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Subject Quantity Servey and estimation.

Submitted TO Engr. Imtiaz Khan

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Q1:-

(i) Determine the quantities of various materials to prepare 100 CFT Concrete if the ratio is (1:4:8)? Also calculate a brick work of 75 CFT and ratio of (1:4). Calculate No of bricks, Dry volume and quantities of mortar.?

Sol:-

Quantity of wet material = 100 CFT

Dry density of concrete = 1.54.

Quantity of dry material = 100 × 1.54

Quantity of dry material = 154 cft.

Ratio of concrete = 1:4:8

Sum of ratio = 1+4+8 = 13

$$\text{Quantity of cement} = \frac{\text{Ratio of cement}}{\text{sum of ratio}} \times \text{Dry material.}$$

$$\text{Quantity of cement} = \frac{1}{13} \times 154 = 11.84 \text{ cft}$$

∵ 1 bag = 1.25 cft

And $11.84 / 1.25$ ⇒ 9.47 bags ≅ 10 bags

$$\text{Quantity of Sand} = \frac{\text{Ratio of sand}}{\text{Sum of ratio}} \times \text{Dry material}$$

$$\text{Quantity of Sand} = \frac{4}{13} \times 154 = 47.38 \text{ cft}$$

Quantity of course aggregate = Ratio of course aggregate / Sum of ratio x Dry material.

Quantity of course aggregate $= \frac{8}{13} \times 154$

Quantity of course aggregate = 94.76 cft

Volume of brick work = 75 Cft

Taking 25% of brick work for mortar.

$\frac{25}{100} \times 75 = 18.75$ cft (wet volume)

For dry volume we have a multiply factor 1.27 with wet volume of mortar.

Dry volume = wet volume x 1.27

Dry volume = 18.75 x 1.27

Dry volume = 23.81 cft.

Ratio = 1:4

Sum of ratio = 1+4 = 5

Quantity of cement = $\frac{\text{ratio of cement}}{\text{sum of ratio}}$ x Dry material.

Quantity of cement $= \frac{1}{5} \times 23.81$

Quantity of cement = 4.76 Cft

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∵ 1 bag = 1.25 cft.

4.76 / 1.25 = 3.8 bags ≈ 4 bags.

Quantity of Sand = $\frac{\text{ratio of Sand} \times \text{Dry material}}{\text{Sum of ratio}}$

Quantity of Sand = $\frac{4}{5} \times 23.81$

Quantity of Sand = 19 cft.

∵ 1 cubic feet = 13.5 No of bricks.

75 cubic feet = 75 (13.5)

75 cft = 1012.5 No of bricks.

No of brick = 1012.5

(ii) :- What is meant by Dry and wet volume? Why 1.27 and 1.54 factor is used in calculation of quantities? How Quantity Survey and estimation is helpful in a construction Project?

Ans:- Dry volume means volume of ingredient of concrete like sand, cement and aggregate in mix dry condition before adding water.

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Wet volume means volume of ingredient of concrete like sand cement and aggregate in mix after adding water

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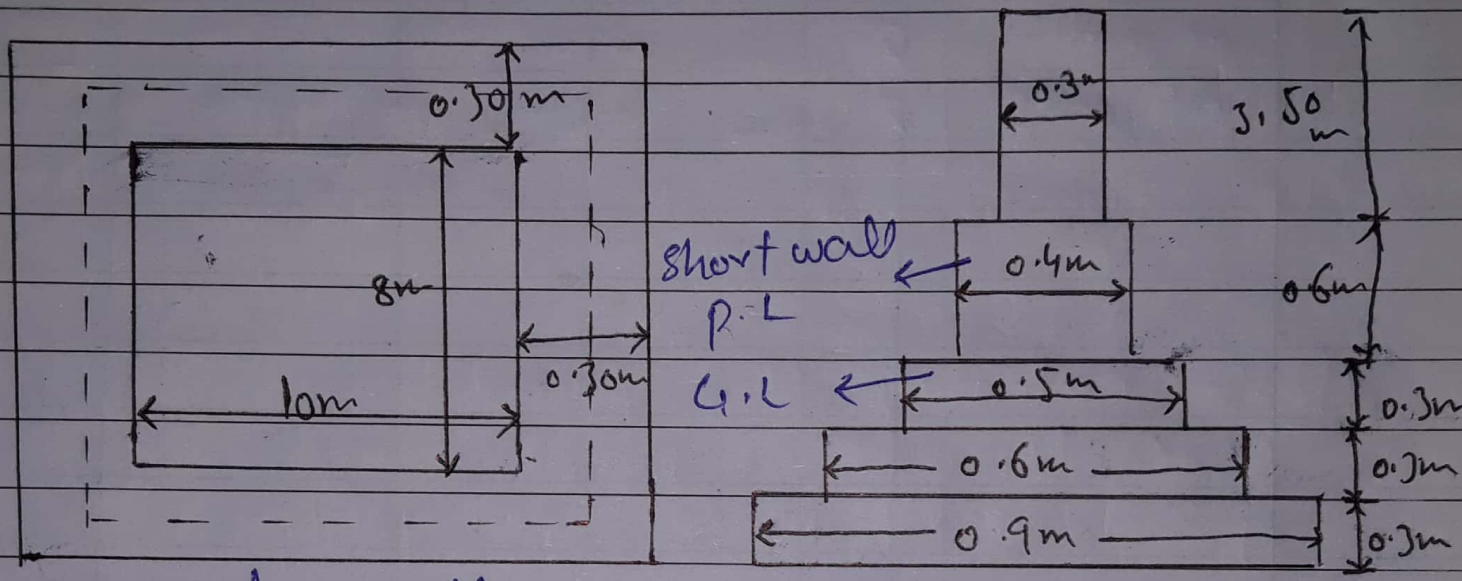
Q2:- calculate the quantities of earthwork = Concrete.



Sol:-

centre to centre length of long wall

$= 10 + (1/2 \times 0.30) + (1/2 \times 0.30)$

$= 10.30\ m$

centre to centre length of short wall

$= 8 + (1/2(0.30)) + (1/2 \times 0.30)$

$= 8.30\ m$

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S.NO	item Description	NO	L	B	H/D	Quantity	Note
1	Excavation of foundtion						
	Long walls	2	11.20m	0.90m	0.90m	18.14 m^3	10.30+0.90 = 11.20m
	short walls	2	7.4m	0.9m	0.9m	11.98 m^3	8.30 - 0.90 = 7.4m
						30.12 m^3	
2	Concrete in foundtion						
	Long wall	2	11.20m	0.9m	0.30m	6.04 m^3	
	Short walls	2	7.4m	0.9m	0.30m	3.99 m^3	
						10.03 m^3	
3	Brick work in foundation and plinth						
	Long walls						
	1st footing	2	10.9m	0.60	0.30	3.92 m^3	L = 10.30+0.60 = 10.9m
	2nd footing	2	10.80	0.50	0.30	3.24 m^3	L = 10.30+0.50 = 10.8m
	Plinth walls	2	10.70	0.40	0.30	2.56 m^3	L = 10.30+0.40 = 10.7m
	Short walls						
	1st flooting	2	7.70	0.60	0.30	2.77 m^3	L = 8.30-0.60 = 7.70m
	2nd footing	2	7.80	0.50	0.30	2.34 m^3	L = 8.30-0.50 = 7.80m
	Plinth walls	2	7.90	0.4	0.30	1.89 m^3	L = 8.30-0.40 = 7.90m
						16.72 m^3	

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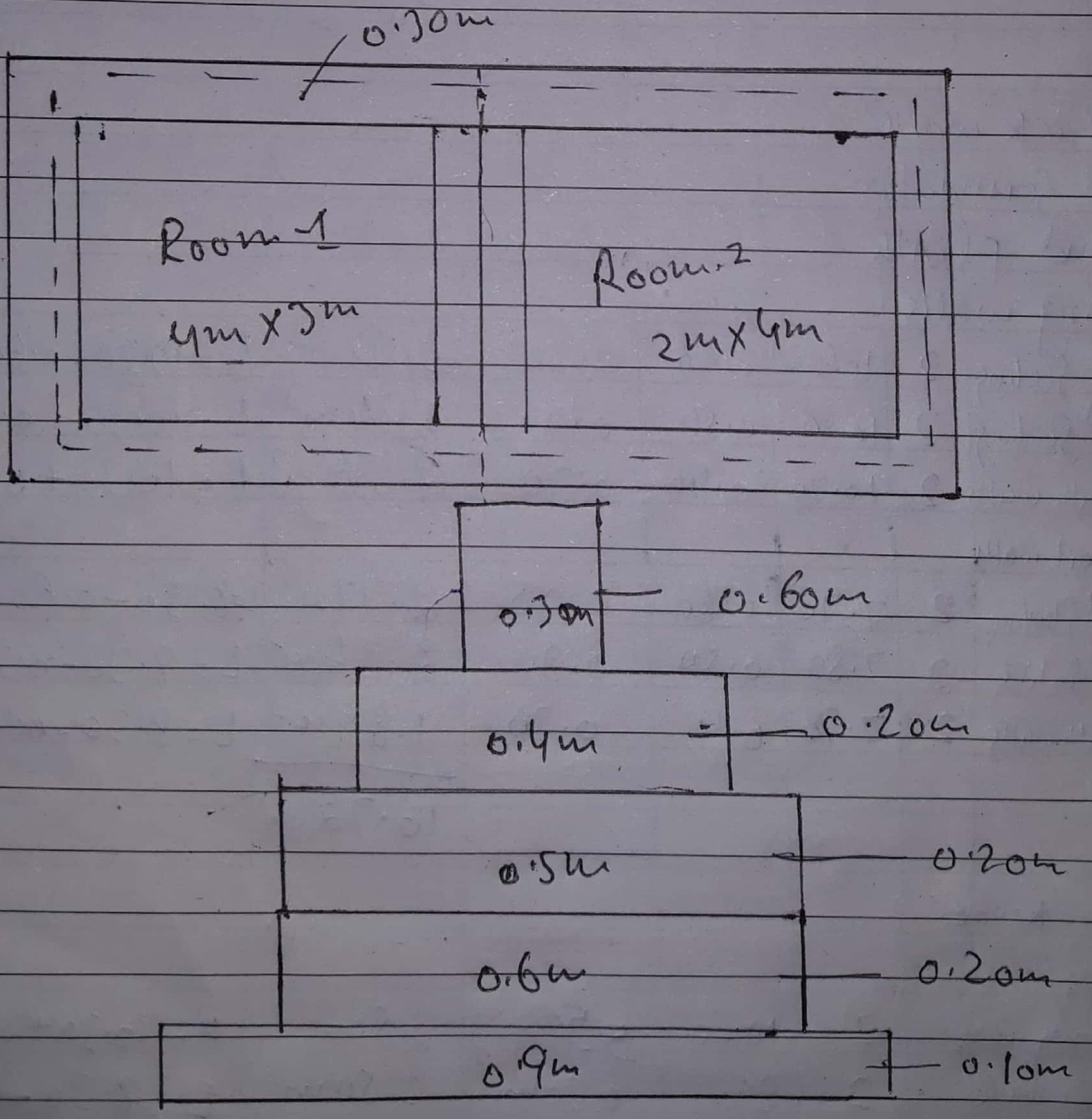
S.No	items	No	L	B	H/D	Quantity	Notes
04	Brickwork in Superstructre						
	Long walls	2	10.60m	0.30m	3.50m	22.26m³	10.30+0.30 = 10.60m
	Short walls	2	8m	0.30m	3.50m	16.80m³	8.30-0.30 = 8m
						39.06m³	

Q3:- calculate the quantities of earthwork concrete work, brick work for the given wall used centre line method



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

$S(H) = (0.15 + 3 + 0.3 + 2 + 0.3)$

$S(H) = 5.75$

Now No of walls are 2

So $\boxed{5.75 \times 2 = 11.5m}$

$S(V) = (0.15 + 4 + 0.15) = 4.3m$

No of walls are 3

So $\boxed{4.3 \times 3 = 12.9m}$

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

$C.L = 11.5 + 12.9 \Rightarrow C.L = 24.4m$

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S.No	Description	L	B	H	Q	Remarks
1	Excavation for foundtion	23.5	0.9	1.3	27.49m³	L = 24.4 - (0.9/2) x 2 = 23.5m
(2)	PCC in foundation	23.5	0.9	0.10	2.11 m³	
(3)	Brickwork in foundtion					step 1:- L = 24.4 - (0.6/2) x 2 L = 23.8m
	Step 1	23.8m	0.6	0.2	2.85m³	Step 2:- L = 24.4 - (0.5/2) 2
	Step 2	23.9m	0.5	0.2	2.39m³	L = 23.9m
	Step 3	24m	0.4	0.2	1.92 m³	Step 3:- L = 24.4 - (0.4/2) 2
	Step 4	24.1m	0.3	0.2	1.44m³	L = 24m
						Step 4:- 24.4 - (0.3/2) 2 = 24.1
			Total quantity of brickwork		8.6m³	

Total quantity of brickwork
= 8.6m³