

GEO5 Numerical Analysis

FEM

This program models a wide range of geotechnical problems such as the terrain settlement, slope stability, excavations, tunnel analysis, steady state or transient water flow analysis, consolidation analysis, analysis of diaphragm walls and other structures, etc. assuming plane strain or axisymmetric conditions. The available material models include Drucker-Prager, Mohr-Coulomb, Modified Mohr-Coulomb with hardening or softening, Modified Cam-Clay, Hypoplastic Clay.

Slab

This program is used for the analyses of foundation mats and slabs of any shape on elastic subsoil.

Consolidation

This extension module of the FEM program performs time-dependent settlement analyses under embankments, foundations or other surcharges.

Water Flow

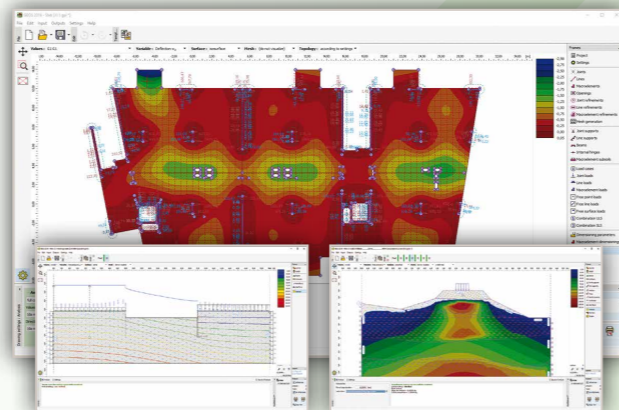
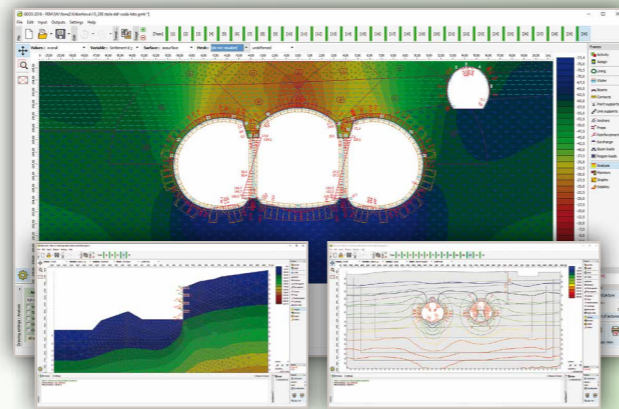
This extension module of the FEM program performs steady state or transient water flow analyses.

Tunnel

This extension module of the FEM program contains useful functionality for tunnel modelling, such as the generation of the lining and load conditions as a result of thermal effects, swelling of soils and support reactions of each excavation stage.

Earthquake

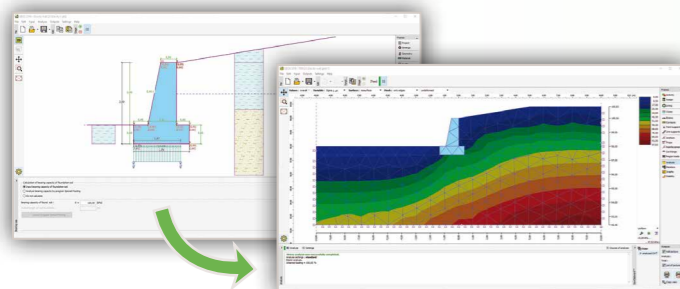
This extension module of the FEM program performs dynamic analysis of geotechnical structures loaded by ground motion. It either accepts user-defined accelerograms or generates ground motion histories compatible with the specified response spectrum.



What makes GEO5 unique?

Combination of Analytical and Numerical Methods

Analytical methods enable effective and rapid structural design and verification, however in some cases additional verification and modelling should be done by using FEM. The same program environment and the possibility of transferring data between programs allow the user to take full advantage of the GEO5 suite.



Supporting Many Standards

Geotechnical methods applied in GEO5 software are used all around the world. GEO5 adopts a unique system of implementing standards and partial factors, which are separate from the structural input. GEO5 contains a database of standards, however it is possible to create user defined standards.

GEO5 supports:

- Factor of Safety (ASD)
- Limit States Theory (LSD)
- Eurocodes EN 1997, including National Annexes
- Load Resistance Factor Design (LRFD – USA)
- Other geotechnical standards (SNiP – Russia, GB – China)
- Standards for reinforced concrete (EN, ACI, SNiP, GB, AS...)

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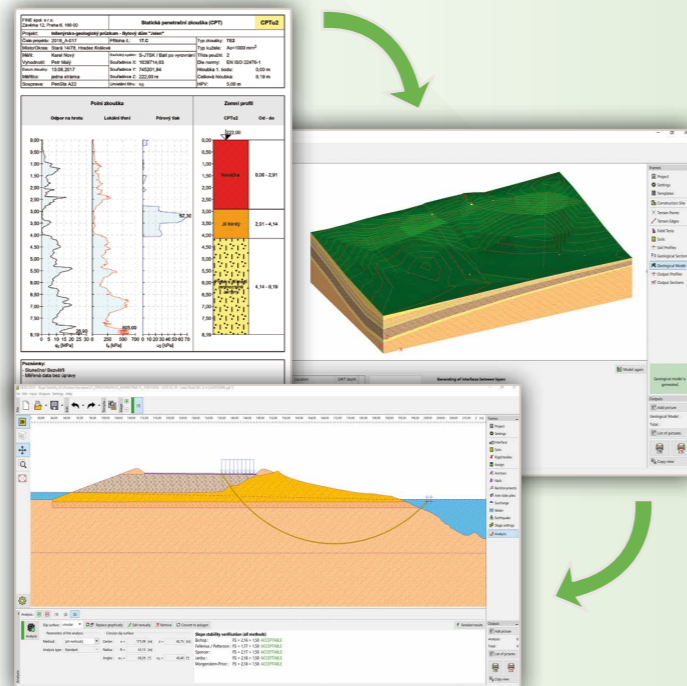
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From the Survey to the Advanced Design

GEO5 is a comprehensive software suite that integrates geological data modelling with the solutions of all advanced geotechnical tasks.



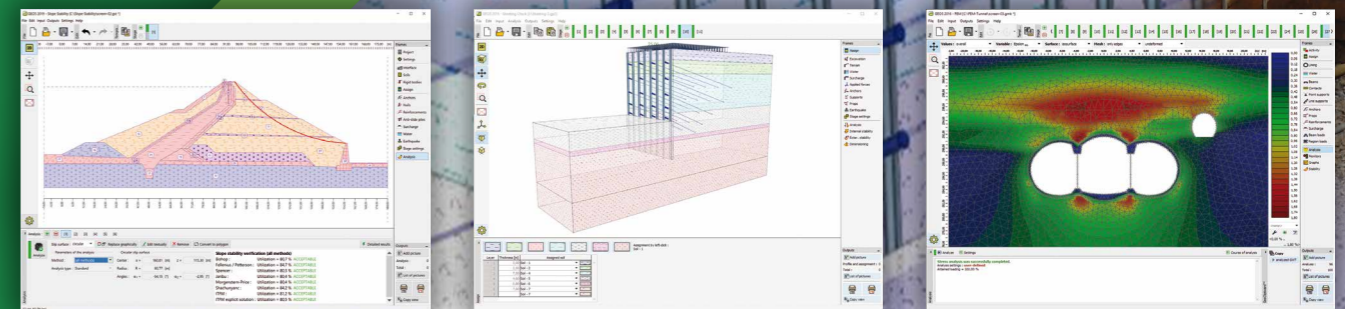
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GEO5

Geotechnical Software for a Wide Range of Analyses

- Stability Analysis
- Excavation Design
- Foundation
- Walls and Gabions
- Tunnels and Shafts
- Settlement Analysis
- Geological Survey
- Field Tests



using FE and Analytical Methods

GEO5 is an intuitive software suite designed to solve a wide range of geotechnical engineering problems in a user-friendly graphical environment. Common characteristics between each program in the software suite include:

- > Each program solves a specific geotechnical problem
- > Active graphical input with 2D or 3D visualization
- > Easy interchange of data between programs
- > Built-in contextual help incorporating many tips
- > BIM support (IFC, LandXML export)
- > Native database of common soils
- > Supports a large number of standards and codes
- > Imports TXT, XLSX, DXF formats
- > Comprehensive text and graphical output for all analyses

Geological Software

Stratigraphy

This program is designed to process results from site investigations (boreholes, wells, CPTs, DPTs, SPTs, DMTs ...), to generate 2D or 3D geological models and then to export cross sections and geological profiles into other GEO5 programs.

Stratigraphy - Logs

This extension module of the Stratigraphy program is designed to produce geological data reports from site investigations. It provides a comprehensive database of pre-defined templates and the ability to create user-defined templates and data reports.

Stratigraphy - Cross-Sections

This extension module of the Stratigraphy program is designed for easy creation of geological cross-sections (including lenses, faults). It provides a scaled outputs of the cross-section with field tests and soil profiles. No CAD program is needed.

Stratigraphy - Earthworks

This extension module of the Stratigraphy program is designed for modelling structures, such as foundation pits, roads, railways, quarries, slopes, and others. It also provides calculation of earthwork or terrain movement volumes.

Analytical Solutions

Slope Stability

This program performs slope stability analyses by optimisation circular and polygonal slip surfaces. The program can model anchors, geo-reinforcements, nails, presence of water (above or below terrain), surcharge and earthquake effects.

Sheeting Check

This program is used to make advanced design of retaining walls using the method of elasto-plastic non-linear analysis. It allows the user to model the real structure behavior using stages of construction, to calculate the deformation and pressures acting upon the structure, to verify the internal anchor stability, cross-sections (steel, RC, timber) and the strength of the anchors. The program has a comprehensive library of commercially available sheet piles.

Sheeting Design

This program is used for quick design of non-anchored and anchored retaining walls. The results show the required embedment lengths, the internal forces and the forces in anchors. The program provides verification of RC, steel or timber cross sections. The program has a comprehensive library of commercially available sheet piles.

Rock Stability

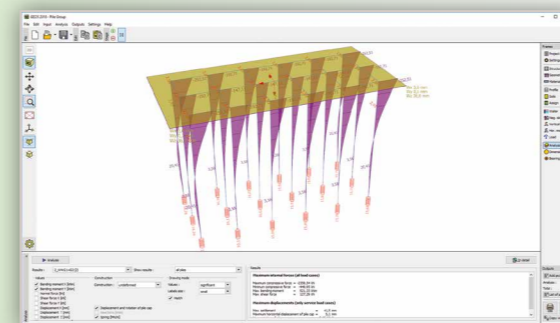
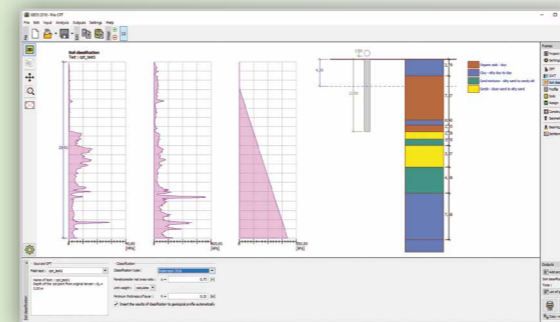
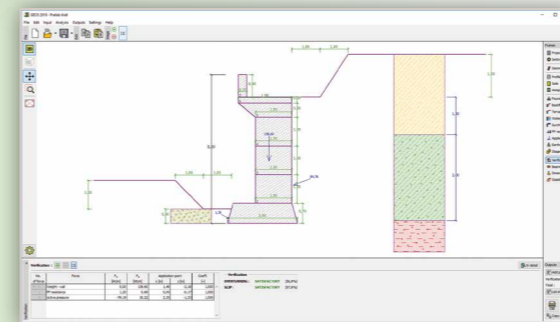
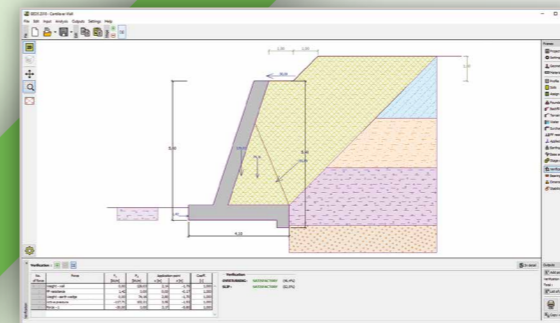
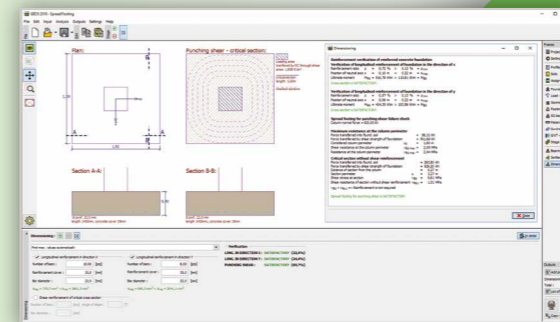
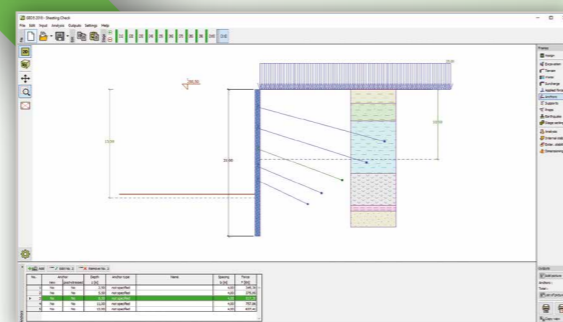
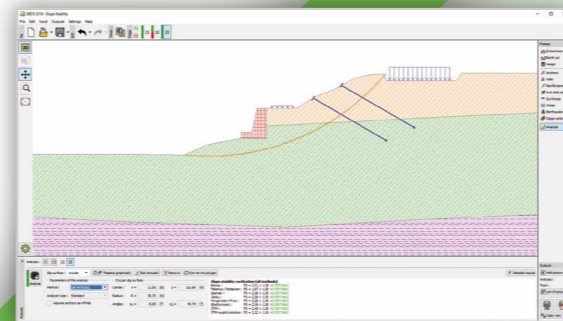
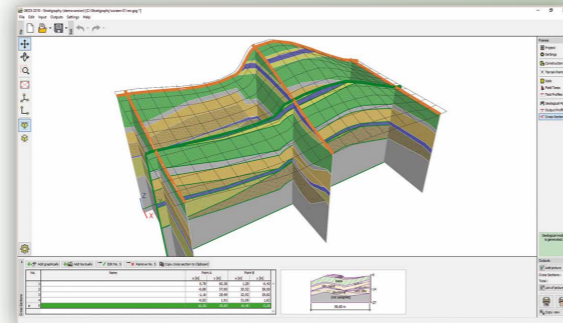
This program is used to analyse the stability of rock slopes on a predefined plane or varying slip surface. It is also solving rocks wedges in stereographic projection.

Nailed Slopes

This program checks for the slip and overturning stability of a reinforced block. It also calculates the internal stability of a nailed wall (utilising a straight or broken slip surface and the bearing capacity of the nails) and its global stability using the Slope Stability program. The concrete cover can be reinforced using a steel mesh.

Spread Footing

This program is used to design spread footings (centric, eccentric, strip footing, circular) subject to typical loadings. It computes the vertical and horizontal bearing capacity, settlement and rotation of the footing, and determines the required longitudinal and shear reinforcement.



Spread Footing CPT

This program verifies the bearing capacity of spread footing based on CPT or SPT tests. It computes the horizontal bearing capacity and settlement. Longitudinal and shear reinforcement of the footing can be also designed.

- Cantilever Wall
- Gravity Wall
- Abutment
- Prefab Wall
- Gabion
- Masonry Wall

GEO5 contains multiple programs for the analysis of retaining walls and supporting structures. These programs provide verification of overturning, slip and the bearing capacity of the foundation soil. They enable the user to check the cross-section strength (plain concrete, RC, masonry) or the stability of wall blocks. The global stability can be checked in the Slope Stability program.

MSE Wall

This program is used to analyse a variety of earth structures reinforced by geogrids (a comprehensive library of commercially available geogrids is implemented). The program checks for slip and overturning of a reinforced block, calculates the internal stability of a wall (extensible or inextensible reinforcement) and the global stability using a fully optimised circular slip surface.

Pile

This program is used to analyse the vertical bearing capacity of a single pile loaded in tension or compression, pile settlement and horizontal bearing capacity. The program allows for the design of various cross-section types (RC, steel pipe, timber pile).

Pile CPT

This program verifies the vertical bearing capacity and settlement of a single pile or a group of piles, based on the results provided by cone penetration tests (CPT).

Micropile

This program is used to verify steel tube micropiles. When calculating the bearing capacity of a micropile, the program verifies both the root and the shaft.

Pile Group

This program is used to analyse a pile group (pile raft foundation with a rigid pile cap) using the spring method (FEM) and analytical solutions. Floating piles and piles constrained within subsoil can be analysed. The program allows for the design of various cross-section types (RC, steel pipe, timber).

Anti-slide Pile

This program is used for the design of pile walls which stabilise slope movement or increasing the safety factor of the slope.

Shaft

This program is used to analyse spatial earth pressures on a circular shaft and to determine the internal forces on the structure.

Beam

This program enables the analysis of foundation/ground beams on elastic subsoils together with the automatic generation of load combinations according to EN 1990.

Settlement

This program can determine the vertical settlement and the time-dependent consolidation under surcharge or embankment loading.

Earth Pressures

This program calculates the earth pressures (active, passive, and at rest pressures) acting on an arbitrary shaped structure.

Ground Loss

This program is used to analyse and determine the shape of the subsidence trough above excavations and evaluate the damage to buildings situated in the affected area.

Try GEO5 Software for Free

Download the DEMO version without any analysis limitations.

Training Materials & Tutorials

View the manuals and online tutorials for guidance and tips on how to efficiently use the software.

