El – Mansoura University
Faculty Of Engineering
Structural Engineering Dept.
Geotechnical group

Soil Mechanics & Foundation
3rd year civil
2013-2014

Question 1 (70%):

For the foundation shown in Figure (1) Determine :

a. Immediate settlement under the strip footing (F1).
b. Primary Consolidation settlement under the strip footing (F1).
c. Secondary settlement of the footing (F1) at thirty years from the construction.
d. Total settlement after twenty years from construction of the footing (F1).

Given Data :

Sand Layer (1 and 3)	**Clay Layer (2)**
Modulus of Elasticity=3000 t/m2 Saturated unit weight = 19 kN / m3	Saturated unit weight = 18 kN / m3 Compression index=0.3 Swelling index=0.06 Secondary coefficient=.012 Consolidation coefficient=1e-7 m2/sec Modulus of Elasticity=1000 t/m2

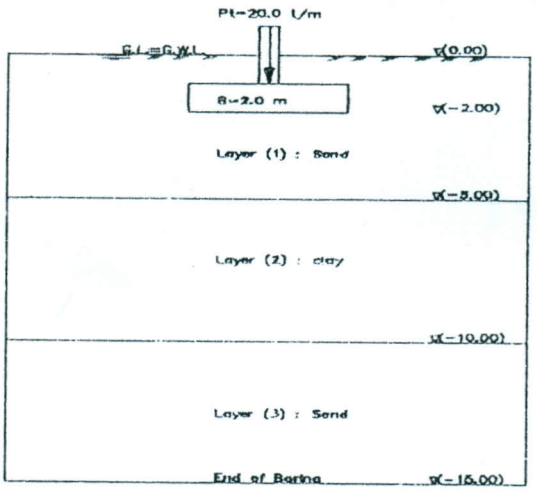


Fig.(1)

Assume time required for 100% degree of consolidation = time required for 90 % degree of consolidation

Question 2 (30%):

1. Explain the active and passive earth pressure.
2. For the wall shown in Figure (2), it is driven to sand soil with the following properties $\gamma = 1.7$ t/m^3, $\varphi = 30^o$ determine the following:
   a) Draw the earth pressure (active and passive)?
   b) Calculate the value of active and passive earth pressure?
   c) The value and location of the resultant (R)?
   d) Check if the wall is stable or not?

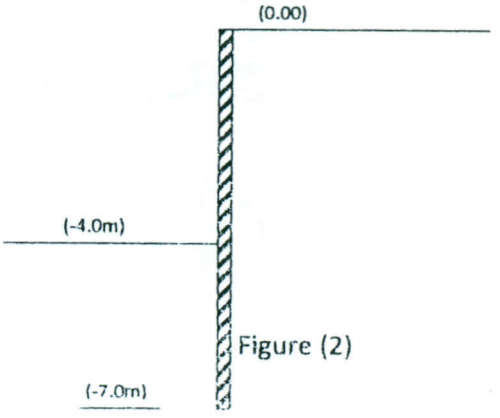
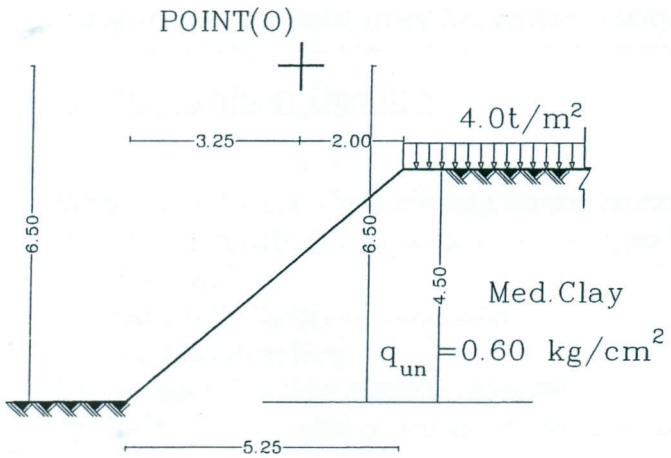
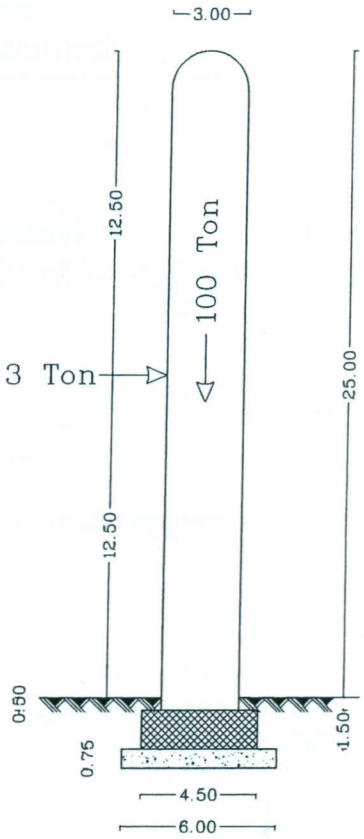


Figure (2)

With my best wishes
Assist. Prof. Ayman Altahrany

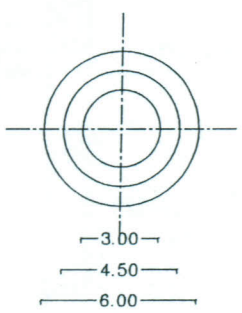


Fig(4)



ELEVATION

Fig(5)



PLAN

Fig(3)