STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

SUPPLEMENT 1004
METHOD OF TEST FOR SIEVE ANALYSIS OF FINE AND COARSE AGGREGATES
(AASHTO METHOD T 27 MODIFIED)

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1004.01   Scope. This method of test covers the requirements in addition to or superseding the requirements of AASHTO T 11 AND T 27 for the determination of the particle size distribution of fine and coarse aggregates. This method of test does not apply to the sieve analysis of aggregates recovered from bituminous mixtures nor to the sieve analysis of mineral fillers.

The quantities of material usually referred to by Methods of Sampling and Testing are (a) the quantity represented by the sample, (b) the size of the sample and (c) the portion for test. The use of "sample" under AASHTO T 27 and AASHTO T 11 has the same meaning as "portion" as used below.

1004.02   Apparatus

A.   Balance. The balance for weighing all fine aggregate portions for test and the test portions for No. 9 and No. 10 standard sizes of coarse aggregates shall have a capacity of 800 to 1000 grams and shall be capable of weighing to 0.1 gram. The balance for weighing the standard sizes of coarse aggregate larger than No. 9 size shall have a capacity of 20 kg and shall be capable of weighing to 10 grams.

B.   Sieves. Sieves of appropriate sizes shall be included to furnish the information required by the specifications covering the material to be tested, and where necessary to reduce the load on a specified sieve size. The woven wire cloth sieve shall conform to the Standard Specifications for Sieves for Testing Purposes, AASHTO M 92.

C.   Oven. The oven shall be capable of maintaining a temperature of 230 + 9 °F (110 ± 5 °C).

1004.03   Samples

A.   The portion for sieve analysis shall be obtained from the sample by the use of a sample splitter. Fine aggregates shall be thoroughly mixed and in a moist condition prior to splitting.

The selection of a portion for test of an exact predetermined weight shall not be attempted. However, the weight of the sample portion before sieving shall be determined and recorded.

B. The portion of fine aggregate for sieve analysis shall weigh, after drying, approximately 500 grams and shall be weighed to the nearest 0.1 gram.

C. The portion of the coarse aggregate for sieve analysis shall be obtained by splitting the sample as follows:

Standard Aggregate Size	Minimum Weight of Sample lb (kg)	Minimum Number of Splits to Obtain Portion for Test	Minimum Weight of Sample to be Tested, lb (kg)
1	100 (45)	0	100 (45)
2 and 24	100 (45)	0	77 (35)
3 and 357	100 (45)	1	44 (20)
4 and 467	66 (30)	1	33 (15)
5, 56 and 57	66 (30)	1	22 (10)
6, 67 and 68	66 (30)	2	11 (5)
7 and 78	66 (30)	3	7.7 (3.5)
8 and 89	66 (30)	3	7.7 (3.5)
9 and 10	22 (10)	4	1.1 (0.5)

The portion of coarse aggregate for test shall be weighed to the nearest 10 grams on the larger balance except for the No. 9 and 10 standard sizes which shall be weighed to 1 gram on the smaller balance.

1004.04   Procedure. The sieve analysis for the coarse and fine aggregates shall be made in accordance with AASHTO T 11 and T 27 except that the wetting agent specified by T 11 in determining the material finer than the No. 200 (75 μm) sieve is not required.

Method T 11 shall be omitted for aggregate gradations under 301 and 302 and for aggregates where the amount of material passing the No. 200 (75 μm) sieve is not specified under the Construction and Material Specifications.

Coarse aggregates shall be surface dry or drier for sieve analysis. All fractions of fine aggregates and the No. 9 and 10 size coarse aggregates shall be weighed to the nearest 0.1 gram and all fractions of the larger sizes of coarse aggregate shall be weighed to the nearest 10 grams. All aggregates shall be sieved for 10 minutes.

1004.05   Calculations

A. The sum of the individual weights retained on each sieve and in the pan shall not vary by more than one percent from the original weight of the sample. When the loss or gain is greater than one percent, the test shall be considered invalid and another portion shall be tested. If the sum of the individual weights is within the one percent limit, the difference between the sum of the individual weights and the original weight shall be added to or subtracted from the sieve with the largest amount of material retained.

B. Fine Aggregate (% Retained). The percent retained on each sieve is computed by dividing the weight of the material retained on that sieve by the original weight (determined in 1004.03.A) of the sample before washing and multiplying by 100 and reported to the nearest 0.01 percent. This value shall be truncated at 0.01 percent and shall not be rounded.

C. Coarse Aggregate (% Retained). The percent retained on each sieve is computed by dividing the weight of the material retained on that sieve by the original weight (determined in 1004.03.A) of the sample and multiplying by 100 and reporting to the nearest 0.01 percent. This value shall be truncated at 0.01 percent and shall not be rounded. The material for determination of the percentage finer than the No. 200 (75 μm) sieve shall be obtained from a separate representative sample that has been placed in a proper plastic container. This percentage shall be determined in accordance with the above procedure.

D. Fine and Coarse Aggregate (% Passing). The percent passing a given sieve is computed by subtracting the percent retained on that sieve from the total percent passing the next larger sieve in the sieve series used and calculated to the nearest 0.01 percent.

1004.06   Report. After the percent passing has been determined for all sieves, the values shall be rounded* to the nearest whole number except for the percentage passing the No. 200 (75 μm) sieve which shall be reported to the nearest 0.1 percent.

*Rounding Values: When a figure is to be rounded to fewer digits than the total number available, the procedure is as follows:

1. When the first digit discarded is less than 5, then the last digit retained should not be changed (e.g. 8.4% rounded to the nearest whole number is 8%).

2. When the first digit discarded is equal to or greater than 5, then the last digit retained should berounded upward (e.g. 8.5% rounded to the nearest whole number is 9%).