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## WSDOT SOP 729

### *Determination of the Moving Average of Theoretical Maximum Density (TMD) for HMA*

#### 1. Scope

This procedure covers the process for obtaining the moving average of the Theoretical Maximum Density (TMD) for calculating pavement compaction in accordance with WSDOT FOP for WAQTC T 355. The TMD is to be determined in accordance with WSDOT FOP for AASHTO T 209.

#### 2. Procedure

The procedure for determining the moving average of TMD is as follows:

- a. On the initial day of production of a new Job Mix Formula, two determinations shall be made to establish an initial average value. The samples shall not be from the same truck. Average the two TMDs and report the result to the Moisture Density Gauge Operator. The TMD value from the Mix Design Verification Report shall not be included in the average. If the two TMDs determined on the initial day do not agree within 1.5 lb/ft<sup>3</sup> (24 kg/m<sup>3</sup>), a third determination shall be made. The initial average density shall be based on the two closest results.
- b. A TMD test shall be taken with each mix sample. The moving average is defined as the average of the last five TMD values for the HMA being placed. Until five TMD values have been determined, the moving average will consist of all previous TMD values plus the first TMD value for the current production shift. When five TMD values have been determined, the moving average for each shift will include the last four TMD values plus the first TMD value for the current paving shift. This new moving average value will be used for the entire paving shift.
- c. Each TMD shall be compared with the previously computed moving average. If a TMD deviates from the moving average by more than 1.5 lb/ft<sup>3</sup> ( $\pm 24$  kg/m<sup>3</sup>), a second test shall be made on another portion of the same sample. If the second TMD agrees within 1.5 lb/ft<sup>3</sup> ( $\pm 24$  kg/m<sup>3</sup>) of the moving average then the first TMD will be discarded and the second TMD will be included in the moving average. If the second TMD is not within 1.5 lb/ft<sup>3</sup> ( $\pm 24$  kg/m<sup>3</sup>) of the moving average but is within 1.5 lb/ft<sup>3</sup> ( $\pm 24$  kg/m<sup>3</sup>) of the first TMD, 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.
- d. A moving average will be sent to the Moisture Density Gauge operator once per production shift, unless two tests during a shift are not within 1.5 lb/ft<sup>3</sup> ( $\pm 24$  kg/m<sup>3</sup>), then a new moving average will be calculated in accordance with “c” of this procedure and sent to the Moisture Density Gauge operator as the new moving average for the shift. The Moisture Density Gauge Operator will continue to use the previous moving average until a new moving average is available.

#### 3. Report

The gauge operator will record the average TMD received from the tester at the HMA plant on WSDOT Form [350-092](#) and [350-157](#) or in the MATS database. The average TMD will be used in WSDOT FOP for WAQTC T 355 to calculate the percent of compaction for statistical evaluation.

