ATT-47/95 CALIBRATION OF ASPHALT DISTRIBUTOR

1.0 SCOPE

This method describes the procedures for determining the spread rate in litres per square metre of asphalt distributors used in the application of surface treatments, seal coat emulsions, and slurry seals.

2.0 EQUIPMENT

stop-watch
road log book
calculator

3.0 PROCEDURE

3.1 Measuring Depth of Asphalt in Distributor

1. Set up a table as shown in Figure 1.

2. Record the temperature of the asphalt, the asphalt supplier, the location of the refinery, the blend, batch and truck numbers in the heading portion of the table.

3. Take a depth reading of the asphalt in the distributor tank. Record as Initial Depth of Asphalt (line "B").

4. From the tank calibration chart, determine the quantity of asphalt in the distributor in litres. Record as Initial Volume of Asphalt (line "D").

5. Inform the distributor operator of the desired spray rate and have the operator select an application rate on the bitumeter which, in his estimation, will yield the required output.

6. Record the Bitumeter Setting in m/min (line "J") and the Desired Spread Rate in L/m^2 (line "M").

7. Have the distributor spray approximately 300 m of smooth level roadway.

8. As soon as the distributor starts spraying asphalt, start the stop-watch.

9. When the distributor stops discharging asphalt, stop the stop-watch. Record the Elapsed Time (line "F") expressed in seconds.

10. Take a depth measurement of the asphalt remaining in the distributor tank and record as Final Depth of Asphalt (line "A").

ASPHALT DISTRIBUTOR CALIBRATION	
ASPHALT TEMPERATURE _____EC ASPHALT SUPPLIER _____ REFINERY LOCATION _____	BLEND NUMBER _____ BATCH NUMBER _____ TRUCK NUMBER _____

A	Final Depth of Asphalt		m	
B	Initial Depth of Asphalt		m	
C	Final Volume of Asphalt		R	
D	Initial Volume of Asphalt		R	
E	Volume of Asphalt Applied	C - D	R	
F	Elapsed Time		s	
G	Distance Spread		m	
H	Spray Width		m	
I	Distributor Speed	60 G / F	m/min	
J	Bitumeter Setting		m/min	
K	Area Spread	G / H	m^2	
L	Actual Spread Rate	E / K	R/m^2	
M	Desired Spread Rate		R/m^2	

FIGURE 1

11. Use the tank calibration chart to determine the litres of asphalt remaining in the tank and record as Final Volume of Asphalt (line "C").

12. Accurately measure the distance in metres the distributor sprayed and record as Distance Spread (line "G").

13. Measure the spray width from the outside limit of the spray on one side, to the edge of the perfect double or triple lap, depending on how high the spray bar is set, on the other side, as shown in Figure 2. Record as Spray Width (line "H").

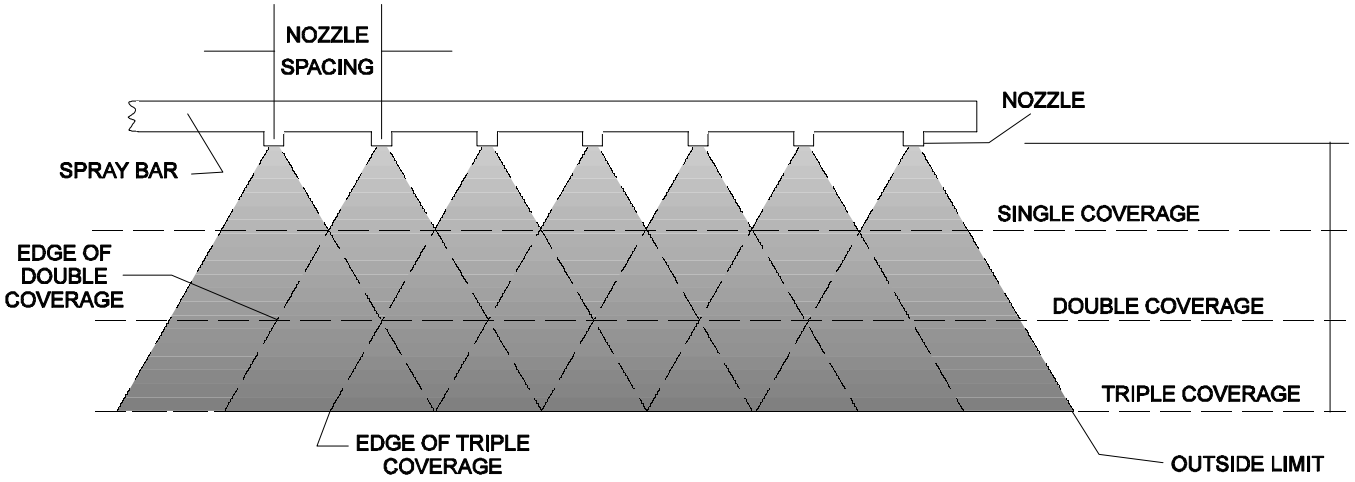

FIGURE 2

3.1.1 Calculations

1. Determine the Volume of Asphalt Applied in litres (line "E") as follows:

   Asphalt Applied (R) = Initial Volume of Asphalt - Final Volume of Asphalt

2. Calculate the Distributor Speed in metres per minute (line "I") using the following formula:

$$Distributor\ Speed\ (m/\min) = \frac{Distance\ Spread\ (m) \times 60\ s/\min}{Elapsed\ Time\ (s)}$$

3. Compare the Distributor Speed (line "I") to the Bitumeter Setting (line "J"). When there is a large difference, the bitumeter should be checked and repaired, if necessary.

4. Calculate the Area Spread (line "K") in square metres using the following formula:

   Area Spread (m2) = Distance Spread x Spray Width

5. Determine the Actual Spread Rate (line "L") in litres per square metre as follows:

$$Actual\ Spread\ Rate\ (R/m^2) = \frac{Volume\ of\ Aphalt\ Applied\ (R)}{Area\ Spread\ (m^2)}$$

6. Compare the Actual Spread Rate (line "L") to the Desired Spread Rate (line "M") and inform the distributor operator of the correction required. Repeat the procedure at a higher or lower bitumeter reading, as required.

3.2 Using the Capacity of Distributor

Another method of determining the spray rate is as follows:

1. Set up a table similar to Figure 1 (lines "A" to "D" are not required) and complete the heading portion of the table.

2. Determine the capacity of the distributor and record as Volume of Asphalt Applied (line "E").

3. Have the contractor fill the distributor.

4. Inform the distributor operator of the desired spray rate and have the operator select an application rate on the bitumeter which, in his estimation, will yield the required output.

5. Record the Bitumeter Setting in m/min (line "J") and the Desired Spread Rate in R/m² (line "M").

6. As soon as the distributor starts spraying asphalt, start the stopwatch.

7. Ensure that the contractor continues spraying until the distributor is empty.

8. When the distributor stops discharging asphalt, stop the stop-watch. Record the Elapsed Time (line "F") expressed in seconds.

9. Obtain and record the station where the distributor started spraying and the station where the distributor stopped spraying.

10. Determine the Distance Spread (line "G") by calculating the difference between the starting and ending stations.

11. Measure the spray width from the outside limit of the spray on one side, to the edge of the perfect double or triple lap, depending on how high the spray bar is set, on the other side, as shown in Figure 2. Record as Spray Width (line "H").

12. Calculate the distributor speed and spread rate as directed in steps 2 to 6 of Section 3.1.1.

4.0 HINTS AND PRECAUTIONS

1. Make sure that the distributor tank is level when measuring quantities.

2. The temperature and viscosity of the asphalt will have a major effect on the spray rate at a given setting. Therefore, a change in either of the calibrated values, will require recalibration.