

Standard WFLHD Test Method for Determining Optimum Asphalt Content for Hot Open-Graded Asphalt Concrete Pavement

1. SCOPE

1.1 This method covers the procedures for determining the optimum asphalt content of a hot open-graded asphalt pavement.

2. APPARATUS

- 2.1 Pyrex Dishes – Five dishes measuring 8" x 8" x 2" made of clear untinted glass.
- 2.2 Oven – Electric oven capable of maintaining temperatures of $325\text{ }^{\circ}\text{F} \pm 5\text{ }^{\circ}\text{F}$.
- 2.3 Balance – A balance having a capacity of 5 kg or more and sensitive to 1.0 g or less for weighing aggregate.
- 2.4 Containers – Containers for heating the aggregates, flat-bottom metal pans or other suitable containers.
- 2.5 Containers – Containers for heating bituminous material, either gill-type tins, beakers, pouring pots, or saucepans may be used.
- 2.6 Mixing Bowl – A bowl of sufficient capacity to allow hand mixing of asphalt and aggregate.
- 2.7 Mixing Tool – Steel trowel, spoon, or spatula suitable for hand mixing.
- 2.8 Gloves – Insulated gloves for handling hot equipment.
- 2.9 Thermometers – Thermometers for determining the temperatures of aggregates, bitumen, and bituminous mixtures. Armored-glass, dial type or digital thermometers with metal stems are recommended. A range from 50 to 400 °F with a sensitivity of 5 °F is required.

3. PROCEDURE

3.1 Prepare at least five samples of aggregate and bitumen to complete the draindown test. Attempt to cover all surface conditions from dry to thick with the five samples. Samples should be in 0.5% asphalt content increments.

3.2 An initial batch shall be mixed for the purpose of "buttering" the mixing bowl and stirrers. This batch shall be emptied after mixing and the sides of the bowl and stirrers shall be cleaned of mixture residue by scraping with a small limber metal spatula but shall not be wiped with cloth or washed with solvent, except when a change is to be made in the binder or at the end of a run.

3.3 Weigh into separate pans for each test specimen the amount of each size fraction required to produce a total aggregate batch weight of 1000g. Place the batched samples in the oven and heat to a temperature not exceeding the mixing temperature by more than 20 °F. The mixing

temperature shall be the temperature to which the asphalt cement must be heated to produce a viscosity of 280 ± 30 cSt. Charge the mixing bowl with the heated aggregate and dry mix thoroughly. Form a crater in the dry blended aggregate and weigh the preheated required amount of bituminous material into the mixture. Care must be taken to prevent loss of the mix during mixing and subsequent handling. Mix the aggregate and bituminous material rapidly until thoroughly coated.

3.4 Following mixing, place the mixture uniformly in the bottom of the Pyrex baking dish.

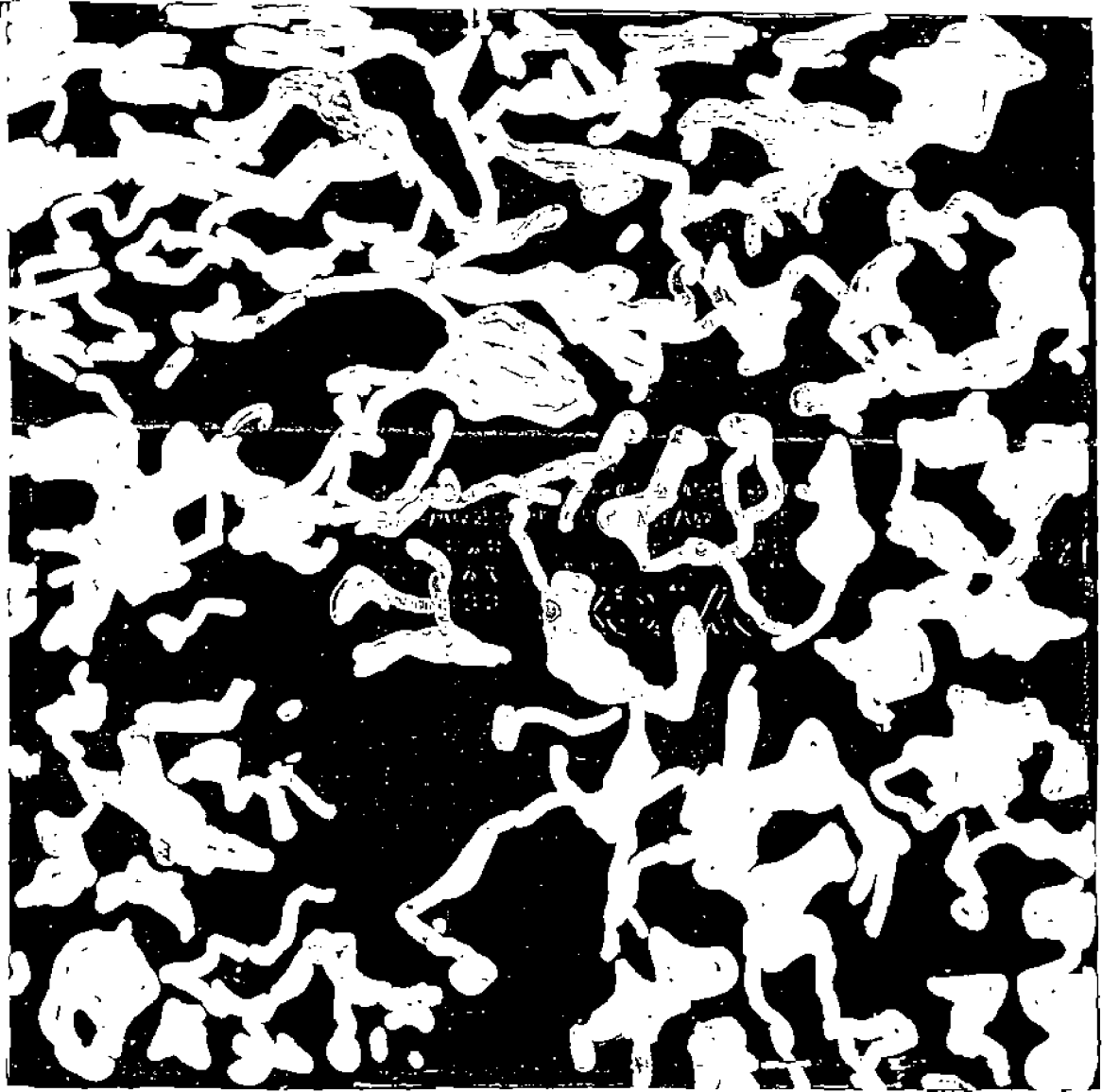
3.5 Put the dishes in a 325 °F oven and cure the mixture for one hour. After one hour, remove the dishes from the oven and allow to cool.

3.6 After the samples are cool, invert the dishes over a white towel or white piece of paper. Place a six-inch square frame over the bottom of the dishes to minimize poor interpretation of the asphalt coverage in the corners of the dish. Estimate the percent of the dish bottom covered with asphalt and compare to the standard photos to determine "percent draindown".

4. REPORT

4.1 Record the percentage draindown for each sample.

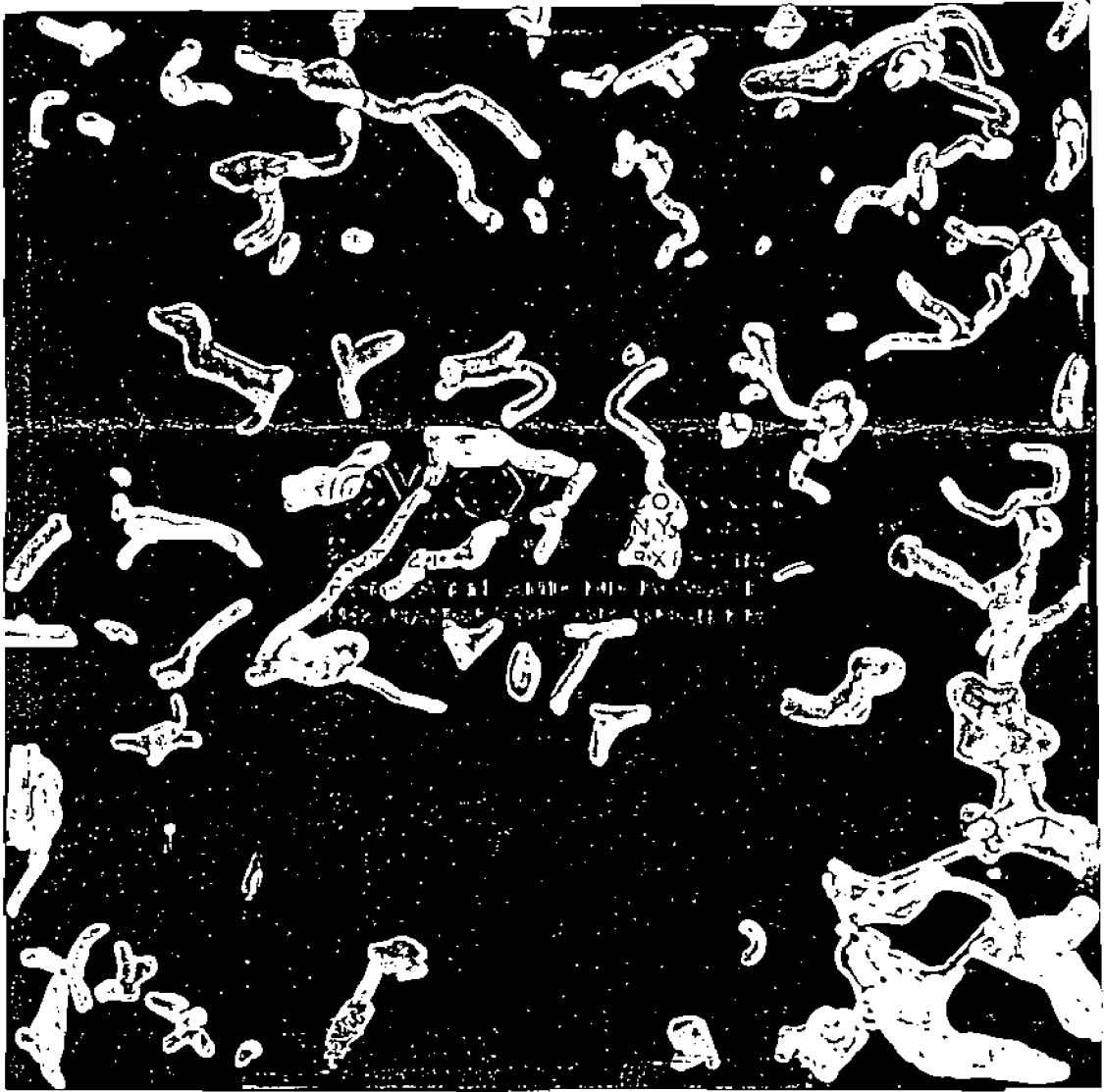
4.2 Select a recommended asphalt content between 60% and 90% based on anticipated field conditions. If unsure what percentage to select between 60% and 90%, examine the surface of the mix. Select a percentage slightly below where the asphalt is observed to be pooling on large flat surfaces or depressions of the aggregate. Large areas of thick shiny asphalt on the aggregate may indicate excess asphalt during construction which will draindown in transport.



60%



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80%



RECOMMENDED SUFFICIENT DRAIN DOWN WILL BE BETWEEN 60 and 90 %.

90%