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SUBJECT : QUANTITY SURVEYING
AND ESTIMATION

SUBMITTED TO : ENGR - IMTIAZ

DEPARTMENT : BE (CIVIL)

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"Ans: 01;" "Quantities of various materials
"a" To prepare 100 c.ft concrete."

"Solution:"

$$\text{Quantity of wet material} = 100 \text{ c.ft}$$

$$\text{Dry density of concrete} = 1.54$$

$$\text{Quantity of Dry material} = 100 \times 1.54$$

$$= 154 \text{ c.ft}$$

$$\text{Ratio of concrete} = 1:4:8$$

$$\text{Sum} = 13$$

$$\text{"1"; Quantity of cement} = \frac{\text{Ratio of cement}}{\text{Sum}} \times \text{Dry material}$$

$$= \frac{1}{13} (154) = 11.84 \text{ c.ft}$$

$$\text{Numbers of bags} = 11.84 / 1.25 = 9.47 \text{ bags}$$

$$\text{"2"; Quantity of sand} = \frac{\text{Ratio of sand}}{\text{Sum}} \times \text{Dry material}$$

$$= \frac{4}{13} (154) = 47.38 \text{ c.ft}$$

"3";

$$\text{Quantity of C. Aggregate} = \frac{\text{Ratio}}{\text{S. Ratio}} \times \text{Dry material}$$

$$= \frac{8}{13} (154)$$

$$= 94.76 \text{ c.ft}$$

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* "No of Bricks in 75 c.ft."

* Bricks in 1 cubic feet;

$$\text{Size of Brick} = 9" \times 4.5" \times 3"$$

$$\text{Brick size with mortar} = 9.08" \times 4.58" \times 3.08"$$

$$\text{Volume} = 128 \text{ inch}^3$$

$$\text{Volume of 1 c.ft} = 1 \text{ ft} \times 1 \text{ ft} \times 1 \text{ ft}$$

$$= 12 \text{ in} \times 12 \text{ in} \times 12 \text{ in}$$

$$= 1728 \text{ inch}^3$$

$$\text{Now number of Bricks} = \frac{\text{Volume (cubic inch)}}{\text{Volume of 1 Brick}}$$

$$= \frac{1728}{128} = 13.5 \text{ NOS}$$

$$\text{No of Bricks in 75 c.ft} = 75 \times 13.5 = 1012.5 \text{ NOS}$$

* "Volume of mortar in 75 c.ft."

We have a Brick work of 75 c.ft and ratio for that is given 1:4.
We have to find Dry volume and quantity of mortar.

$$\text{Volume of Brick work} = 75 \text{ c.ft.}$$

We Take 20% to 30% mortar in Brick work.

Taking 25% of Brick work for mortar.

$$\frac{25}{100} \times 75 = 18.75 \text{ c.ft (wet volume)}$$

$$\text{Dry volume} = 18.75 \times 1.30 = 24.375 \text{ cuft}$$

$$\text{Ratio of Mortar} = 1:4$$

$$\text{Sum} = 5$$

$$\text{"1"}; \text{ Now Quantity of Cement} = \frac{1}{5} \times 24.375$$

$$= 4.875 \text{ c.ft}$$

$$\text{No of cement bags} = \frac{4.875}{1.25} = 3.9 \text{ bags.}$$

$$\text{"2"}; \text{ Quantity of Sand} = \frac{4}{5} (24.375)$$

$$= 19.5 \text{ c.ft}$$

Ans: 01

"Part : b"

"Wet volume";

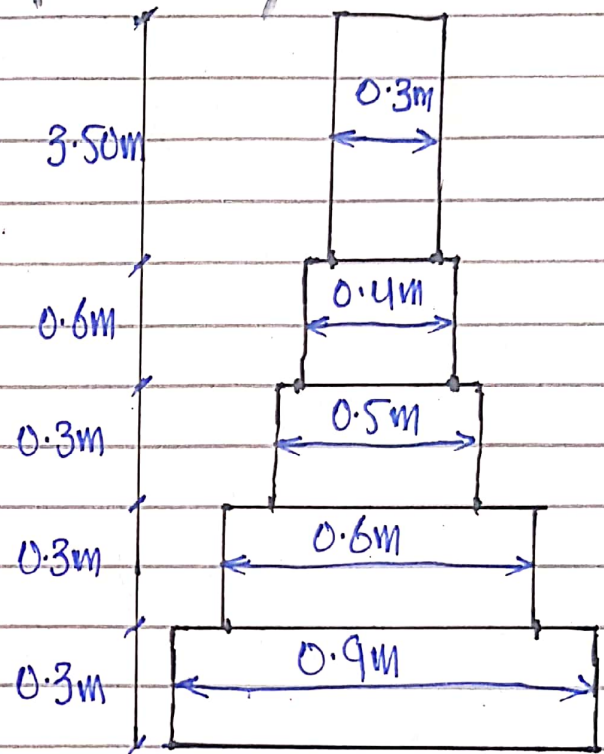
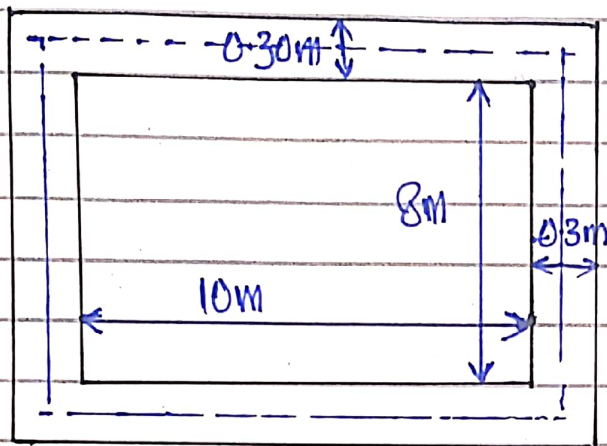
Wet volume of concrete is mixture of cement, sand and aggregate with water in wet condition,

volume of dry concrete is decrease by 54% in wet condition due to evaporation of air void between aggregate, sand and cement particles.

Dry volume;

Dry volume of concrete is mixture of cement, sand and aggregate without water in dry condition

"Ans: 02" "Long wall and short wall Method for eye room"



* Using the above image we will find length of long wall and short wall.

$$\begin{aligned} \text{c/c of long wall} &= 10 + \left(\frac{1}{2}(0.30)\right) + \left(\frac{1}{2}(0.30)\right) \\ &= 10.30\text{m} \end{aligned}$$

$$\begin{aligned} \text{c/c of short wall} &= 8 + \left(\frac{1}{2}(0.30)\right) + \left(\frac{1}{2}(0.30)\right) \\ &= 8.30\text{m} \end{aligned}$$

After finding out the length of the long wall and short wall, Now find the quantity of the various items which are used in construction.

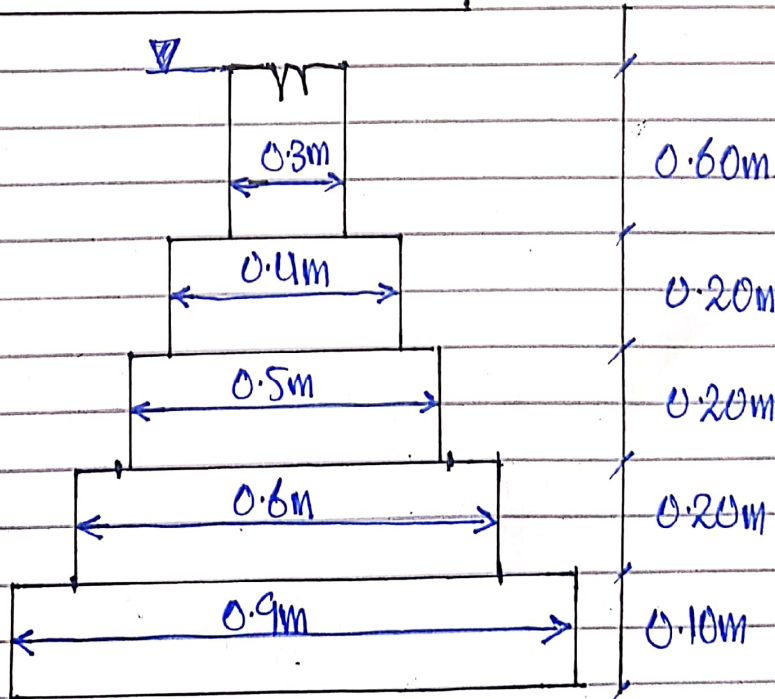
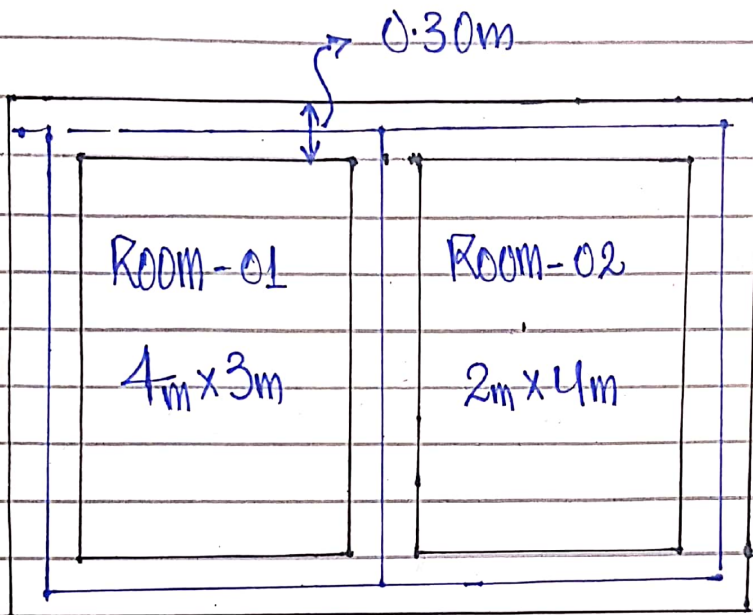
Sr.No	Details of Measurement and calculation.					
Sr.No	Item-Description	NO	Length	Breadth	H	Quantity
01	Excavation and Foundation;					
*	Long wall	2	11.20m	0.90m	0.90	16.68
*	Short wall	2	9.20m	0.90m	0.90	13.45
				Total	=	30.126 cum
02	Concrete in Foundation;					
*	Long wall	2	11.20m	0.90	0.30	5.562
*	Short wall	2	9.20m	0.90	0.30	4.482
				Total	=	10.044 cum
03	Brick work in Foundation/plinth.					
	Long walls					
	1st Footing	2	10.90	0.60	0.30	3.924
	2nd Footing	2	10.80	0.50	0.30	3.24
	Plinth wall	2	10.70	0.40	0.60	2.568
	Short walls					
	1st Footing	2	10.90 9.50	0.60	0.30	3.42
	2nd Footing	2	9.60	0.50	0.30	2.88
	Plinth wall	2	9.70	0.40	0.60	2.328
				Total	=	18.36 cum
04	B. work Superstructure					
	Long wall	2	10.60	0.30	3.50	22.26
	Short wall	2	8.00	0.30	3.50	16.80

Total = 39.06 cum

"Ans: 03;"

"CENTER LINE METHOD;"

"TWO ROOMS"



"Center Line Calculation"

$$C.L = S(H) + S(V)$$

$S(H)$ = Sum of C.L of Horizontal walls

$S(V)$ = Sum of C.L of vertical walls.

$$S(H) = 4.0 + 0.15 + 0.3 + 2 + 0.15 = 6.60 \text{ m}$$

$$\text{So, } 6.60 \times 2 = 13.20$$

$$S(V) = 0.15 \times 4 + 0.15 = 4.30 \text{ m} \times 2 = 8.60$$

$$C.L = S(H) + S(V)$$

$$= \cancel{6.60} + \cancel{8.60} =$$

$$= 13.20 + 8.60$$

$$\boxed{= 21.80 \text{ m}}$$

Deduction of T-Junction

$$\text{Length} = C.L - (\text{breadth}/2) \times \text{no of T-junction}$$

S.NO	Description	L	B	H	Q	Remarks
1	Excavation for foundation	20.90	0.90	1.30	24.45	\neq $21.80 - \left(\frac{0.9}{2}\right)(2)$ $= 20.90$
2	PCC in foundation	20.90	0.90	0.10	1.88	\neq $21.80 - \left(\frac{0.9}{2}\right)(2)$ $= 20.90$
3	Brick in foundation.					
	Step-01	21.20	0.6	0.20	2.544	\neq $21.80 - \left(\frac{0.6}{2}\right)(2)$ $= 21.20$
	Step-02	21.30	0.5	0.20	2.13	\neq $21.80 - \left(\frac{0.5}{2}\right)(2)$ $= 21.30$
	Step-03	21.40	0.4	0.20	1.712	\neq $21.80 - \left(\frac{0.4}{2}\right)(2)$ $= 21.40$
	Step-04	21.50	0.3	0.60	3.87	\neq $21.80 - \left(\frac{0.3}{2}\right)(2)$ $= 21.50$

Total Brick work quantity = 10.256 cubic meter.