FLORIDA DEPARTMENT OF TRANSPORTATION
State Materials Office
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Florida Method of Test
For
Shell Content of Coarse Aggregate

Designation: FM 5-555

1. SCOPE

This method of test covers a procedure for the determination of free shell in coarse aggregate.

2. DEFINITIONS

2.1 Shell is defined as all fossil skeletons of invertebrate marine life (fresh and/or saltwater) including but not limited to snails, conchs, limpets, turritellas, vermicularia, and oliva, as well as bi-values, etcetera.

2.2 Free shell is defined as that portion of the coarse aggregate retained on the No. 4 (4.75 mm) sieve consisting of loose, whole or broken shell, having a ratio of the maximum length of the particle to the shell wall thickness exceeding five to one. Coral, molds or casts of shells, and crushed clam and oyster shell indigenous to the formation is not considered as free shell.

2.3 For those shells infilled, or for those shell surfaces more than 50% coated by rock or other hard adherent coating, the infilling or coating shall be considered as part of the wall thickness. In no case will wall thickness be determined along a hinge line.

3. APPARATUS

3.1 Balance - The balance shall conform to AASHTO M 231, Class G2 (readability 0.1g) for samples less than 200g; class G5 (readability 1.0g) for samples of at least 200g but less than 500g; and Class G20 (readability 5g) for samples of 500g or more.

3.2 Calipers - A digital or manual caliper capable of measuring down to 2mm, with an accuracy of + 0.02mm.

3.3 Ovens and Sieves - Shall meet requirements as specified in AASHTO T 27 Section 6.

4. TEST SAMPLES

4.1 Obtain field samples for free shell analysis in accordance with FM 1-R 076.

4.2 Samples of coarse aggregate for free shell analysis shall weigh after drying not less than the amounts indicated in AASHTO T 27 Section 7.4.

4.3 The selection of a sample of exact predetermined weight shall not be attempted.

5. PREPARATION OF SAMPLE

5.1 Dry the field sample to constant mass at a temperature of 110+5°C (230+9°F).

5.2 Split the sample to required test size as required in section FM 1-R 076.

5.3 Weigh the mass of the test sample and record to the nearest 0.1g.

5.4 Sieve the test sample on the No. 4 (4.75 mm) sieve by mechanical shaker or hand, as per AASHTO T 27. Use additional sieves of convenient size if necessary, to meet proper sieving requirements (restriction on sieve overload).

6. PROCEDURE

6.1 On the portion of the test sample retained on the No. 4 (4.75 mm) sieve, separate out the free shell as defined in Section 2 definitions, using visual determination.

6.2 Use calipers to determine compliance with the five to one particle length to wall thickness requirement.

6.3 Weigh the mass of the retained No. 4 (4.75 mm) sieve sample determined to be free shell and divide that weight by the weight of the entire test sample, to determine free shell

7. REPORT

7.1 Report results to the nearest 0.1%