



INDIAN INSTITUTE OF TECHNOLOGY GANDHINAGAR
Department of Civil Engineering
Soil Mechanics Laboratory

b) WET AND DRY SIEVE ANALYSIS

IS: 2720 (Part 4) – 1985 (Reaffirmed-2006)

THEORY:

Soil gradation (sieve analysis) is the distribution of particle sizes expressed as a percent of the total dry weight. Gradation is determined by passing the material through a series of sieves stacked with progressively smaller openings from top to bottom and weighing the material retained on each sieve.

NEED AND SCOPE:

The results of testing will reflect the condition and characteristics of the aggregate from which the sample is obtained. Therefore, when sampling, it is important to obtain a disturbed representative sample that is representative of the source being tested because the distribution of different grain sizes affects the engineering properties of soil.

APPARATUS REQUIRED:

1. A series of sieve sets ranging from 4.75mm to 75 μ m
(4.75mm, 2.00mm, 1.00mm, 425 μ m, 212 μ m, 150 μ m, 75 μ m)
2. Balance sensitive to ± 0.01 g

PROCEDURE:

Soil passing 4.75mm I.S. Sieve and retained on 75micron I.S. Sieve contains no fines. Those soils can be directly dry sieved rather than wet sieving.

Dry Sieving:

1. Take 500gm of the soil sample from disturbed representative sample.
2. Conduct sieve analysis using a set of standard sieves as given in the data sheet.
3. The sieving may be done either by hand or by mechanical sieve shaker for 10 minutes.
4. Weigh the material retained on each sieve.
5. The percentage retained on each sieve is calculated on the basis of the total weight of the soil sample taken.
6. From these results the percentage passing through each of the sieves is calculated.
7. Draw the grain size curve for the soil in the semi-logarithmic graph provided.

Wet Sieving:

If the soil contains a substantial quantity (say more than 5%) of fine particles, a wet sieve analysis is required. All lumps are broken into individual particles.

1. Take 500gm of oven dried soil sample and soaked in water.
2. For heavy clays if deflocculation is required, 2% calgon solution is used instead of water.
3. The sample is stirred and left for soaking period of at least 10 minutes.
4. The material is sieved through 75 micron sieve.
5. The material is washed until the water filtered becomes clear.
6. The soil retained on 75 micron sieve is collected and dried in oven.



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7. It is then sieved through the sieve shaker for ten minutes and retained material on each sieve is collected and weighed.
8. The material that would have been retained on pan is equal to the total mass of soil taken for dry sieve analysis minus the sum of the masses of material retained on all sieves.
9. Draw the grain size distribution curve for the soil in a semi-logarithmic graph.

PRESENTATION OF DATA:

SIEVE ANALYSIS

Sample Details: _____

Weight of Sample taken for Sieve Analysis = _____ gms.

Location: _____

S. No.	I.S. Sieve No.	Weight retained in gms	Cumulative weight retained in gms	Percent (%) weight retained	Percent (%) weight passing
1.	4.75mm				
2.	2.00mm				
3.	1.00mm				
4.	425 microns				
5.	212 microns				
6.	150 microns				
7.	75 microns				
8.	Pan				