

UNIT II

Bay Method:

- ✓ This method is useful and is generally followed in case of building having several bays.
- ✓ The cost of the one class room is worked out and then multiplied by the number of bays in that building.
- ✓ The extra cost of the end walls and difference in framing.
- ✓ If there is any, should be made, so as to arrive at the correct cost.

Service Unit Method:

- ✓ This method is followed in cases such as school building where there are so many class rooms.
- ✓ The cost of one class room is worked out and then multiplied by the number of class rooms to be constructed.
- ✓ In case of Hospitals, the service unit is a bed, in case of Water Tank, it is a litre and in case of Cinema Hall, the service unit is a seat.

Lumpsum:

- ✓ While preparing an estimate, it is not possible to work out in detail in case of petty items. Items other than civil engineering such items are called Lumpsum items or simply L.S. items.
- ✓ The following are some of L.S. items in the estimate:
- ✓ Water supply and sanitary arrangements.
- ✓ Electrical installations like meter, motor, etc.,
- ✓ Architectural features.
- ✓ Contingencies and unforeseen items.
- ✓ In general, certain percentage on the cost of estimation is allotted for the above L.S. items.

Work Charged Establishment:

- During the construction of a project considerable number of skilled supervisors, work assistance, watch men etc., are employed on temporary basis.
- The salaries of these persons are drawn from the L.S. amount allotted towards the work charged establishment.
- That is, establishment which is charged directly to work. An L.S. amount of $1\frac{1}{2}$ to 2% of the estimated cost is provided towards the work charged establishment.

ESTIMATION METHODS OF BUILDING WORKS:

- ✓ The estimation of building quantities like earth work, foundation concrete, brickwork in plinth and super structure etc., can be worked out by any of the following two methods:

1. Long wall – short wall method
2. Centre line method.
3. Partly centre line and short wall method.

Long wall – short wall method:

- In this method, the wall along the length of room is considered to be long wall while the wall perpendicular to long wall is said to be short wall.
- To get the length of long wall or short wall, calculate first the centre line lengths of individual walls. Then the length of long wall, (out to out) may be calculated after adding half breadth at each end to its centre line length.
- Thus, the length of short wall measured into in and may be found by deducting half breadth from its centre line length at each end.
- The length of long wall usually decreases from earth work to brick work in super structure while the short wall increases. These lengths are multiplied by breadth and depth to get quantities.

Centre line method:

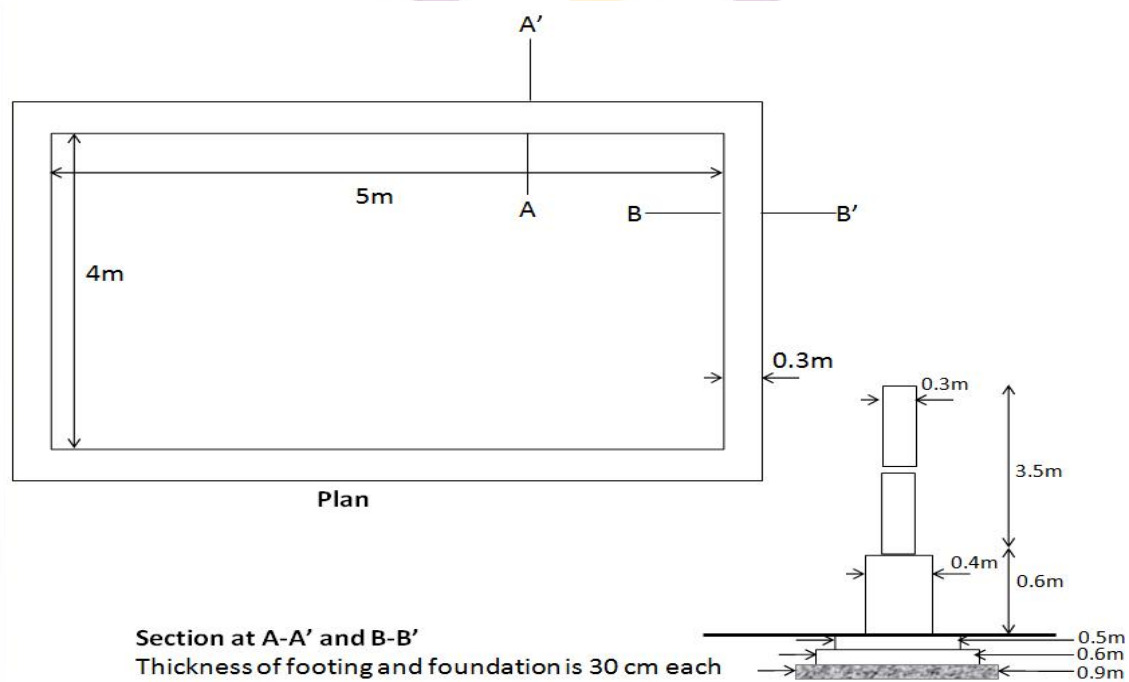
- This method is suitable for walls of similar cross sections.
- Here the total centre line length is multiplied by breadth and depth of respective item to get the total quantity at a time.
- When cross walls or partitions or verandah walls join with main wall, the centre line length gets reduced by half of breadth for each junction.
- Such junction or joints are studied carefully while calculating total centre line length.
- The estimates prepared by this method are most accurate and quick.

Partly centre line and partly cross wall method:

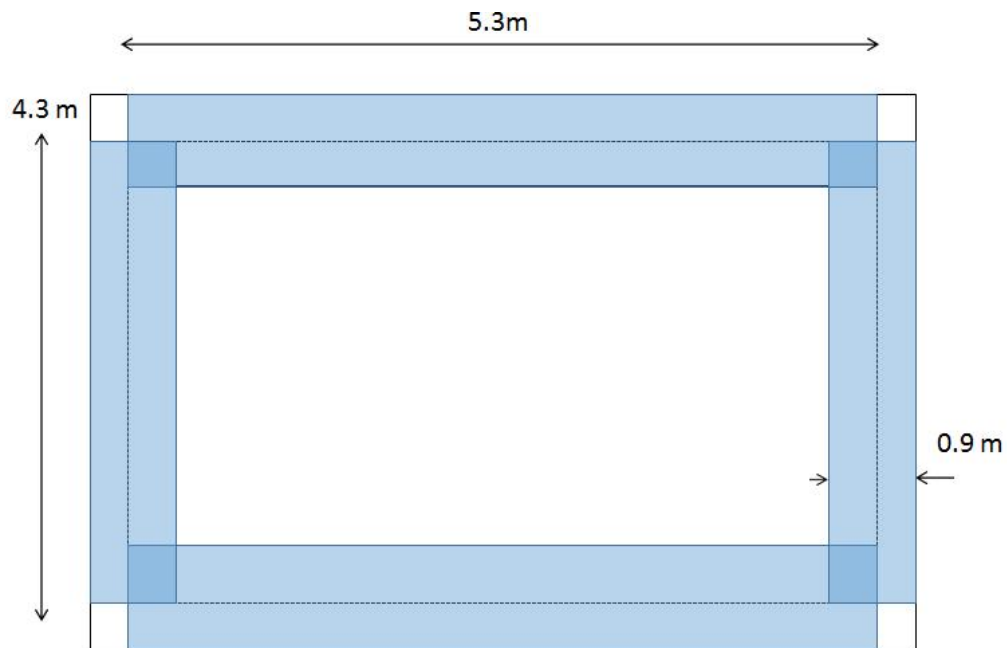
- This method is adopted when external (i.e., around the building) wall is of one thickness and the internal walls having different thicknesses.
- In such cases, centre line method is applied to external walls and long wall-short wall method is used to internal walls.
- This method suits for different thicknesses walls and different level of foundations.
- Because of this reason, all Engineering departments are practising this method.

PROBLEMS:

1. Prepare a detailed estimate of a part of a wall of a building from the given plan and section. Calculate,
 - Earthwork excavation in foundation
 - Lime concrete in foundation
 - First class brickwork in foundation and plinth
 - Brickwork in superstructure.



Centre length of walls = $5.3 + 4.3 + 5.3 + 4.3$
= 19.20 m.



Center Line Method

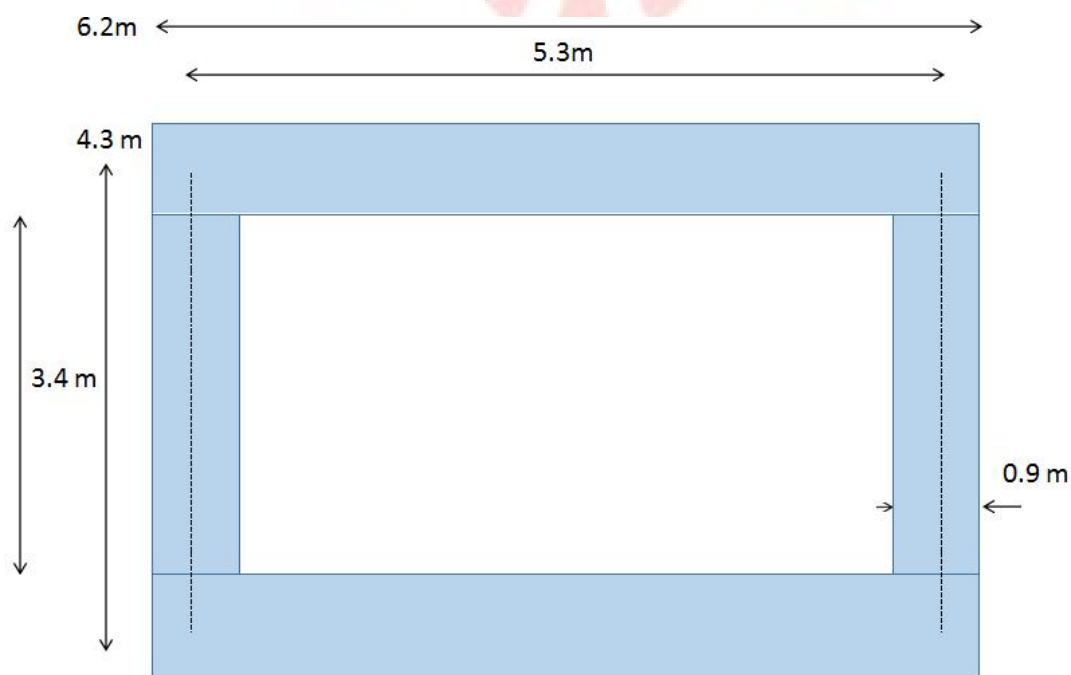
Total Center line = $5.3 + 5.3 + 4.3 + 4.3 = 19.2$ m

Width = 0.9 m

Total Qty of concrete in foundation = $(19.2 \times 0.9 \times 0.3)$ cum

Contents	No.	L	B	H	Quantity
1. Earthwork excavation on foundation	1	19.2	0.9	0.9 (0.3+0.3+0.3)	15.55 m ³
2. Concrete in foundation	1	19.2	0.9	0.3	5.18 m ³

3. Brickwork foundation and Plinth	1	19.2	0.6	0.3	3.46 m ³
1 st Footing	1	19.2	0.5	0.3	2.88 m ³
2 nd Footing	1	19.2	0.4	0.6	4.61 m ³
3 rd Footing					10.95 m ³
4. Brickwork in Super structure	1	19.2	0.3	3.5	20.16 m ³



Separate Wall Method

$$\text{Long Wall} = 5.3 + 0.9 = 6.2 \text{ m} \quad \text{Short Wall} = 4.3 - 0.9 = 3.4 \text{ m}$$

$$\text{Width} = 0.9 \text{ m} \quad \text{Total Qty of concrete in fdn} = (2 \times 6.2 \times 0.9 \times 0.3) + (2 \times 3.4 \times 0.9 \times 0.3) \text{ cum}$$

Long wall = c/c length + one breadth

$$= 5.3 + 0.9 = 6.2 \text{ m}$$

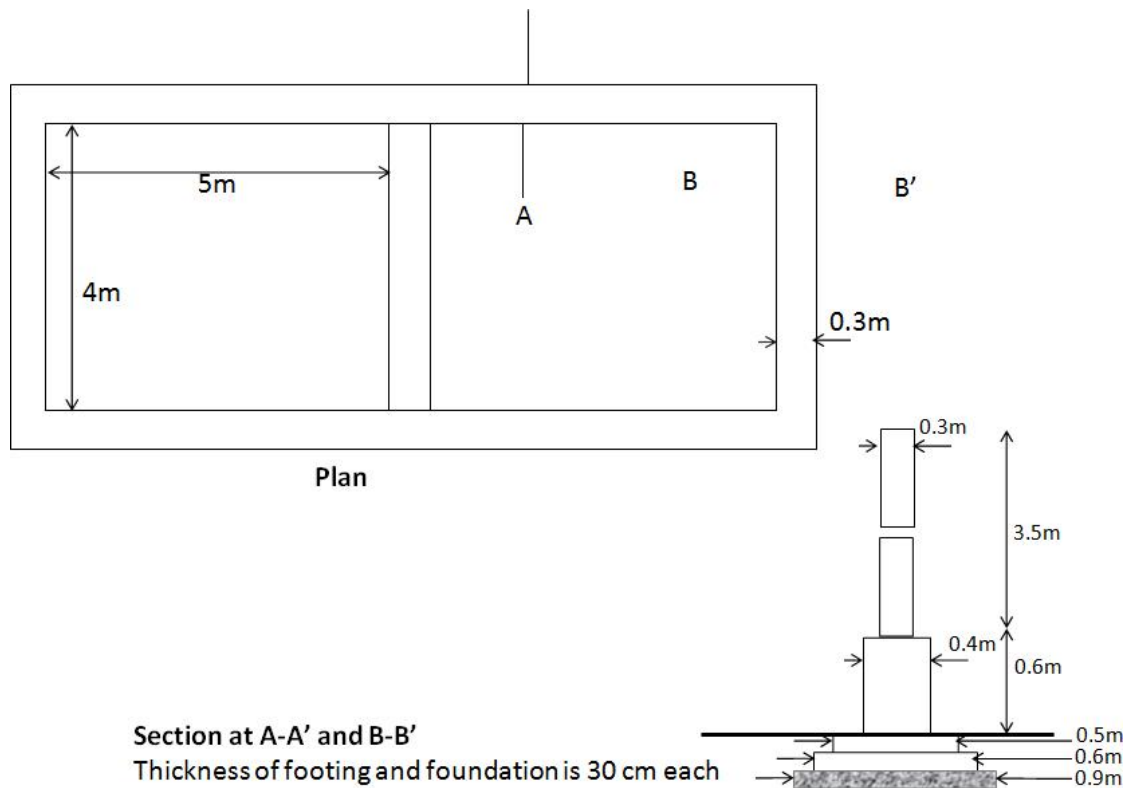
Short wall = c/c length – one breadth

$$= 4.3 - 0.9 = 3.4 \text{ m}$$

Contents	No.	L	B	H	Quantity	Remarks OR Explanatory notes.
1. Earthwork excavation on foundation	2	6.2	0.9	0.9	0.04 m ³	
Long wall	2	3.4	0.9	(0.3+0.3+0.3) 0.9	5.51 m ³	
Short wall					5.55 m ³	
2. Concrete in foundation	2	6.2	0.9	0.3	33.3 m ³	
Long wall	2	3.4	0.9	0.3	1.83 m ³	
Short wall					5.18 m ³	
3. Brickwork in foundation and Plinth	2	5.9(5.3+0.6)	0.6	0.3		
Long wall	2	5.8(5.3+0.5)	0.5	0.3		
1 Footing	2	5.7(5.3+0.4)	0.4	0.6		
2 Footing	2	3.7(4.3-0.6)	0.6	0.3		
3 Footing	2	3.8(4.3-0.5)	0.5	0.3		
Short wall	2	3.9(4.3-0.4)	0.4	0.6		
1 Footing						
2 Footing						
3 Footing						
4. Brickwork in Super structure	2	5.6(5.3+0.3)	0.3	3.5	11.76 m ³	
Long wall	2	4.0(4.3-0.3)	0.3	3.5	8.4 m ³	
Short wall					20.16 m ³	

2. Prepare a detailed estimate of a part of a wall of a building from the given plan and section. Calculate,

- Earthwork excavation in foundation
- Lime concrete in foundation
- First class brickwork in foundation and plinth
- Brickwork in superstructure.



Centre line method

$$\text{Horizontal} = 0.15 + 5 + 0.3 + 5 + 0.15 = 10.6 \text{ m}$$

$$\text{Vertical} = 0.15 + 4 + 0.15 = 4.3 \text{ m}$$

$$\text{Middle wall} = 0.15 + 4 + 0.15 = 4.3 \text{ m}$$

$$\text{c/c length} = 10.6 + 10.6 + 4.3 + 4.3 + 4.3 = 34.1 \text{ m [OR]}$$

$$\begin{aligned} \text{Centre length of walls} &= 5.3 + 5.3 + 5.3 + 5.3 + 4.3 + 4.3 + 4.3 \\ &= 34.1 \text{ m.} \end{aligned}$$

NOTE: > for 2 rooms Formula to find out the length.

$$L = \text{c/c length} - [\text{No.of.units}/2 \times 1 \text{ breadth}]$$

To find actual length :

$$L = \text{c/c length} - [\text{No.of.units}/2 \times 1 \text{ breadth}]$$

$$= \text{c/c length} - [2/2 \times 1 \text{ B}]$$

$$= 34.1 - 1\text{B}$$

$$= 34.1 - 0.9 = 33.2 \text{ m.}$$