

Birzeit University
Faculty of Engineering
Department of Civil and Environmental Engineering

ENCE 331, Soil Mechanics

Homework assignment #1

Due on Thursday, September 24th, 2020 @ 08:30 AM.

Problem 1:

The following are the results of a sieve analysis.

- Determine the percent finer than each sieve and plot a grain-size distribution curve.
- Determine D_{10} , D_{30} , and D_{60} for each soil.
- Calculate the uniformity coefficient C_u .
- Calculate the coefficient of gradation C_c .
- Which soil is coarser? Justify your answer?

Soil A:

U.S. sieve no.	Mass of soil retained on each sieve (g)
4	0
6	30.0
10	48.7
20	127.3
40	96.8
60	76.6
100	55.2
200	43.4
Pan	22.0

Soil B:

U.S. sieve no.	Mass of soil retained on each sieve (g)
4	0
6	0
10	0
20	9.1
40	249.4
60	179.8
100	22.7
200	15.5
Pan	23.5

Problem 2:

The following are the results of a sieve and hydrometer analysis for different soil samples from the same stockpile.

For each soil:

- Draw the grain-size distribution curve.
- Determine the percentages of gravel, sand, silt, and clay according to the AASHTO system.
- Determine the percentages of gravel, sand, fines soil according to the USCS system.
- Find the effective diameter, coefficient of gradation, and uniformity coefficient.
- Although the soils are obtained from the same stockpile, why are the curves so different? (Hint: Comment on particle segregation and representative field sampling.)

Soil A:	Analysis	Sieve number/grain size	Percent finer
	Sieve	40	100
		80	96
		170	85
		200	80
	Hydrometer	0.04 mm	59
		0.02 mm	39
		0.01 mm	26
		0.005 mm	15
		0.0015 mm	8

Soil B:	Analysis	Sieve number/grain size	Percent finer
	Sieve	20	100
		30	96
		40	90
		60	76
		80	65
		200	34
	Hydrometer	0.05 mm	27
		0.03 mm	19
		0.015 mm	11
		0.006 mm	7

Soil C:	Analysis	Sieve number/grain size	Percent finer
	Sieve	40	100
		80	97
		170	92
		200	90
	Hydrometer	0.04 mm	74
		0.015 mm	42
		0.008 mm	27