

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

FORMWORKS, FRAMEWORKS AND SCAFFOLDING

A. Footing FORMWORKS

F-1

Get the surface area of each side

a= Length of footing (L) = 1m

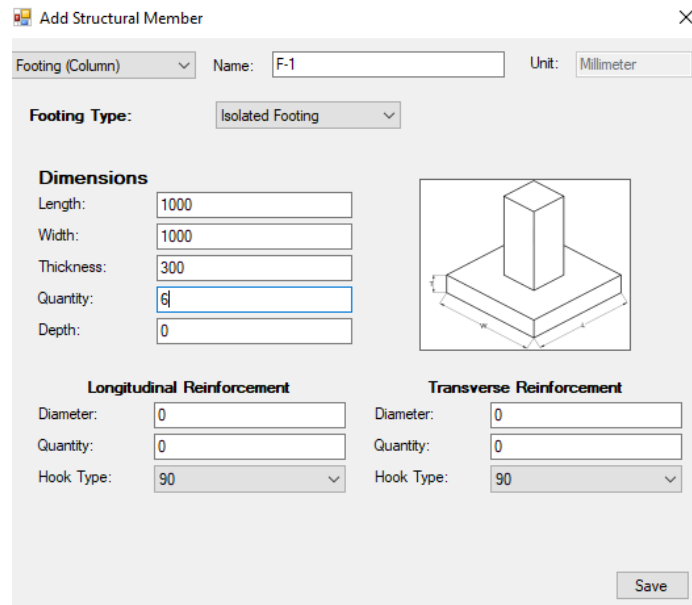
b= Width of footing (W) = 1m

t = thickness = 0.3 m

A = Perimeter x Thickness x set

Perimeter = $2(\text{length} + \text{width}) + 0.2$

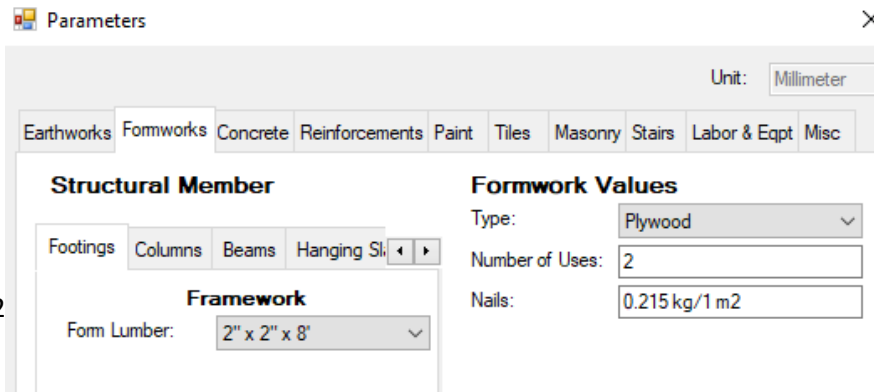
= $(2(1+1) + 0.2) \times 0.3\text{m} \times 6\text{sets} = 7.56 \text{ m}^2$



F-2

L = 900, W= 900 T=300

A= $(2(0.9+0.9) + 0.2) \times 0.3 \times 5 \text{ sets} = 5.7 \text{ m}^2$



F-3 (L = 800 , W=800, T 300)

A= $(2(0.8+0.8) + 0.2) \times 0.3 \times 2 \text{ sets} = 2.04 \text{ m}^2$

Total surface area of footings = $7.56 \text{ m}^2 + 5.7 \text{ m}^2 + 2.04 \text{ m}^2 = 15.3 \text{ m}^2$

$$\text{No. of pieces of Plywood needed} = \frac{\text{TOTAL surface AREA}}{\text{AREA OF PLYWOOD "}(1.2 \text{ m} \times 2.4\text{m})"} = \frac{15.3}{(1.2 \times 2.4)} = 5.31 \text{ pcs} \times 50\%$$

= 2.66 or 3 pcs always round up if there's a decimal

NOTE:

50% is the number of “uses”

If number of uses is set to 2 in FORMWORKS PARAMETERS, multiply by ½ or 50%

If number of uses is set to 3, multiply by 1/3 or 33.33%

¼ or 25%, 1/5 or 20%, 1/6 or 16.67%

Always round up the nearest whole number in terms of pieces

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B. FRAMEWORKS FOR FOOTINGS.

F-1 (SELECTED FOR COMPUTATION SINCE F-1 HAS THE LARGEST AREA= 7.56 m2)

Find the total number of Bd.Ft for lumber framework. (SELECTED FORM LUMBER 2" X 2" X 8')

- i. For Length (L) which is 1m in this example. (1m + 0.1m = 1.1m) @ 4 sets
To get the Bd.Ft for the length:

$$\begin{aligned} &= \frac{4(\text{SELECTED FORM LUMBER} * ((L + 0.1) * 3.28)}{12} \\ &= \frac{4(2 * 2 * (1.1 * 3.28))}{12} = 4.81 \text{ bd. ft} \end{aligned}$$

Note: 2 * 2 Here is from 2" x 2" x 8' Selected by the user

- ii. For Width (W) which is 1m in this example. (1m) @ 4 sets

Note: Use only the width, no need to add 0.1m

$$\begin{aligned} &= \frac{4(\text{SELECTED FORM LUMBER} * (W * 3.28))}{12} \\ &= \frac{4(2 * 2 * (1 * 3.28))}{12} = 4.37 \text{ bd. ft} \end{aligned}$$

- iii. In a footing, there are always 4 sides for form work

2 sets of sides are always identical.

First set of sides:

Determine the number of vertical frame

$$= (L+0.1)/0.7m + 1$$

$$= (1+0.1)/0.7 + 1 = 2.57 \text{ or } 3 \text{ pcs.}$$

(ALWAYS ROUND UP IF THERE IS A DECIMAL IN THIS PART)

Multiply by 2 (because this is an identical set)

$$= 3 * 2 = 6 \text{ pcs.}$$

2nd set of sides:

$$= ((W)/0.7m + 1) = ((1)/0.7 + 1) = 2.43 \text{ or } 3 \text{ pcs.}$$

$$= 3 * 2 = 6 \text{ pcs}$$

Total number of Pieces = 6+6 = 12 pcs.

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To get its length:

If the user selected 2" x 2" = thickness of footing – 0.1m

If the user selected 2" x 3" = thickness of footing – 0.15 m

In this case use = 0.3 – 0.1 = 0.2m (since the user selected 2" x 2")

$$= \frac{12 (2 * 2 * (0.2 * 3.28))}{12} = 2.624 \text{ bd. ft}$$

12 is the number of pcs, but only for this part (vertical frames)

Total number of bd.ft = 4.81 + 4.37 + 2.624 = 11.804 bd. Ft

iv. Solve for the multiplier

Multiplier= (Total bd. Ft /area of the largest footing (F1 =7.56 m2))

Surface area = (L+0.1 x thickness x 2) + (W x thickness x 2)

$$= 11.804 / ((1.1 \times 0.3 \times 2) + (1 \times 0.3 \times 2)) = 9.38 \text{ bd ft} / \text{m}^2$$

Total Board foot (bd.ft) = 9.38 x 15.3 = 143.514 bd ft. x 50% = 71.575 bd. Ft

Note: 15.3 m2 came from Total surface area of footings computed above from page 1

SELECTED FORM LUMBER UNDER PARAMETERS BY USER: 2" X 2" X 8'

$$\text{Pcs of wood} = \frac{\text{TOTAL NUMBER OF BD.FT} * 12}{\text{SELECTED LUMBER FORM}} = \frac{71.757 * 12}{2 * 2 * 8} = 27 \text{ pcs of } 2" \times 2" \times 8'$$

Total no of pcs for footings 1 2 and 3 = 27pcs of 2" x 2" x 8'

Summary for Footing Formworks

Plywood: 3pcs (P 674.00 /pc) = P 2,022.00

Total number of LUMBER: 2" x 2" x 8' @ 27pcs (P 130.00 /pc) = P 3,510.00

Total Material Cost= 2,022 + 3510 = P 5,532.00

Unit cost = Total Material cost / area of formworks= 5532/ 15.3 = P 361.568

Labor cost = labor rate* area of formwork = P 300.00 / m2 * 15.3 m2 = P 4590.00

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D. FOR TRAPEZOIDAL WALL FOOTING

(FOR REFERENCE ONLY, NOT INCLUDED IN THE TOTAL)

L: 53.25 m

L f-f: 32.7 m

BT: 0.4m

BU: 0.2m

T: 0.2m

$$A = (((c \times L) + 0.2] + \left(\frac{B_U + B_T}{2} \times T\right)) \times 2 \times \text{no of sets.}$$

$$c = \sqrt{\left(\frac{B_T - B_U}{2}\right)^2 + (T)^2}$$

$$c = \sqrt{\left(\frac{0.4 - 0.2}{2}\right)^2 + (0.2)^2} = 0.2236 \text{ m}$$

$$A = (((0.2236 \times 53.25) + 0.2] + \left(\frac{0.2 + 0.4}{2} \times 0.2\right)) \times 2 \times 1 = 24.3334 \text{ m}^2$$

$$\text{No. of pieces of Plywood needed} = \frac{\text{TOTAL surface AREA}}{\text{AREA OF PLYWOOD "(1.2 m * 2.4m)"}} = \frac{24.334}{(1.2 \times 2.4)} = 8.449 \text{ pcs} \times 50\%$$

= 4.224 or **5 pcs of plywood**

**NOTE: BEFORE COMPUTING THE NO. OF PIECES , ADD ALL THE AREA OF ALL FOOTINGS FIRST
(FOOTING, COMBINED FOOTING, TRAPEZOIDAL FOOTING)**

**For RECTANGULAR WALL FOOTING, no need for form works assuming the trimmed soil is
shaped good enough.**

5 pcs of plywood (@ 674 per pc) = P 3370.00

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I. COLUMNS

Note: sets = quantity = QTY

A. Form work

For Columns 1, 2, and 3 @ 13 sets x 3

(GROUND FLR)

H1: 3469 mm

B: 600 mm

D: 600 mm

Perimeter = $2(b+d) + 0.2 = 2(0.6 + 0.6) + 0.2 = 2.6$ m

A= Perimeter x height x sets

AREA = $2.6 \times 3.469 \times 13$ sets x 3 columns = **351.75 m²**

STRUCTURAL MEMBER: COLUMN NAME: C-1 UNIT: mm

DIMENSIONS

B: 600

D: 600

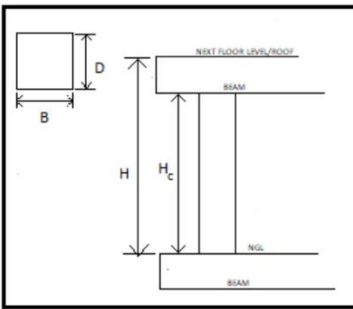
H: 3469

H_c: 2869

QUANTITY: 13

CONNECTION BELOW: CF-1

MAIN REINFORCEMENTS:



$$\frac{\text{TOTAL surface AREA}}{\text{AREA OF PLYWOOD } (1.2 \text{ m} * 2.4 \text{ m})} = \frac{351.75}{(1.2 * 2.4)} = 122.14 \text{ pcs} \times 50\% = 61.07 \text{ or } 62 \text{ pcs}$$

Add Floor Parameters

1 GROUND FLOOR X

FOOTINGS
COLUMNS
BEAMS
SLABS
STAIRS
ROOFINGS

+STRUCT. MEMBER

Note: Ground floor is always and forever permanently 1 anyways.

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For Columns 1, 2, and 3 @ 13 sets x 3 (C1 C2 AND C3 HAVE SAME INPUTS AND DIMENSIONS)

(2ND FLOOR – 4TH FLOOR)

H: 3150 mm

B:600

D:600

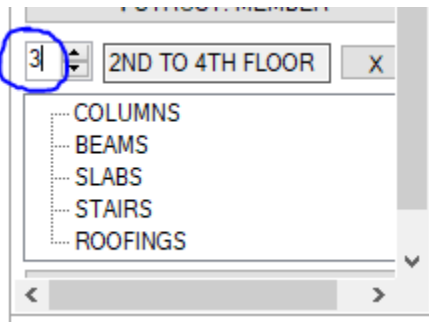
Perimeter = $2(b+d) + 0.2 = 2(0.6 + 0.6) + 0.2 = 2.6 \text{ m}$

A= Perimeter x height x sets

A= $2.6 \times 3.150 \times 13 \text{ sets} \times 3 \text{ columns} = 319.41 \text{ m}^2$

$$= \frac{\text{TOTAL surface AREA}}{\text{AREA OF PLYWOOD "(1.2 m * 2.4m)"}} = \frac{319.41}{(1.2*2.4)} = 110.91 \text{ pcs} \times 50\%$$

= 55.45 pcs = 56 pcs



= 56 pcs * 3 floors = 168 pcs.

Area Total = $351.75 + 319.41 \times 3 \text{ floors} = 1309.98 \text{ m}^2$ (TO BE USED IN TOTAL SQM IN BOQ)

Total no. of plywood = $62 + 168 = 230 \text{ pcs}$

STRUCTURAL MEMBER		NAME:	
COLUMN	▼	C-1	▼
UNIT: mm ▼			
DIMENSIONS			
B	600		
D	600		
H	3150		
H _c	2550		
QUANTITY	13		

Earthworks	Formworks	Concrete	Reinforcements	Paint	Tiles	Masonry	Stairs	Labor & Eqpt	Misc
Structural Member									
Formworks Values									
Type: Plywood ▼									
Number of Uses: 2									
Nails: 0.215 kg/1 m2									
Footings									
Beams									
Columns									
Hanging Slab									
Framework									
Form Lumber: 2" x 3" x 10' ▼									
Scaffolding									
Vertical Support: 2" x 3" x 8" ▼									
Horizontal Brace: 2" x 2" x 8" ▼									
Diagonal Brace: 2" x 2" x 8" ▼									

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B. COLUMN (OR POST) FRAMEWORK

From lumber selected by user: 2" x 3" x 10"

Thickness of plywood = BASED ON ALWAYS ½" (FIXED)

Look for the value in the table that matched the category

Size of Wood Frame	THICKNESS OF PLYWOOD FORM			
	POST		BEAM	
	6 mm (1/4")	12 mm (1/2")	6 mm (1/4")	12 mm (1/2")
2" x 2"	29.67	20.33	25.06	18.66
2" x 3"	44.50	30.50	37.60	28.00

Note: disregard the rectangular highlights in this table

FOR GROUND FLOOR:

$$= 62 \text{ pcs} \times 30.50 = 1891 \text{ bd. ft.}$$

$$\text{Pcs of wood} = \frac{\text{TOTAL NUMBER OF BD.FT} \times 12}{\text{SELECTED LUMBER FORM}} = \frac{1891 \times 12}{2 \times 3 \times 10} = 378.2 \text{ or } 379 \text{ pcs of } 2" \times 3" \times 10'$$

$$379 \text{ pcs} \times 1 \text{ floor} = 379 \text{ pcs}$$

FOR 2nd to 4th FLOOR:

$$= 56 \text{ pcs} \times 30.50 = 1708 \text{ bd. ft.}$$

$$\text{Pcs of wood} = \frac{\text{TOTAL NUMBER OF BD.FT} \times 12}{\text{SELECTED LUMBER FORM}} = \frac{1708 \times 12}{2 \times 3 \times 10} = 341.6 \text{ or } 342 \text{ pcs of } 2" \times 3" \times 10'$$

$$342 \text{ pcs} \times 3 \text{ floors} = 1026 \text{ pcs of } 2" \times 3" \times 10'$$

Add Floor

1 GROUND F

FOOTINGS
COLUMNS
BEAMS
SLABS
STAIRS
ROOFINGS

+STRUCT

3 2ND TO 4TH FLOOR X

COLUMNS
BEAMS
SLABS
STAIRS
ROOFINGS

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C. SCAFFOLDING

Lumber Size	Column			Beam		Flooring
	Board Ft. per M. Ht.			Board Ft. per M. Ht.		Board Ft Per Sq. M.
	Vertical	Hor.	Brace	Vertical	Hor.	
2" x 2"	4.70	21.00	11.70	4.00	4.70	6.10
2" x 3"	7.00	31.67	17.50	6.00	7.00	9.10
2" x 4"	9.35	42.25	23.35	8.00	9.35	12.10

Note: disregard the rectangular highlights in this table

FOR GROUND FLOOR

VERTICAL SUPPORT

FORM LUMBER (2" X 3" 8')

= Total column height x value in the table

C-1, C-2, C-3 @ 13 sets (GROUND FLR)

H1: 3469 mm

B: 600 mm

D: 600 mm

Total bd ft = [(3.469) x3 x 13] x 7 = 947.037 bd. Ft

Pcs of wood = $\frac{\text{TOTAL NUMBER OF BD.FT} \times 12}{\text{SELECTED LUMBER FORM}} = \frac{947.037 \times 12}{2 \times 3 \times 8} = 236.759 \times 50\% = 118.37 \text{ or } 119 \text{ pcs of } 2" \times 3" \times 8'$

119 pcs x 1 floor = 119 pcs of 2" x 3" x 8'

Add FloorParameters

1

GROUND FLOOR

X

FOOTINGS

COLUMNS

BEAMS

SLABS

STAIRS

ROOFINGS

+STRUCT. MEMBER

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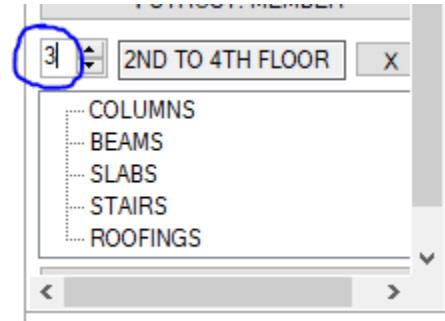
C-1, C-2, C-3 @ 13 sets (2ND FLOOR – 4TH FLOOR)

H: 3150 mm

B: 600

D: 600

Total bd ft = [(3.150) x 3 x 13] x 7 = 859.95 bd. Ft



$$\text{Pcs of wood} = \frac{\text{TOTAL NUMBER OF BD.FT} \times 12}{\text{SELECTED LUMBER FORM}} = \frac{859.95 \times 12}{2 \times 3 \times 8} = 214.98 \times 50\% = 107.49 \text{ or } 108 \text{ pcs of } 2" \times 3" \times 8'$$

$$= 108 \text{ pcs} \times 3 \text{ floors} = 324 \text{ pcs of } 2" \times 3" \times 8'$$

HORIZONTAL BRACE (2 X 2 X 8)

C-1, C-2, C-3 @ 13 sets (GROUND FLR)

H1: 3469 mm

B: 600 mm

D: 600 mm

Total bd ft. = [(3.469) x 3 x 13] x 21 = 2841.111 bd. Ft

$$\text{Pcs of wood} = \frac{\text{TOTAL NUMBER OF BD.FT} \times 12}{\text{SELECTED LUMBER FORM}} = \frac{2841.111 \times 12}{2 \times 2 \times 8} = 1065.41 \times 50\% = 532.71 \text{ or } 533 \text{ pcs of } 2" \times 2" \times 8'$$

C-1, C-2, C-3 @ 13 sets (2ND FLOOR – 4TH FLOOR)

H: 3150 mm

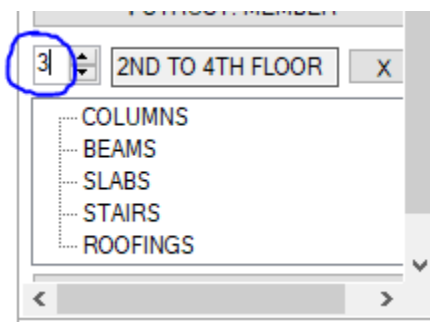
B: 600

D: 600

Total bd ft. = [(3.150) x 3 x 13] x 21 = 2,579.85 bd. Ft

$$\text{Pcs of wood} = \frac{\text{TOTAL NUMBER OF BD.FT} \times 12}{\text{SELECTED LUMBER FORM}} = \frac{2,579.85 \times 12}{2 \times 2 \times 8} = 967.44 \times 50\% = 483.72 \text{ or } 484 \text{ pcs of } 2" \times 3" \times 8'$$

$$484 \text{ pcs} \times 3 \text{ floor} = 1452 \text{ pcs of } 2" \times 2" \times 8'$$



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DIAGONAL BRACE (2 X 2 X 8)

C-1, C-2, C-3 @ 13 sets (GROUND FLR AND FIRST FLOOR)

H1: 3469 mm

B: 600 mm

D: 600 mm

Total bd ft= [(3.469) x3 x 13] x 11.7 = 1582.9047 bd. Ft

$$\text{Pcs of wood} = \frac{\text{TOTAL NUMBER OF BD.FT} \times 12}{\text{SELECTED LUMBER FORM}} = \frac{1582.9047 \times 12}{2 \times 2 \times 8} = 593.58 \times 50\% = 296.79 \text{ or } 297 \text{ pcs of } 2" \times 2" \times 8'$$

C-1, C-2, C-3 @ 13 sets (2ND FLOOR – 4TH FLOOR)

H: 3150 mm

B:600

D:600

Total height= [(3.150) x3 x 13] x 11.7 = 1437.345 bd. Ft

$$\text{Pcs of wood} = \frac{\text{TOTAL NUMBER OF BD.FT} \times 12}{\text{SELECTED LUMBER FORM}} = \frac{1437.345 \times 12}{2 \times 2 \times 8} = 539 \times 50\% = 269.5 \text{ or } 270 \text{ pcs of } 2" \times 3" \times 8'$$

270 pcs x 3 floor = 810 pcs of 2" x 2" x 8'

SUMMARY:

Plywood: 230 pcs (P 674.00 /pc) = P 155,020.00

2x2x8: 3092 pcs (P 130.00 /pc) = P 401,960.00

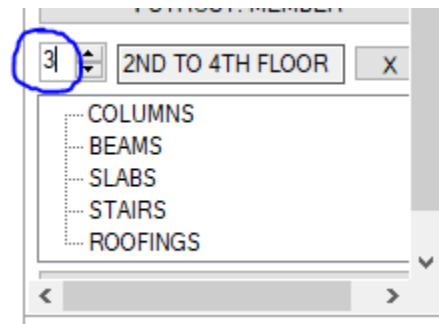
2x3x8: 443 pcs (P 150.00 /pc) = P 66,450.00

2x3x10: 1405 pcs (P 150.00 /pc) = P 210,750.00

Total material cost = P 834,180.00

Unit Cost= 834,180.00/1309.98= P 636.79

Labor cost = 1309.98* 300 = P 392,994.00



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II. Beams / TIE BEAMS

A. formwork

ADD STRUCTURAL MEMBER

STRUCTURAL MEMBER

BEAM ▼

NAME:

BR-1 ▼

BEAM TYPE

FOOTING TIE BEAM ▼

UNIT:

mm ▼

Depth 1500

Quantity 2

MAIN BARS HOOK TYPE 90° ▼

STIRRUP HOOK TYPE 135° ▼

SPLICE TYPE MECHANICAL ▼

L_c or Clear Length

Top Reinforcement

Bottom Reinforcement

BEAM ROW				
Beam Name	Quantity	Length	Clear Length	Support
FTB-1A ▼	1	4.9	4.23	▼
FTB-1 ▼	10	4.5	3.83	▼
FTB-1A ▼	1	4.9	4.23	▼
▼				▼
▼				▼
▼				▼

SUSPENDED BEAM SCHEDULE									
Name	B	D	Properties	Ext. Support	Midspan	Int. Support	Stirrups	Web Bars	
FTB1-A	400	600		Dia. Qty	Qty	Qty	Dia. Qty	Dia.	
			▼	Qty	Qty	Qty	@		
			▼	Qty	Qty	Qty	Rest @	Qty.	
FTB-1	400	600		Dia. Qty	Qty	Qty	Dia. Qty	Dia.	
			▼	Qty	Qty	Qty	@		
			▼	Qty	Qty	Qty	@	Qty.	

$$\text{Area} = [(2(d) + b + 0.1)] \times [\text{total Length}] \times \text{QTY}$$

$$= [(2(0.6) + 0.4 + 0.1)] \times [(4.9 \times 1) + (4.5 \times 10) + (4.9 \times 1)] = 93.16 \text{ m}^2 \times 2 \text{ QTY} = \mathbf{186.32 \text{ m}^2}$$

NOTE: ONLY THE ONES INCLUDED IN THE **BEAM ROW** ARE TO BE COMPUTED. BEAM SCHEDULE IS JUST THE LIST OF BEAMS IN THE PROJECT THAT CAN BE ADDED IN THE BEAM ROW. FOCUS ON WHAT IS INVOLVED IN THE **BEAM ROW**.

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ADD STRUCTURAL MEMBER

STRUCTURAL MEMBER

BEAM ▼

NAME:

BR-2 ▼

BEAM TYPE

FOOTING TIE BEAM ▼

UNIT:

mm ▼

Depth

Quantity

MAIN BARS HOOK TYPE

STIRRUP HOOK TYPE

SPLICE TYPE

L_c or Clear Length

Top Reinforcement

Bottom Reinforcement

BEAM ROW				
Beam Name	Quantity	Length	Clear Length	Support
FTB-1	1	4.9	4.23	
FTB-1	10	4.5	3.83	
FTB-1	1	4.9	4.23	

SUSPENDED BEAM SCHEDULE									
Name	B	D	Properties	Ext. Support	Midspan	Int. Support	Stirrups	Web Bars	
FTB1-A	400	600		Dia.	Qty.	Qty.	Qty.	Dia.	Dia.
				Qty.	Qty.	Qty.	Rest	Qty.	
FTB-1	400	600		Dia.	Qty.	Qty.	Qty.	Dia.	Dia.
				Qty.	Qty.	Qty.	Rest	Qty.	
				Dia.	Qty.	Qty.	Qty.	Dia.	Dia.
				Qty.	Qty.	Qty.	Rest	Qty.	

$$\text{Area} = [(2(d) + b + 0.1)] \times [\text{total Length}] \times QTY$$

$$= [(2(0.6) + 0.4 + 0.1)] \times [(4.9 \times 1) + (4.5 \times 10) + (4.9 \times 1)] = 93.16 \text{ m}^2$$

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ADD STRUCTURAL MEMBER

STRUCTURAL MEMBER

BEAM ▼

NAME:

BR-3 ▼

BEAM TYPE

FOOTING TIE BEAM ▼

UNIT:

mm ▼

Depth

Quantity

MAIN BARS HOOK TYPE

STIRRUP HOOK TYPE

SPLICE TYPE

L_c or Clear Length

Top Reinforcement

Bottom Reinforcement

BEAM ROW				
Beam Name	Quantity	Length	Clear Length	Support
FTB-2A	1	6.9	6.23	
FTB-2	1	2.4	1.73	

SUSPENDED BEAM SCHEDULE									
Name	B	D	Properties	Ext. Support	Midspan	Int. Support	Stirrups	Web Bars	
FTB1-A	400	600		Qty	Qty	Qty	Qty	Qty	Qty
				Qty	Qty	Qty	Qty	Qty	Qty
FTB-1	400	600		Qty	Qty	Qty	Qty	Qty	Qty
				Qty	Qty	Qty	Qty	Qty	Qty
FTB-2	400	600		Qty	Qty	Qty	Qty	Qty	Qty
				Qty	Qty	Qty	Qty	Qty	Qty
FTB-2A	400	600		Qty	Qty	Qty	Qty	Qty	Qty
				Qty	Qty	Qty	Qty	Qty	Qty

$$\text{Area} = [(2(d) + b + 0.1)] \times [\text{total Length}] \times QTY$$

$$= [(2(0.6) + 0.4 + 0.1)] \times [(6.9 \times 1) + (2.4 \times 1)] = 15.81 \text{ m}^2 \times 4 = 63.24 \text{ m}^2$$

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

ADD STRUCTURAL MEMBER

STRUCTURAL MEMBER

BEAM ▼

NAME:

BR-4 ▼

BEAM TYPE

FOOTING TIE BEAM ▼

UNIT:

mm ▼

Depth

Quantity **9**

MAIN BARS HOOK TYPE **90°** ▼

STIRRUP HOOK TYPE **135°** ▼

SPLICE TYPE **MECHANICAL** ▼

L_c or Clear Length

Top Reinforcement

Bottom Reinforcement

BEAM ROW				
Beam Name	Quantity	Length	Clear Length	Support
FTB-2	1	6.9	6.23	
FTB-2	1	2.4	1.73	

SUSPENDED BEAM SCHEDULE									
Name	B	D	Properties	Ext. Support	Midspan	Int. Support	Stirrups	Web Bars	
FTB1-A	400	600		Qty.	Qty.	Qty.	Qty.	Qty.	Qty.
FTB-1	400	600		Qty.	Qty.	Qty.	Qty.	Qty.	Qty.
FTB-2	400	600		Qty.	Qty.	Qty.	Qty.	Qty.	Qty.
FTB-2A	400	600		Qty.	Qty.	Qty.	Qty.	Qty.	Qty.

$$\text{Area} = [(2(d) + b + 0.1)] \times [\text{total Length}] \times \text{QTY}$$

$$= [(2(0.6) + 0.4 + 0.1)] \times [(6.9 \times 1) + (2.4 \times 1)] = 15.81 \text{ m}^2 \times 9 = \mathbf{142.29 \text{ m}^2}$$

Total area for Ground floor (Footing tie beam) = 186.32 + 93.16 + 63.24 + 142.29 = **485.01 m²**

$$\text{No. of pieces of formworks needed} = \frac{\text{TOTAL surface AREA}}{\text{AREA OF PLYWOOD "}(1.2 \text{ m} \times 2.4 \text{ m)"}} = \frac{485.01}{(1.2 \times 2.4)} = 168.406 \text{ pcs} \times \mathbf{50\%}$$

$$= 84.203 \text{ or } 85 \text{ pcs} \times 1 \text{ floor} = \mathbf{85 \text{ pcs}}$$

Add Floor

Parameters

1

GROUND FLOOR

X

FOOTINGS

COLUMNS

BEAMS

SLABS

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

B. Framework

Lumber selected: 2" x 3" x 8'

Thickness of formwork: ½" constant

Look for the value in the table that matched the category

TABLE 5-1 BOARD FOOT OF WOOD FRAME FOR COLUMN AND BEAM PER PLYWOOD FORM				
Size of Wood Frame	THICKNESS OF PLYWOOD FORM			
	POST		BEAM	
	6 mm (1/4")	12 mm (1/2")	6 mm (1/4")	12 mm (1/2")
2" x 2"	29.67	20.33	25.06	18.66
2" x 3"	44.50	30.50	37.60	28.00

Note: disregard the rectangular highlights in this table

85 pcs (from single floor ground floor) x 28 = 2380 bd ft.



Parameters



Unit:

Earthworks Formworks Concrete Reinforcements Paint Tiles Masonry Stairs Labor & Eqpt Misc

Structural Member

Footings Beams Columns Hanging Sl.

Framework

Form Lumber:

Formwork Values

Type:

Number of Uses:

Nails:

$$\text{Pcs of wood} = \frac{\text{TOTAL NUMBER OF BD.FT} \times 12}{\text{SELECTED LUMBER FORM}} = \frac{2380 \times 12}{2 \times 3 \times 8} = 595 \text{ pcs of } 2" \times 3" \times 8'$$

$$595 \text{ pcs} \times 1 \text{ FLOOR (GROUND FLOOR)} = 595 \text{ pcs of } 2" \times 3" \times 8'$$

NO NEED TO COMPUTE FOR SCAFFOLDING, NO SCAFFOLDING FOR FOOTING TIE BEAMS.

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

(Grade beams (2-4th floor))

ADD STRUCTURAL MEMBER

STRUCTURAL MEMBER

NAME:

BEAM

BR-5

BEAM TYPE

UNIT:

GRADE BEAM

mm

Depth

Quantity

MAIN BARS HOOK TYPE

STIRRUP HOOK TYPE

SPLICE TYPE

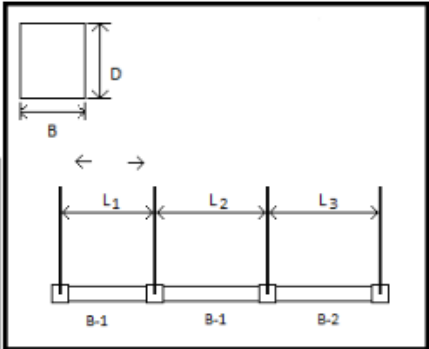
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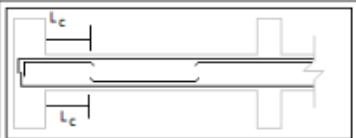
2

90°

135°

MECHANICAL





L_c or Clear Length







Top Reinforcement

Bottom Reinforcement

BEAM ROW

Beam Name	Quantity	Length	Clear Length	Support
G-2	1	4.9	4.3	
G-2	10	4.5	3.9	
G-2	1	4.9	4.3	

SUSPENDED BEAM SCHEDULE

Name	B	D	Properties	Ext. Support	Midspan	Int. Support	Stirrups	Web Bars
G-2	250	400		Qty. Dia.	Qty. Dia.	Qty. Dia.	Qty. Dia.	Qty. Dia.
				Qty. Dia.	Qty. Dia.	Qty. Dia.	Qty. Dia.	Qty. Dia.
				Qty. Dia.	Qty. Dia.	Qty. Dia.	Qty. Dia.	Qty. Dia.
				Qty. Dia.	Qty. Dia.	Qty. Dia.	Qty. Dia.	Qty. Dia.
				Qty. Dia.	Qty. Dia.	Qty. Dia.	Qty. Dia.	Qty. Dia.
				Qty. Dia.	Qty. Dia.	Qty. Dia.	Qty. Dia.	Qty. Dia.

Area = [(2(d) + b+ 0.1)] x [total Length] x QTY

$$= [(2 (0.4) + 0.25+ 0.1)] \times [(4.9 \times 1) + (4.5 \times 10) + (4.9 \times 1)] = 63.02 \text{ m}^2 \times 2 = 126.04 \text{ m}^2$$

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

ADD STRUCTURAL MEMBER

STRUCTURAL MEMBER

BEAM ▼

NAME:

BR-6 ▼

BEAM TYPE

GRADE BEAM ▼

UNIT:

mm ▼

Depth

Quantity

MAIN BARS HOOK TYPE

STIRRUP HOOK TYPE

SPLICE TYPE

L_c or Clear Length

Top Reinforcement

Bottom Reinforcement

BEAM ROW				
Beam Name	Quantity	Length	Clear Length	Support
G-3	1	4.9	4.3	
G-3	10	4.5	3.9	
G-3	1	4.9	4.3	

SUSPENDED BEAM SCHEDULE									
Name	B	D	Properties	Ext. Support	Midspan	Int. Support	Stirrups	Web Bars	
G-2	250	400		Qty	Qty	Qty	Dia.	Dia.	
				Qty	Qty	Qty	@	Qty.	
				Qty	Qty	Qty	Rest	Qty.	
G-3	400	500		Qty	Qty	Qty	Dia.	Dia.	
				Qty	Qty	Qty	@	Qty.	
				Qty	Qty	Qty	Rest	Qty.	
				Qty	Qty	Qty	Dia.	Dia.	
				Qty	Qty	Qty	@	Qty.	
				Qty	Qty	Qty	Rest	Qty.	

$$\text{Area} = [(2(d) + b + 0.1)] \times [\text{total Length}] \times QTY$$

$$= [(2(0.5) + 0.4 + 0.1)] \times [(4.9 \times 1) + (4.5 \times 10) + (4.9 \times 1)] = 82.2 \text{ m}^2 \times 1 = 82.2 \text{ m}^2$$

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

ADD STRUCTURAL MEMBER

STRUCTURAL MEMBER

BEAM ▼

NAME:

BR-7 ▼

BEAM TYPE

GRADE BEAM ▼

UNIT:

mm ▼

Depth

Quantity

MAIN BARS HOOK TYPE

STIRRUP HOOK TYPE

SPLICE TYPE

L_c or Clear Length

Top Reinforcement

Bottom Reinforcement

Beam Name	Quantity	Length	Clear Length	Support
B-1	2	4.8	4.4	

Name	B	D	Properties	Ext. Support	Midspan	Int. Support	Stirrups	Web Bars
G-2	250	400		Qty	Qty	Qty	Dia.	Dia.
G-3	400	500		Qty	Qty	Qty	Dia.	Dia.
				Qty	Qty	Qty	Rest	Qty.
				Qty	Qty	Qty	Rest	Qty.
B-1	250	400		Qty	Qty	Qty	Dia.	Dia.
				Qty	Qty	Qty	Rest	Qty.
				Qty	Qty	Qty	Rest	Qty.

$$\text{Area} = [(2(d) + b + 0.1)] \times [\text{total Length}] \times \text{QTY}$$

$$= [(2(0.4) + 0.25 + 0.1)] \times [(4.8 \times 2)] = 11.04 \text{ m}^2 \times 1 = 11.04 \text{ m}^2$$

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

ADD STRUCTURAL MEMBER

STRUCTURAL MEMBER

BEAM ▼

NAME:

BR-8 ▼

BEAM TYPE

GRADE BEAM ▼

UNIT:

mm ▼

Depth

Quantity

MAIN BARS HOOK TYPE

STIRRUP HOOK TYPE

SPLICE TYPE

L_c or Clear Length

Top Reinforcement

Bottom Reinforcement

BEAM ROW				
Beam Name	Quantity	Length	Clear Length	Support
B-1	2	3.8	3.47	

SUSPENDED BEAM SCHEDULE									
Name	B	D	Properties	Ext. Support	Midspan	Int. Support	Stirrups	Web Bars	
G-2	250	400		Qty.	Qty.	Qty.	Dia.	Dia.	
				Qty.	Qty.	Qty.	@		
			Dia.	Qty.	Qty.	Qty.	Rest	@	Qty.
G-3	400	500		Qty.	Qty.	Qty.	Dia.	Dia.	
				Qty.	Qty.	Qty.	@		
			Dia.	Qty.	Qty.	Qty.	Rest	@	Qty.
B-1	250	400		Qty.	Qty.	Qty.	Dia.	Dia.	
				Qty.	Qty.	Qty.	@		
			Dia.	Qty.	Qty.	Qty.	Rest	@	Qty.

$$\text{Area} = [(2(d) + b + 0.1)] \times [\text{total Length}] \times QTY$$

$$= [(2(0.4) + 0.25 + 0.1)] \times [(3.8 \times 2)] = 8.74 \text{ m}^2 \times 1 = 8.74 \text{ m}^2$$

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

ADD STRUCTURAL MEMBER

STRUCTURAL MEMBER

BEAM ▼

NAME:

BR-9 ▼

BEAM TYPE **GRADE BEAM** ▼

UNIT: mm ▼

Depth

Quantity **4**

MAIN BARS HOOK TYPE 90° ▼

STIRRUP HOOK TYPE 135° ▼

SPLICE TYPE MECHANICAL ▼

L_c or Clear Length

Top Reinforcement

Bottom Reinforcement

BEAM ROW				
Beam Name	Quantity	Length	Clear Length	Support
G-1C	1	6.9	6.3	
G-1B	1	2.4	1.8	

SUSPENDED BEAM SCHEDULE									
Name	B	D	Properties	Ext. Support	Midspan	Int. Support	Stirrups	Web Bars	
G-2	250	400		Qty	Qty	Qty	Dia.	Dia.	
G-3	400	500		Qty	Qty	Qty	Dia.	Dia.	
B-1	250	400		Qty	Qty	Qty	Rest	Dia.	
G-1C	400	600		Qty	Qty	Qty	Dia.	Dia.	
G-1B	400	600		Qty	Qty	Qty	Rest	Dia.	

$$\text{Area} = [(2(d) + b + 0.1)] \times [\text{total Length}] \times QTY$$

$$= [(2 (0.6) + 0.4 + 0.1)] \times [(6.9 \times 1) + (2.4 \times 1)] = 15.81 \text{ m}^2 \times 4 = 63.24 \text{ m}^2$$

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

ADD STRUCTURAL MEMBER

STRUCTURAL MEMBER

BEAM ▼

NAME:

BR-10 ▼

BEAM TYPE

GRADE BEAM ▼

UNIT: mm ▼

Depth

Quantity

MAIN BARS HOOK TYPE

STIRRUP HOOK TYPE

SPLICE TYPE

L_c or Clear Length

Top Reinforcement

Bottom Reinforcement

BEAM ROW	Beam Name	Quantity	Length	Clear Length	Support
	G-1	1	6.9	6.3	
	G-1A	1	2.4	1.8	

SUSPENDED BEAM SCHEDULE									
Name	B	D	Properties	Ext. Support	Midspan	Int. Support	Stirrups	Web Bars	
G-2	250	400		Qty. <input type="text"/>	Qty. <input type="text"/>	Qty. <input type="text"/>	Dia. <input type="text"/>	Dia. <input type="text"/>	
				Qty. <input type="text"/>	Qty. <input type="text"/>	Qty. <input type="text"/>	@ <input type="text"/>	@ <input type="text"/>	Qty. <input type="text"/>
				Qty. <input type="text"/>	Qty. <input type="text"/>	Qty. <input type="text"/>	Rest @ <input type="text"/>	@ <input type="text"/>	Qty. <input type="text"/>
G-3	400	500		Qty. <input type="text"/>	Qty. <input type="text"/>	Qty. <input type="text"/>	Dia. <input type="text"/>	Dia. <input type="text"/>	
				Qty. <input type="text"/>	Qty. <input type="text"/>	Qty. <input type="text"/>	@ <input type="text"/>	@ <input type="text"/>	Qty. <input type="text"/>
				Qty. <input type="text"/>	Qty. <input type="text"/>	Qty. <input type="text"/>	Rest @ <input type="text"/>	@ <input type="text"/>	Qty. <input type="text"/>
B-1	250	400		Qty. <input type="text"/>	Qty. <input type="text"/>	Qty. <input type="text"/>	Dia. <input type="text"/>	Dia. <input type="text"/>	
				Qty. <input type="text"/>	Qty. <input type="text"/>	Qty. <input type="text"/>	@ <input type="text"/>	@ <input type="text"/>	Qty. <input type="text"/>
				Qty. <input type="text"/>	Qty. <input type="text"/>	Qty. <input type="text"/>	Rest @ <input type="text"/>	@ <input type="text"/>	Qty. <input type="text"/>
G-1C	400	600		Qty. <input type="text"/>	Qty. <input type="text"/>	Qty. <input type="text"/>	Dia. <input type="text"/>	Dia. <input type="text"/>	
				Qty. <input type="text"/>	Qty. <input type="text"/>	Qty. <input type="text"/>	@ <input type="text"/>	@ <input type="text"/>	Qty. <input type="text"/>
				Qty. <input type="text"/>	Qty. <input type="text"/>	Qty. <input type="text"/>	Rest @ <input type="text"/>	@ <input type="text"/>	Qty. <input type="text"/>
G-1B	400	600		Qty. <input type="text"/>	Qty. <input type="text"/>	Qty. <input type="text"/>	Dia. <input type="text"/>	Dia. <input type="text"/>	
				Qty. <input type="text"/>	Qty. <input type="text"/>	Qty. <input type="text"/>	@ <input type="text"/>	@ <input type="text"/>	Qty. <input type="text"/>
				Qty. <input type="text"/>	Qty. <input type="text"/>	Qty. <input type="text"/>	Rest @ <input type="text"/>	@ <input type="text"/>	Qty. <input type="text"/>
G-1	400	600		Qty. <input type="text"/>	Qty. <input type="text"/>	Qty. <input type="text"/>	Dia. <input type="text"/>	Dia. <input type="text"/>	
				Qty. <input type="text"/>	Qty. <input type="text"/>	Qty. <input type="text"/>	@ <input type="text"/>	@ <input type="text"/>	Qty. <input type="text"/>
				Qty. <input type="text"/>	Qty. <input type="text"/>	Qty. <input type="text"/>	Rest @ <input type="text"/>	@ <input type="text"/>	Qty. <input type="text"/>
G-1A	400	600		Qty. <input type="text"/>	Qty. <input type="text"/>	Qty. <input type="text"/>	Dia. <input type="text"/>	Dia. <input type="text"/>	
				Qty. <input type="text"/>	Qty. <input type="text"/>	Qty. <input type="text"/>	@ <input type="text"/>	@ <input type="text"/>	Qty. <input type="text"/>
				Qty. <input type="text"/>	Qty. <input type="text"/>	Qty. <input type="text"/>	Rest @ <input type="text"/>	@ <input type="text"/>	Qty. <input type="text"/>

$$\text{Area} = [(2(d) + b + 0.1)] \times [\text{total Length}] \times \text{QTY}$$

$$= [(2(0.6) + 0.4 + 0.1)] \times [(6.9 \times 1) + (2.4 \times 1)] = 15.81 \text{ m}^2 \times 9 = 142.29 \text{ m}^2$$

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

ADD STRUCTURAL MEMBER

STRUCTURAL MEMBER

BEAM ▼

NAME:

BR-11 ▼

BEAM TYPE

GRADE BEAM ▼

UNIT:

mm ▼

Depth

Quantity 1

MAIN BARS HOOK TYPE 90° ▼

STIRRUP HOOK TYPE 135° ▼

SPLICE TYPE MECHANICAL ▼

L_c or Clear Length

Top Reinforcement

Bottom Reinforcement

BEAM ROW				
Beam Name	Quantity	Length	Clear Length	Support
B-1	10	4.5	4.1	

SUSPENDED BEAM SCHEDULE									
Name	B	D	Properties	Ext. Support	Midspan	Int. Support	Stirrups	Web Bars	
G-2	250	400		Qty	Qty	Qty	Dia.	Dia.	
				Qty	Qty	Qty	@	Qty.	
				Qty	Qty	Qty	Rest	@	
B-1	250	400		Qty	Qty	Qty	Dia.	Dia.	
				Qty	Qty	Qty	@	Qty.	
				Qty	Qty	Qty	Rest	@	
				Qty	Qty	Qty	Dia.	Dia.	
				Qty	Qty	Qty	@	Qty.	
				Qty	Qty	Qty	Rest	@	

$$\text{Area} = [(2(d) + b + 0.1)] \times [\text{total Length}] \times QTY$$

$$= [(2(0.4) + 0.25 + 0.1)] \times [(4.5 \times 10)] = 51.75 \text{ m}^2 \times 1 = 51.75 \text{ m}^2$$

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

ADD STRUCTURAL MEMBER

STRUCTURAL MEMBER

BEAM ▼

NAME:

BR-12 ▼

BEAM TYPE

GRADE BEAM ▼

UNIT: mm ▼

Depth

Quantity

MAIN BARS HOOK TYPE

STIRRUP HOOK TYPE

SPLICE TYPE

L_c or Clear Length

Top Reinforcement

Bottom Reinforcement

BEAM ROW				
Beam Name	Quantity	Length	Clear Length	Support
CB-1	1	1.3	1	

SUSPENDED BEAM SCHEDULE									
Name	B	D	Properties	Ext. Support	Midspan	Int. Support	Stirrups	Web Bars	
G-2	250	400		Qty	Qty	Qty	Dia	Dia	
				Qty	Qty	Qty	Rest	Qty	
G-3	400	500		Qty	Qty	Qty	Dia	Dia	
				Qty	Qty	Qty	Rest	Qty	
B-1	250	400		Qty	Qty	Qty	Dia	Dia	
				Qty	Qty	Qty	Rest	Qty	
G-1C	400	600		Qty	Qty	Qty	Dia	Dia	
				Qty	Qty	Qty	Rest	Qty	
G-1B	400	600		Qty	Qty	Qty	Dia	Dia	
				Qty	Qty	Qty	Rest	Qty	
G-1	400	600		Qty	Qty	Qty	Dia	Dia	
				Qty	Qty	Qty	Rest	Qty	
CB-1	250	400		Qty	Qty	Qty	Dia	Dia	
				Qty	Qty	Qty	Rest	Qty	

$$\text{Area} = [(2(d) + b + 0.1)] \times [\text{total Length}] \times \text{QTY}$$

$$= [(2(0.4) + 0.25 + 0.1)] \times [(1.3 \times 1)] = 1.495 \text{ m}^2 \times 1 = 1.495 \text{ m}^2$$

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

BEAM TYPE **GRADE BEAM** UNIT: mm

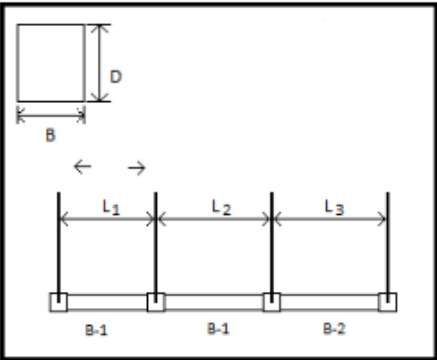
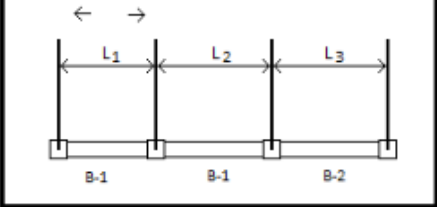
Depth Quantity **1**

MAIN BARS HOOK TYPE **90°**

STIRRUP HOOK TYPE **135°**

SPLICE TYPE **MECHANICAL**

L_c or Clear Length
Top Reinforcement
Bottom Reinforcement

BEAM ROW				
Beam Name	Quantity	Length	Clear Length	Support
CB-1	1	1.3	1	

SUSPENDED BEAM SCHEDULE									
Name	B	D	Properties	Ext. Support	Midspan	Int. Support	Stirrups	Web Bars	
G-2	250	400		Qty. Qty.	Qty. Qty.	Qty. Qty.	Dia. Qty.	Dia. Qty.	
G-3	400	500		Qty. Qty.	Qty. Qty.	Qty. Qty.	Dia. Qty.	Dia. Qty.	
B-1	250	400		Qty. Qty.	Qty. Qty.	Qty. Qty.	Dia. Qty.	Dia. Qty.	
G-1C	400	600		Qty. Qty.	Qty. Qty.	Qty. Qty.	Dia. Qty.	Dia. Qty.	
G-1B	400	600		Qty. Qty.	Qty. Qty.	Qty. Qty.	Dia. Qty.	Dia. Qty.	
G-1	400	600		Qty. Qty.	Qty. Qty.	Qty. Qty.	Dia. Qty.	Dia. Qty.	
CB-1	250	400		Qty. Qty.	Qty. Qty.	Qty. Qty.	Dia. Qty.	Dia. Qty.	

$$\text{Area} = [(2(d) + b + 0.1)] \times [\text{total Length}] \times \text{QTY}$$

$$= [(2(0.4) + 0.25 + 0.1)] \times [(1.3 \times 1)] = 1.495 \text{ m}^2 \times 1 = \mathbf{1.495 \text{ m}^2}$$

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

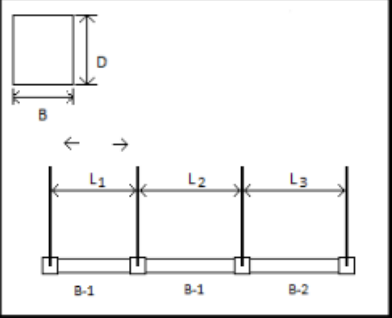
BEAM TYPE **GRADE BEAM** UNIT: mm

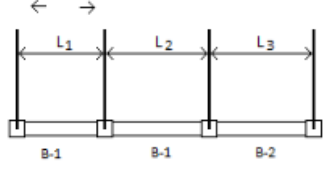
Depth Quantity **1**

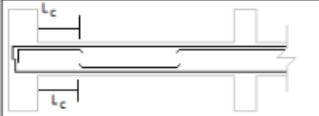
MAIN BARS HOOK TYPE **90°**

STIRRUP HOOK TYPE **135°**

SPLICE TYPE **MECHANICAL**







L_c or Clear Length

Top Reinforcement

Bottom Reinforcement

Beam Name	Quantity	Length	Clear Length	Support
CB-1	1	1.3	1	

Name	B	D	Properties	Ext. Support	Midspan	Int. Support	Stirrups	Web Bars
G-2	250	400		Qty.	Qty.	Qty.	Dia.	Dia.
				Qty.	Qty.	Qty.	@	Qty.
				Qty.	Qty.	Qty.	Rest @	
G-3	400	500		Qty.	Qty.	Qty.	Dia.	Dia.
				Qty.	Qty.	Qty.	@	Qty.
				Qty.	Qty.	Qty.	Rest @	
B-1	250	400		Qty.	Qty.	Qty.	Dia.	Dia.
				Qty.	Qty.	Qty.	@	Qty.
				Qty.	Qty.	Qty.	Rest @	
G-1C	400	600		Qty.	Qty.	Qty.	Dia.	Dia.
				Qty.	Qty.	Qty.	@	Qty.
				Qty.	Qty.	Qty.	Rest @	
G-1B	400	600		Qty.	Qty.	Qty.	Dia.	Dia.
				Qty.	Qty.	Qty.	@	Qty.
				Qty.	Qty.	Qty.	Rest @	
G-1	400	600		Qty.	Qty.	Qty.	Dia.	Dia.
				Qty.	Qty.	Qty.	@	Qty.
				Qty.	Qty.	Qty.	Rest @	
CB-1	250	400		Qty.	Qty.	Qty.	Dia.	Dia.
				Qty.	Qty.	Qty.	@	Qty.
				Qty.	Qty.	Qty.	Rest @	

$$\text{Area} = [(2(d) + b + 0.1)] \times [\text{total Length}] \times \text{QTY}$$

$$= [(2(0.4) + 0.25 + 0.1)] \times [(1.3 \times 1)] = 1.495 \text{ m}^2 \times 1 = \mathbf{1.495 \text{ m}^2}$$

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

ADD STRUCTURAL MEMBER

STRUCTURAL MEMBER

BEAM ▼

NAME:

BR-15 ▼

BEAM TYPE **GRADE BEAM** ▼

UNIT: mm ▼

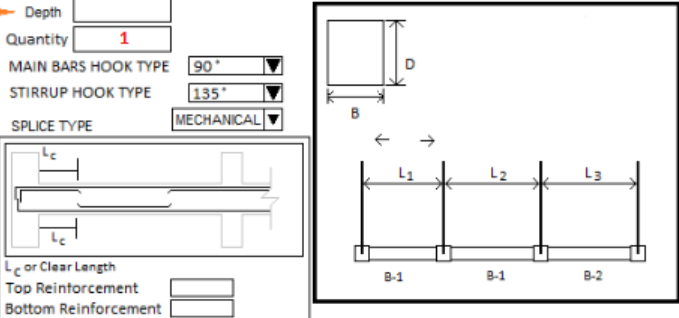
Depth

Quantity **1**

MAIN BARS HOOK TYPE 90° ▼

STIRRUP HOOK TYPE 135° ▼

SPLICE TYPE MECHANICAL ▼



L_c or Clear Length

Top Reinforcement

Bottom Reinforcement

BEAM ROW				
Beam Name	Quantity	Length	Clear Length	Support
B-2	2	4.675	4.425	

SUSPENDED BEAM SCHEDULE									
Name	B	D	Properties	Ext. Support	Midspan	Int. Support	Stirrups	Web Bars	
G-2	250	400		Qty	Qty	Qty	Qty	Qty	
G-3	400	500		Qty	Qty	Qty	Qty	Qty	
B-1	250	400		Qty	Qty	Qty	Qty	Qty	
G-1C	400	600		Qty	Qty	Qty	Qty	Qty	
G-1B	400	600		Qty	Qty	Qty	Qty	Qty	
G-1	400	600		Qty	Qty	Qty	Qty	Qty	
B-2	250	400		Qty	Qty	Qty	Qty	Qty	

$$\text{Area} = [(2(d) + b + 0.1)] \times [\text{total Length}] \times \text{QTY}$$

$$= [(2(0.4) + 0.25 + 0.1)] \times [(4.675 \times 2)] = 10.7525 \text{ m}^2 \times 1 = \mathbf{10.7525 \text{ m}^2}$$

$$\text{Total area for Grade beams} = 126.04 + 82.2 + 11.04 + 8.74 + 63.24 + 142.29 + 51.75 + 1.495 + 1.495 + 1.495 + 10.7525 = \mathbf{500.5375 \text{ m}^2}$$

$$\text{No. of pieces of formworks needed} = \frac{\text{TOTAL surface AREA}}{\text{AREA OF PLYWOOD "(1.2 m * 2.4m)"}} = \frac{500.5375}{(1.2 \times 2.4)} = 173.797 \text{ pcs} \times \mathbf{50\%}$$

$$= 86.89 \text{ or } 87 \text{ pcs of plywood} \times \mathbf{3 \text{ floors} = 261 \text{ pcs of plywood}}$$

3 2ND TO 4TH FLOOR X

- ... COLUMNS
- ... BEAMS
- ... SLABS
- ... STAIRS
- ... ROOFINGS

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

C. Framework

Lumber selected: 2" x 3" x 8'

Thickness of formwork: ½" constant

Look for the value in the table that matched the category

TABLE 5-1 BOARD FOOT OF WOOD FRAME FOR COLUMN AND BEAM PER PLYWOOD FORM				
Size of Wood Frame	THICKNESS OF PLYWOOD FORM			
	POST		BEAM	
	6 mm (1/4")	12 mm (1/2")	6 mm (1/4")	12 mm (1/2")
2" x 2"	29.67	20.33	25.06	18.66
2" x 3"	44.50	30.50	37.60	28.00

Note: disregard the rectangular highlights in this table

87 pcs (from single floor ground floor) x 28 = 2436 bd ft.

Parameters

Unit:

Earthworks Formworks Concrete Reinforcements Paint Tiles Masonry Stairs Labor & Eqpt Misc

Structural Member

Footings Beams Columns Hanging Sl.
Framework
Form Lumber:

Formwork Values

Type:

Number of Uses:

Nails:

$$\text{Pcs of wood} = \frac{\text{TOTAL NUMBER OF BD.FT} \times 12}{\text{SELECTED LUMBER FORM}} = \frac{2436 \times 12}{2 \times 3 \times 8} = 609 \text{ pcs of } 2" \times 3" \times 8'$$

$$609 \text{ pcs} \times 3 \text{ FLOOR (2ND TO 4TH FLR)} = 1827 \text{ pcs of } 2" \times 3" \times 8'$$

3 2ND TO 4TH FLOOR X

COLUMNS
BEAMS
SLABS
STAIRS
ROOFINGS

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

D. Scaffolding for beams (NO SCAFFOLDING FOR TIE BEAMS!!!)

TABLE 5-3 QUANTITY OF LUMBER FOR SCAFFOLDING OR STAGING						
Lumber Size	Column			Beam		Flooring
	Board Ft. per M. Ht.			Board Ft. per M. Ht.		Board Ft Per Sq. M.
	Vertical	Hor.	Brace	Vertical	Hor.	
2" x 2"	4.70	21.00	11.70	4.00	4.70	6.10
2" x 3"	7.00	31.67	17.50	6.00	7.00	9.10
2" x 4"	9.35	42.25	23.35	8.00	9.35	12.10

Note: disregard the rectangular highlights in this table

THERE are two Scaffoldings, VERTICAL AND HORIZONTAL .

Find the total height by summing up all the lengths of the beams in that floor.



$$\text{Area} = [(2(d) + b + 0.1)] \times [\text{total Length}] \times \text{QTY}$$

$$= [(2(0.4) + 0.25 + 0.1)] \times [(4.9 \times 1) + (4.5 \times 10) + (4.9 \times 1)] \times 63.02 \text{ m}^2 \times 2 = 126.04 \text{ m}^2$$

Total length = $[(4.9 \times 1) + (4.5 \times 10) + (4.9 \times 1)] \times 2 \text{ set} + [(4.9 \times 1) + (4.5 \times 10) + (4.9 \times 1)] \times 1 \text{ set} + [(4.8 \times 2)] \times 1 \text{ set} + [(3.8 \times 2)] \times 1 \text{ set} + [(6.9 \times 1) + (2.4 \times 1)] \times 4 \text{ sets} + [(6.9 \times 1) + (2.4 \times 1)] \times 9 \text{ sets} + [(4.5 \times 10)] \times 1 \text{ set} + [(1.3 \times 1)] \times 1 \text{ set} + [(1.3 \times 1)] \times 1 \text{ set} + [(1.3 \times 1)] \times 1 \text{ set} + [(4.675 \times 2)] \times 1 \text{ set}$

Total length = 360.75 m

Vertical Support (2" x 2" x 8')

= Total length of beams x value in the table

= $360.75 \times 4 = 1443 \text{ bd. ft.}$

$$\text{Pcs of wood} = \frac{\text{TOTAL NUMBER OF BD.FT} \times 12}{\text{SELECTED LUMBER FORM}} = \frac{1443 \times 12}{2 \times 2 \times 8} = 541.125 \times 50\% = 270.56 \text{ or } 271 \text{ pcs of } 2 \times 2 \times 8$$

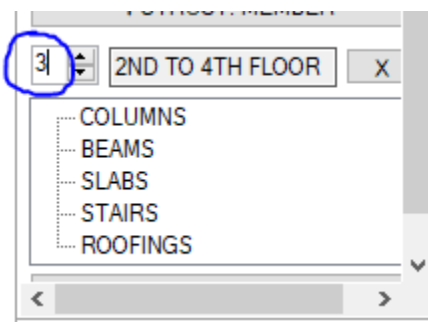
271 pcs * 3 floors = 813 pcs of 2" x 2" x 8'

Horizontal Support (2" x 2" x 8')

= $360.75 \text{ m} \times 4.7 = 1695.525 \text{ bd. Ft}$

$$\text{Pcs of wood} = \frac{\text{TOTAL NUMBER OF BD.FT} \times 12}{\text{SELECTED LUMBER FORM}} = \frac{1695.525 \times 12}{2 \times 2 \times 8} = 635.821 \times 50\% = 317.91 \text{ or } 318 \text{ pcs of } 2 \times 2 \times 8$$

318 x 3 floors = 954 pcs 2" x 2" x 8'



VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

(ROOF BEAM) - Same inputs and given as Grade beams, same illustrations used.

ADD STRUCTURAL MEMBER

STRUCTURAL MEMBER

BEAM ▼

NAME:

BR-5 ▼

BEAM TYPE

GRADE BEAM ▼

UNIT:

mm ▼

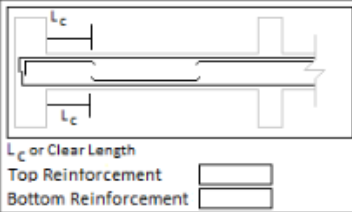
Depth **1500**

Quantity **2**

MAIN BARS HOOK TYPE **90°** ▼

STIRRUP HOOK TYPE **135°** ▼

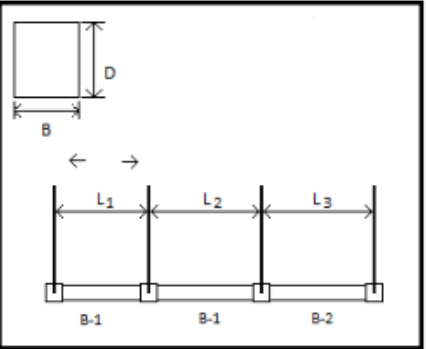
SPLICE TYPE **MECHANICAL** ▼



L_c or Clear Length

Top Reinforcement

Bottom Reinforcement



BEAM ROW				
Beam Name	Quantity	Length	Clear Length	Support
G-2	1	4.9	4.3	
G-2	10	4.5	3.9	
G-2	1	4.9	4.3	

SUSPENDED BEAM SCHEDULE									
Name	B	D	Properties	Ext. Support	Midspan	Int. Support	Stirrups	Web Bars	
G-2	250	400		Qty	Qty	Qty	Dia.	Dia.	
				Qty	Qty	Qty	Rest	Qty	
				Qty	Qty	Qty	Dia.	Dia.	
				Qty	Qty	Qty	Rest	Qty	
				Qty	Qty	Qty	Dia.	Dia.	
				Qty	Qty	Qty	Rest	Qty	

BEAM ROW 16

Area = [(2(d) + b+ 0.1)] x [total Length] x QTY

$$= [(2 (0.4) + 0.25+ 0.1)] x [(4.9x1)+(4.5x10)+(4.9x 1)] = 63.02 \text{ m}^2 \times 2 = \mathbf{126.04 \text{ m}^2}$$

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

ADD STRUCTURAL MEMBER

STRUCTURAL MEMBER

BEAM ▼

NAME:

BR-6 ▼

BEAM TYPE

GRADE BEAM ▼

UNIT:

mm ▼

Depth

Quantity 1

MAIN BARS HOOK TYPE 90° ▼

STIRRUP HOOK TYPE 135° ▼

SPLICE TYPE MECHANICAL ▼

L_c or Clear Length

Top Reinforcement

Bottom Reinforcement

BEAM ROW				
Beam Name	Quantity	Length	Clear Length	Support
G-3	1	4.9	4.3	▼
G-3	10	4.5	3.9	▼
G-3	1	4.9	4.3	▼
				▼
				▼
				▼

SUSPENDED BEAM SCHEDULE									
Name	B	D	Properties	Ext. Support	Midspan	Int. Support	Stirrups	Web Birs	
G-2	250	400		Qty. 	Qty. 	Qty. 	Dia. 	Dia. 	
				Qty. 	Qty. 	Qty. 	Rest 	Qty. 	
G-3	400	500		Qty. 	Qty. 	Qty. 	Dia. 	Dia. 	
				Qty. 	Qty. 	Qty. 	Rest 	Qty. 	
				Qty. 	Qty. 	Qty. 	Dia. 	Dia. 	
				Qty. 	Qty. 	Qty. 	Rest 	Qty. 	

BEAM ROW 17

Area = [(2(d) + b+ 0.1)] x [total Length] x QTY

$$= [(2 (0.5) + 0.4 + 0.1)] \times [(4.9 \times 1) + (4.5 \times 10) + (4.9 \times 1)] = 82.2 \text{ m}^2 \times 1 = \mathbf{82.2 \text{ m}^2}$$

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

ADD STRUCTURAL MEMBER

STRUCTURAL MEMBER

BEAM ▼

NAME:

BR-7 ▼

BEAM TYPE

GRADE BEAM ▼

UNIT:

mm ▼

Depth

Quantity

MAIN BARS HOOK TYPE

STIRRUP HOOK TYPE

SPLICE TYPE

L_c or Clear Length

Top Reinforcement

Bottom Reinforcement

BEAM ROW				
Beam Name	Quantity	Length	Clear Length	Support
B-1	2	4.8	4.4	

SUSPENDED BEAM SCHEDULE									
Name	B	D	Properties	Ext. Support	Midspan	Int. Support	Stirrups	Web Bars	
G-2	250	400		Dia. Qty.	Qty.	Qty.	Dia. @	Dia.	
				Dia. Qty.	Qty.	Qty.	Rest @	Qty.	
G-3	400	500		Dia. Qty.	Qty.	Qty.	Dia. @	Dia.	
				Dia. Qty.	Qty.	Qty.	Rest @	Qty.	
B-1	250	400		Dia. Qty.	Qty.	Qty.	Dia. @	Dia.	
				Dia. Qty.	Qty.	Qty.	Rest @	Qty.	

BEAM ROW 18

Area = [(2(d) + b+ 0.1)] x [total Length] x QTY

$$= [(2 (0.4) + 0.25 + 0.1)] \times [(4.8 \times 2)] = 11.04 \text{ m}^2 \times 1 = \mathbf{11.04 \text{ m}^2}$$

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

ADD STRUCTURAL MEMBER

STRUCTURAL MEMBER

BEAM ▼

NAME:

BR-8 ▼

BEAM TYPE

GRADE BEAM ▼

UNIT:

mm ▼

Depth

Quantity

MAIN BARS HOOK TYPE

STIRRUP HOOK TYPE

SPLICE TYPE

L_c or Clear Length

Top Reinforcement

Bottom Reinforcement

BEAM ROW				
Beam Name	Quantity	Length	Clear Length	Support
B-1	2	3.8	3.47	

SUSPENDED BEAM SCHEDULE									
Name	B	D	Properties	Ext. Support	Midspan	Int. Support	Stirrups	Web Bars	
G-2	250	400		Qty.	Qty.	Qty.	Dia.	Dia.	
				Qty.	Qty.	Qty.	@		
			Dia.	Qty.	Qty.	Qty.	Rest	@	Qty.
G-3	400	500		Qty.	Qty.	Qty.	Dia.	Dia.	
				Qty.	Qty.	Qty.	@		
			Dia.	Qty.	Qty.	Qty.	Rest	@	Qty.
B-1	250	400		Qty.	Qty.	Qty.	Dia.	Dia.	
				Qty.	Qty.	Qty.	@		
			Dia.	Qty.	Qty.	Qty.	Rest	@	Qty.

BEAM ROW 19

Area = $[(2(d) + b + 0.1)] \times [\text{total Length}] \times \text{QTY}$

$$= [(2(0.4) + 0.25 + 0.1)] \times [(3.8 \times 2)] = 8.74 \text{ m}^2 \times 1 = 8.74 \text{ m}^2$$

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

ADD STRUCTURAL MEMBER

STRUCTURAL MEMBER

BEAM ▼

NAME:

BR-9 ▼

BEAM TYPE

GRADE BEAM ▼

UNIT:

mm ▼

Depth

Quantity

MAIN BARS HOOK TYPE

STIRRUP HOOK TYPE

SPLICE TYPE

L_c or Clear Length

Top Reinforcement

Bottom Reinforcement

BEAM ROW				
Beam Name	Quantity	Length	Clear Length	Support
G-1C	1	6.9	6.3	
G-1B	1	2.4	1.8	

SUSPENDED BEAM SCHEDULE									
Name	B	D	Properties	Ext. Support	Midspan	Int. Support	Stirrups	Web Bars	
G-2	250	400		Dia. Qty	Qty	Qty	Dia.		Dia.
				Dia. Qty	Qty	Qty			Qty.
G-3	400	500		Dia. Qty	Qty	Qty	Dia.		Dia.
				Dia. Qty	Qty	Qty			Qty.
B-1	250	400		Dia. Qty	Qty	Qty	Rest		Dia.
				Dia. Qty	Qty	Qty			Qty.
G-1C	400	600		Dia. Qty	Qty	Qty	Rest		Dia.
				Dia. Qty	Qty	Qty			Qty.
G-1B	400	600		Dia. Qty	Qty	Qty	Rest		Dia.
				Dia. Qty	Qty	Qty			Qty.

BEAM ROW 20

Area = $[(2(d) + b + 0.1)] \times [\text{total Length}] \times QTY$

$$= [(2(0.6) + 0.4 + 0.1)] \times [(6.9 \times 1) + (2.4 \times 1)] = 15.81 \text{ m}^2 \times 4 = 63.24 \text{ m}^2$$

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

ADD STRUCTURAL MEMBER

STRUCTURAL MEMBER

BEAM ▼

NAME:

BR-10 ▼

BEAM TYPE

GRADE BEAM ▼

UNIT: mm ▼

Depth

Quantity

MAIN BARS HOOK TYPE

STIRRUP HOOK TYPE

SPLICE TYPE

L_c or Clear Length

Top Reinforcement

Bottom Reinforcement

BEAM ROW				
Beam Name	Quantity	Length	Clear Length	Support
G-1	1	6.9	6.3	
G-1A	1	2.4	1.8	

SUSPENDED BEAM SCHEDULE									
Name	B	D	Properties	Ext. Support	Midspan	Int. Support	Stirrups	Web Bars	
G-2	250	400		Dia. Qty.	Qty.	Qty.	Dia. @	Dia.	
G-3	400	500		Dia. Qty.	Qty.	Qty.	Dia. @	Dia.	
B-1	250	400		Dia. Qty.	Qty.	Qty.	Dia. @	Dia.	
G-1C	400	600		Dia. Qty.	Qty.	Qty.	Dia. @	Dia.	
G-1B	400	600		Dia. Qty.	Qty.	Qty.	Dia. @	Dia.	
G-1	400	600		Dia. Qty.	Qty.	Qty.	Dia. @	Dia.	
G-1A	400	600		Dia. Qty.	Qty.	Qty.	Dia. @	Dia.	

BEAM ROW 21

Area = [(2(d) + b + 0.1)] x [total Length] x QTY

$$= [(2 (0.6) + 0.4 + 0.1)] \times [(6.9 \times 1) + (2.4 \times 1)] = 15.81 \text{ m}^2 \times 9 = 142.29 \text{ m}^2$$

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

ADD STRUCTURAL MEMBER

STRUCTURAL MEMBER

BEAM ▼

NAME:

BR-11 ▼

BEAM TYPE

GRADE BEAM ▼

UNIT:

mm ▼

Depth

Quantity 1

MAIN BARS HOOK TYPE 90° ▼

STIRRUP HOOK TYPE 135° ▼

SPLICE TYPE MECHANICAL ▼

L_c or Clear Length

Top Reinforcement

Bottom Reinforcement

BEAM ROW				
Beam Name	Quantity	Length	Clear Length	Support
B-1	10	4.5	4.1	

SUSPENDED BEAM SCHEDULE									
Name	B	D	Properties	Ext. Support	Midspan	Int. Support	Stirrups	Web Bars	
G-2	250	400		Qty	Qty	Qty	Dia.		Dia.
			▼	Qty	Qty	Qty	@		Qty.
			▼	Qty	Qty	Qty	Rest	@	Qty.
B-1	250	400		Qty	Qty	Qty	Dia.		Dia.
			▼	Qty	Qty	Qty	@		Qty.
			▼	Qty	Qty	Qty	Rest	@	Qty.
				Qty	Qty	Qty	Dia.		Dia.
			▼	Qty	Qty	Qty	@		Qty.
			▼	Qty	Qty	Qty	Rest	@	Qty.

BEAM ROW 22

Area = [(2(d) + b+ 0.1)] x [total Length] x QTY

$$= [(2 (0.4) + 0.25 + 0.1)] \times [(4.5 \times 10)] = 51.75 \text{ m}^2 \times 1 = 51.75 \text{ m}^2$$

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

ADD STRUCTURAL MEMBER

STRUCTURAL MEMBER

BEAM ▼

NAME:

BR- 23 ▼

BEAM TYPE

ROOF BEAM ▼

UNIT:

mm ▼

Depth

Quantity **26**

MAIN BARS HOOK TYPE 90° ▼

STIRRUP HOOK TYPE 135° ▼

SPLICE TYPE MECHANICAL ▼

L_c or Clear Length

Top Reinforcement

Bottom Reinforcement

BEAM ROW				
Beam Name	Quantity	Length	Clear Length	Support
CB-1	1	1.3	1	

SUSPENDED BEAM SCHEDULE									
Name	B	D	Properties	Ext. Support	Midspan	Int. Support	Stirrups	Web Bars	
G-2	250	400		Dia. Qty	Qty	Qty	Dia. Qty	Dia.	
G-3	400	500		Dia. Qty	Qty	Qty	Rest Qty	Dia.	
B-1	250	400		Dia. Qty	Qty	Qty	Dia. Qty	Dia.	
G-1C	400	600		Dia. Qty	Qty	Qty	Rest Qty	Dia.	
G-1B	400	600		Dia. Qty	Qty	Qty	Rest Qty	Dia.	
G-1	400	600		Dia. Qty	Qty	Qty	Rest Qty	Dia.	
CB-1	250	400		Dia. Qty	Qty	Qty	Rest Qty	Dia.	

BEAM ROW 23

Area = [(2(d) + b+ 0.1)] x [total Length] x QTY

$$= [(2 (0.4) + 0.25 + 0.1)] x [(1.3 \times 1)] = 1.495 \text{ m}^2 \times 26 = \mathbf{38.87 \text{ m}^2}$$

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

ADD STRUCTURAL MEMBER

STRUCTURAL MEMBER

BEAM ▼

NAME:

BR-15 ▼

BEAM TYPE **GRADE BEAM** ▼

UNIT: mm ▼

Depth

Quantity **1**

MAIN BARS HOOK TYPE 90° ▼

STIRRUP HOOK TYPE 135° ▼

SPLICE TYPE MECHANICAL ▼

L_c or Clear Length

Top Reinforcement

Bottom Reinforcement

BEAM ROW				
Beam Name	Quantity	Length	Clear Length	Support
B-2 ▼	2	4.675	4.425	▼
▼	▼	▼	▼	▼
▼	▼	▼	▼	▼
▼	▼	▼	▼	▼
▼	▼	▼	▼	▼

SUSPENDED BEAM SCHEDULE									
Name	B	D	Properties	Ext. Support	Midspan	Int. Support	Stirrups	Web Bars	
G-2	250	400		Dia. Qty	Qty	Qty	Dia. Qty	Dia.	
				Dia. Qty	Qty	Qty	Rest Qty		Qty.
G-3	400	500		Dia. Qty	Qty	Qty	Dia. Qty	Dia.	
				Dia. Qty	Qty	Qty	Rest Qty		Qty.
B-1	250	400		Dia. Qty	Qty	Qty	Dia. Qty	Dia.	
				Dia. Qty	Qty	Qty	Rest Qty		Qty.
G-1C	400	600		Dia. Qty	Qty	Qty	Dia. Qty	Dia.	
				Dia. Qty	Qty	Qty	Rest Qty		Qty.
G-1B	400	600		Dia. Qty	Qty	Qty	Dia. Qty	Dia.	
				Dia. Qty	Qty	Qty	Rest Qty		Qty.
G-1	400	600		Dia. Qty	Qty	Qty	Dia. Qty	Dia.	
				Dia. Qty	Qty	Qty	Rest Qty		Qty.
B-2	250	400		Dia. Qty	Qty	Qty	Dia. Qty	Dia.	
				Dia. Qty	Qty	Qty	Rest Qty		Qty.

BEAM ROW 24

$$\text{Area} = [(2(d) + b + 0.1)] \times [\text{total Length}] \times \text{QTY}$$

$$= [(2(0.4) + 0.25 + 0.1)] \times [(4.675 \times 2)] = 10.7525 \text{ m}^2 \times 1 = \mathbf{10.7525 \text{ m}^2}$$

$$\text{Total area for ROOF beams} = 126.04 + 82.2 + 11.04 + 8.74 + 63.24 + 142.29 + 51.75 + 1.495(26) + 10.7525 = \mathbf{534.9225 \text{ m}^2}$$

$$\text{No. of pieces of formworks needed} = \frac{\text{TOTAL surface AREA}}{\text{AREA OF PLYWOOD "(1.2 m * 2.4m)"}} = \frac{534.9225}{(1.2 \times 2.4)} = 185.73 \text{ pcs} \times \mathbf{50\%}$$

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

=92.86 or 93 pcs of plywood x 1 roof deck = 93 pcs of plywood

E. Framework

Lumber selected: 2" x 3" x 8'

Thickness of formwork: ½" constant

Look for the value in the table that matched the category

Size of Wood Frame	THICKNESS OF PLYWOOD FORM			
	POST		BEAM	
	6 mm (1/4")	12 mm (1/2")	6 mm (1/4")	12 mm (1/2")
2" x 2"	29.67	20.33	25.06	18.66
2" x 3"	44.50	30.50	37.60	28.00

Note: disregard the rectangular highlights in this table

93 pcs (from single floor ground floor) x 28 = 2604 bd ft.



Parameters



Unit:

Earthworks Formworks Concrete Reinforcements Paint Tiles Masonry Stairs Labor & Eqpt Misc

Structural Member

Footings Beams Columns Hanging Sl

Framework

Form Lumber:

Formwork Values

Type:

Number of Uses:

Nails:

$$\text{Pcs of wood} = \frac{\text{TOTAL NUMBER OF BD.FT} \times 12}{\text{SELECTED LUMBER FORM}} = \frac{2604 \times 12}{2 \times 3 \times 8} = 651 \text{ pcs of } 2" \times 3" \times 8'$$

$$651 \text{ pcs} \times 1 \text{ FLOOR (ROOF DECK)} = 651 \text{ pcs of } 2" \times 3" \times 8'$$

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

F. Scaffolding for beams (NO SCAFFOLDING FOR TIE BEAMS!!!)

TABLE 5-3 QUANTITY OF LUMBER FOR SCAFFOLDING OR STAGING						
Lumber Size	Column Board Ft. per M. Ht.			Beam Board Ft. per M. Ht.		Flooring Board Ft Per Sq. M.
	Vertical	Hor.	Brace	Vertical	Hor.	
2" x 2"	4.70	21.00	11.70	4.00	4.70	6.10
2" x 3"	7.00	31.67	17.50	6.00	7.00	9.10
2" x 4"	9.35	42.25	23.35	8.00	9.35	12.10

Note: disregard the rectangular highlights in this table

THERE are two Scaffoldings, VERTICAL AND HORIZONTAL .

Find the total height by summing up all the lengths of the beams in that floor.



$$\text{Area} = [(2(d) + b + 0.1)] \times [\text{total Length}] \times \text{QTY}$$

$$= [(2(0.4) + 0.25 + 0.1)] \times [(4.9 \times 1) + (4.5 \times 10) + (4.9 \times 1)] \times 63.02 \text{ m}^2 \times 2 = 126.04 \text{ m}^2$$

Total length = $[(4.9 \times 1) + (4.5 \times 10) + (4.9 \times 1)] \times 2 \text{ set} + [(4.9 \times 1) + (4.5 \times 10) + (4.9 \times 1)] \times 1 \text{ set} + [(4.8 \times 2)] \times 1 \text{ set} + [(3.8 \times 2)] \times 1 \text{ set} + [(6.9 \times 1) + (2.4 \times 1)] \times 4 \text{ sets} + [(6.9 \times 1) + (2.4 \times 1)] \times 9 \text{ sets} + [(4.5 \times 10)] \times 1 \text{ set} + [(1.3 \times 1)] \times 26 \text{ set} + [(4.675 \times 2)] \times 1 \text{ set}$

Total length = 391.95 m

Vertical Support (2" x 2" x 8')

= Total length of beams x value in the table

= $391.95 \times 4 = 1567.8 \text{ bd. ft.}$

$$\text{Pcs of wood} = \frac{\text{TOTAL NUMBER OF BD.FT} \times 12}{\text{SELECTED LUMBER FORM}} = \frac{1567.8 \times 12}{2 \times 2 \times 8} = 587.925 \times 50\% = 293.97 \text{ or } 294 \text{ pcs of } 2 \times 2 \times 8$$

294 pcs * 1 floor (ROOF DECK) = 294 pcs of 2" x 2" x 8'

Horizontal Support (2" x 2" x 8')

= $391.95 \text{ m} \times 4.7 = 1842.165 \text{ bd. Ft}$

$$\text{Pcs of wood} = \frac{\text{TOTAL NUMBER OF BD.FT} \times 12}{\text{SELECTED LUMBER FORM}} = \frac{1842.165 \times 12}{2 \times 2 \times 8} = 690.81 \times 50\% = 345.4 \text{ or } 346 \text{ pcs of } 2 \times 2 \times 8$$

346 x 1 ROOF DECK = 346 pcs 2" x 2" x 8'

Summary for beam formworks:

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

plywood: $85 + 261 + 93 = 438$ pcs (P 674.00 /pc) = P 295,212.00

2" x 2" x 8': $813 + 954 + 294 + 346 = 2407$ pcs (P 130.00 /pc) = P 312,920.00

2" x 3" x 8': $595 + 1827 + 651 = 3037$ pcs (P 150.00 /pc) = P 455,550.00

Total material cost : P 1,063,682.00

total area: $485.01 + 500.5375(3) + 534.9225 = 2521.545$ m²

Unit cost : P 1,063,682.00 / 2521.545 m² = P 421.84

Labor cost = $300 * 2521.545 = 756,463.5$

III. SLAB (SUSPENDED SLAB ONLY)

Not applicable to ground floor slabs, 2nd floor and above only.

RED = IMPORTANT NOTE TO READ

Hanging or Suspended Slab (2nd floor to 4th floor)

$$A = 4.4 \times 2.675 = 11.77 \text{ m}^2 \times 2 \text{ qty} = \mathbf{23.54 \text{ m}^2}$$

L TOP: 4100mm

RED = IMPORTANT NOTE TO READ

$$A = 4.1 \times 2.800 = 11.48 \text{ m}^2 \times 10 = 114.8 \text{ m}^2$$

L TOP: 4100mm

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

W LEFT: 3350mm

T: 100mm

A= 4.1 x 3.35= 13.735 m2 x 10 = 137.35 m2

S-2 (A) @ 2 SETS

L TOP: 4400mm

W LEFT: 1900 mm

T: 100mm

Area = 4.4 x 1.9 x 2 sets = **16.72 m2**

ADD STRUCTURAL MEMBER

STRUCURAL MEMBER

NAME:

SLAB

S-2(A)

UNIT: mm

SLAB MARK: S-2

QUANTITY

SLAB POSITION

SLAB DETAIL

L_a

L_b

Bent Up/Continuous

LONGITUDINAL

TRANSVERSE

TOP

MECHANICAL

MECHANICAL

BOTTOM

MECHANICAL

MECHANICAL

SLAB BORDER

TOP

LENGTH

CLEAR LENGTH

4400

BOTTOM

LENGTH

CLEAR LENGTH

4400

LEFT

LENGTH

CLEAR LENGTH

1900

RIGHT

LENGTH

CLEAR LENGTH

1900

SLAB SCHEDULE

SLAB MARK	THICKNESS	REBAR SPACING ALONG SHORT DIRECTION				REBAR SPACING ALONG LONG DIRECTION				REMARK
		SIZE	EXT. SUPP.	MIDSPAN	INT. SUPP.	SIZE	EXT. SUPP.	MIDSPAN	INT. SUPP.	
		TOP	BOTT.	TOP	BOTT.	TOP	BOTT.	TOP	BOTT.	
S-1	100									2-WAY
S-2	100									

Custom Length

OPEN

Custom Length

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

S-2 (A) @ 10 SETS

L TOP: 4100mm

W LEFT: 1900 mm

T: 100mm

A= 4.1 x 1.9 x 10SETS = **77.9 m2**

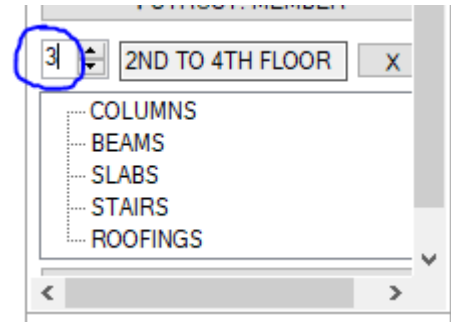
S-3 (A) @ 2 SETS

L TOP: 1250mm

W LEFT: 3475mm

T: 100mm

V = 1.25 x 3.475= 4.34375 m2 x 2 = **8.6875 m2**



TOTAL AREA = 23.54 + 114.8+137.35+ 16.72+77.9+8.6875 = 378.9975 m2 (SINGLE FLOOR ONLY)

No. of pieces of Plywood needed = $\frac{\text{TOTAL surface AREA}}{\text{AREA OF PLYWOOD "}(1.2 \text{ m} * 2.4\text{m})"}$ = $\frac{378.9975}{(1.2*2.4)}$ 131.596 or 132 pcs

No. of uses of formwork is not applicable in slab, do not multiply 50 % (in sus. slab only).

132 pcs x 3 floors = **396 pcs.**

B. Scaffolding

Form lumber selected by user: 2" x 3" x 10'

A= 378.9975 m2 x 9.1 = 3448.87725 bd.ft

$$\frac{3448.87725 * 12}{2 * 3 * 10} = 689.775 \text{ or } 690 \text{ pcs of } 2"x 3" ;$$

690 pcs X 3 FLOORS = 2070 pcs of 2"x 3" x10'

SIZE	FLOORING
	bd. Ft. Per sq.m
2" x 2"	6.1
2"x 3"	9.1
2" x 4"	12.1

Parameters

Unit: Millimeter

Earthworks Formworks Concrete Reinforcements Paint Tiles Masonry Stairs Labor & Eqpt Misc

Structural Member

Columns Beams Hanging Slabs Stairs

Scaffolding

Vertical Support: 2" x 3" x 10'

Formwork Values

Type: Plywood

Number of Uses: 2

Nails: 0.215 kg/1 m2

VIOLET = CONSTANT (always in equation)

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

RED = IMPORTANT NOTE TO READ

ROOF DECK

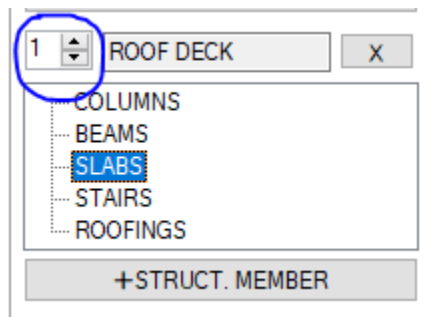
S-1 (A) @ 2 SETS

L: 4400 mm

W: 2675 mm

T: 100mm

A = 4.4 x 2.675 = 11.77 m² x 2 qty = **23.54 m²**



ADD STRUCTURAL MEMBER

STRUCTURAL MEMBER

SLAB

NAME:

S-1(A)

UNIT: mm

SLAB MARK: S-1

QUANTITY: **2**

SLAB POSITION:

SLAB DETAIL:

L_a: Bent Up/Continuous

L_b:

Diagram showing a rectangular slab with 'OPEN' text inside.

LONGITUDINAL: MECHANICAL

TRANSVERSE: MECHANICAL

TOP: MECHANICAL

BOTTOM: MECHANICAL

SLAB BORDER:

TOP: LENGTH: CLEAR LENGTH: **4400**

BOTTOM: LENGTH: CLEAR LENGTH: **4400**

LEFT: LENGTH: CLEAR LENGTH: **2675**

RIGHT: LENGTH: CLEAR LENGTH: **2675**

SLAB MARK	THICKNESS	REBAR SPACING ALONG SHORT DIRECTION				REBAR SPACING ALONG LONG DIRECTION				REMARK
		SIZE	EXT. SUPP.	MIDSPAN	INT. SUPP.	SIZE	EXT. SUPP.	MIDSPAN	INT. SUPP.	
S-1	100									2-WAY

$$\text{No. of pieces of Plywood needed} = \frac{\text{TOTAL surface AREA}}{\text{AREA OF PLYWOOD "(1.2 m * 2.4m)"}} = \frac{23.54}{(1.2*2.4)} = 8.1736 \text{ or } 9 \text{ pcs}$$

Scaffolding

Form lumber selected by user: 2" x 3" x 10'

A = 23.54 m² x 9.1 = 211.86 bd.ft

$$\frac{211.86 * 12}{2 * 3 * 10} = 42.372 \text{ OR } 43 \text{ pcs of } 2" \times 3" \times 10'$$

TOTAL AREA FOR WHOLE SLAB = 378.9975(3 FLOORS) + 23.54 = 1160.5325

Plywood: **405 pcs (P 674.00 /pc) = P 272,970.00**

2x3x10: **2113 pcs (P 150.00 /pc) = P 316,950.00**

Total material cost = P 589,920

Unit cost = 589,920/ 1160.5325 = P508.32

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

Labor cost = $1160.5325 \times 300 = \text{P } 348,159.75$

IIV. STAIRS (U-STAIRS)

IN THIS EXAMPLE, U-STAIRS IS USED

FIRST FLIGHT:

$$L = \sqrt{(\text{RISER HEIGHT} * \text{NO OF STEPS})^2 + (\text{TREAD WIDTH} * \text{NO OF STEPS})^2}$$

$$\text{FLIGHT 1 LENGTH} = \sqrt{(150 * 10)^2 + (225 * 10)^2} = 2.705 \text{ m}$$

AREA OF PLYWOOD FOR BOTTOM SUPPORT

$$A = L \times \text{SL STAIR LENGTH} = 2.705 \times 1.2 = 3.246 \text{ m}^2$$

RISER BOARD

$$A = (L * (\text{RISER HEIGHT} + 0.1)) * 2$$

$$A = (2.705 * (0.15 + 0.1)) * 2 = 1.3525 \text{ m}^2$$

NOTE: STAIR LENGTH SHOULD BE "STAIR WIDTH" (SW)

SECOND FLIGHT:

$$L = \sqrt{(\text{RISER HEIGHT} * \text{NO OF STEPS})^2 + (\text{TREAD WIDTH} * \text{NO OF STEPS})^2}$$

$$\text{FLIGHT 2 LENGTH} = \sqrt{(150 * 7)^2 + (225 * 7)^2} = 1.892 \approx 1.9 \text{ m (ROUND UP MULTIPLES OF 5)}$$

AREA OF PLYWOOD FOR BOTTOM SUPPORT

$$A = L \times \text{STAIR WIDTH "SW"} = 1.9 \times 1.2 = 2.28 \text{ m}^2$$

RISER BOARD

$$A = (L * (\text{RISER HEIGHT} + 0.1)) * 2$$

$$A = (1.9 * (0.15 + 0.1)) * 2 = 0.95 \text{ m}^2$$

LANDING

STEPS (FIRST FLIGHT)	10
STEPS (2ND FLIGHT)	7
STAIR LENGTH:	1200 mm
RISER HEIGHT :	150 mm
TREAD WIDTH:	225 mm
WAIST SLAB THICKNESS:	150mm
LANDING WIDTH:	1200 mm
GAP:	125 mm
LANDING THICKNESS:	150 mm

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

$$A = (SW \times 2 + GAP) \times \text{LANDING WIDTH} + [2 \times \text{LANDING WIDTH} \times \text{LAND THICK}] + [(SL \times 2 + GAP) \times \text{LAND THICK}]$$

$$A = [(1.2 \times 2) + 0.125] \times 1.2 + [2 \times (1.2 \times 0.15)] + [(1.2 \times 2) + 0.125] \times 0.15 = 3.76875 \text{ m}^2$$

STEPS:

$$A = SW \times \text{RISER} \times (\text{STEPS FIRST FLIGHT} + \text{STEPS SECOND FLIGHT}) = (1.2 \times 0.15) \times (10 + 7) = 3.06 \text{ m}^2$$

Area total= Add all acquired area (**BOLD NUMBERS**) X QTY OF STAIRS IN THAT FLOOR

$$\text{Area total} = [(3.246 + 1.3525 + 2.28 + 0.95 + 3.76875 + 3.06) \times 1 \text{ set}] = 14.65725 \text{ m}^2$$

$$\begin{aligned} \text{No. of pieces of Plywood needed} &= \frac{\text{TOTAL surface AREA}}{\text{AREA OF PLYWOOD "(1.2 m * 2.4m)"}} = \frac{14.65725}{(1.2 \times 2.4)} = 5.089 \times 50\% \\ &= 2.54 \text{ or } 3 \text{ pcs} \times 1 \text{ floor} = 3 \text{ pcs} \end{aligned}$$

FRAMEWORK FOR STAIRS:

By Default, 2" x 3" x 8' is used

FOR FRONT SUPPORT BRACING

$$= \frac{\frac{SW}{0.6} (\text{LUMBER WOOD SIZE} \times (L \times 3.28))}{12}$$

$$\frac{SW}{0.6} = \frac{1.2}{0.6} = 2 \text{ (ROUND UP TO NEAREST WHOLE NUMBER IF THERE'S A DECIMAL. ALWAYS. E.G 2.38 = 3)}$$

$$\text{Front wood bracing (FIRST FLIGHT)} = \frac{2(2 \times 3 \times (2.705 \times 3.28))}{12} = 8.8724 \text{ bd. ft}$$

$$\text{Front wood bracing (SECOND FLIGHT)} = \frac{2(2 \times 3 \times (1.9 \times 3.28))}{12} = 6.23 \text{ bd. ft}$$

$$\text{Bracing support per steps} = \frac{\text{TOTAL STEPS} (\text{LUMBER SIZE} \times 3.28)}{12} \times \frac{SL}{0.6} (* \text{rounded off value})$$

$$\text{Bracing support per steps} = \frac{(10+7) (2 \times 3 \times 3.28)}{12} = 27.88 \text{ bd. ft} \times 2 = 55.76 \text{ bd. ft}$$

$$\text{NOTE: } 2 \text{ is from } \frac{SW}{0.6} = \frac{1.2}{0.6} = 2$$

FOR BACK SUPPORT BRACING

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

$$\frac{SW}{0.3} = \frac{1.2}{0.3} = 4 \text{ (ROUND UP TO NEAREST WHOLE NUMBER IF THERE'S A DECIMAL. ALWAYS.)}$$

$$\text{Back wood bracing (FIRST FLIGHT)} = \frac{4(2 \times 3 \times (2.705 \times 3.28))}{12} = 17.7448 \text{ bd. ft}$$

$$\text{Back wood bracing (SECOND FLIGHT)} = \frac{4(2 \times 3 \times (1.9 \times 3.28))}{12} = 12.464 \text{ bd. ft}$$

FOR STEPS

No. of steps: $10+7=17$

SW = 1.2 m

Lumber wood: 2" x 3"

$$\text{Wood bracing for steps} = \frac{2(\text{LUMBER WOOD SIZE} \times (\text{SW} \times 3.28))}{12} \times \text{no. of steps}$$

$$\text{Wood bracing for steps} = \frac{2(2 \times 3 \times (1.2 \times 3.28))}{12} \times 17 = 66.912 \text{ BD Ft.}$$

TOTAL VOLUME FOR STAIRS (FRAMEWORK): $(8.8724 + 6.23 + 55.76 + 17.7448 + 12.464 + 66.912) \times 1 \text{ set} = 168.0132 \text{ bd. Ft}$

$$\text{Pcs of wood} = \frac{\text{TOTAL NUMBER OF BD.FT} \times 12}{\text{SELECTED LUMBER FORM}} = \frac{168.0132 \times 12}{2 \times 3 \times 8} = 42 \times 50\% = 21 \text{ pcs of } 2 \times 3 \times 8 \text{ * 1 floor} = 21 \text{ pcs}$$

SCAFFOLDING FOR STAIRS:

USER SELECTION: 2" X 3" x 8'

12 bd ft / m (CONSTANT)

$$\begin{aligned} &= \text{Flight 1 length} + \text{SW} \times 2 + \text{Gap} + \text{flight 2 length} \\ &= 2.705 + 1.2 \times 2 + 0.125 + 1.9 = 7.13 \text{ m} \\ &7.13 \text{ m} \times 12 \text{ bd ft/ m} = 85.56 \text{ bd. Ft} \times 1 \text{ set} = 85.56 \end{aligned}$$

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

TOTAL VOLUME OF WOOD FOR STAIRS (SCAFFOLDING):

$$\text{Pcs of wood} = \frac{\text{TOTAL NUMBER OF BD.FT} \times 12}{\text{SELECTED LUMBER FORM}} = \frac{85.56 \times 12}{2 \times 3 \times 8} = 21.39 \times 50\% = 10.695 \text{ or } 11 \text{ pcs of } 2 \times 3 \times 8 \times 1 \text{ floor} = 11 \text{ pcs}$$

$$\text{PLYWOOD:} = 3 \text{ pcs (P 674.00 /pc)} = \text{P 2,022.00}$$

$$2'' \times 3'' \times 8'' = 32 \text{ pcs (P 150.00 /pc)} = \text{P 4800.00}$$

$$\text{Total material cost} = \text{P 6,822.00}$$

$$\text{Unit cost} = 6,822.00 / 14.657 = \text{P 465.44}$$

$$\text{Labor cost} = 14.657 \times 300 = \text{P 4,397.00}$$

FOR NAILS

Parameters

Unit: Millimeter

Earthworks Formworks Concrete Reinforcements Paint Tiles Masonry Stairs Labor & Eqpt Misc

Structural Member

Footings Columns Beams Hanging Sl... < >

Formwork Values

Type: Plywood

Number of Uses: 2

Nails: 0.215 kg/m2

Framework

Form Lumber: 2" x 3" x 8"

Scaffolding

Vertical Support: 2" x 2" x 8"

Horizontal Brace: 2" x 2" x 8"

$$\text{KG OF NAILS} = \text{TOTAL AREA OF PLYWOOD or PHENOLIC or ECOBOARD} \times 0.215$$

note: 0.215 is inputted by the user in formworks parameters.

$$\begin{aligned} \text{ADD ALL AREA OF FORMWORKS} &= 14.657 + 1160.5325 + 2521.545 + 1309.98 + 24.334 + 15.3 \\ &= 5046.3485 \text{ m}^2 \times 0.215 \\ &= 1084.9649 \text{ kg} \end{aligned}$$

$$\begin{aligned} &= 1084.96 \text{ kg (@ 150php /kg)} \\ &= 1084.96 \times 150\text{php} \\ &= \text{PHP 162,744.735} \end{aligned}$$

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

FOR STRAIGHT STAIRS

(FOR REFERENCE ONLY, NOT INCLUDED IN THE TOTALITY OF THIS EXAMPLE)

- Basically from U -stairs , remove 2nd flight, landing, and gap, you get straight stairs

FLIGHT:

$$L = \sqrt{(RISER HEIGHT * NO OF STEPS)^2 + (TREAD WIDTH * NO OF STEPS)^2}$$

$$FLIGHT 1 LENGTH = \sqrt{(150 * 10)^2 + (225 * 10)^2} = 2.705m$$

AREA OF PLYWOOD FOR BOTTOM SUPPORT

$$A = L \times SL \text{ STAIR LENGTH} = 2.705 \times 1.2 = 3.246 m^3$$

RISER BOARD

$$A = (L * (RISER HEIGHT + 0.1)) * 2$$

$$A = (2.705 * (0.15 + 0.1)) * 2 = 1.3525 m^2$$

STEPS:

$$A = SL \times RISER \times (\text{no of STEPS}) = (1.2 \times 0.15) \times (10) = 1.8 m^2$$

Area total= Add all acquired area **(BOLD NUMBERS) X QTY OF STAIRS IN THAT FLOOR**

$$Area total = (3.246 + 1.3525 + 1.8) \times 1 = \mathbf{6.40 m^2}$$

$$\begin{aligned} \text{No. of pieces of Plywood needed} &= \frac{TOTAL \text{ surface AREA}}{AREA \text{ OF PLYWOOD } "(1.2 m * 2.4m)"} = \frac{6.40}{(1.2*2.4)} = 2.05 \times 50\% \\ &= 1.11 \text{ or } 2pcs \end{aligned}$$

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

FRAMEWORK FOR STRAIGHT STAIRS:

By Default, 2" x 3" is used

FOR FRONT SUPPORT BRACING

$$\frac{SL}{0.6} (LUMBER WOOD SIZE \times (SL \times 3.28))$$
$$12$$

$$\frac{SL}{0.6} = \frac{1.2}{0.6} = 2 \text{ (ROUND UP TO NEAREST WHOLE NUMBER IF THERE'S A DECIMAL. ALWAYS. E.G } 2.38 = 3)$$

$$\text{Front wood bracing} = \frac{2(2 \times 3 \times (2.705 \times 3.28))}{12} = 8.8724 \text{ bd. ft}$$

$$\text{Bracing support per steps} = \frac{TOTAL STEPS (LUMBER SIZE \times (3.28))}{12} \times \frac{SL}{0.6} (* \text{ rounded off value})$$

$$\text{Bracing support per steps} = \frac{(10)(2 \times 3 \times (3.28))}{12} = 16.4 \text{ bd. ft} \times 2 = 32.8 \text{ bd. ft}$$

FOR BACK SUPPORT BRACING

$$\frac{SL}{0.3} = \frac{1.2}{0.3} = 4 \text{ (ROUND UP TO NEAREST WHOLE NUMBER IF THERE'S A DECIMAL. ALWAYS.)}$$

$$\text{Back wood bracing} = \frac{4(2 \times 3 \times (2.705 \times 3.28))}{12} = 17.7448 \text{ bd. ft}$$

FOR STEPS

No. of steps: 10

SL = 1.2 m

Lumber wood: 2" x 3"

$$\text{Wood bracing for steps} = \frac{2(LUMBER WOOD SIZE \times (SL \times 3.28))}{12} \times \text{no. of steps}$$

$$\text{Wood bracing for steps} = \frac{2(2 \times 3 \times (1.2 \times 3.28))}{12} \times 10 = 39.36 \text{ BD Ft.}$$

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

SCAFFOLDING FOR STAIRS:

USER SELECTION: 2" X 3"

12 bd ft / m (CONSTANT)

= Flight length

= 2.705

2.705 m x 12 bd ft/ m = 32.46 bd. Ft

TOTAL VOLUME OF WOOD FOR STAIRS:

= (ALL BD. FT. OF SAME LUMBER SIZE) X QTY of stairs

= 8.8742 + 32.8+17.7448+39.36+32.46

* NOTE THAT IN THIS CASE ALL LUMBER SIZE IS 2" x 3".

= 131.239 bd ft. (2" x 3" lumber size)

FOR L-STAIRS

(FOR REFERENCE ONLY, NOT INCLUDED IN THE TOTALITY OF THIS EXAMPLE)

- Basically, from U -stairs, remove the gap and you'll get L-stairs

FIRST FLIGHT:

$$L = \sqrt{(RISER HEIGHT * NO OF STEPS)^2 + (TREAD WIDTH * NO OF STEPS)^2}$$

$$FLIGHT 1 LENGTH = \sqrt{(150 * 10)^2 + (225 * 10)^2} = 2.705m$$

AREA OF PLYWOOD FOR BOTTOM SUPPORT

$$A = L \times SW STAIR WIDTH = 2.705 \times 1.2 = 3.246 m^2$$

RISER BOARD

$$A = (L * (RISER HEIGHT + 0.1)) * 2$$

$$A = (2.705 * (0.15 + 0.1)) * 2 = 1.3525 m^2$$

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

SECOND FLIGHT:

$$L = \sqrt{(RISER HEIGHT * NO OF STEPS)^2 + (TREAD WIDTH * NO OF STEPS)^2}$$

$$FLIGHT 2 LENGTH = \sqrt{(150 * 10)^2 + (225 * 10)^2} = 1.892 \approx 1.9m \text{ (ROUND UP MULTIPLES OF 5)}$$

AREA OF PLYWOOD FOR BOTTOM SUPPORT

$$A = L \times SL \text{ STAIR LENGTH} = 1.9 \times 1.2 = 2.28 m^2$$

RISER BOARD

$$A = (L * (RISER HEIGHT + 0.1)) * 2$$

$$A = (1.9 * (0.15 + 0.1)) * 2 = 0.95 m^2$$

LANDING

$$A = SL^2 + [3 * (LAND THICK * SL)]$$

$$A = [(1.2^2)] + [3 * (0.15 * 1.2)] = 1.98 m^2$$

STEPS:

$$A = SL \times RISER \times (STEPS FIRST FLIGHT + STEPS SECOND FLIGHT) = (1.2 \times 0.15) \times (10+7) = 3.06 m^2$$

Area total= Add all acquired area **"BOLD NUMBERS"** X QTY OF STAIRS IN THAT FLOOR

$$Area total = (3.246 + 1.3525 + 2.28 + 0.95 + 1.98 + 3.06) \times 1 = 12.8685 m^2$$

$$\begin{aligned} \text{No. of pieces of Plywood needed} &= \frac{TOTAL \text{ surface AREA}}{AREA OF PLYWOOD "(1.2 m * 2.4m)"} = \frac{12.8685}{(1.2*2.4)} = 4.468 \times 50\% \\ &= 2.23 \text{ or } 3pcs \end{aligned}$$

FRAMEWORK FOR STAIRS:

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

By Default, 2" x 3" x 8' is used

FOR FRONT SUPPORT BRACING

$$\frac{SL}{0.6} (LUMBER WOOD SIZE \times (SL \times 3.28))$$
$$12$$

$$\frac{SL}{0.6} = \frac{1.2}{0.6} = 2 \text{ (ROUND UP TO NEAREST WHOLE NUMBER IF THERE'S A DECIMAL. ALWAYS. E.G } 2.38 = 3)$$

$$\text{Front wood bracing (FIRST FLIGHT)} = \frac{2(2 \times 3 \times (2.705 \times 3.28))}{12} = 8.8724 \text{ bd. ft}$$

$$\text{Front wood bracing (SECOND FLIGHT)} = \frac{2(2 \times 3 \times (1.9 \times 3.28))}{12} = 6.23 \text{ bd. ft}$$

$$\text{Bracing support per steps} = \frac{TOTAL STEPS (LUMBER SIZE \times (3.28))}{12} \times \frac{SL}{0.6} (* \text{ rounded off value})$$

$$\text{Bracing support per steps} = \frac{(10+7) (2 \times 3 \times (3.28))}{12} = 27.88 \text{ bd. ft} \times 2 = 55.76 \text{ bd. ft}$$

FOR BACK SUPPORT BRACING

$$\frac{SL}{0.3} = \frac{1.2}{0.3} = 4 \text{ (ROUND UP TO NEAREST WHOLE NUMBER IF THERE'S A DECIMAL. ALWAYS.)}$$

$$\text{Back wood bracing (FIRST FLIGHT)} = \frac{4(2 \times 3 \times (2.705 \times 3.28))}{12} = 17.7448 \text{ bd. ft}$$

$$\text{Back wood bracing (SECOND FLIGHT)} = \frac{4(2 \times 3 \times (1.9 \times 3.28))}{12} = 12.464 \text{ bd. ft}$$

FOR STEPS

No. of steps: 10+7= 17

SL = 1.2 m

VIOLET = CONSTANT (always in equation)

RED = IMPORTANT NOTE TO READ

GREEN = SELECTED BY USER. (Dependent upon input or selection) ORANGE – CORRESPONDING VALUE

Lumber wood: 2" x 3"

$$\text{Wood bracing for steps} = \frac{2(\text{LUMBER WOOD SIZE} \times (\text{SW} \times 3.28))}{12} \times \text{no. of steps}$$

$$\text{Wood bracing for steps} = \frac{2(2 \times 3 \times (1.2 \times 3.28))}{12} \times 17 = 66.912 \text{ BD Ft.}$$

SCAFFOLDING FOR STAIRS:

USER SELECTION: 2" X 2"

12 bd ft / m (CONSTANT)

= Flight 1 length + SW+ flight 2 length

= 2.705 + 1.2 + 1.9 = 5.805 m

5.805 m x 12 bd ft/ m = 69.66 bd. Ft

TOTAL VOLUME OF WOOD FOR STAIRS:

= ALL BD. FT. X QTY

* FOR 2" X 3" LUMBER WOOD

= 8.8724 + 6.23 + 55.76 + 17.7448 + 12.464 + 66.912 = 167.9832 X 1 = 167.98 bd. ft

* FOR 2" X 2" LUMBER WOOD

= 69.66 bd. Ft
