# FIDES-GeoStability
Stability computations in the Geotechnics with the Kinematic Element Analysis (KEA)

The conventional stability proofs in geotechnics (earth pressure determination according to DIN 4085, embankment stability, ground failure, sliding circle according to DIN 4084, shear failure according to DIN 4017 etc..) depending upon situation indicate often too small or too large safety against stability because of insufficient accuracy of the failure figure. This is already the case, if concentrated loads, geometrical constraints, lubrication layers or the like cause the formation of sliding surfaces, which cannot be represented by the simplified failure mechanisms as suggested by the standards. With the help of KEA arbitrary rupture mechanisms can be modelled and optimized and thus most geometrical situations can be modelled correctly
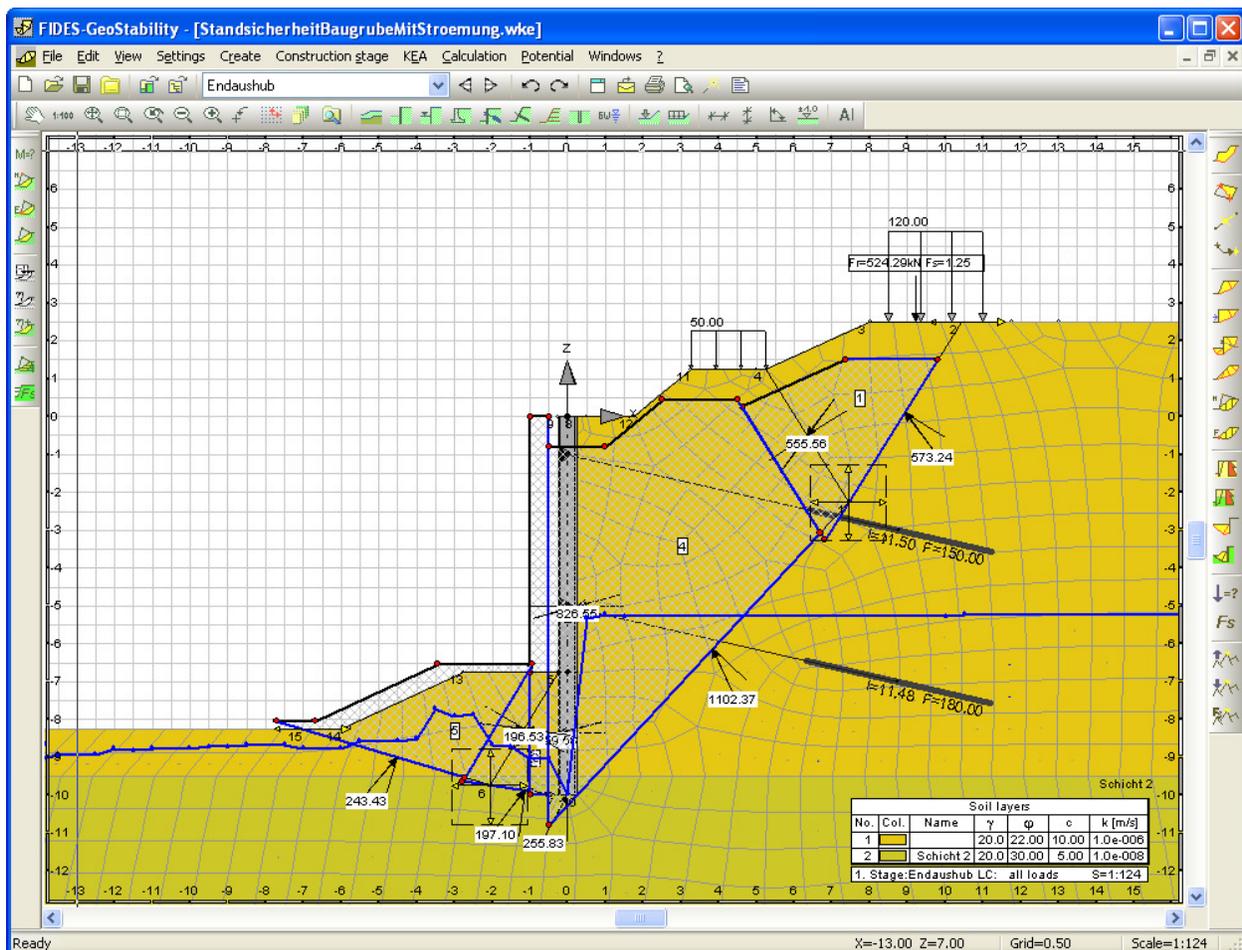
Performance characteristics

User Interface

- Object oriented graphical user interface
- CAD like input functionality
- Arbitrary number of polygonal outlined soil layers. Material properties of soils are stored in a layer data base which can be expanded by the user. Access to the extended soil layer data base which is common to all FIDES geotechnics programs
- Common document format for all FIDES Geotechnics programs
- Import and export functions for data exchange with other FIDES Geotechnics programs
- Detailed on-line assistance with exact explanation of the computing method
- Windows standard like for example Undo und Redo for all actions, Copy & Paste, context menue, System explorer, ...

Computation

- Arbitrary number of polygonally outlined soil layers with vertical embankments or embankments of any inclination.
- Consideration of the entered water level situation or the free water surface computed by the program FIDES-Flow
- Consideration of walls, piles, nails, anchors, geo textiles...
- Line and area loads, ...
- Earth pressure for arbitrary system geometry
- Proof of ground failure: arbitrary polytonally outlined soil layers, load placing, embankment geometry, ...
- Program includes the functionality of FIDES-Slipcircle and FIDES-Earthpressure without surcharge
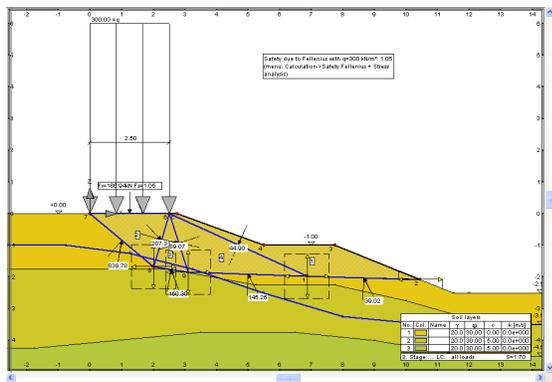
Complete Soil Nailing

- Automatic determination of nail lengths
- Internal and external stability safety
- Dimensioning of the wall including punch through checks
- Includes all soil static checks required by the supervisory authority for building approval
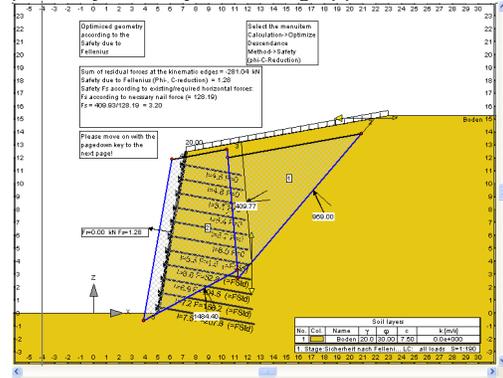
Results

- Stability after Fellenius (φ-c-Reduction)
- Remaining force at the edges with prescribed displacement
- Active or passive resultant earth pressure
- Automatic geometry optimization for stability or minimization/maximization of the edge force
- Results in RTF-Format or directly as Word-Document containing mixed text and graphics

Application areas

- Calculation of embankments
- Calculation of soil nailings
- Flowed through dams, groundwater flow
- Stability of excavations
- Geotextile-reinforced land spreads
- All non-standard cases
- Realistic simulation of the effects of excavation phases

Program options

FIDES-Flow

- Calculation ground water flows
- Determination of the free water surface and the water pressures

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