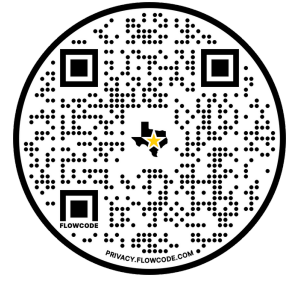


TEX-207-F, PART VII

Determining Longitudinal Joint Density using a Density-Testing Gauge



Why

Evaluate density of longitudinal joints.

Low density/high air voids along the joint will allow water to penetrate. This may lead to premature cracking, raveling, and roughness of hot mix asphalt pavements.



When

After Compaction

1. Engineer one per project.
2. Contractor one per subplot.

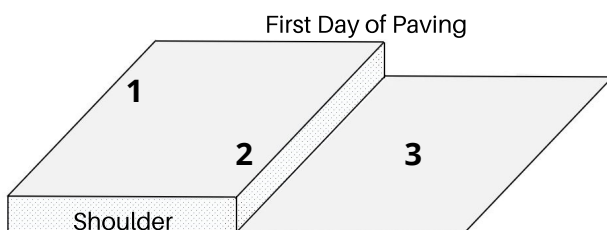
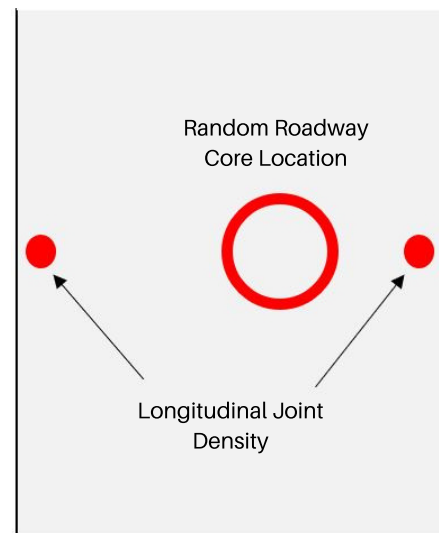


How

1. Identify the random sample location for in-place air void testing (roadway core location).
2. Mark and record this location.
3. Identify the pavement edge that will become a longitudinal joint.
4. Take density-testing gauge readings at each location.
5. Identify each joint type as 'Confined' or 'Unconfined'.

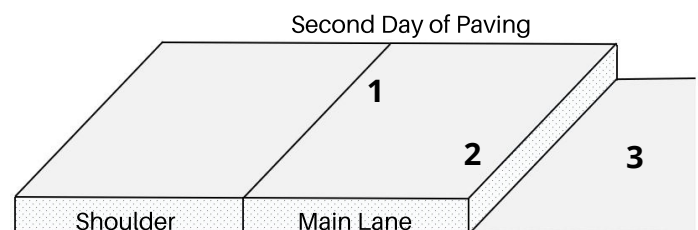
Confined or Unconfined

- Confined - Pavement edge is next to another pavement or structure, curb & gutter.
- Unconfined - Pavement edge is open and another lane will be paved next to it.



First Day of Paving

1. Unconfined joint, will not become a longitudinal joint, no testing required.
2. Unconfined joint, testing required.
3. Main lane, next day paving, no testing required.



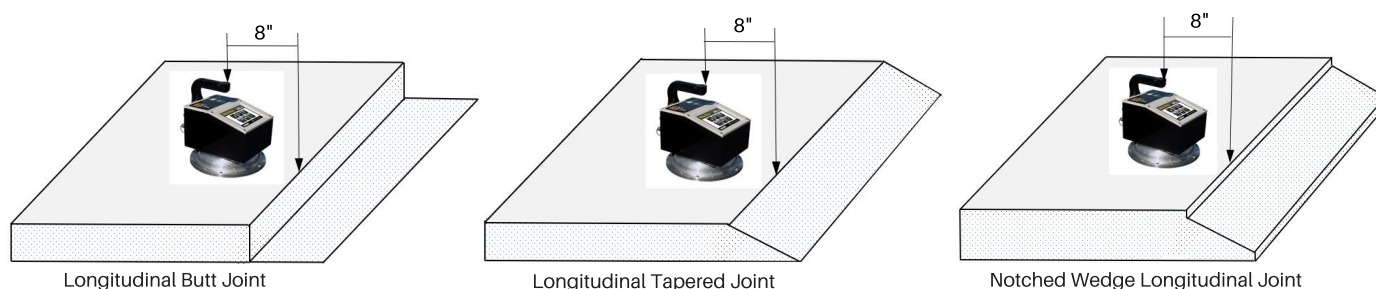
Second Day of Paving

1. Confined joint, testing required.
2. Unconfined joint, testing required.
3. Main lane, next day paving, no testing required.

QUICK FACTS: LEVEL 1B

Density-Testing Gauge Readings

- Position gauge with center placed eight inches from longitudinal joint.
- *Electrical Impedance Gauge (Non-Nuclear)*
 - 2 readings in continuous mode.
- *Nuclear Density Gauge*
 - Three one-minute readings in backscatter mode.
 - Longer dimension of gauge is parallel to joint.



Action

1. Record the readings from each location.
2. Determine the difference in density between the readings taken at the random roadway core location and the readings taken at the longitudinal joint.
3. Determine a Correlated Joint Density for each longitudinal joint.
 - Record the average Bulk Specific Gravity (G_a) of the roadway cores.
 - Record the Theoretical Maximum Specific Gravity (G_r) for the subplot from where the cores were taken.
 - Use equation in the test procedure to calculate the Correlated Joint Density for each longitudinal joint.

SPECIFICATION

1. Longitudinal joint density is failing when:
 - Reading at the joint is more than 3.0 pcf below the density reading taken at the random core location **and**
 - Correlated Joint Density is less than 90.0%.
 2. Suspend production when the joint density evaluation for two consecutive sublots do not meet this criteria.
 3. Resume production after the Engineer approves changes to production or placement methods.
- When the difference in readings between the core location and the joint increases, the density at the joint decreases having higher air voids.
 - When the correlated joint density decreases, falls below 90%, the density at the joint decreases having higher air voids.
 - Under these circumstances, water is more likely to drain into the joint and lead to cracking and raveling.