

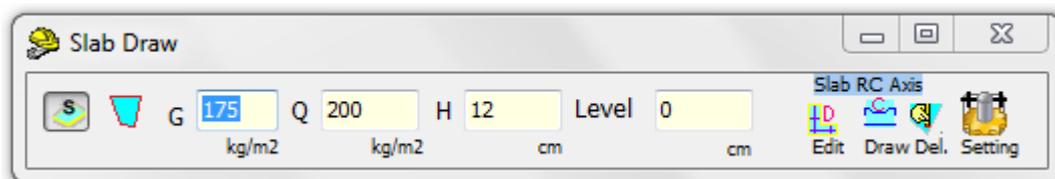
### 3.4- DRAWING SLAB

**Important note:** In order to perform load transfer, slab edge should be supported from the center of the element (static axis), to which load will be transferred.

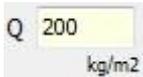
In StatiCAD-Yigma software, slabs are used for transferring loads and self weights to walls. Slab calculation axes enable the reinforcement calculations of concrete slabs. Lack of slab calculation axis in an area where a slab is present would result in lack of concrete slab calculation and drawing operations. Similarly, lack of slab in an area where slab calculation axis is present would cause lack of load transfer from the calculation axis to wall; and slab calculation axis weights cannot be used in earthquake calculations. When slab is created with rectangular slab  or quadrilateral slab  commands, slab calculation axes are automatically generated with the same properties. In slabs with special shapes like L, T, Z, H; slab calculation axes' coordinates should be changed in order to draw slab reinforcements in a proper way. In such situations, slab calculation axes can be modified with commands like ,  and . As calculation axes are automatically generated except special conditions, no other operation is necessary.

By definition, different G and Q loads, levels, slab heights and supporting conditions can be applied to slabs and slab calculation axes. So, when you change G, Q, K, Level values of drawn slabs, you should change slab calculation axis properties as well (if there are no special conditions).

To draw slab, slab properties form is displayed by clicking the  button in the main window. When  button is selected, (slab toolbar is displayed) slab drawing mode is active.



Total coating load except self concrete weight (ceiling coating+leveling concrete under coating+coating weight+etc..) is entered in the  box in Draw Slab toolbar. Entry unit is  $\text{kg/m}^2$ .

Live load on the slab and slab calculation axis is entered in the  box in Draw Slab toolbar.

 is the concrete height of slab and slab calculation axis. It can be changed if necessary.

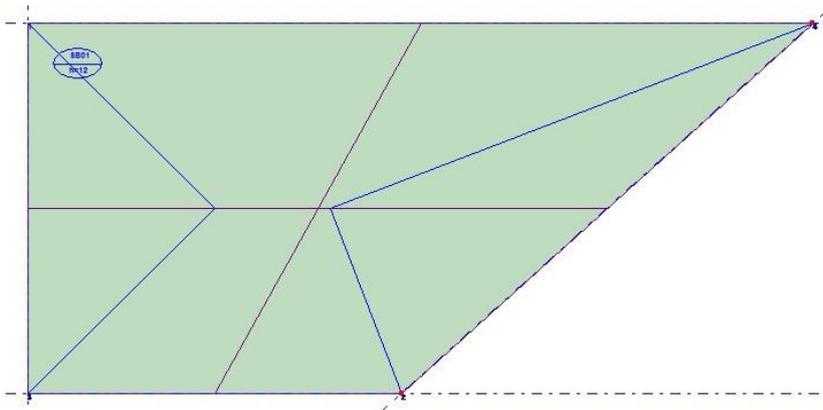
Level 0  
cm

is the elevation of slab surface from the story up level defined in general story settings. Positive (+) values refer to up, negative (-) values refer to down. For example, Level value should be set as -25 for a slab 25 cm below the story ceiling.

Software is in rectangular slab drawing mode when  button is selected in the Draw Slab toolbar. When top left and bottom right points of the slab are selected by left mouse click, the software draws the rectangular slab and slab calculation axes.

Software is in quadrilateral slab drawing mode when  button is selected in the Draw Slab toolbar. Rectangular or quadrilateral slabs can be drawn. To define slab, four corners should be clicked in the main window, with respect to nodes. When top left, bottom right, bottom left, top right points of the slab are selected by left mouse click, the software draws the quadrilateral slab and slab calculation axes.

If clickings are performed in a different order, the software rearranges the clicking order.



When slab is drawn, load transfer areas are displayed (with bisectors drawn from slab corners) as if all slabs are supported from four sides. After the analysis, the software tries to display load transfer areas accurately for slabs supported from 1-2-3 sides.

If any slab bisector intersection points (blue inner lines) are present outside the slab, it will be convenient to erase the slab and redraw it. After the analysis, the software detects the slabs that perform faulty load transfer and highlight those on the main screen, reporting the slab is incorrect. In such cases, it would be convenient to erase the incorrect slab and rerun analysis.

While transferring loads from the slab to horizontal bond beams and walls, StatiCAD-Yigma linearizes load transfers compared to triangular and trapezoid areas and performs load transfer to connected elements. **In order to perform load transfer, slab edge should be supported from the center of the element (static axis), to which load will be transferred.**

If there are no bearing elements in the entirety of slab edge, there is not any problem with load transfer. However, slab concrete calculations can only be carried out in four-side and one-side supported slabs (cantilever). Efforts were taken in order to preserve safety for two and three side supported slabs.

If there are no bearing elements (wall, horizontal bond beam) in parts of slab edge, no load transfer is performed in those parts. As the calculations slightly differ for slabs of L, T, +, H, etc. shapes; a user willing to make more accurate calculations can place horizontal bond beams next to slab edges, in order to maintain continuity.

Slab static and concrete calculations are performed with regard to the simple method presented in TS.500. The user must investigate the situations that the method can be used; and must perform slab calculations as well where the method cannot be used.

When slab is created with rectangular slab  or quadrilateral slab  commands, slab calculation axes are automatically generated with the same properties. In slabs with special shapes like L, T, Z, H; slab calculation axes' coordinates should be changed in order to draw slab reinforcements in a proper way. In such situations, slab calculation axes can be modified with commands like  Del,  Edit and  Draw. As calculation axes are automatically generated except special conditions, no other operation is necessary.

When delete  Del command is active in Draw Slab toolbar, slab calculation axis can be deleted by clicking on it.

When edit  Edit command is active in Draw Slab toolbar, after deleting slab calculation axis, a new axis with the same properties can be created by clicking top left, bottom right, bottom left and top right points of the slab calculation axis.

When  Draw command is active in Draw Slab toolbar, a new axis can be created by clicking top left, bottom right, bottom left and top right points of the slab calculation axis. A new slab calculation axis is created.

**Note:**  and  commands create slabs and slab calculation axes at the same time, where  Draw command only creates slab calculation axis. It does not recreate the slab used in load transfer and earthquake calculations. Except for special conditions,  and  commands will suffice.

If a wall is defined over the slab, no load transfer is performed between up story walls and down story slabs. Hence, when it is necessary to define wall over the slab, it would be convenient to draw horizontal bond beam under the wall (down story ceiling) If no horizontal bond beam is present, beam height can be equal to slab height.



Setting button opens a window, from which Draw Slab toolbar settings can be performed in another form. This feature is not necessary for new slabs and slab calculation axes to be drawn. When slab or slab calculation axis properties will be changed, property changes are done in this form.

The screenshot shows a dialog box titled "Döşeme Özellikleri" (Slab Properties). It contains several input fields and labels:

Property	Value	Unit	Description
ID	S01		Slab ID
h	12	cm	Slab Thickness
G coating	175	kg/m <sup>2</sup>	Slab Coating weight per unit area
Q	200	kg/m <sup>2</sup>	Slab Live Load
Elevation	0	cm	Distance between slab up level and story up level (down direction (-))

At the bottom of the dialog box, there are two buttons: "Ok" and "Cancel".

There is no need to enter any information in the Slab ID section. The software automatically assigns names while drawing.

H Slab thickness is entered as centimeters.

Slab concrete dead load should not be entered while entering slab coating weight per unit area. The software automatically calculates the dead load of the slab, regarding slab thickness. Weights of coating materials over and under the slab concrete are calculated and values (coating, screed, drop ceiling, ceramic, timber, etc.) are entered in kg/m<sup>2</sup>.

Slab live load should be selected by the user, as per TS.498 terms.

After entering data in Draw Slab form, the window is closed by clicking OK. Desired number of slabs are drawn by marking first and second points, so that they go through the axis intersections drawn earlier.

In order to keep the program in Drawing mode, Draw Slab toolbar should not be closed while drawing.