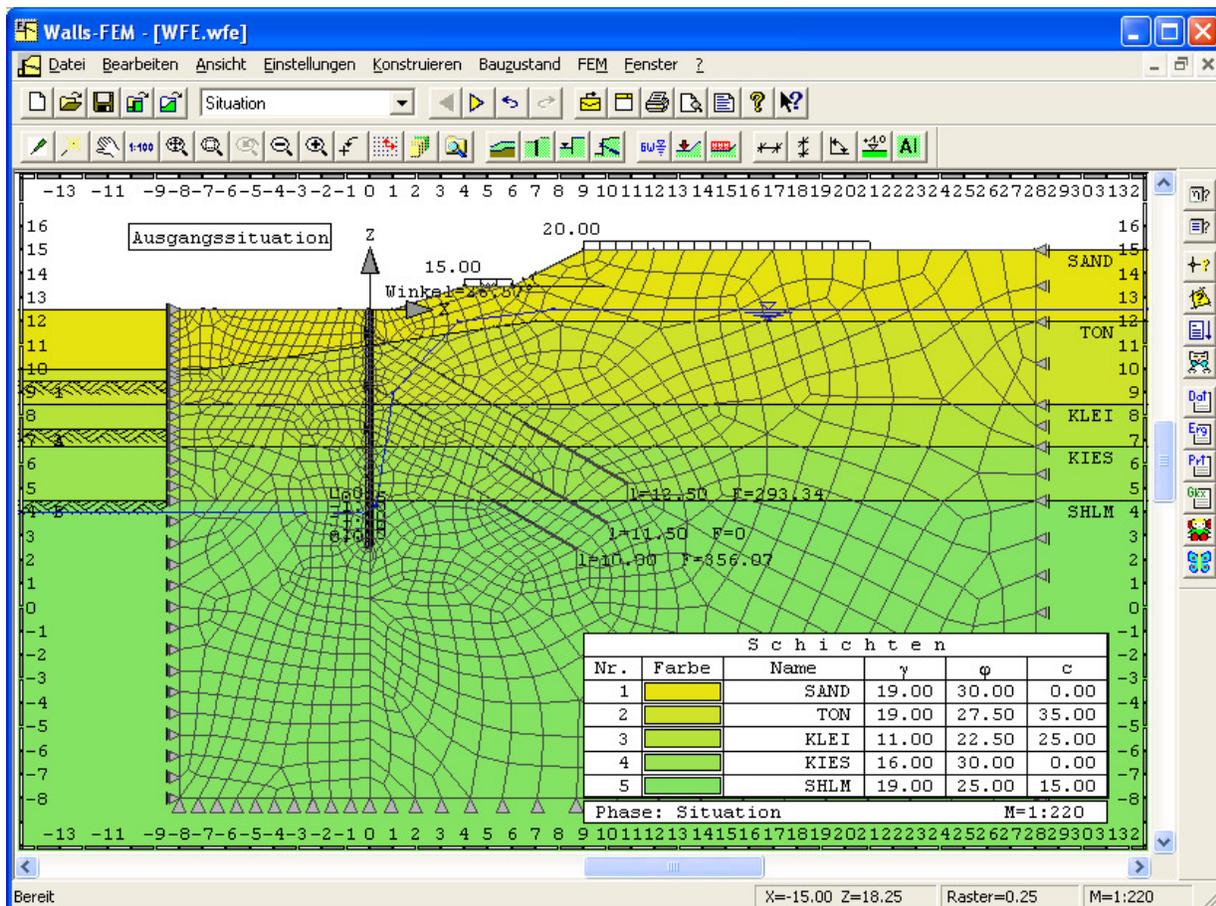


# WALLS-FEM

## Finite Element Analysis for excavation walls

Because of the increasing building density in cities, a higher demand for analysis of deformations of retention walls is necessary. The program WALLS-FEM with its effective input and its automatic mesh generation provides an economic way to get a calculation of complex excavation pit walls. The SOFISTIK-calculation kernel implemented in WALLS-FEM computes realistic settlement dells and wall deformations using modern ways of material definitions in all construction stages according to the new recommendation EB103 of the EAB.

WALLS-FEM presents itself as the ideal complement for the WALLS-series (the classic walls excavation calculation program). In this combination first with the program WALLS-excavation you will design the geometry, compute the walls anchoring depth and anchor length due to the formulas of the EAB, then you can import the complete system into WALLS-FEM and after few additional steps you can perform the FE-analysis. With the FEA all relative displacements of soil anchors and wall will fully be considered and now you can verify whether the assumption of the EAB for this case were valid or not. Because of the interactive design of all objects (like anchor angle and -length, initial tension...) the system can be optimised very easily, e.g. for the minimisation of the settlements.



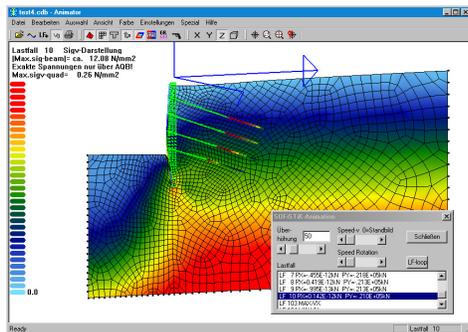
## Performance characteristics

### User Interface

- CAD-like input functionality
- Extensive importing possibilities such as e.g. DXF, XML, ...
- Automatic mesh generation
- Arbitrary number of anchors, struts, nails, piles, loads, ...
- Access to the extendible soil layer database, used by all FIDES geotechnics programs in common
- Simple change of the geometry subsequent by strict holding the building stages
- Assistants for generation of realistic building stages
- Arbitrary load cases
- Description of groundwater-levels
- Arbitrary number of polygonal soil layers
- Windows standard interface like e.g. undo and redo for all actions, copy & paste, context popup menu, system-explorer, ...

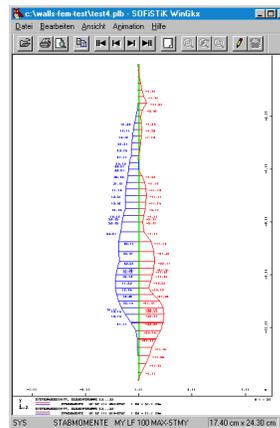
### Calculation

- Integrated elastoplastic Finite Element calculation kernel TALPA from SOFiSTiK
- Many non linear material definitions: Mohr/Coulomb, Drucker-Prager, Duncan-Chang, GRAN, ...
- Loading and unloading with different modulus
- Extraction of anchors, nails or piles
- Prestressing of anchors at constant stress
- Clear generation of building stages
- Fully compatible to the SOFiSTiK programs



### Results

- Settlement dell, stresses and displacements in the ground
- Stresses, deformations and initial forces of the wall
- Anchor-, nail-, pileforces
- Resulting earth pressure onto the wall
- Stability safety due to Fellenius
- Envelopes for extreme values
- Mixed Output text and graphic
- The whole SOFiSTiK post processing is usable (ANIMATOR, URSULA, DBVIEW, WINGRAF, ...)
- Numerous exporting formats are possible e.g. DXF, RTF, MS-Word,...



### Application range

- Estimation of settlements and displacements of the building pit wall
- Determination of characteristic action effects in representative intersections
- Safety against slope- and embankment failure
- Calculation of complex geometries
- Examination of building pit walls, where a reliable determination of earth pressure due to DIN is not possible (e.g. compliant anchor and flexible wall)
- Realistic representation of the excavation effects