

New in Design Expert version 3.3

All modules

Export to ZWCAD 2017 is added. Older versions of ZWCAD+ 2014 and 2015 are also supported.

A connection is added between mark labels in sections and the corresponding bars. After the reinforcement is transferred to ZWCAD or AutoCAD, each time the bar mark is changed, all referenced labels will be automatically updated. This option is available for ZWCAD 2017 only, as well as AutoCAD. RC Detailing Plug-in need to be also installed.

Steel Expert

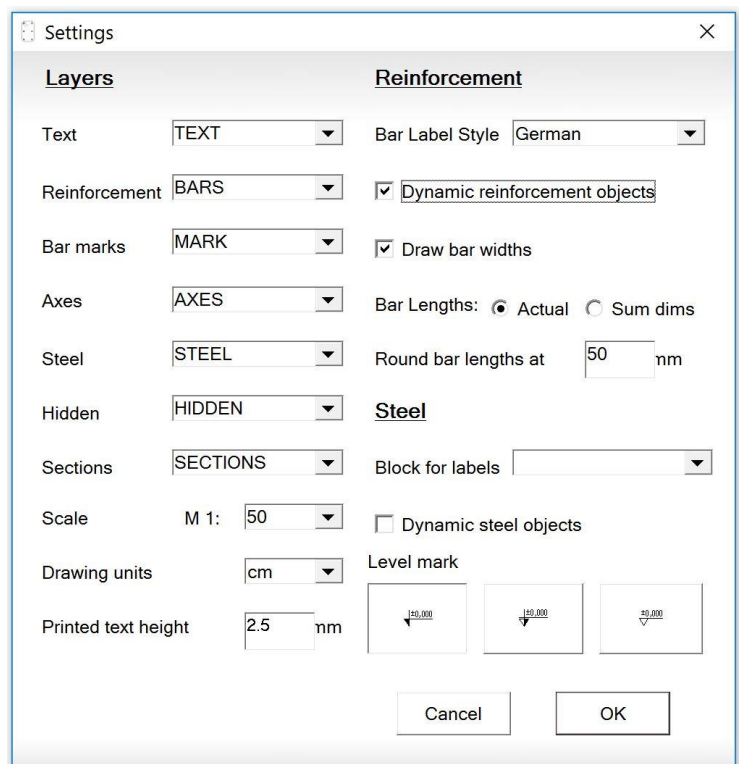
A new case is added for lateral-torsional analysis: simply supported beam with uniform load and lateral bracing at the middle of the compression flange. For that case, factor C_1 is assumed to be $C_1 = 1.3$. In older versions, it used to be calculated as $C_1 = 1.88$. That was because, for non-standard cases, C_1 is obtained by dividing the bending moment diagram at bracing points and assuming linear distribution for each segment. For multiple bracings, this is a good approximation to the actual diagram, except for this special case of one bracing at the middle. This is a very common case and that is why, it was isolated as a special case.

Reinforcement Detailing Plug-in

All new features are supported in both ZWCAD 2017 and AutoCAD.

Settings

1. A new option is added for drawing of bars with zero polyline widths. That allows users to assign lineweights for plotting by layer, color or object. In AutoCAD, polyline widths are relevant for plotting and other setting are not applicable when they are not exactly zero.
2. A new style **German** is added for bar labeling. This option allows bar labels and bending schedules to be according to German standards and in German language.
3. Different methods for calculation of total bar lengths are added. The module provides two options:
 - a. **Actual length** – bar length is measured along the middle axis of the bar including bending radiuses.
 - b. **Sum of dims** – the length is calculated as a sum of dimensions of straight segments, as they are labeled on the bar.



Drawing and labeling of bars

- An option is added to select if a bar should be included into the bending schedule or not. This allows a single bar to be drawn and labeled at two places (e.g. plan or elevation) but to be counted only once. Mark labels are inserted into the "MARK" layer for all bars to be scheduled. Otherwise they are placed into the "TEXT" layer. If you change the color or lineweight of layer "MARK" you will clearly see which bars will be scheduled.

Bar Label

Bar mark 197 Member - As = 25.4 cm²/m

Count 15 No of mbrs - Label Style: General

Type N Include in BOM Text Leader

Size 18 Radius - Label Alignment: Bar Zone

Length 290 Scale 1.0

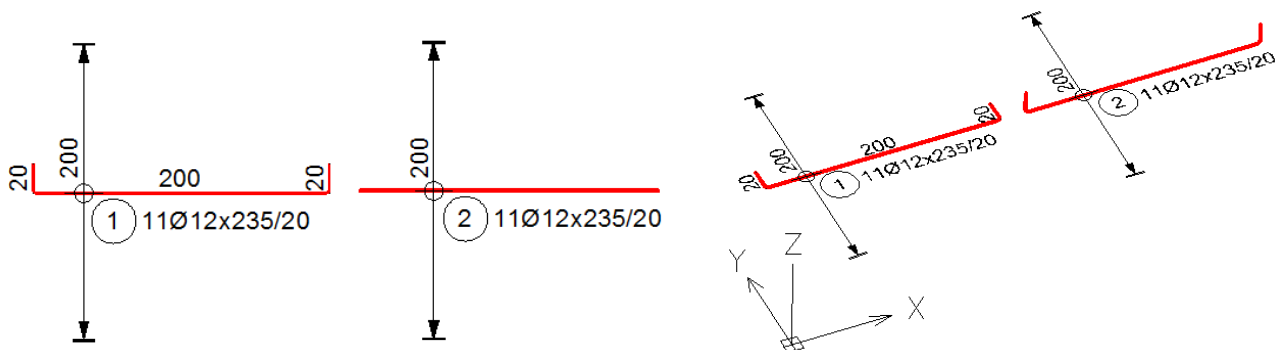
Spacing / 10 Dimensions

Note - Bar View: Side Plan

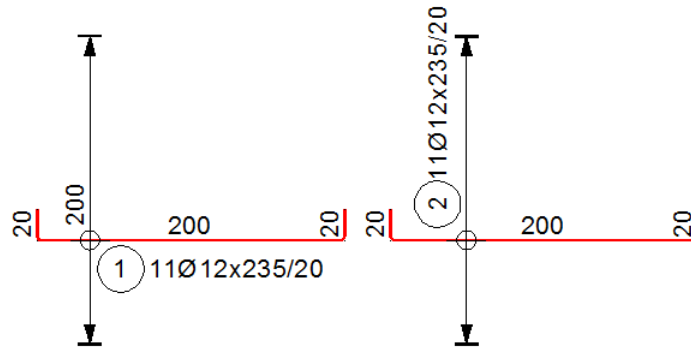
Arrangement Zone

Cancel Enter

- You can select different bar views: "Side" and "Plan". Bars with "Side" view are drawn within the current drawing plane. Bars with "Plan" view are drawn in a perpendicular plane. They are seen from above as a single line. You should rotate the drawing in 3D to see actual shapes of such bars. When bar view is set to "Plan", dimensions are not displayed.

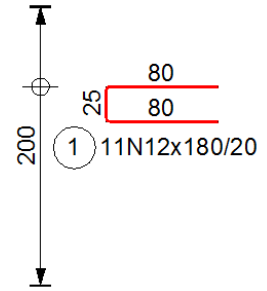


- You can easily switch between "Side" and "Plan" views. Select bars and start the "BARLABEL" command. Select the preferred option (Bar View) and click "Enter" without changing the rest of the data (unless it is necessary).
- Bar labels may be aligned either with bars or arrangement zones, depending on user preferences (Label Alignment: Bar, Zone). The second option is used in many countries for labeling of bars in slabs and walls.



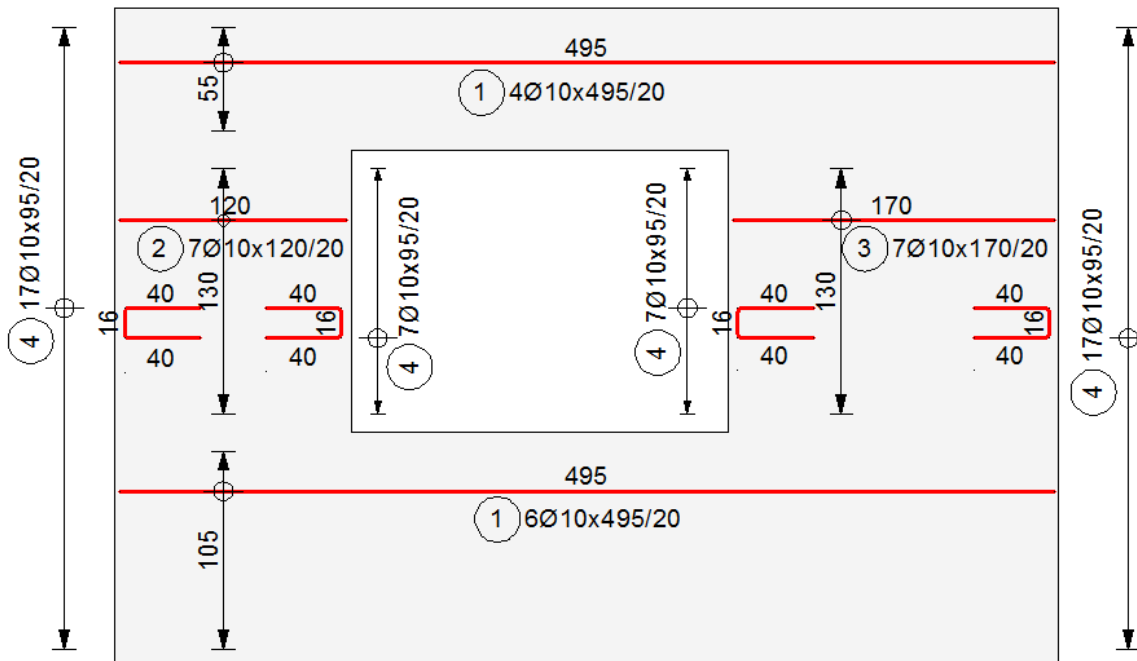
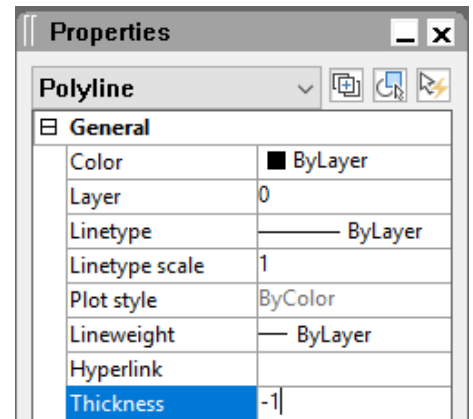
Zones

8. The circle at bar-zone intersection is now part of the whole group. When you move either the bar or the zone, circle moves automatically to remain at the intersection.
9. It is not necessary that zone intersects the corresponding bar. It can be located outside. This is often used for shear links or slab edge reinforcement (U-bars).



Slab reinforcement

10. You can define holes where the reinforcement to be cut. Draw a rectangle or polyline and assign a negative value for thickness, for example -1. This can be done using the "Properties" side panel. If it is not visible, it can be opened with the "MODIFY" command (shortly MO). Then start the slab reinforcement command and select all main contours and holes together. This will generate reinforcement which will be automatically cut around the holes. They are considered while computing the geometry of bars and zones.



Slab reinforcement dialog box settings:

- Start mark: 3
- Slab depth: 20 cm
- Type/size: N 10
- Spacing: 20
- Direction: X
- Bottom reinforcement selected
- Max. length: 1200 cm
- Slab depth: 20 cm
- Cover: 1.5 cm
- Anchorage: 34 Ø
- Lapping: 40 Ø
- Bar View: Side
- Label Alignment: Bar
- Lengthen left:
- Lengthen right:
- Add hooks:
- Add U-bars:
- Zones:
- Shrink:
- Labels:
- Dimensions:
- As = 3.93 cm²/m

- Settings for bar view (**Side** or **Plan**) and label alignment (**bar** or **zone**) are also included in Slab reinforcement dialog.
- A new option for automatic generation of **U-bars** along the slab edge is added. Just click on the “**Add U-bars**”. The horizontal dimension of the U-bar is taken the greater of $2h_{pl}$ and the lapping length.
- Zones can shrink automatically to leave spacing between consecutive zones (“**Zones**” - “**Shrink**”). This option solves the problem with duplicate bars at the ends of adjacent zones. In general, bar count is calculated as zone length divided by bar spacing plus one. But this is applicable only for a single zone. For consecutive zones the last bar in each zone will duplicate the first one in the next zone, unless the “Shrink” options is selected.

Labeling of bars in section

- Bars in sections are drawn as circles with the appropriate diameters. Usually, labels for the corresponding bar marks are added as well. This is performed by standard AutoCAD/ZWCAD commands like **Text**, **MText**, **Leader**, **MLeader** etc. A **block** with single attribute can be used as well. The software allows you to connect these mark labels to the corresponding bar objects. After that, each time you change the bar mark, all connected labels will be updated as well. This command is very useful when you use bar auto-numbering for the whole drawing. The connection is created by the “**ATAN**” command (Attach Annotations). You should click the respective bar and select the annotation objects in sections to be attached with it. To remove the connection between bars and labels use the “**DETAN**” command (Detach Annotations).

Bending schedule and BOM

- The automatic renumbering of bar marks has been improved. Detailed analysis of bar geometry is performed additionally to comparison of diameters, lengths and shape types. Equal bar marks are assigned for those bars that have identical shapes and dimensions within certain tolerances. Transformations like rotation or mirror are considered as well.