CAIRO UNIVERSITY
FACULTY OF ENGINEERING
Soil Mechanics and Foundation Engineering Division

FOUNDATIONS

EXERCISE (8)

4th Year Civil — 2016-2017

DEWATERING

1) a- Mention the side effects of ground water lowering.

b- Illustrate using a sketch the appropriate dewatering methods for different soils. What is the main factor, controlling the choice of these methods?

c- Briefly describe the different types of gravity dewatering. State the main advantages and disadvantages of each type.

2) The sheeted excavation shown in Figure (1) shall be dried to a level of one meter below G.L using a central trench of 0.7m width. Plot the flow net for seepage flow and then determine the total pump discharge.

3) For the soil condition shown in Figure (2), you are asked to design a well point dewatering system for constructing a building at the following foundation levels:

i- F.L. = (-6.0) m.

ii- F.L. = (-10.0) m.

The area of the foundation is 30 m × 50 m and the side slope for the excavation is 2:1.

4) For a very long trench 3.5 m deep 3.0 m wide, Design one sided well point system for dewatering the trench. The GWT is located at the ground surface. The following data are given:

The coefficient of permeability is 0.001 m/s , H=15 m

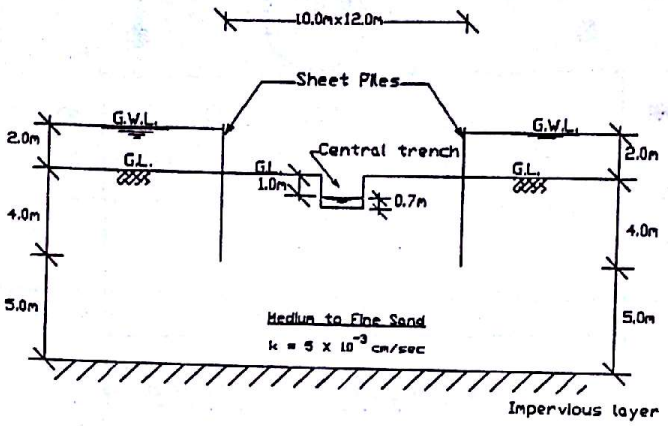
The spacing between well points is 1 m

The contractor will use 2.0 H.P pumps only in this project.

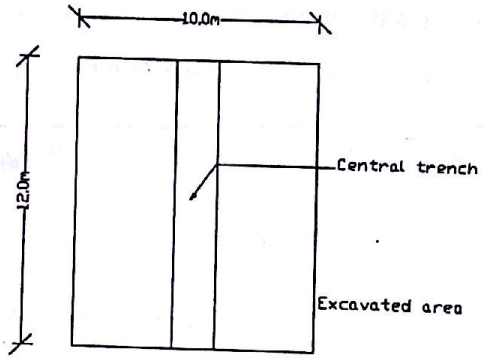
5) During lowering the GWT using 8 deep wells for the site shown in Fig. (3) The contractor realized that pump No.(1) is not working properly. He decided to shut down well No. (1) to change the defected pump. Calculate the effect of drawdown at point A during this operation (i.e. only 7 pumps are working) giving the following data:

$H = 40$ m, $h_c = 33$ m, $K = 0.0005$ m/s .

6) A row of deep wells was constructed on one side of the strutted excavation shown in Figure (4). The length of excavation is 200 m. Determine the appropriate number of wells for successful site dewatering (D_w = 0.3 m and $Q_w = 50$ m^3/hr).

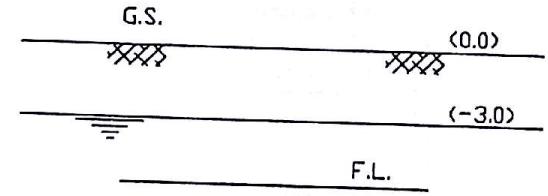


Elevation



Plan

Figure (1)



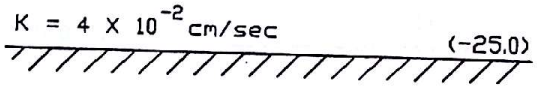


Figure (2)

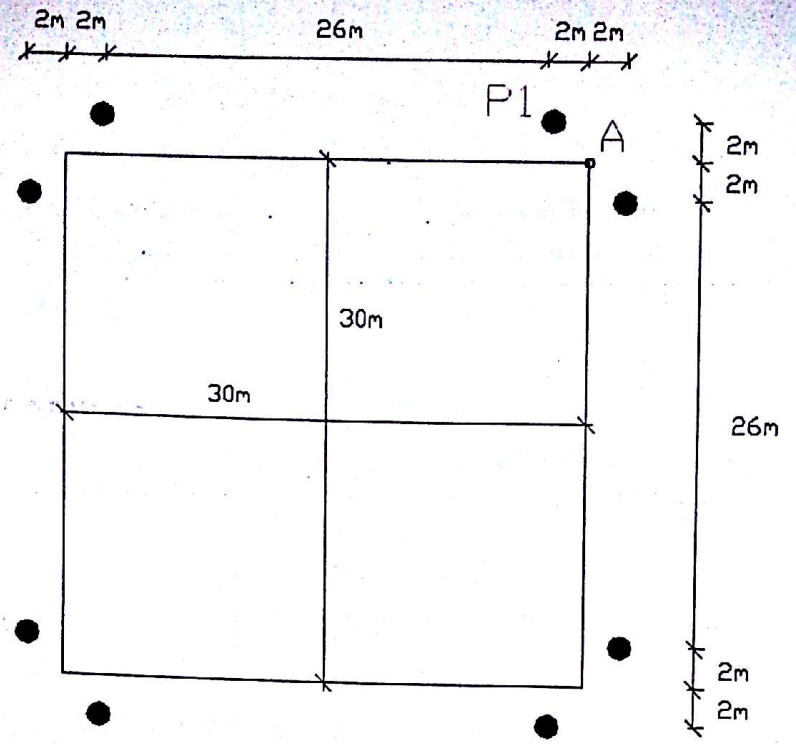


Figure (3)

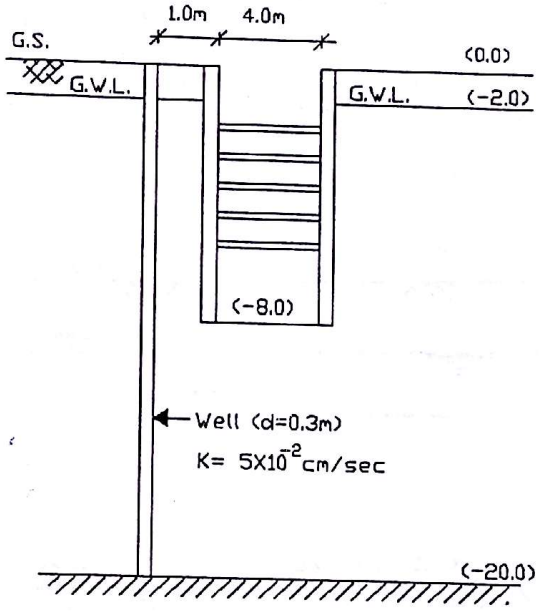


Figure (4)