



Custom Concrete Column Bar Setout

In this tutorial:

- Creating a concrete column with a custom bar layout

Note: Both the Shear and Confinement are based on the reinforcement arrangement for the standard column setout and do not calculate the capacity for the custom layout.

The capacity is based on positive bending resulting in compression in the top (about x-x axis) and left (about y-y axis).

Step 1 – Creating a Custom Steel Section in Section Properties

1. Setup a standard column like what you want

Geometry			
Concrete strength (f'c) =	50 MPa	Min. Ecc.y (0.05*cX) =	23 mm
Size (cX=D) =	450 mm	Min. Ecc.x (0.05*cY) =	23 mm
Size (cY=B, cY=0 for Circle) =	450 mm	Tie diameter =	12 mm
Circ. reinft pattern =	N (Y)es,(N)o	Min. tie diameter =	6 mm
Cover to ties (cover) =	30 mm	Max. spacing (Rest.) =	300 mm
Bar size (db) =	20 mm		
No. bars in X face (nox) =	4	Clear gap (ccx) =	95 mm
No. bars in Y face (noy) =	4	Bar spacing (scx) =	115 mm
Steel yield strength (fsy) =	500 MPa (Class N)		

Figure 1-Column geometry and bars

You will need to set the geometry of your column in the [Capacity] Tab as you would for any column design. Also set the number of bars you want in each face. You can add or subtract these later, however this will set the basis for your custom bar setout.

2. Go to the [Calculations] tab
3. In the side Notes area, Use Custom = "Y"



4. Press the [Generate...] button

Reduce compression area for bars = Y (Y)es,(N)o
 Override min. concrete = N (Y)es/(N)o

Use Custom = N (Y)es,(N)o
 Rotate circular pattern half spacing = N (Y)es,(N)o

Flips X values (cx-x)

Flips Y Values (cy-y)

Generates the custom layout from the current

Clear the custom table

Figure 2-Custom layout generation and use selection

Clicking the generate button will create a bar layout based on your inputs on the [Capacity] tab. You must select “Y” in the selection box titled “Use Custom” for the custom bar layout to be used in your design.

5. In the table, remove or modify the bars and setouts

Layer No.	Bars Dia. mm	Area Asi - mm ²	Depth (x) mm	Depth (y) mm
1	20	314	52	52
2	20	314	167	52
3	20	314	283	52
4	20	314	398	52
5	20	314	52	167
6	20	314	398	167
7	20	314	52	283
8	20	314	398	283
9	20	314	52	398
10	20	314	167	398
11	20	314	283	398
12	20	314	398	398
13		0		

Figure 3-Automatically generated bar layout

The automatically generated bar layout will have bars of the diameter nominated on the [Capacity] tab and equally spaced based on the number of bars per face.



Layer No.	Bars Dia. mm	Area Asi - mm ²	Depth (x) mm	Depth (y) mm
1	32	804	52	52
2		0	167	52
3		0	283	52
4	32	804	398	52
5	20	314	52	167
6	20	314	398	167
7	20	314	52	283
8	20	314	398	283
9	32	804	52	398
10	20	314	167	398
11	20	314	283	398
12	32	804	398	398

Figure 4-Altered bar layout

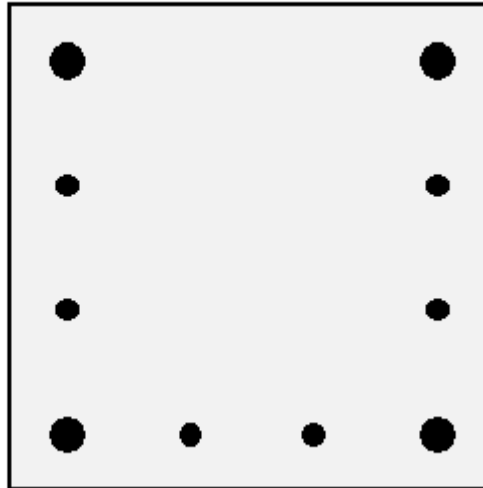
You can then change individual bar sizes, delete bars or change the position of the bars within the column.



6. Preview in the [Preview] tab

Preview

Warning - Custom bar setout



Bar	X mm	Y mm	No. Bars	Spacing mm	Area Asi - mm ²
1	52	52	1	0	804
2	167	52	0	0	0
3	283	52	0	0	0
4	398	52	1	0	804
5	52	167	1	0	314
6	398	167	1	0	314
7	52	283	1	0	314
8	398	283	1	0	314
9	52	398	1	0	804
10	167	398	1	0	314
11	283	398	1	0	314
12	398	398	1	0	804

Figure 5-Custom bar preview

Once you have changed your bar layout, go to the preview tab to ensure the changes you have made are reflected correctly in the preview.

7. [Recalculate...]

Warning - Recalculation required

Recalculate...

Figure 6-Recalculate on the Capacity Tab



After confirming your custom bar layout is correct, go back to the capacity tab and click on the [Recalculate...] button. This will ensure the capacities used in design are based on your custom bar layout.

8. Switch to the [Calculations] tab again, and press the [Flip about X-X...] or [Flip about Y-Y...] to assess from the reverse direction.

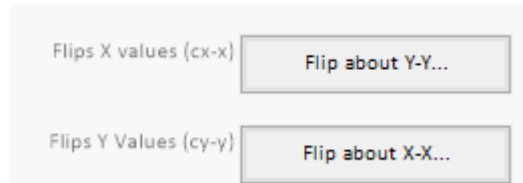


Figure 7-Flip axis buttons

Important! You must flip the axis of the custom bar setout and [Recalculate] to ensure the capacities are assessed in each direction – they are no longer symmetrical as with the standard setout and have a capacity that may be different from each direction.

If you are using a circular column you should also “Rotate circular pattern half spacing” and [Generate...] again and review capacities. This is automatically done for standard circular layouts