Pavement Preservation

Checklist Series

7 Diamond Grinding of Portland Cement Concrete Pavem

FP2

U.S. Department of Transportation

Federal Highway Administration

Diamond Grinding of Portland Cement Concrete Pavements Checklist

This checklist is one of a series created to guide State and local highway maintenance and inspection staff in the use of innovative pavement preventive maintenance processes. The series is provided through the joint efforts of the Pavement Preservation Program of the Federal Highway Administration (FHWA) and the Foundation for Pavement Preservation (FP^2).

FHWA uses its partnerships with FP^2, the American Association of State Highway and Transportation Officials, and State and local transportation agencies to promote pavement preservation.

To obtain other checklists or to find out more about pavement preservation, contact your local FHWA division office or FP^2 (at www.fp2.org), and check into these Web pages:

www.fhwa.dot.gov/preservation

www.fhwa.dot.gov/infrastructure/asstmgmt/resource.htm

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Preliminary Responsibilities

Document Review

- ❑ Bid/project specifications and design
- ❑ Special provisions
- ❑ Agency requirements
- ❑ Traffic control plan
- ❑ Equipment specifications
- ❑ Manufacturers' instructions
- ❑ Material safety data sheets (if required for concrete slurry)

Project Review

- ❑ Verify that pavement conditions have not significantly changed since the project was designed.
- ❑ Joints and transverse cracks sustaining severe faulting (equal to or greater than 12 mm [1/2 in.]) or displaying evidence of pumping (e.g., surface staining or isolated wetness) are potential candidates for load transfer restoration with dowels prior to diamond grinding. (See *Concrete Pavement Rehabilitation: Guide for Load Transfer Restoration* [FHWA-SA-97-103].)

- ❑ Verify that structural repairs are completed in the proper sequence (see Figure 1).

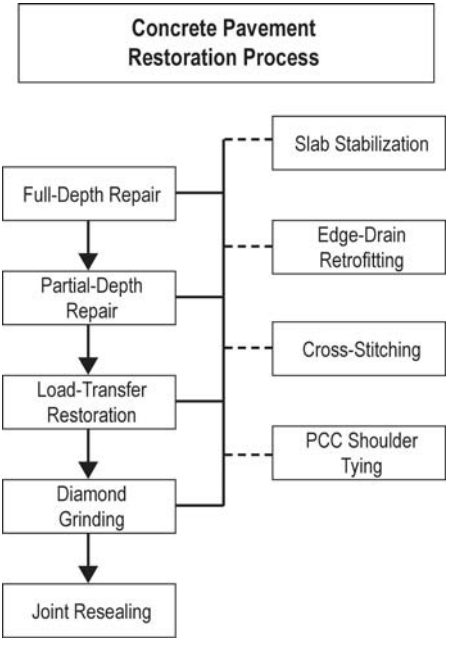


FIGURE 1. Sequence of repairs in the concrete pavement restoration process.

Equipment Inspections

Diamond-Grinding Machine

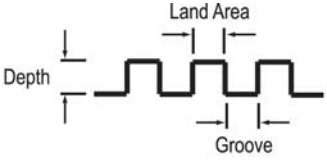
- ❑ Verify that the diamond-grinding machine meets requirements of the contract documents for weight, horsepower, and configuration.
- ❑ Verify that the blade spacing on the diamond-grinding cutting head meets requirements of the contract documents.
- ❑ Verify that the vacuum assembly is in good working order and capable of removing concrete slurry from the pavement surface.

Profilograph or Profiler

- ❑ Verify that the profilograph or pavement profiler meets requirements of the contract documents.
- ❑ Verify that the unit has been calibrated in accordance with manufacturer's recommendations and contract documents.
- ❑ Verify that the profilograph operator meets requirements of the contract documents for training/certification.

Project Inspection Responsibilities

- ❑ Verify that diamond grinding proceeds in a direction parallel with the pavement centerline, beginning and ending at lines normal to the pavement centerline.
- ❑ Verify that diamond-grinding results in a corduroy texture extending across the full lane width and complying with contract documents.
- ❑ Verify that texturing cut into the existing pavement surface is in accordance with texturing requirements presented in the contract documents. Typical values are presented in Figure 2 for reference purposes only. Specific dimensions and tolerances contained in the project documents take precedence over this example.
- ❑ Verify that each application of the diamond-ground texture overlaps the previous application by no more than the amount designated in the contract documents, typically 50 mm (2 in.).
- ❑ Verify that each application of the diamond-ground texture does not exceed the depth of the previous application by more than the amount permitted in the contract documents, typically 6 mm (1/4 in.).



	Tolerance	Hard Aggregate (Typical)	Soft Aggregate (Typical)
Groove	2.0 – 4.0 mm	2.5 – 4.0 mm	2.5 – 4.0 mm
Land Area	1.5 – 3.5 mm	2.0 mm	2.5 mm
Depth	1.5 mm	1.5 mm	1.5 mm
Grooves/ Meter	164 – 194	174 – 194	164 – 177

(Note: 25.4 mm = 1 in)

FIGURE 2. Diamond grinding and grooving terminology and requirements.

- ❑ Verify that the transverse slope of the ground surface is uniform to the extent that no misalignments or depressions that are capable of ponding water exist. Project documents typically have specific measurable criteria for transverse slope that must be met.
- ❑ Verify on a daily basis that diamond-ground texture meets smoothness specifications.
- ❑ Verify that concrete slurry is adequately vacuumed from the pavement surface and is not allowed to flow into adjacent traffic lanes.

- ❑ Verify that the grinding residue is not discharged into a waterway, a roadway slope within 61 m (200 ft) of a waterway, or any area forbidden by the contract documents or engineer. Concrete slurry from the grinding operation is typically collected and discharged at a disposal area designated in the contract document.

Weather Requirements

- ❑ Air and/or surface temperature should meet minimum agency requirements (typically 2 °C [35 °F] and rising) for diamond-grinding operations in accordance with contract documents.
- ❑ Diamond grinding shall not proceed if icy weather conditions are imminent.

Traffic Control

- ❑ Verify that signs and devices match the traffic control plan presented in the contract documents.
- ❑ Verify that the setup complies with the Federal *Manual on Uniform Traffic Control Devices* or local agency traffic control procedures.
- ❑ Verify that the repaired pavement is not opened to traffic until all equipment and personnel have been removed from the work zone.
- ❑ Verify that signs are removed or covered when they are no longer needed.
- ❑ *Verify that any unsafe conditions are reported to a supervisor (contractor or agency).*

Common Problems and Solutions

(Problem: Solution)

- ❑ Concrete fins fail to break off: Reduce the spacing between the blades.
- ❑ Light vehicles and motorcycles experience vehicle tracking: Reduce the spacing between the blades.
- ❑ Some areas are left without diamond-ground texture: If the untextured area exceeds project specifications, regrind it.
- ❑ Large amounts of concrete slurry are left on pavement surface: Stop grinding operations and check the vacuum unit and skirt surrounding the cutting head.

Sources

Information in this checklist is based on or refers to the following sources:

- ❑ *Concrete Pavement Rehabilitation: Guide for Diamond Grinding*. Pub. No. FHWA-SRC 1/10-01(5M). 2001. Atlanta, GA: Federal Highway Administration, Southern Resource Center. Available at www.fhwa.dot.gov/pavement/concrete/diamond.cfm.
- ❑ *Concrete Pavement Rehabilitation: Guide for Load Transfer Restoration*. Pub. No. ACPA JP001P / FHWA-SA-97-103. 1997. Washington, DC: Federal Highway Administration. Available at www.pavement.com.
- ❑ "Diamond Grinding and Concrete Pavement Restoration," *Concrete Paving Technology*. Pub. No. TB008P. 2000. Skokie, IL: American Concrete Pavement Association. Available at www.pavement.com.
- ❑ *Longevity and Performance of Diamond-Ground Pavements*. Pub. No. RD118T. 1999. Skokie, IL: Portland Cement Association. Available at www.pavement.com.
- ❑ *Longevity and Performance of Diamond-Ground Pavements*. Pub. No. IS522P. 2002. Skokie, IL: American Concrete Pavement Association. Available at www.pavement.com.
- ❑ *Manual on Uniform Traffic Control Devices.* 2003. Washington, DC: Federal Highway Administration. Available free at http://mutcd.fhwa.dot.gov.

For more information on the Pavement Preservation Checklist Series, contact:

Construction and System Preservation Team
Office of Asset Management
Federal Highway Administration, HIAM-20
U.S. Department of Transportation
400 Seventh Street, SW, Room 3211
Washington, DC 20590
E-mail: preservation@fhwa.dot.gov
Telephone: 202-366-1557

National Center for Pavement Preservation
Michigan State University
2857 Jolly Road
Okemos, MI 48864
E-mail: galehou3@msu.edu
Telephone: 517-432-8220
www.pavementpreservation.org

Foundation for Pavement Preservation
8613 Cross Park Drive
Austin, TX 78754
E-mail: fppexdir@aol.com
Telephone: 866-862-4587 (toll free)
www.fp2.org

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