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Paper : Quantity Survey & Estimation.

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Q No. 1 Part (i)

⇒ Determine the quantities of various materials to prepare 100 CFT concrete (1:4:8).

Sol:- step 1:

Quantity of wet material = 100 cft

Dry Density of concrete = 1.54

step 2:

Quantity of dry material =
 $100 \times 1.54 = \boxed{154 \text{ cft}}$

Step 3:

Ratio of concrete = 1:4:8

Sum of ratio = 1+4+8 = 13

→ Quantity of cement =

$\frac{\text{Ratio of cement} \times \text{Dry Material}}{\text{Sum of Ratio}}$

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

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

→ Quantity of sand =

$\frac{\text{Ratio of sand} \times \text{Dry material}}{\text{Sum of Ratio}}$

$$= \frac{4}{13} \times 154 = 47.12 \text{ cft}$$

→ Quantity of coarse agg =

$\frac{\text{Ratio of coarse egg} \times \text{Dry material}}{\text{Sum of Ratio}}$

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

cement bags = 10

Sand = 47.12 cft

Quantity of coarse Agg = 94.24 cft

⇒ Brick work of 75 cft

and Ratio for that is

given 1:4.

Sol:- volume of brick work
= 75 cft

To find volume of mortar.

Taking 25% of brickwork
for mortar;

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

For dry volume we have
multiply factor 1.27 with
wet volume.

$$\text{Dry vol} = \text{wet vol} \times 1.27$$

$$= 18.75 \times 1.27 = 23.81 \text{ cft}$$

$$\text{Dry vol} = 23.81 \text{ cft.}$$

for a cement we have
Quantity of cement.

$$= \frac{\text{Ratio of cement}}{\text{sum of Ratio}} \times \text{Dry Vol}$$

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

$$\text{Sum of Ratio} = 5 \Rightarrow \frac{1}{5} \times 23.81$$

$$\text{Quantity of cement} = 4.76 \text{ cft}$$

$$1 \text{ bag} = 1.25 \Rightarrow \frac{4.76}{1.25} = 3.8 \text{ bags}$$

4 bags of cement.

For A sand we have

$$\text{Quantity of sand} = \frac{\text{Ratio of sand}}{\text{sum of ratio}} \times \text{Dry Vol}$$

$$= \frac{4}{5} \times 23.81 = 19 \text{ cft.}$$

Q No. 1 (Part 2)

⇒ Dry & wet volume
of concrete.

→ Dry volume of concrete
is the volume of cement,
fine aggregates sand, coarse
agg: in dry condition.

→ After mixing the resultant
wet vol turns out to be
approximately of the dry
vol for estimation purpose,
dry vols of concrete can
be taken as 1.54 of its
wet vol.

→ For concrete $1\text{m}^3 = 54\%$

→ Dry vol = wet vol + 54%
of wet vol

$$= 1 + (54/100 \times 1)$$

$$= 1 + 0.54$$

$$\text{Dry vol} = \underline{1.54}$$

→ For estimation purpose dry vol of mortar can be taken 1.27 or 1.54 times of its wet vol.

For cement mortar 1m^3

$$= 27\% \text{ or } 54\%$$

$$\text{Dry vol} = \text{wet vol} + 27\% \text{ of wet vol}$$

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

$$= 1 + 0.27$$

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

Q No. 1 (Part 2)

⇒ How Quantity Survey and Estimation is helpful in a construction Project.

Quantity Survey largely deals with managing and controlling various aspect of construction.

It gives an understanding of the technical element of construction over the life cycle of a facility or building, a necessary project controls tool to achieve the value and best quality within the clients specification. For estimation purposes, dry volume of mortar can be

taken as 1.27 or 1.30
times of its wet volume.

Q No. 2

S.No	Item Description	No	L	B	H/D	Quantity	Note
1	Excavation of foundation						
	Long wall	2	11.20m	0.90m	0.90m	18.14m ³	10.30 + 0.90 = 11.20m
	Short wall	2	7.4m	0.90m	0.90m	11.98m ³	8.30 - 0.90 = 7.4m
						30.12m ³	
2	concrete in foundation						
	Long wall	2	11.20m	0.90m	0.30m	6.04	
	Short wall	2	7.4m	0.90m	0.30m	3.99	
						10.03 cum	
3	Brick work in foundation & Path.						
	1st footing	2	10.9m	0.60	0.30	3.92	L = 10.3 + 0.6 = 10.9m
	2nd footing	2	10.80m	0.50	0.30	3.24	L = 10.3 + 0.50 = 10.8m
	Plinth wall	2	10.70m	0.40	0.30	2.56	L = 10.3 + 0.40 = 10.7m
	Short wall						
	1st footing	2	7.70	0.60	0.30	2.77	8.30 - 0.60 = 7.7m
	2nd footing	2	7.80	0.50	0.30	2.34	8.30 - 0.50 = 7.8m
	Plinth wall	2	7.90	0.40	0.30	1.89	8.30 - 0.40 = 7.9m
							16.72 cum
4	Brick work in super structure						
	Long wall	2	10.6m	0.30m	3.5m	22.26	10.30 + 0.30 = 10.6m
	Short wall	2	8m	0.30m	3.5m	16.80	8.30 - 0.30 = 8m
						39.06 cum	

Q3:-

$$\text{center line} = \Sigma H + \Sigma V$$

First we find Horizontal

$$H = 0.15 + 3 + 0.30 + 2 + 0.15 = 5.6$$

$$= 5.6 \times 2 = 11.2$$

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

$$4.3 \times 3 = 12.9$$

$$L.L = 11.2 + 12.9$$

$$= 24.8$$

Description	No	L	w	H	@
1) Excavation in foundation length $= L.L - \frac{w}{2} \times \text{No. of Junction}$ $24.8 - \frac{0.9}{2} \times 2$ $= 23.9$	1	23.9	0.9	1.3	26.1 m ³
2) PCC in foundation length $= 24.8 - \frac{0.9}{2} \times 2$ $= 23.9$	2	23.9	0.9	0.10	2.15 m ³

3) Brick work in foundation

	1	24.2	0.6	0.2	2.904m ³
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step 1 = $24.8 - \frac{0.6 \times 2}{2}$
 = 24.2

	1	24.3	0.5	0.2	2.43m ³
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step 2 = $L = 24.8 - \frac{0.5 \times 2}{2}$
 = 24.3

	1	24.4	0.4	0.2	1.952m ³
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step 3 = $L = 24.8 - \frac{0.4 \times 2}{2}$
 = 24.4

	1	24.5	0.3	0.6	4.41m ³
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step 4 = upto ground level.
 Length = $24.8 - \frac{0.3 \times 2}{2}$
 = 24.5