
UTAH DEPARTMENT OF TRANSPORTATION

TECHNICAL BULLETIN MT-03.02A

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Dowel Bar Retrofit

The purpose of a Dowel Bar Retrofit (DBR) is to restore the load transfer from one slab to another at joints and cracks in concrete pavement. Joints with poor load transfer begin to exhibit faulting, the difference in elevation between slabs, at joints or cracks. It starts when a heavy loads cross a joint or crack, inducing high deflections at the slab corners and pumps the support material from under the slab or moves it from one side of the joint to the other. Applying DBR to these pavements extends their life by eliminating the high deflections at the slab corners by restoring the load transfer. DBR consists of sawing slots across transverse joints or cracks, cleaning the slot, injecting caulking filler, placing a reinforcing steel dowel in the slot, filling the slot with a patching material, and establishing a joint by saw cut. DBR will extend the life of the concrete pavement by an estimated 10 to 15 years.



PROPER APPLICATION

Trigger values to be used as a guide to restore load transfer for concrete rehabilitation using DBR are as follows. (Note – slab cracking is defined as the percent of panels that are cracked into 3 or more pieces):
If average joint faulting is $< 1/8$ inch and slab cracking is ≤ 10 percent – Do nothing.
If average joint faulting is $\geq 1/8$ inch and $< 1/2$ inch and slab cracking ≤ 10 percent – DBR.
If average joint faulting is $\geq 1/2$ inch, slab cracking ≤ 10 percent, and ADT $\leq 50,000$ – DBR.
If average joint faulting is $\geq 1/2$ inch, slab cracking ≤ 10 percent, and ADT $> 50,000$ – Reconstruct.
If cracking is > 10 percent – Reconstruct.
If pumping is present, irrespective of faulting or cracking, DBR should be considered.

SPECIFICATIONS/DETAILS

DBR is a relatively simple procedure that consists of five main operations: 1. Cutting the slots, 2. Preparing the slots, 3. Placing the dowel bars, 4. Back-filling the slots, 5. Diamond grind if required for smoothness.

Use gang mounted saws capable of cutting at least 3 slots per wheel path simultaneously and vacuuming water and paste residue from the surface after sawing. Jackhammer and sand blast to clean all exposed surfaces and cracks and to remove slurry and loose concrete. A flat level surface on the slot bottom is critical. Smooth steel rod dowels $1 \frac{1}{2}$ inch x 18 inches are used. Refer to UDOT standard specification 02754 for details.

FURTHER INFORMATION: <http://www.pavement.com/Downloads/RP335P.pdf>
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