prior to returning traffic to the roadway. If a significant amount of residue remains after grinding, the Engineer may require flushing be done in a manner and in sufficient quantity to assure that liquids, solids, or other materials produced by the pavement grinding is not deposited on vehicles.

The Contractors proposed method of flushing the roadway should produce acceptable results, which will be based on a driving surface that will not create a nuisance for the public. All costs for flushing roadway shall be incidental to the contract unit price per square yard for "PCC Pavement Grinding".

Residue may continuously flow on adjacent vegetated roadway slopes or ditches within the right-of-way. A flexible drag hose shall be attached to the discharge end of the slurry pipe to minimize splashing of slurry placed on roadway slopes or ditches.

If the Engineer determines that the slurry is going to enter a waterway, drainage facility, or curb & gutter section, the slurry shall be placed in storage tanks and deposited in settling basins, spread over flat vegetated areas, or filtered by other means approved by the Engineer at no additional cost.

B. PROFILOGRAPH TEST

- 1. Equipment:** The Contractor shall furnish and operate an approved 25 foot California style profilograph. The profilograph machine shall consist of a 25 foot rigid truss frame supported upon a multiple system of six wheels at both ends. The trace measurement shall be accomplished with the use of a single 24" diameter wheel, which is offset approximately 3" from the center of the multiple wheel system, for determining both horizontal and vertical measurements. The profilograph (trace) shall be recorded on a scale of one inch equal to twenty-five feet longitudinally and one inch equal to one inch vertically.

A computerized profilograph shall be used. The computer shall smooth the profile using only a third-order Butterworth filter with a cutoff wavelength of 2.0 feet. The computer shall generate a profile index using a 0.2 inch blanking band and shall use a 0.3 inch "bump" (deflection) threshold to identify "must grind" locations.

- 2. Calibration:** Prior to grinding and periodically thereafter, the calibration of the profilograph shall be checked by the Contractor in the presence of the Engineer. The horizontal scale can be checked by running the profilograph over a known distance and scaling the results on the trace. The vertical scale may be checked by putting a board of known thickness under the profile wheel and again scaling the result on the trace. All necessary corrections to the calibration shall be performed prior to using the profilograph.
- 3. Operation:** The profilograph shall be operated at a speed no greater than a normal walk. Two trace passes shall be made in each driving lane, one trace approximately 31" from centerline of the roadway and the other trace approximately 39" from the outside edge of the 12' driving lane. Each trace shall be labeled to show the project, stationing, lane, wheel pass, date ground, date tested, and the name of the operator.

Each trace shall be furnished to the Engineer prior to the Contractor moving on to the next phase of work in the test area. All areas that need to be reground will have the retest results attached to the original tracing.

- 4. Evaluation:** After completion of the grinding and texturing, two profiles will be recorded with the profilograph in each driving lane, one in each approximate wheel path. Determine the average profile index by averaging the two wheel path results in each driving lane. Each lanes average profile index shall be 8.0 inches per mile or less in each 0.1 mile section. Individual bumps in excess of 0.3 inches in 25 feet, as measured by the profilograph, shall be reground and retested, as required by the Engineer. Evaluation consists of determining the average Profile Index to

the nearest 0.1 inch per mile by measuring and summing scallops that appear outside a 0.2 inch blanking band. The profilograph will be furnished and operated by the Contractor.

Unless specified in the plans, there will be no areas excluded from the profilograph evaluation. The contractor will be allowed to mud jack problem areas in order to improve the ride index. Any damage to adjacent concrete pavement that is caused by the contractor performing mud jacking operations on these areas will be repaired by the contractor at no cost to the Department.

The Department will spot check or retest areas it desires, with the Department profilograph. If a discrepancy between the traces exist, the cause of the discrepancy shall be determined and the area rerun if necessary, as determined by the Engineer.

- 5. Incentive Payment:** Sections which exhibit an exceptional riding quality and have an average profile index of less than 5.00 in/mile as measured by the California profilograph, are paid at the unit bid price plus an incentive for each 0.1 mile section according to the following formula:

$$y = ((5.0 - x) \times \$0.10)$$

where y = incentive in dollars per square yard per 12 foot driving lane
where x = average profile index to the nearest 0.1 inch per mile

IV. METHOD OF MEASUREMENT

PCC Pavement Grinding: Measurement will not be made for PCC pavement grinding. The plan quantity will be the basis of payment.

V. BASIS OF PAYMENT

PCC Pavement Grinding: The grinding will be paid for at the contract unit price per square yard. Payment shall be full compensation for grinding the pavement and the profilograph testing.

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