

Diamond Grinding Repairs Concrete Pavement

New research demonstrates the benefits of diamond grinding to rehab pavement

Though diamond grinding has a history of over three decades, documentation validating it as a concrete pavement restoration (CPR) technique was lacking. A new study reviews performance data and makes comparisons with other rehabilitation alternatives.



A close-up of diamond-ground concrete pavement shows the surface texture. (69075)

Applications for Grinding

The following types of distress can be repaired using diamond grinding:

- Removal of transverse joint and crack faulting (most common reason for grinding)
- Smoothing out built-in or construction roughness
- Texturing of a polished concrete surface to improve friction
- Removal of wheelpath rutting caused by studded tire wear
- Reducing noise level caused by tire-pavement interaction
- Removal of permanent upward slab warping at joints
- Improvement of transverse slope to improve surface drainage

Procedure

Diamond grinding involves removing a thin layer (4-6 mm) at the surface of hardened portland cement concrete using closely spaced diamond saw blades. The blade assembly cuts tiny grooves in the pavement surface, providing texture as it smooths down surface irregularities.

Advantages of Grinding

Aside from being quick and effective, grinding offers additional advantages compared to other rehabilitation alternatives:

- Costs much less than an overlay
- Enhances surface friction of the old surface, improving safety
- Causes minimal interference with traffic during repairs

- Allows treating only problem areas
- Does not affect clearance under bridges
- Does not affect hydraulic capacities of curbs and gutters

Effectiveness

Pavement surfaces improved by grinding are generally more smooth than new pavements and there is no evidence of deleterious effects from diamond grinding. The pavement must be in good structural condition. Therefore, other concrete pavement restoration techniques, like full-depth repairs, partial-depth repairs, retrofit edgedrains, and slab stabilization may be required prior to grinding. Pavement grinding repairs generally last 8 to 10 years or longer and the procedure can be repeated up to three times. Grinding is not effective where D-cracking or reactive aggregates are present.

The research concludes that diamond grinding is able to provide a smooth riding surface and extend service life of distressed pavements. In addition, diamond grinding also saves maintenance time and costs, and minimizes congestion while keeping roads operating efficiently and safely.

More information on pavement grinding can be obtained from the International Grooving and Grinding Association at 49 Reed Street, P.O. Box 58, Coxsackie, NY 12051, phone 518.731.7450; and from the American Concrete Pavement Association at 5420 Old Orchard Road, Suite A100, Skokie, IL 60077, phone 847.966.2272.

Reference

Rao, Shreenath, Yu, H. Thomas, and Darter, Michael I., *The Longevity and Performance of Diamond-Ground Pavements*, RD118, Portland Cement Association, Skokie, Illinois, 1999.

Serial No. 2175b