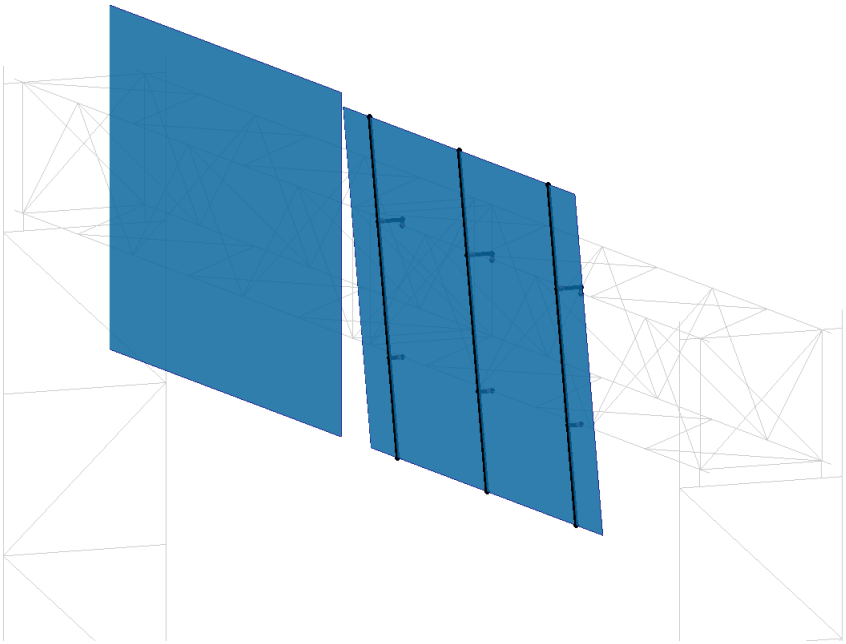
NEW PANELS (REINFORCED PANELS, VMS AND WALKWAYS)

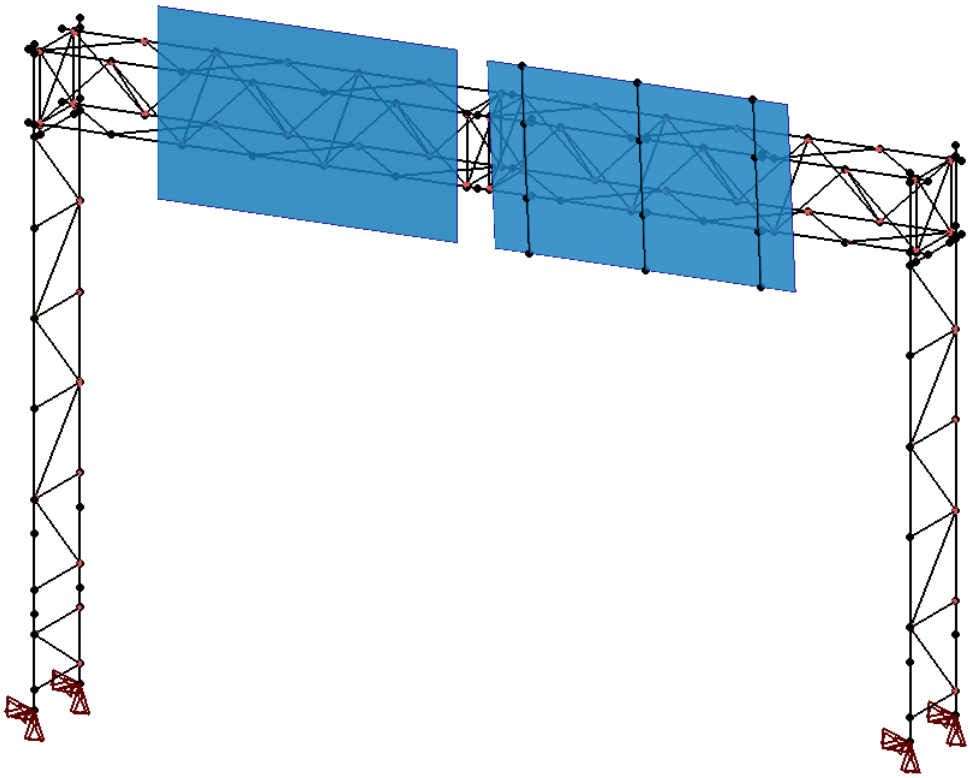
It is possible to model 4 types of panels: *Simple panels*, *Reinforced panels*, *Variable Message Signs (VMS)* and *Walkways*. Each of these panels may be generated in a **Simplified** or **Detailed** way. The simplified method corresponds to the method used in the previous versions of SAFI.

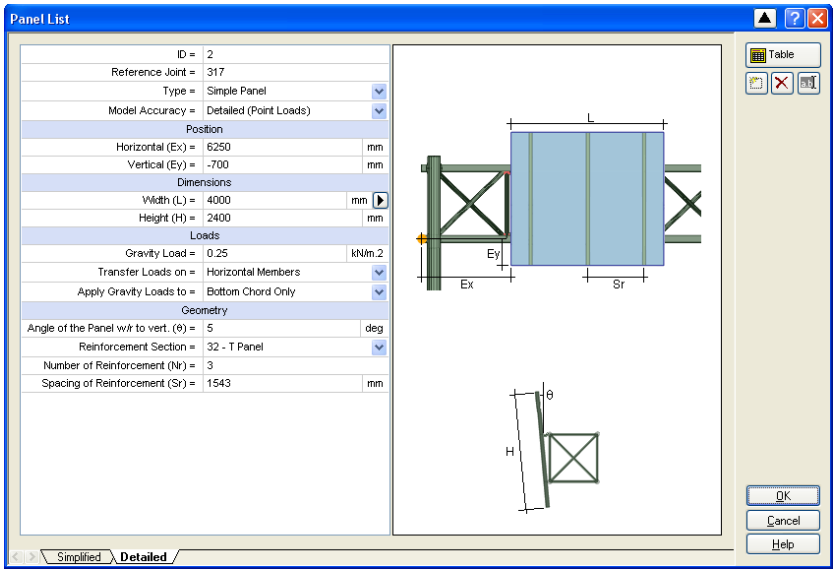
When the model is **simplified**, the loads acting on the panels are transferred to the longitudinal members of the beam as uniformly distributed loads. When the model is **detailed**, the uniform loads are applied to the Tee vertical bars of the panel which are attached to the beam by small transfer members which will lead to concentrated loads acting on the longitudinal members of the beam.



SIMPLE PANELS

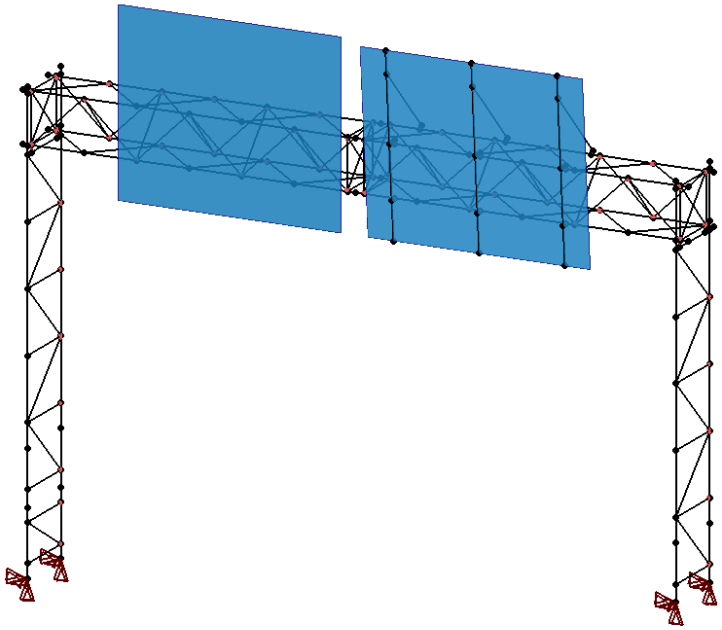
The figures below summarize the input data for a simple panel considering a simplified mode (left) and a detailed model (right). In the detailed model, the Tee vertical bars are modeled and it is possible to specify the angle of the panel.

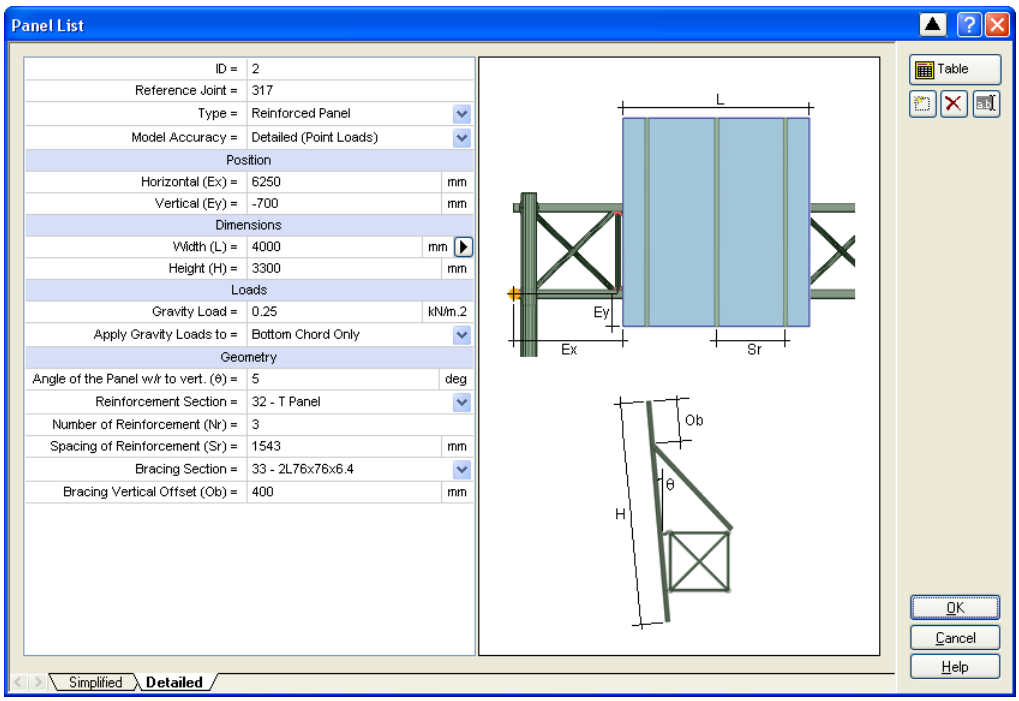




REINFORCED PANELS (WITH BRACINGS)

The figures below summarize the input data for a reinforced panel considering a simplified mode (left) and a detailed model (right). In the detailed model, the Tee vertical bars and 2L bracings are modeled and it is possible to specify the angle of the panel.

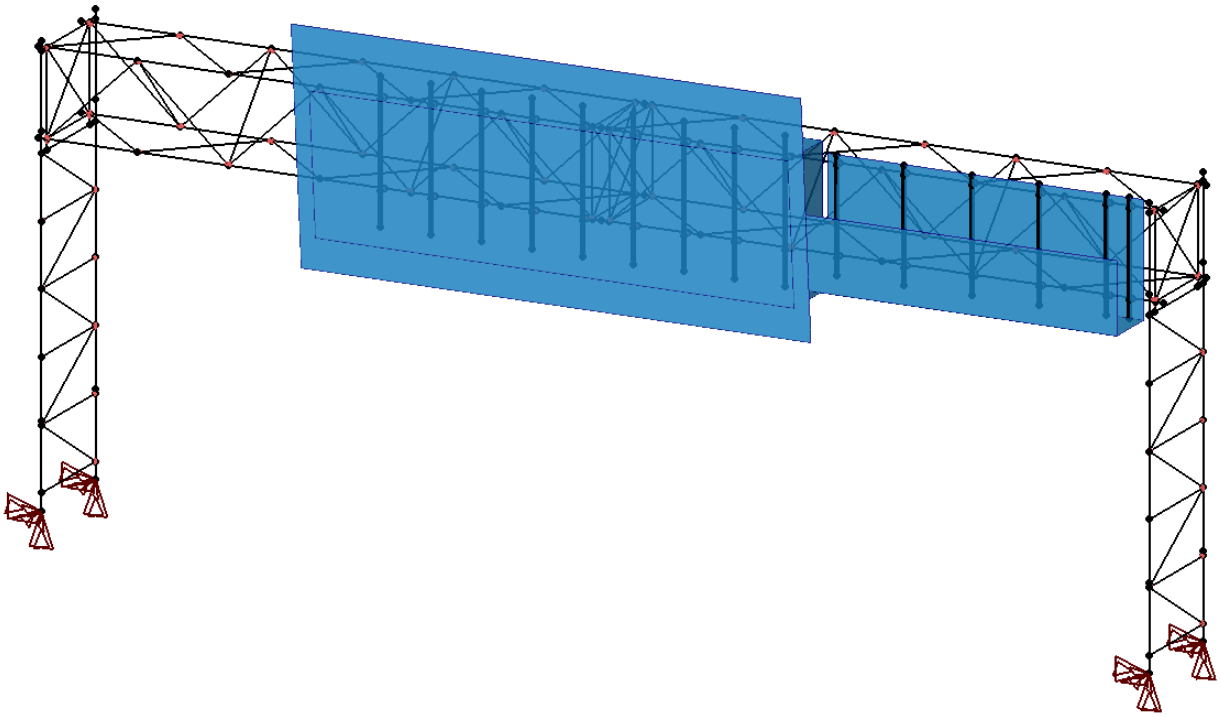


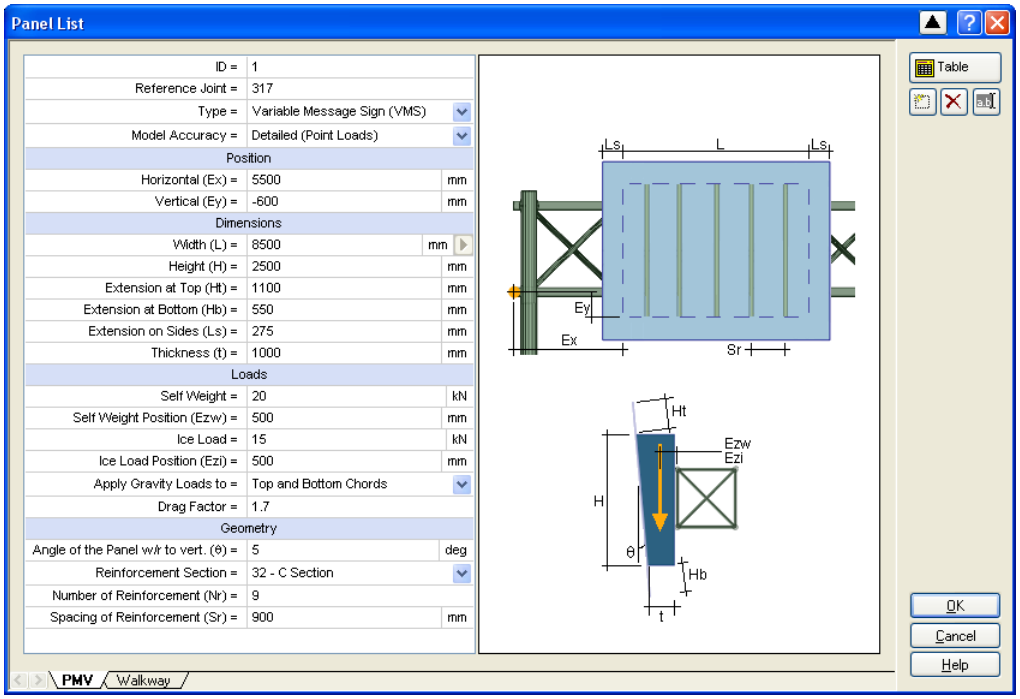


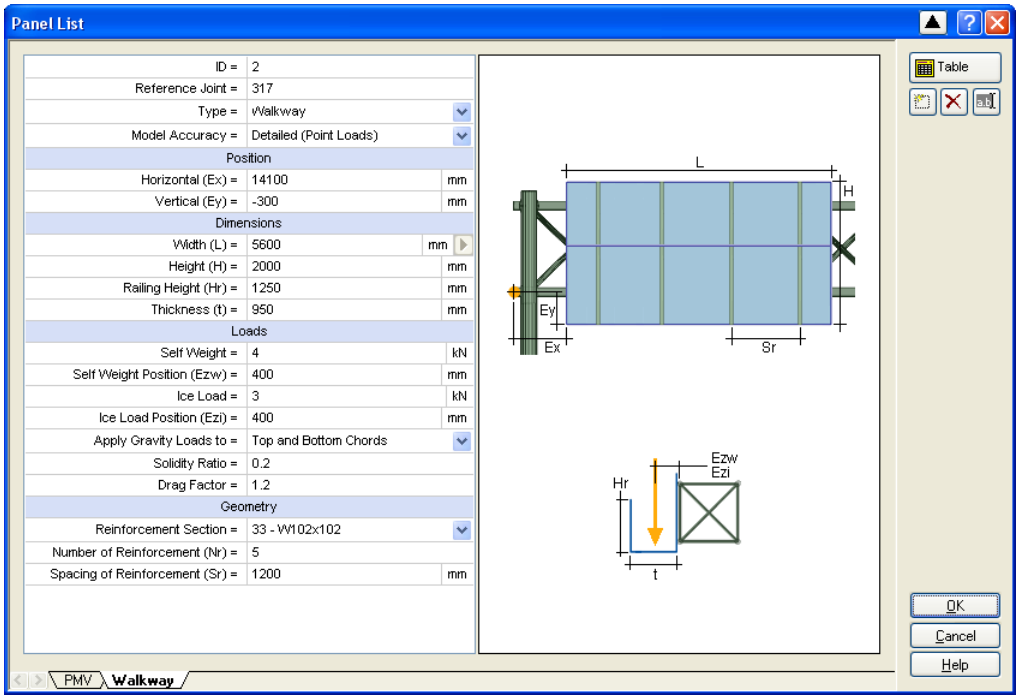
Note that the self weight and ice loads of the additional members generated in a detailed model add to the specified weight of the panel.

VARIABLE MESSAGE SIGNS (VMS) AND WALKWAYS

The figures below summarize the input data for a variable message sign (left) and a walkway (right) considering a detailed model. In the detailed model, the vertical bars transfer the loads of the panel to the structure at concentrated locations.





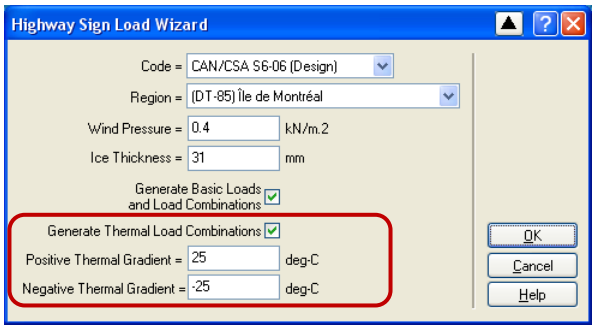


LOAD COMBINATIONS FOR DEFLECTION

In addition to the 24 ultimate load combinations already generated, 8 serviceability combinations have been added for the deflections. The verification of the horizontal and vertical deflection criterions are left to the user which may be checked using the global deformations of the structure for the serviceability combinations.

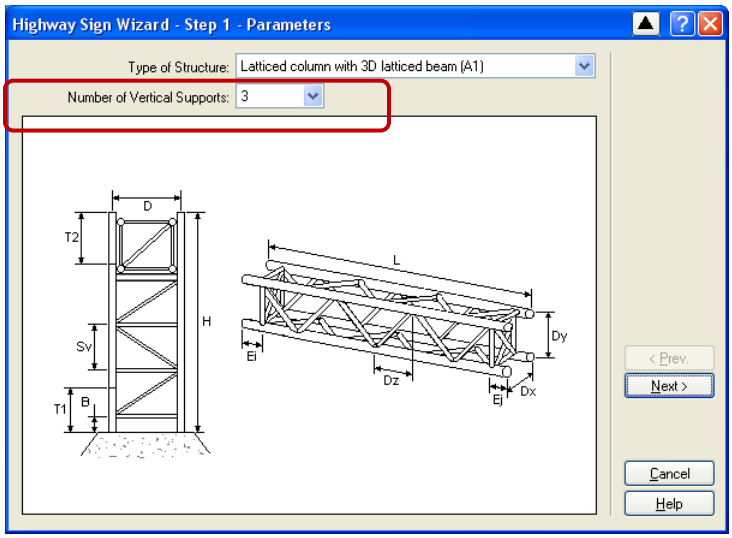
THERMAL LOAD COMBINATIONS

A total of 32 ultimate combinations and 16 serviceability combinations have been added for thermal loads. They are generated when the appropriate option is checked by the user.

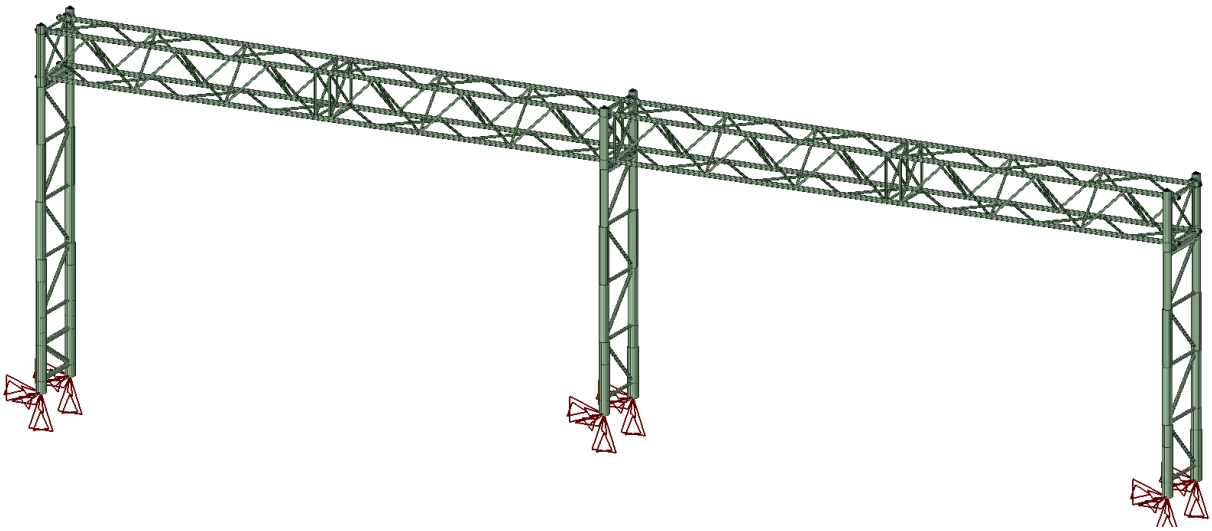


POSSIBILITY TO AUTOMATICALLY GENERATE A THIRD SUPPORT FOR A1 MODELS

The number of vertical supports may be two or three.

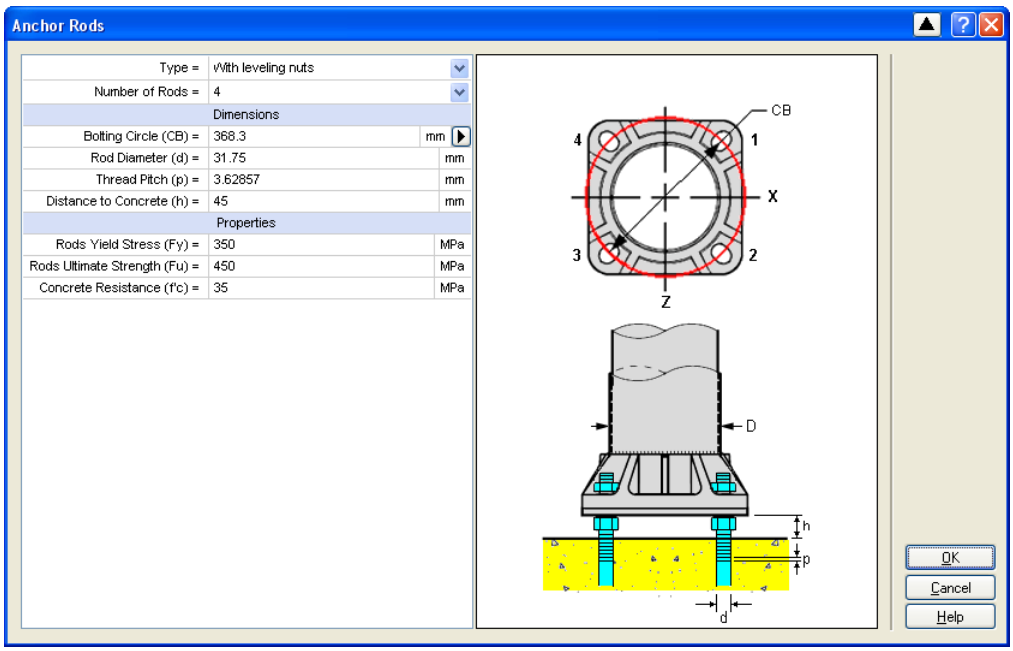


The additional support at axis 2 is located with respect to the first support by specifying its relative position from the center of axis 1

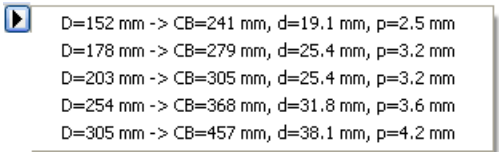


CALCULATION OF ANCHOR RODS

The calculation of the forces acting on the anchor rods and the calculation of the rods resistance is now available for highway sign structures.



The arrow at the right of the **Bolting Circle (CB)** field allows to quickly select usual anchor rods parameter according to the diameter of the vertical support legs.:



The results for the anchor rods are shown in the table below:

Highway Sign Structure Anchorage

Table Commands View Selection

0 4	Joint ID	Nb Anchors	Area mm.2	Net Area mm.2	Tr kN	Vr kN	Mr kN-m	Comb ID	Joint FX (kN)	Joint FY (kN)	Joint FZ (kN)	Joint MX (kN-m)	Joint MY (kN-m)	Joint MZ (kN-m)	Critical Anchor	Tf kN	Vf kN	Mf kN-m	ULS Tf/Tr	ULS Vf/Vr	ULS Mf/Mr	ULS Combined	ULS	Notes
	100	4	791.7305	631.0819	227.1895	119.7097	0.6261	1 - ELUL A1(1) Dmin+Wz+Wx	-6.3511	-185.3282	-48.1721	-18.2786	1.0865	22.3438	4	-124.3239	11.3102		0.5472	0.0945		0.3084	0.5472	
	101	4	791.7305	631.0819	227.1895	119.7097	0.6261	1 - ELUL A1(1) Dmin+Wz+Wx	-5.4266	163.7070	-9.6377	-9.9236	1.1113	19.2545	2	96.9463	3.4883		0.4267	0.0291		0.1829	0.4267	
	200	4	791.7305	631.0819	227.1895	119.7097	0.6261	1 - ELUL A1(1) Dmin+Wz+Wx	-4.7147	-164.8920	-43.6952	-16.5689	-1.0664	17.5150	4	-106.6613	11.9485		0.4695	0.0998		0.2304	0.4695	
	201	4	791.7305	631.0819	227.1895	119.7097	0.6261	1 - ELUL A1(1) Dmin+Wz+Wx	-5.5640	147.6796	-8.7766	-8.9975	-1.1249	20.1693	2	92.9179	2.7105		0.4090	0.0226		0.1678	0.4090	

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