

Q1(cii) Determine the quantities of various  
..... quantities of mortar?

Solution: Given data :-

(ii) Quantity of wet material = 100 cft

(iii) Dry density of concrete = 1.54

Quantity of dry material =  $\frac{\text{Quantity of wet material}}{\text{Dry density of concrete}}$

$$= 100 \times 1.54$$

Quantity of dry material = 154 cft

Ratio of concrete = 1:4:8

Sum of ratio = 1+4+8

$$= 13$$

Quantity of cement =  $\frac{\text{Ratio of cement} \times \text{dry material}}{\text{Sum of ratio}}$

$$= \frac{1 \times 154}{13}$$

$$13$$

Quantity of cement = 11.78 cft

One bag cement = 1.25 cft

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

So 10 bags are required of cement

Quantity of sand =  $\frac{\text{Ratio of sand}}{\text{Sum of ratios}} \times \text{dry material}$

$$= \frac{4}{13} \times 154$$

13

$$= 47.12 \text{ cft}$$

Quantity of coarse aggregate =  $\frac{\text{Ratio of coarse aggregate}}{\text{Sum of ratios}} \times \text{Dry material}$

$$= \frac{8}{13} \times 154$$

13

$$= 94.24 \text{ cft}$$

Now brick work of 75 cft and ratio for that is given 1:4

Volume of brick work = 75 cft

To find volume of mortar taking 25% of brickwork for mortar

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

For dry volume we have multiply factor 1.27 with wet volume

$$\begin{aligned} \text{Dry volume} &= \text{Wet volume} \times 1.27 \\ &= 18.75 \times 1.27 \\ &= 23.81 \text{ cft} \end{aligned}$$

Quantity of cement =  $\frac{\text{Ratio of cement}}{\text{Sum of ratio}} \times \text{dry volume}$

$$\begin{aligned} \text{Ratio} &= 1:4 &= \frac{1}{5} \times 23.81 \\ \text{Sum} &= 5 & \end{aligned}$$

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

1 bag = 1:25  $\Rightarrow$  4.76 bags  
 3.8 bags

4 bags of cement

for sand

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

$$= \frac{4}{5} \times 23.81$$

$$= 19.048$$

(iii) What is meant by dry .....  
 ..... construction project?

Ans: When different dry ingredients of concrete like cement, sand and aggregate mix by adding water then their volume is decreased by 54% due to evaporation of air voids and filling of pores in aggregate, sand and cement.

Volume of dry mix of different ingredients of concrete like cement, sand and aggregate before adding water is known as dry volume of concrete having air voids and pores.

Suppose we have concrete cube of  $1 \text{ m}^3$ .

When we convert this into dry volume increased by 54%.

$$\therefore \text{Dry volume} = \text{Wet volume} + 54\% \text{ wet volume}$$

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

$$= 1 + 0.54$$

$$= 1.54$$

Quantity survey & estimation is very important for any construction project. As in start we have to calculate the amount of material and how much quantity is required. So without quantity survey & estimation it is quite hard to get estimated amount or quantity of material.

Q:3 Calculate the quantity .....

..... wall method?

Ans

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

First we will find horizontal

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

$$= 5.6$$

$$= 5.6 \times 2 \Rightarrow 11.2$$

$$V = 0.15 + 4 + 0.15$$

$$= 4.3$$

$$= 4.3 \times 3 \Rightarrow 12.9$$

$$L.L = 11.2 + 12.9$$

$$= 24.8$$

Description	No	L	W	H	$\Phi$
(i) Excavation in Foundation	1	23.9	0.9	1.3	2.601 m <sup>3</sup>
$\text{lengths} = \frac{L.L - W \times \text{No of junction}}{2}$ $\frac{24.8 - 0.9 \times 2}{2}$ $= 23.9$					

(ii) P.C.C in found

1

23.9

0.9

0.10

2.151 m<sup>3</sup>

$$\text{length} = 24.8 - \frac{0.9 \times 2}{2}$$

$$= 23.9$$

(iii) Brick masonry found

1

24.2

0.6

0.2

2.904 m<sup>3</sup>

$$24.8 - \frac{0.6 \times 2}{2}$$

$$= 24.2$$