PERCENTAGE OF UNCOATED PARTICLES USING ASPHALT EMULSIONS

(An Arizona Method)

1. SCOPE

1.1 This method describes a procedure for determining percentage of uncoated particles based on the failure of emulsions to coat a specific mixture of Standard Sand and Type III portland cement.

1.2 This test method may involve hazardous material, operations, or equipment. This test method does not purport to address all of the safety concerns associated with its use. It is the responsibility of the user to consult and establish appropriate safety and health practices and determine the applicability of any regulatory limitations prior to use.

1.3 See Appendix A1 of the Materials Testing Manual for information regarding the procedure to be used for rounding numbers to the required degree of accuracy.

2. APPARATUS

2.1 Requirements for the frequency of equipment calibration and verification are found in Appendix A3 of the Materials Testing Manual.

2.2 Mixing Bowl or Pan - A mixing bowl or round bottom pan with a surface which is non-reactive with the emulsion (e.g., stainless steel, glass, or plastic) of approximately 3 liter (3 quart) capacity.

2.3 Mixing Tool - A stainless steel spoon approximately ten inches long.

2.4 Thermometer - A thermometer accurate to 1 °F.

2.5 Balance - A balance or scale capable of measuring the maximum weight to be determined and conforming to the requirements of AASHTO M 231, except the

readability and sensitivity of any balance or scale utilized shall be at least 0.1 gram.

2.6 Stopwatch or other timing device.

2.7 No. 20 sieve conforming to the requirements of ASTM E11.

3. MATERIALS

3.1 Standard Sand (20-30) conforming to ASTM C778.

3.2 Type III Portland cement conforming to ASTM C150 and having a minimum specific surface of 1900 cm^2 /gram.

4. PROCEDURE

4.1 Thoroughly mix a representative sample of the emulsion to be tested. If any large particles are present, the emulsion shall be strained through a single layer of damp cheesecloth or the No. 20 sieve.

4.2 Screen approximately 500 grams of the Standard Sand through the No. 20 sieve.

4.3 Weigh 461 ± 0.1 grams of the screened sand into the tared mixing bowl or pan.

4.4 Add 4 ± 0.1 grams of the cement to the sand.

4.5 Mix the sand and cement for one minute, using the mixing spoon to obtain a uniform mixture.

4.6 Bring the emulsion to a temperature of 77 ± 3 °F.

4.7 Weigh 35 $\pm$ 0.1 grams of the emulsion into the sand-cement mixture.

4.8 Mix vigorously with the spoon for 2-1/2 minutes, using a stirring and kneading motion.

4.9 Empty the contents of the mixing bowl or pan onto absorbent paper so that the mixture covers an area approximately 10 inches in diameter.

4.10 Allow to dry thoroughly (approximately two hours).

4.11 Pour the dried mixture into the No. 20 sieve and shake and vibrate the sieve until all of the uncoated particles have passed through the sieve.

4.12 Pour sand which has passed the No. 20 sieve into a tared pan and weigh to the nearest 0.1 gram.

5. CALCULATIONS

5.1 Calculate the percent of uncoated sand using the following formula:

$$U = \frac{W_p}{465} \times 100$$

Where: U = Percent of uncoated sand
Wp = Weight of Sand passing No. 20 sieve.

6. REPORT

6.1 Report percentage of uncoated sand to the nearest one percent.