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SUBJECT : QUANTITY SURVEY  
AND ESTIMATION.

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DEPARTMENT : BE (C).

Q15 01 "Quantities of various  
Materials to prepare  
100 c.ft Concrete"

Solution

Quantity of Wet Material = 100 c.ft

Dry Density of Concrete = 1.54

Quantity of Dry Material =  $100 \times 1.54$

= 154 c.ft

Ratio of concrete = 1:4:8

Sum = 13

Quantity of Cement =

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

$$= \frac{1}{13} (154) = 11.84 \text{ cft}$$

$$\text{Number of bags (c)} = \frac{11.84}{1.25} = \boxed{9.47 \text{ bags}}$$

(2) Quantity of Sand =  $\frac{\text{Ratio of Sand} \times \text{Dry material}}{\text{Sum}}$

$$= \frac{14}{13} (154) = \boxed{47.38 \text{ cft}}$$

(3) Quantity of C. Aggregate =  $\frac{\text{Ratio} \times \text{Dry material}}{\text{S. Ratio}}$

$$= \frac{8}{13} (154)$$

$$= \boxed{94.76 \text{ cft}}$$



\* No. of Bricks in 75 c.ft

$$\Rightarrow \text{Bricks Size} = 9'' \times 4.5'' \times 3''$$

$$\text{Bricks Size with mortar} = 9.08'' \times 4.58'' \times 3.08''$$

$$\text{Volume} = \boxed{128 \text{ inch}^3}$$

$$\text{Volume of 1 c.ft} = 1 \text{ ft} \times 1 \text{ ft} \times 1 \text{ ft}$$

$$= 12 \text{ inch} \times 12 \text{ inch} \times 12 \text{ inch}$$

$$= \boxed{1728 \text{ inch}^3}$$

$$\text{Now number of Bricks} = \frac{\text{Volume (Cubic Inch)}}{\text{Volume of 1 Brick}}$$

$$= \frac{1728}{128} = 13.5 \text{ Nos.}$$

$$\text{No. of Bricks in 75 c.ft} = 75 \times 13.5$$

$$= \boxed{1012.5 \text{ Nos.}} \text{ Ans}$$

$\Rightarrow$  \* (Volume of mortar  
in 75 c.ft)

We have brick work of 75 c.ft  
and ratio for that 1:4

⇒ Volume of Brick work = 75 c.ft

we take 20% to 30%  
mortar in Brick work

taking 25% of Brick work

for mortar

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

$$\text{Dry volume} = 18.75 \times 1.30 = \boxed{24.375 \text{ c.ft}}$$

Ratio of Mortar = 1:4

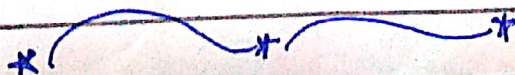
$$\boxed{\text{Sum} = 5}$$

$$(1) \text{ Now quantity of Cement} = \frac{1}{5} \times 24.375 \\ = 4.875 \text{ c.ft}$$

$$\text{No. of Cement Bags} = \frac{4.875}{125} = \boxed{3.9 \text{ bags}}$$

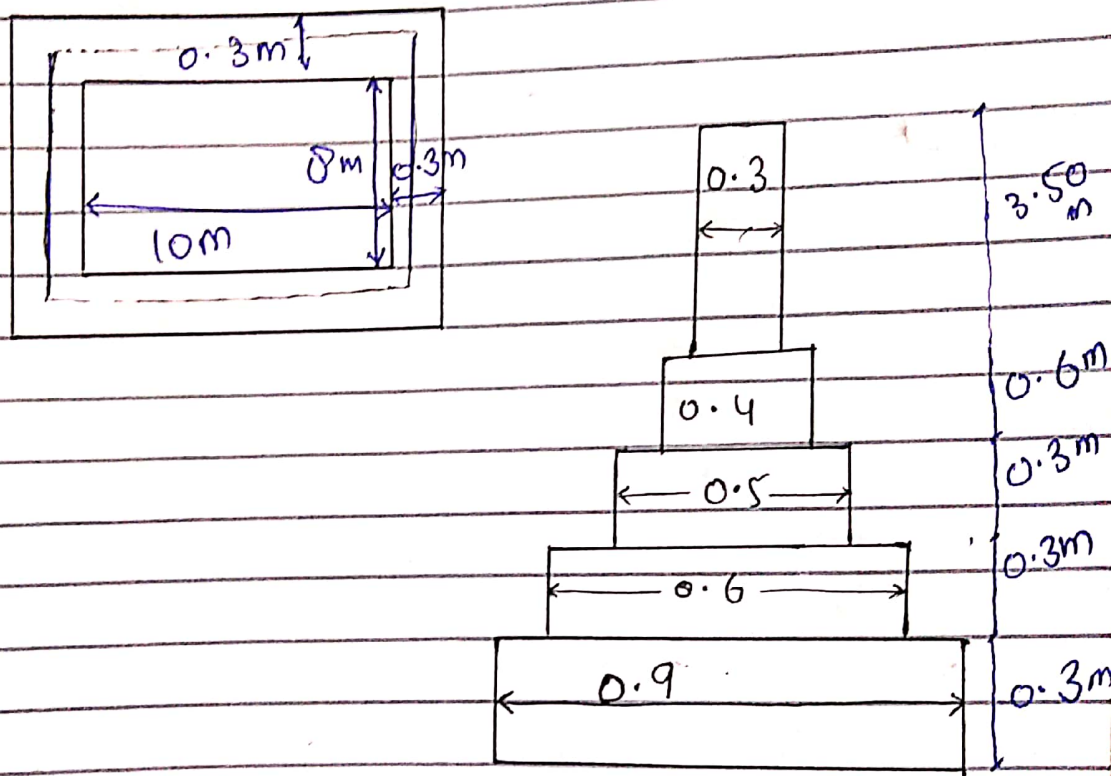
$$(2): \text{ Quantity of Sand} = \frac{4}{5} (24.375)$$

$$\boxed{= 19.5 \text{ c.ft}}$$



ANS 02

Long wall and Short wall Method for one Room



Using the above figure we will

find length of long wall and

Short wall

$$\text{C/c of long wall} = 10 + \left(\frac{1}{2}(0.30)\right) + \left(\frac{1}{2}(0.30)\right)$$

$$= 10.30\text{m}$$

$$\text{C/c of Short wall} = 8 + \left(\frac{1}{2}(0.30)\right) + \left(\frac{1}{2}(0.30)\right)$$

$$= 8.30\text{m}$$

## Details of Measurement and Calculation

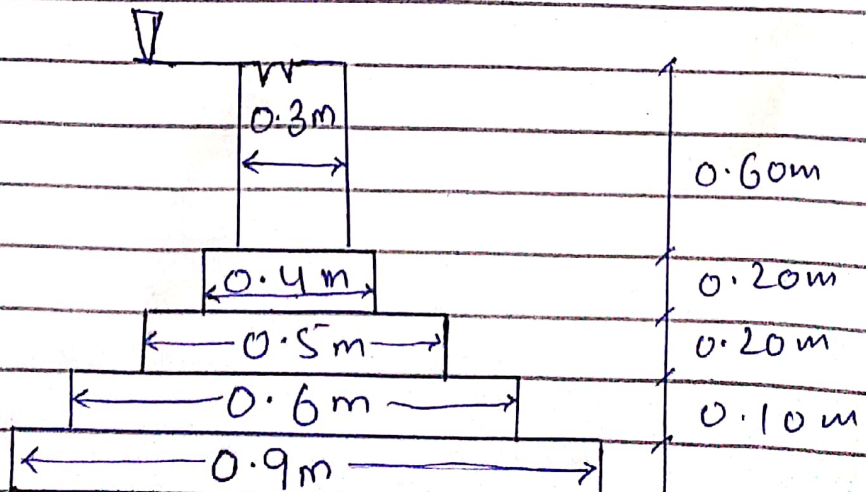
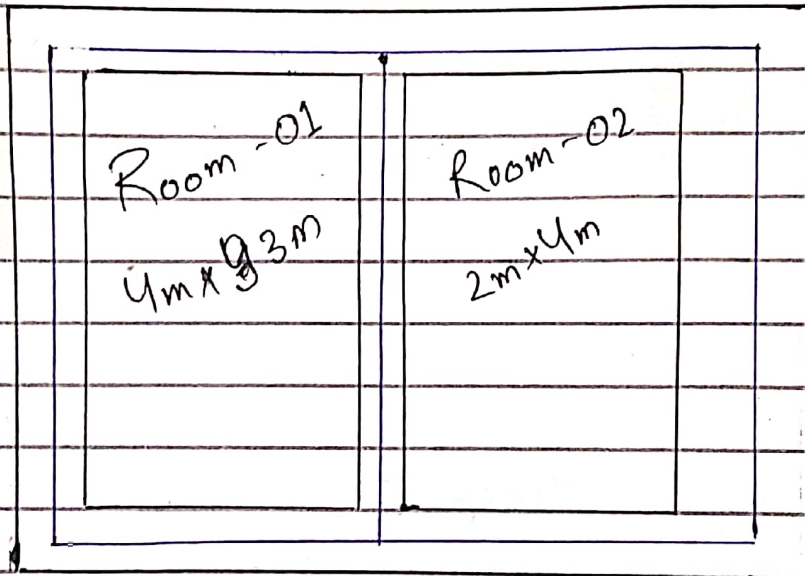
| S.No          | Item Description            | No   | Length  | Breadth | Height | Quantity | Note   |
|---------------|-----------------------------|------|---------|---------|--------|----------|--------|
| 01            | Excavation and Foundation   |      |         |         |        |          |        |
|               | Long wall                   | 2    | 14.30 m | 0.90 m  | 0.90   | 16.68    |        |
|               | Short wall                  | 2    | 8.20 m  | 0.90 m  | 0.90   | 13.45    |        |
|               | Total =                     |      |         |         |        |          | 30.126 |
| 02            | Concrete in Foundation      |      |         |         |        |          |        |
|               | * Long wall                 | 2    | 14.20 m | 0.90    | 0.30   | 5.562    |        |
|               | * Short wall                | 2    | 8.20 m  | 0.90    | 0.30   | 4.482    |        |
|               | Total =                     |      |         |         |        |          | 10.044 |
| 03            | Brickwork Foundation Plinth |      |         |         |        |          |        |
|               | Long walls                  |      |         |         |        |          |        |
|               | * 1 <sup>st</sup> Footing   | 2    | 10.90   | 0.60    | 0.30   | 3.924    |        |
|               | * 2 <sup>nd</sup> Footing   | 2    | 10.80   | 0.50    | 0.30   | 3.24     |        |
|               | Plinth wall                 | 2    | 10.70   | 0.40    | 0.60   | 2.568    |        |
|               | Short wall                  |      |         |         |        |          |        |
|               | * 1 <sup>st</sup> Footing   | 2    | 10.90   | 0.60    | 0.30   | 3.42     |        |
|               | * 2 <sup>nd</sup> Footing   | 2    | 9.60    | 0.50    | 0.30   | 2.88     |        |
| * Plinth wall | 2                           | 9.70 | 0.40    | 0.60    | 2.328  |          |        |
| total =       |                             |      |         |         |        | 8        |        |
| B. Work       |                             |      |         |         |        |          |        |
| Long wall     | 2                           | 2    | 10.60   | 0.30    | 3.50   |          |        |
| Short wall    | 2                           | 2    | 8.00    | 0.30    | 3.50   |          |        |

Total = 39.06 m

ANS 03

“ CENTER LINE METHOD ”

( Two Rooms )





#10

(Center line calculation)

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

$S(H)$  = Sum of C.L of vertical wall

$S(V)$  = Sum of C.L of vertical wall

$$S(H) = 4.0 + 0.15 + 0.3 + 2 + 0.15 = 6.60m$$

So,  $6.60 \times 2 = 13.20$

$$S(V) = 0.15 \times 4 + 0.15 = 0.75m \times 2 = 1.50$$

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

$$= 13.20 + 1.50$$

$$= 21.80m$$

Deduction of T-junction

$$length = C.L - \left(\frac{breadth}{2}\right) \text{ No. of T-junction}$$

Q No. 1

Part (iii)

⇒ Wet volume:-

Concrete is mixture of wet volume of cement

Sand and aggregate with

water in wet condition.

Volume of concrete is decreased by 54% in wet condition

due to evaporation of air void between aggregate sand cement particles.

⇒ Dry volume

Dry volume is

Concrete mixture of cement

Sand and aggregate without

water in dry condition

this volume is increased by 54%.

of wet volume due to

due presence of voids between

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Cement      Sand      aggregate

after adding water      w

dry mix of concrete      the volume

of concrete level (4%) reduced