

STRUCTURE PEDIA

Design Consultant

Calculation for : 1STRUCTE - PAPER 1

Date : 20 JUNE 2024

Project Title : ANALYSIS & DESIGN

Revision No. : R1

Job description : ANALYSING SITE CONDITION & TYPE OF FOUNDATION

Designed by : TM

Checked by :

S.No.	Calculation:	Codes/Remarks
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Site condition :-

Ground condition :-

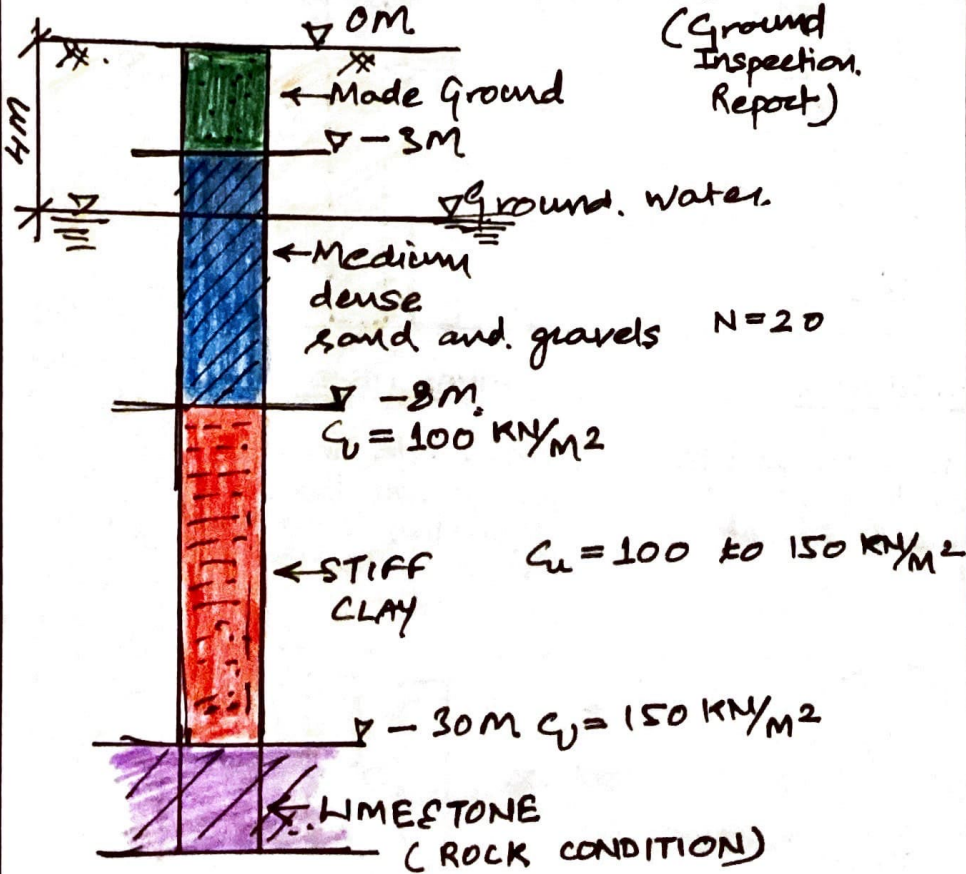


Table 2.2 c.s (EC): -

Condition :- Dense sand or stiff clay over layer of soft-clay, over stiff clay to greater depth.

Deep foundations generally required.

c.c (EC) \*\*  
Table.2.2

STRUCTURE  
PEPIA

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File foundation selected :-

Stiff clay : File ends at level = 30M  
where  $c_u = 150 \text{ kN/m}^2$

File diameter selected = 900 MM  
For  $c_u = 150 \text{ kN/m}^2$  & File dia = 900 MM.

File base capacity = 344 KN  $\left( \frac{c_u N_c A_b}{\gamma_b} \right)$   
 $\left. \begin{array}{l} \gamma_b \\ \gamma_b \\ 2.5 \end{array} \right\}$

CC-EC  
Table 3.43

File shaft capacity :-

SAND  
 $Q = \frac{A_s q'_{0, \text{mean}} K_s \tan \delta}{\gamma_f = 3.0}$

$A_s = 3.14 \times 0.9 \times 5$

$q'_{0, \text{mean}} = 18 \times \frac{5}{2} = 45 \text{ kN/m}^2$

$L = 5000, d = 900$

$\frac{L}{d} = 5.55$  } REFER  
 $N_q^* = 20$  } CC-EC  
 Table 3.45

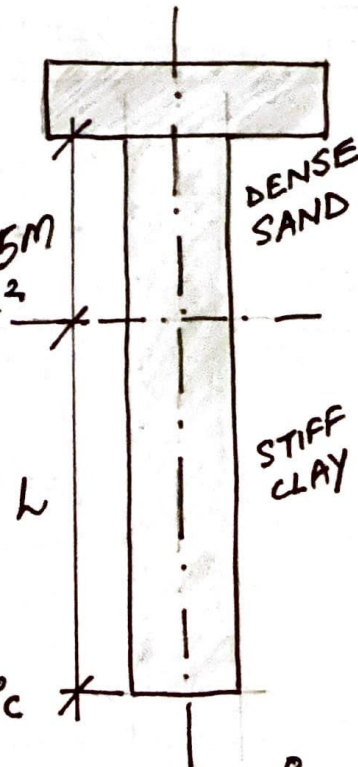
Angle of internal friction  
 $\theta = 28^\circ$

Referring to Table 3.46

$K_s = 0.4$  &  $\delta = 28^\circ$

$Q_a = \frac{3.14 \times 0.9 \times 45 \times 5 \times 0.4 \times \tan 28^\circ}{3}$

$Q_a = 45 \text{ KN (SAND)}$



Calculation for : 1STRUCB-PAPER1

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Clay shaft capacity:-

$$\begin{aligned}
 Q_{f, \text{clay}} &= \frac{K C A_s}{\gamma_s} \\
 &= \frac{0.45 \times (100 + 15d/2) \times \pi \times d \times L}{3.0} \\
 &= 52.98 L \\
 &= 52.98 \times 22 = 1165 \text{ KN}
 \end{aligned}$$

$$Q_{\text{shaft}} = 1165 + 45 = 1210 \text{ KN}$$

$$Q_{\text{base}} = 344 \text{ KN}$$

$$\text{Total Pile capacity} = 1554 \text{ KN}$$

• Total. Pile shaft capacity  
• Pile base capacity  
  
• Total. Pile Capacity

