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Section A

Subject: Quantity Survey &
Estimation

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Q.No. (0.1)

- i) Determine the quantity of various material to prepare 100 cft concrete if the ratio is (1:4:8)? Also calculate a brick work of 75 cft and ratio for that is given (1:4). Calculate No of bricks, Dry volume and quantity of mortar?

Solution: 100 cft concrete if the ratio (1:4:8)
Given Data

Step # 1

Quantity of wet material = 100 cft

2) Dry density of concrete = 154

Step # 2

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

$$= 100 \times 1.54 = 154 \text{ cft}$$

• Quantity of dry material = 154 cft Dry
mat

Ratios of concrete = 1: 4: 8

$$\text{Sum of Ratio} = 1 + 4 + 8 = 13$$

• Quantity of Cement = $\frac{\text{Ratio of cement}}{\text{Sum of Ratio}} \times \text{Dry material}$

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

$$\text{Quantity of Cement} = 11.78 \text{ cft}$$

And

$$\text{one bag cement} = 1.25 \text{ cft}$$

Now

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

So

10 bags required for a cement

Quantity of Sand = $\frac{\text{Ratio of Sand}}{\text{Sum of Ratios}} \times \text{Dry material}$

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

Quantity of Coarse Aggregate = $\frac{\text{Ratio of Coarse aggregate} \times \text{Dry}}{\text{Sum of Ratio mortar}}$ p-03

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

$$\text{Cement bags} = 10$$

$$\text{Sand} = 47.12 \text{ cft}$$

$$\text{Quantity of Coarse Aggregate} = 94.24 \text{ cft}$$

⇒ Brick work of 75 cft and
Ratio for that is given

1:4
Solution
Volume of brick work = 75 cft

To find the volume of mortar:

Taking 25% of brick work
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

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

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

$$\text{Dry volume} = 23.81 \text{ cft}$$

for a cement we have

$$\text{Quantity of Cement} = \frac{\text{Ratio of cement}}{\text{Sum of Ratio}} \times \text{Dry volume}$$

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

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

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

$$1 \text{ bag} = 1.25 \Rightarrow \frac{4.76}{1.25} = 3.86 \text{ bags}$$

say 4 bags of Cement

for A sand we have

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

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

Quantity of sand = 19 cft

We have a brick work of 75 cft and ratio of that is give (1:4)

volume of brick work = 75 cft

1 cubic feet = 13.5 No of brick

No of brick = volume of brick
X No of brick

$$= 75 \times 13.5 = \frac{1012.5}{1012.5}$$

1 cft = 13.5 No.s of brick

Required brick for a work = 1013

Q# 21 Part (ii)

Answer. Dry volume: dry volume means volume of ingredient of concrete like cement, sand, and aggregate in mix dry condition before adding water.

Wet volume: wet volume mean ~~water~~ volume of ingredient of concrete like cement, sand and aggregate in wet mix after adding water.

1.54 is a factor that help us to convert the wet volume of concrete into dry volume. So that we can calculate the number of material in dry condition.

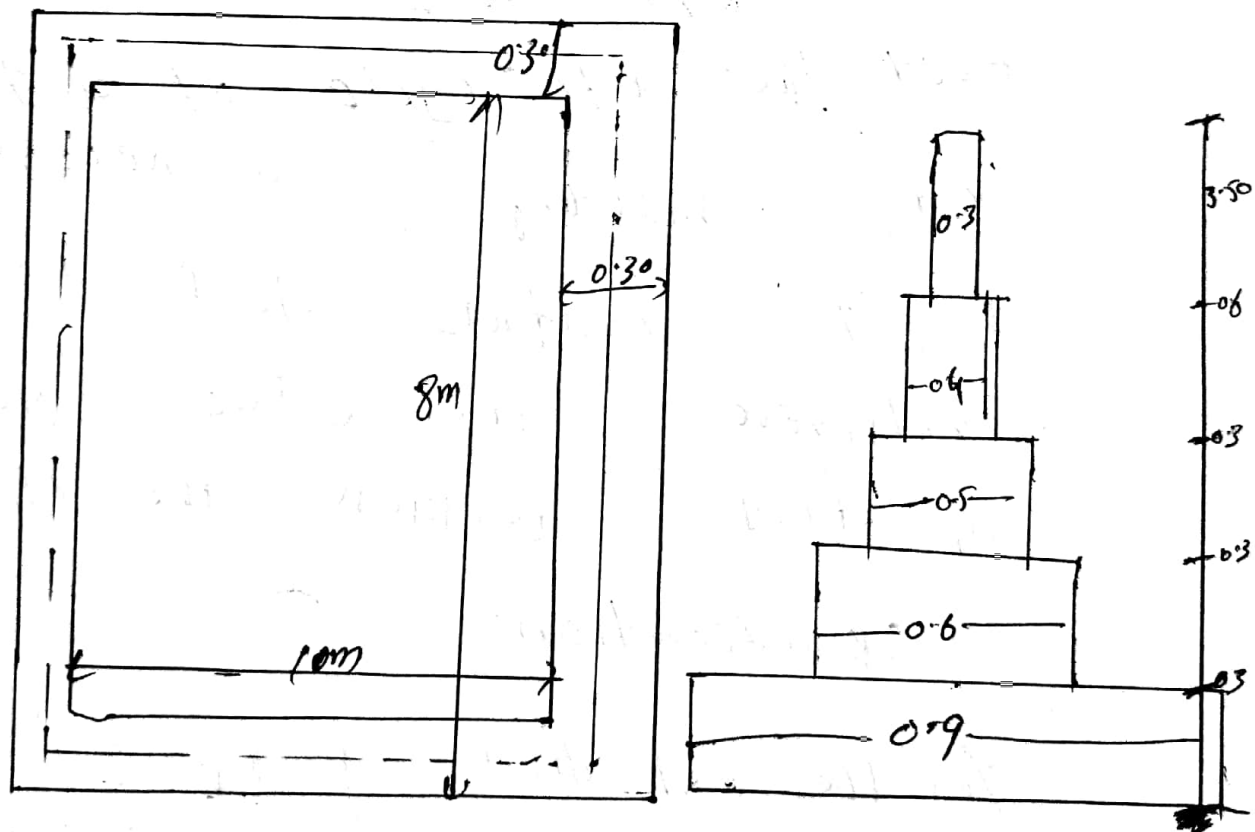
Estimation in a help ful in a construction
 Quantity survey largely deals with
 managing and controlling various
 aspect of construction. It gives
 an understanding of the
 technical element of construction
 over the life cycle of a facility
 or building, a necessary
 Project controls tool to
 achieve the value and best
 quality within the client's

Specification:

For the estimation purposes, dry volume
 of mortar can be taken as
 1.27 or 1.30 times of its
 wet volume.

Q. Q#2

Calculate the quantities of earth work, concrete work, brick work for the given wall as shown in a figure using long wall and short wall method.



Solution

S.N	item description	No	Length	Breadth	Height	Quantity	Note
1	Excavation in foundation long wall and short wall	2	11.20m	0.90m	0.90m	18.14	$10.3 + 0.90 = 11.2m$
		2	7.4m	0.9m	0.9m	$\frac{11.98}{30.12}$	$8.3 - 0.90 = 7.4m$
2	Concrete and foundation long wall and short wall	2	11.20m	0.90m	0.30m	6.04	$L = 10.3 + 0.6 = 10.9m$
		2	7.4m	0.90m	0.3m	3.99	$L = 10.3 + 0.50 = 10.8m$
						$\frac{10.03 \text{ cum}}$	$L = 10.3 + 0.40 = 10.7$
3)	Brickwork in foundation and path 1st footing	2	10.90m	0.60	0.30	3.92	$L = 10.30 + 0.6 = 10.9$
		2	10.80m	0.50	0.30	3.24	$= 10.3 + 0.5 = 10.8$
	2	10.70m	0.40	0.30	2.56	$10.3 + 0.4 = 10.7$	
	2	7.70	0.60	0.30	2.77	$8.30 - 0.60 = 7.70$	
	2	7.80	0.50	0.30	2.31	$8.30 - 0.50 = 7.80$	
	8	7.90	0.40	0.30	$\frac{1.89}{16.72 \text{ cum}}$	$8.3 - 0.40 = 7.90$	

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Brickwork
in supper
structure

Long wall

2

10.6m

0.30m

3.50m

22.26

Short wall

2

8m

0.30m

3.50m

16.80

39.06

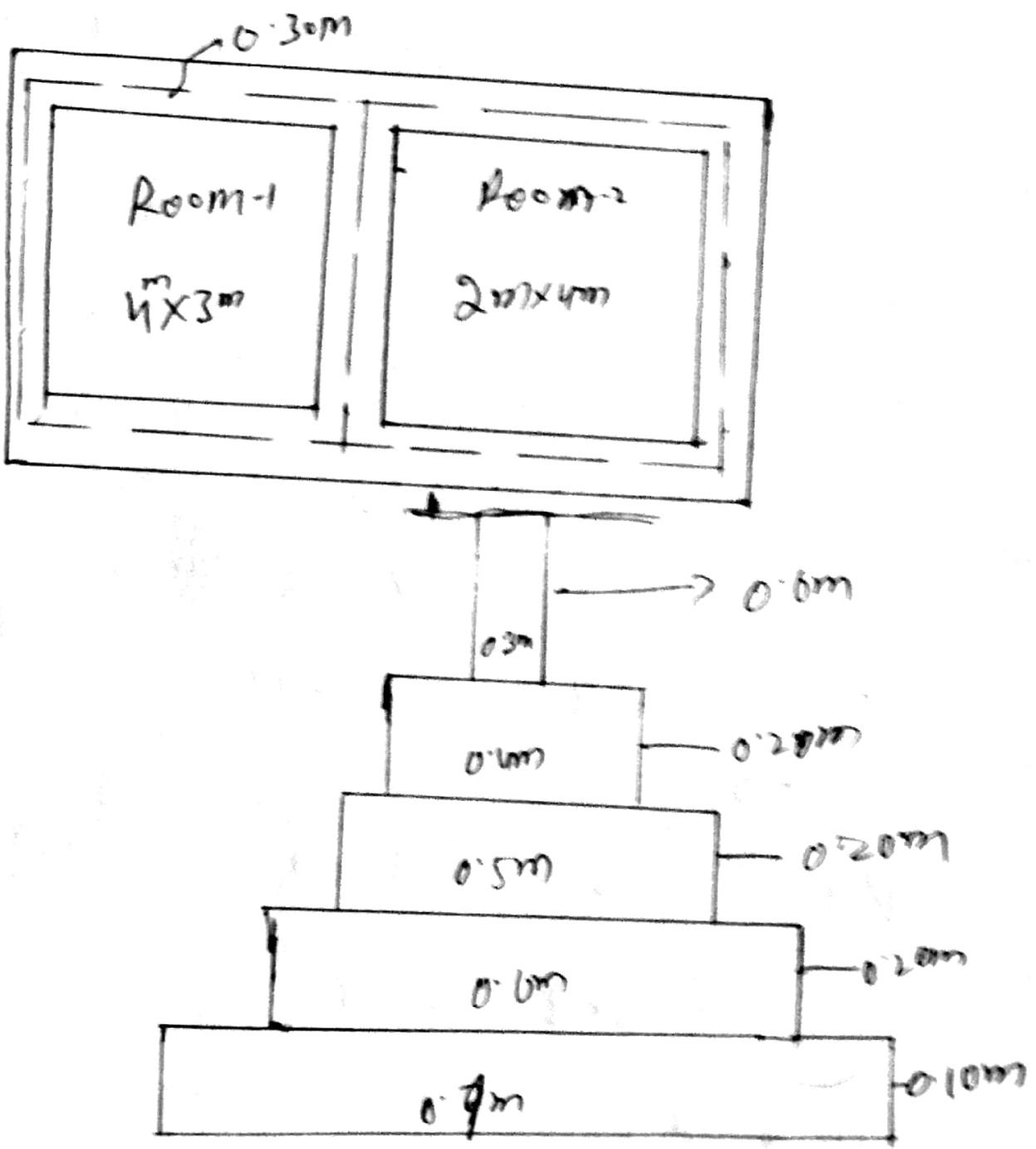
Unit

$$10.30 + 0.3$$

$$8.3 - 0.3 = 8m$$

Q#3)

Calculate the Quantity of Earth work
 concrete work, back work for the given wall
 as shown in figure using center
 line wall Method:-



Q#3

(1)

Sol.,

Center to Center long wall

$$10 + \left(\frac{1}{2} \times 0.30\right) + \left(\frac{1}{2} \times 0.30\right) = 10$$

$$= 10.95m$$

Center to Center short wall

$$8 + \left(\frac{1}{2} \times 0.30\right) + \left(\frac{1}{2} \times 0.30\right) = 8.3m$$

Deflection of measurement

Calculation of Quantity

S.No	Item	No	L	B	H/D	Quantity
1)	Excavation of foundation					
	long wall	2	11.85m	0.90	0.90	19.197
	short wall	2	7.4m	0.9	0.9m	11.988
				Total		31.185 cut

02

Concrete

Foundation
long wall

2

11.85

0.90m

0.30

6.399

Short wall

2

7.4

0.90m

0.30

3.996

Total

10

10.395

3)

Brick work
Foundation
plinth

long wall

2

11.55m

0.60

0.30 m

4.58

short wall

2

11.45m

0.50

0.30 m

4.435

plinth wall

2

11.35m

0.40

0.3 m

5.448

Total

4)

Short wall

First footing

2

7.40

0.60m

~~2.664~~

2.664

2nd footing

2

7.30

0.30

0.30

2.19

plinth wall

2

7.20

0.60m

2.19

3.456

~~3.469~~
0.30

Total

21.357

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Back wall

long wall

2

11.25m

0.30m

3.50

23.625

short wall

2

8 m

0.30m

3.50

16.8

Total

40.425