

ND T 87 - DRY PREPARATION OF DISTURBED SOIL AND SOIL AGGREGATESAMPLES FOR TEST

Conduct this procedure according to ND T 87.

Consult the current edition of AASHTO for procedure in its entirety and equipment specification details.

The following describes the "Alternate Method" using the No. 4 and 10 sieves.

SCOPE

Dry preparation of soil and soil-aggregate is used to prepare samples received from the field for mechanical analysis, physical tests, or moisture-density relation tests.

APPARATUS

Balance

Oven

Sample splitter

Pan

Pulverizing apparatus - mortar and rubber-covered pestle, or mechanical device

Sieves: 3/4" (19.0 mm), 3/8" (9.5 mm), No. 4 (4.75 mm), No. 10 (2.00 mm), No. 40 (0.425 mm)

SAMPLE SIZE

The initial sample size needed will be dependent upon the tests required.

For Particle Size Analysis:

Material passing the No. 10 sieve is required in the amount of 110 g for sandy soil and 60 g for silty or clayey soil. A sufficient amount of material retained on the No. 4 or No. 10 sieve is necessary to obtain a representative gradation. If the material is not being used in a base or subbase the following table (page 2) may not be needed.

Diameter of Largest Particle	Approximate Minimum Mass of Portion
3/8" (9.5 mm)	1 lb (0.5 kg)
1" (25 mm)	4.25 lbs (2.0 kg)
2" (50 mm)	8.5 lbs (4.0 kg)
3" (75 mm)	11 lbs (5.0 kg)

For Physical Tests:

The final amount needed is approximately 300 g of material passing the No. 40 sieve. The breakdown for each physical test is listed below.

Test	Sample Size Needed
Liquid Limit ND T 89	100 g
Plastic Limit ND T 90	20 g
Shrinkage Factors	30 g
Check and Referee Tests	100 g

For Moisture Density Tests:

The amount needed for a sample is approximately 7 lbs (3.2 kg) or more passing the No. 4 sieve.

PROCEDURE

Dry the material in air or by oven at a temperature that does not exceed 140°F (60° C).

Break up the clumps of soil with a mortar and rubber covered pestle without reducing the size of the individual grains.

Split the material with a sample splitter or by quartering to obtain a representative sample in the desired amount for testing.

Weigh portion selected and record as weight of total sample.

Method using No. 4 and No. 10 sieves:

Separate the sample into two portions by sieving through the No. 4 sieve. Set aside material that passes the sieve.

Pulverize the material remaining on the No. 4 sieve until the particles are broken into separate grains.

Separate again on the No. 4 sieve. When repeated grinding produces only a small amount of material passing the sieve, the retained material is set aside for use in coarse sieve analysis. The material passing the No. 4 sieve is added to the previously sieved material. Mix together all material passing the No. 4 sieve. Again split by the sample splitter or quartering to obtain a representative portion for the required tests.

Once again separate the material passing the No. 4 sieve into two portions by sieving through the No. 10 sieve. Set aside material that passes the sieve.

Pulverize the material remaining on the No. 10 sieve until the particles are broken into separate grains.

Separate again on the No. 10 sieve. When repeated grinding produces only a small amount of material passing the sieve, the retained material is set aside for use in coarse sieve analysis. The material passing the No. 10 sieve is added to the previously sieved material. Mix together all material passing the No. 10 sieve.

Again split by the sample splitter or quartering to obtain a representative sample in the desired amount for testing.

Once again separate the material passing the No. 10 sieve into two portions by sieving through the No. 40 sieve. Set aside material that passes the sieve.

Pulverize the material remaining on the No. 40 sieve until the particles are broken into separate grains.

Separate again on the No. 40 sieve. When repeated grinding produces only a small amount of material passing the sieve, discard the material that is retained on the sieve. The material passing the No. 40 sieve is added to the previously sieved material. Mix together all material passing the No. 40 sieve.

Again split by the sample splitter or quarter to obtain a representative sample in the desired amount for testing.

CALIBRATION

A calibration check of the equipment should be performed annually as a minimum, or whenever damage or repair occurs.