Pavement Preservation
Checklist Series

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Longitudinal Diamond Grooving of Portland Cement Concrete Pavements

U.S. Department of Transportation
Federal Highway Administration

Longitudinal Diamond Grooving of Portland Cement Concrete Pavements Checklist

This checklist is one in a series created to guide State and local highway preservation/maintenance and inspection staff on the use of innovative pavement preservation techniques.

FHWA uses its partnerships with different pavement preservation organizations including 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 check the following FHWA Web page:

www.fhwa.dot.gov/pavement/preservation/resources.cfm

Other valuable resources on pavement preservation:

- www.acpa.org
- www.cement.org
- www.cptechcenter.org
- www.igga.net

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Preliminary Responsibilities

Document Review

- ☐ Bid/project specifications and design
- ☐ Special provisions
- ☐ Staging requirements
- ☐ Traffic control plan
- ☐ Slurry disposal requirements
- ☐ See sources

Project Review

- ☐ Verify that pavement conditions have not significantly changed since project design.
- ☐ Ensure broken or rocking slabs are repaired/replaced prior to diamond grooving.
- ☐ Verify that other pavement repairs are conducted prior to diamond grooving, except for joint sealing.
- ☐ Verify that construction phasing/staging allows for grooving placement at all required locations.

Equipment Inspections

- ☐ Verify that diamond-grooving equipment meets contract requirements and uses multiple diamond blades mounted on a self-propelled machine designed for diamond grooving concrete pavement and bridge decks.

- ☐ Verify that grooving equipment has a depth control device enabling adjustment of the cutting head height to maintain specified groove depth.
- ☐ Verify that grooving equipment has the capability to maintain alignment to the center of the roadway.
- ☐ Verify that grooving equipment can install grooves to the dimensions and spacing designated in the plans.
- ☐ Verify that grooving equipment has a positive means of vacuuming the grinding residue from the pavement surface, leaving the surface in a clean, near-dry condition.
- ☐ Verify that blade spacing on the diamond grooving head meets contract requirements and can produce the desired groove width, spacing, and depth.

Weather Requirements

- ☐ Air and/or surface temperature should meet minimum agency requirements (typically 35°F and rising) for diamond-grooving operations.
- ☐ Diamond grooving 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 *Manual on Uniform Traffic Control Devices (*MUTCD).
- ☐ Verify that the grooved pavement is not opened to traffic until all equipment and personnel have been removed from the work zone and the pavement is clean and safe for traffic.
- ☐ 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).

Project Inspection Responsibilities

- ☐ Ensure that diamond grooving proceeds in a direction parallel with the pavement centerline, beginning and ending at lines normal to the pavement centerline.
- ☐ Verify that the grooving equipment does not cause raveling and produces neat vertical saw cut groove faces.
- ☐ Verify that the construction operation proceeds in a manner that produces a neat, uniformly grooved surface across the full roadway width. (Note: Grooving often terminates at the shoulder stripe.)

- ☐ Grooves should not be allowed to overlap an existing longitudinal joint. (Note: Grooves are typically not cut closer than 3 in. and no more than 6 in. away from longitudinal joints.)
- ☐ Verify that each application of the diamond grooving does not overlap the previous application and maintains the specified groove spacing, typically, ¾ in.
- ☐ Verify that proper groove width is obtained, typically ⅛ in., and is uniform throughout the project.
- ☐ Verify that groove depth conforms to project specifications, typically ¼ in., and is uniform throughout the project.
- ☐ Verify that concrete grooving slurry is adequately vacuumed from the pavement surface and is not allowed to flow into adjacent traffic lanes.
- ☐ Verify that grooving residue is not discharged into a waterway, a roadway slope within 100 ft of any natural stream, or lake or within 3 ft of a water-filled ditch. Concrete grooving slurry is collected and discharged at a disposal area designated in the contract document.

Common Problems and Solutions

(Problem: Solution)

Incorrect Groove Spacing Exists:

- ☐ Stop immediately and restack head to attain proper groove spacing.

Incorrect Groove Width Exists:

- ☐ Stop immediately and restack head to attain proper groove width.

Improper Groove Depth Is Obtained:

- ☐ Stop immediately and set groove depth to correct value.

Groove Alignment Does Not Parallel Centerline:

- ☐ Stop immediately and align equipment to produce the correct alignment.

Concrete Is Raveling:

- ☐ Replace blades with blades that better match the grooving conditions.

Roadway Profile Is Such That Consistent Groove Depth Cannot Be Obtained:

- ☐ The surface should be diamond ground in advance or depth requirements not enforced in areas of irregular roadway profile.

Large Amounts of Concrete Slurry Are Left on Pavement Surface:

- ☐ Stop grinding operations and verify proper operation of the equipment.

Web-Based Training:

- NHI-134207C Proper Diamond Grinding Techniques for Pavement Preservation

Sources

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

Concrete Pavement Preservation Guide, Second Edition. Pub. No. FHWA-HIF-14-004. 2014. Ames, IA: Iowa State University, National Concrete Pavement Technology Center. Available at https://intrans.iastate.edu/app/uploads/2018/08/preservation_guide_2nd_ed_508_final.pdf.

Darter, M. 2017. *Concrete Repair Best Practices: A Series of Case Studies*. Missouri Department of Transportation, Jefferson City, MO.

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. 2009, Revised May 2012. Washington, DC: Federal Highway Administration. Available at http://mutcd.fhwa.dot.gov.

Proper Diamond Grinding Techniques for Pavement Preservation, Web Based Training (WBT). NHI-134207C. Washington, DC: Federal Highway Administration, National Highway Institute.

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

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www.fhwa.dot.gov/pavement/preservation

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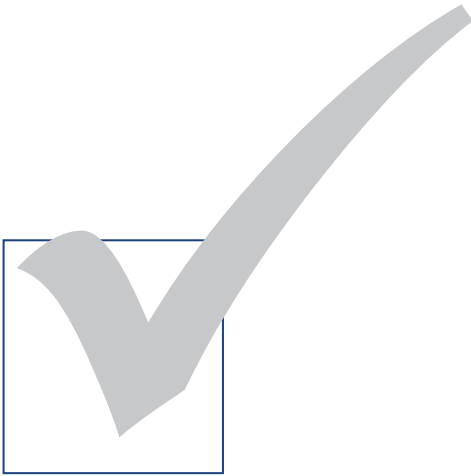

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