

Overlays Webinar 4 – Questions and Answers

The questions submitted during the webinar follow with answers that our speakers have provided. Please note that there are several references to CP Tech Center guides and reports that are available without charge in PDF format through the website:

<https://cptechcenter.org/concrete-overlays/>

Recordings of the previous webinars are also available there.

1. On a 4-lane urban local corridor (curb & gutter and sidewalk), how would you propose to construct a concrete overlay? Residential driveways every 100 feet or so along the mile corridor. What is the best guidance to handle residents accessing driveways during the project while minimizing impact to the overlay placement.

Those are difficult conditions for any type of pavement rehabilitation. Assuming that a concrete overlay can be designed to fit within the vertical constraints described; the maintenance of traffic should accommodate local traffic. There is no design formula for this. One approach could be to maintain 2-way traffic on one side of the roadway (contra-flow). Residents on that side of the roadway can access their driveways without any construction interference. For residents on the side under construction, the contractor could construct one lane at a time and utilize the dead lane for local access and/or parking.

2. Is the concrete filler always recommended or is there a minimum thickness?

I'm not sure of the "concrete filler" reference. If you are referring to a separation layer, then the following applies:

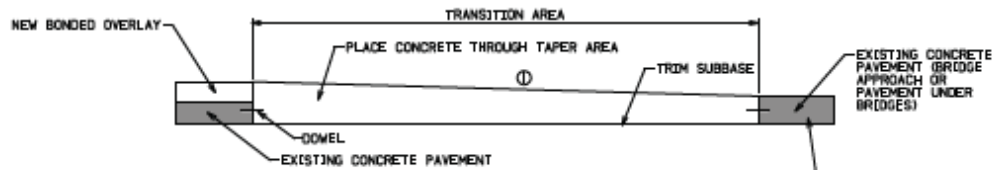
- Bonded overlays do not require a separation layer.
- Unbonded overlays of existing asphalt or composite pavements do not require a separation layer, but some have been constructed with a separation layer.
- Unbonded overlays of existing concrete pavement use a separation layer between the concrete overlay and the existing pavement. These separation layers provide isolation from movement of the underlying pavement, provide cushioning for the overlay and should provide for drainage. Recommended separation layers are:
 - Nonwoven geotextile fabric
 - HMA

3. Can you give transition detail from overlay to bridge?

Yes.

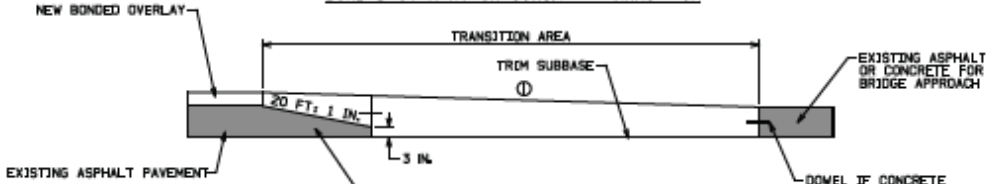
THE THICKNESS OF THE TRANSITION/RECONSTRUCTION SECTION MUST BE DESIGNED WITH THE UNDERLYING SUPPORT CONDITIONS AND ANTICIPATED TRAFFIC IN MIND. IT HAS NO RELATIONSHIP TO THE OVERLAY THICKNESS NOR THE OVERLAY PLUS EXISTING THICKNESS

① USE 40:1 TAPER FOR SPEED 45 MPH OR GREATER. USE 25:1 TAPER FOR SPEEDS LESS THAN 45 MPH



NOTE: RECOMPACT AND RESHAPE EXISTING SUBBASE IN AREA OF TRANSITION AND RECONSTRUCTION. IF THE SECTION IS UNDER BRIDGE, THE EXISTING PAVEMENT MAY REQUIRE RECONSTRUCTION TO INCREASE THE THICKNESS TO PROVIDE FOR EQUAL LOAD - CARRYING CAPABILITIES AS THE OVERLAY SECTION.

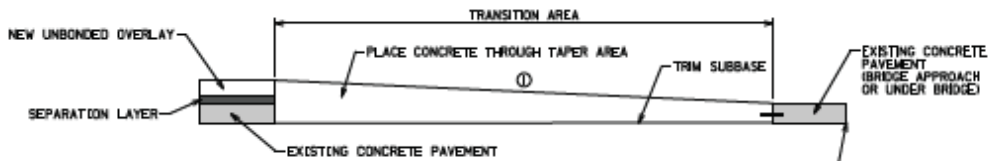
BONDED OVERLAY ON CONCRETE TRANSITION



NOTE: RECOMPACT AND RESHAPE EXISTING SUBBASE IN AREA OF TRANSITION AND RECONSTRUCTION. IF LESS THAN 5" THEN TAPER IS NOT NEEDED

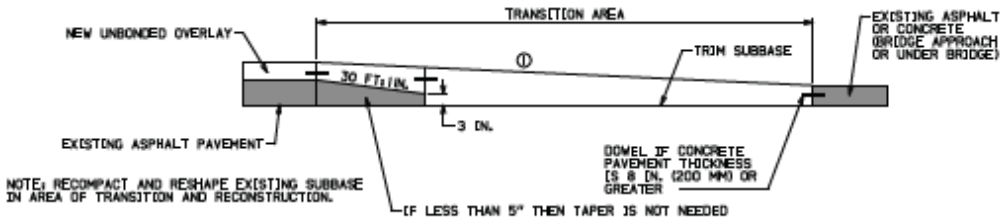
BONDED OVERLAY ON ASPHALT TRANSITION

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UNBONDED OVERLAY ON CONCRETE TRANSITION



NOTE: RECOMPACT AND RESHAPE EXISTING SUBBASE IN AREA OF TRANSITION AND RECONSTRUCTION. IF LESS THAN 5" THEN TAPER IS NOT NEEDED

UNBONDED OVERLAY ON ASPHALT TRANSITION

See [Guide for the Development of Concrete Overlay Construction Documents](#), P. 15, for full resolution details and more guidance.

4. Can you explain what edge drop-off criteria is?

Edge drop-off is the vertical distance between the traffic lane and the construction zone where they abut each other. The criteria is typically a function of speed, vertical distance and horizontal distance from the drop off to the traffic lane. Local requirements should be consulted to determine the appropriate criteria. An example of Minnesota DOT's edge drop off criteria can be found here: <http://www.dot.state.mn.us/trafficeng/publ/fieldmanual/longdropoffs.pdf>

5. Did you use dowel bars on transverse joints on thin overlay?

Load transfer dowels are not recommended for overlays less than 7 in (175 mm) thick. Reference the [Guide to Concrete Overlays: Sustainable Solutions for Resurfacing and Rehabilitating Existing Pavements \(3rd edition\)](#), P. 54.

6. What is Gary's response to the contractor argument of they can't saw when pavement is cured as thick as a white sheet of paper because the blades and wheels of the saw spin? Especially with Linseed oil based cure or PAMS cure?

I recognize that this can be an issue especially on super-elevated curves and vertical curves. However, the risk of not curing before evaporation occurs is too great to ignore. The intent is for uniform and complete coverage of the curing compound. So, I would ask the contractor if the nozzles of their cure machine are properly adjusted. It could be that they end up with areas of heavy application of curing compound which complicates the sawing operation because the nozzles are not adjusted to provide a uniform coverage across the width of the pavement.

7. What separation layer do you recommend for different scenarios?

Every project is unique and requires engineering judgment. Both HMA and geotextiles have proven to be successful separation layers when used in the correct application. I personally lean towards geotextile fabrics for the following reasons:

- Cost
- Ease of installation
- Positive drainage

8. How critical is the milled surface finish in regularity?

The milled surface does not have to be perfect. The same standard of care and specifications used for milling prior to an asphalt overlay are adequate.

9. What bond coats should we use between the asphalt separation layer and concrete?

No bonding agents are required for bonded or unbonded overlays. If an HMA separation layer is used, a tack coat between the HMA separation layer and the existing pavement can be used.

10. The county highway example (first example) - 2 lanes, work on one, maintain traffic on other lane with pilot cars. Do you need pilot cars 24/7 until the first lane is cured out and accepts traffic (could be 4-7 calendar days)?

Yes, on two-lane projects constructed with a pilot car, the operation is 24 hours per day. That specific project shown had a total length of over 15 miles. However, the project was divided into multiple construction zones so that the one-lane traffic requiring a pilot car was restricted to approximately 3-mile segments.