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| Course No. : CE363 | Date of Testing : 28.10.2011 |
| No. And Title of Test : (6b) Determination of Particle Size Distribution of Medium and Coarse- Grained Soils | |
| Year and Section : 2011/5 | Lab Group : 3 |
| Surname, Name: | |

**DETERMINATION OF PARTICLE SIZE DISTRIBUTION OF MEDIUM AND COARSE-GRAINED SOILS**

**Object**

The object of this experiment is to determine the particle size distribution of a soil sample down to the fine sand size.

**Apparatus**

1. A set of test sieves to cover adequately the range of sizes for the particular soil being tested
2. A balance readable and accurate to 0.5 g
3. A balance readable and accurate to 0.01 g
4. A sample divider (riffle box)
5. A thermostatically controlled drying oven, capable of maintaining a temperature to 105-110C
6. Sieve brush
7. Metal trays
8. Evaporating dishes
9. A light hammer and/or a mortar and a rubber pestle
10. A scoop
11. A mechanical sieve shaker (optional)



**(11) A mechanical sieve shaker (1) A set of sieves**

**Theory**

Sieve analysis is a procedure commonly used in civil engineering to determine the particle size distribution of a soil with different-sized granules. The particle size distribution has essential significance to the way the material acts when it is used.

**Procedure**

1. Reduce the dried specimen to an amount in the table below, and weigh this to 0.1% of its total mass by using the sample divider.

Max. Size of material Minimum mass of sample

forming more than 10 % to be taken for sieving

of sample

(mm) (kg)

63 50

40 15

20 2

10 0.5

5 0.2

2.5 and finer 0.1

1. Rub the material with the rubber pestle to ensure that particles are retained on each sieve only individually.
2. Assemble the sieves in order of their sizes placing largest sieve at the top and the receiver at the bottom. Put the material on the top sieve and insert the sieves in the sieve shaker. Run the machine for at least10 minutes. If there is no mechanical sieve shaker, do the sieving by hand.
3. Transfer the material retained on each sieve to an evaporating dish and weigh them.

**Calculations**

Cumulative % retained= cumulative mass retained / total mass of sample\*100

Cumulative % passing = 100 - Cumulative % retained

For 37.5 mm sieve;

Cumulative % retained = 120.93/2178.45\*100 = 5.55

Cumulative % passing = 100 - 5.55 = 94.45

According to the particle size distribution chart, D10=0.6D30 =1.65 D60 =5.5

Cu= D60/ D10 Cu =5.5/0.6 = 9.16

Cc = (D30)2/(D60\*D10) Cc = 1.652 / 5.5\*0.6 = 0.825

**Discussion of Results**

The results and the chart obtained from the data of the experiment are added to the report.

The results may have some error due to some data obtaining procedure. First of all, we have error because the total mass of the sample is not measured, therefore we couldn’t take the error into consideration while calculating. Besides, during the test there were particles that stuck in the sieves. This prevented us from doing accurate measurements. Lastly, the device we used for weighing the sample may be a source of error.

**Conclusion**

As result of dry sieving, particle size distribution of the sample is determined. Some properties of the soil can be obtained with the help of it. Dry sieve is just a method of sieving. There also