Test Procedure for

DETERMINING THE AMOUNT OF MATERIAL IN SOILS FINER THAN 75 μM (NO. 200) SIEVE

TexDOT Designation: Tex-111-E

Effective Date: August 1999

1. SCOPE

1.1 This method determines the amount of soil material finer than the 75 μm (No. 200) sieve.

1.2 The values given in parentheses (if provided) are not standard and may not be exact mathematical conversions. Use each system of units separately. Combining values from the two systems may result in nonconformance with the standard.

2. APPARATUS

2.1 Drying oven, maintained at 110 ± 5°C (230 ± 9°F).

2.2 Balance
   ■ Class G1 in accordance with Tex-901-K for samples with a mass of 200 g or less
   ■ Class G2 in accordance with Tex-901-K for specimens with a mass of greater than 200 g.

2.3 Containers of sufficient size, to hold the test sample covered with water and to permit vigorous agitation without inadvertent loss of any part of the sample.

2.4 Sieves, meeting the requirements of Tex-907-K, in the following sizes:
   ■ 425 μm (No. 40)
   ■ 75 μm (No. 200).

2.5 Quartering machine, sample splitter or quartering cloth.

2.6 Stirring device, with dispersion cup or soil dispersion tube.

3. PROCEDURE

3.1 Thoroughly mix the field sample and use a sample splitter or quartering cloth to produce a representative test sample. The test sample should be sufficient in size to produce a dry mass of approximately the sample size indicated in Table 1.
3.2 Place the test sample in a tared container and dry to a constant mass in the 110 ± 5°C (230 ± 9°F) oven.

3.3 Weigh and record the initial mass of the sample as \( W_T \) under Section 4.

3.4 Cover the sample completely with clean water in the container and allow to soak for a minimum of two hours (preferably overnight).

3.5 Agitate the contents of the container vigorously and pour the washed water immediately over the nested sieves with the 425 \( \mu \text{m} \) (No. 40) sieve on top.

3.6 Repeat the process of adding clear water to the container, agitate the contents, and keep pouring the wash water over the sieves until the water is clear.

**Note 1**—For soils containing a relative high percentage of material finer than 75 \( \mu \text{m} \) (No. 200) sieve, after the initial washing disperse the particles passing the 425 \( \mu \text{m} \) (No. 40) sieve in the stirring device for one minute. Return the dispersed sample on to the 75 \( \mu \text{m} \) (No. 200) sieve and wash until the wash water is clear. While washing, tap the sieve to expedite the operation.

3.7 After the first washing (when the total sample is small), transfer the entire contents of the soaking container to the nested sieves and wash them under running water.

3.8 When the sample is larger than can be handled at one time on the nested sieves, wash a portion of the sample and transfer to another container for later drying.

3.9 Use a small amount of water to transfer the retained particles to the original container.

3.10 Drain off clear water, and dry the container and retained materials in the oven to a constant mass.

3.11 Sieve the oven-dried material over the nested sieves, and weigh and record the total mass of the oven-dry materials retained as \( W_R \) under Section 4.

**Table 1—Representative Test Sample Size**

<table>
<thead>
<tr>
<th>Nominal Size of Largest Particle</th>
<th>Approximate Minimum Dry Mass of Sample, g</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.00 mm (No. 10)</td>
<td>200</td>
</tr>
<tr>
<td>4.75 mm (No. 4)</td>
<td>500</td>
</tr>
<tr>
<td>19.00 mm (3/4 in.)</td>
<td>1500</td>
</tr>
<tr>
<td>25.00 mm (1 in.)</td>
<td>2000</td>
</tr>
<tr>
<td>37.50 mm (1-1/2 in.) and larger</td>
<td>2500</td>
</tr>
</tbody>
</table>
4. **CALCULATIONS**

4.1 Use the following equation to calculate the percentage of material finer than the 75 μm (No. 200) sieve:

\[ P = 100 \left( \frac{W_T - W_R}{W_T} \right) \]

Where:
- \( W_T \) = initial mass of the oven-dried test sample
- \( W_R \) = mass of the oven-dried samples retained on the sieves.

5. **REPORT**

5.1 Report calculations to nearest 0.1%. 

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**Construction Division**

**Last Reviewed: September 2014**