# FIDES-WinTUBE

Interactive Graphical Preprocessing for Tunneling and Geotechnical Models for SOFiSTiK Solvers

FIDES-WinTUBE has been initially developed as a specialized tool for tunneling. It includes a lot of wizards to assist the user to define and carry out very easy tunneling-specific tasks. However the functionality of WinTUBE is universal enough to become the tool of choiche for many general FE-analyses especially if 3D volume models should be analyzed and/or successive construction stages need to be simulated. The integrated SOFiSTiK-interface generates mesh- and calculation-control files and starts the SOFiSTiK-calculation. These ASCII files needn't, but could be edited manually. In addition to the detailed and illustrated technical report generated directly by WinTUBE, the SOFiSTiK kernel will be requested to generate a file containing a set of plots and numerical results. Additional all SOFiSTiK postprocessing tools may be used at any time.
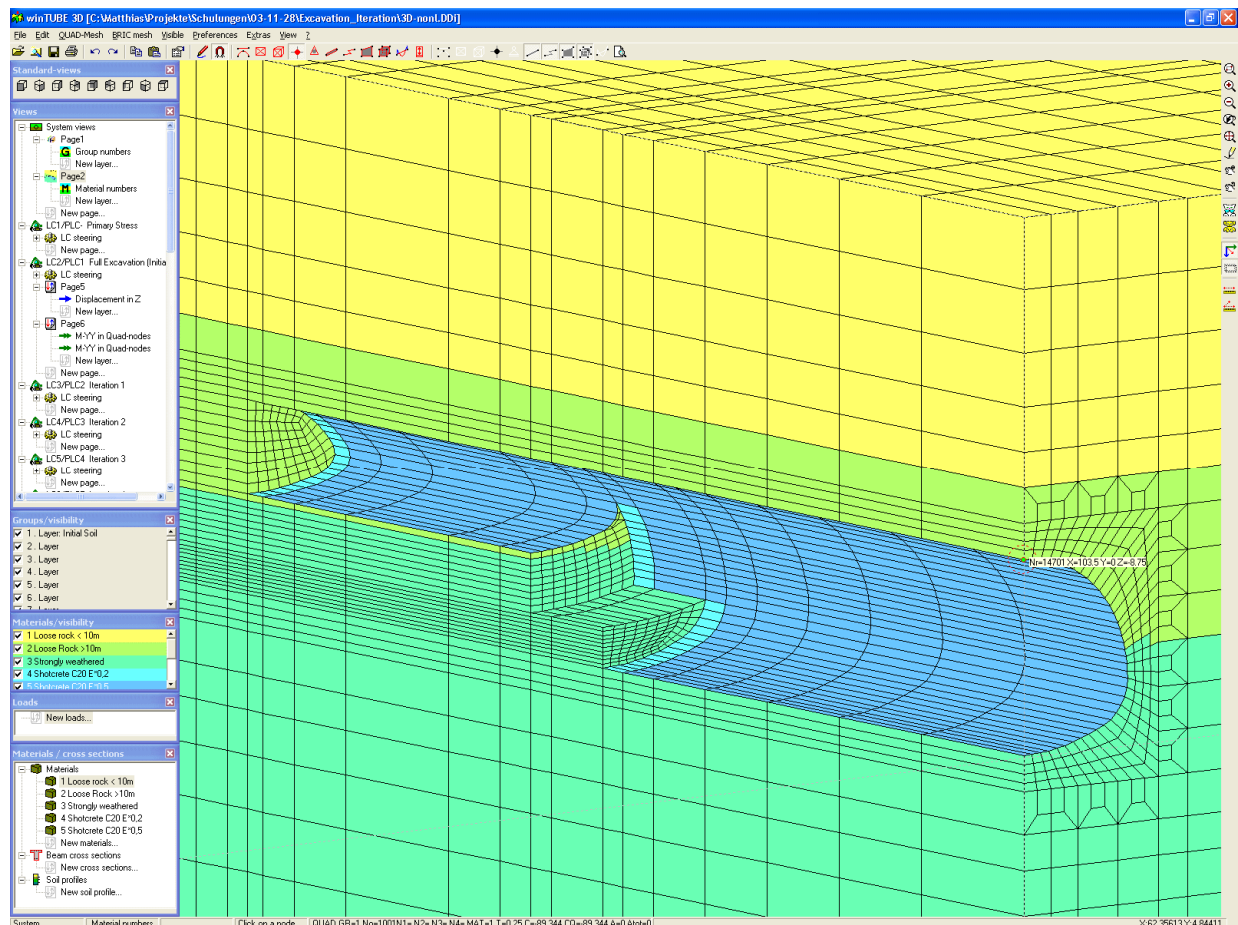
Capabilities

Graphical User Interface

- CAD-functionality, extensive control of visibilities, named views, intelligent selection of objects, ...
- Automatic intersection of structural-volumes, ...
- DXF-import, import of structures from an existing SOFiSTiK-database
- Numerous wizards f.e. for: tunnel-cross-sections, tunnel-junctions, costruction stages, loading, file-check, ...
- Automatic mesh generation, structured grids and unstructured meshes may be mixed up, automatic detection of structural surfaces, functions for mesh enhancement of selected mesh regions, refinement- and compulsory points, ...
- Generation of excavation- or construction phases and loading
- Data generation for the SOFiSTiK program HYDRA for seepage or thermal analysis
- Generation of non-linear 2D und 3D-Interface-elements, ...
- Generation of 3D-Models by extrusion of any plain system, unstructured mesh generator for 3D-meshes with tetrahedral elements, …
- Generation of sinus shaped eccentricities, saving of the deformed structure, …
- Simulation of tension- and tubbing-hinges, …
- Powerful generation of pile and pilecap systems in combination with volume elements
- FIDES-WinTUBE generates pure ASCII-files, simultaneous editing with FIDES-WinTUBE and a texteditor is possible
- Merging of multiple files, saving of subsystems, multiple copying, …
- Visualisization of input-data and results
- Detailed and illustrated technical report (RTF)
- Two computational methods for simulating construction stages:
  Step-by-step method: mesh with groups for simulation of construction stages
  Iterative (β) method: fixed mesh with stress transition during iterations

FEA Models

- Non linear beams with distributed non linear bedding
- 2D analysis (plain strain)
- Non linear 3D shell structures with distributed non linear bedding
- Non linear 3D volume structures
- Iterative non linear 3D volume structures
- General spatial structures, folded plate structures, bubble soap surfaces, ...

Application Fields

Tunneling

- Cut & cover
- Shotcreting method
- Tunnelling machines (TBM)
- Tubbing-lining
- Special blocks like tunnel-junctions, branch of emergency exits, portals etc.
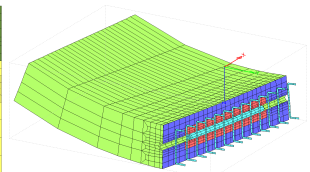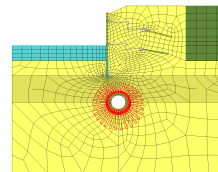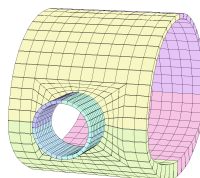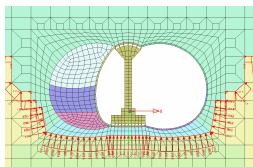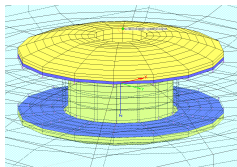- 3D detail analyses eg. tubbing hinges, ...

Geotechnics

- Shafts
- Slopes
- Dams, bulkheads, …
- Foundations of overall-structures on volume elements, pile- or combined pile-raft-foundations, ...

Various

- All kinds of volume-structures eg. laminated glass, elastomer bearing, ...
- Dynamic analysis eg. falling rocks, ...

Versions

- FIDES-WinTUBE-Beam (planar beams)
- FIDES-WinTUBE-2D (plane strain)
- FIDES-WinTUBE-3D (spatial structures, comlete package)