GSE SOFTWARE
General Structural Engineering

APPLICATION
GSE Concrete

FUNCTIONALITY
Automatic slab on grade generation

SLAB ON GRADE

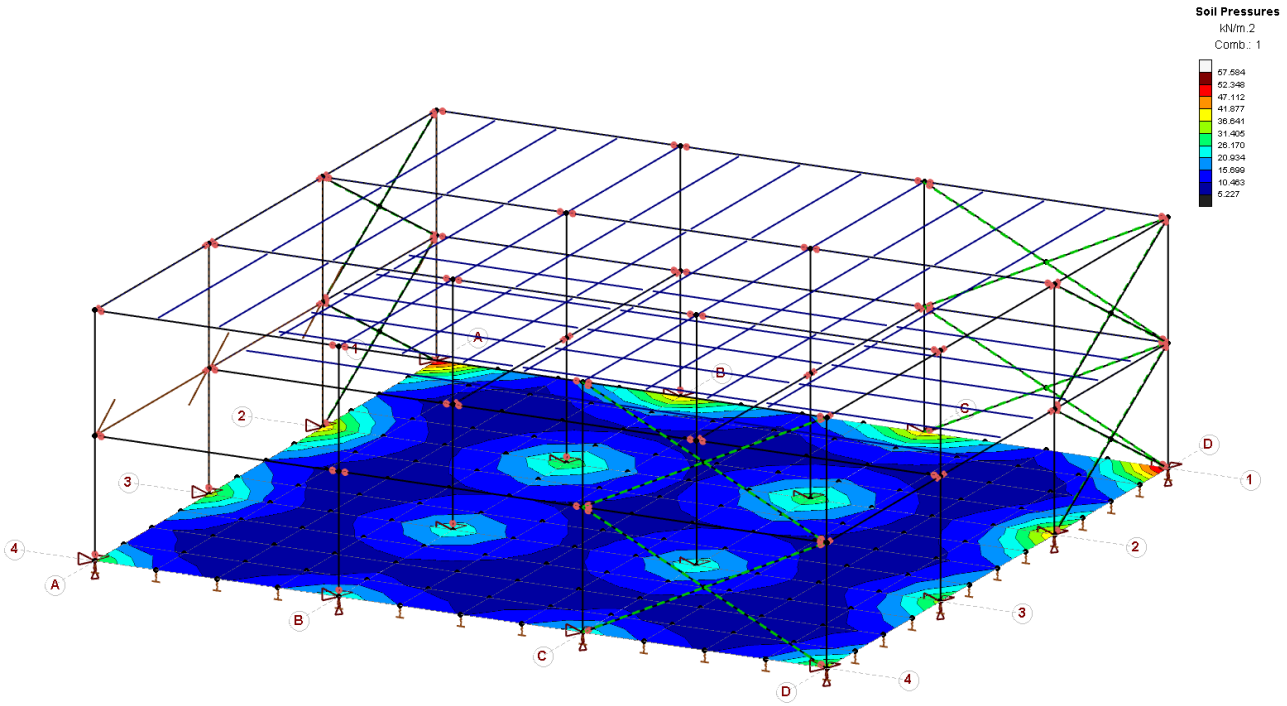
The soil-structure interaction is an important component in the design of a building or any structure in general. In order to enhance productivity of SAFI GSE users, an automatic slab on grade generation function has been added.

This function makes it possible to distribute the soil stiffness to the slabs modeled by finite elements by the means of equivalent springs. This allows for the complete analysis and design of slabs, using a 3D model as well as the reinforced concrete design tools from the GSE Concrete module.

With this function, users can generate and efficiently analyze slabs of complex geometries.

Soil-structure analysis is done considering the soil as a Winkler spring operating in compression only. The rigidity brought by the soil is distributed to the joints of the plate's elements composing the raft. The equivalent soil rigidity is function of the subgrade modulus of the soil as well as the nodal tributary area of the plates.

The function in the GSE software automatically calculates the nodal tributary areas to save users' time. The foundation can be supported by either: ground springs, regular springs, fixed supports, piles or imposed displacements allowing flexible modeling for the user.



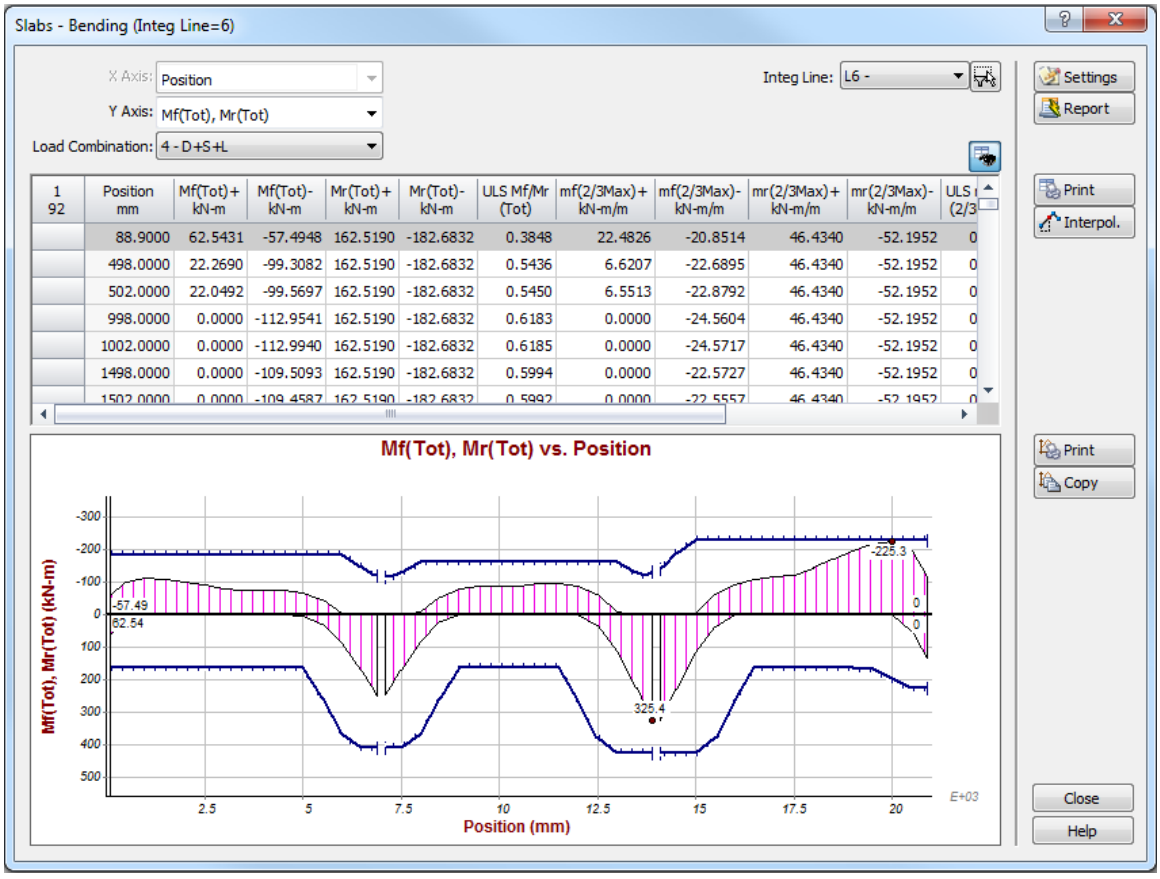
The analysis of the model allows to calculate several important parameters for the design of the foundation. While considering the various load combinations, the nodal displacements of the slab on the ground make it possible to check the stability and deflections of the structure.

According to the deflection, the stiffness and the tributary area calculated for each of the nodes, the exerted pressure of the slab on the ground is calculated. This data makes it possible to verify the sizing of the foundations by ensuring that the bearing capacity of the soil is not exceeded.

The use of the finite element method makes it possible to consider the flexibility of the foundation and its effect on the behavior of the structure. The use of unidirectional springs in compression makes it possible to check the uplifting of the slab.

The GSE Concrete software supports several concrete design standards, including the ACI-318 American standard and the CSA A23.3 Canadian standard. With the automated slab generation and design tools in the GSE, the longitudinal reinforcement required to withstand bending forces is calculated according to the design parameters defined by users.

Also, verifications are done for the shear and punching forces acting on the slab. The 3D visualization of the reinforcement is available in the GSE Concrete software.



1 92	Position mm	Mf(Tot)+ kN-m	Mf(Tot)- kN-m	Mr(Tot)+ kN-m	Mr(Tot)- kN-m	ULS Mf/Mr (Tot)	mf(2/3Max)+ kN-m/m	mf(2/3Max)- kN-m/m	mr(2/3Max)+ kN-m/m	mr(2/3Max)- kN-m/m	ULS (2/3
	88.9000	62.5431	-57.4948	162.5190	-182.6832	0.3848	22.4826	-20.8514	46.4340	-52.1952	0
	498.0000	22.2690	-99.3082	162.5190	-182.6832	0.5436	6.6207	-22.6895	46.4340	-52.1952	0
	502.0000	22.0492	-99.5697	162.5190	-182.6832	0.5450	6.5513	-22.8792	46.4340	-52.1952	0
	998.0000	0.0000	-112.9541	162.5190	-182.6832	0.6183	0.0000	-24.5604	46.4340	-52.1952	0
	1002.0000	0.0000	-112.9940	162.5190	-182.6832	0.6185	0.0000	-24.5717	46.4340	-52.1952	0
	1498.0000	0.0000	-109.5093	162.5190	-182.6832	0.5994	0.0000	-22.5727	46.4340	-52.1952	0
	1502.0000	0.0000	-109.4587	162.5190	-182.6832	0.5992	0.0000	-22.5557	46.4340	-52.1952	0

PHONE
1 (416) 705-5977

TOLL FREE (USA&CAN)
1 (800) 810-9454

GENERAL INQUIRIES
info@safi.com

WEBSITE
www.safi.com