IGGA
International Grooving & Grinding Association
Your Pavement Preservation Resource since 1972

ODOT GROOVES ASPHALT FOR SAFETY

THE OHIO DEPARTMENT OF TRANSPORTATION (ODOT) USES LONGITUDINAL DIAMOND GROOVING FOR SAFETY ON ASPHALT AS WELL AS CONCRETE PAVEMENTS.

Photo courtesy ODOT

Longitudinal Grooving: Not Just for Concrete Anymore

ODOT has specified longitudinal diamond grooving for concrete bridge decks, both new construction and overlays, since 2012.

Photo courtesy ODOT

What is Grooving?

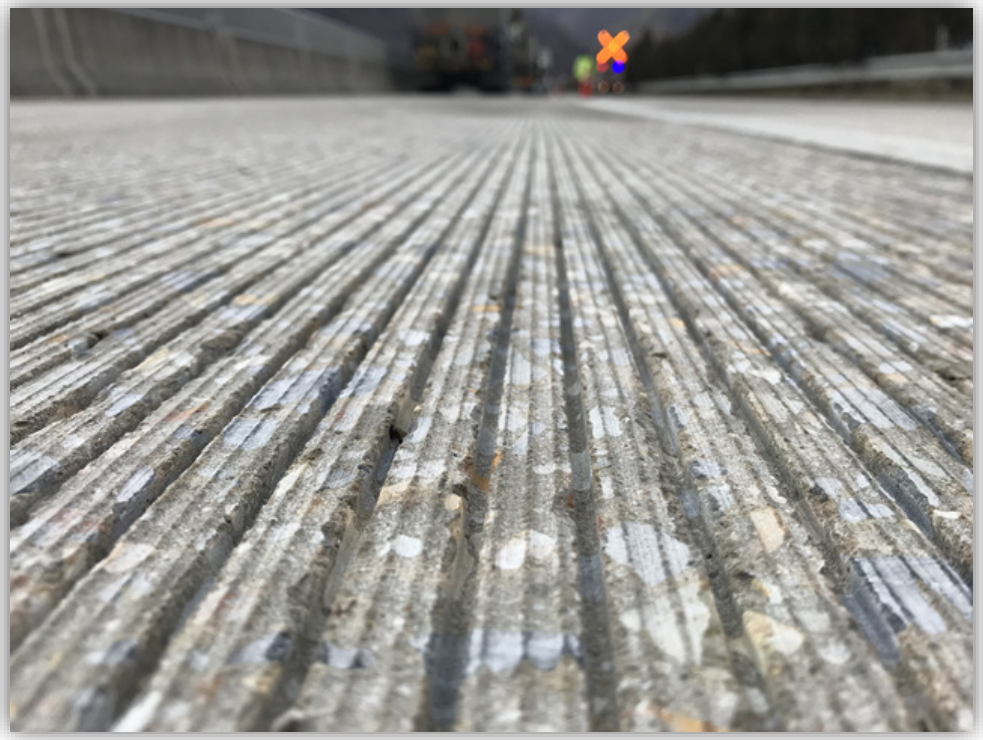

Photo courtesy Hexacon Inc.

Grooving involves cutting narrow, discrete grooves into the pavement surface and has been shown to reduce hydroplaning risks, increase drainage at the tire/pavement interface and aid in a vehicle's control. Statistics show a clear relationship between longitudinally grooved surfaces and a reduction in accident rates.

Safety for ALL Road Surfaces

- Ohio has only 2-3% concrete pavements in the state system. Composite pavements (asphalt over brick or concrete) represent 45-48%, and the remainder is full-depth asphalt.
- Because of the superior safety performance of their grooved concrete bridge decks, ODOT tested grooving on several sections of asphalt pavement beginning in 2013.

Photo courtesy ODOT

The Grooving Advantage

- Costs less than overlays
- Long-term, low-maintenance solution
- Excellent skid test results
- Work can be performed year-round, even in low (although not freezing) temperatures
- Minimal traffic disruption during construction

Photo courtesy ODOT

Superior Traction and Stability

Research shows that tire treads embed in longitudinal grooves and are then able to resist a vehicle's lateral motion, providing additional stability in both wet and dry conditions.

Photo courtesy Pixabay

Asphalt Grooving Research in Ohio

ODOT installed grooving at three locations:

- SR 126 in Hamilton County
- I-90 in Cuyahoga County
- I-75 in Montgomery County

BOCA Construction of Norwalk, Ohio performed all grooving.

Photo courtesy ODOT

SR 126 in Hamilton County

- Crash analysis of a mile-long S-curve showed fixed-object/run-off-the road crashes in wet conditions.
- Skid test revealed concentrated areas of concern.
- Previous milling had not improved conditions, so ODOT chose to perform grooving.
- Skid numbers showed nearly a 50 percent improvement in SN 40 smooth tire values after grooving.
- Crash rates were reduced after grooving.

Photo courtesy ODOT

I-90 Innerbelt Curve in Cuyahoga County

- Accidents occurred in eastbound and westbound directions of the curve.
- A 12.5-mm Superpave mix, with high-grade binder and high-quality course aggregate, had been installed in 2014 to improve friction.

Photo courtesy Pixabay

I-90 Innerbelt Curve in Cuyahoga County (continued)

- In 2015, a longitudinal diamond grooved test section was installed on the westbound lanes to improve macrotexture, reduce hydro-planing and extend the life of the 2014 surface.
- The diamond grooved section improved the average SN 40 smooth tire skid value by more than 50 percent, increasing it to 1.5 times its previous value.

Photo courtesy ODOT

I-75 in Montgomery County

Photo courtesy BOCA Construction

- Commercial trucks had a higher-than-expected crash rate on a heavily traveled high-speed zone with multiple curves.
- Macrotexture was determined to require improvement.
- In June 2013, grooving was performed on two lane miles.

I-75 in Montgomery County (continued)

- ODOT modified the state's bridge deck grooving specifications to better suit its use on asphalt, making grooves slightly wider and deeper than those in concrete, to prevent asphalt grooves from collapsing and deformation due to the heavy traffic.
- Crash data demonstrated that grooving significantly reduced crash incidents.
- The diamond grooved section improved the average SN 40 smooth tire value by more than 70 percent, increasing it to 1.7 times its previous value.

Photo courtesy ODOT

An Effective Solution

"Covering the surface with overlays is more costly than treatments that reuse the existing surface. In many applications, particularly when we're looking for a long-term solution, grooving and grinding is the desirable option."

-- Brian Schleppi, Highway Infrastructure Management supervisor with the ODOT Office of Technical Services

"The District milled this location in 2010 and the wet crash trend continued, so we chose to groove it since the milling did not work previously. Diamond grooving and grinding have been shown to improve the friction of a location (as well as ride and noise) over other methods. Since this section of SR 126 showed a lack of macrotexture from the skid test results, the diamond grooving option was selected."

-- Brianne Hetzel, assistant traffic studies engineer with ODOT District 8

An Effective Solution

"Transportation engineers have used longitudinal grooving to reduce accidents and improve wet weather traction for decades on concrete surfaced pavements. CALTRANS [the California Highway Department] documented a nearly 70 percent reduction in wet weather accidents after installing safety grooving dating back to the early 1970s. Applying these treatments to asphalt-surfaced roadways has been increasing in recent years due to its effectiveness, low cost and minimal traffic disruption during construction. It is very encouraging to see ODOT continue to seek innovative, cost-competitive solutions in their pursuit to provide Ohio motorists with a safe, comfortable and sustainable transportation network."

-- John Roberts, executive director of the International Grooving & Grinding Association (IGGA)

Read more about ODOT's highway grooving in Public Works magazine and Roads & Bridges magazine.

Contact the IGGA today to learn more.

IGGA
International Grooving & Grinding Association
Your Pavement Preservation Resource since 1972