



WSDOT SOP 729

In-Place Density of Bituminous Mixes Using the Nuclear Moisture-Density Gauge FOP for WAQTC TM 8

1. Number and Locations of Nuclear Tests
 - a. Control lots representing 400 tons (400 metric tones) or less of mix as determined in the Standard Specification shall be established. Nuclear gauge tests for compaction control during paving construction shall be taken at ~~a minimum~~ of five locations per control lot. The locations will be picked at random by WSDOT Test Method No. 716.
2. Theoretical Maximum Density determination FOR PAVEMENT COMPACTION CONTROL
 - a. Theoretical Maximum Density is to be determined daily per WSDOT FOP for AASHTO T 209.
 - b. On the initial day of production of a new Job Mix Formula (JMF), two determinations shall be made to establish an initial average value. The samples shall not be from the same truck. Average the two Theoretical Maximum Densities and report the result to the Moisture Density Gauge Operator. The Theoretical Maximum Density value from the Mix Design shall not be included in the average.
 - c. If the two Theoretical Maximum Densities determined on the initial day do not agree within 3.0 lb./ft.³ (48 kg/m³), a third determination shall be made. The average density shall be based on the two closest sets of results.
 - d. The moving average is defined as the average of the ~~most recent~~ last five determinations for the HMA being placed. All Theoretical Maximum Density determinations performed in a day or shift of paving will be included in the moving average. For Non Volumetric projects, a rice density test shall be taken with the first mix sample each day. For Volumetric projects, a rice density test shall be taken with each mix sample and all tests included in the moving average. Until five Theoretical Maximum Density values have been determined, the average will consist of the number of Theoretical Maximum Densities currently available. When five Theoretical Maximum Density values have been determined, the moving average for each day or shift will include the last four Theoretical Maximum Density determinations performed plus the first Theoretical Maximum Density determined for the current day or shift of paving. ~~This new value will be used for the entire day or shift of paving~~ value will continue to be used until a new moving average is established.

- e. Subsequent Theoretical Maximum Density determinations shall be compared with the previously computed moving average. If a determination deviate from the moving average by more than 3.0 lb./ft.³ ($\pm 48 \text{ kg/m}^3$), a second determination shall be made on another portion of the same sample. If the second determination is within 3.0 lb./ft.³ ($\pm 48 \text{ kg/m}^3$) of the first determination a new moving average will be initiated, discarding all previous results. The new moving average will be sent to the Moisture Density Gauge operator and will replace the current moving average. If the second determination agrees within 3.0 lb./ft.³ ($\pm 48 \text{ kg/m}^3$) of the moving average then the first determination will be discarded and the second determination will be included in the moving average.
- f. An average Theoretical Maximum Density (moving average) will be sent to the Moisture Density Gauge operator once ~~per day or shift change~~ a new moving average is established, unless two determinations during a day or shift are not within 3.0 lb./ft.³ ($\pm 48 \text{ kg/m}^3$), then a new moving average will be calculated in accordance with “e” of this procedure and sent to the Moisture Density Gauge operator as the new moving average ~~for the day or shift~~. The Moisture Density Gauge Operator will continue to use the previous moving average until a new moving average is available.

3. Acceptance

- a. For acceptable compaction, nuclear gauge test results for the control lot shall be determined by WAQTC FOP for TM8, as required by current specifications or contract plans.
- b. The percent compaction equals the ~~average of two~~ in place nuclear gauge wet density readings in accordance with TM8, times the gauge correlation factor divided by the current average Theoretical Maximum Density multiplied by 100.

$$\text{percent compaction} = \frac{(\text{WD}) (\text{CF})}{\text{Average Theoretical Maximum Density}} \times (100)$$

WD = ~~average of two in place~~ nuclear gauge wet density readings in accordance with TM8.

CF = gauge correlation factor.

4. REPORT

Report the results on the Asphalt Concrete Pavement Compaction Test Report DOT Form 350-092.

Report the percent compaction to the nearest tenth of a percent (0.1 percent).