CIVL 4151
Spring 2015
Homework 3

1. A sample of soil was tested and the following grain-size analysis results were obtained:

Sieve No.	Sieve Opening (mm)	Percent Retained
4	4.75	36
10	2.00	52
20	0.85	64
40	0.425	69
60	0.25	71
100	0.15	77
200	0.075	91
Pan		100

In addition, it was found that LL = 26, PL = 23, and 30% of the sample was coarser than a ½-inch sieve. Classify this soil according to USCS (group symbol and name) and AASHTO (including group index).

2. A sample of soil was tested and the following grain-size analysis results were obtained:

Sieve No.	Sieve Opening (mm)	Percent Finer
4	4.75	100
10	2.00	100
20	0.85	100
40	0.425	94
60	0.25	82
100	0.15	66
200	0.075	45
Pan		0

Atterberg limits on the minus No. 40 material were LL = 36, PL = 14. Classify this soil according to USCS (group symbol and name) and AASHTO (including group index).

3. A minus No. 40 material has a liquidity index of 0.73, a natural water content of 44.5%, and a plasticity index of 24.7. Determine the liquid limit and classify this soil according to the USCS and AASHTO.

4. A sample of soil was obtained to determine its Atterberg limits. For the PL determination, the wet weight + dish = 11.53 g and the dry weight + dish = 10.49 g. The dish weighed 4.15 g. Three liquid limit were made determinations. For 17 blows, the water content was 49.8%; for 26 blows, it was 47.5%; and for 36 blows, it was 46.3%. Determine the USCS group symbol for this soil.

(continued on back)

5. Laboratory testing was performed on two soil samples (A and B) and the data is summarized in the table below:

Sieve No. (Opening Size)	Sample A Percent Passing	Sample B Percent Passing
3 in. (76.2 mm)	100	–
1.5 in. (38.l mm)	98	–
0.75 in. (19.1 mm)	96	–
4 (4.75 mm)	77	100
10 (2.00mm)	–	96
20 (0.85 mm)	55	94
40 (0.425 mm)	–	73
100 (0.150 mm)	30	–
200 (0.075 mm)	18	55
Liquid limit	32	52
Plastic limit	25	32

Determine the USCS and AASHTO classifications for these two soils.