



**IQRA NATIONAL UNIVERSITY**

# Quantity Survey & Estimation

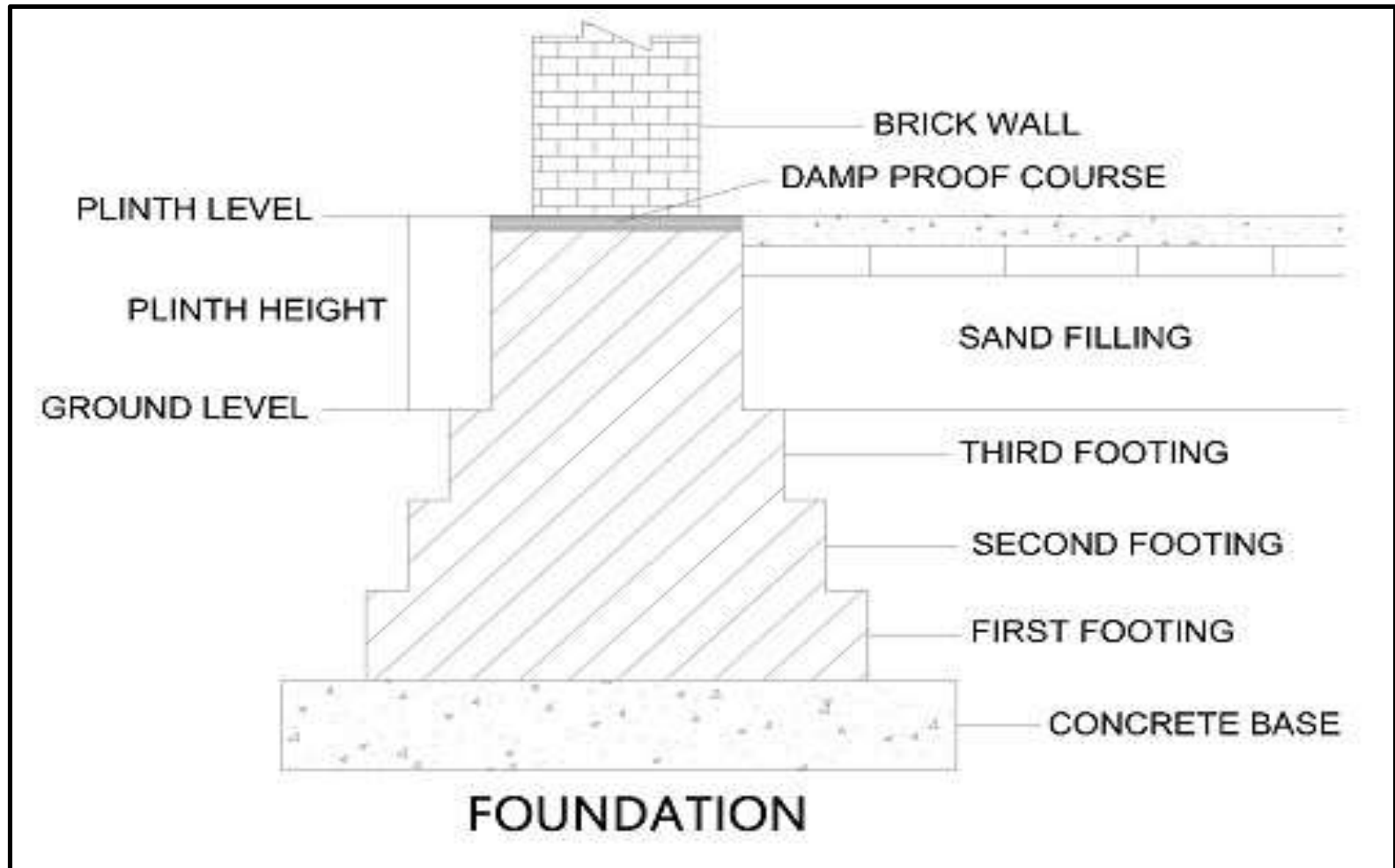
## Lecture 02

**Long wall & short wall method and single wall estimation**

**PREPARED BY ENGR. IMTIAZ KHAN LECTURER CED ,INU PESH**

Quantity Survey & Estimation is the method for finding out the quantity of various construction item and materials which are used in construction work. The required dimensions, length, breadth and depth or height, are to be taken out from the drawings i.e. plan, elevation and sections.

## Brick wall foundation section



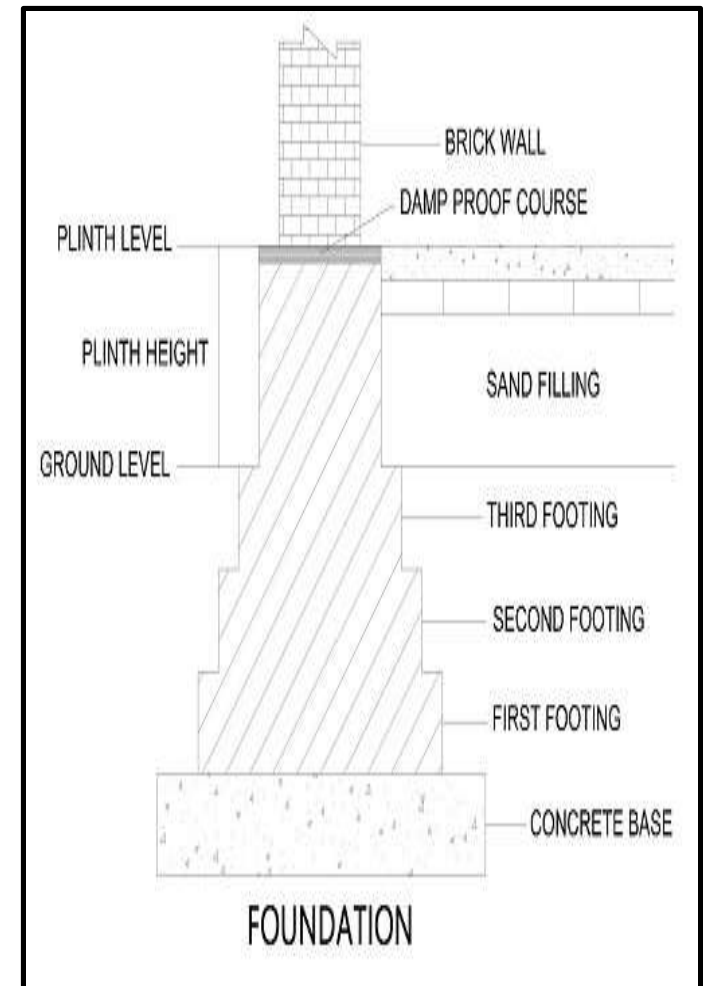
# GENERAL TERMINOLOGIES

- Ground level

it is at the same level as the ground, natural ground level.

- Plinth level

Plinth is constructed above the ground level. Plinth is line which differentiates the substructure and superstructure. In simple the Plinth is the bottom portion of superstructure and above from the **ground level**.



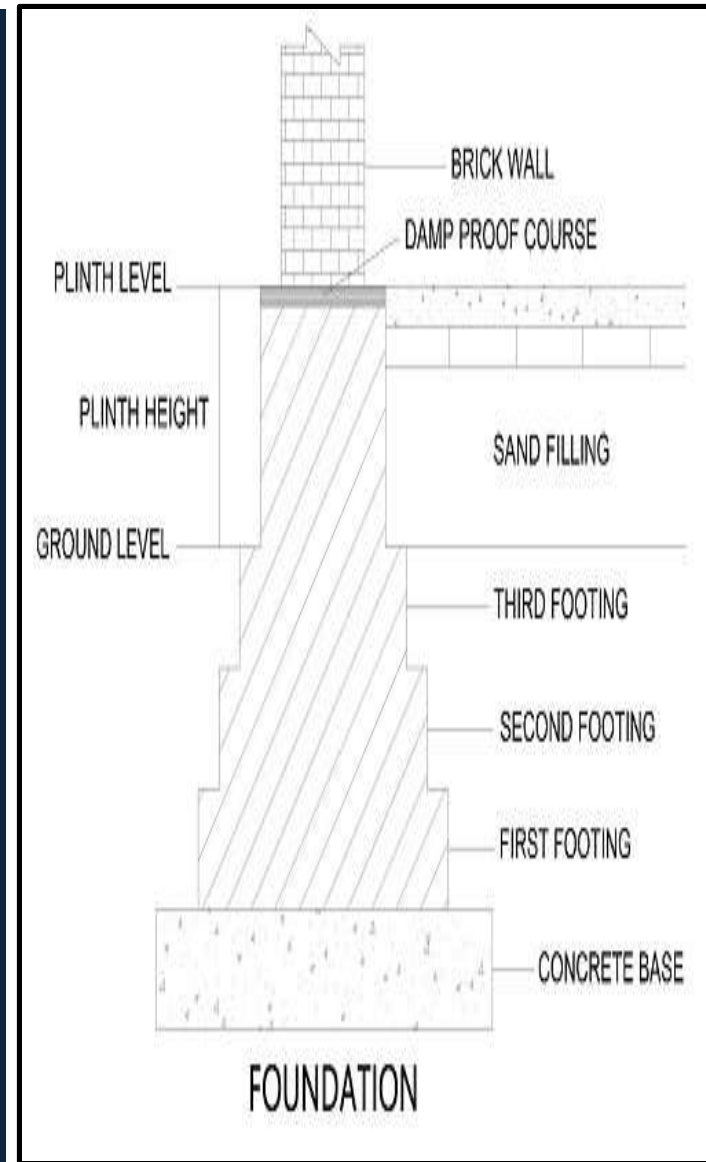
# GENERAL TERMINOLOGIES

- **Sub structure**

The substructure is the lower part of a building which is constructed below the ground level. The function of substructure is the transfer of loads from the superstructure to the underlying soil. So, the substructure is in direct contact with supporting soil. Substructure involves footing and plinth of a building.

- **Super structure**

The superstructure is the portion of a building which is constructed above the ground level and it serves the purpose of structure's intended use. It includes columns, beams, slab upwards including all finishes, door and window schedules, flooring, roofing, lintels, and parapets.



# METHODS

```
graph TD; A[METHODS] --> B[Long wall and short wall method]; A --> C[Centre line method];
```

**Long wall and short wall  
method**

**Centre line method**

**Here we are going to discuss long wall and short wall cost estimation method.**

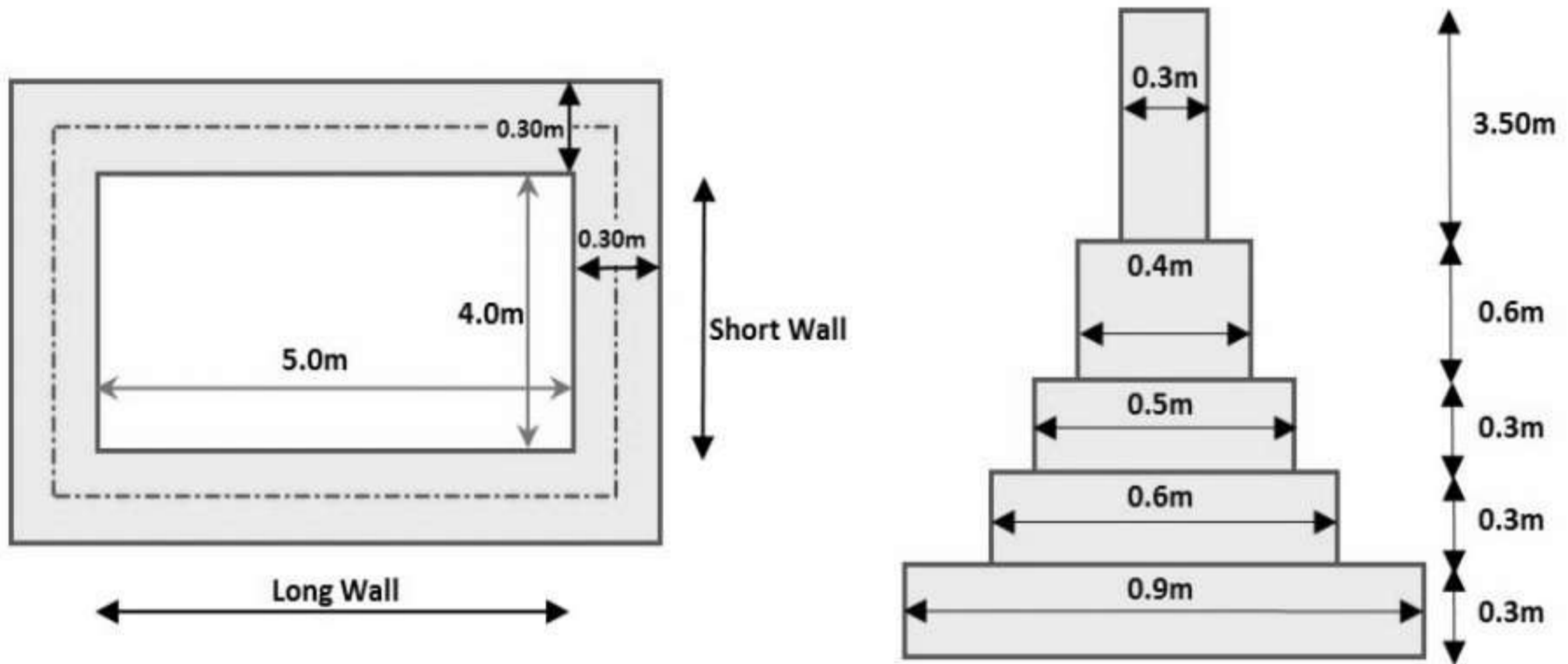
# Long Wall and Short Wall Method

For finding out the length of long wall & short wall, simply add/subtract centre length of wall to the two times half breadth on one side of the wall.

---

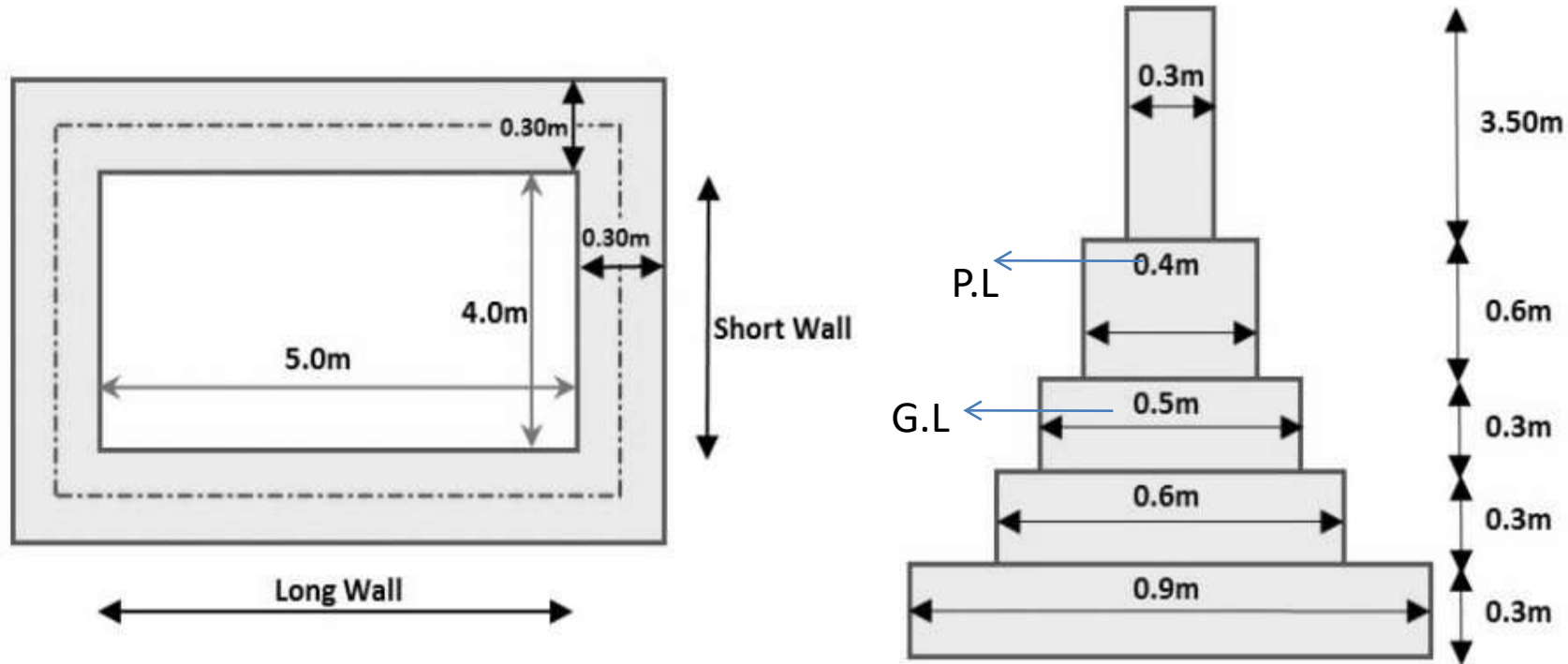
- **Length of Long Wall** = Length of wall + Half Breadth on One Side + Half Breadth on the Other Side = Center to Center Length of wall .  
**Center to Center Length of wall + One Breadth**
- **Length of short Wall** = Length of wall + Half Breadth on One Side + Half Breadth on the Other Side = Center to Center Length of wall  
**Center to Center Length of wall -One Breadth**

Calculate the given wall section with help of long wall and short wall method.





# Example of long wall and short wall method

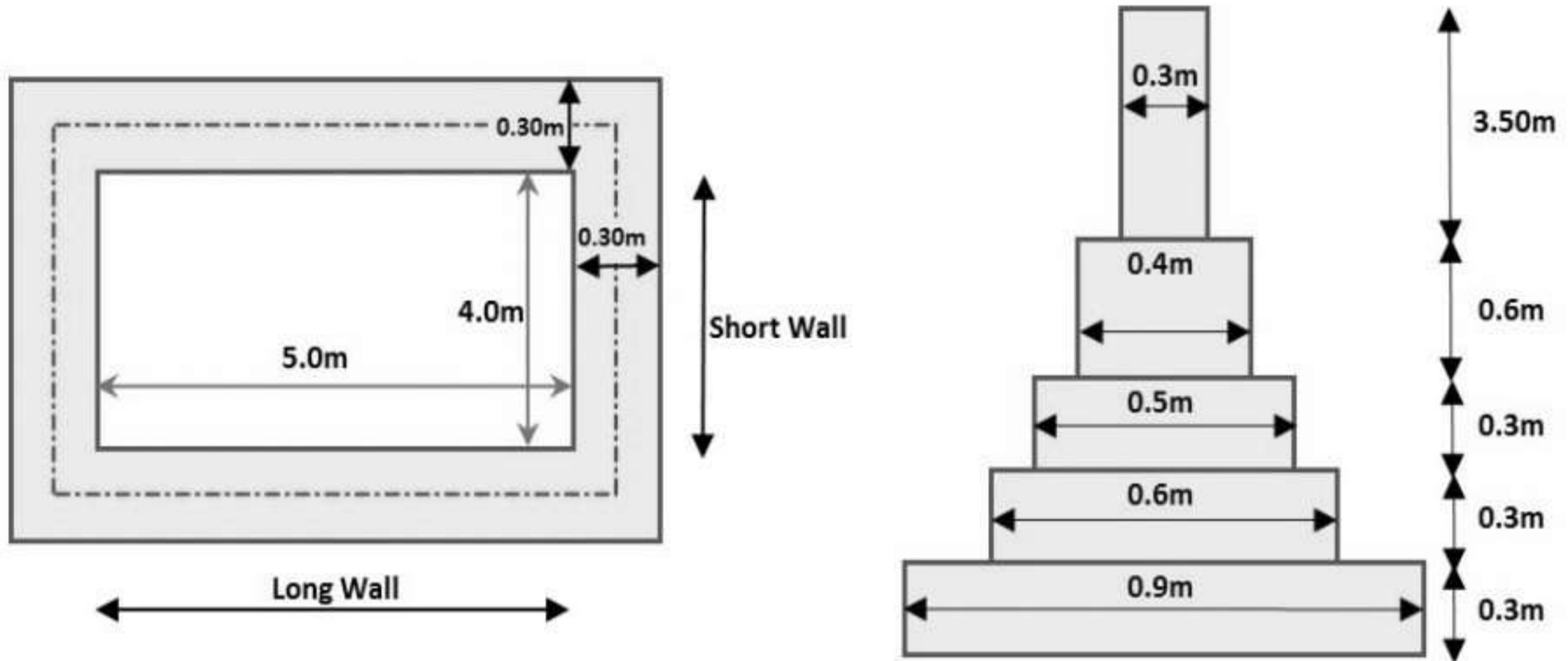


Using the above image, you can first find the length of long wall and short wall.

**Centre to Centre length of long wall** =  $5 + (1/2 \times 0.30) + (1/2 \times 0.30) = 5.30$  m

**Centre to Centre length of short wall** =  $4 + (1/2 \times 0.30) + (1/2 \times 0.30) = 4.30$  m

- After finding out the length of the long wall and short wall, now find the quantity of the various items which are used in construction.

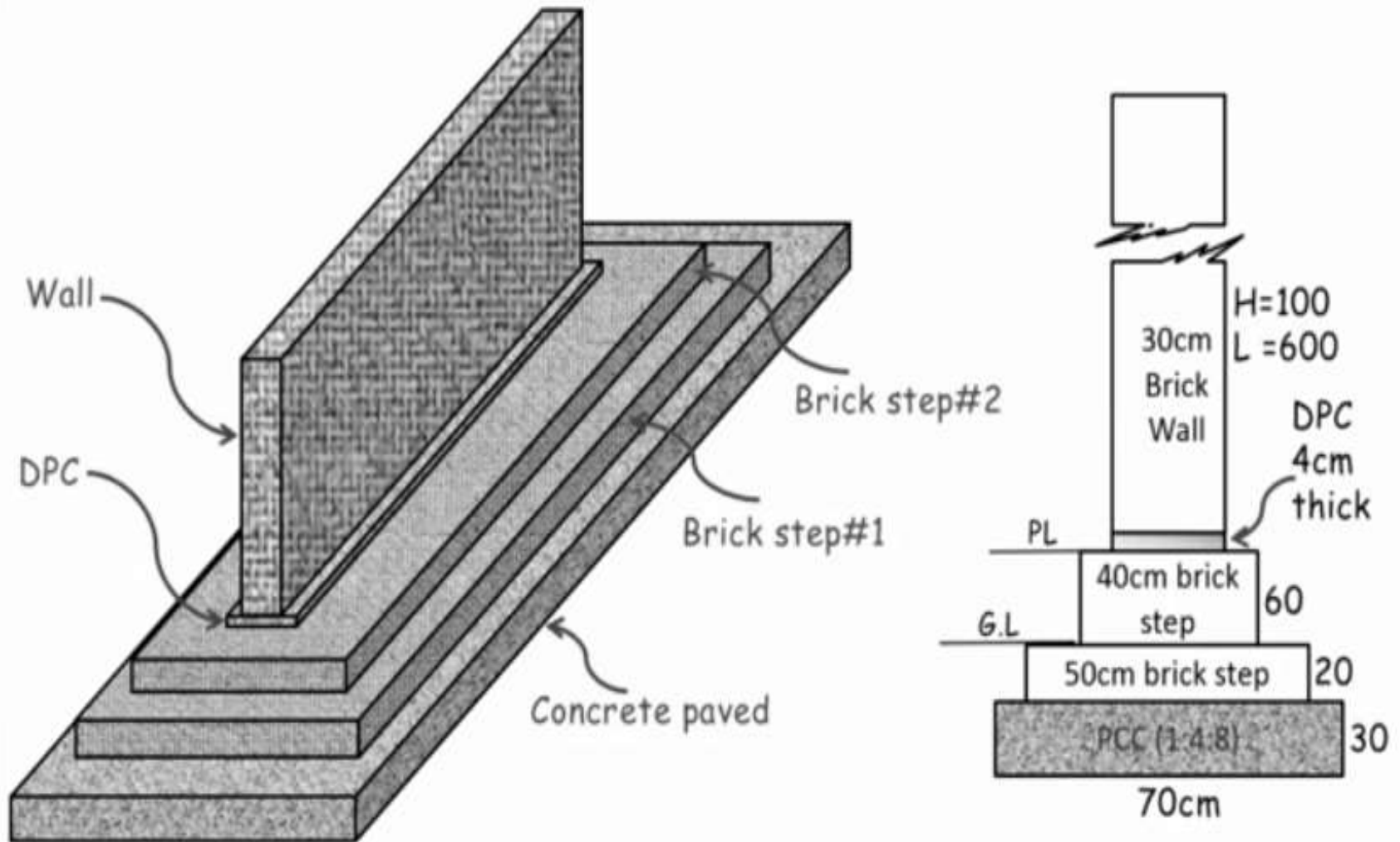


## Details of Measurement and Calculation of Quantities

Sr no.	Item Description	No	Length	Breadth	Height/Depth	Quantity	Note
01	<b>Excavation</b> in Foundation						
	Long walls	2	6.20 m	0.90 m	0.90 m	10.04	Length = 5.30 + 0.90 = 6.20 m
	Short walls	2	3.40 m	0.90 m	0.90 m	5.51	Breadth = 4.30 - 0.90 = 3.40 m
					<b>Total</b>	<b>15.55 Cumt</b>	
02	<b>Concrete</b> in Foundation						
	Long walls	2	6.20 m	0.90 m	0.30 m	3.35	Length = 5.30 + 0.90 = 6.20 m
	Short walls	2	3.40 m	0.90 m	0.30 m	1.84	Breadth = 4.30 - 0.90 = 3.40 m
					<b>Total</b>	<b>5.18 Cumt</b>	
03	<b>Brickwork</b> in Foundation and Plinth						
	<b>Long walls</b>						
	1 st footing	2	5.90 m	0.60 m	0.30 m	2.12	Length = 5.30 + 0.60 = 5.90 m
	2 nd footing	2	5.80 m	0.50 m	0.30 m	1.74	Length = 5.30 + 0.50 = 5.80 m
	Plinth walls	2	5.70 m	0.40 m	0.60 m	2.74	Length = 5.30 + 0.40 = 5.70 m
	<b>Short walls</b>						
	1 st footing	2	3.70 m	0.60 m	0.30 m	1.33	Length = 4.30 - 0.60 = 3.70 m
	2 nd footing	2	3.80 m	0.50 m	0.30 m	1.14	Length = 4.30 - 0.50 = 3.80 m
	Plinth walls	2	3.90 m	0.40 m	0.60 m	1.87	Length = 4.30 - 0.40 = 3.90 m
					<b>Total</b>	<b>10.94 Cumt</b>	
04	<b>Brickwork</b> in Superstructure						
	Long walls	2	5.60 m	0.30 m	3.50 m	11.76	Length = 5.30 + 0.30 = 5.60 m
	Short walls	2	4.00 m	0.30 m	3.50 m	8.40	Length = 4.30 - 0.30 = 4.00 m
					<b>Total</b>	<b>20.16 Cumt</b>	

# SINGLE WALL QUANTITIES ESTIMATION

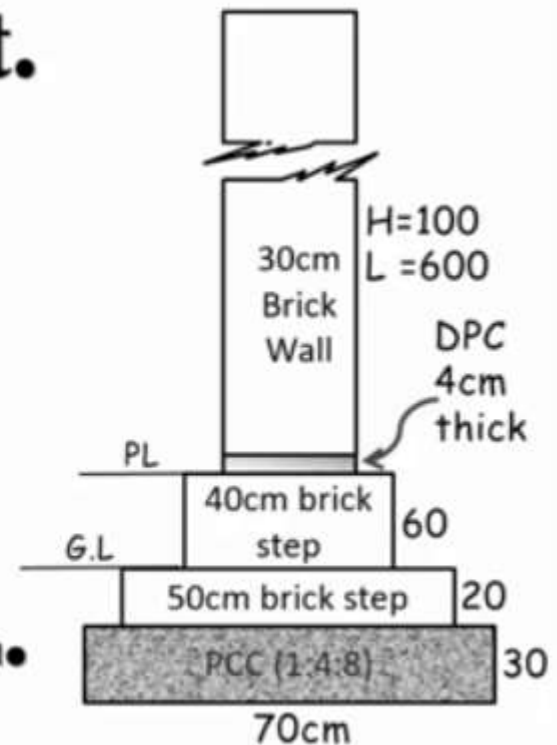
**Calculate the quantities of earthwork, concrete work, brick work , damp proof course, cement plaster and white wash for the given wall as shown the length of the wall is 600cm and height is 100cm ? (1meter is equal to 100cm)**



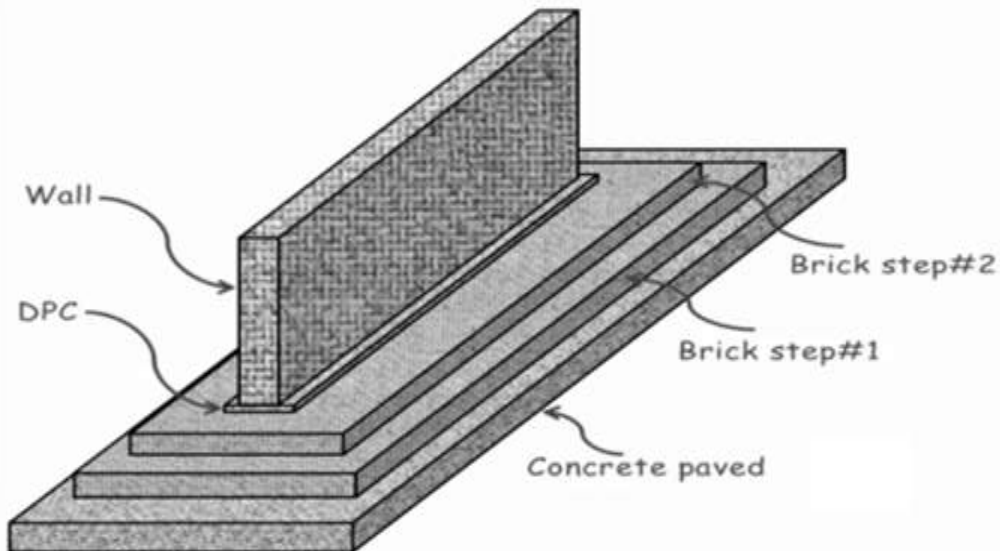
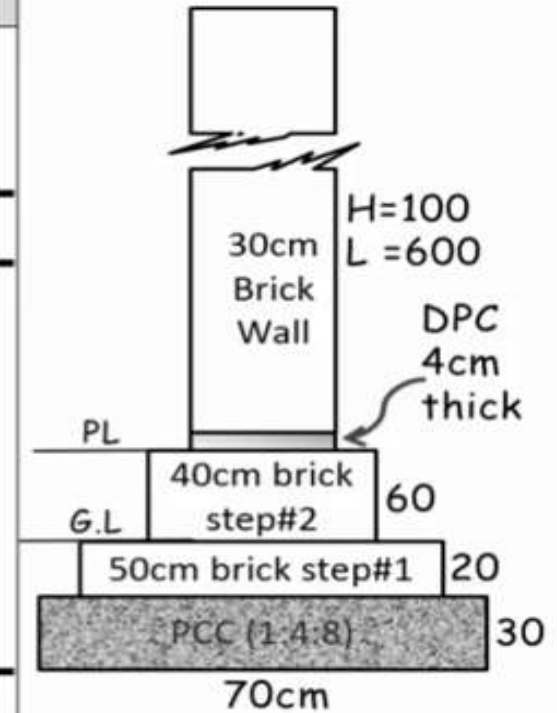
# REQUIRED

**We are asked to workout.**

- 1) Earth work.**
- 2) Concrete work.**
- 3) Brick work.**
- 4) Damp proof course.**
- 5) Cement plaster** above plinth level●
- 6) White washing.**

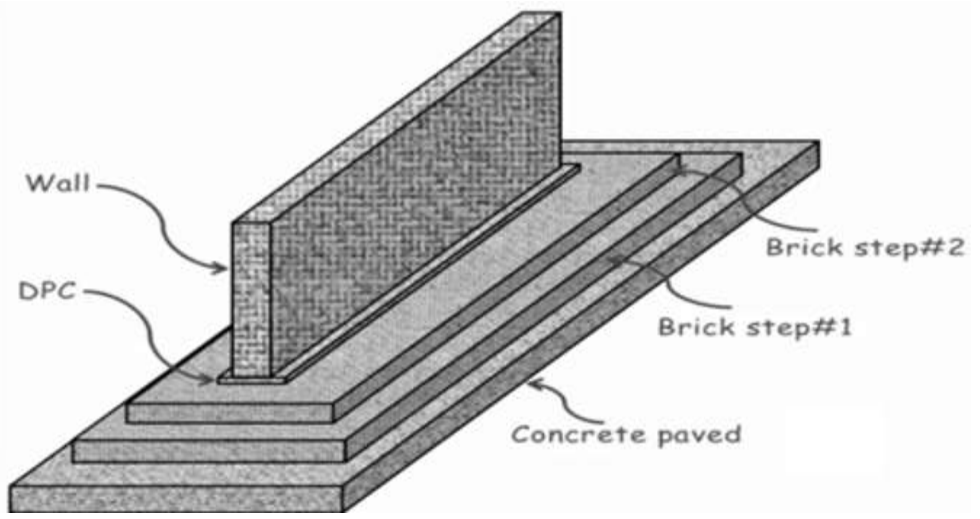
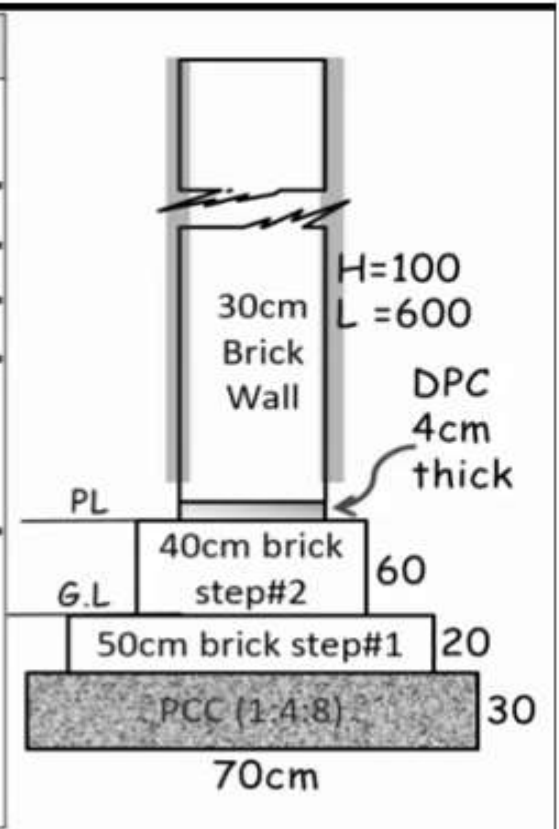


Description	No	L	B	H/D	Q	Remarks
Earthwork (excavation)	1	6.40	0.70	0.50 G.L (0.20+0.30)	2.24 m <sup>3</sup>	Excavation length $6 + (0.70 - 0.3)$ $= 6.40\text{m}$
PCC (1:4:8)	1	6.40	0.70	0.30	1.344 m <sup>3</sup>	
Brick Work						
1) foundation						
Step#1	1	6.20	0.50	0.20	0.62 m <sup>3</sup>	Step#1 length $6 + (0.50 - 0.3)$ $= 6.20\text{m}$
Step#2	1	6.10	0.40	0.60	1.464 m <sup>3</sup>	Step#2 length $6 + (0.40 - 0.3)$ $= 6.10\text{m}$
2) Brick Work in Super structure	1	6.00	0.30	1.00	1.80 m <sup>3</sup>	
Total brick work					<u>3.884 m<sup>3</sup></u>	
DPC (1:2:4)	1	6.00	0.30	.....	1.80 m <sup>2</sup>	



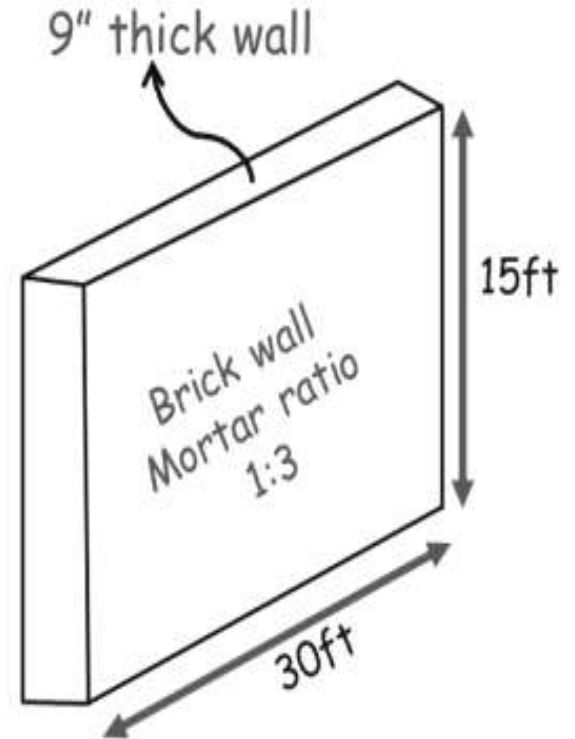
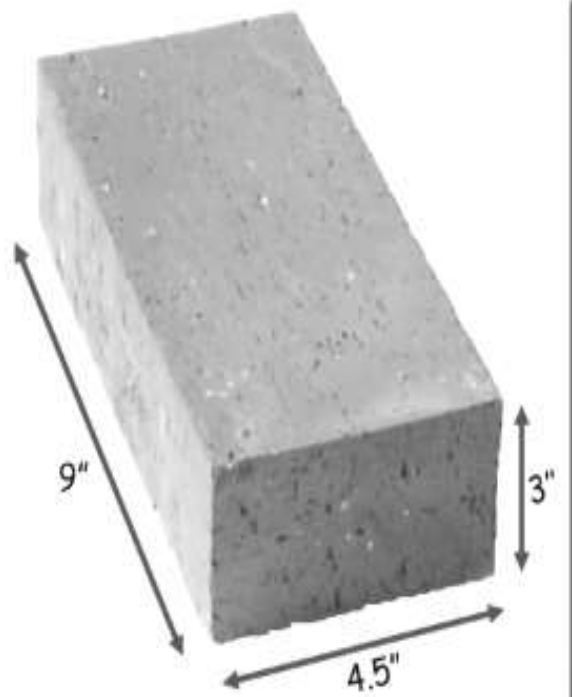
**NOTE**  
**1M = 100CM**  
**1CFT = 13.5 BRICKS**  
**1CUM = 500 BRICKS**

Description	No	L	B	H/D	Q	Remarks
Earthwork (excavation)					2.24 m <sup>3</sup>	
PCC (1:4:8)					1.344 m <sup>3</sup>	
Brick Work					3.884m <sup>3</sup>	
DPC (1:2:4)					1.80 m <sup>2</sup>	
Plaster above P.L	2	6.00	.....	1.04	12.48 m <sup>2</sup>	Height of plaster = 1 + 0.04 = 1.04 m
White washing	As plaster work					





Suppose we are asked to determine number of bricks, Cement and Sand from the given brick wall, if brick size is 9 x 4.5 x 3 inches and mortar is 25 % of wall. ???



Suppose we are asked to determine number of bricks, Cement and Sand from the given brick wall, if brick size is 9 x 4.5 x 3 inches and mortar is 25 % of wall. ???

**Solution :**

Total brick work = Length x height x thickness of the wall

Total brick work = 30 x 15 x 0.75

Total brick work = 337.5 Cft

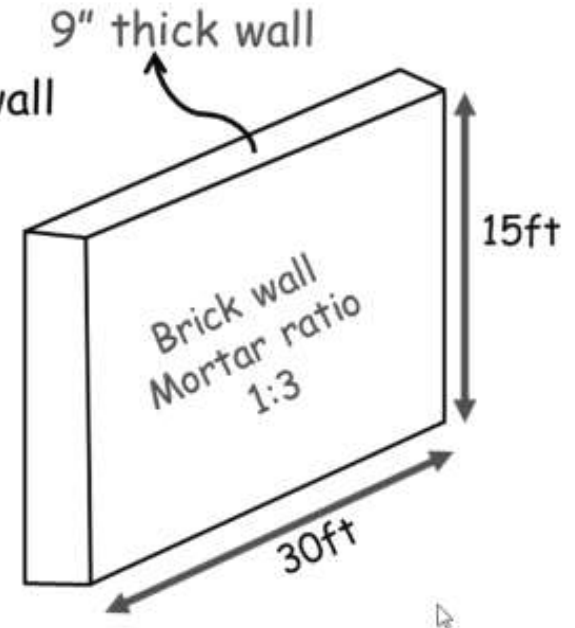
Deduction for the mortar:

Volume of mortar =  $\frac{25\%}{100} \times 337.5 = 84.375$  Cft

Net brick work = Total brick work - volume of mortar

Net brick work = 337.5 - 84.375

Net brick work = 253.125 Cft



Suppose we are asked to determine number of bricks, Cement and Sand from the given brick wall, if brick size is 9 x 4.5 x 3 inches and mortar is 25 % of wall. ???

Solution :

Net brick work = 253.125 Cft

$$\text{No of bricks} = \frac{\text{Net brick work}}{\text{volume of one brick}}$$

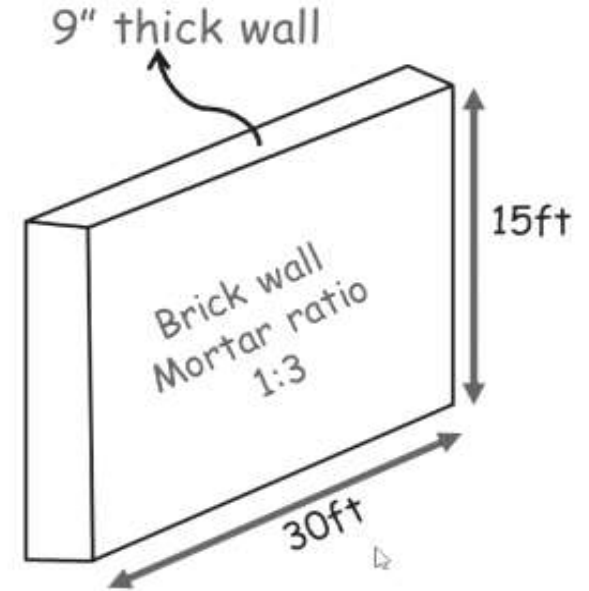
$$\text{No of bricks} = \frac{253.125}{0.75 \times 0.375 \times 0.25} = 3600 \text{ No's}$$

Let me include 10% bricks wastage .

$$10\% \text{ wastage} = \frac{10\%}{100} \times 3600 = 360 \text{ No's}$$

Net Number of bricks = 3600 + 360 = 3960 bricks

---



Suppose we are asked to determine number of bricks, Cement and Sand from the given brick wall, if brick size is 9 x 4.5 x 3 inches and mortar is 25 % of wall. ???

**Solution :**

Number of bricks = 3960 Nos

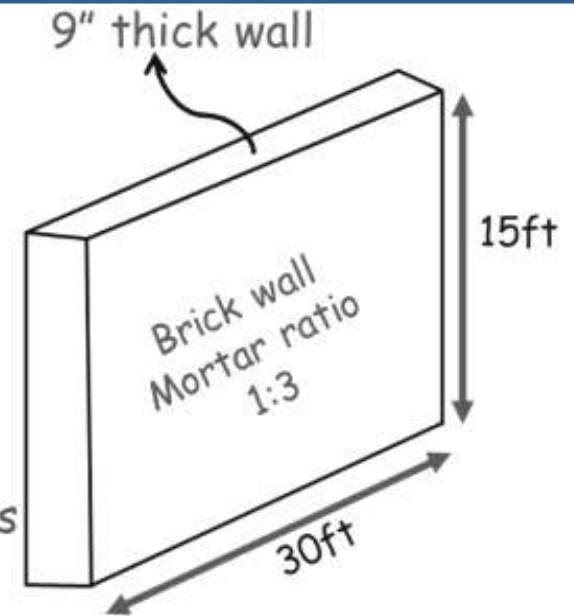
Now Cement and Sand = ?

$$\text{Volume of mortar} = \frac{25\%}{100} \times 337.5 = 84.375 \text{ Cft}$$

$$\text{Sum of ratio} = 1 + 3 = 4$$

$$\text{Cement} = \frac{1 \times 84.375 \times 1.27}{4} = \frac{26.789 \text{ cft}}{1.25} = 21.43 \text{ bags}$$

$$\text{Sand} = 26.789 \times 3 = 80.367 \text{ Cft}$$



**Number of bricks = 3960 Nos**

**Cement = 21.5 bags**

**Sand = 80.367 Cft**

**THE END**

