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Section " "A"

Subject " Quantity survey & estimation

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(10)

(d) step #04

$$B = 0.3 \text{ m}, \quad H = 0.6 \text{ m}$$

$$L = 24.1 \text{ m} + 0.3 \frac{1}{2} \times 2$$

$$L = 23.8 \text{ m}$$

$$Q = 23.8 \times 0.3 \times 0.6$$

$$Q = 4.284 \text{ m}^3$$

Total Quantity of brick work

$$Q = 2.822 + 2.36 + 1.896 + 4.284$$

$$Q = 11.36 \text{ m}^3$$

⑨

$$L = 23.2 \text{ m}$$

$$\text{Quantity} = 23.2 \times 0.9 \times 0.1$$

$$Q = 2.088 \text{ m}^3$$

(3) Brick work in foundation :-

(a) Step No # 01

$$B = 0.6 \text{ m}, H = 0.2 \text{ m}$$

$$L = C.L - B/2 \times \text{No of T Junction}$$

$$L = 24.1 - 0.6/2 \times 2$$

$$L = 23.5$$

$$Q = 23.5 \times 0.6 \times 0.2 = 2.82 \text{ m}^3$$

(b) Step No # 02

$$B = 0.5 \text{ m}, H = 0.2 \text{ m}$$

$$L = 24.1 - 0.5/2 \times 2 = 23.6 \text{ m}$$

$$Q = 23.6 \times 0.5 \times 0.2 = 2.36 \text{ m}^3$$

(c) Step # 03

$$B = 0.4 \text{ m}, H = 0.2 \text{ m}$$

$$L = 24.1 - 0.4/2 \times 2$$

$$L = 23.7 \text{ m}$$

$$Q = 23.7 \times 0.4 \times 0.2$$
$$= 1.896 \text{ m}^3$$

(8)

Q No 3

Solution:-

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

$$S(H) = 0.15 + 3 + 0.3 + 2 + 0.15 = 5.6 \text{ m}$$

$$\begin{aligned} \text{No. of wall} &= 2 \\ \text{So } 5.6 \times 2 &= 11.2 \text{ m} \end{aligned}$$

$$S(V) = 0.15 + 4 + 0.15 = 4.3 \text{ m}$$

$$\begin{aligned} \text{No. of short wall} &= 3 \\ \text{So } 4.3 \times 3 &= 12.9 \text{ m} \end{aligned}$$

$$\Rightarrow C.L = 11.2 + 12.9 = 24.1 \text{ m}$$

(1) Excavation or Earth work

$$B = 0.9 \text{ m}, \quad H = 1.3 \text{ m}$$

$$L = C.L - \left(\frac{1}{2} \times B\right) \times \text{No. of T Junctions}$$

$$= 24.1 - \left(\frac{0.9}{2}\right) \times 2$$

$$L = 23.2 \text{ m}$$

$$\Rightarrow Q = L \times B \times H$$

$$= 23.2 \times 0.9 \times 1.3$$

$$Q = 27.144 \text{ cum or m}^3$$

(2) Concrete work in foundation:

$$B = 0.9 \text{ m}, \quad H = 0.1 \text{ m}$$

$$L = C.L - \frac{B}{2} \times \text{No. of T Junctions}$$

$$= 24.1 - \frac{0.9}{2} \times 2$$

Sr.No

Item

No

Length

breadth

Height

Quantity

Note

short wall

2

7.70m

0.60m

0.30m

2.77

Length =  $8.3 - 0.6 = 7.7m$

1st footing

2

7.80m

0.50m

0.30m

2.34

Length =  $8.3 - 0.5 = 7.80m$

2nd footing

2

7.90m

0.40m

0.60m

3.79

Length =  $8.3 - 0.4 = 7.90m$

Plinth walls

2

Total

8

8.90m

(4)

7

Breadth work in super-structure

Long wall

2

10.6m

0.30m

3.50

22.96

Length =  $10.3 + 0.3 = 10.6$

short wall

2

8.0m

0.30m

3.50

16.8

Length =  $8.3 - 0.3 = 8.0m$

Total = 35.06

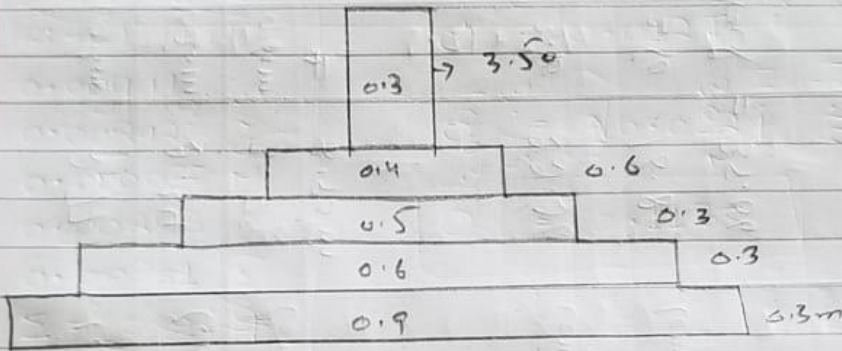
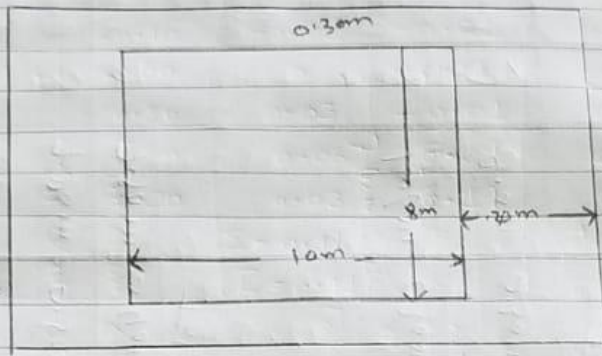
Detail of measurement and calculation of Quantities:-

S.No	Item Description	No	Length	Breadth	Height	Quantity	Note
(1)	Execution in foundation						
	Long wall	2	11.2m	0.90	0.90m	18.14	Length = $10.3 + 0.90 = 11.2m$
	Short wall	2	7.4m	0.90	0.90m	11.98	Breadth = $8.3 - 0.90 = 7.4m$
					Total = <del>30.02</del>	30.12	
(2)	Concrete in foundation						
	Long wall	2	11.2m	0.90	0.30	6.04	Length = $10.3 + 0.9 = 11.2m$
	Short wall	2	7.40m	0.90	0.30	3.99	Breadth = $8.3 - 0.90 = 7.40m$
					Total =	10.03	
(3)	Brick work in foundation and Plinth Long wall						
	1st footing	2	10.9m	0.60m	0.30m	3.92	Length = $10.3 + 0.6 = 10.9m$
	2nd footing	2	10.8m	0.50m	0.30m	3.24	Length = $10.3 + 0.5 = 10.8m$
	Plinth	2	10.7m	0.40m	0.60m	3.12	Length = $10.3 + 0.4 = 10.7m$

6

(5)

Q No # 02 ::



Solution :-

$$\text{c/c length of long wall} = \left(\frac{0.30}{2}\right) + 10$$

$$+ \frac{(0.30)}{2} = 10.3 \text{ m}$$

$$\text{c/c length of short wall} = \left(\frac{0.30}{2}\right) + 8 + \left(\frac{0.30}{2}\right)$$

$$= 8.3 \text{ m}$$

(4)

Why we use  $1.27$  or  $1.54$  ?  
When we calculate the material quantity for any masonry work, we get the wet volume. To calculate the required volume of sand & cement, we need to convert that wet volume into dry volume. For estimation purpose dry volume can be  $1.27$  or  $1.30$ .

Dry volume =  $1 + \left(\frac{27}{100} \times 1\right) = 1.27$   
 $1.54$  is a factor help us to convert the wet volume of concrete into dry volume.

### Purpose of Quantity & Estimation

in Construction.

- To know the amount of money required in construction.
- To know Quantity of material used in construction.
- To Justify the Investment.
- Assess to the required requirement of tool plants & equipment to complete the work accordingly.
- Ensure that project remain profitable to the contractor or not.



(3)

$$\Rightarrow \text{Net brick work} = \text{total brickwork} - \text{volume of mortar}$$

$$= 75 - 18.75$$

$$= 56.25 \text{ ft}^3$$

$$\Rightarrow \text{No of bricks} = \frac{\text{Net brick work}}{\text{Vol. of one brick}}$$

$$\text{Volume of 1 brick} = \frac{9}{12} \times \frac{4.5}{12} \times \frac{8}{12}$$

$$= 0.0703 \text{ ft}^3$$

$$\text{No of bricks} = \frac{56.25}{0.0703} = 800 \text{ bricks}$$

Let include 10% wastage,

$$= \frac{10}{100} \times 800 = 80$$

$$\text{Net Number of bricks} = 800 + 80 = 880 \text{ bricks.}$$

Q No 1 part "B"

Ans Dry volume means:-

= = Volume of Ingredient of concrete like sand, cement, & aggregate in mix dry condition before adding water.

wet volume means:-

= = Volume of Ingredient of concrete like sand, cement & aggregate in wet after adding water.

(2)

## Brick work

Solution

We have brick work of volume =  $75 \text{ ft}^3$   
Ratio of cement and sand = 1:4

(1) Find Volume of Mortar

Taking 25% of brick work for mortar  
 $= \frac{25}{100} \times 75 = 18.75 \text{ ft}^3$   
wet volume

Now the dry volume =  $18.75 \times 1.27$   
 $= 23.81 \text{ ft}^3$

(2) Quantities of mortar:-

For cement:

We use the formula

$$\text{Cement} = \frac{1}{5} \times 23.81$$

$$\begin{aligned} \therefore \text{Ratio} &= 1:4 \\ \text{sum} &= 1+4=5 \\ \text{Cement} &= 1 \\ \text{Sand} &= 4 \end{aligned}$$

$$= 4.76 \text{ ft}^3 \text{ and } 3.8 \text{ bags}$$

$$\text{for sand} = \frac{4}{5} \times 23.81 = 19.04 \text{ ft}^3$$

(3) Number of brick:-

We have total brick work of volume =  $75 \text{ ft}^3$

→ Taking 25% of brick work for mortar  
 $= \frac{25}{100} \times 75 = 18.75 \text{ ft}^3$

①

QNO # 1

Quantities of various material to prepare  
100 ft<sup>3</sup> concrete with 1:4:8 ratio

Solution :-

→ Volume of wet concrete = 100 ft<sup>3</sup>  
→ Dry Density of concrete = 1.54

$$\text{Dry volume of concrete} = 100 \times 1.54 = 154 \text{ ft}^3$$

$$\text{C.S.A Ratio} = 1:4:8$$

$$\text{Cement} = 1$$

$$\text{Sand} = 4$$

$$\text{Aggregate} = 8$$

$$\text{sum of ratio} = 1 + 4 + 8 = 13$$

$$\Rightarrow \underline{\text{Cement}} = \frac{1}{13} \times 154 = 11.84 \text{ ft}^3$$

$$\text{No' of cement bags} = \frac{11.84}{1.25} = 9.47 \text{ bags}$$

$$\Rightarrow \underline{\text{Sand}} = \frac{4}{13} \times 154 = 47.38 \text{ ft}^3$$

$$\Rightarrow \underline{\text{Aggregate}} = \frac{8}{13} \times 154 = 94.76 \text{ ft}^3$$