

Homework # 3 (Due Date: 2-21-2011)

Problem #1

The results of a Standard Proctor Test are given in the following table. Determine the maximum dry density (kg/m^3) of compaction and the optimum moisture content

Volume of Proctor Mold (cm^3)	Mass of wet soil in the mold (kg)	Moisture Content (%)
943.3	1.68	9.9
943.3	1.71	10.6
943.3	1.77	12.1
943.3	1.83	13.8
943.3	1.86	15.1
943.3	1.88	17.4
943.3	1.87	19.4
943.3	1.85	21.2

Problem #2

A field unit weight determination test for the soil described above in Problem # 1 yielded the following data: moisture content = 10.5% and moist density = 1705 kg/m^3 . Determine the relative compaction.

Problem # 3

The maximum and minimum dry densities of a sand were determined in the laboratory to be 1682 kg/m^3 and 1510 kg/m^3 , respectively. In the field, if the relative density of compaction of the same sand is 70%, what are its relative compaction (%) and dry density (kg/m^3)?

Problem # 4

The backfill material for a vibroflotation material project has the following grain sizes:

$$D_{10} = 0.11 \text{ mm}$$

$$D_{20} = 0.19 \text{ mm}$$

$$D_{50} = 1.3 \text{ mm}$$

Determine the Suitability Number, S_N , for the soil.