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METHOD OF TEST FOR SPECIFIC GRAVITY AND ABSORPTION OF COARSE AGGREGATE

A. SCOPE

This test method describes the procedure for the determination of the bulk and apparent specific gravities and absorption of coarse aggregate.

B. REFERENCES

AASHTO T 85 – Specific Gravity and Absorption of Coarse Aggregate

C. APPARATUS

1. A balance having a capacity of at least 5,500 g with accuracy of 1 g or less.

2. A wire mesh basket made of No. 8 mesh, and of sufficient capacity for samples weighing up to 5,500 g.

3. Immersion tank of sufficient size to allow the wire mesh basket to be completely immersed. The immersion tank and balance shall be arranged in a manner that will allow weighing the wire mesh basket and test sample while immersed.

4. Corrosion-resistant containers with a capacity of approximately 2 gal.

D. PREPARATION OF SAMPLE

1. Rock Slope Protection: Crush the submitted sample to pass the 1½ in. sieve. Then sieve the crushed material over the 1½ in., 1 in., and ¾ in. sieves. Prepare a test specimen weighing 5,000 g ± 500 g by combining equal mass of the 1½ in. × 1 in. and 1 in. × ¾ in. sieve size fractions of material.

2. All Other Materials: Prepare a representative 5,000 g ± 500 g portion of the retained No. 4 sieve size material for testing.

E. TEST PROCEDURE

1. Place sample in 2 gal container, cover with water at a temperature of 60˚F to 80˚F, and soak for a minimum period of 15 hr.

2. Transfer the sample to the wire basket and rinse clean with fresh water.

3. Suspend the wire basket from the balance immersing the basket and sample completely in water and weigh to the nearest gram.

a. Record the mass as "Mass of Sample in Water".

4. Transfer the sample onto a large absorbent cloth and remove all visible films of water.

   a. Surface water can be removed by rolling the sample in the cloth or by blotting with a towel.

   b. Large aggregate particles may be individually wiped with a cloth towel.

5. Weigh the sample to the nearest gram.

   a. Record the mass as "Mass of saturated surface-dry sample in air".

   b. Avoid loss of absorbed water by drying the sample to surface dry condition as rapidly as possible and then weighing immediately.

6. Transfer the sample to a suitable container and dry to constant mass at 230°F ± 9°F.

7. Cool to room temperature and weigh to nearest gram.

   a. Record the mass as "Oven-dry mass".

F. CALCULATIONS

1. Description of factor:

   A = mass in grams of sample in oven-dry condition,

   B = mass in grams of sample in saturated surface-dry condition, and

   C = mass in grams of saturated sample immersed in water.

2. Bulk specific gravity (oven-dry basis).

   a. Use this procedure for bituminous mix aggregates, aggregate base and cement treated base aggregate.

   b. $\text{Specific Gravity} = A/(B - C)$

3. Bulk specific gravity (saturated surface-dry basis).

   a. Use this procedure for portland cement concrete aggregates.

   b. $\text{Specific Gravity} = B/(B - C)$

4. Bulk specific gravity (apparent).

   a. Use this procedure for rock slope protection.

   b. $\text{Specific Gravity} = A/(A - C)$

5. Absorption

a. Percent Absorption $= [(B - A)/A] \times 100$

G. PRECAUTIONS

When tare mass is used to compensate the mass of the basket and/or apparatus used to suspend the basket from the balance, be certain the correct tare mass is used.

H. REPORTING OF RESULTS

Report specific gravities to the nearest hundredth (2.65, 2.52, etc.), and absorptions to the nearest tenth (1.4, 2.3, etc.).

I. HEALTH AND SAFETY

It is the responsibility of the user of this test method to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. Prior to handling, testing or disposing of any materials, testers must be knowledgeable about safe laboratory practices, hazards and exposure, chemical procurement and storage, and personal protective apparel and equipment.

Caltrans Laboratory Safety Manual is available at:

http://www.dot.ca.gov/hq/esc/ctms/pdf/lab_safety_manual.pdf

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(California Test 206 contains 3 pages)