

(Q₁)
(i)

PIANO
Point
0.8mm

10

100 cu.ft concrete if the ratio (1:4:8)

Given Data:

Step #1: Quantity of wet material = 100

2) Dry density of concrete = 1.54

Step #2:

Quantity of dry material = $\frac{\text{Quantity of wet material}}{\text{Dry density of concrete}}$
= $100 \times 1.54 = 154$ cu. ft

⇒ Quantity of dry material = 154 cu. ft

Step: 3: Ratio of concrete = 1:4:8

Sum of ratio = 1:4:8 = 13

⇒ Quantity of cement = $\frac{\text{Ratio of cement}}{\text{Sum of ratio}}$

$$\begin{aligned} & \times \text{Dry material} \\ & = \frac{1}{13} \times 154 \end{aligned}$$

Quantity of cement = 11.78 cuft
and
one bag cement = 1.25 cuft

Now

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

So 10 bags required for a cement

$$\begin{aligned} \text{Quantity of sand} &= \frac{\text{Ratio of sand} \times \text{Dry material}}{\text{sum of ratio}} \\ &= \frac{4}{13} \times 154 = 47.2 \text{ cuft} \end{aligned}$$

$$\text{Quantity of Coarse Aggregate} = \frac{\text{Ratio of coarse agg.}}{\text{sum of ratio}} \times \text{Dry material}$$

$$\text{Quantity of Coarse Aggregate} = \frac{8}{13} \times 154 = 94.24 \text{ cuft}$$

Cement bags = 10

Sand = 47.2 cuft

Quantity of coarse Aggregate = 94.24 cuft

⇒ Brickwork of 75 cu.ft
ratio for it given 1:4

Sol: Vol. of brickwork = 75 cu.ft

To find volume of mortar:

Taking 25% of brickwork for mortar;

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

for dry volume multiply factor 1.27 with wet volume

$$\begin{aligned} \text{Dry volume} &= \text{wet volume} \times 1.27 \\ &= 18.75 \times 1.27 = 23.81 \text{ cu.ft} \end{aligned}$$

$$\text{Dry volume} = 23.81 \text{ cu.ft}$$

For cement we have

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

Ratio 1:4

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

$$\text{Quantity of cement} = 4.76 \text{ cu.ft}$$

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

Say 4 bags of cement

For sand we have

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

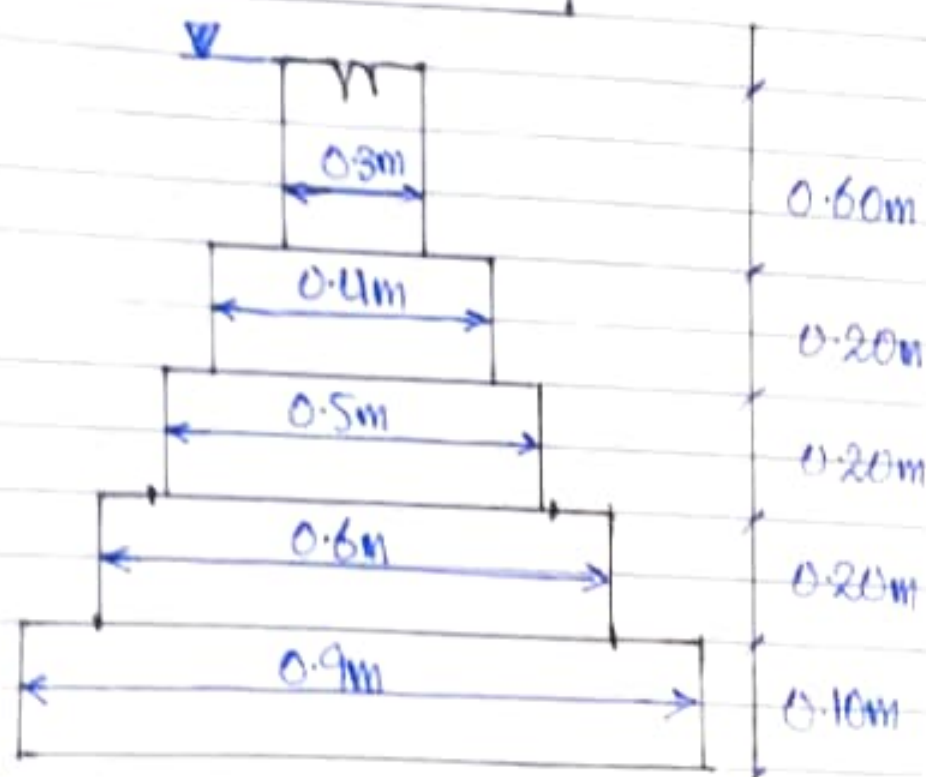
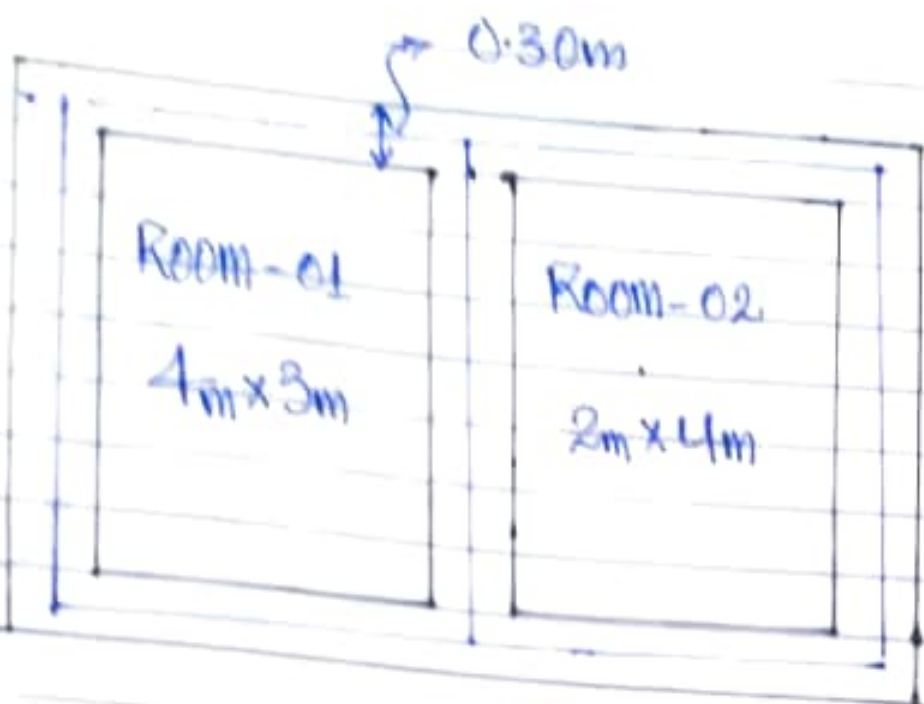
$$= \frac{4}{5} \times 23.81$$

$$= 4.76 \text{ cu. ft}$$

PIANO
Por
0.8mm

4

Sr. No	item Description	No	length	Breadth	Height	Quantity	Note
①	Excavation in foundation						
	Long wall	2	11.20m	0.90m	0.90m	18.14	$10.3 + 0.90 = 11.2 \text{ m}$
	Short wall	2	7.4m	0.90m	0.90m	11.98	$8.3 - 0.90 = 7.4 \text{ m}$
						30.12 cumt	
②	Concrete & 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 cumt	
③	Brick work in foundation and path						
	1st Footing	2	10.9m	0.60	0.30	3.92	$L = 10.3 + 0.6 = 10.9 \text{ m}$
	2nd Footing	2	10.80m	0.50	0.30	3.24	$L = 10.3 + 0.50 = 10.8 \text{ m}$
	Plinth wall	2	10.70m	0.40	0.30	2.56	$L = 10.3 + 0.40 = 10.7 \text{ m}$
	Short wall						
	1st Footing	2	7.70	0.60	0.30	2.77	$8.30 - 0.60 = 7.7 \text{ m}$
	2nd Footing	2	7.80	0.50	0.30	2.34	$8.30 - 0.50 = 7.8 \text{ m}$
Plinth wall	2	7.90	0.40	0.30	1.89	$8.30 - 0.40 = 7.9 \text{ m}$	
						16.72 cumt	
④	Brick work in super structure						
	long wall	2	10.6m	0.30m	3.50m	22.26	$10.3 + 0.30$
	Short wall	2	8m	0.30m	3.50m	16.80	$8.30 - 0.30 = 8 \text{ m}$
						39.06 cumt	



S No	Description	L	B	H	Area	Remarks
1	Excavation for foundation	2.90	0.90	1.30	24.45	20.90×1.30
2	PCC in foundation	2.90	0.90	0.10	1.88	20.90×0.10 $- 20.90$
3	Bricks in foundation					
Step 01	2.10	0.6	0.20	2.544	21.00×0.20	
Step 02	2.130	0.5	0.20	2.13	21.20×0.20 $- 21.00$	
Step 03	2.140	0.4	0.20	1.712	21.40×0.20 $- 21.20$	
Step 04	2.150	0.3	0.60	3.87	21.40×0.60 $- 21.40 \times 0.20$ $- 21.40$	

Total Brick work quantity: 10.256 m³