

## Longitudinal Joint Construction

- ✓ Discuss longitudinal joint construction at pre-pave meeting
- ✓ Stagger joints at least 6" horizontally from layer below
- ✓ Follow all best practices for HMAC placement
- ✓ Apply tack including face of the joint
- ✓ Overlap existing lane 1" +/-0.5" (overlap milled edge 0.5" for inlays)
- ✓ Avoid pushing material away from the joint. Don't rake!
- ✓ First pass of breakdown roller should be on the hot mat 6" from the cold joint or with a 6" overhang on the cold mat.
- ✓ Check compacted joint to ensure that overlap height is 0.1", confirming that no bridging occurred.

### Resources

- 2008 Oregon Standard Specifications for Construction Sec. 00745.61
- ODOT HMAC Inspector Certification Manual  
[http://www.oregon.gov/ODOT/HWY/CONSTRUCTION/pages/hmac\\_inspection\\_manual.aspx](http://www.oregon.gov/ODOT/HWY/CONSTRUCTION/pages/hmac_inspection_manual.aspx)
- Longitudinal joint training through FHWA, Asphalt Institute  
<http://www.asphaltinstitute.org/public/engineering/longitudinal-joint-information.dot>

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**Spec Notes** are prepared by the Construction Section QA Unit for inspectors to provide background information around design elements and specifications.

If you have a topic you would like to see addressed in this format, please contact Jim Doll at ODOT.

## 745.61 Longitudinal Joints



All pavements have one internal weakness – joints. Premature joint failures are the result of a combination of low density, permeability, segregation and lack of adhesion at the interface. According to a recent FHWA and Asphalt Institute study, improving HMAC joint quality is probably the single most important thing that can be done to improve pavement performance.

**Q** – So what's so bad about raking?

**A** – Raking can remove material away from the pavement edge creating a trench area that does not get adequately compacted. As shown in Figure 1 on the next page.

If the red material (Box A) is removed from the hot mat, the roller bridges the area as shown in Box B. When the mat is finally compacted, the area under the wedge of material has experienced no compaction (Box C) so has a high void content and is most likely more permeable than the surrounding mat.

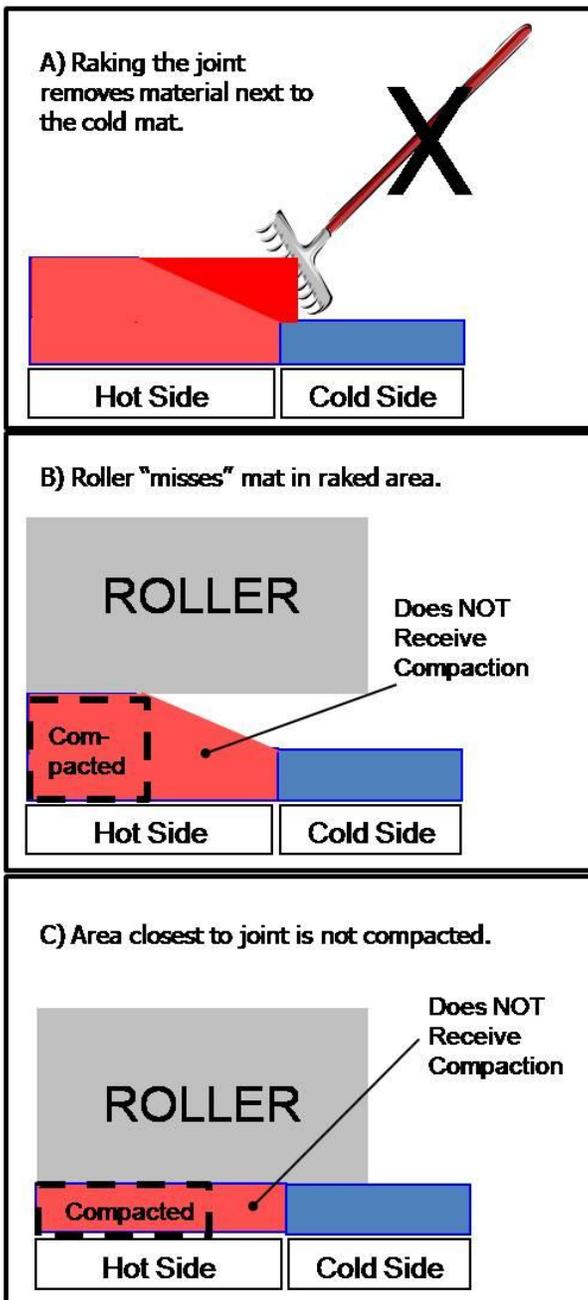


Figure 1. Pushing too much material away from the joint will result in low density at the joint as shown in Box C.

**Q** – What if the contractor doesn't rake the joint but places hot mix right at the face of the cold joint?

**A** – This method would be good and fine if all pavements were uniform and smooth. Most contractors use a ski to determine pavement depth that is averaged over the length of the ski.

If there are intermittent high spots along the length of the cold joint, insufficient material will be placed to provide a tight joint. Also, the high spots could be bridged creating marginally compacted areas as shown above.

**Q** – What is the best process for building a longitudinal joint?

**A** – Best practices include:

- First, overlap the existing lane (of a butt joint constructed with the paver) 1 inch +/- 0.5". When the butt joint is constructed by milling or cutting back the existing lane, the overlap should be about 1/2 inch. If the overlap exceeds 1.5", carefully remove the excess with a shovel. See Figure 2.
- Don't rake the joint and only bump the joint if more material is needed. Ensure that enough material is at the joint - thickness of rolldown – 25% (2" lift – 1/2").
- Compact the supported edge of joint with the first pass of vibratory roller drum on the hot mat, but staying back from the joint 6 to 8" on the 1st pass. The 2<sup>nd</sup> pass should then overlap onto the cold mat 4 to 6". Watch for any stress cracks developing in the mat that are parallel and 6 to 8" off the joint. If cracks develop, switch to the method presented in the next bullet.
- An alternative compaction process is to have the 1<sup>st</sup> pass of the vibratory roller on the hot mat overlapping 4 to 6" onto the cold mat. A concern is that if an insufficient depth of HMAC is placed next to the cold mat (starving the joint), the roller will bridge over and not compact the hot material completely as shown in Figure 1.

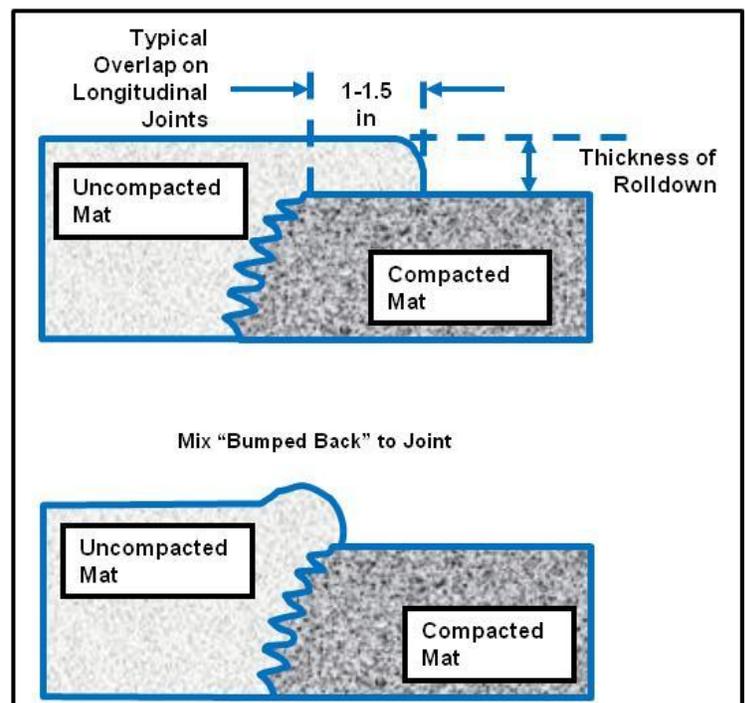


Figure 2. Best practices for placing mix at a longitudinal joint.