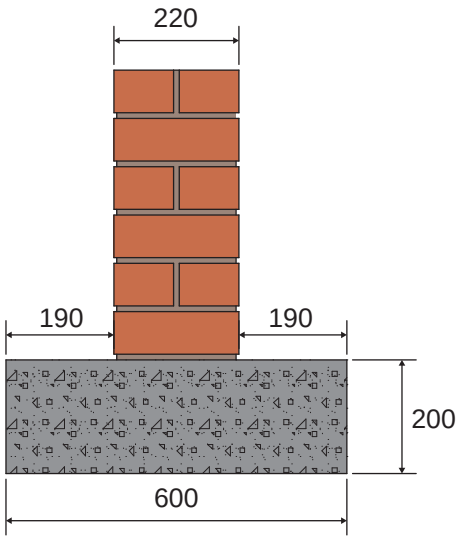
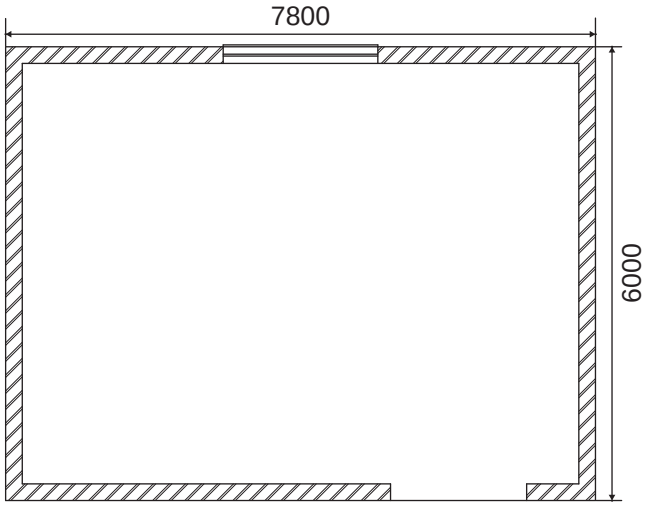
CHAPTER 21

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 x B x H (thickness)
	=	2(8180) + 2(6380) x 600 x 200
	=	(16360 + 12760) x 600 x 200
	=	29.120 x 600 x 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 x 5.5	=	19.195 bags cement (round off to 20 bags)
3.49 x 0.75	=	2.6175m^3 riversand (round off to 3m^3)
3.49 x 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 x 5.560m x 0.075m
	=	3.069m^3

Requirements: Medium Strength Concrete

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

3.069 x 7 =	21.483 bags of cement (round off to 22)
3.069 x 0.70 =	2.1483 (round off to 2.2m^3 riversand sand)
3.069 x 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
	=	(2X7800 + 2X6000) x 2.4
	=	15.600 + 12.000 x 2.4
	=	27.600 x 2.4
	=	66.24m^2 walling

Number of Clay Bricks	=	66.24m^2 x 110
	=	7286 Clay Bricks

Number of Clay Bricks required in foundation walling

Assume 500mm height	=	Wall Length x Height
	=	27.600 x 500
	=	13.80m^2
	=	13.80 x 110
	=	1518 Clay Bricks

Total Required	:	7286 + 1518
	=	8804 Clay Bricks

NOTE

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

4. Topping (Screed)

To produce 100m^2 of screed, that is 25mm thick you will need:

23	bags of cement
3.0m^3	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 (41m^2)

0.41 x 23	=	9.43 (10) pockets cement
0.41 x 3	=	1.23m^3 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
	=	62.016m^2

For every 100m^2 of plaster 15mm thick, the following is required. Consult with your local materials supplier should you need assistance.

10	bags of cement
2.0m^3	plaster sand

62 x 0.10	=	6.2 bags of cement (round off to 7)
62 x 0.02	=	1.24m^3 plaster sand

External

Area	=	Length x Height
	=	(2X7800 + 2X6000) x 2.4
	=	(15.60 + 12.00) x 2.4
	=	27.60m x 2.4m
	=	66.24m^2
	=	0.6624 x 10
	=	6.624 bags of cement (round off to 7)
	=	0.6624 x 2
	=	1.32m^3 sand

NOTES