METHOD OF TEST TO MEASURE RESISTIVITY OF CONDUCTIVE ASPHALT MIXTURES

1. SCOPE

1.1 This method describes the procedure for the measurement of electrical resistance of an asphalt briquette prepared by the MTO Method of Mix Design using Marshall compaction and testing apparatus.

2. RELEVANT DOCUMENTS

- 2.1 ASTM D 1664
- 2.2 MTO LS-261
- 2.3 MTO LS-262
- 2.4 MTO LS-263
- 2.5 MTO LS-264
- 2.6 MTO LS-265
- 2.8 OPSS 1149

3. APPARATUS

3.1 AC or DC OHMETER: Capable of measuring to .01 ohms is acceptable for both laboratory measurements and testing at field lab installations.

- Note: Two models which have demonstrated satisfactory performance are;
 - (1) Vibroground, Associated Research Inc., and
 - (2) Neilson 400.
- 3.2 "C" CLAMP: 100 mm size, one required.
- 3.3 PLEXIGLASS DISCS: 98 mm diameter by 6.35 mm thick, two required.
- 3.4 COPPER SHEET: 101 mm diameter by 0.8 mm thick, as required.
- 3.5 VERNIER CALIPER: With 0.025 mm accuracy, one required.

4. PROCEDURE

- 4.1 Use MTO Test Method LS-261 for the preparation of the Marshall specimens.
- 4.1.1 Determine the mass and the thickness of the two copper plates being used.
- 4.1.2 Place one copper plate in the bottom of the compaction mold.

4.1.3 Weigh in a mass of approximately 900 g of mixture to produce a briquette with a desired compacted volume ranging from 510 to 520 mL.

ohm cm

ohm cm²

cm

4.1.4 Rod the mixture as outlined in MTO Test Method LS-261, place the other copper plate on the rodded mixture, and compact in the normal manner.

4.2 Using the Vernier calipers, measure the diameter and the height of the briquettes at four different locations. An average value for each is then computed. If the copper plates are attached to the briquettes, subtract the thickness of the plates from the height dimensions.

4.3 Subtract the mass of both copper plates, and calculate the bulk relative densities of the briquettes.

4.4 Place a plexiglass disc against each of the copper plates leaving sufficient area of the copper plates exposed so that the ohmeter lead terminals can contact each copper plate.

4.5 Centre the "C" clamp on each plastic disc, and apply a small compressive force to hold the discs on the copper plates. Place an ohmeter lead terminal on each copper plate.

4.6 After each 1/8 turn of the "C" clamp, measure the resistance of the sample between the copper plates and record the value. The resistance value should decrease as the applied compressive force is increased. Apply pressure in increments by means of the 1/8 turn of the "C" clamp until the resistance no longer decreases. The lowest resistance achieved is recorded for the final calculations, and should be obtained before the sample has noticeably deformed.

5. REPORT

5.1 The resistivity for each sample is determined using the following formula:

Р	=	$\frac{R \propto A}{L}$	
where: P	=	resistivity	-
R	=	resistance	-
А	=	area of briquette	-

L = length of briquette between copper plates

5.2 Maximum allowable resistivity is 3 ohm cm.

6. GENERAL NOTES

6.1 If the resistivity is greater than 3 ohm cm, alter the mix proportions by replacing a portion of the sand with a maximum of 5 percent by mass of additional coke breeze.