

12.40 PAVEMENT SURFACE REPAIR

12.41 DIAMOND GRINDING

This instruction establishes uniform inspection procedures for diamond grinding projects. The purpose of diamond grinding is to smooth the pavement, reduce noise, and optimize the friction numbers. See [Appendix 12-9](#) for basic terms and components common to diamond grinding.

Pavement Smoothness

Compliance is evaluated by final profilometer readings. There may be areas that should be exempt because of conditions beyond contractor control. Exempt areas would include panels where maximum cut at mid panel or at a fault has prevented further grinding, and broken or distorted areas. **It is very important that the inspector and the Contractor mutually agree upon and document these areas on a daily basis.**

Odd length segments less than 75 m (250 feet) in length created by exempt areas will be included with adjoining segment when determining compliance.

Testing Equipment

A tire depth gauge and caliper are needed to inspect this work. Calipers can be checked out through the Office of Materials.

Surface Texture

The key to obtaining the desired pavement texture is assembling the grinding head to match the specific pavement being ground. The Contractor is concerned about blade wear and attempts to minimize cost by selecting the blades most suited for a particular pavement. The key to obtaining a good surface texture is primarily in blade spacing and is varied by using different thickness spacers between the individual saw blades. If proper blade spacing is being used, the specified surface texture is easy to obtain. The following should be checked:

Blade segment thickness

With a caliper, measure segment thickness of ten separate blades on the grinding head. Average of the ten readings cannot exceed 3.30 mm (0.130 inch). Blade segment thickness should be checked initially for each machine and then each time a grinding head is changed.

Land area

With a caliper, measure ten representative samples of "chips" or "fins." Average must fall in range specified in [Specification 2532](#) according to the aggregate type. You may be able to measure "chips" left on pavement surface or break off standing "fins" to obtain a sample. Land areas should be checked once per day per machine for each type of aggregate ground. Measurements should not be taken on horizontal curves.

Texture depth

With a tire gauge, measure texture depth at six places across width of grinding head. Depth measurement spot should be visually selected to be representative of texture depth in that portion of grinding head. For pavements, the target depth is 2 mm (1/16 inch). For bridge decks, the target depth is 3 mm (1/8 inch). Depth measurements should be based on an average of a minimum of six measurements across the ground width for one pass. Texture depth should be checked at least twice per day per machine.

Texture depth is a function of land area and aggregate type. **Both land area and texture depth must be in specified ranges to be in compliance.** If texture depth is outside the specified range, the land area should be adjusted within specified range. Insufficient texture will result in reduced longevity of friction number improvement. Excessive texture depth will result in a harsh appearance and some complaints may be received about vehicle handling. Mechanical removal of high fins may be permitted, but is intended for small areas. It is not intended as a loophole for not generally producing the specified texture. If too coarse a texture is being produced, the grinding head needs to be restacked using thinner spacers.

Documentation

The following results require documentation:

- Grinding head checks for blade segment thickness
- Land areas
- Texture depth
- Transverse cross slope of the ground pavement
- Areas excluded from profilograph testing

12.42 NIGHTTIME DIAMOND GRINDING

[Specification 2532](#) states that nighttime work may be required. Any request for nighttime diamond grinding should be favorably viewed by the Project Engineer. This approval shall be in writing and shall include the following nighttime traffic control requirements.

All Roadways

General requirements for nighttime diamond grinding that need to be followed for any roadway include:

- Work site should be sufficiently lighted per current specifications for night work lighting.
- All workers shall wear reflective vests or clothing as required by [Specification 2528](#).
- Work shall progress in the direction with normal traffic in the lane being ground.

Two-Lane Two-Way Roadways

Use [Standard Road Plan TC-214](#) with the following modifications:

- Add Type B high intensity flashing warning lights to "One Lane Road Ahead" and "Flagger" signs
- Flaggers and flagging stations shall be equipped for nighttime flagging per requirements of the Iowa Flagger's Handbook.
- At a crossroad positions, flaggers shall be adjacent to an official vehicle equipped with a flashing light. A "Flagger" sign shall be placed on crossroads 150 m (500 feet) in advance of existing "Stop" signs.

Four-Lane Divided Roadways

Use [Standard Road Plan TC-418](#) with the following modifications:

- Vehicle headlights are not to be used in a manner opposing the direction of traffic flow.
- All vehicles are to use parking lights, flashing lights, or other visible lights that do not glare or confuse motorists per current specifications for night work lighting.

Four-Lane Undivided Roadways

Use [Standard Road Plan TC-419](#) with appropriate applicable provisions of previous categories.