

Z-Axis
Has Engineered A Solution

TM

ARCBDS

(A Reinforced Concrete Beam Detailing Software)

A Boon Tool To Generate RC Beam Details

Introduction

Z-Axis Engineering Solutions is proud to present **ARC BDS**

Using this program you can generate Beam Layout and Beam Longitudinal Section and Beam Cross section details with great speed and accuracy.

The program is designed to take minimum required input in the easiest possible way and produce outstanding ready to present drawings, generates BOQ of Steel, Concrete and the Shuttering area of the floor, saving lots of man hours of the Engineer & Detailer thereby increasing the productivity of your organization.

Please flip through the pages to know how exactly this software works and how is it beneficial to you and your organization.

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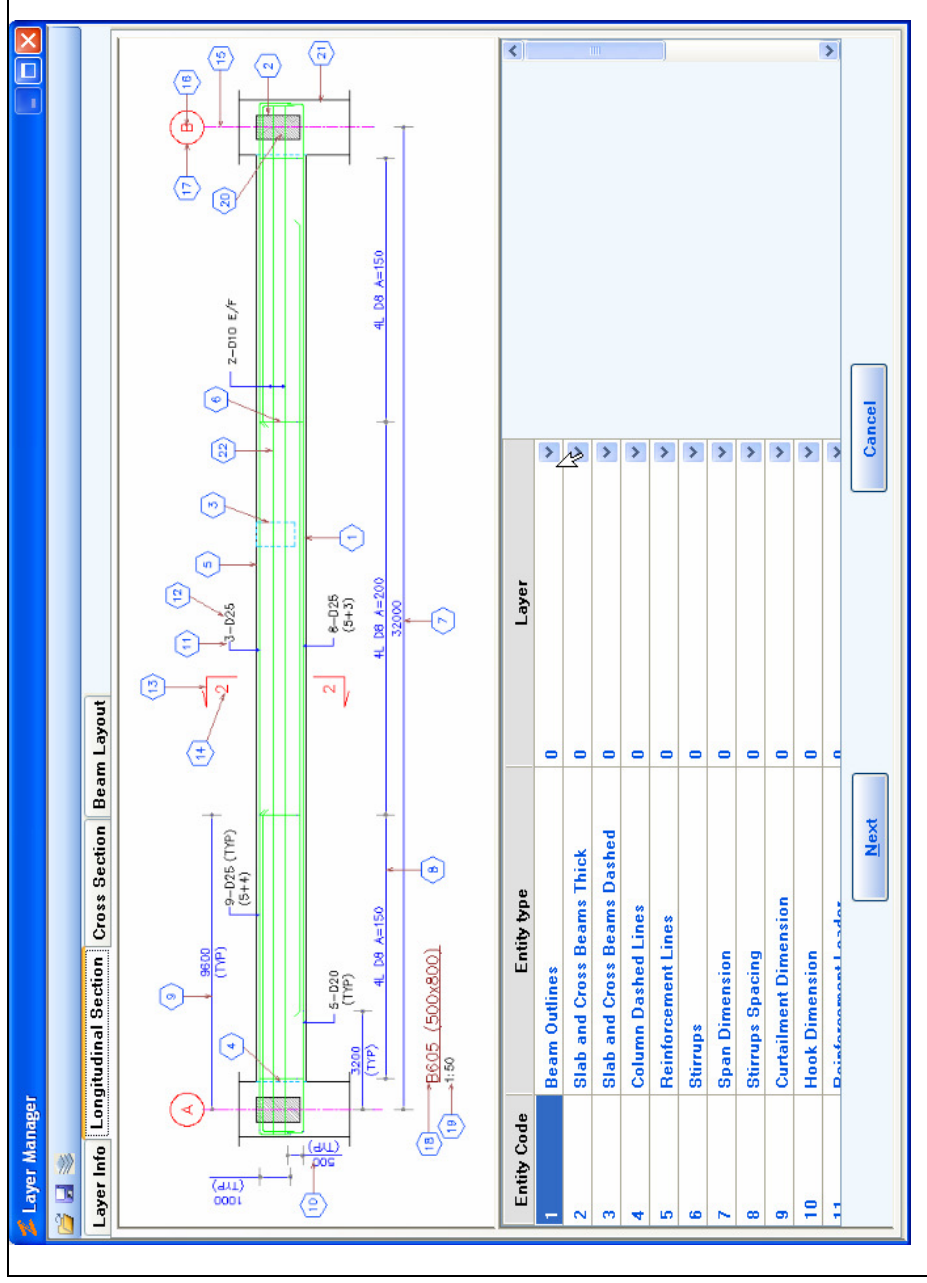
Features

The following features and benefits have been described along with views (screen shots) representation for your better grasp.

Flexibility

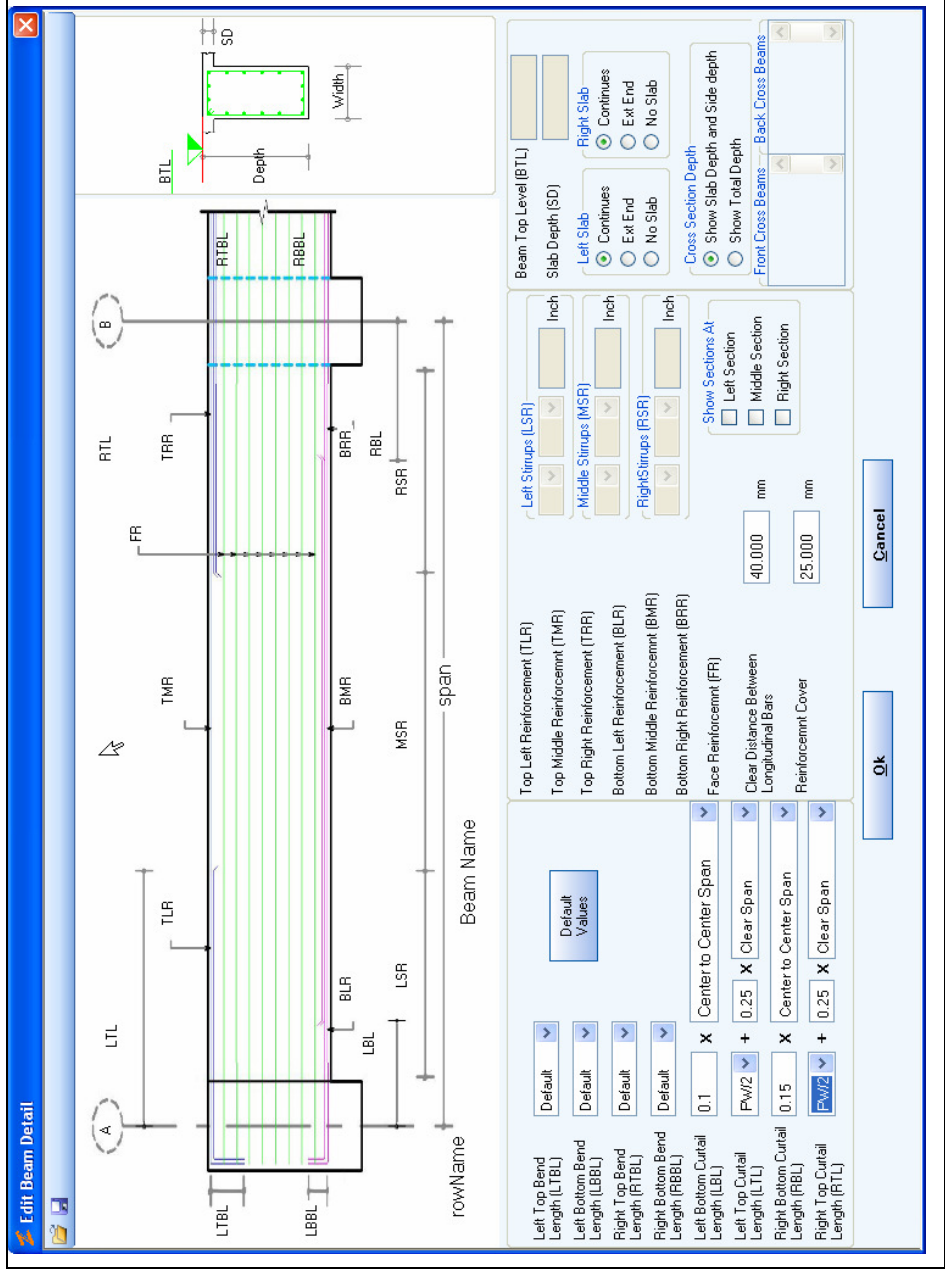
❖ Customizable layers

The user can place different entities of the layout, beam Longitudinal sections and Cross sections in the layer of his choice, this needs to be done only once so that the entities are placed in layers as per companies standards and that can be followed by all the users using the program.



❖ Customizable Beam drafting standards

The user can customize the curtailment lengths, the hook dimension, clear distance between rods, clear cover. These values can be set to company standards or project standards also, thus giving great flexibility to the program; thereby the program can be used for any detailing standards by just changing the above values. To add further, the program can be used to detail by B.S codes , Euro Codes, American Codes or any codes just by setting the standard values.



❖ Customizable output representation

The user can provide the output scale as per his requirements differently for Layout, LS and Cross sections

❖ Customizable reinforcement representation (T10, D10, #10)

The user can customize the representation of the dia of bars as per various industry standards.

❖ Grouping of multiple rows details

The user can group similar row of beams as a single row, there by reducing the details being generated

Eg B1 (B4, B6) => all these beams have same reinforcement.

❖ Input in SI or FPS system output can be in both SI system or FPS system

The input to the program can be given in SI or FPS units and the output can be generated in SI or FPS units, thus adding great flexibility to the program to choose the input / output format based on the requirements, and making the program open to the American standards also!!!

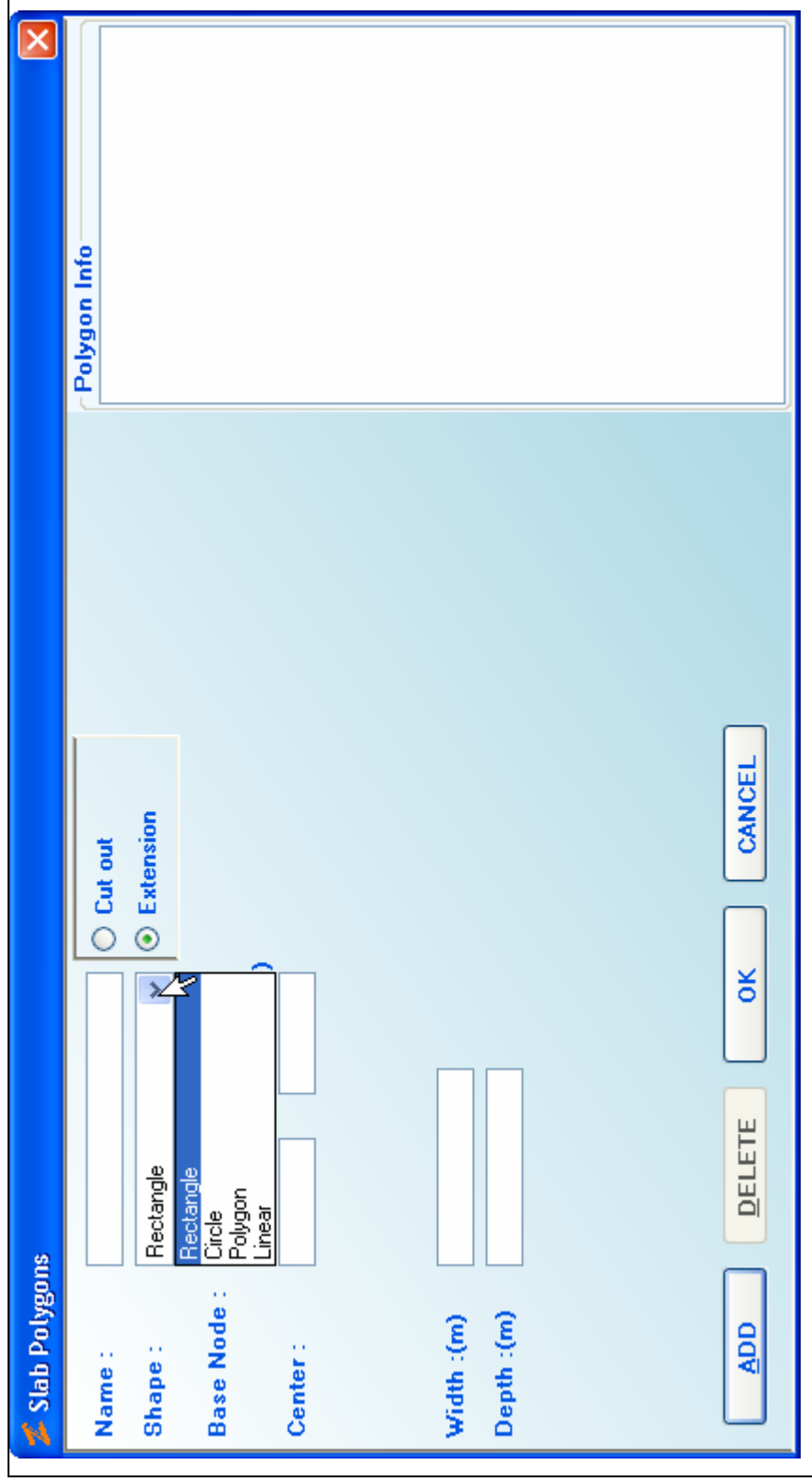
❖ Detailing system with row names or beam names

The user can chose to name the beams by the row name or individual beam name as per the company's standard.

The screenshot shows the 'Project Settings' dialog box with three main sections: 'General Data', 'Scale', and 'Output Formats'.
General Data: Building Name: MILL BUILDING; Floor Description: FLOOR AT +21.000 M LVL; Input Units: SI; Output Units: SI; Floor Level: 21.000 m; Slab Thickness: 125 mm; Slab Concrete Mix: M20; Beam Concrete Mix: M20.
Scale: Layout Scale: 1 : 100; Beam Longitudinal Section Scale: 1 : 50; Beam Cross Section Scale: 1 : 50.
Output Formats: Beam Marking Type: B1 (450 x 600), B1 (H=600); Beam Name Marking By: Row Names, Beam Names; Output Spacing Format: @ 100 C/C, A = 100; Output Diameter Format: T 10, D 10, # 10.
Buttons: OK, CANCEL.

❖ **User defined slab cut outs and extensions shapes in Layout**

The program is flexible to let the user define slab Cut outs, and slab extensions there by giving great flexibility to the user both in the beam detail layout and in the BOQ of shuttering area, concrete volume etc



Ease of Input

Layout Input Reinforcement

NODES

Node Id	X Coordinate (m)	Y Coordinate (m)	Node Type	Column Size (mmxmm)	Column Orientation	X Shift (mm)	Y Shift (mm)	Edit	Delete
A1	0	0	Column	700x900	Vertical	0	0	Edit	Delete
A2	0	10	Column	700x900	Vertical	0	0	Edit	Delete
B1	6.2	0	Column	700x900	Vertical	0	0	Edit	Delete
B2	6.2	10	Column	700x900	Vertical	0	0	Edit	Delete
C1	11.2	0	Column	700x900	Vertical	0	0	Edit	Delete
C2	11.2	10	Column	700x900	Vertical	0	0	Edit	Delete
D1	18	0	Column	900x1200	Vertical	0	0	Edit	Delete
D3	18	16	Column	900x1200	Vertical	0	0	Edit	Delete
DA	0	12.4	Free					Edit	Delete
			Column		Horizontal			Add	Cancel

BEAM DATA

Row Name	Beam Name	Left Parent	Right Parent	Beam Size (mmxmm)	Shift (mm)	Edit	Delete
01	B414	A1	A2	450x2000	0	Edit	Delete
01	B414A	A2	DA	450x800	0	Edit	Delete
02	B420	D1	D3	400x2000	0	Edit	Delete
04	B413	A1	B1	400x600	0	Edit	Delete
04	B413A	B1	C1	400x600	0	Edit	Delete
04	B413B	C1	D1	400x600	0	Edit	Delete
05	B402	A2	B2	400x800	0	Edit	Delete
05	B402A	B2	C2	400x800	0	Edit	Delete
05	B402B	C2	B420@10	400x800	0	Edit	Delete
06	B416	B1	B2	450x2500	0	Edit	Delete
06	B416A	B2	DB	450x1000	0	Edit	Delete
07	B418	C1	C2	450x2200	0	Edit	Delete
07	B418A	C2	DC	450x1000	0	Edit	Delete
08	B403	B416@8.9	B418@8.9	600x500	0	Edit	Delete
09	B404	B414@8.35	B416@8.35	300x500	0	Edit	Delete
10	B405	B418@8.07	B420@8.07	300x600	0	Edit	Delete
11	B406	B416@7.098	B418@7.098	600x500	0	Edit	Delete
12	B407	B414@6.55	B416@6.55	450x1400	0	Edit	Delete
13	B408	B418@6.17	B420@6.17	450x1100	0	Edit	Delete
14	B409	B416@5.77	B418@5.77	400x1000	0	Edit	Delete
						Add	Cancel

❖ **Very User friendly input** of Nodes, Beams & Reinforcement data

❖ **The Input of Beams Data will automatically create the Cross beams on the Main Beams in L.S.**

The intake of the input data is very user friendly and minimum possible input, and most of the data is calculate internally (such as the cross beams coming on each beam, appropriate left and right parent widths of the beam based on the column orientation).

❖ **Reinforcement Input.**

The reinforcement data can be given by front end or through a XLS file, there by giving a Data sheet for checking to the Design Engineer well before the details are drawn, there by reducing the checking time by the engineer on the L.S details of the beams. The program will automatically distribute the reinforcement into multiple layers based on width of the beam, allowed spacing between the rods. (Eg if the user gives 8-16, the program will automatically place it as (5+3) i.e. 5 rods in first layer and 3 rods in the second layer, accordingly based on the space available) the user can fine tune the arrangement through detail edit if required.

Reinforcement Data being given through Front End of the program.

Beam Row ID	Beam ID	Beam Size (mmxmm)	Top Left Reinforcement	Top Middle Reinforcement	Top Right Reinforcement	Bot Left Reinforcement	Bot Middle Reinforcement	Bot Right Reinforcement	Stirrups Left (mm)	Stirrups Mid (mm)	Stirrups Right (mm)	Face enforcement Each/Face
01	B414	450x2000	8-20	3-20	8-20	7-32	9-32	7-32	4L 8 @200	4L 8 @250	4L 8 @200	7-12
01	B414A	450x800	8-20	8-20	8-20	2-20	2-20	2-20	8 @200	8 @200	8 @200	2-12
02	B420	400x2000	8-25	3-25	8-25	40-25	15-25	10-25	4L 8 @125	4L 8 @200	4L 8 @125	7-12
04	B413	400x600	5-16	2-16	5-16	4-16	4-16	4-16	8 @200	8 @250	8 @200	2-12
04	B413A	400x600	5-16	2-16	6-16	4-16	4-16	4-16	8 @200	8 @250	8 @200	Edit
04	B413B	400x600	6-16	2-16	6-16	4-16	7-16	4-16	8 @150	8 @200	8 @150	Edit
05	B402	400x800	5-16	2-16	5-16	4-16	4-16	4-16	8 @200	8 @250	8 @200	Edit
05	B402A	400x800	5-16	2-16	6-16	5-16	8-16	5-16	8 @200	8 @250	8 @200	Edit
05	B402B	400x800	6-16	2-16	2-16	4-16	4-16	4-16	8 @200	8 @250	8 @200	Edit
06	B416	450x2500	7-25	4-25	7-25	8-32	12-32	8-32	4L 8 @150	4L 8 @200	4L 8 @150	9-12
06	B416A	450x1000	7-25	7-25	7-25	2-20	2-20	2-20	8 @200	8 @200	8 @200	3-12
07	B418	450x2200	6-25	4-25	6-25	8-32	12-32	8-32	4L 8 @150	4L 8 @200	4L 8 @150	8-12
07	B418A	450x1000	6-25	6-25	6-25	2-20	2-20	2-20	8 @150	8 @150	8 @150	3-12
08	B403	600x500	2-16	2-16	2-16	5-16	7-16	5-16	8 @200	8 @250	8 @200	Edit
09	B404	300x500	2-16	2-16	2-16	4-16	6-16	4-16	8 @200	8 @250	8 @200	Edit
10	B405	300x600	2-16	2-16	2-16	5-16	7-16	5-16	8 @200	8 @250	8 @200	Edit
11	B406	600x500	2-16	2-16	2-16	5-16	7-16	5-16	8 @200	8 @250	8 @200	Edit

Open Reinforcement Data Sheet

Load Reinforcement From Data Sheet

Editing Beam = [B414A(450x800)]

Top Left Rein	Bot Left Rein	Top Right Rein	Bot Right Rein	Top Middle Rein	Bot Middle Rein	Top Left Rein	Bot Left Rein	Top Right Rein	Bot Right Rein	Top Middle Rein	Bot Middle Rein	Face Rein
8-20	2-20	8-20	2-20	8-20	2-20	8-20	2-20	8-20	2-20	8-20	2-20	2-12

Reinforcement Data being given from the XLS Sheet generated by the program.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1																			
2																			
3																			
4	Sample Bldg 10.5 at +21 M BEAM REINFORCEMENT DETAILS																		
5	Beam Row ID	Beam Name	Beam Size mm x mm	Top Reinforcement	Bottom Reinforcement	Stirrups Left	Stirrups Mid	Stirrups Right	Face Rein (E/F)										
				Left	Mid	Right	Left	Mid	Right	No of Legs	Spacing (mm)	Dia (mm)	No of Legs	Spacing (mm)	Dia (mm)	No of Legs	Spacing (mm)	Dia (mm)	Face Rein (E/F)
6	01	B414	450x2000	8-20	3-20	8-20	7-32	9-32	7-32	4	200	8	4	250	8	4	200	8	7-12
7		B414A	450x800	8-20	8-20	8-20	2-20	2-20	2-20	2	200	8	2	200	8	2	200	8	2-12
8	02	B420	400x2000	8-25	3-25	8-25	40-25	15-25	10-25	4	125	8	4	200	8	4	125	8	7-12
9		B413	400x600	5-16	2-16	5-16	4-16	4-16	4-16	2	200	8	2	250	8	2	200	8	2-12
10	04	B413A	400x600	5-16	2-16	6-16	4-16	4-16	4-16	2	200	8	2	250	8	2	200	8	
11		B413B	400x600	6-16	2-16	6-16	4-16	7-16	4-16	2	150	8	2	200	8	2	150	8	
12		B402	400x800	5-16	2-16	5-16	4-16	4-16	4-16	2	200	8	2	250	8	2	200	8	
13	05	B402A	400x800	5-16	2-16	6-16	5-16	8-16	5-16	2	200	8	2	250	8	2	200	8	
14		B402B	400x800	6-16	2-16	2-16	4-16	4-16	4-16	2	200	8	2	250	8	2	200	8	
15	06	B416	450x2500	7-25	4-25	7-25	8-32	12-32	8-32	4	150	8	4	200	8	4	150	8	9-12
16		B416A	450x1000	7-25	7-25	7-25	2-20	2-20	2-20	2	200	8	2	200	8	2	200	8	3-12
17	07	B418	450x2200	6-25	4-25	6-25	8-32	12-32	8-32	4	150	8	4	200	8	4	150	8	8-12
18		B418A	450x1000	6-25	6-25	6-25	2-20	2-20	2-20	2	150	8	2	150	8	2	150	8	3-12
19	08	B403	600x500	2-16	2-16	2-16	5-16	7-16	5-16	2	200	8	2	250	8	2	200	8	
20	09	B404	300x500	2-16	2-16	2-16	4-16	6-16	4-16	2	200	8	2	250	8	2	200	8	
21	10	B405	300x600	2-16	2-16	2-16	5-16	7-16	5-16	2	200	8	2	250	8	2	200	8	
22	11	B406	600x500	2-16	2-16	2-16	5-16	7-16	5-16	2	200	8	2	250	8	2	200	8	
23	12	B407	450x1400	3-20	3-20	3-20	8-25	12-25	8-25	4	100	10	4	100	10	4	100	10	5-12
24	13	B408	450x1100	3-20	3-20	3-20	8-25	12-25	8-25	4	100	10	4	100	10	4	100	10	5-12
25	14	R409	400x1000	3-20	3-20	3-20	5-25	7-25	5-25	4	125	8	4	150	8	4	150	8	3-12

Power Customization

- ❖ Customizable Curtailment lengths
- ❖ Customizable Bend Lengths
- ❖ Customizable Section position display in Longitudinal Section
- ❖ Customizable Position of Arrangement of Reinforcement bars
- ❖ Customizable Beam Top Levels
- ❖ Customizable Slab Top Levels

The program allows the user the change the finer details of a single beam (which are by default calculated based on the Beam General settings data) thereby giving great flexibility to the user to change the curtailment length, beam top level, arrangement of reinforcement, slab top level, section showing etc.

Row name = 01 Beam Name = B414 (450x2000)

Parameter	Value	Unit
Left Top Bend Length (LTBL)	400.000	mm
Left Bottom Bend Length (LBBL)	350.000	mm
Right Top Bend Length (RTBL)	400.000	mm
Right Bottom Bend Length (RBBL)	350.000	mm
Left Bottom Curtail Length (LBL)	1000.000	mm
Left Top Curtail Length (LTU)	2730.000	mm
Right Bottom Curtail Length (RBL)	1000.000	mm
Right Top Curtail Length (RTL)	2730.000	mm

Parameter	Value	Unit
Top Left Reinforcement (TLR)	8-20(5+3)	
Top Middle Reinforcement (TMR)	3-20(3)	
Top Right Reinforcement (TRR)	8-20(5+3)	
Bottom Left Reinforcement (BLR)	7-32(5+2)	
Bottom Middle Reinforcement (BMR)	9-32(6+3)	
Bottom Right Reinforcement (BRR)	7-32(5+2)	
Face Reinforcement E/F (FR)	7-12	

Parameter	Value	Unit
Left Stimpus (LSR)	4L	mm
Middle Stimpus (MSR)	4L	mm
Right Stimpus (RSR)	4L	mm

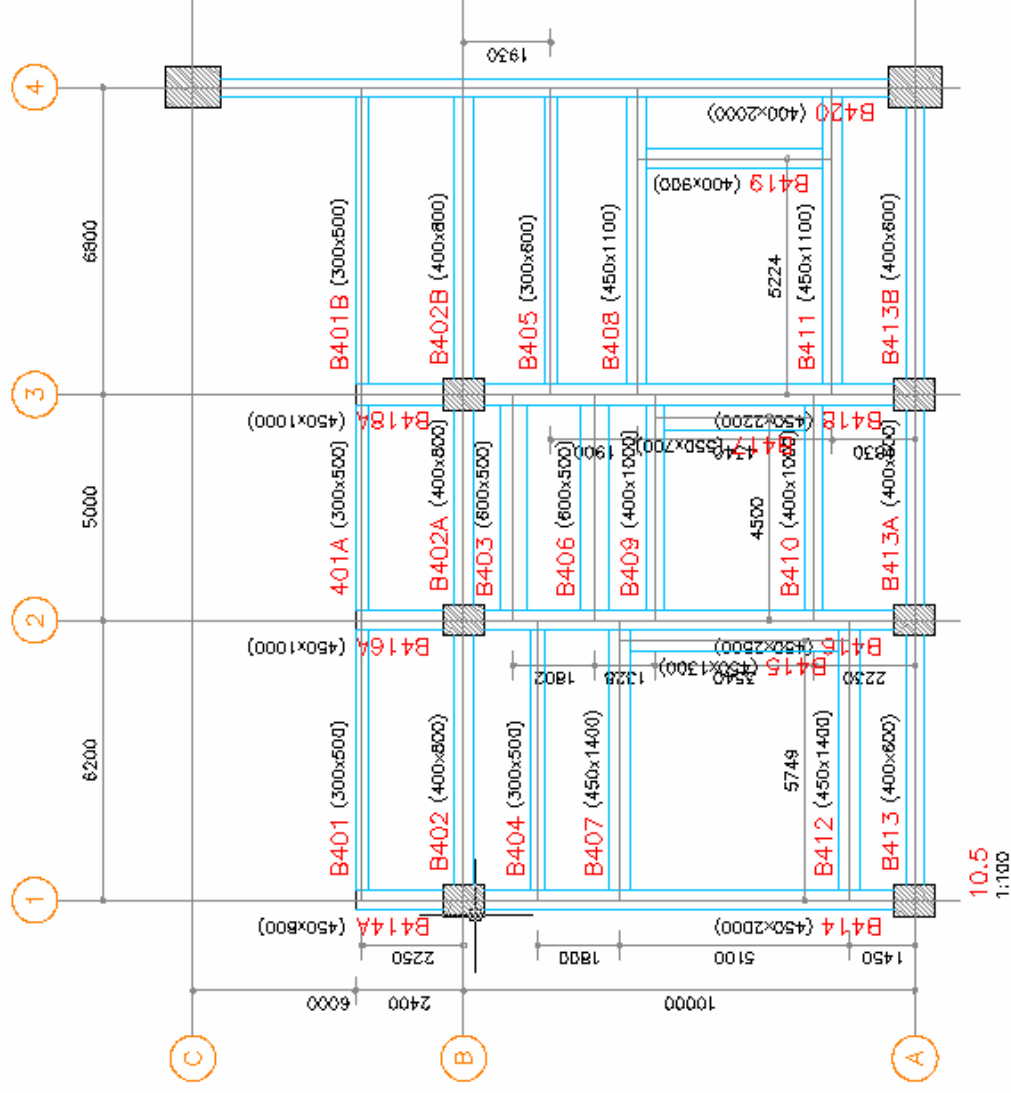
Beam Top Level: 21.000 m
Slab Depth (SD): 125.000 mm

Left Slab: Continues Ext End No Slab
Right Slab: Continues Ext End No Slab

Front Cross Beams: B413@0, B412@1.45, B421@2.7, B422@5.3

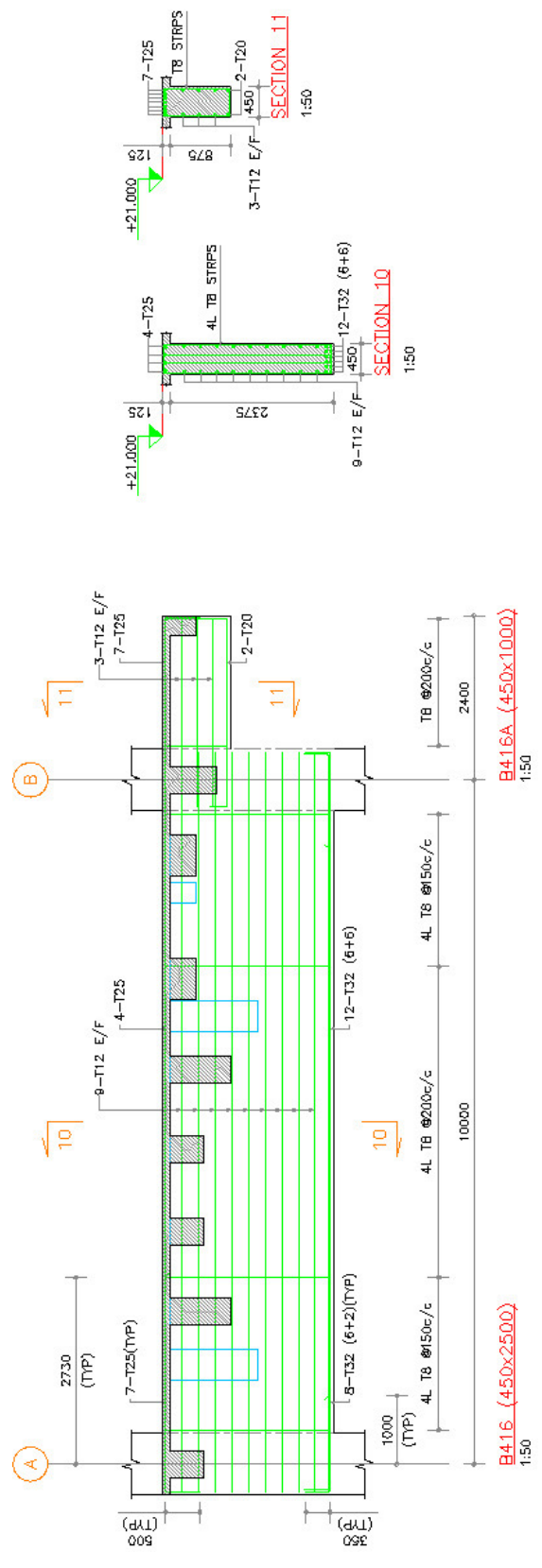
Outstanding Output

❖ Beautiful Beam Layout



The layout generated would reduce almost 80 % of the work in generating the beam layout drawing for a residential, commercial complex, and will reduce at least 60 % work for the Industrial structure, where the user has to add the insert plates, fan pedestals etc.

❖ Excellent Beam Longitudinal Section and Beam Cross section output with minimum possible clashes.



This is the icing on the cake, the output is pleasing and near perfect with almost no clashes in L.S
 The L.S generated is near perfect with almost no clashes, all the user has to do is to place them in the paper space layout appropriately based on the sheet size etc

❖ Steel Take off, detailed and abstract.

**MILL BUILDING FLOOR AT +21.000 M LVL
DETAILED STEEL BOQ**


Description	Diameter (mm)	No of Steel bars	Each Length (m)	Total Length (m)	Unit Weight (kg/m)	Total Weight (kg)
01 (B414 + B414A) TOP-REIN						
Top Straight(B414 + B414A)	20	3	13.61	40.82	2.46	100.61
Top Right Extra(B414 + B414A)	20	5	5.51	27.53	2.46	67.85
01 (B414) TOP-REIN						
Top Left Extra(B414)	20	5	3.56	17.8	2.46	43.88
01 (B414+B414A) STRRIUPS						
(B414 (LEFT STRRIUPS) D8)	8	26	4.37	113.67	0.39	44.56
(B414 (MID STRRIUPS) D8)	8	36	4.48	161.14	0.39	63.16
(B414 (RIGHT STRRIUPS) D8)	8	26	4.37	113.67	0.39	44.56
(B414A (LEFT STRRIUPS) D8)	8	4	2.43	9.71	0.39	3.81
(B414A (MID STRRIUPS) D8)	8	4	2.43	9.71	0.39	3.81
(B414A (RIGHT STRRIUPS) D8)	8	4	2.43	9.71	0.39	3.81
01 (B414) BOTTOM-REIN						
Bottom Straight(B414)	32	7	11.55	80.85	6.31	510.16
Bottom Mid Extra(B414)	32	2	8	16	6.31	100.96
01 (B414A) BOTTOM-REIN						
Bottom Straight(B414A)	20	2	3.3	6.6	2.46	16.27
01 (B414) FACE-REIN						
(B414)	12	14	10.8	151.2	0.89	134.11
01 (B414A) FACE-REIN						
(B414A)	12	4	2.75	11	0.89	9.76
02 (B420) TOP-REIN						
Top Straight(B420)	25	3	18.16	54.46	3.86	209.96
Top Left Extra(B420)	25	5	5.38	26.9	3.86	103.7
Top Right Extra(B420)	25	5	5.38	26.88	3.86	103.6


**MILL BUILDING FLOOR AT +21.000 M LVL
ABSTRACT STEEL BOQ**

Description	Diameter (mm)	Total Length (m)	Unit Weight (kg/m)	Total Weight (kg)
01				
	8	417.62	0.39	163.71
	12	162.2	0.89	143.87
	20	92.74	2.46	228.6
	32	96.85	6.31	611.12
02				
	8	862.92	0.39	338.26
	12	239.4	0.89	212.35
	25	423.99	3.86	1634.48
04				
	8	163.88	0.39	64.24
	12	74.8	0.89	66.35
	16	170.96	1.58	269.6
05				
	8	181.58	0.39	71.18
	16	160.22	1.58	252.67
25				
	10	197.3	0.62	121.54
	12	43.6	0.89	38.67
	20	18.62	2.46	45.89
	32	42.74	6.31	269.69
26				
	8	71.28	0.39	27.94
	12	7.68	0.89	6.81
	20	13.78	2.46	33.98
	25	31.43	3.86	121.16
Total Steel				
	8	3894.28	0.39	1561.84
	10	1260.66	0.62	776.69
	12	1284.34	0.89	1139.21
	16	702.36	1.58	1107.65
	20	282.42	2.46	696.15
	25	1054.97	3.86	4066.89
	32	388.39	6.31	2450.74
			Total Weight Of All Steel bars	11799.18 Kg

The Steel take off generated is highly accurate and given in detailed to maximum possible limit there by making it very easy for the checker to cross check, an abstract report of the steel take off is also generated that can be given to the contractor etc


❖ Concrete Take off of the floor.


		JOB NO./CODE: _____ SUB/COD/SHT NO: 1 OF 2 DESIGNED BY: _____ DATE _____ CHECKED BY: _____ DATE _____	
MILL BUILDING FLOOR AT +21.000 M LVL			
DETAIL CONCRETE BOQ			
Description	Volume	Units	
BEAMS			
Row: 01			
Beam B414	7.68	cum	
Beam B414A	0.59	cum	
Row: 02			
Beam B420	11.1	cum	
Row: 04			
Beam B413	1.05	cum	
Beam B413A	0.82	cum	
Beam B413B	1.14	cum	
Row: 05			
Beam B402	1.49	cum	
Beam B402A	1.16	cum	
Beam B402B	1.69	cum	
Row: 06			

		JOB NO./CODE: _____ SUB/COD/SHT NO: 1 OF 1 DESIGNED BY: _____ DATE _____ CHECKED BY: _____ DATE _____	
MILL BUILDING FLOOR AT +21.000 M LVL			
ABSTRACT CONCRETE BOQ			
Description	Volume	Units	
BEAMS			
Beams Quantity	71.98	cum	
COLUMNS (COLUMN-BEAM Junctions)			
Columns(column-beam junctions) Quantity M20	12.76	cum	
SLAB			
Slab Quantity	21.45	cum	
TOTAL			
Total Concrete Quantity	106.19	cum	

The concrete volume is calculated, for the slabs, beams, and column junctions separately both as detailed and abstract report

❖ Shuttering Area.

		JOB NO./CODE:	4	OF	4
		SUB/COD/SHT NO.:	1	DATE	DATE
		DESIGNED BY:		DATE	DATE
		CHECKED BY:		DATE	DATE
MILL BUILDING FLOOR AT +21.000 M LVL					
DETAIL SHUTTERING AREA					
Description	Length in Meter	Area in sqm			
Row 01					
Beam B414					
Bottom 450	9.1	4.1			
Side 600	0.9	0.54			
Side 1200	0.4	0.48			
Side 1400	0.4	0.56			
Side 1500	0.3	0.45			
Side 1800	16.2	30.46			
Beam B414A					
Bottom 450	1.95	0.88			
Side 300	0.3	0.09			
Side 680	3.6	2.45			
Row 02					
Beam B420					
Bottom 400	14.8	5.92			
Side 900	0.9	0.81			
Side 1200	0.4	0.48			
Side 1400	0.7	0.98			
Side 1500	0.3	0.45			
Side 1800	27.3	51.32			

		JOB NO./CODE:	4	OF	4
		SUB/COD/SHT NO.:	4	DATE	DATE
		DESIGNED BY:		DATE	DATE
		CHECKED BY:		DATE	DATE
MILL BUILDING FLOOR AT +21.000 M LVL					
ABSTRACT SHUTTERING AREA					
Description	Length in Meter	Area in sqm			
ABSTRACT BEAM SHUTTERING					
SIDES					
Side 300	1.4	0.42			
Side 600	0.9	0.54			
Side 100	0.09	0.09			
Side 200	0.8	0.16			
Side 300	1.4	0.42			
Side 360	63.1	23.96			
Side 480	42.7	20.45			
Side 500	1.2	0.6			
Side 570	6.3	3.58			
Side 600	0.9	0.54			
Side 680	33	22.44			
Side 2000	1.5	3			
Side 2080	13.4	27.87			
Side 2380	13.4	31.89			
Total Side Area		324.09			
BOTTOMS					
Bottom 400	59.7	23.86			
Bottom 450	62.1	27.93			
Bottom 550	3.2	1.73			
Total Bottom Area		53.51			
Total beams shuttering area		377.6			
COLUMNS (COLUMN-BEAM Junctions) SHUTTERING					
Total Columns(column-beam junctions) Shuttering		47.75			
SLAB SHUTTERING AREA					
Bottom		162.17			
Side	74.75	9.34			
Total Slab Shuttering Area		171.59			

The shuttering area is calculated accurately. Slabs (by deducting cut outs, and adding slab extensions accordingly), beam bottoms, beam sides, column sides all are separately calculated there by aiding the contractor etc