ATT-67/96, PERCENT COMPACTION, Asphalt Concrete Pavement

1.0 SCope

This method describes the procedure for calculating the percent compaction of asphalt concrete pavement core densities for each lot and segment, as related to the average dry density of the field formed Marshall specimens compacted for the lot.

2.0 EQUIPMENT

calculator

Data Sheets: Mix Moisture Content and Marshall Density Data, MAT 6-80 or Core Density, Extraction and Sieve Analysis, MAT 6-79, or Ignition Asphalt Content MAT 6-98, or ACP Density and Void Contents, MAT 6-40, and Lot Paving Report, MAT 6-78

3.0 PROCEDURE

3.1 Lot Marshall Density

1. Use the moisture content of the mix sample to calculate the dry weight of each of the two field formed Marshall specimens, as per ATT-7.

2. Calculate the dry density of each of the two field formed Marshall specimens using the formula:

\[
\text{Marshall Dry Density (kg/m}^3\text{)} = \frac{\text{dry wt. of marshall specimen (g)}}{\text{volume of marshall specimen (cm}^3\text{)}} \times 1000
\]

The mix sample moisture content and the Marshall specimen dry density are calculated on data sheet MAT 6-80.

3. Determine the average dry density of the two Marshall specimens. Enter the Average Marshall Density of each mix sample on form MAT 6-78, in the order of testing.

4. Calculate the average Marshall density of the mix samples obtained for the lot. Record as Lot Average Formed Marshall Specimen Density on form MAT 6-78 or 98.
3.2 Segment Percent Compaction

1. Calculate the dry density (kg/m$^3$) of the core obtained for the segment using the formula:

$$\text{Segment Core Dry Density (kg/m}^3) = \frac{\text{Oven Dry Wt. of Core (g)}}{\text{Volume of Core (cm}^3)} \times 1000$$

2. Determine the percent compaction for the segment as follows:

$$\text{Segment % Compaction} = \frac{\text{Segment Core Dry Density (kg/m}^3)}{\text{Lot Average Marshall Density (kg/m}^3)} \times 100\%$$

The segment core dry density and percent compaction are calculated on forms MAT 6-40, MAT 6-79 or MAT 6-98 and transferred to form MAT 6-78.

3.3 Lot Percent Compaction

1. Average the segment core dry densities obtained for the lot.

2. Calculate the lot average percent compaction on form MAT 6-78 using the formula:

$$\text{Lot Ave. Core Dry Density (kg/m}^3) \times 100\%$$

4.0 HINTS AND PRECAUTIONS

1. Do not average the segment percent compaction to calculate the lot percent compaction. Rounding off errors could result in contractor payment penalties.