

ALI HASNAIN

7966

SEC-B

ASSIGNMENT #01

ESTIMATION

SIR IMTIAZ

Question No. 01

①

Determine the quantities of various materials to prepare 100 cuft concrete if the ratio is (1:4:8)? Also calculate a brick work of 75 cuft & ratio for that is given (1:4). Calculate No of bricks, Dry volume & quantities of water?

∴ Solution:-

Given that :-  
Quantity of wet material = 100 cuft.

Dry density of concrete = 1.54.

⇒ Quantity of Dry material =  $100 \times 1.54$

Ratio of concrete = 1 : 4 : 8 (Given)

Sum of Ratio =  $1 + 4 + 8 = 13$

Quantity of cement =  $\frac{\text{Ratio of cement}}{\text{Sum of ratio}}$

× Dry materials.



(2)

Putting values in above equations.

$$= \frac{1}{13} \times 154 = 11.78 \text{ cft.}$$

OR.

$$= 11.78 / 1.25 = 9.92 \text{ bags of cement}$$

$$\Rightarrow \text{Quantity of sand} = \frac{\text{Ratio of sand} \times \text{dry materials}}{\text{Sum of ratio}}$$
$$= \frac{4}{13} \times 154 = 47.12 \text{ cft.}$$

$\Rightarrow$  Quantity of coarse aggregate.

$$= \frac{\text{Ratio of coarse aggregate} \times \text{Dry materials}}{\text{Sum of ratio.}}$$

$$= \frac{8}{13} \times 154 = 94.24 \text{ cft.}$$

Brick:

$$\text{Size of brick} = 9'' \times 4.5'' \times 3''$$

$$\text{Volume of brick} = 121.5 \text{ inch}^3$$

$$\text{Volume of brick wall} = 75 \text{ ft}^3$$

$$\text{No of bricks without mortar} = \left( \frac{75}{\frac{121.5}{(12)^3}} \right)$$

$$= \frac{75}{0.0703}$$

$$\text{No. of bricks} = 1066.85 \text{ or } 1067$$

Dry volume = wet volume, + 27% of (3)

$$= 1 + \left( \frac{27}{100} + 1 \right)$$

$$= 1 + 0.27$$

$$\text{Dry volume} = 1.27.$$

## Dry & wet volume of mortar (4)

When water is added to the dry mix of cement sand the volume of dry mix is reduced. It happens due to the presence of air voids on sand particles.

When we calculate the mortar quantity for any masonry work, we want to calculate the required volume of sand & cement. We need to convert that wet volume into the dry volume.

For estimation purpose, dry volume of mortar can be taken 1.27 & 1.54 times of its wet volume.

For cement mortar 1m?  
= 27% or 54%.



Dry & wet volume of concrete? (5)

Dry volume of concrete is the combined of cement, fine aggregates & coarse agg in dry condition.

After mixing the resultant wet volume turns out to be approximately 60-70% of the dry volume. For estimation purpose, dry volume of concrete can be taken as 1.54 of its ~~wet~~ wet volume.

For concrete  $1\text{m}^3 = 54\%$

Dry volume = wet volume + 54%  
of wet volume

$$= 1 + \left(\frac{54}{100} \times 1\right)$$

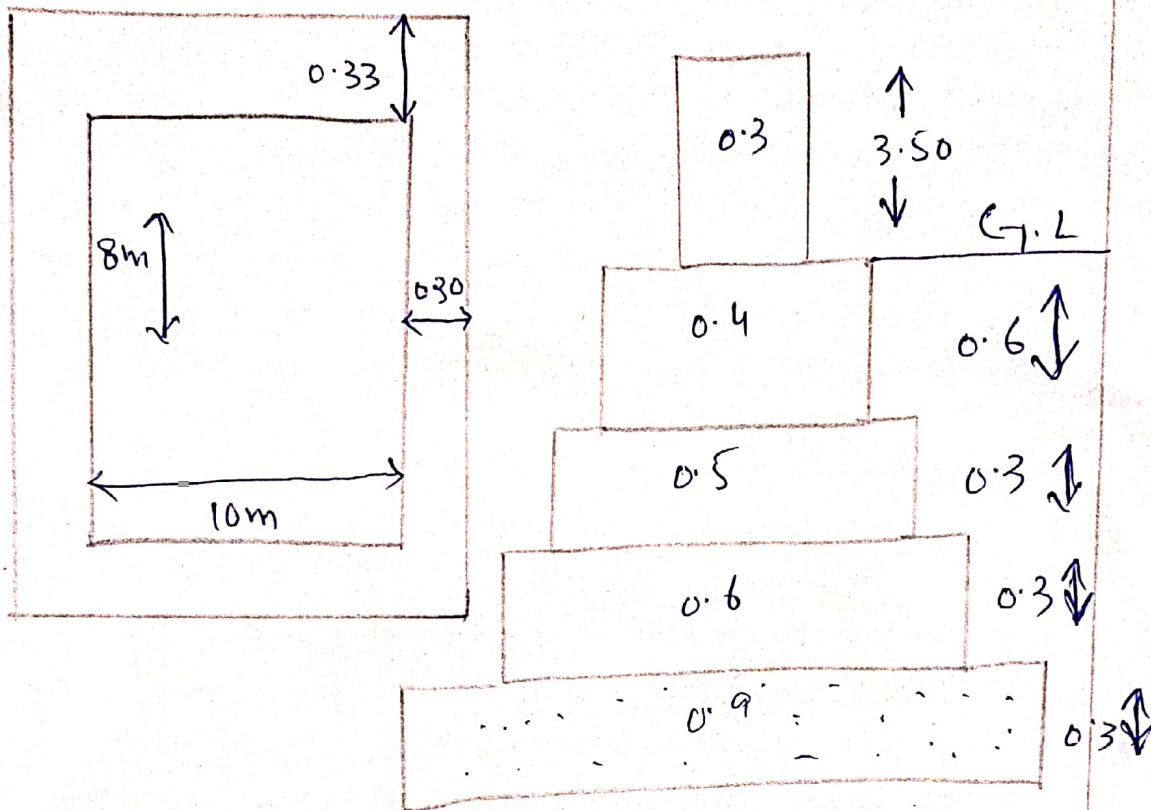
$$= 1.54$$

Dry volume = 1.54.

Question # 02

Calculate the quantities of earth work, concrete ..... by long and short wall.

(6)



$$L/w = 10 + 0.3 + 0.3 = 10.6m$$

$$S/w = 8m$$

Excavation:

$$L/w = 2 \times 10.6 \times 0.9 \times 1.5 = 28.62m^3$$

$$S/w = 2 \times 8 \times 0.9 \times 1.5 = 21.6m^3$$

$$\text{Total excavation} = 50.22m^3$$

$$\Rightarrow 28.62 + 21.6 = 50.22m^3$$

Concrete:

$$L/w = 2 \times 10.6 \times 0.9 \times 0.3 = 5.724m^3$$

$$S/w = 2 \times 8 \times 0.9 \times 0.3 = 4.32m^3$$

$$\text{Total concrete work} = 10.44m^3$$



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Brick wall:-

L/W

$$1^{\text{st}} \text{ footing} = 2 \times 10.6 \times 0.6 \times 0.3 = 3.816 \text{ m}^3$$

$$2^{\text{nd}} \text{ footing} = 2 \times 10.6 \times 0.5 \times 0.3 = 3.18 \text{ m}^3$$

$$3^{\text{rd}} \text{ footing} = 2 \times 10.6 \times 0.4 \times 0.3 = 2.544 \text{ m}^3$$

Brick wall above G.L

$$= 2 \times 10.6 \times 0.3 \times 3.5 = 22.26 \text{ m}^3$$

S/W

$$1^{\text{st}} \text{ footing} = 2 \times 8 \times 0.6 \times 0.3 = 2.88 \text{ m}^3$$

$$2^{\text{nd}} \text{ footing} = 2 \times 8 \times 0.5 \times 0.3 = 2.4 \text{ m}^3$$

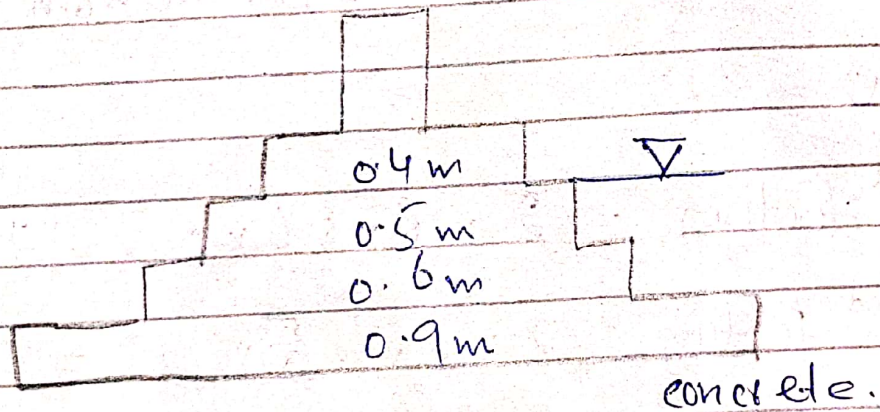
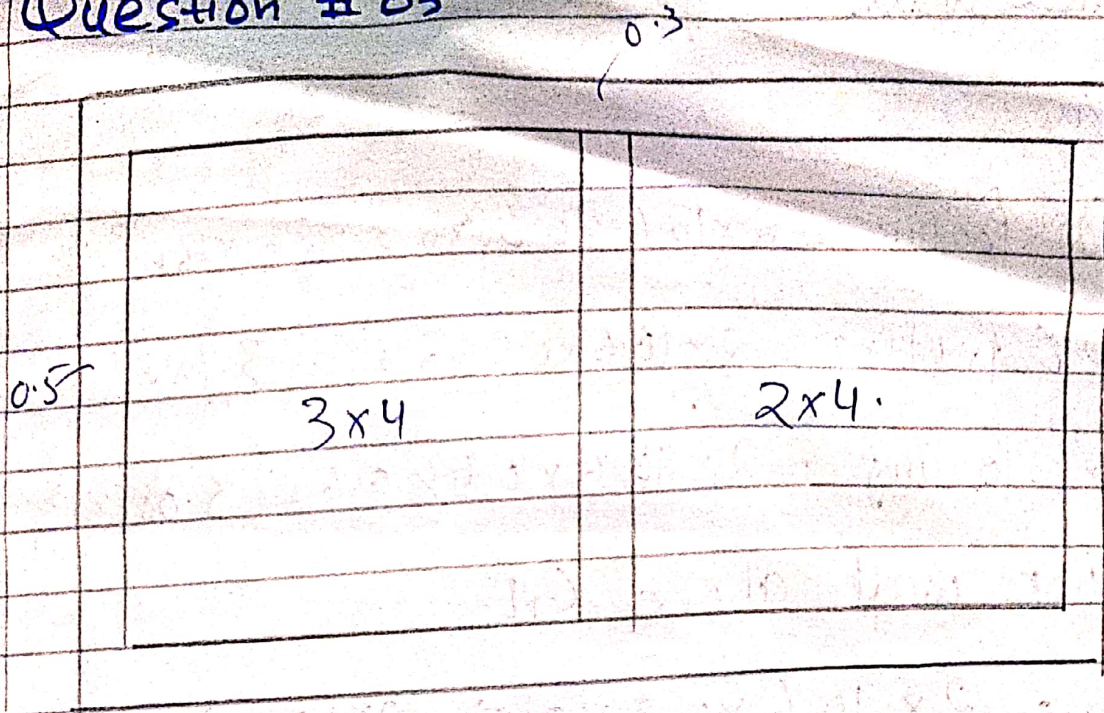
$$3^{\text{rd}} \text{ footing} = 2 \times 8 \times 0.4 \times 0.3 = 1.92 \text{ m}^3$$

$$\text{Above G.L wall} = 2 \times 8 \times 0.3 \times 3.5 = 16.8 \text{ m}^3$$

$$\underline{\underline{\text{Total S/W} = 16.8 \text{ m}^3}}$$



Question # 03



$$V = 0.15 + 4 + 0.15 = 4.3$$

$$EV = 3 \times 4.3 = 12.9$$

$$H = 0.15 + 3 + 0.3 + 2 + 0.15 = 5.8$$

$$EN = 2 \times 5.8 = 11.2$$

Centre line length

$$= 11.2 + 12.9$$

$$= 24.8$$



Excavation:

(9)

$$L = 24.8 - 0.9 = 23.9$$

SO

$$1 \times 23.9 \times 0.9 \times 0.5 = 10.955 \text{ m}^3$$

Concrete:

$$1 \times 23.9 \times 0.9 \times 0.1 = 2.151 \text{ m}^3$$

Brick work:

$$1^{\text{st}} \text{ footing} = 1 \times 24.2 \times 0.6 \times 0.2 = 2.904 \text{ m}^3$$

$$2^{\text{nd}} \text{ footing} = 1 \times 24.3 \times 0.5 \times 0.2 = 2.43 \text{ m}^3$$

$$3^{\text{rd}} \text{ footing} = 1 \times 24.4 \times 0.4 \times 0.2 = 1.952 \text{ m}^3$$

$$\begin{aligned} \text{Brick wall} &= 1 \times 24.5 \times 0.3 \times 0.6 \\ &= 4.41 \text{ m}^3 \end{aligned}$$