Shanghai Normal University
Tutorial (T04) - Compaction

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1. The natural water content of a soil is 10%. Assuming 2100 g of wet soil is used for laboratory compaction tests, calculate how much water is to be added to other 2100 g samples to bring their water contents up to 13, 17, 20 and 24%.

2. The following results were obtained from a standard compaction test on a soil. The value of G_s is 2.67. Plot the dry density-water content curve, and

Mass (g)	2010	2092	2114	2100	2055
Water content (%)	12.8	14.5	15.6	16.8	19.2

   give the optimum water content and maximum dry density. The volume of the mould is 1000 cm^3.

3. For the data given below ($G_s = 2.64$):

   a) Plot the compaction curves.

   b) Establish the maximum dry density and optimum water content for each test.

   c) Plot the zero air voids line. Also plot the 70, 80 and 90% saturation curves.

   d) Plot the line of optimums.

Heavy compaction		Standard compaction	
Dry density	w (%)	Dry density	w (%)
1.873	9.3	1.691	9.3
1.91	12.8	1.715	11.8
1.803	15.5	1.755	14.3
1.699	18.7	1.747	17.6
1.641	21.1	1.685	20.8
		1.619	23