

## Concrete Pavement Preservation Webinar 4 – Questions and Answers

The questions submitted during the webinar follow with answers that our speakers have provided.

Additional resources are available at <https://cptechcenter.org/pavement-preservation/> and <https://spexternal.modot.mo.gov/sites/cm/CORDT/>

1. Do you generally recommend retrofit of 100% of joints on projects?

Recommend you consider DBR by traffic lane and truck volume. Get the traffic data on truck lane distribution and that will give a good idea where you need dowels. Certainly, any lane that has substantial truck traffic will fault if no DBR. Inner and HOV lanes typically do not need DBR.

Also, another alternative, look at the joint faulting on each lane (use IRI if needed). Consider using Washington's criteria of mean faulting of 20 joints < 0.125 inches may not need DBR.

2. Do you recommend sealing or not sealing JPCP?

Guidance on joint sealing is also available from <http://www.acpa.org/wp-content/uploads/2019/04/Jointing-Sealing-Tech-Bulletin-TB010-2018.pdf>

3. Is there a specific type of grease to use on the bars?

The recommendation in the following publication is to use plant based material, typically tectyl, or an asphalt based coating.

<https://intrans.iastate.edu/app/uploads/2018/08/Dowel-load-guide.pdf>

4. Under the white topping, the HMA is stripped and damaged. For a full depth repair, is it a good idea to remove the damaged HMA and use flowable fill before placing the concrete?

A challenging question! Its especially interesting to see that the HMA has stripped and is damaged. Seems like there are these alternatives:

- (1) Remove the PCC slab area and the deteriorated HMA and then just place fresh concrete into the repair area. This would give you a good bond/friction between the good HMA and the new slab.
- (2) Remove the PCC slab and deteriorated HMA and place new HMA if you can compact it well.
- (3) Remove the PCC slab and deteriorated HMA and replace that with flowable fill.

The best alternative may be to replace the deteriorated HMA with new HMA material that has been checked for stripping and hydrated lime used if so. This would keep a uniform layer upon which the PCC slab resides, that may avoid other problems in future.

5. What alignment of dowel bar is recommended with respect to traffic direction?

Dowel bars should be parallel to direction of mainline pavement traffic. ACPA is developing guidance on tolerance w.r.t. vertical skew, horizontal skew and depth. Some states do have tolerances, but to date there is no universal standard.

6. What is the maximum % of slab thickness for grinding?

I would not specify that as a % of slab thickness but base it on the existing slab thickness. If the slab is relatively thin (<24 cm), then I would not want to lose more than 2.5 cm say. If the slab is relatively thick (>24 cm), then you could lose more than say 5 cm. But if your slab is  $\geq 25$  cm I would not worry much about thickness and remove what was needed to smooth out the pavement.

7. Why do you suppose WA has had excellent performance of DBR? Can it be attributed to timing of DBR, expertise of contractors, or anything else?

They have sound concrete for sure with little transverse joint spalling. They have conducted lots of research on DBR also. Dr. Linda Pierce did her excellent PhD thesis on this topic and fed that right into the procedures. All this helped Washington develop some effective specs and guidelines and inspections.

8. Why would distance from the longitudinal joint vary for DBR and full depth plain concrete replacement? For DBR Mr Darter stated Washington DOT found extra stresses within first 18in and therefore DBR uses 18in spacing, but for plain everyone still uses 12in or less for dowel placement.

Very good question! I have seen the cracking that Washington experienced and its basically a corner break or crack that goes right through the DBR slot. Here is the key reference:

Pierce, L.M., Uhlmeyer, J.S and Weston, J. "Dowel Bar Retrofit – Do's and Don'ts," Report WA-RD 576.2, Washington DOT, March 2009.