

## Construction Cost (400 SQ FT) Latest Estimation in 2021

- ✓ **Foundation PCC plinth beam and their cost.**
- ✓ **Brick cost calculation, number of bricks, quantity of cement sand and their cost.**
- ✓ **Concrete work, column, beam and slab.**
- ✓ **Reinforcement quantity and their cost.**
- ✓ **Tile flooring quantity and their cost.**
- ✓ **Labour work and their cost.**



## **Footings/ Foundation cost for room size 20'×20'.**

Let Foundation size is 4'×4' and 4 feet depth, so volume of soil excavation for 4 footings =  $4 \times 4' \times 4' \times 4' = 256$  cubic feet. Converting into cubic meter  $256/35.32 = 7.25$  m<sup>3</sup>. Soil excavation rate is around rs 800 per m<sup>3</sup> for hard soil and rs 300 per m<sup>3</sup> for soft soil. We take soil excavation rate Rs 400/m<sup>3</sup> for this calculation. Total cost of soil excavation for foundation =  $7.25 \times 400 = \text{Rs } 2900$ .

## **Brick work quantity and cost calculation**

Assume room 20'×20' have 9" brick wall on four side height up to 10 feet and parapet wall for partition wall will be of 4.5 inch. Outer dimension of room is 21.5'×21.5' and inner dimension of room excluding brick wall is 20'×20'.

Area of one brick wall having 10feet height =  $20' \times 10' = 200$  sq foot

Area of 4 brick wall =  $4 \times 200 = 800$  sq foot.

Door size =  $4' \times 7' = 28$  sq ft

Window size =  $5' \times 6' = 30$  sq ft

Door and window size should be deducted from total area of brick wall.

Net area of brick wall =  $800 - (28+30) = 742$  sq ft

Volume of 9 inch thick brick wall =  $742 \times 9/12 = 556.5$  cubic feet, converting into cubic meter we have  $556.5/35.32 = 15.75$  cubic meter.

Consider parapet brick wall 3.5 feet height 4.5 inch thick, and outer dimension of room is  $21.5' \times 21.5' = 182.25$  sq ft, total area of parapet brick wall on all four side =  $21.5 \times 3.5 \times 4 = 301$  sq ft.

Volume of parapet wall =  $(4.5/12) \times 301 = 113$  cubic ft, converting into cubic meter,  $113/35.32 = 3.2$  cubic meter.

Total brickwork = 4 brick wall + parapet wall =  $15.75 + 3.2 = 18.95$  cubic meter.

Thumb Rule for brickwork:- 1 cubic metre of brickwork require 500 bricks, 1.26 bags of cement and 9.28 cubic feet sand quantity.

## Brick quantity and their cost:

number of brick in 18.95 cubic meter =  $500 \times 18.95 = 9475$  nos, suppose first class brick rate is around rs 8000 per thousand, so brick cost =  $8000 \times (9475/1000) =$  rs 75800.

## Cement quantity and their cost:-

quantity of cement required for 18.95 cubic metre brickwork is  $1.26 \times 18.95 =$  around 24 bags cement. Suppose market rate of cement is around rupees 400 per bag so cement cost =  $24 \times 400 =$  rs 9600.

## Sand quantity and their cost:—

quantity of sand required for 18.95 cubic metre brick work is  $9.28 \times 18.95 =$  176 cft. Market rate of sand is around rupees 40 per CFT then sand cost=  $176 \times 40 =$  rs 7040.

So total brickwork cost = brick cost + cement cost + sand cost = 75800 + 9600 + 7040 = rs 92440.

### **concrete quantity and cost calculation for footing, column, plinth beam, wall Beam and rcc slab.**

Footing is 4 feet depth and column size is 12 inch into 12 inch and height of column is 10 feet up to slab and 3.5 feet above slab. There is four column.

So column length is =  $4' + 10' + 3.5' = 17.5'$

Total volume of concrete quantity for 4 column =  $4 \times (12'' \times 12'') \times 17.5' = 70$  cubic feet.

Plinth beam size  $9'' \times 12''$  for all around for length  $21.5 \times 4 = 86$  feet. Total volume of concrete quantity for plinth beam =  $(9'' \times 12'') \times 86 = 64.5$  cubic feet.

Wall beam size  $12'' \times 12''$  for all around for length  $21.5 \times 4 = 86$  feet. Total volume of concrete quantity for wall beam =  $(12'' \times 12'') \times 86' = 86$  cubic feet.

RCC slab 5 inch thick for  $21.5' \times 21.5'$ , concrete volume is  $21.5' \times 21.5' \times 5/12' = 192.6$  cft.

Total Weight volume of rcc concrete = concrete quantity for column + concrete quantity for RCC plinth beam + concrete quantity for RCC wall + concrete quantity for RCC slab = 70 +64.5+86+192.6 = 413 cft.

Converting 170cft into cubic metre,  $413/35.32 = 11.70\text{m}^3$ . Ready mix concrete available in market is around rupees 4000 per  $\text{m}^3$  for M20 grade of concrete, so total material cost of concrete =  $4000 \times 11.70 = \text{rs}46800$ .

### **Reinforcement cost and quantity calculation :-**

Suppose reinforcement required is 1% of concrete volume for RCC work like footing column beam and RCC slab.

Steel quantity =  $(1/100) \times 11.70\text{m}^3 = 0.1170\text{m}^3$

Weight of steel =  $0.1170\text{m}^3 \times 7850\text{kg}/\text{m}^3 = 919\text{kg}$ , market rate of Steel is around 60 rupees per kg then total cost of Steel =  $60 \times 919 = \text{rs} 55140$ .

## Labour cost for construction of house

Around 180 rupees per square foot without plastering and PCC or tile flooring.

So total outer area of one room is  $21.5' \times 21.5 = 462.25$  square foot, total labour cost =  $180 \times 462.25 = \text{rs } 83205$ .

Total cost for construction of one room = soil excavation cost + brick work cost + concreting cost + reinforcement cost + labour cost.

Total construction cost for one room =  $2900 + 92440 + 46800 + 55140 + 83205 = \text{Approx rs } 280485$ .

## How much does it cost to build a 20'×20' Room?

Construction cost for one room 20'×20' with parapet wall is around rs 280485, this total cost includes soil excavation cost rs 2900, brickwork cost rs 92440, concrete cost rs 46800, steel cost rs 55140 and labour cost rs 83205 without plastering PCC and tile flooring.

Consider finishing cost is about 60% of total construction cost of one room, finishing should be required plastering, PCC flooring, tile flooring, putty painting, electrical fitting, plumbing, water and sanitization.

60% of construction cost of one room =  $(60/100) \times 280485 = 168291$ .

**Cost =  $280485 + 168291 = \text{RS } 448775$ .**

**Total Cost = Rs. 500000**

Total construction cost for fully furnished one room 20'×20' is around rs 448775, this total cost includes cost of building construction, plastering, PCC flooring, tile flooring, electrical fitting, plumbing, painting putty and water and sanitization.



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