

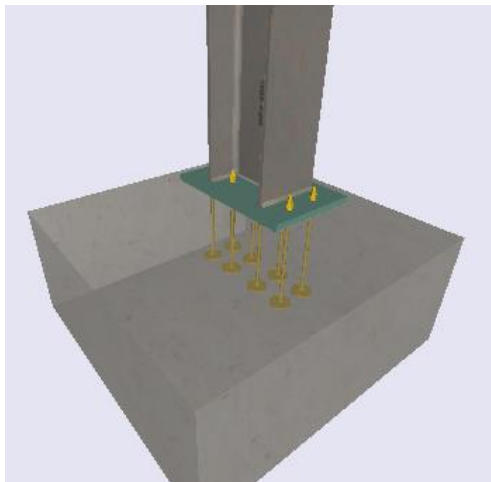


New version of program STEELCON 2018.068

Dear colleagues,

A new version of the “STEEL CONNECTIONS” program for the design of bolted and welded steel connections has been released.

New Anchorage Calculations for Footing Plate Connection



In Steel Structures the height of the foundation is often too small for a proper embedment length of the anchors. In this case we must use headed anchors that decrease the anchor length significantly. The program performs all the checks that are demanded by the Eurocodes.

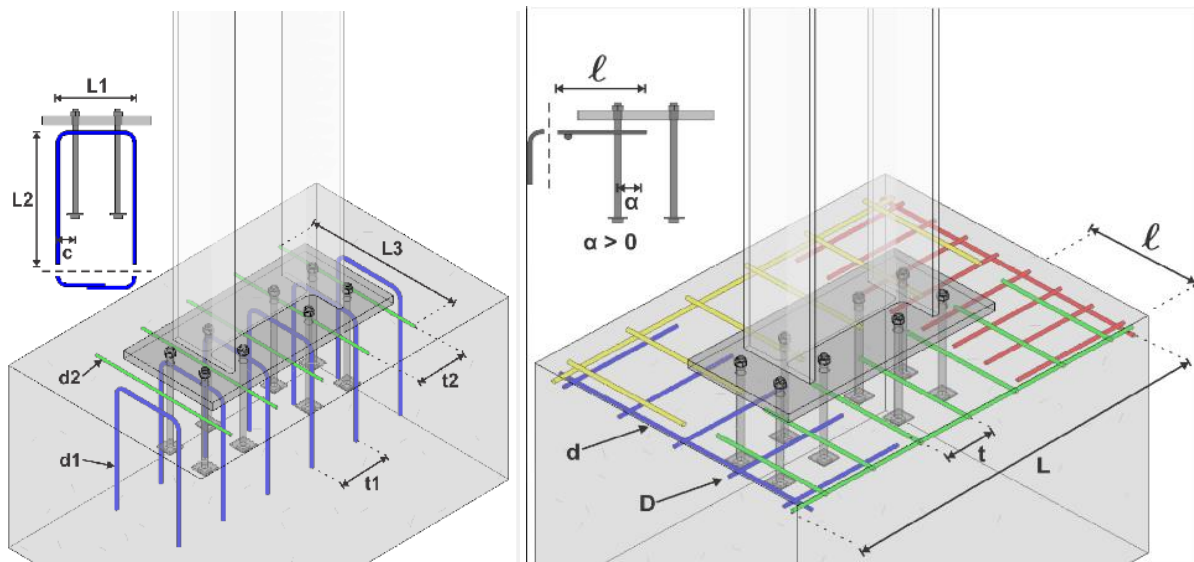
Node: -99-LC : -99 Results - Unnamed-21

Results	Interaction Diagram	Stiffness	Anchorage	Tension Reinf.	Shear Reinf.
Steel in Shear Ratio: 0,16 Frk: 38,27 Frd: 31,89 CRITICAL 0,16				Steel in Tension Ratio: 0,49 Frk: 325,63 Frd: 217,08 CRITICAL 0,98	
Concrete Edge Ratio: 0,48 Frk: 200,66 Frd: 133,77 CRITICAL 0,64			Splitting Resistance Ratio: 0,28 Frk: 564,04 Frd: 376,03 CRITICAL 0,57		
					Concrete Cone Ratio: 0,52 Frk: 63,79 Frd: 53,16 CRITICAL 0,54
Pryout Ratio: 0,15 Frk: 651,25 Frd: 434,17 CRITICAL 0,19			Blow Out Ratio: 0,00 Frk: ---- Frd: ---- CRITICAL 0,00		N-V-Ratios Concrete: 0,20 Steel: 0,91
			Pull Out Ratio: 0,25 Frk: 317,33 Frd: 211,55 CRITICAL 0,25		 Anchors Type: Anchor With Lower Plate Required anchorage length: 290,00 Required supporting plate dimension (diameter or side): 50,00

Y Axis
 Z Axis
 Y and Z Axis

Exit

These checks are very hard to nearly impossible to be met without using any supplementary reinforcements. In this new version of the program, the user is able to calculate the additional tension or shear reinforcement bars in order to not allow concrete crack lines to be formed.



All the calculations are based in Eurocode standards, and the loadings can be applied to both, major and minor axes, as was in the previous version.

The printouts are in full detail, containing formulas and intermediate results to ensure that the calculations are well documented.

Action to resistance ratio for pull-out failure, $\beta_{N,p}$

Reference: B.3.3.4[?]

$$\beta_{N} = \frac{N_{Ed}}{N_{Rd}} \leq 1 \quad \beta_{V} = \frac{V_{Ed}}{V_{Rd}} \leq 1 \quad \beta_{N} + \beta_{V} \leq 1 \quad (\text{B.11 - B.13}[?])$$

Parameters:

Action to resistance ratio for cone failure, $\beta_{N,c}$	0.13
Action to resistance ratio for splitting failure, $\beta_{N,sp}$	0.25
Action to resistance ratio for blow-out failure, $\beta_{N,cb}$	0.15
Action to resistance ratio for edge failure, $\beta_{V,c}$	0.00
Action to resistance ratio for pry-out failure, $\beta_{N,cp}$	0.07
Maximum action to resistance ratio for tensile failures, β_{N}	0.02

Maximum action to resistance ratio for shear failures, β_{V}

= 0.25

Tension-shear interaction ratio, β_{NV}

= 0.07

No true biaxial action

= 0.33

Verification :

0.33 ≤ 1.00 ✓