Geotechnical Engineering–I

BSc Civil Engineering – 4th Semester

Lecture # 14

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by

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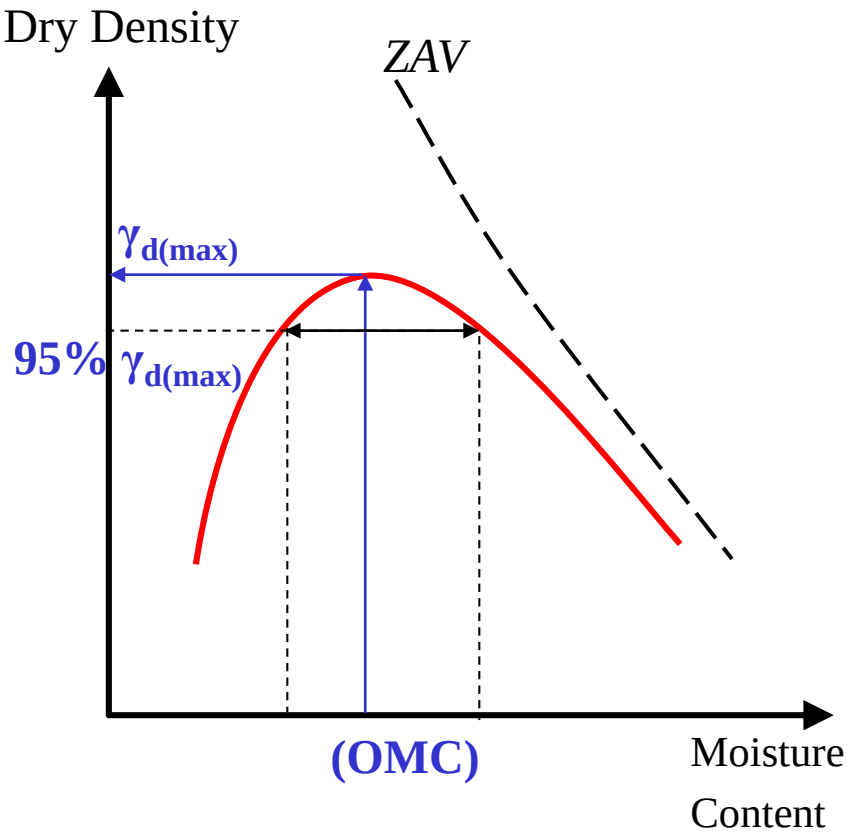
Lecture Handouts: https://groups.google.com/d/forum/geotec-1

FIELD COMPACTION

Because of the differences between lab and field compaction methods, the maximum dry density in the field may only reach *90% to 95%.*



Practice Problem #7

Given

The in situ *void ratio, e* of a *borrow pit*'s soil is *0.72*

The borrow pit soil is to be excavated and transported to *fill* a *construction site* where it will be compacted to a *void ratio* of *0.42*.

The construction project requires *10,000* m^3 of compacted fill.

Required

Volume of soil that must be excavated from the *borrow pit* to provide the required volume of fill.

Practice Problem #8

You are a ***Project Engineer*** on a large ***dam project*** that has a *volume* of 5×10^6 yd^3 of select *fill*, compacted such that the final *void ratio* in the dam is *0.80*. Your boss, the ***Project Manager*** delegates to you the important decision of buying the *earth fill* from one of three suppliers.

Supplier A sells fill at *Rs. 50/yd^3* with $e = 0.90$

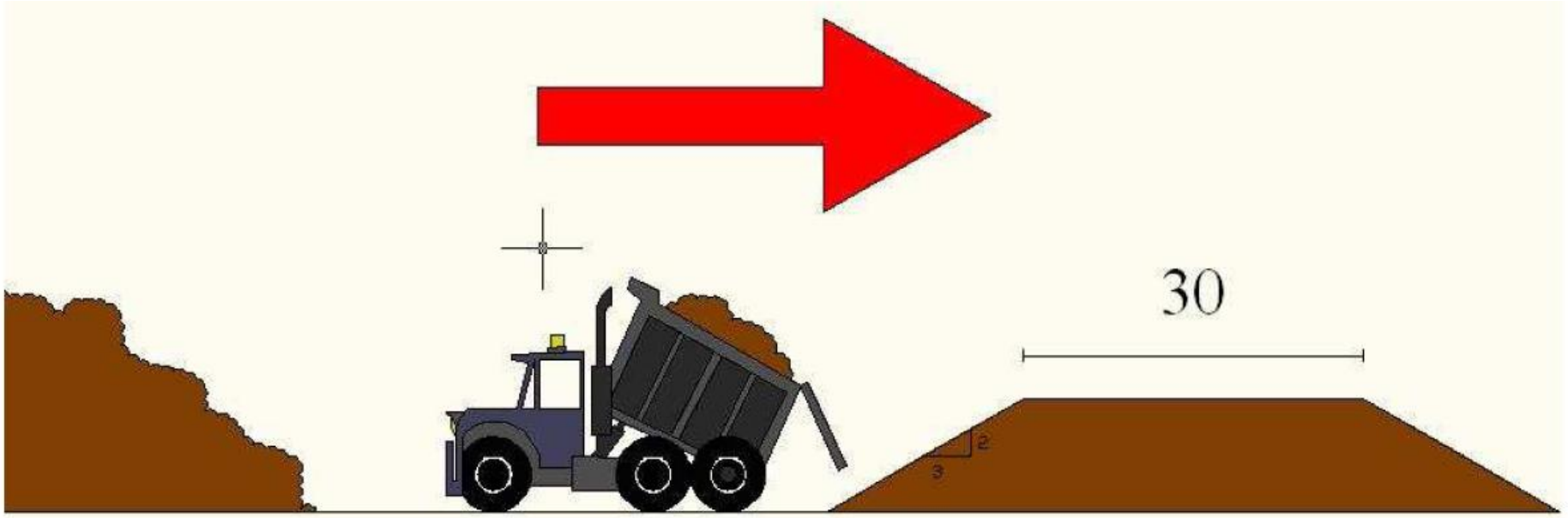
Supplier B sells fill at *Rs. 33/yd^3* with $e = 2.00$

Supplier C sells fill at *Rs. 44/yd^3* with $e = 1.60$

Which one of the three suppliers is the ***most economical***, and how much will you save?

Practice Problem #9

Based on the previous problem data, if the fill dumped into the truck has an $e = 1.2$, how many *truck loads* will you need to fill the dam? Assume each truck carries $10\ yd^3$ of soil.



Practice Problem #10

A proposed earth embankment is required to be compacted to 95% of Standard Proctor dry density. Tests on the material to be used for the embankment gives maximum dry density of 1.98 Mg/m^3 at optimum moisture content of 12%. The borrow pit material in its natural condition has a void ratio of 0.6. If Gs for borrow pit material is 2.7, what is the minimum volume of barrow material required to make 100 cu. m of acceptable compacted fill.

CONCLUDED