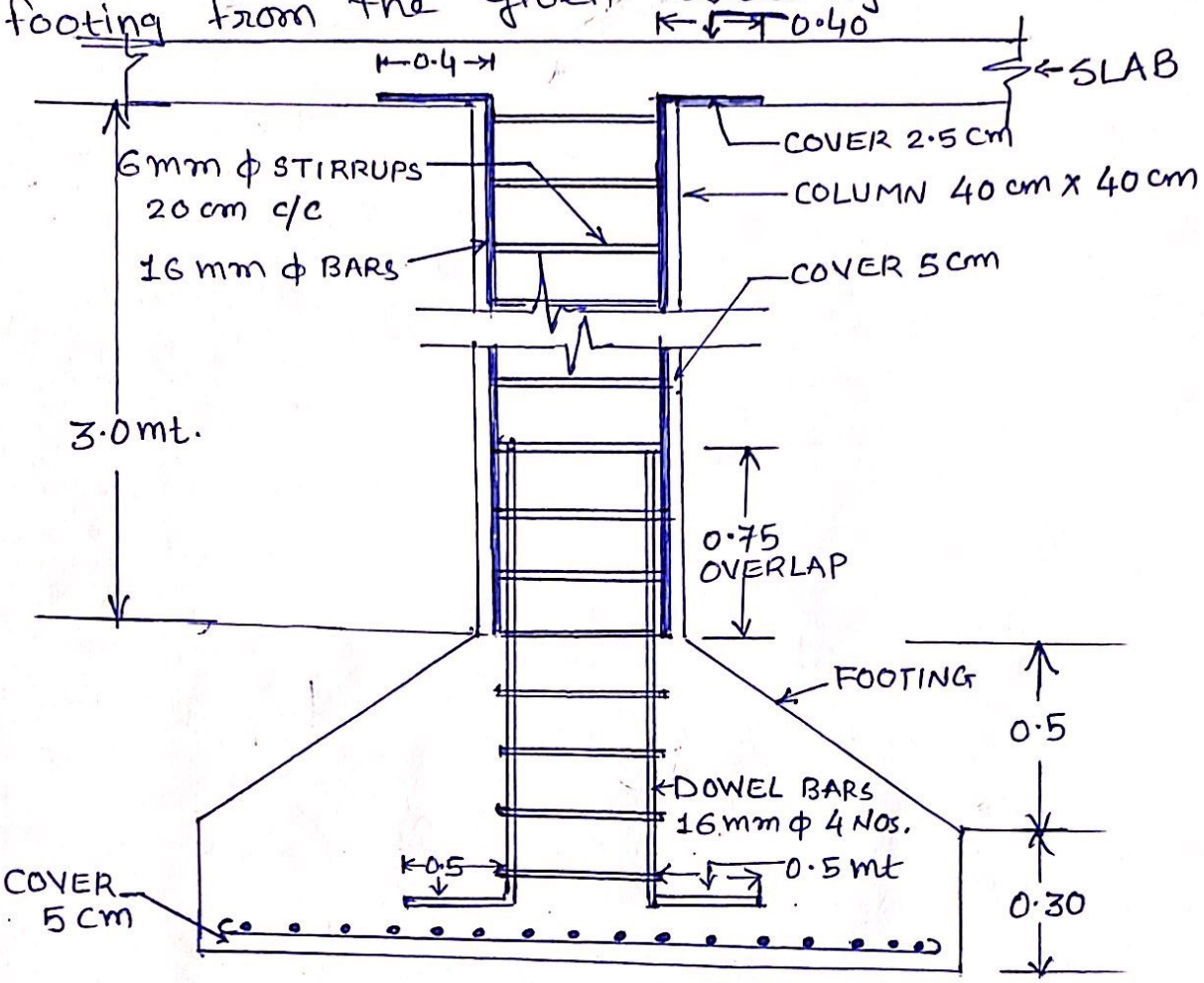
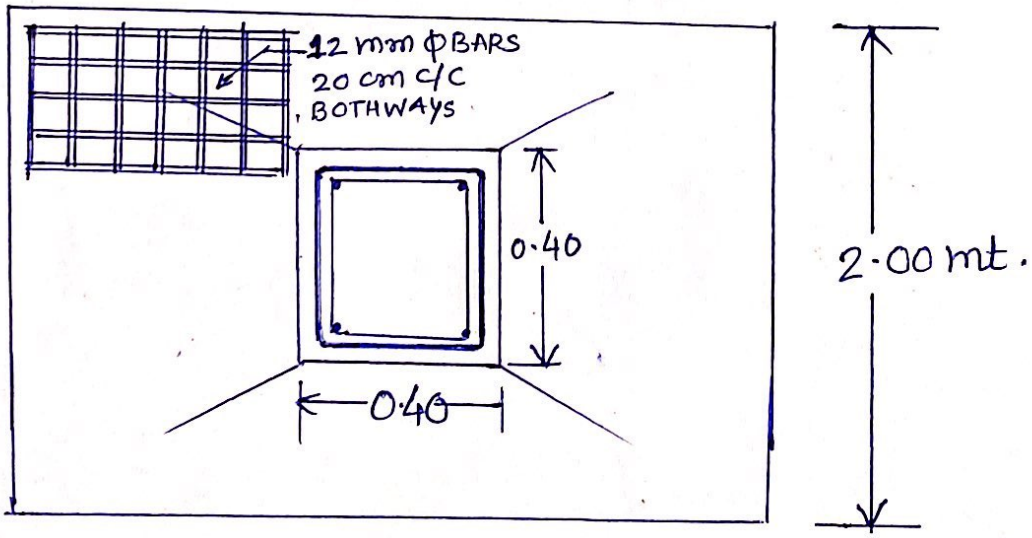
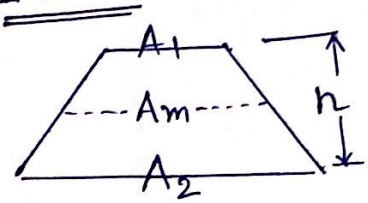
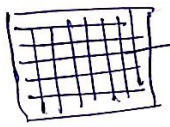
# ESTIMATE OF R.C.C. COLUMN

→ Provide a detailed estimate of R.C.C. column footing from the given drawing.



# MEASURMENT SHEET

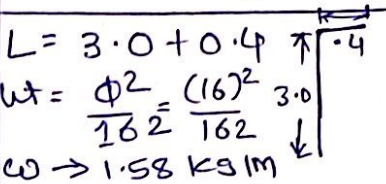
| Item No | Item Description | NO | L | B | H or D | Quantity |
|---|---|---|---|---|---|---|
| 1. | R.C.C. work (1:1.5:3) in column & footing excluding Steel & its bending | | | | | |
| | (a) FOR column | 1 | 3.0 | 0.4 | 0.4 | 0.48 $m^3$. |
| | (b) FOR FOOTING | | | | | |
| | footing without slop. (Bottom Square Portion) | 1 | 2.0 | 2.0 | 0.3 | 1.20 $m^3$ |
| | footing With slope. (Trepezoidal Portion) | | | | |   |
| | Vol. = $\frac{h}{6}(A_1+A_2+4A_m)$ | | | | | $A_1$ = 0.16 $M^2$ |
| | $A_1$ = Area at top of footing = 0.4 × 0.4 = 0.16 $m^2$. | | | | | $A_2$ = 4.0 $m^2$ |
| | $A_2$ = Area at Bottom footing = 2 × 2 = 4 $m^2$. | | | | | $A_m = \left(\frac{0.4+2}{2}\right)^2 = 1.44\ M^2$ |
| | | | | | | h = 0.5 mt |
| | $= \frac{0.5}{6}\left[0.16+4.0+4(1.44)\right]$ | | | | | |
| | $= \frac{0.5}{6}\left[9.92\right] = .8266\ M^3 \simeq 0.83\ M^3$ | 1 | | | | 0.83 $M^3$ |
| | | | | | | TOTAL = 2.51 $M^3$ |
| 2. | Steel reinforcing bars including bending | | | | |  Bothway |
| | (a) 12 mm ϕ bars 20 cm c/c Bothway | | | | | Length of bar = Total length − cover + 2 hook |
| | No of Bars = $\frac{\text{Length} - 2\times\text{cover}}{\text{spacing}} + 1$ | | | | | = 2 − (2 × .05) + 18(.012) |
| | $= \frac{2 - 2\times.05}{0.2} + 1$ | | | | | = 2.12 m |
| | $\simeq$ 11 | | | | | Unit wt = $\frac{\phi^2}{162}$ |
| | Bothway = 11 × 2 = 22 → | 11 × 2 = 22 | 2.12 | @ 0.89 kg/m | | $= \frac{(12)^2}{162}$ = 0.89 kg/m |
| | | | | | | 41.51 kg |

# MEASURMENT SHEET.

| Item No | Item Discription | NO | L | B | H or D | Quantity. |
|---|---|---|---|---|---|---|
| | (b) Reinforcement steel in column | | | | | |
| | → Vertical bar in Column | | | | | |
| | 16 mm ϕ & 4 Nos. | 4 | 3.4 | @ 1.58 kg/m | | 21.48 kg |
| | → Dowel bar In Column | | | | | |
| | 16 mm ϕ & 4 Nos. | | | | | |
| | Unit wt = $\frac{(16)^2}{162}$ = 1.58 kg/m | 4 | 1.98 | @ 1.58 | | |
| | → Stirrups | | | | | |
| | 6mm ϕ Stirrups 20 cm c/c | | | | | |
| | A = 0.4 − 2(cover) − $\frac{Dia}{2}$ | | | | | |
| | = (0.4 − (2×.05) − 2×.006 | | | | | |
| | = (0.4 − .1 − .012) = 0.288 | | | | | |
| | B = 0.288 | | | | | |
| | NO of Stirrups | | | | | |
| | $\frac{(3+.5+.3-.05-2\times.012)}{0.2}+1$ | 19 | | | | |
| | $= \frac{3.726}{0.2}+1 = 18.63$ | +1 | | | | |
| | $\simeq 19$ NO. | | | | | |
| | +1 | | | | | |
| | $\simeq$ 20 NO | 20 | 1.30 | @ 0.22 | kg/m | 5.72 kg |

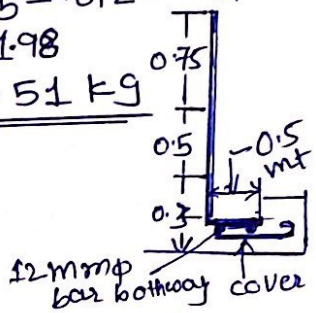
L = 3.0 + 0.4

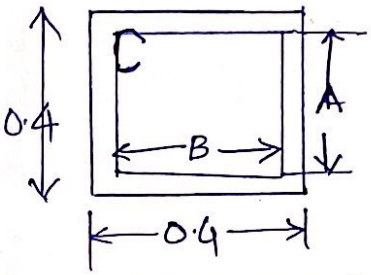
wt = $\frac{\phi^2}{162} = \frac{(16)^2}{162}$ → 1.58 kg/m




L = 0.75 + 0.5 + 0.3 + 0.5 − .05 − .012 − .012 = 1.98

12.51 kg




L = 2A + 2B + 24D

= 2(.288) + 2(.288) + 24(.006)

= 1.296 ≃ 1.30 mt

5.72 kg

TOTAL = 39.71 kg

# Material Calculation R.C.C (1:1.5:3)

R.C.C. Praposion is 1:1.5:3 so

1 Part Cement
1.5 Part Sand
3 Part Aggregate.

Total 5.5 Part.

Now Q+y of Volume of concrete = 2.51 $M^3$

Now Dry Volume of Concrete = $1.52 \times 2.51$
= 3.82 $m^3$.

Q+y of Cement in $M^3$ = $\frac{1 \times 3.82}{5.5}$
= 0.694 $M^3$. But Vol. of 1 beg of Cement = .035 $m^3$.

∴ No of Cement bags = $\frac{0.694}{0.035}$
= 19.84 ≃ 20 begs

Sand volume = $\frac{1.5 \times 3.82}{5.5}$ = 1.04 $M^3$

Aggregate Volume = $\frac{3 \times 3.82}{5.5}$ = 2.08 $m^3$

% of steel in ~~column footing~~

Total weight of steel = 41.51 kg + 39.71 kg = 81.22 kg.

Vol. of steel = $\frac{81.22 kg}{7850 kg/M^3}$ = 0.0103 $m^3$.

% of steel = $\frac{\text{Vol. of Steel}}{\text{Vol. of footing}} \times 100 = \frac{0.0103}{2.51} \times 100$

% of steel = 0.412 %.