

- f. Lightly tamp the surface of the aggregate 25 times with the metal tamping rod. Do not add additional aggregate to the mold while tamping or after tamping is completed.
- g. Lift the mold vertically from the formed cone of fine aggregate.
- h. If the sand retains its conical shape, free moisture is still present in the sample and drying must be continued. As the saturated surface-dry condition is approached, the sample must be constantly stirred and tested at frequent intervals until the cone of sand slumps as the mold is removed.
- i. Slumping of the sand as the mold is removed indicates that the sand is in a saturated surface-dry condition.
- j. If the cone of sand slumps upon removal of the cone on the first trial, the sand may have been dried past the saturated surface-dry condition before the first test was made. In this case, add a few milliliters of water to the sample, thoroughly mix and allow the sample to stand in a covered container for 30 minutes. Then proceed with the process of drying and testing prescribed above.

D. TEST PROCEDURE

1. Weigh the dry, empty flask to the nearest 0.1 g.
2. When the aggregate reaches the saturated surface-dry condition, immediately weigh out a 500 g representative portion, pour it into the flask, and fill the flask almost to the 500 mL mark with water at a temperature of approximately 23°C.
3. Weigh the remaining portion of the saturated surface-dry sand to the nearest 0.1 g and record this mass as the SSD mass. Dry this portion to a constant mass at $110 \pm 5^\circ\text{C}$ and record this mass as the oven-dry mass.
4. Eliminate entrapped air from the flask by gently rolling the flask in an inclined position or by whirling it in a horizontal circle in such a manner as to agitate the sand particles.

5. Place the flask in a water bath or constant temperature room maintained at $23 \pm 1.7^\circ\text{C}$.
6. After approximately 1 hour, remove the flask and again roll it to eliminate any remaining air bubbles. Fill the flask with water to exactly the 500 mL mark, wipe moisture off the outer surface of the flask, and weigh the flask and its contents to the nearest 0.1 g.

E. CALCULATIONS

1. Calculate the specific gravity to the nearest 0.01 using the following formula:

$$\text{Bulk specific gravity (SSD)} = \frac{500}{(V - M)}$$

Where:

V = volume in milliliters of flask, and

M = mass (to the nearest 0.1 g) of water added to flask $M = (\text{Mass of flask} + \text{sample} + \text{water}) - (\text{Mass of flask} + \text{sample})$.

2. Calculate the absorption to the nearest 0.1%, from the following formula using the data obtained in Paragraph D-3 above:

$$\text{Percent absorption} = \frac{[(\text{SSD mass} - \text{Oven-dry mass}) / \text{Oven-dry mass}] \times 100}{1}$$

F. PRECAUTIONS

1. Frequent stirring of the sample is required during the process of drying the wet sand to a saturated surface-dry condition in order to ensure uniform drying throughout the sample. If non-uniform drying is allowed, the specific gravity obtained may be in error because the oven-dried portions of the sample will not be saturated.
2. Weigh both portions of the sample immediately after it reaches a saturated surface-dry condition to avoid undue moisture loss due to evaporation.
3. Exercise care to eliminate all air bubbles from the sample in the flask before making the final weighing.

G. SAFETY AND HEALTH

Aggregates may contain bacteria and/or organisms that can be harmful to one's health. The wearing of dust masks and protective gloves when handling materials is advised.

Use of heat resistant gloves/mitts or potholders is required for removing samples from the ovens.

Prior to handling, testing or disposing of any materials, testers are required to read Caltrans' Laboratory Safety Manual: Part A, Section 5.0, Hazards and Employee Exposure; Part B, Sections: 5.0, Safe Laboratory Practices; 6.0, Chemical Procurement Distribution and Storage; and 10.0, Personal Protective Apparel and Equipment; and Part C, Section 1.0, Safe Laboratory Practices. Users of this method do so at their own risk.

References:

End of Text (California Test 207 contains 3 Pages)