

# How to calculate steel quantity for slab- Step By Step

Slabs are plan structures whose thickness is quite small as compare to another dimension. Slabs are mostly used in roof covering and floor in various shapes like square, rectangle, or circular. But here we will calculate only the estimate of the steel rod for Slab.

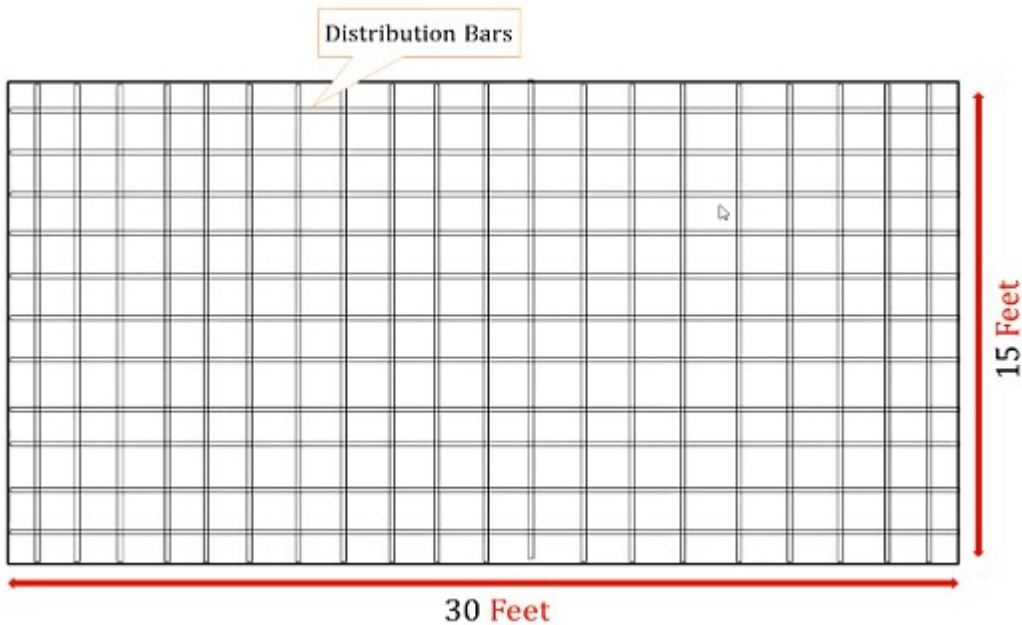
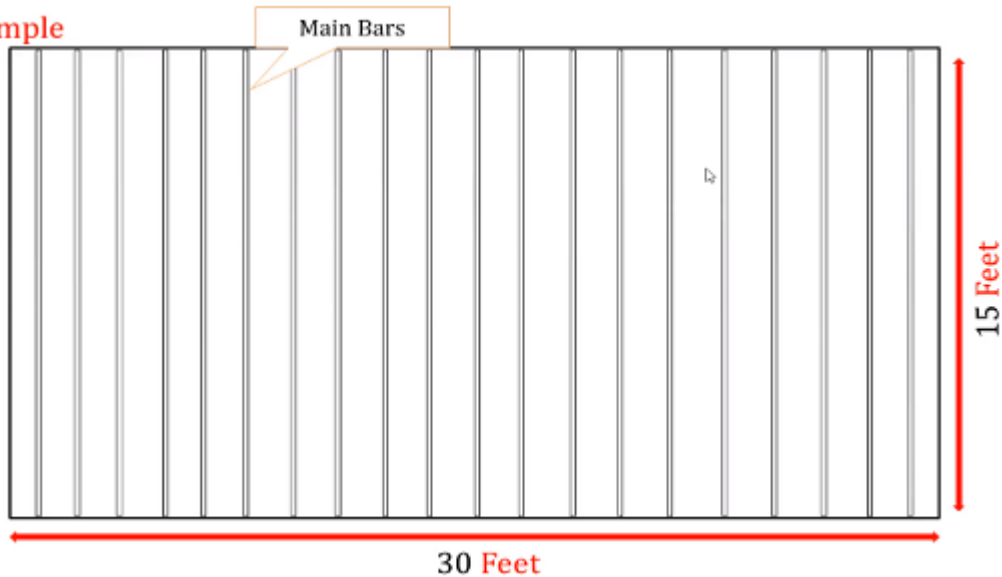
## Slab are of two types:-

- One way slab
- Two way Slab

I have explained the difference between both slabs in the previous article in detail. Here we will only discuss “How to calculate steel quantity for slab?”

Let us take an example, we have to calculate the quantity of steel of slab having dimension 30 feet as long span and 15 feet as short span. The Longest side steel rod is called the main rods while the shortest side steel rods are called distribution bars.

For Example



We will complete the numerical in three steps given below.

Step-One- (Calculate Total number of different size of bars)

Step-One- (Calculate Total Length of different size of bars)

Step-One- (Calculate Total weight of different size of bars)

Remember That, the formula to calculate the weight of steel rod is given by,

$$W = \frac{D^2}{52.9} \times \text{Total Length} \quad (\text{If the length is in feet and diameter is in mm})$$

and,  $W = \frac{D^2}{152.25} \times \text{Length}$  (If the length is in meter and diameter in mm)

Here the length is in feet so, we will use the formula for length in feet.

1) We calculate The Number of All Bars.

2) Then we calculate the Total length of All Bars.

Dia of Bar Must be in Sutter

$$\text{Weight of Bars} = \frac{D^2}{52.9} \times \text{Total length}$$

**WEIGHT OF 1 FT BAR IN KG**



**IF THE DIMENSION IN METER**

Dia of Bar Must be in mm

$$\text{Then The Weight of Bars} = \frac{D^2}{162.198}$$

### Example:-

Calculate steel for shown slab. Ignore concrete work.  
Take main Bars #4 @ 6" c/c Distance and  
Distribution Bars #4 @ 6" c/c ....?

### Solution

$$\text{No of Main Bars} = \frac{\text{Total Length}}{\text{C/C}} + 1$$

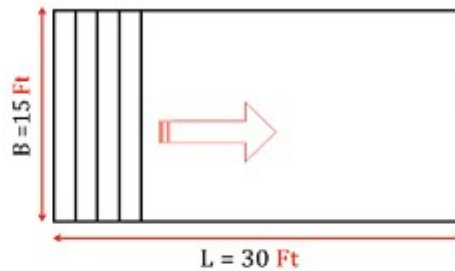
$$\text{No's of Main Bars} = \frac{30}{.5'} + 1$$

$$\text{No's of Main Bars} = 61 \text{ No's}$$

$$\text{Total Length} = \text{Length of One Bar} \times \text{No of Main Bars}$$

$$\text{Total Length} = 15 \times 61$$

$$\text{Total Length} = 915 \text{ ft}$$



$$\text{W of Main Bars} = \frac{D^2}{52.9} \times \text{Total length}$$

$$\frac{4^2}{52.9} \times 915$$

$$\text{W of Main Bars} = 276.748 \text{ kg}$$

**Example:-**

Calculate steel for shown slab. Ignore concrete work.  
Take main Bars #4 @ 6" c/c Distance and  
Distribution Bars #4 @ 6" c/c ....?

**Solution**

$$\text{No of Diss Bars} = \frac{\text{Total Breadth}}{\text{C/C}} + 1$$

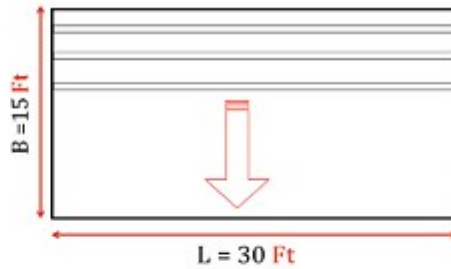
$$\text{No's of Diss Bars} = \frac{15}{.5'} + 1$$

$$\text{No's of Diss Bars} = 31 \text{ No's}$$

$$\text{Total Length} = \text{Length of One Bar} \times \text{No of Diss Bars}$$

$$\text{Total Length} = 30 \times 31$$

$$\text{Total Length} = 930 \text{ ft}$$



$$\begin{aligned} \text{W of Diss Bars} &= \frac{D^2}{52.9} \times \text{Total length} \\ &= \frac{4^2}{52.9} \times 930 \\ \text{W of Diss Bars} &= 281 \text{ Kg} \end{aligned}$$

$$\begin{array}{r} \text{Total weight} = + 277 \text{ Kg} \quad \leftarrow \text{W of Main Bars} \\ \quad \quad \quad 281 \text{ Kg} \quad \leftarrow \text{W of Diss Bars} \\ \hline \quad \quad \quad 558 \text{ Kg} \end{array}$$

I hope this article on “How to calculate steel quantity for slab” remains helpful for you.

Happy Learning – Civil Concept

Contributed by,

Civil Engineer – Ranjeet Sahani

Read Also,

Calculate weight of steel bar | Quantity of steel bar in circular slab

Minimum clear cover for slab, column, beam, Retaining Structure

Quick guide to design of one way slab with IS Code 456:2000

What makes one-way slab and two-way slab different from each other