

SECTION 425
DIAMOND GRINDING CONCRETE PAVEMENT

425.01. DESCRIPTION. This work shall consist of grinding portland cement concrete pavement to restore drainage and riding characteristics to the pavement surface. This work shall be accomplished in accordance with these Specifications and in reasonably close conformity to the details shown on the Plans.

425.03. EQUIPMENT. The grinding equipment shall be a power driven, self-propelled machine that is specifically designed to smooth and texture portland cement concrete pavement with diamond blades. The effective wheel base of the machine shall not be less than 3.6 m. It shall have a set of pivoting tandem bogey wheels at the front of the machine and the rear wheels shall be arranged to travel in the track of the fresh cut pavement. The center of the grinding head shall be no further than 0.9 m forward from the center of the back wheels.

The equipment shall be of a size that will cut or plane at least 0.9 m wide. It shall also be of a shape and dimension that does not encroach on traffic movement outside of the work area. Equipment that causes excessive ravels, aggregate fractures, spalls or disturbance of the transverse and longitudinal joints or cracks will not be permitted.

Other equipment may be considered in accordance with Subsection 108.06.

425.04. CONSTRUCTION.

- (a) **Grinding Pavement.** The Plans will designate the areas of pavement surfaces to be ground. Grinding shall be performed in the longitudinal direction so that grinding begins and ends at lines normal to the pavement centerline. The entire area designated on the Plans shall be ground until the pavement surfaces of adjacent sides of transverse joints and cracks are in the same plane. Extra depth grinding to eliminate minor depressions in the pavement to obtain 100% texturing will not be required.

The construction operation shall be scheduled and proceed in a manner that produces a uniform finished surface. Grinding shall be accomplished in a manner that eliminates joint or crack faults, while providing positive lateral drainage by maintaining a constant cross-slope between the edges of grinding operations. Auxiliary or ramp lane grinding shall transition as required from the mainline edge to provide positive drainage and an acceptable riding surface.

1. *Surface Texture and Grooving.* The grinding process shall produce a pavement surface that is uniform in appearance with a longitudinal line type texture. The surface shall have grooves between 2-4 mm wide, spaced up to 3 mm apart. The peaks of the ridges shall be a minimum of 1.5 mm higher than the bottom of the grooves.
2. *Slurry Removal.* The Contractor shall provide positive means for removal of grinding slurry or residue by vacuum or other continuous methods. Slurry shall not be allowed to flow across lanes being used by traffic.
3. *Pavement Smoothness.*

- 3.1. *Profiling Pavement Surface.* All ground surfaces shall be profiled by the Contractor in accordance with ASTM E 1274. The profilograph shall have non-uniformly spaced wheels. Pavement so tested shall have a profile index of 125 mm or less using a 5 mm blanking width. Individual high points in excess of 8 mm, as determined by measurements of the profilograph shall be reduced by grinding, until such high points as indicated by reruns of the profilograph do not exceed 8 mm.

After grinding has been completed to reduce individual high points in excess of 8 mm, additional grinding shall be performed as necessary to reduce the profile index to values specified above in any 0.16 km section along any line parallel with the pavement edge.

Additional grinding shall be performed as necessary. All ground areas shall be neat rectangular areas of uniform surface appearance.

- 3.2. *Straight Edge Tolerance.* The surface may be straightedged, at locations to be determined by the Engineer, with a straightedge 3 meters long. When the straightedge is laid on finished pavement parallel to centerline or normal to the centerline, the maximum distance to the roadway surface from the bottom edge of the straightedge shall not exceed 3 mm at any point. Additional grinding will be required at the locations found in excess of the 3 mm tolerance.

- (b) **Traffic Control.** Traffic control shall be in accordance with the Manual on Uniform Traffic Control Devices. Overnight closure of traffic lanes for the sole purpose of grinding pavement will not be permitted.

- (b) **Weather Limitations.** Pressure grouting shall not be started unless the ambient temperature is at least 2° C and rising; and shall stop if the temperature is 7° C and falling. The temperature of the pavement while pressure grouting shall not be less than 2° C.
- (c) **Coring Holes.** The Contractor shall core 50 mm diameter injection holes through the pavement at locations and depths shown on the Plans. The hole pattern and spacing may be modified by the Engineer. Irregular or unsatisfactory holes which cannot be satisfactorily used in pressure grouting shall be temporarily plugged or filled with grout and not measured for payment and new holes shall be cored. No more holes shall be cored than can be grouted during the same day, unless specific approval is given by the Engineer.
- (d) **Clearing Holes.** After the holes are cored to the depths shown on the Plans, and within 10 minutes of pumping the grout, the holes shall be cleaned of debris to provide a passage for the grout. This shall be done by inserting a pipe nozzle into the holes and applying sufficient water pressure to clean the holes.
- (e) **Grouting.** The grout flow rate while pumping shall be a maximum of 26.5 L/min. at the pump head. The nozzle of the grout discharge hose shall be secured in the hole in a manner that provides a seal adequate to maintain the grout pressure underneath the slab. The nozzle end shall not extend below the bottom of the concrete. Pumping shall continue in a hole until the slab corner is lifted 0.825 to 0.925 mm, or until the pressure gauge in the discharge line indicates a pressure exceeding 414 kPa. If the slab does not lift and there is no pressure buildup, then pumping shall continue until the amount of clear grout flowing up through joints or cracks equal the amount of grout injected. This procedure shall be repeated in other holes until it is indicated that all voids are filled.
- During pumping very close attention shall be given to the lift measuring device to prevent rapid lift of the slabs or substantial raising of the adjacent shoulders. The Contractor shall provide personnel and equipment to satisfactorily control the lift on every slab that is pressure grouted. Temporary plugging of adjacent holes may be required during pumping operations.
- (f) **Permanently Sealing Holes.** All grout shall be removed from the holes and the holes filled with a stiff sand-cement mortar composed of one part portland cement to three parts fine aggregate, by volume, or a commercial quality premixed rapid set mixture. Filled holes that ravel out or become damaged shall be repaired at the Contractor's expense.
- (g) **Regrouting.** If in the judgment of the Engineer a slab may benefit from additional grouting, the Contractor shall regrout any such slab. New holes shall be cored for regrouting as specified by the Engineer.
- (h) **Clean Up.** Deposits of grout on the pavement or shoulders shall be removed and the surface cleaned before traffic is permitted on the completed sections. Other debris, bags, spillage, etc., shall be removed from the right-of-way each day.
- (i) **Opening to Traffic.** Traffic shall be restricted from the grouted slabs for 3 days.

426.05. METHOD OF MEASUREMENT.

- (a) Cored holes will be measured per each hole.
- (b) Portland cement incorporated into the grouting mix will be measured by the metric ton.
- (c) Fly ash incorporated into the grouting mix will be measured by the metric ton.
- (d) Water used in the grout mix will not be measured for payment.

426.06. BASIS OF PAYMENT. The accepted quantities of cored holes, portland cement and fly ash, measured as provided above, will be paid for at the contract unit price for:

(A)	CORED HOLES	EA.
(B)	PORTLAND CEMENT	METRIC TON
(C)	FLY ASH	METRIC TON

which shall be full compensation for furnishing all materials, equipment, labor and incidentals to complete the work as specified.