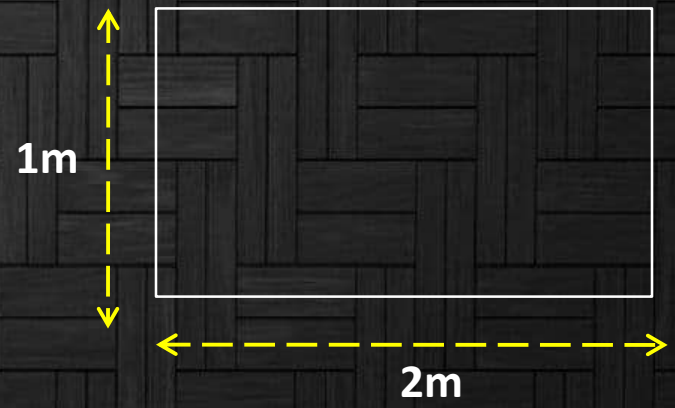
Thumb Rule For Excavation

1.) Excavation Quantity – 3 x Concrete Quantity of footing

Let's take an Example,

Footing Size – 2 x 1mtr.

Depth of Footing – 3mtr.



So, Concrete Quantity of footing = 2x1x3 = 6m3.

Then, Excavation Quantity – 3 x concrete quantity

– 3 x 6 = 18m3.

Thumb Rule For Excavation

Always Consider Offsets for excavations

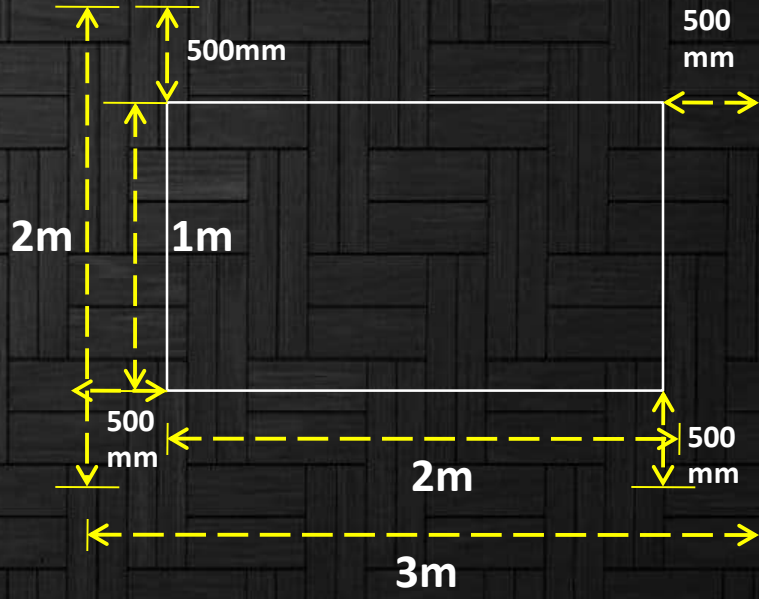
Length of Footing – 0.5 + 2 + 0.5 = 3mtr.

Width of Footing – 0.5 + 1 + 0.5 = 2mtr.

Depth of Footing – 0.100 + 3 = 3.1mtr.

Then, Excavation Quantity – L x B x H

– 3 x 2 x 3.1 = 18.6m3.



IMPORTANT THUMB RULE

2.) Thumb Rule for Concrete Volume of Area

Concrete consume in 1sqft Area = 0.038m3 of concrete required

Let's take an Example,

Let, Area of Plot – 40'x20' = 800sqft.

Then, Volume of concrete – 800x0.038

So, Volume of concrete – 30.4m3 (for any structural members area)

IMPORTANT THUMB RULE

3.) Steel Quantity Required for Slab, beam, footing & columns.

For residential buildings – 4.5 to 4.75kg/-Sqft.

For commercial buildings – 5 to 5.50kg/-Sqft.

Or 80 to 150kg/m3.

IMPORTANT THUMB RULE

3.) Steel Quantity Required for Slab, beam, footing & columns.

B.N Dutta recommendation

i). Slab – 1% of total concrete Volume.

ii). Beam – 2% of total concrete Volume.

iii). Column – 2.5% of total concrete Volume.

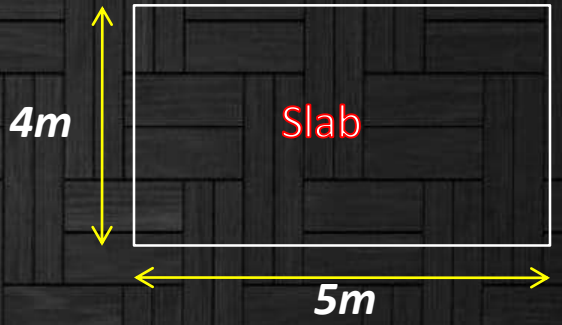
iv). Footing – 0.8% of total concrete Volume.

IMPORTANT THUMB RULE

For Example,

Slab having dimension – 5mx4mx0.15m (L x B x D)

Total Concrete volume – 3m3



According to B.N Dutta recommendation, Slab – 1% of total concrete Volume.

So, Required Qty of Steel in Slab = Concrete Volume x Density of steel x 1%

= 3m3 x 7850 kg/m3 x 0.01 = 235kg.

IMPORTANT THUMB RULE

4.) Shuttering Area Calculation by Thumb rule

Shuttering Cost – 15 to 18% of total construction cost.

Suppose, Total Structure Cost – Rs.2Lakh.

So, Total Shuttering Cost – 15 to 18% of 2lakh = Rs.30,000 to 36,000/-

Shuttering Required – 6 times more than concrete quantity or 2.4 times of Plinth Area.

IMPORTANT THUMB RULE

5.) Shuttering Ply quantity Calculation by Thumb rule

Suppose, Ply size – 2.44 x 1.22 x 0.012mm.

No. of Ply Sheets required = 0.22 times of shuttering area

Let, Area of Shuttering = 5m2.

So, Shuttering Ply Required = 0.22 x 5 = 1.1m2.

IMPORTANT THUMB RULE

6.) Batten quantity Calculation by Thumb rule

Batten Quantity – 19.82 x No. of Ply Boards

Let, Construction required 25 Ply sheets

So, Quantity of Batten required = 19.82 x 25 = 495 Nos. Battens.

IMPORTANT THUMB RULE

7.) Nails quantity Calculation by Thumb rule

In 1m2 Shuttering = 75gm nails are required.

In 1m2 Shuttering = 75gm bolts are required.

8.) Binding wire quantity Calculation by Thumb rule

In 1m2 Shuttering = 75gm binding wire are required.

IMPORTANT THUMB RULE

9.) Shuttering oil quantity Calculation by Thumb rule

Oil Required – 0.065 x total area of shuttering.

Let's take an example,

Suppose, Shuttering Area = 15m2

So, Oil Required = 15 x 0.065 = 0.975 or 1ltr.

IMPORTANT THUMB RULE

10.) Thumb rule for quantity of cement/sand/Coarse aggregates and fine aggregates in different grades for 1 m3.

Concrete Mix	Cement	Coarse Aggregates	Sand
M – 5	2.82 bags	0.98m3	0.49m3
M - 7.5	3.48 bags	0.97m3	0.48m3
M – 10	4.50 bags	0.90m3	0.45m3
M – 15	6.60 bags	0.88m3	0.44m3
M - 20	8.40 bags	0.84m3	0.42m3

11.) Thumb rule for quantity of Plaster

Types of Plastering	Cement Bags	Cement in Kg
Rough Plastering	0.09bags/m2	4.5kg/m2
Internal Plastering	0.09bags/m2	4.5kg/m2
Duct Plastering	0.09bags/m2	4.5kg/m2
External Plastering	0.175bags/m2	8.75kg/m2
Stucco Plastering	0.175bags/m2	8.75kg/m2
Lathen Plastering	0.55bags/m2	27.5kg/m2

12.) Thumb rule for Brick Masonry Work

Brickwork for 1m3	*Cement Qty in m3*	*Cement Qty. in bags*
230mm width (9’’)	0.867m3	25.4 bags
115mm width (5’’)	0.218m3	6.32 bags

13.) Thumb rule for Masonry wall Quantity

A 100sqft wall consume

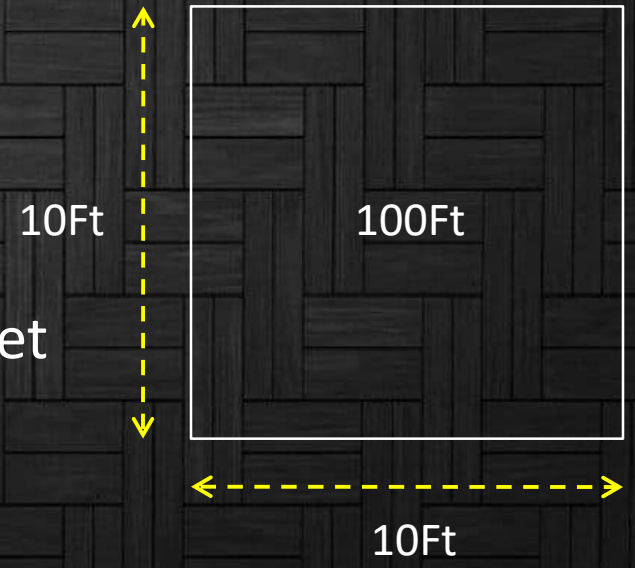
Cement bags – 2Nos.

Sand – 24Nos. Bucket. (1:4)

And, 1 bag cement containing – 3 bucket

So, Cement Bucket – 6 Nos.

Sand Bucket – 24 Nos.

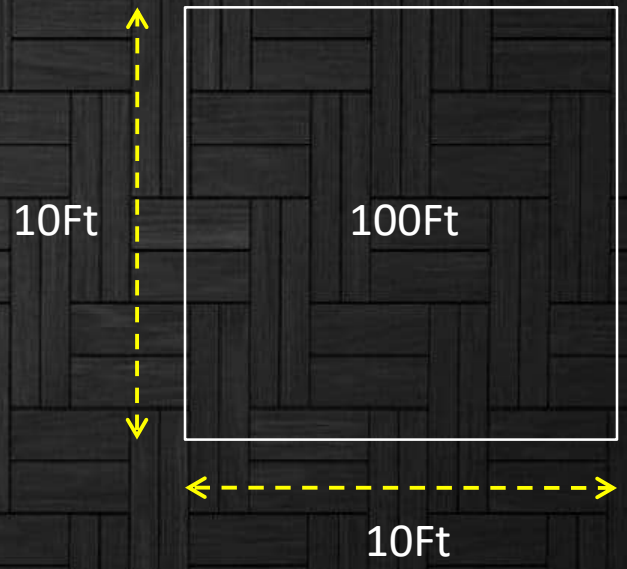


14.) Thumb rule for Masonry wall Bricks Quantity

A 100sqft wall consume

Brick 9'' – 950 -1000 bricks.

Brick 4'' – 450 – 500 bricks.



But Always order 50 to 100 bricks extra for wastage.

15.) Cement bags quantity in Concrete Slab

Let's Take an Example

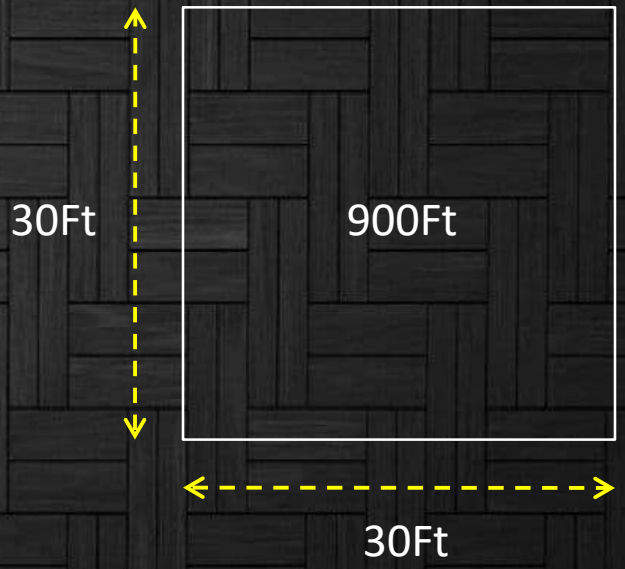
Slab Area – 900Sqft

So, Cement Bags – 9 x 7 = 63 Bags.

Let's take another example

Slab Area – 1300sqft

So, Cement Bags – 13 x 7 = 91 Bags.



16.) Find depth of Foundation by thumb rule

As per IS Code – 1080 – 1982

Depth of foundation for multistory building.

5% to 10% of the height of the building.

For example,

No. of floor – 17Nos & overhead tank height 3mtr.

Ground to first floor height = 4.2mtr.

16.) Find depth of Foundation by thumb rule

1st to 17th floor – 3mtr.

So, Total Height of Building – 4.2 + (17 x 3) + 3 = 58.21mtr.

So, depth of foundation may be as per thumb rules.

Total building height x 5 to 10%

= 58.21 x 5% = 2.91mtr or, 58.21 x 10% = 5.82mtr.

It depends on soil condition.

17.) Labor Productivity by thumb rule

Brickwork - 1 mason + 1 Labor = 1.25m3 or 45cft (for 8 hrs).

Wall Plastering - 1 mason + 1 Labor = 10m2 or 107sft (for 8 hrs).

Ceiling Plastering – 1 mason + 1 Labor = 8m2 or 85sft (for 8 hrs).

External Plastering - 1 mason + 1 Labor = 8m2 or 85sft (for 8 hrs).

17.) Labor Productivity by thumb rule

Carpenter - 1 skilled + 1 unskilled = 4m2 (for 8 hrs).

Bar Binder - 1 skilled + 1 unskilled = 150kg (for 8 hrs).

Tile Work - 1 mason + 1 Labor = 10sqm (for 8 hrs).

Earth digging - 5 male labor + 4 female Labor = 1000cft (for 8 hrs).

18). Bricks Required in 1m3 – 500 Nos. (For standard sizes bricks).

19). Mortar Required for 500 Bricks – 0.25m3.

20). Concrete Qty = Area x thumb rules

Area – Total Built up Area (Plinth area x No. of Floors).

For Commercial - Area x 0.5m3

For Residential – Area x 0.2m3

21). House Construction Cost by Thumb rules

Civil Structural works cost – Rs.1150/-sqft.

Finishing work cost – Rs. 650/-sqft.

22). Painting cost by thumb rules

2 layer putty + 2 Layer paint coat.

Rs. 18 to 20/-sqft.

23). Flooring

Marble Rate – Rs.100 to 120/-sqft.

Granite Rate – Rs.20 to 22/-sqft.

24). Electricals

Rs.70to120/-sqft For materials (A rough guide).

Rs.15 to 32/-sqft for labor.

25). Cement Required per m3

M10 - 210kg

M20 - 320kg

M25 - 340kg

M30 - 380kg

M35 - 410kg

M40 - 430kg

M45 - 450kg

26). Anti – termite treatment

Chemicals name is chlorophyrifac 20%.

Diluting 5ltr of chemical with 95ltr of water and usage is 7.5sqm per ltr.

To provide 1’’ dia. Hole and 1 feet depth Use 7.5sqm per ltr.

27). Water – Proofing for walls

0.23bags /sqm.

28). Water – Proofing for Balcony/toilet

0.65bags /sqm.

29). Water – Proofing for Sunken Slab

0.23bags /sqm.

30). Vitrified tile flooring

0.28 cement bags/sqm.

31). Ceramic tile flooring

0.28 cement bags/sqm.

32). Daddo tile flooring

0.27 cement bags/sqm.

33). AAC Blocks – 12.5Nos/sqm.

34). Wall Putty – 14 to 15sqft/-kg (For 2 Coat).

– 8 to 12sqft/-kg (For 3 Coat).

35). Primer - 120 to 140sqft/-kg (For 1 Coat).

- 70 to 90sqft/-kg (For 2 Coat).

36). Labor cost for painting - Rs.10 to 15/-sqft.

37). Cement Consume for Plastering by thumb Rules

For External Plastering – 8.75kg/m2.

For Internal Plastering – 4.5kg/m2.

Ceiling Plastering – 0.11bags/m2.

38). Labor required for Demolishing by thumb Rules

PCC (1:2:4 or 1:3:6) for 1m3 – 2 Labors (8hrs).

RCC (Lead 50mtr) for 1 m3 – 4 Labors (8hrs).

Brickwork (Lead 50mtr) for 1 m3 – 2Labor (8hrs).

Removing Mortars for 10m3 – 4 mason & 25 labors with (cleaning & stacking).

Labor required for Masonry by thumb Rules

39). Brickwork :- 7.55sqm – 1 mason + 1 man labor + 1 Women labor (for 8hrs).

40). Block work :- 12m2 – 1 mason + 1 man labor + 1 Women labor (for 8hrs).

41). DPC :- 100m2 – 5 mason + 6 man labor (for 8hrs).

42). Cement Consume for Marble flooring – 0.3bags/sqm.

43). Thumb Rules For Contractor

i). Floor to floor height should be minimum.

ii). Use repetitive formwork & Ms shuttering.

iii). Use Standard size of Columns.

iv). Same beam bottom & beam depth.

v). Use high strength concrete in column eg.M30.

vi). Use high early strength concrete.

Vii).Use locally available materials.

44). Thumb Rules to calculate materials qty. for house construction.

Let, Built-up Area – 1000sqft

i). Cement – Built up Area x 0.4

= 1000 x 0.4 = 400bags

ii). Sand – Built-up Area x 0.816

= 1000 x 0.816 = 816 tone or 51m3.

44). Thumb Rules to calculate materials qty. for house construction.

Let, Built-up Area – 1000sqft

iii). Aggregates - Built-up Area x 0.608

= 1000 x 0.608 = 608 tone.

iv). Steel – Built up Area x 4

= 1000 x 4 = 4tone.

44). Thumb Rules to calculate materials qty. for house construction.

Let, Built-up Area – 1000sqft

v). Paint – Built-up Area x 0.18

= 1000 x 0.18 = 18ltr.

vi). Flooring - Built-up Area x 1.3

= 1000 x 1.3 = 1300sqft (with skirting).

44). Thumb Rules to calculate materials qty. for house construction.

Let, Built-up Area – 1000sqft

vii). Bricks – Built up Area x 8

= 1000 x 8 = 8000Nos.

45). Thumb Rules to Find Depth of Beams

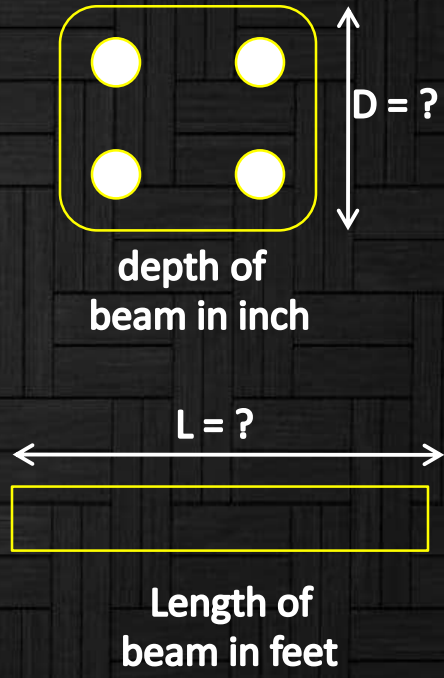
According to ACI Code – 318 -14 (Table no. 9.5A)

Depth of beam in inch = Length of beam in feet

For Example,

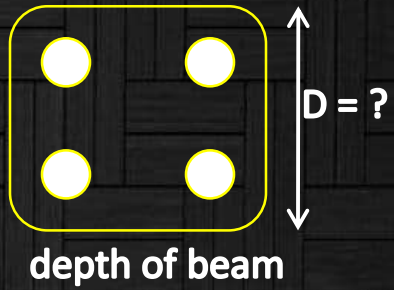
Length of beam = 5mtr. Or 5 x 3.28 = 16.40 feet

So, depth of beam = 16.40 inch.

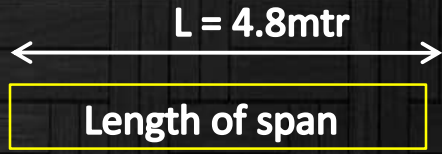


46). Thumb Rules for Design beam size

$$\text{Depth of beam} = \frac{\text{Effective Span}}{12}$$



For Example,



$$\text{Length of Span} = 5\text{mtr or } \frac{5000\text{mm}}{12} = 417\text{mm.}$$

or, depth of beam = 16.40 inch.

47). Thumb Rules for Design Slab size

As per IS 456

i). Simply supported Slab

ii). Continuous Slab

$$\frac{\text{Span}}{30}$$

iii). Cantilever Slab

$$\frac{\text{Span}}{7}$$

This is applicable for slab span 10mtr or less than 10mtr only not for more than 10mtr.

48). Standard data for tolerance

i). Accuracy of measuring equipment in batching plant

i). cement	+_2%
ii). Aggregates	+_3%
iii). Admixture	+_3%
iv). Water	+_3%
v). Mixing time	2 minutes for 1 mixing.

49). Standard data for tolerance

ii). Tolerance on steel diameter in length

i). 0 - 25mm +_0.5%

ii). 25 - 35mm +_0.6%

iii). 35 – 50mm +_0.8%

49). Standard data for tolerance

iii). Tolerance on steel weight per mater

i). 0 - 10mm +_7%

ii). 10 - 16mm +_5%

iii). 16mm & above +_3%

49). Standard data for tolerance

iv). Tolerance for cutting length.

i). When the specified length is not given = _+75mm.

ii). When the length is given for cutting L = _+50mm.

50). Materials consumption per sqft

i). RMC – 0.05m3/-sqft.

ii). Cement – 0.5bags/-sqft.

iii). Electrical cost – Rs.150/-sqft.

iv). Plumbing Cost – Rs.140/-sqft.

v). Fire fighting Cost - Rs.55/-sqft


THANK YOU