



WSDOT Test Method T 601

Method of Test for Sieve Analysis of Soils – Coarse Sieving

1. Scope
 - a. This test method describes the procedure for quantitative determinations of the distribution of particles larger than the 4.75 mm (U.S. No. 4) sieve.
2. Equipment
 - a. Drying oven to maintain a temperature of approximately 50°C (122°F).
 - b. Drying pans.
 - c. A sieve shaker with sieves of the following sizes which conform to the Specifications for Sieves for Testing Purposes (Appendix A), 1 in. (25.4 mm), ¾ in. (19.0 mm), ½ in. (12.5 mm), ⅜ in. (9.5 mm), and U.S. No. 4 (4.75 mm).
 - d. A platform scale which has a capacity of 100 lbs. (45 kg) and graduations of 0.1 lb. (0.1 kg).
 - e. A metal scoop for removing the sample fraction from the sieves. A heavy-duty household dustpan is satisfactory.
 - f. Metal tub or pan for retaining the fine fraction of the screend sample.
 - g. Paper sacks, size No. 6.
 - h. 5 gal. (20 liter).
 - i. Riffle splitter.
 - j. Box sieves are to be used for determining the size of particles which are larger than 1½ in. (37.5 mm).
 - k. Rotary screen.
3. Preparations
 - a. Empty the sample, unless thoroughly dry, into a large drying pan, spread evenly, and break up large lumps. With some materials, especially those containing clay, it will be necessary to break up aggregations of particles. This may be done by using rodding-type blows with a hammer or by using the rotary screen as a maller (see note).

Note: Some materials are resistant to shock and abrasion, but are sensitive to moisture. For samples of this nature, a representative portion is soaked in water to observe possible slaking or decomposition characteristics. If slaking or decomposition occurs place the entire sample in a large, rectangular, shallow pan, completely soak with water until decomposition ceases, then thoroughly dry the sample for sieve analysis.
 - b. Place a sample identification tag marked with the laboratory and storage container number with the sample.

- c. Dry the sample in the oven for approximately 24 hours. Although most materials will dry sufficiently in 24 hours, some clay requires a longer time.
 - (1) An alternate method of drying a large sample is by the “Air-drying Method” below. Use the following procedure:

Spread the sample, in a uniform layer, on a clean, dry, flat surface (e.g., concrete floor), and allow it to air-dry.

4. Procedure

- a. Insert the sieves in the sieve shaker and secure them.
- b. Put the sample in the top sieve and start the machine.
- c. When the sample contains particles larger than 1½ in. (38 mm), place these particles in the box sieves to determine their maximum size. Particles larger than 2½ in. (63.5 mm) must be measured. Weigh the particles and record the weight (mass) on the test record form.
- d. When the sieving is complete, remove the particles retained on each sieve and weigh to the nearest 0.1 lb. (0.056 g). Record the weight (mass) retained on each sieve.
- e. Any sample that contains individual fractured particles must be checked to determine the percent of fracture by AASHTO T 335. Record the 1 percent of fracture.
- f. Unless otherwise instructed under “Remarks,” on DOT Form 351-007, the portions of the sample retained on the 1½ in. (38 mm), 1 in. (25 mm), and ¾ in. (19 mm) sieves are discarded in the waste bin. The ¾ in. (19 mm) to ⅜ in. (9.5 mm) and ⅜ in. (9.5 mm) to U.S. No. 4 (4.75 mm) fractions are to be labeled and placed in separate paper sacks.
- g. Weigh and record the weight (mass) of the portion passing the U.S. No. 4 (4.75 mm) sieve.
- h. Separate the fines using the riffle splitter until a 3 to 4 lb. (1.4 to 1.8 kg) representative sample is obtained this portion is placed in a paper sack, identified by laboratory number, and forwarded to the Fine Grading Laboratory for grain-size analysis, AASHTO T 38.
- i. Place the remainder of the fines U.S. No. 4 (4.75 mm) passing sieve in numbered storage container along with the sacks containing the U.S. No. 4 (4.75 mm) plus fractions (from g. above).
- j. Store the storage container pending further soil tests.

5. Precautions

- a. Do not wear loose clothing or apron that will catch on the rotary screen.

6. Reports

- a. Test results will be reported on a computer generated test report.