

Qo2

Given:-

Size of Column = 500mm x 500mm each

Distance b^t two column = 5mW₁ = 1600 kN (each)

width restriction = 2.4m

 $q_0 = 200 \text{ kN/m}^2$ $f_{ck} = 25 \text{ N/mm}^2$ $f_y = 415 \text{ N/mm}^2$ Find = Design Combined footingCalculate Area of Footingi) Total Column load = $2 \times 1600 = 3200 \text{ kN}$

ii) Assuming self weight of footing as 10% of total weight = 320 kN.

iii) Total load, W = 3520 kN

iv) Area of footing required = $W/q_0 = 3520/200 = 17.6 \text{ m}^2$

(v) Available width of footing = 2.4m

Length of footing = $17.6/2.4 = 7.33 \text{ m}$

Hence adopting a length of 7.5m such that the CG of the load system coincides with the CG of the footing as shown in fig.

(vi) Upward soil pressure = $\frac{\text{Total load}}{\text{Area of footing}}$

$$= \frac{1600 \times 2}{7.5 \times 2.4} = 177.8 \text{ kN/m}^2$$

- (vii) Factored soil pressure $= 1.5 \times 177.8 = 266.67 \text{ kN/m}^2$
- (viii) Upward soil pressure per unit length
 $= 266.67 \times 2.4 = 640 \text{ kN/m}$

