

Analytical Solutions

GEO5 analytical programs solve common geotechnical problems such as the analysis of sheeting structures and foundations, slope stability, terrain models and earth grading, etc. The programs are based on generally known and widely accepted theories enhanced in some cases by finite element techniques. For clarity and ease-of-use, each program solves one defined task but is part of an integrated suite – for example the clipboard may be used to transfer data from one program to another.

The basic program features include:

- User-friendly application environment
- Comprehensive graphical outputs
- Integrated contextual help
- Metric and imperial units
- Built-in database of soil characteristics
- General definition of all design coefficients



Terrain

- generation of digital terrain model (DTM) from input points, edges and boreholes
- universal import of data (txt, dxf) and geodetic measurements
- calculation of excavation and embankment volumes
- simple definition of structures and earth grading
- modeling of geotechnical layers using boreholes
- modeling of ground water table
- user friendly graphical 3D interface, drawing of contour lines
- export of data into other GEO5 programs
- task manager for GEO5 programs



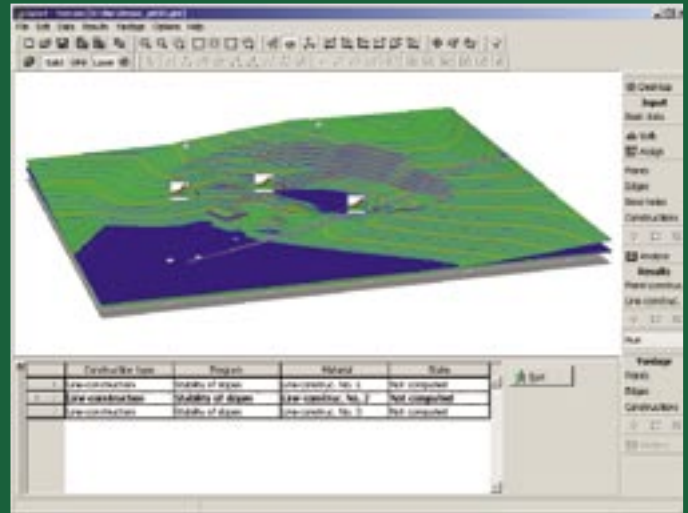
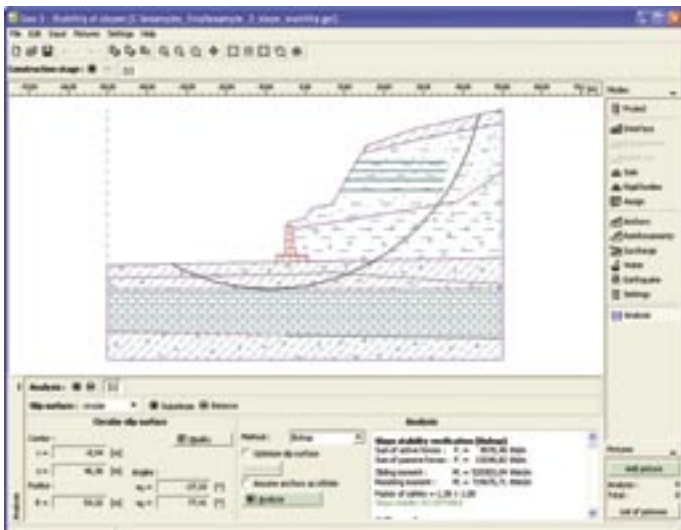
Slope stability

- Simple input of terrain and layer geometry
- Built-in database of soils and rocks
- Fast and reliable optimization of circular and polygonal slip surfaces
- Any number of surcharges (strip, trapezoidal, concentrated loading)
- Any number of anchors and georeinforcements
- Water modeled using ground water table or by pore pressure isolines
- Earthquake effects
- Foliation of soils
- Analysis using effective or total parameters
- Multiple construction stages, any number of analyses within any one stage
- Slip surface optimization can be restricted within limits
- Analysis according to limit states theory or factor of safety



Rock stability

- slip along straight or polygonal slip surface
- slip of space earth wedge
- material models include Mohr-Coulomb, Hoek-Brown and Barton-Bandis
- smooth, rough and stepped plane slip surface
- simple input of block geometry
- Any number of surcharges (strip, trapezoidal, linear)
- Any number of anchors
- modeling of water in joints and tension cracks
- modeling of earthquake effects



Geotechnical Software



Cantilever wall

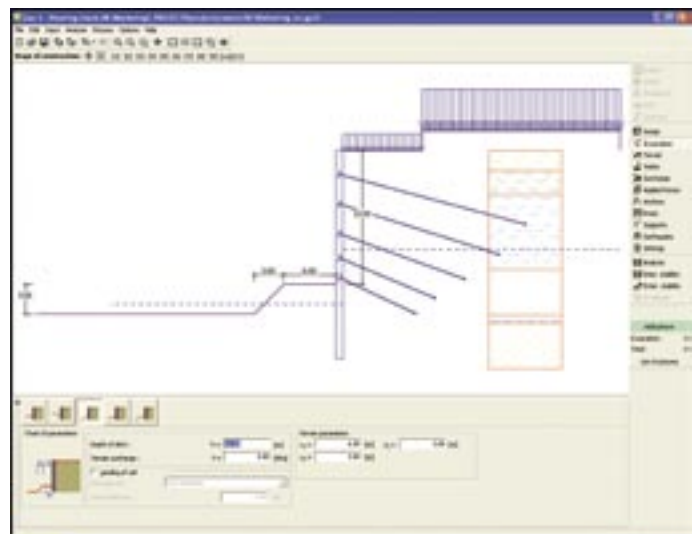


Gravity wall

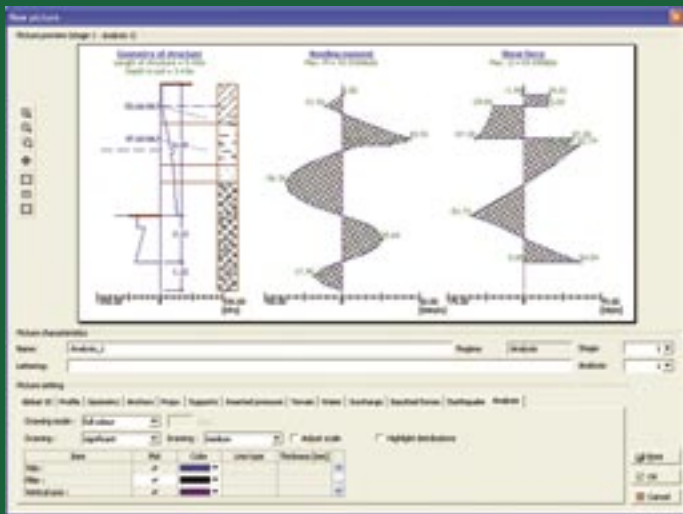


Abutment

- Computation of internal stability (overturning, translation, bearing capacity of foundation soil)
- Verification of concrete cross-sections according to various standards (EC2, BS 8110, IS456, CSN, PN ..)
- Analysis according to limit states and factor of safety
- Generally layered soil environment
- Built-in database of soil parameters
- Any number of surcharges (strip, trapezoidal, concentrated load)
- Modeling of water in front of and behind structures
- Entirely general shape of terrain behind the structure
- Analysis of earth pressures in effective and total parameters
- Earthquake effects (Mononobe-Okabe, Arrango)
- Any number of construction stages
- Verification of external stability of a wall using the Slope Stability program
- Analysis of bearing capacity of foundation soil in the Spread footing program



geotechnical software suite GEO5



Geotechnical Software

Sheeting design Sheeting check

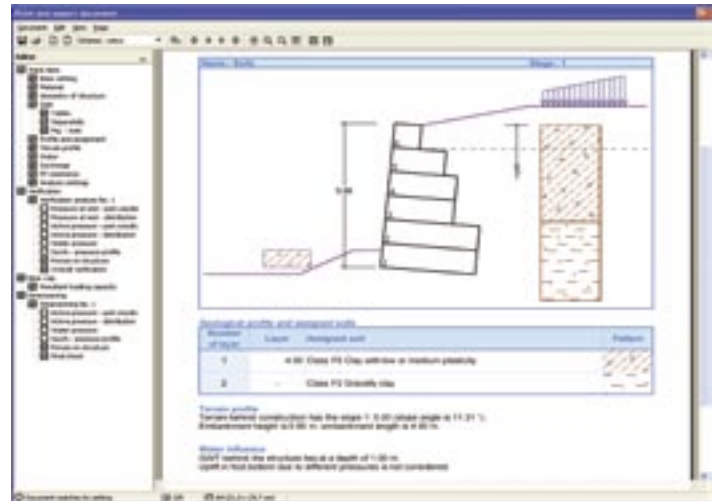
- Accurate modelling of the structure's behavior during construction using the method of dependent pressures
- Simply input of geometry (pile walls, braced sheeting, sheet pile, etc.)
- Generally layered soil environment
- Analysis of sheeting structures (anchored, strutted and non-anchored)
- Any number of surcharges (strip, trapezoidal, concentrated load)
- Modelling of water in front of and behind structures
- Verification of internal stability of anchors
- Entirely general shape of terrain behind the structure
- Earthquake effects (Mononobe-Okabe, Arrango)
- Envelope of internal forces for individual construction stages
- Verification of external stability of a wall using the Slope Stability program

Prefab wall Gabion Masonry wall

- Computation of internal stability (overturning, translation, load-bearing capacity of foundation soil)
- Analysis according to limit states and factor of safety
- Generally layered soil environment
- Any number of surcharges
- Modeling of water in front of and behind structures
- Entirely general shape of terrain behind the structure
- Berms may be specified in front of the structure
- Earthquake effects (Mononobe-Okabe, Arrango)
- Verification of the external stability of a wall using the Slope Stability program

Nailed Slopes

- Generally layered soil environment
- Any number of surcharges (strip, trapezoidal, concentrated load)
- Any number of applied forces (anchors, safety fences, etc.)
- Computation of internal stability (overturning, translation, load-bearing capacity of foundation soil, stability along straight or polygonal slip surface)
- Analysis according to limit states or factor of safety
- Entirely general shape of terrain behind the structure
- Analysis of earth pressures in effective and total parameters
- Earthquake effects (Mononobe-Okabe, Arrango)
- Any number of construction stages
- Stability along straight or polygonal slip surface



Settlement

- Theories of settlement analysis (Janbu, Buismann, Soft soil, using the index and coefficient of compression, secondary settlement according to Ladde)
- Reduction of influence zone based on the theory of structural strength, by percentage of geostatic stress or by incompressible subsoil
- Settlement analysis exploiting the Oedometric modulus specified in terms of the oedometric loading curve
- Any number of surcharges applied to structures (strip, trapezoidal, concentrated load)
- Automatic analysis of settlement and stresses at all important points

Piles

- Computation of limit loading curve using the finite element method and deformational parameters of soil
- Accounting for technological processes
- Shapes of pile cross-sections (rectangle, circular, I - cross-section, cross)
- Circular cross-sections may change diameter with depth
- Negative skin friction
- Dimensioning of steel-concrete elements according to EC2, BS, PN, IS, ACI
- Modulus of the subsoil around the pile can be determined according to Vesic, Matlock and Rees, CSN or input by user

Spread footing

- Analyses based on a large number of theories (EC7, PN, IS, Brinch-Hansen)
- Analysis of foundations on drained, undrained or rock subsoil
- Footing with fillet, stepped and circular footing
- Inclined shape of grouted slope
- Inclined footing bottom
- General shape of stress diagram under the footing due to combined bending and tension/compression
- Settlement analysis (Janbu, Buismann, Soft soil, ...)
- Settlement analysis exploiting the Oedometric modulus specified in terms of the oedometric loading curve
- Dimensioning of concrete elements according to EC2, BS, PN, IS, ACI



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