If an undistributed quantity of HMA wedge and level mixture is included in the contract, the PEMS should inspect the existing pavement to determine the limits for wedge and level construction and mark them on the pavement. After this is complete, compare the quantity to the plan quantity for the HMA wedge and level mixture pay item. If the proposed quantity resulting from the layout overruns or underruns the plan quantity by more than five percent, contact the AE for additional guidance. The AE should contact the PM and request a recommendation regarding the resolution of the potential overrun or underrun funding and scope.

13.14 JOINT CONSTRUCTION *(Rev. 03-01-22)*

Proper construction of joints is critical in obtaining the design life of the pavement. Two primary causes of premature asphalt pavement failure are improper longitudinal joint construction and deficient joint density. The PEMS must verify that the longitudinal joint for each course is offset approximately 6 in. from the longitudinal joint of the underlying course. This makes the joint more resistant to infiltration of water and allows for better compaction of the material placed in subsequent courses at the joint.

Transverse joints are required at the end of the day's work, when moving from one lane to another, upon suspension of work for an extended period of time, at paving exceptions, when matching with adjacent pavement sections, and as indicated in the plans. Lapped joints are not permitted for these situations.

If traffic is to be maintained across a transverse joint, the joint must be tapered sufficiently to allow a smooth ride. It is necessary to place paper or other bond breaker material under the tapered pavement to facilitate removal of the taper material prior to resuming the paving operation. When paving resumes at the joint location, the paver should be positioned so that the screed rests approximately over the joint line. After the hot mixture is conveyed into position, sufficient time should be allowed to reheat the joint area before the forward movement of the paver begins. The paver is then advanced ahead of the joint enough to allow the workers to perform the necessary handwork to transition the new material the old. The use of a straightedge throughout this process is of primary importance. Paving should continue only after the joint has been satisfactorily shaped, rolled and finished.

The QCP must address the Contractor's method for constructing these transverse joints. Pay special attention to the method of placing and compacting transverse joints at bridges, paving exceptions, and contract limits. The lower courses are of particular concern because the roller cannot be operated across the joint between the newly placed course and the adjacent existing pavement. These areas require transverse rolling or special compaction equipment.

13.15 COURSE DEFECTS *(Rev. 03-01-22)*

After completion of the finish rolling portion of the paving operation, the PEMS should review the newly placed course for defects. Segregation, flushing, and pulling or tearing are common defects found in newly placed courses.

Segregation occurs when the fine and coarse aggregates become separated from each other during the hauling or paving operation. Segregated course feature locations where there are primarily coarse aggregate particles with no fines. The appearance is similar to an open graded mixture. There will be other locations within a segregated course where there are few, if any, pieces of coarse aggregate and mainly consists of asphalt coated fines. The appearance is similar to a sand surface. Common causes of segregation include improper loading of trucks, faulty paver auger operation, and situations where a paver is forced to stop because the hopper runs out of mixture. To avoid the paver having to stop, many paving trains include a material transfer device sometimes referred to as an MTD or a "shuttle buggy". Shuttle buggies essentially provide a larger hopper capacity for the paver and permit the paving operation to progress as long as a sufficient number of trucks hauling mixture are available.

Flushed pavements have locations where liquid asphalt collects on the surface of the course. This may result from excess tack coat being brought up through the course, improper mixing of the materials, or too much PG binder in the mixture.

The remedy for segregated courses usually requires removal of the affected areas and replacement with suitable material. Minor areas of segregation can be repaired using a sand seal coat. Larger and more significant flushed pavement areas shall require removal and replacement, diamond grinding, or other fine milling to remove the excess asphalt. Mark all segregated or flushed areas for correction by the Contractor prior to the course being covered by another lift of material or opened to traffic. Corrective action should be in accordance with the Contractor's QCP. If the QCP does not address the repair of segregated or flushed pavements and an agreement on a solution cannot be reached with the Contractor, contact the AE. The M&T, CM, and the Department's Highway and Pavement Design section are all available resources for determining the scope of the required repair.

Another common defect in a newly placed course is pulling or tearing. The course can be torn or pulled by:

- a paver that is traveling too fast
- a paver with a worn screed, or a screed that is not heated properly
- compacted by a roller that is traveling too fast or rolling a mix that is too tender.

Mark all torn areas so they can be repaired by the Contractor prior to the course being covered by another lift of material or opened to traffic. All torn areas must be repaired in accordance with the QCP. If the QCP does not address the repair of tears in the course, contact the AE if no agreement on an appropriate repair can be reached with the Contractor.

13.16 COMPACTION AND DENSITY *(Rev. 03-01-22)*

For 402 mixtures, compaction is performed in accordance with 402.15. Since cores are not taken to verify in-place density, the PEMS must verify that the Contractor is performing the rolling operation in accordance with the SS requirements.

For 401 QC/QA mixtures, density is one of the properties included in the QA Adjustment calculation. In most situations, it is necessary to take cores to determine the density pay