

Geotechnical Module

The Geotechnical module was created with the purpose of becoming a powerful tool to allow civil engineers to deal easily with most typical geotechnical problems, and make the advanced features of ANSYS user friendly.

With the aim of designing a compact program that allows the integration of a wide range of tools into it, CivilFEM has been provided with a geotechnical database which includes important characteristics. Examples are, a library of soil and rock properties, the most common used correlations among different geotechnical parameters, the possibility of creating and adding user material libraries and correlations between properties into the program, effective pressure consideration, etc.

With the Geotechnical module, it is possible to carry out slope stability analysis applying either the results of a Finite Element Method calculation or the classical failure methods, such as Fellenius, Bishop and Janbu . Any kind of load can be introduced in the analysis such as anchors, seismic action, pore water pressures and so on.

The Geotechnical Module allows the definition of layered soils that are modeled by means of finite elements. The calculation of the soil foundation stiffness for any kind of geometry is also an example of how useful and easy to use are the capabilities of this module.

The generation and calculation by FEM models of sheet piles (retaining walls) is another feature included in this module. It allows the user to carry out a nonlinear analysis of the construction sequence process (excavation or back fill) of this kind of structures.

A seepage analysis through a porous media can also be carried out using CivilFEM specific finite elements, allowing the calculation of the water table and the flow along element's faces. The water pressure from seepage analysis can be introduced in CivilFEM as loads for the analysis of slope stability.

Geotechnical Module Features

1. SLOPE STABILITY ANALYSIS

- Classic failure methods
 - Fellenius
 - Bishop
 - Janbu
 - Morgensten Price (*)
- FEM results

2. SOILS AND ROCKS LIBRARY

- Geotechnical properties and correlations
- User library

3. GENERATION OF LAYERED SOILS

- Automatic generation of layered soils model and properties.

4. HOEK & BROWN FAILURE CRITERIA

- Behavior of rock following Hoek&Brown criteria

5. CALCULATION OF SHEET PILES

- Nonlinear construction sequence analysis
- One or two sheet piles can be analysed simultaneously

6. SEEPAGE ANALYSIS

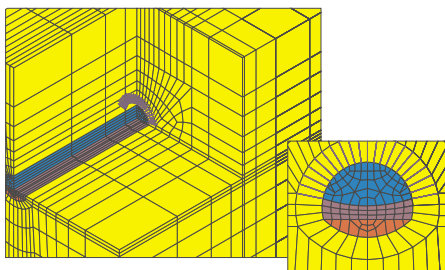
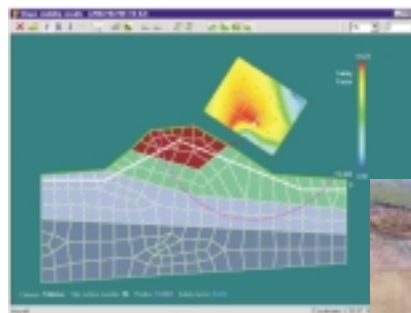
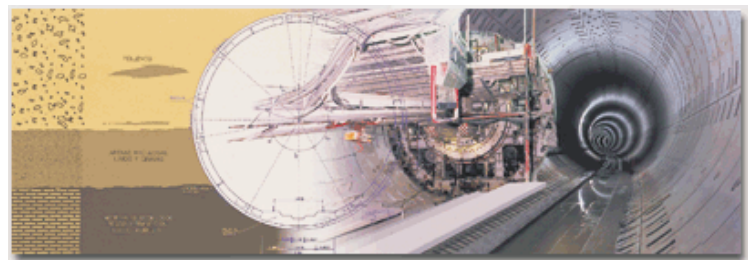
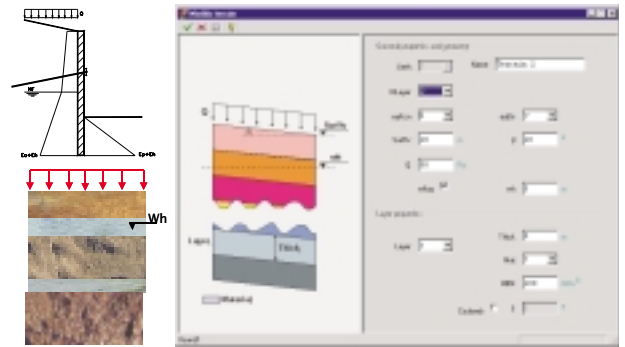
- Obtain the water table and water pressure

7. SOIL FOUNDATION STIFFNESS

- Calculation of precise, average, maximum and minimum values

8. TERRAIN INITIAL STRESS

- Automatic calculation of the initial stress without strain from a given topography



(*) Please for further information and available capabilities contact your local CivilFEM Support Distributor

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