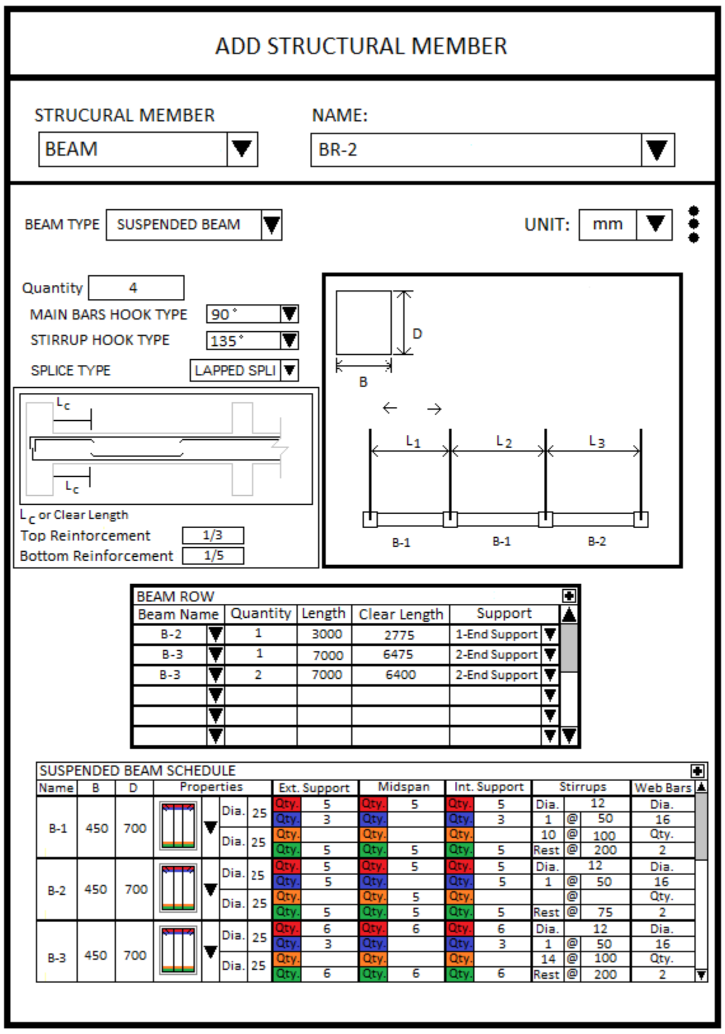
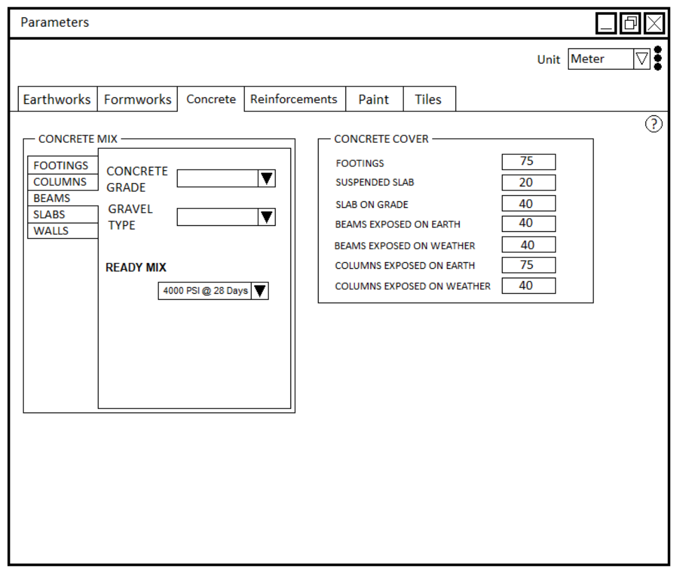
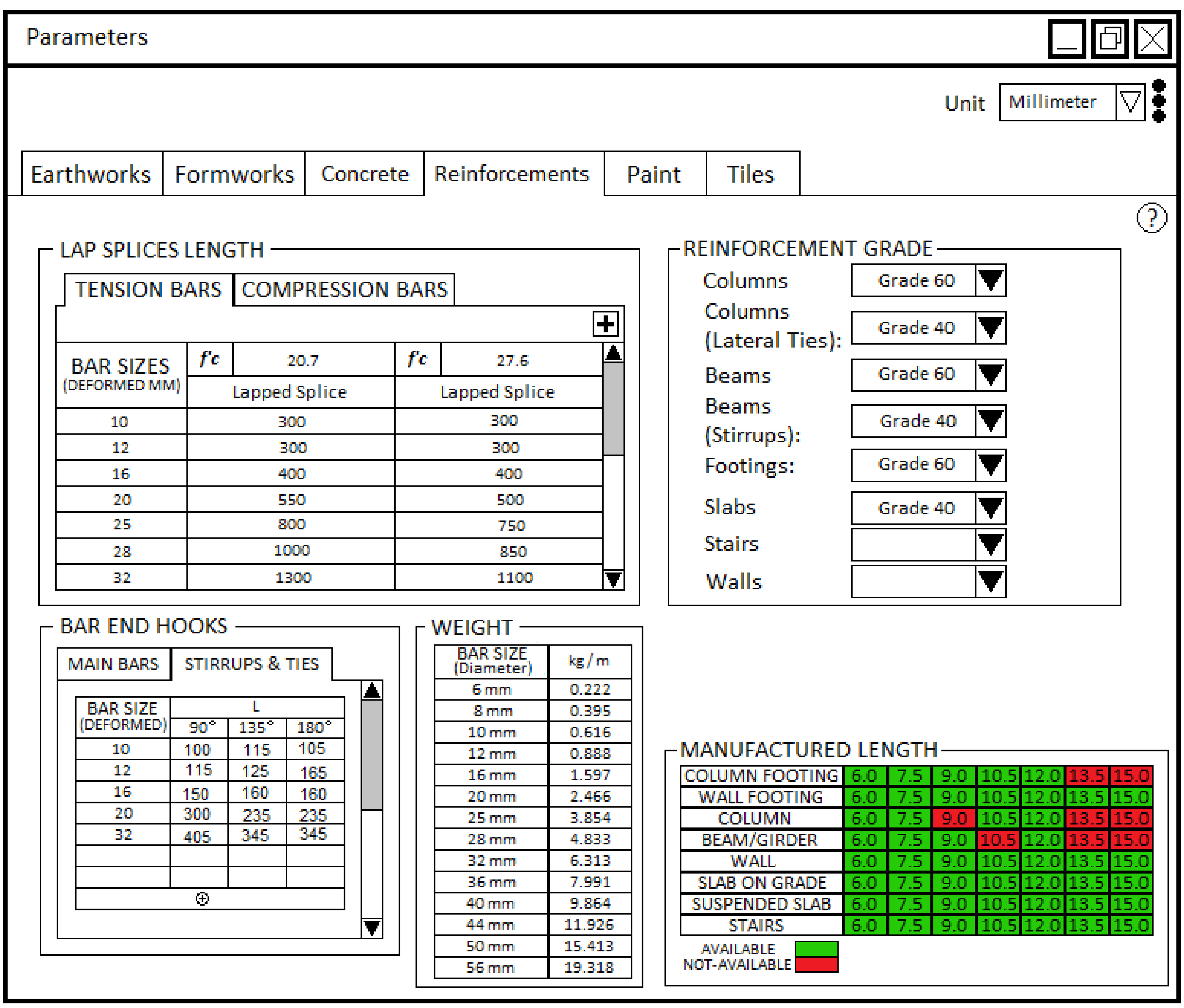
REFERENCE


ADD STRUCTURAL MEMBER
STRUCURAL MEMBER
BEAM
NAME:
BR-2
BEAM TYPE
SUSPENDED BEAM
UNIT:
mm
Quantity
4
MAIN BARS HOOK TYPE
90°
STIRRUP HOOK TYPE
135°
SPLICE TYPE
LAPPED SPLI
Lc or Clear Length
Top Reinforcement
1/3
Bottom Reinforcement
1/5
D
B
L1
L2
L3
B-1
B-1
B-2
BEAM ROW
Beam Name
Quantity
Length
Clear Length
Support
B-2
1
3000
2775
1-End Support
B-3
1
7000
6475
2-End Support
B-3
2
7000
6400
2-End Support
SUSPENDED BEAM SCHEDULE
Name
B
D
Properties
Ext. Support
Midspan
Int. Support
Stirrups
Web Bars
B-1
450
700
B-2
450
700
B-3
450
700


Parameters
Unit
Meter
Earthworks
Formworks
Concrete
Reinforcements
Paint
Tiles
CONCRETE MIX
FOOTINGS
COLUMNS
BEAMS
SLABS
WALLS
CONCRETE GRADE
GRAVEL TYPE
READY MIX
4000 PSI @ 28 Days
CONCRETE COVER
FOOTINGS
75
SUSPENDED SLAB
20
SLAB ON GRADE
40
BEAMS EXPOSED ON EARTH
40
BEAMS EXPOSED ON WEATHER
40
COLUMNS EXPOSED ON EARTH
75
COLUMNS EXPOSED ON WEATHER
40


Parameters
Unit
Millimeter
Earthworks
Formworks
Concrete
Reinforcements
Paint
Tiles
LAP SPLICES LENGTH
TENSION BARS
COMPRESSION BARS
BAR SIZES (DEFORMED MM)
f'c 20.7
f'c 27.6
Lapped Splice
Lapped Splice
10 300 300
12 300 300
16 400 400
20 550 500
25 800 750
28 1000 850
32 1300 1100
REINFORCEMENT GRADE
Columns
Grade 60
Columns (Lateral Ties):
Grade 40
Beams
Grade 60
Beams (Stirrups):
Grade 40
Footings:
Grade 60
Slabs
Grade 40
Stairs
Walls
BAR END HOOKS
MAIN BARS
STIRRUPS & TIES
BAR SIZE (DEFORMED)
L
90° 135° 180°
10 100 115 105
12 115 125 165
16 150 160 160
20 300 235 235
32 405 345 345
WEIGHT
BAR SIZE (Diameter)
kg / m
6 mm 0.222
8 mm 0.395
10 mm 0.616
12 mm 0.888
16 mm 1.597
20 mm 2.466
25 mm 3.854
28 mm 4.833
32 mm 6.313
36 mm 7.991
40 mm 9.864
44 mm 11.926
50 mm 15.413
56 mm 19.318
MANUFACTURED LENGTH
COLUMN FOOTING 6.0 7.5 9.0 10.5 12.0 13.5 15.0
WALL FOOTING 6.0 7.5 9.0 10.5 12.0 13.5 15.0
COLUMN 6.0 7.5 9.0 10.5 12.0 13.5 15.0
BEAM/GIRDER 6.0 7.5 9.0 10.5 12.0 13.5 15.0
WALL 6.0 7.5 9.0 10.5 12.0 13.5 15.0
SLAB ON GRADE 6.0 7.5 9.0 10.5 12.0 13.5 15.0
SUSPENDED SLAB 6.0 7.5 9.0 10.5 12.0 13.5 15.0
STAIRS 6.0 7.5 9.0 10.5 12.0 13.5 15.0
AVAILABLE
NOT-AVAILABLE

STEPS

1. The program will determine the clear length of each beam.

Example:

BEAM ROW				
Beam Name	Quantity	Length	Clear Length	Support
B-2	1	3000	2775	1-End Support
B-3	1	7000	6475	2-End Support
B-3	2	7000	6400	2-End Support

Ref (1)

$$L_{C(1)} = 2775$$

Ref (2)

$$L_{C(2)} = 6475$$

Ref (3)

$$L_{C(3)} = 6400$$

2. The program will determine the quantity of stirrups each beam.

Case 1: 2-End Support

$$Qty_{Cn} = \frac{L_C - 2[Qty_A \cdot Spacing_{@A} + Qty_B \cdot Spacing_{@B}]}{Spacing_{@Rest}} + 1$$

Case 2: 1-End Support

$$Qty_{Cn} = \frac{L_C - [Qty_A \cdot Spacing_{@A} + Qty_B \cdot Spacing_{@B}]}{Spacing_{@Rest}} + 1$$

Example:

BEAM ROW				
Beam Name	Quantity	Length	Clear Length	Support
B-2	1	3000	2775	1-End Support
B-3	1	7000	6475	2-End Support
B-3	2	7000	6400	2-End Support

SUSPENDED BEAM SCHEDULE														
Name	B	D	Properties		Ext. Support		Midspan		Int. Support		Stirrups			Web Bars
B-1	450	700	Dia.	25	Qty.	5	Qty.	5	Qty.	5	Dia.	12		Dia.
					Qty.	3	Qty.		Qty.	3	1	@	50	16
			Dia.	25	Qty.		Qty.		Qty.		10	@	100	Qty.
					Qty.	5	Qty.	5	Qty.	5	Rest	@	200	2
B-2	450	700	Dia.	25	Qty.	5	Qty.	5	Qty.	5	Dia.	12		Dia.
					Qty.	5	Qty.		Qty.	5	1	@	50	16
			Dia.	25	Qty.		Qty.	5	Qty.			@		Qty.
					Qty.	5	Qty.	5	Qty.	5	Rest	@	75	2
B-3	450	700	Dia.	25	Qty.	6	Qty.	6	Qty.	6	Dia.	12		Dia.
					Qty.	3	Qty.		Qty.	3	1	@	50	16
			Dia.	25	Qty.		Qty.		Qty.		14	@	100	Qty.
					Qty.	6	Qty.	6	Qty.	6	Rest	@	200	2

Ref (1)

Since it has end support on both sides. Thus,

$$Qty_{C(1)} = \frac{L_{C(1)} - 2[Qty_{A1} \cdot Spacing_{@A1} + Qty_{B1} \cdot Spacing_{@B1}]}{Spacing_{@Rest1}} + 1$$

$$Qty_{C(1)} = \frac{2775 - [1(50) + 0(0)]}{75} + 1$$

$$Qty_{C(1)} = 37.33 \rightarrow 38$$

Ref (2)

Since it has end support on both sides. Thus,

$$Qty_{C(2)} = \frac{L_{C(2)} - 2[Qty_{A2} \cdot Spacing_{@A2} + Qty_{B2} \cdot Spacing_{@B2}]}{Spacing_{@Rest2}} + 1$$

$$Qty_{C(2)} = \frac{6475 - 2[1(50) + 14(100)]}{200} + 1$$

$$Qty_{C(2)} = 18.875 \rightarrow 19$$

Ref (3)

Since it has end support on both sides. Thus,

$$Qty_{C(3)} = \frac{L_{C(3)} - 2[Qty_{A3} \cdot Spacing_{@A3} + Qty_{B3} \cdot Spacing_{@B3}]}{Spacing_{@Rest3}} + 1$$

$$Qty_{C(3)} = \frac{6400 - 2[1(50) + 14(100)]}{200} + 1$$

$$Qty_{C(3)} = 18.5 \rightarrow 19$$

3. The program will determine the spacing of the main reinforcements of each beam.

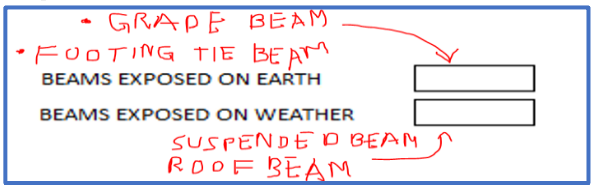
LEGEND:

$B_{B(n)} = B\ dimension\ of\ the\ beam$

$CC_B = Concrete\ Cover\ of\ the\ Beam\ (depends\ on\ beam\ type)$

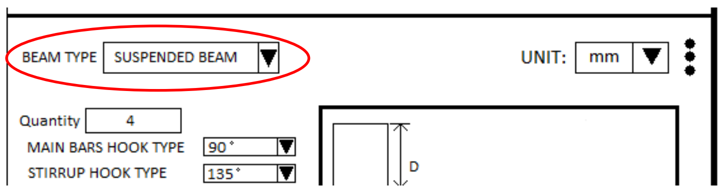
$d_{bUM} = diameter\ of\ the\ upper\ Main\ Reinforcement\ Top$

$d_{bS} = diameter\ of\ Stirrups$



$$S = \frac{B_{B(n)} - d_{bUM} - 2[d_{bS} + CC_B]}{Qty_{RED@Int.Support(n)} - 1}$$

Example:



CONCRETE COVER	
FOOTINGS	75
SUSPENDED SLAB	20
SLAB ON GRADE	40
BEAMS EXPOSED ON EARTH	40
BEAMS EXPOSED ON WEATHER	40
COLUMNS EXPOSED ON EARTH	75
COLUMNS EXPOSED ON WEATHER	40

BEAM ROW

Beam Name	Quantity	Length	Clear Length	Support
B-2	1	3000	2775	1-End Support
B-3	1	7000	6475	2-End Support
B-3	2	7000	6400	2-End Support

Ref (1)

B-2	450	700	Dia.	25	Qty.	5	Qty.	5	Qty.	5	Dia.		12	Dia.
					Qty.	5	Qty.		Qty.	5	1	@	50	16
			Dia.	25	Qty.		Qty.	5	Qty.			@		Qty.
					Qty.	5	Qty.	5	Qty.	5	Rest	@	75	2

$$d_{bUM(1)} = 25$$

$$d_{bS(1)} = 12$$

$$S_1 = \frac{B_{B(1)} - d_{bUM(1)} - 2\left[d_{bS(1)} + CC_B\right]}{Qty_{RED@Int.Support(1)} - 1} = \frac{450 - 25 - 2(12 + 40)}{5 - 1} = \mathbf{80.25}$$

Ref (2)

B-3	450	700	Dia.	25	Qty.	6	Qty.	6	Qty.	6	Dia.		12	Dia.
					Qty.	3	Qty.		Qty.	3	1	@	50	16
			Dia.	25	Qty.		Qty.		Qty.		14	@	100	Qty.
					Qty.	6	Qty.	6	Qty.	6	Rest	@	200	2

$$d_{bUM(2)} = 25$$

$$d_{bS(2)} = 12$$

$$S_2 = \frac{B_{B(2)} - d_{bUM(2)} - 2\left[d_{bS(2)} + CC_B\right]}{Qty_{RED@Int.Support(2)} - 1} = \frac{450 - 25 - 2(12 + 40)}{6 - 1} = \mathbf{64.2}$$

Ref (3)

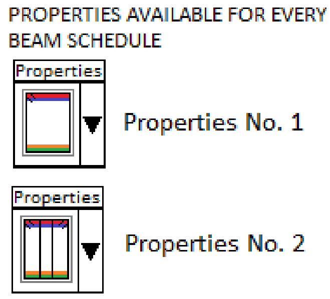
B-3	450	700	Dia.	25	Qty.	6	Qty.	6	Qty.	6	Dia.		12	Dia.
					Qty.	3	Qty.		Qty.	3	1	@	50	16
			Dia.	25	Qty.		Qty.		Qty.		14	@	100	Qty.
					Qty.	6	Qty.	6	Qty.	6	Rest	@	200	2

$$d_{bUM(3)} = 25$$

$$d_{bS(3)} = 12$$

$$S_3 = \frac{B_{B(3)} - d_{bUM(3)} - 2\left[d_{bS(3)} + CC_B\right]}{Qty_{RED@Int.Support(3)} - 1} = \frac{450 - 25 - 2(12 + 40)}{6 - 1} = \mathbf{64.2}$$

4. The program will determine the length of each beam through their corresponding property of their respected Beam Mark (Must be converted to meter)



- Properties No. 1:

$$L_{Bn} = 2\left[D_{Bn} + d_{bUM} + S_n\left(Qty_{RED@Int.Support(n)} - 1\right) + H_{L(135)}\right] - 4(CC_B) - 11d_{bS(n)}$$

- Properties No. 2

$$L_{Bn} = 2\left[D_{Bn} + d_{bUM} + S_n\left(Qty_{RED@Int.Support(n)} - 2\right) + H_{L(135)}\right] - 4(CC_B) - 11d_{bS(n)}$$

Where:

$$H_L = Hook\ Length\ of\ the\ Stirrups(135°)\ based\ on\ the\ Table\ in\ Parameters(Renforcement)$$

Example:

BAR END HOOKS — MAIN BARS | STIRRUPS & TIES

BAR SIZE (DEFORMED)	L 90°	L 135°	L 180°
10	100	115	105
12	115	125	165
16	150	160	160
20	300	235	235
32	405	345	345

BEAM ROW

Beam Name	Quantity	Length	Clear Length	Support
B-2	1	3000	2775	1-End Support
B-3	1	7000	6475	2-End Support
B-3	2	7000	6400	2-End Support

Ref (1)

B-2	450	700	Dia.	25	Qty.	5	Qty.	5	Qty.	5	Dia.		12	Dia.
					Qty.	5	Qty.		Qty.	5	1	@	50	16
			Dia.	25	Qty.		Qty.	5	Qty.			@		Qty.
					Qty.	5	Qty.	5	Qty.	5	Rest	@	75	2

$$d_{bS(1)} = 12$$

$$H_{L(135)} = 125$$

$$L_{B(1)} = 2\left[D_{B(1)} + d_{bUM(1)} + S_1\left(Qty_{RED@Int.Support(1)} - 2\right) + H_{L(135)}\right] - 4(CC_B) - 11d_{bS(1)}$$

$$= 2[700 + 25 + 80.25(5 - 2) + 125] - 4(40) - 11(12)$$

$$L_{B(1)} = 1889.5\ mm \rightarrow \mathbf{1.8895\ m}$$

Ref (2)

B-3	450	700	Dia.	25	Qty.	6	Qty.	6	Qty.	6	Dia.		12	Dia.
					Qty.	3	Qty.		Qty.	3	1	@	50	16
			Dia.	25	Qty.		Qty.		Qty.		14	@	100	Qty.
					Qty.	6	Qty.	6	Qty.	6	Rest	@	200	2

$$L_{B(2)} = 2\left[D_{B(2)} + d_{bUM(2)} + S_2\left(Qty_{RED@Int.Support(2)} - 2\right) + H_{L(135)}\right] - 4(CC_B) - 11d_{bS(2)}$$

$$= 2[700 + 25 + 64.2(6 - 2) + 125] - 4(40) - 11(12)$$

$$L_{B(2)} = 1921.6\ mm \rightarrow \mathbf{1.9216\ m}$$

Ref (3)

B-3	450	700	Dia.	25	Qty.	6	Qty.	6	Qty.	6	Dia.		12	Dia.
					Qty.	3	Qty.		Qty.	3	1	@	50	16
			Dia.	25	Qty.		Qty.		Qty.		14	@	100	Qty.
					Qty.	6	Qty.	6	Qty.	6	Rest	@	200	2

$$L_{B(3)} = 2\left[D_{B(3)} + d_{bUM(3)} + S_3\left(Qty_{RED@Int.Support(3)} - 2\right) + H_{L(135)}\right] - 4(CC_B) - 11d_{bS(3)}$$

$$= 2[700 + 25 + 64.2(6 - 2) + 125] - 4(40) - 11(12)$$

$$L_{B(3)} = 1921.6\ mm \rightarrow \mathbf{1.9216\ m}$$

5. After determining the quantities of main reinforcement and their respective required bar length, the program will determine their respective manufactured bars and no. of manufactured pcs.

If $\sum Qty_{(n)}$ *or its* L_B *is equal to* ***ZERO*** *then,*

$$Qty_{Pn} = 0\ pcs$$

$$L_{CBn} = 0\ m$$

Else, compute

$$Qty_{Pn} = \frac{L_M}{L_{Bn}}$$

For Qty_{Mn}

If the Beam Properties No. 1: $m = 1$
If the Beam Properties No. 2: $m = 2$

Case 1: 2-End Support ▼

$$Qty_{Mn} = \frac{m \cdot Qty_{Beam(n)} \cdot \left[2\left(Qty_{A(n)} + Qty_{B(n)}\right) + Qty_{C(n)}\right]}{Qty_{Pn}\ (round\ down\ into\ whole\ number)} \cdot Qty_{Beam\ Row}$$

Case 2: 1-End Support ▼

$$Qty_{Mn} = \frac{m \cdot Qty_{Beam(n)} \cdot \left[Qty_{A(n)} + Qty_{B(n)} + Qty_{C(n)}\right]}{Qty_{Pn}\ (round\ down\ into\ whole\ number)} \cdot Qty_{Beam\ Row}$$

Then,

$$L_W = [Qty_{Pn} - Qty_{Pn}\ (round\ down\ into\ whole\ number)] \times L_{Bn}$$

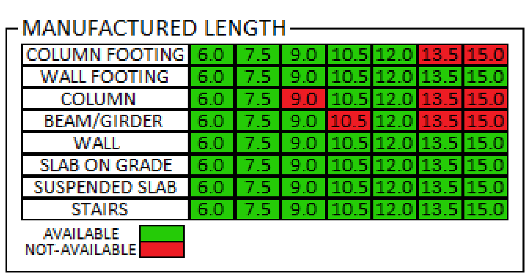
$$L_E\ (m) = [Qty_{Mn} (round\ up\ to\ whole\ number) - Qty_{Mn}] \times L_M$$

And

$$Total\ Wastage\ = L_E + L_W Qty_{Mn} (round\ down\ to\ whole\ number)$$

Then the program will choose the manufactured bar length with the lowest $Total\ Wastage$.

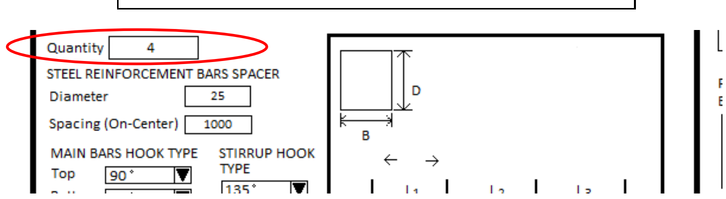
Example:

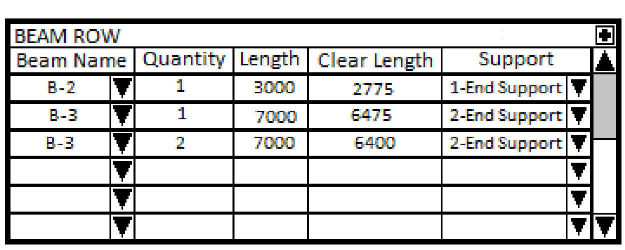


MANUFACTURED LENGTH

COLUMN FOOTING	6.0	7.5	9.0	10.5	12.0	13.5	15.0
WALL FOOTING	6.0	7.5	9.0	10.5	12.0	13.5	15.0
COLUMN	6.0	7.5	9.0	10.5	12.0	13.5	15.0
BEAM/GIRDER	6.0	7.5	9.0	10.5	12.0	13.5	15.0
WALL	6.0	7.5	9.0	10.5	12.0	13.5	15.0
SLAB ON GRADE	6.0	7.5	9.0	10.5	12.0	13.5	15.0
SUSPENDED SLAB	6.0	7.5	9.0	10.5	12.0	13.5	15.0
STAIRS	6.0	7.5	9.0	10.5	12.0	13.5	15.0

AVAILABLE
NOT-AVAILABLE

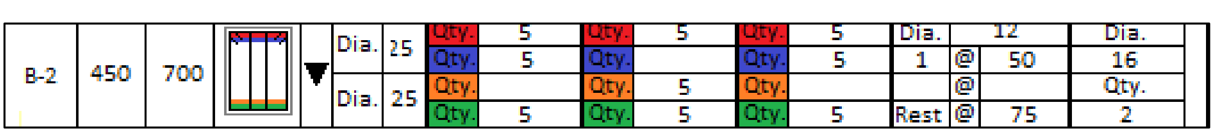




BEAM ROW

Beam Name	Quantity	Length	Clear Length	Support
B-2	1	3000	2775	1-End Support
B-3	1	7000	6475	2-End Support
B-3	2	7000	6400	2-End Support

Ref (1)



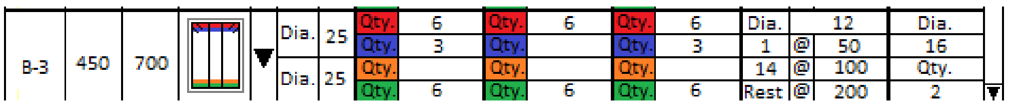
B-2	450	700		▼	Dia.	25	Qty.	5	Qty.	5	Qty.	5	Dia.		12	Dia.
							Qty.	5	Qty.		Qty.	5	1	@	50	16
					Dia.	25	Qty.		Qty.	5	Qty.			@		Qty.
							Qty.	5	Qty.	5	Qty.	5	Rest	@	75	2

$$Qty_{Total(1)} = Qty_{Beam(1)} \cdot \left[\left(Qty_{A(1)} + Qty_{B(1)}\right) + Qty_{C(1)}\right] = 1 \cdot [1 + 0 + 38] = 39$$

L [M]	Qty [Total]	L [B]	Qty (**Beam** **R**ow)	m	Qty [P]		Qty [M]		L [W]	L [E]	Total Waste
6	39	1.8895	4	2	3.18	3	104	104	0.332	0	34.476
7.5					3.97	3	104	104	1.832	0	190.476
9					4.76	4	78	78	1.442	0	112.476
12					6.35	6	52	52	0.663	0	34.476

$L_{CM(1)} = \mathbf{6\ m}$ and $Qty_{M(1)} = \mathbf{104\ pcs}$

Ref (2)



$$Qty_{Total(2)} = Qty_{Beam(2)} \cdot \left[2\left(Qty_{A(2)} + Qty_{B(2)}\right) + Qty_{C(2)}\right] = 1 \cdot [2(1+14)+19] = 49$$

L [M]	Qty [Total]	L [B]	Qty (**Beam** **R**ow)	m	Qty [P]		Qty [M]		L [W]	L [E]	Total Waste
6	49	1.9216	4	2	3.14	3	130.7	131	0.262	2	36.086
7.5					3.92	3	130.7	131	1.762	2.5	231.586
9					4.71	4	98	98	1.350	0	132.261
12					6.27	6	65.33	66	0.524	8	42.086

$L_{CM(2)} = \mathbf{6\ m}$ and $Qty_{M(2)} = \mathbf{131\ pcs}$

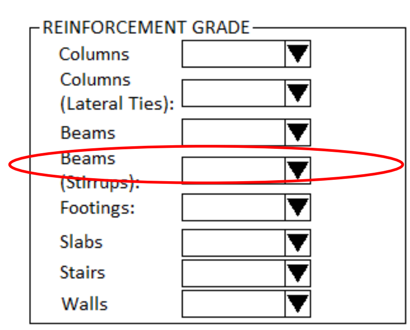
Ref (3)

$$Qty_{Total(3)} = Qty_{Beam(3)} \cdot \left[2\left(Qty_{A(3)} + Qty_{B(3)}\right) + Qty_{C(3)}\right] = 2 \cdot [2(1+14)+19] = 98$$

L [M]	Qty [Total]	L [B]	Qty (**Beam** **R**ow)	m	Qty [P]		Qty [M]		L [W]	L [E]	Total Waste
6	98	1.9216	4	2	3.14	3	261.3	262	0.262	4	72.434
7.5					3.92	3	261.3	262	1.762	5	464.934
9					4.71	4	196	196	1.350	0	264.522
12					6.27	6	130.7	131	0.524	4	72.172

$L_{CM(3)} = \mathbf{6\ m}$ and $Qty_{M(3)} = \mathbf{262\ pcs}$

6. The program will compute the Price of the Stirrup of the Beam Row



$$Price_{BR} = \sum Qty_M Price_M$$

Where:

$Price_M = Price\ of\ the\ steel\ reinforcement\ based\ on\ Pricing$

$= Sorted\ through\ Reinforcement\ Grade, diameter, and\ Manufactured\ Length$

Example

REINFORCEMENT GRADE	
Columns	Grade 60
Columns (Lateral Ties):	Grade 40
Beams	Grade 60
Beams (Stirrups):	Grade 40
Footings:	Grade 60
Slabs	Grade 40
Stairs	
Walls	

Ref (1)

B-2	450	700	▼	Dia.	25	Qty.	5	Qty.	5	Qty.	5	Dia.		12	Dia.
						Qty.	5	Qty.		Qty.	5	1	@	50	16
				Dia.	25	Qty.		Qty.	5	Qty.			@		Qty.
						Qty.	5	Qty.	5	Qty.	5	Rest	@	75	2

$L_{CM(1)} = 6\,m \;\; \& \;\; Qty_{M(1)} = 104\,pcs$

Rebar GRADE 40 (⌀12mm) [6m]- **P 234.43**

Rebar GRADE 40 (⌀12mm) [7.5m]- **P 293.04**

Rebar GRADE 40 (⌀12mm) [9m]- **P 351.65**

Rebar GRADE 40 (⌀12mm) [10.5m]- **P 410.26**

Rebar GRADE 40 (⌀12mm) [12m]- **P 468.86**

$Price_M = ₱\,234.43$

$$Qty_M Price_M = 104(234.43) = ₱\,24380.72$$

Ref (2)

B-3	450	700	▼	Dia.	25	Qty.	6	Qty.	6	Qty.	6	Dia.		12	Dia.
						Qty.	3	Qty.		Qty.	3	1	@	50	16
				Dia.	25	Qty.		Qty.		Qty.		14	@	100	Qty.
						Qty.	6	Qty.	6	Qty.	6	Rest	@	200	2

$L_{CM(2)} = 6\,m \;\; \& \;\; Qty_{M(2)} = 131\,pcs$

Rebar GRADE 40 (⌀12mm) [6m]- **P 234.43**

Rebar GRADE 40 (⌀12mm) [7.5m]- **P 293.04**

Rebar GRADE 40 (⌀12mm) [9m]- **P 351.65**

Rebar GRADE 40 (⌀12mm) [10.5m]- **P 410.26**

Rebar GRADE 40 (⌀12mm) [12m]- **P 468.86**

$Price_M = ₱\,234.43$

$$Qty_M Price_M = 131(234.43) = ₱\,30710.33$$

Ref (3)

B-3	450	700	▼	Dia.	25	Qty.	6	Qty.	6	Qty.	6	Dia.		12	Dia.
						Qty.	3	Qty.		Qty.	3	1	@	50	16
				Dia.	25	Qty.		Qty.		Qty.		14	@	100	Qty.
						Qty.	6	Qty.	6	Qty.	6	Rest	@	200	2

$L_{CM(3)} = 6\,m \;\; \& \;\; Qty_{M(3)} = 262\,pcs$

Rebar GRADE 40 (⌀12mm) [6m]- **P 234.43**

Rebar GRADE 40 (⌀12mm) [7.5m]- **P 293.04**

Rebar GRADE 40 (⌀12mm) [9m]- **P 351.65**

Rebar GRADE 40 (⌀12mm) [10.5m]- **P 410.26**

Rebar GRADE 40 (⌀12mm) [12m]- **P 468.86**

$Price_M = ₱\,234.43$

$$Qty_M Price_M = 262(234.43) = ₱\,61320.66$$

Total

$$Price_{BR} = \sum Qty_M Price_M = 24380.72 + 30710.33 + 61320.66 = ₱\,\mathbf{116511.71}$$

7. The program will then compute the total weight of the reinforcement.

$$W_T = \sum W_{Dn} L_{CMn} Qty_{Mn}$$

Where:

$W_{Dn} = Weight\ based\ of\ the\ closest\ coresponding\ diameter\ of\ the\ stirrup\ of\ each\ beam.$

Example

WEIGHT

BAR SIZE (Diameter)	kg / m
6 mm	0.222
8 mm	0.395
10 mm	0.616
12 mm	0.888
16 mm	1.597
20 mm	2.466
25 mm	3.854
28 mm	4.833
32 mm	6.313
36 mm	7.991
40 mm	9.864
44 mm	11.926
50 mm	15.413
56 mm	19.318

BEAM ROW

Beam Name	Length	Quantity	End Support (Left/Top)	End Support (Right/Bottom
B-2	3000	1	C-1 (B)	C-1 (B)
B-3	7000	1	C-1 (B)	C-1 (B)
B-3	7000	1	C-1 (B)	B-1

Ref (1)

B-2	450	700	Dia.	25	Qty.	5	Qty.	5	Qty.	5	Dia.		12	Dia.
					Qty.	5	Qty.		Qty.	5	1	@	50	16
			Dia.	25	Qty.		Qty.	5	Qty.			@		Qty.
					Qty.	5	Qty.	5	Qty.	5	Rest	@	75	2

$L_{CM(1)} = 6\,m \;\;\&\;\; Qty_{M(1)} = 104\,pcs$

$W_{Dn} = 0.888\,kg/m$

$$W_{D(1)}L_{CM(1)}Qty_{M(1)} = 0.888(6)(104) = 554.112\,kg$$

Ref (2)

B-3	450	700	Dia.	25	Qty.	6	Qty.	6	Qty.	6	Dia.		12	Dia.
					Qty.	3	Qty.		Qty.	3	1	@	50	16
			Dia.	25	Qty.		Qty.		Qty.		14	@	100	Qty.
					Qty.	6	Qty.	6	Qty.	6	Rest	@	200	2

$L_{CM(2)} = 6\,m \;\;\&\;\; Qty_{M(2)} = 131\,pcs$

$W_{D(2)} = 0.888\,kg/m$

$$W_{D(2)}L_{CM(2)}Qty_{M(2)} = 0.888(6)(131) = 697.968\,kg$$

Ref (3)

B-3	450	700	Dia.	25	Qty.	6	Qty.	6	Qty.	6	Dia.		12	Dia.
					Qty.	3	Qty.		Qty.	3	1	@	50	16
			Dia.	25	Qty.		Qty.		Qty.		14	@	100	Qty.
					Qty.	6	Qty.	6	Qty.	6	Rest	@	200	2

$L_{CM(3)} = 6\,m \;\;\&\;\; Qty_{M(3)} = 262\,pcs$

$W_{D(3)} = 0.888\,kg/m$

$$W_{D(3)}L_{CM(3)}Qty_{M(3)} = 0.888(6)(262) = 1395.936\,kg$$

Total

$$W_T = \sum W_{Dn}L_{CMn}Qty_{Mn}$$

$$W_T = 554.112 + 697.968 + 1395.936$$

$$W_T = \mathbf{2648.016\,kg}$$

8. The program will then compute the labor price of the Beam Row

$$Price_{Labor} = W_T \cdot L_R$$

Where:

$L_R = Labor\ Rate\ in\ Footing\ based\ in\ the\ Pricing$

Example:

CATEGORY: LABOR RATE (REBAR **PER KG**) - 9 items

FOOTING [KG]- **P 17**
WALL FOOTING [KG]- **P 17**
COLUMN [KG]- **P 15**
STAIRS [KG]- **P 15**
BEAM [KG]- **P 16**
FOOTING TIE BEAM [KG] - **P 16**
SLAB ON GRADE [KG]- **P 17**
SUSPENDED SLAB [KG]- **P 18**
WALLS [KG]- **P 16**

$$Price_{Labor} = W_T \cdot L_R = 2648.016 \cdot 16 = ₱\,\mathbf{42368.256}$$