ASSIGNMENT:2 SHALLOW FOUNDATION

1. Define the terms: (1) Ultimate bearing capacity (2) Net ultimate bearing capacity (3) Net safe bearing capacity (4) Allowable bearing pressure.

2. Explain clearly the effect of ground water table on the safe bearing capacity of soil.

3. Enumerate the factors affecting bearing capacity and explain in detail.

4. State different types of shallow foundation. Explain any one with neat sketch.

5. Describe the plate load test with neat sketches.

6. Describe Skempton's analysis for bearing capacity of cohesive soils.

7. Define contact pressure. Which factors affect contact pressure distribution? Draw contact pressure diagram for rigid footing on clay and sand.

8. Explain methods to reduce foundation settlement.

9. In which conditions the raft foundation is preferred?

10. What will be the gross and net safe bearing pressure of sand having $\varphi=360°$ and effective unit weight 1.8 tonnes/m^3 under the following cases:

I. 1 m wide strip footing

II. 1 m x 1 m square footing

Consider the footing are placed at a depth of 1 m from ground surface and water table is at a great depth . Assume a factor of safety of 3. Use Terzaghi's theory. Given for $\varphi=360°$ from Terzaghi's chart Nq=47 and Nγ=43.

11. Determine net allowable load and gross allowable load for a square footing of 2 m x 2 m size and depth 1 m . Use Terzaghi's theory.

$\gamma = 18 \text{kN/m3}$

C'= 15 kN/m3

Φ'= 250

FOS= 3, N'C = 14.8, N'q = 5.6 , N' γ = 3.2 .

12. Calculate using Skemptons equation, the ultimate bearing capacity of a square footing on the

surface of clay having unconfined compressive strength of 60 kN/m^3.