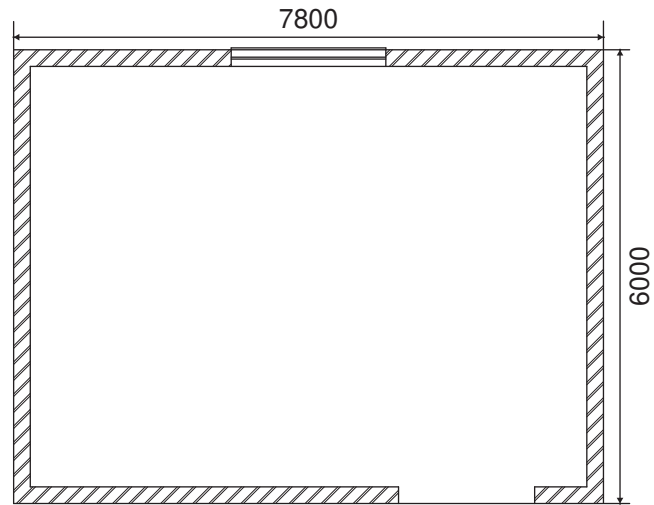
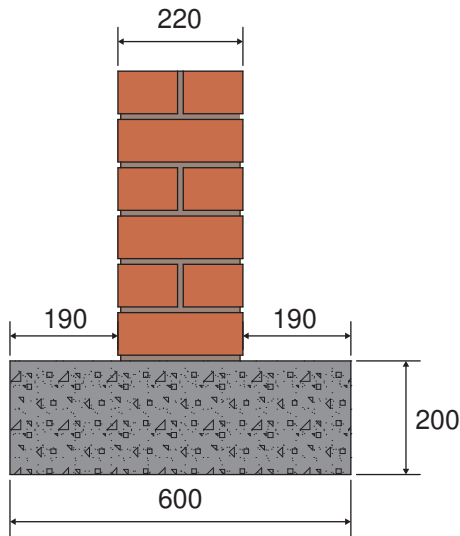


CHAPTER 21

How to Calculate Material Requirements



HOW TO CALCULATE MATERIAL REQUIREMENTS



Examples on how to Calculate Material Quantities:

Wall Height : 2.4m

Calculate:

1. Volume of concrete - foundation slab
2. Number of bricks required
3. Material required for topping
4. Material required for plaster internally and externally

1. Concrete Footing (Strip Foundation)

To calculate the volume of concrete required, the overall dimensions of the concrete strip foundations need to be determined. Also, refer to guidelines of cement manufacturer.

Overall length + outside wall dimension + 380

Therefore : $7800 + 380 = 8180m$
 $6000 + 380 = 6380m$

Volume = $L \times B \times H$ (thickness)
 $= 2(8180) + 2(6380) \times 600 \times 200$
 $= (16360 + 12760) \times 600 \times 200$
 $= 29.120 \times 600 \times 200$
 $= 3.49m^3$

Requirements: Low Strength Concrete

To produce $1m^3$ of concrete you will need:

5.5 bags cement
 $0.7m^3$ riversand
 $0.75m^3$ stone

To produce $3.49m^3$ of concrete as per the calculation, the following is required:

$3.49 \times 5.5 = 19.195$ bags cement (round off to 20 bags)
 $3.49 \times 0.75 = 2.6175m^3$ riversand (round off to $3m^3$)
 $3.49 \times 0.75 = 2.6175m^3$ stone (round off to $3m^3$)

2. Floor Slab

To calculate the volume of concrete required, refer to the Internal dimensions of the room. Also, refer to guidelines of cement manufacturer.

Therefore: $7800mm - (220 + 220) = 7800 - 440 = 7360$
 $6000mm - (220 + 220) = 6000 - 440 = 5560$

Volume = Length x Width x Thickness
 $= 7.360m \times 5.560m \times 0.075m$
 $= 3.069m^3$

Requirements: Medium Strength Concrete

To produce medium strength concrete as per the calculation, the following is required:

$3.069 \times 7 = 21.483$ bags of cement (round off to 22)
 $3.069 \times 0.70 = 2.1483$ (round off to $2.2m^3$ riversand sand)
 $3.069 \times 0.70 = 2.1483$ (round off to $2.2m^3$ stone)

3. Clay Brick Walls

To calculate the number of Clay Bricks required for the construction of walls, the following formula is applied. Also, contact your local Clay Brick supplier should you need assistance.

External Walls : 220mm or two leaf walls
 For every $1m^2$ of walling : 110 bricks are required

Formula = Area

	=	Length x Height	10	bags of cement
	=	(2X7800 + 2X6000) x 2.4	2.0m ³	plaster sand
	=	15.600 + 12.000 x 2.4		
	=	27.600 x 2.4	62 x 0.10	= 6.2 bags of cement (round off to 7)
	=	66.24m ² walling	62 x 0.02	= 1.24m ³ plaster sand
Number of Clay Bricks	=	66.24m ² x 110	External	
	=	7286 Clay Bricks	Area	
Number of Clay Bricks required in foundation walling			=	Length x Height
			=	(2X7800 + 2X6000) x 2.4
Assume 500mm height	=	Wall Length x Height	=	(15.60 + 12.00) x 2.4
	=	27.600 x 500	=	27.60m x 2.4m
	=	13.80m ²	=	66.24m ²
	=	13.80 x 110	=	0.6624 x 10
	=	1518 Clay Bricks	=	6.624 bags of cement (round off to 7)
Total Required	:	7286 + 1518	=	0.6624 x 2
	=	8804 Clay Bricks	=	1.32m ³ sand



NOTE

Clay Bricks are delivered on pallets or packages. Please check with your supplier to order economical loads.

4. Topping (Screed)

To produce 100m² of screed, that is 25mm thick you will need:

23 bags of cement
3.0m³ riversand sand

The formula to calculate the volume of screed required is as follows. Consult with your local materials supplier should you need assistance.

Floor Area = 7.360m x 5.560m
= 40.92 (41m²)

0.41 x 23 = 9.43 (10) pockets cement
0.41 x 3 = 1.23m³ sand

5. Plaster

The formula to calculate 15mm thick plaster is as follows.

Internal

Formula = Length x Height
= (14.72 + 11.12) x 2.4
= 25.84 x 2.4
= 62.016m²

For every 100m² of plaster 15mm thick, the following is required. Consult with your local materials supplier should you need assistance.



NOTES

Lined area for writing notes, consisting of multiple horizontal lines.