Assignment #3
Rekayasa Pondasi I

Lateral Earth Pressure

(duration of task : 1 weeks)
Lecture : Sherly Meiwa ST., MT

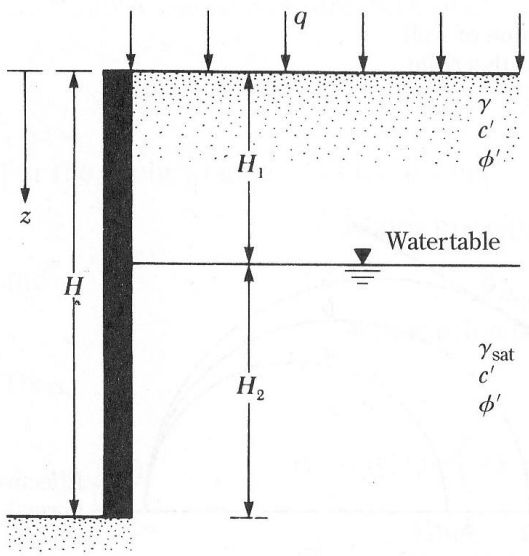
Note :

YOU ARE REQUESTED to complete this task and make a report. Assignments can be handwritten or typed but must be in pdf format.
Problem 1-5 *due dates 4 November 2020*

Problem No 1

a) Please explain about *at-rest earth pressure*.
b) Please explain about *active earth pressure.*
c) Please explain about *passive earth pressure.*

Problem No 2



In figure 1, let H_1 = 3, 4, 5 m, H_2 = 3, 4, 5 m, q = 0, γ = 16, 17, 18 kN/m^3, γ_{sat} =19 kN/m^3, c'=0 and ϕ'=28^o, 30^o, 32^o. Determine the at-rest lateral earth force per meter length of the wall. Also, find the location of the resultan force.

Problem No 3

A vertical retaining wall (figure 1) is H_1 high with a horizontal backfill. Let H_1 = 5, 6, 7 m, H_2 = 0. For the backfill, γ = 16, 17, 18 kN/m^3, c' = 10, 11, 12 kN/m^2 and ϕ'=23^o, 24^o, 25^o.

a) Determine the Rankine active pressure distribution diagram behind the wall.
b) Determine the depth of the tensile crack, z_c.
c) Estimate the Rankine active force per foot length of the wall after the tensile crack appears.

Problem No 4

In figure 2, let H_1 = 3, 4, 5 m, H_2 = 3, 4, 5 m. γ_1 = 16, 17, 18 kN/m^3, q = 0, ϕ'_1 = 33^o, 34^o, 35^o.c'$_1$ = 0, γ_2 = 16.5, 17.5, 18.5 kN/m^3, ϕ'_2 = 24^o, 25^o, 26^o.c'$_2$ = 10, 12.5, 15 kN/m^2. Determine the Rankine active force per unit length of the wall.

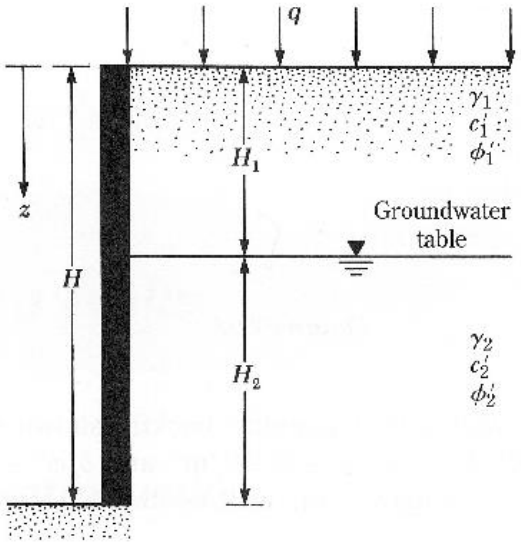


Figure 2

Problem No 5

With regard to Problem No 4,

a) Draw the Rankine passive pressure distribution diagram behind the wall.
b) Estimate the Rankine passive force per foot length of the wall and also the location of the resultant force.