

## Unit 10 - Week 8

## Course outline

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 Lecture 37 : Pile Foundation - XI

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## Assignment Solution

## Assignment 8

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

Due on 2019-09-25, 23:59 IST.

 1) 1 point

A group of 9 piles with 3 piles in a row was driven into medium clay extending from ground level to a great depth. The diameter and the length of the piles were 30 cm and 10 m respectively. The unconfined compressive strength of the clay is 70 kPa. If the piles were placed 90 cm centre to centre, compute the allowable load on the pile group on basis of shear failure criterion for a factor of safety of 2.5,  $\alpha = 0.7$

- (a) 911 kN  
 (b) 1233 kN  
 (c) 724 kN  
 (d) 1876kN

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
 Score: 0

Accepted Answers:  
 a.

 2) The group efficiency of pile ( $\eta_g$ ) < 1 generally for 1 point

- (a) Smaller spacing between piles  
 (b) Driven pile between loose to medium sand  
 (c) Larger spacing of piles  
 (d) All of the mentioned

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
 Score: 0

Accepted Answers:  
 a.

 3) 1 point

A square pile group consisting 9 piles passes through a recently constructed soft deposits with  $q_u=50\text{kN/m}^2$  and  $\gamma=15\text{kN/m}^3$ . The depth of deposit is  $L_u=3\text{m}$ . The diameter of the pile is 30 cm and the piles are spaced 90 cm centre to centre. What is the negative skin friction load on the pile group.

- (a) 535kN  
 (b) 335kN  
 (c) 828 kN  
 (d) 986 kN

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
 Score: 0

Accepted Answers:  
 c.

 4) 1 point

A precast concrete pile of size 30x 30 cm is driven by a 300 kg drop hammer with the height of fall of 1.5m. The allowable pile load is given as 2000 kg. Considering a factor of safety of 6, what is the final set per blow using Engineering News Record formula?

- (a) 1.55 cm  
 (b) 1.05 cm  
 (c) 1.25 cm  
 (d) 2.25 cm

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
 Score: 0

Accepted Answers:  
 c.

 5) 1 point

A 400 mm diameter, 10 m long piles are used as foundations for a column in a uniform deposit of clay ( $c_u = 60 \text{ kN/m}^2$ ). The spacing between the piles is 300 mm. There are 9 piles in the ground arranged in a square pattern. Determine the group efficiency. Assume adhesion factor = 0.4.

- (a) 0.88  
 (b) 0.75  
 (c) 0.98  
 (d) 1.00

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
 Score: 0

Accepted Answers:  
 a.

 6) 1 point

The minimum pile spacing of friction pile with diameter D (length < 12 m ) in sand is taken as

- (a) 2D  
 (b) 3D  
 (c) 6D  
 (d) 8D

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
 Score: 0

Accepted Answers:  
 b.

 7) 0 points

A group of 9 driven piles, 12 m long and 300 mm in diameter is to be arranged in a square pattern in sandy soil ( $\phi = 30^\circ$ ). The centre to centre spacing of the piles are 400 mm. Calculate the ultimate load capacity of the pile group ( $\eta = 1$ ). The unit weight of sand is  $16 \text{ kN/m}^3$ .  $N_q = 25$ .  $\delta = 0.75\phi$ ,  $K=1$ ,  $L_{cr} = 15D$ . (consider critical depth concept and neglect the water table effect)

- (a) 2334 kN  
 (b) 3105 kN  
 (c) 3423 kN  
 (d) 3899 kN

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
 Score: 0

Accepted Answers:  
 b.

 8) 1 point

In problem 7, what is the settlement of pile group, if the settlement of single pile is 3mm [ use Skempton (1953) correlation ]

- (a) 6.8 mm  
 (b) 7.8 mm  
 (c) 9.4 mm  
 (d) 10 mm

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
 Score: 0

Accepted Answers:  
 a.

 9) 1 point

A group of 9 friction piles arranged in a square pattern is to be proportioned in a deposit of medium stiff clay. The size of the piles is 30x 30 cm and 10 m long. Find the optimum spacing of the piles. Assume  $\alpha=0.8$  and  $c_u=50\text{kN/m}^2$ .

- (a) 400 mm  
 (b) 550 mm  
 (c) 450 mm  
 (d) 697 mm

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
 Score: 0

Accepted Answers:  
 d.

 10) Negative skin friction in a soil is considered when the pile is constructed through a 1 point

- (a) Dense fine sand  
 (b) Dense coarse sand  
 (c) Over consolidated stiff clay  
 (d) Fill material

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
 Score: 0

Accepted Answers:  
 d.