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ROLL #: 7399  
PAPER: Quantity survey and  
Estimation

DATE: 24-8-2020  
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QNO 2

- (1) Determine the quantities of various materials to prepare 100 CFT concrete of ratio is (1:4:8)? Also calculate a brick work of 75 CFT and ratio of it is given (1:4). Calculate no of bricks, Dry volume and quantities of mortar.

Solution:

Quantities of various materials to prepare 100 CFT concrete (1:4:8).

- Quantity of wet material = 100 cft
- Dry density of concrete = 1.54

Quantity of dry material =  $100 \times 1.54 = 154$  cft

Ratio of concrete = 1:4:8

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

- Quantity ratio of cement =  $\frac{\text{Ratio of cement} \times \text{Dry mat}}{\text{Sum of ratio}}$   
 $= \frac{1}{13} \times 154 = 11.78$  cft

and  $\frac{11.78}{1.25} = 9.42$  bags

- Quantity of sand =  $\frac{\text{Ratio of sand}}{\text{Sum of sand}} \times \text{Dry material}$   
 $= \frac{4}{13} \times 154 = 47.12 \text{ cft}$

- Quantity of coarse agg =  $\frac{\text{ratio of coarse agg}}{\text{sum of ratio}} \times \text{Dry Mat}$   
 $= \frac{8}{13} \times 154$   
 $= 94.24 \text{ cft}$

$\therefore$  1 cubic feet = 13.5 No. of bricks

Bricks in 1 cubic foot

Size of brick = 9" x 4.5" x 3"

Size of brick with mortar = 9.08" x 4.58" x 3.08"

Volume of brick with mortar =  $L \times B \times H$   
 $= 9.08 \times 4.58 \times 3.08$   
 $= 128 \text{ inch}^3$

Volume of 1 cft =  $1 \text{ ft} \times 1 \text{ ft} \times 1 \text{ ft}$   
 $= 12 \text{ inch} \times 12 \text{ inch} \times 12 \text{ inch}$   
 $= 1728 \text{ inch}^3$

No of bricks =  $\frac{\text{Volume of 1 cubic inch}}{\text{Volume of 1 brick}}$   
 $= \frac{1728}{128}$

No of bricks = 13.5 Nos.

Brick work of : 75 cft

Ratio that is = 1:4.

finding Dry volume and quantity of mortar

To find volume of mortar.

Taking 25% of brick work.  
for mortar.

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

Note: we consider  
20% to 3% mortar  
in brick work

## Q No: 1 Part 'B'

Dry and Wet <sup>volume of</sup> concrete

- \* Dry volume of concrete is the combine volume of concrete, fine aggregates of coarse agg. in dry condition.
- \* After mixing the resultant wet volume turns out to be approximately ( $x=10^5$ ) of the dry volume for the estimation purpose. dry volume of concrete can be taken as 1.54 of its wet volume.

for concrete  $1m^3 = 54\%$

$$\text{Dry volume} = \text{Net volume} \mp 54\% \text{ of wet volume.}$$

$$= 1 + \frac{54}{100}$$

$$= 1 + 0.54$$

$$\text{Dry volume} = 1.54.$$

When water is added to the dry mix cement sand the volume of dry mix is reduced. It happens due to the presence of air and sound particle.

- \* when we calculate the motion of empty for any masonry work we get the net volume of masonry.

if we want to calculate the required volume of sand & cement we need to convert that wet volume into dry volume.

\* For estimate purpose dry volume of mortar can be taken 1.27 & 1.54 times of its wet volume

For cement mortar  $1m^3$   
27% or 54%.

Dry volume = wet volume + 27% of wet volume.

$$= 1 + (27/100 + 1)$$

$$= 1 + 0.27$$

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

## QNo:2 Details of measurement & calculation:

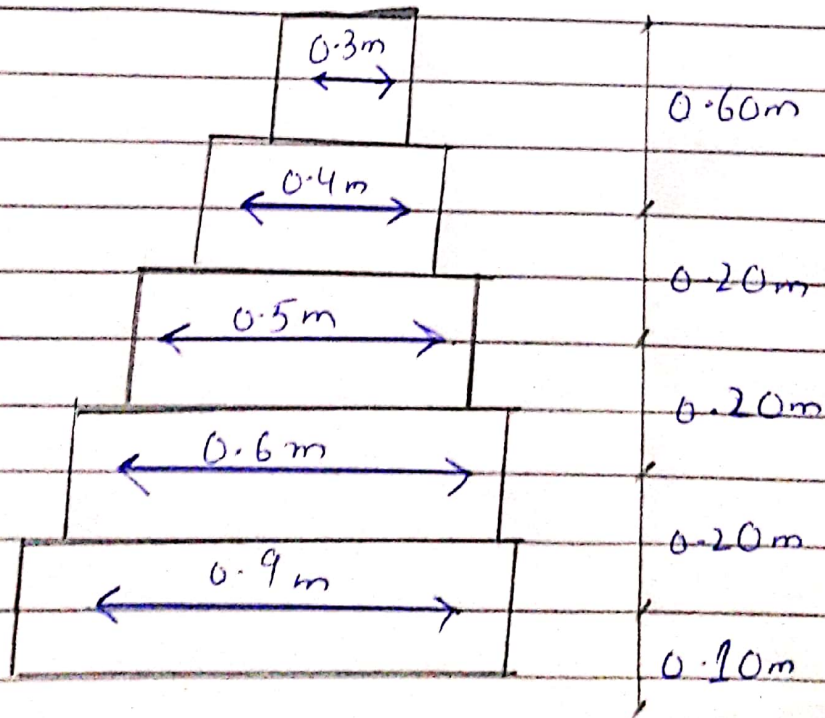
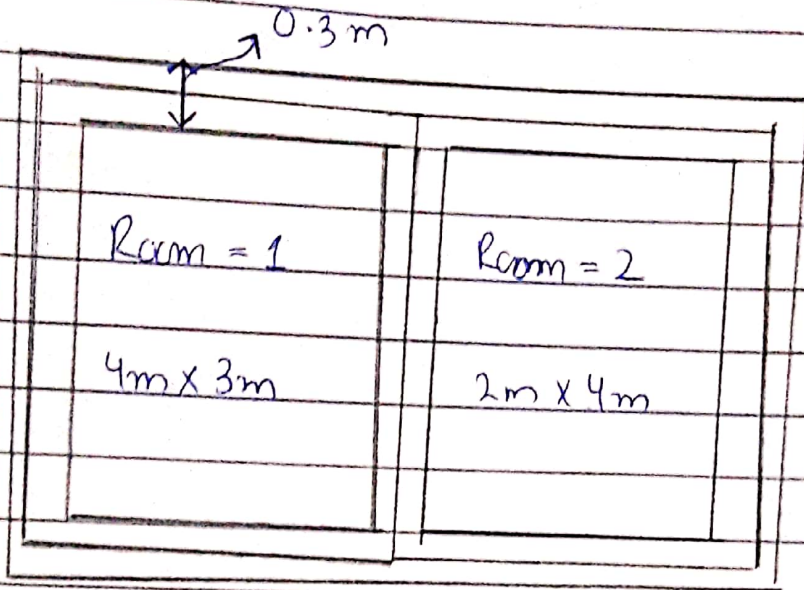
SNo	item description	No	length	Breath	hieght	Quantity	Note
1:	Excavation and foundation						
+	long wall	2	11.30 <sup>m</sup>	0.90m	0.90	16.68	
+	Short wall	2	9.20m	0.90m	0.90	13.45	
				<b>Total</b>	<b>=</b>	<b>30.126</b>	
2:	Concrete foundation						
+	long wall	2	11.20m	0.90	0.30	5.562	
+	short wall	2	9.20m	0.90	0.30	4.482	
				<b>Total</b>	<b>=</b>	<b>10.044</b>	
3:	Brick work foundation Plinth						
	long walls						
+	1 <sup>st</sup> footing	2	10.90	0.60	0.30	3.924	
+	2 <sup>nd</sup> footing	2	10.80	0.50	0.30	3.24	
+	Plinth wall	2	10.70	0.40	0.60	2.568	
	Short wall						
+	1 <sup>st</sup> footing	2	<del>10.950</del> 9.50	0.60	0.30	3.42	
+	2 <sup>nd</sup> footing	2	9.60	0.50	0.30	2.88	
+	Plinth wall	2	9.60	0.40	0.60	2.328	
				<b>Total</b>	<b>=</b>	<b>8</b>	
	long wall	2	2	10.60	0.30	3.50	
	Short wall	2	2	8.00	0.30	3.50	

1.1	L	B	H	Q
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Remarks

20.80 -  $(0.9/2) \times 2$

Q No: 3 "CENTER LINE METHOD"  
Two Rooms



Srno	Description	L	B	H	Q	Remarks
1	Excavation for foundation	2.40	0.90	1.30	24.45	$20.80 - (0.9 \times 1.3)$
2	PCC in foundation	2.40	0.90	1.10	1.89	20.90
3	Bricks of foundation					2
Step 1	21.20	0.6	2.544			21.80 $(\frac{2.6}{2}) \times 2$
Step 2	21.30	0.5	2.13			21.30
Step 3	21.46	0.4	1.712			21.30
Step 4	21.50	0.3	3.87			21.8
						21.50

Total brick work quantity

$= 10.56 \text{ (m)}$