



# TECHNICAL ADVISORY

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## Use of Tapered Longitudinal Joints such as The Notched Wedge Joint

### ➔ INTRODUCTION

Tapered longitudinal joints are widely used because they provide at least three significant benefits: they make it easier for vehicles to traverse between lanes that are under construction; they allow the paving operation to be more efficient by eliminating the need to “pull up” the adjacent lanes each day to eliminate having a drop off exposed to overnight traffic; and they often improve the density along the longitudinal joint, which in turn leads to a longer pavement life.

The construction of longitudinal joints has a significant impact on pavement service life. Using proper construction techniques and equipment are essential to avoid premature failure. Poorly constructed longitudinal joints are generally poorly compacted longitudinal joints. Poor compaction produces high air voids, with subsequent cracking and raveling providing a pathway for water to seep into the pavement structure weakening the flexible base or subgrade. This can quickly lead to pavement deterioration. Figure 1 illustrates a poorly compacted longitudinal joint that has cracked and raveled.



Figure 1. Poorly constructed longitudinal joint.

### ➔ BACKGROUND

One construction technique gaining popularity in Texas and throughout the United States is the use of the notched wedge joint. Numerous entities have conducted research and published articles recommending its use because it reduces air voids along the longitudinal joint. Several states and TxDOT districts have adopted the use of notched wedge joints in their hot mix asphalt (HMA) specifications, and approximately half of the districts in Texas currently specify its use through general notes.

The notched wedge joint is an extended taper of the HMA pavement beyond the normal lane width. An attached strike off device on the paver screed provides a uniform slope of the tapered HMA, while not restricting the main screed from placing mixture. Compacting the tapered portion of this joint is critical, and can be accomplished with a small, static steel-wheel roller also attached to the paver (Figure 2) or by using pneumatic rollers. Figure 3 shows the notched wedge joint after compaction.



Figure 2. Compaction of a notched wedge longitudinal joint with static steel wheel roller.

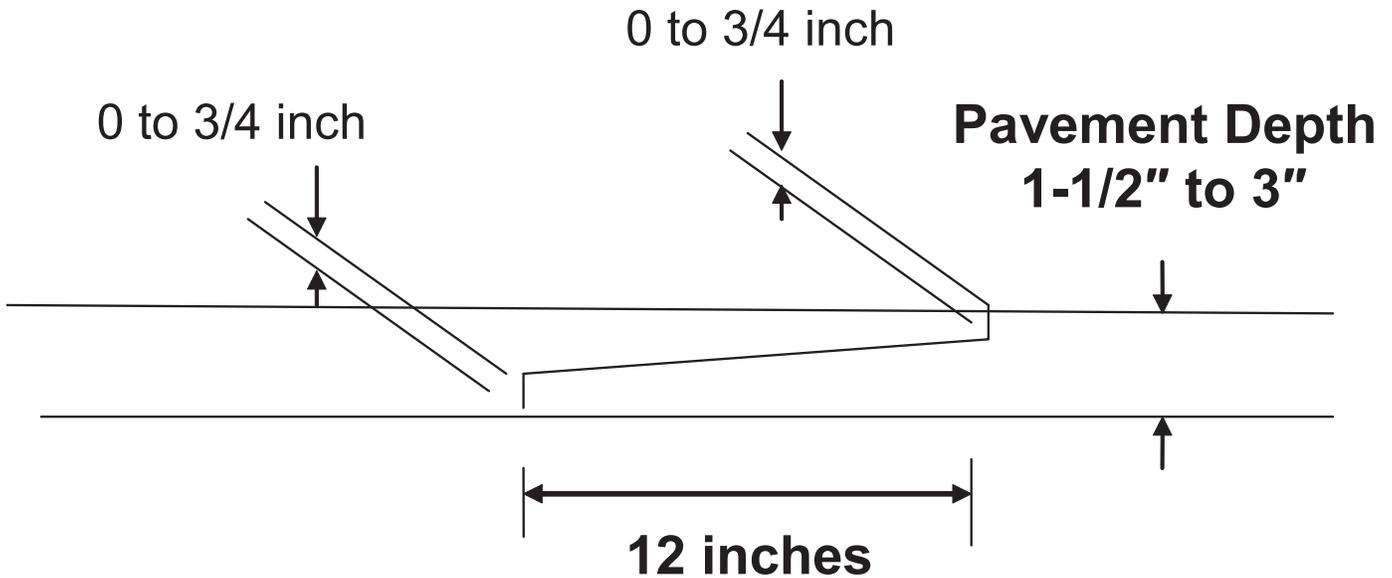


Figure 3. Notched wedge longitudinal joint after compaction.

**➔ USES OF THE NOTCHED WEDGE JOINT**

Figure 4 is a detail of the notched wedge joint for use with any HMA pavement lift with a pavement depth from 1-1/2 to 3 inches. We recommend using it for any project that will be opened to traffic overnight or where traffic is allowed to cross the edge of the new pavement lane.

A standard practice for constructing HMA pavements is to apply a uniform amount of tack coat on all vertical surfaces prior to paving adjacent areas. This bonds the HMA at longitudinal joints, which can mitigate cracking and deterioration of the joint. The notch shown as “0 to 3/4 inch” in Figure 4 above the wedge or tapered portion is a vertical face, and it is recommended to spray tack coat on this part of the notched wedge joint prior to placing HMA. It may also be pertinent, depending on the circumstances, to spray tack coat on the wedge or tapered portion, such as when the constructed pavement has been left open to traffic for a significant amount of time.



**The engineer may allow for variances to the dimensions shown.**

*Figure 4. Suggested tapered joint detail for a notched wedge longitudinal joint.*

**➔ CONCLUSIONS**

The use of tapered joints provides several benefits for HMA pavements. The most common benefits are that they are easier for vehicles to traverse, improve the efficiency of the paving operation and often improve the density along the longitudinal joint. Districts are encouraged to require the use of a tapered longitudinal joint device, such as the notched wedge joint, for areas to be constructed under traffic.

**➔ CONTACT**

The Flexible Pavements Branch of the Construction Division is available at 512/506-5836 to provide assistance to districts interested in using these devices.