

Unwedge 3.0

Underground Wedge Stability Software

Unwedge is a 3D stability analysis and visualization program for underground excavations in rock containing intersecting structural discontinuities. Use Unwedge to quickly create a model, perform a safety factor analysis, place reinforcement and interpret the results.

New Interface

Unwedge's Windows-based interface provides an easy to use graphical environment for data entry and visualization that greatly simplifies the analysis and design process. Editing tools such as point and click geometry input/editing and popup windows make performing parametric studies easier than ever before. The graphical data interpreter provides a rich set of tools, including 3D animation, for the convenient display of wedges surrounding the excavation.

New, Powerful Engine

Incorporate induced stress around an excavation and analyze its effect on stability using Unwedge's new analysis engine based on Goodman and Shi's block theory. Wedge computation is quicker and more accurate and the ability to scale and size wedges is improved. An entirely new calculation algorithm has also been added for finding and determining the size of possible end wedges.

More Strength & Support Models

Unwedge provides new strength models such as Barton-Bandis and Power Curve. Choose from new bolt models including cable bolts, Swellex and split-set and enhanced support models for bolts, shotcrete and support pressures. Account for bolt orientation efficiency, bolt shear strength and joint waviness factor. Simulate multiple layers of shotcrete with different properties.

Enhanced Modeling

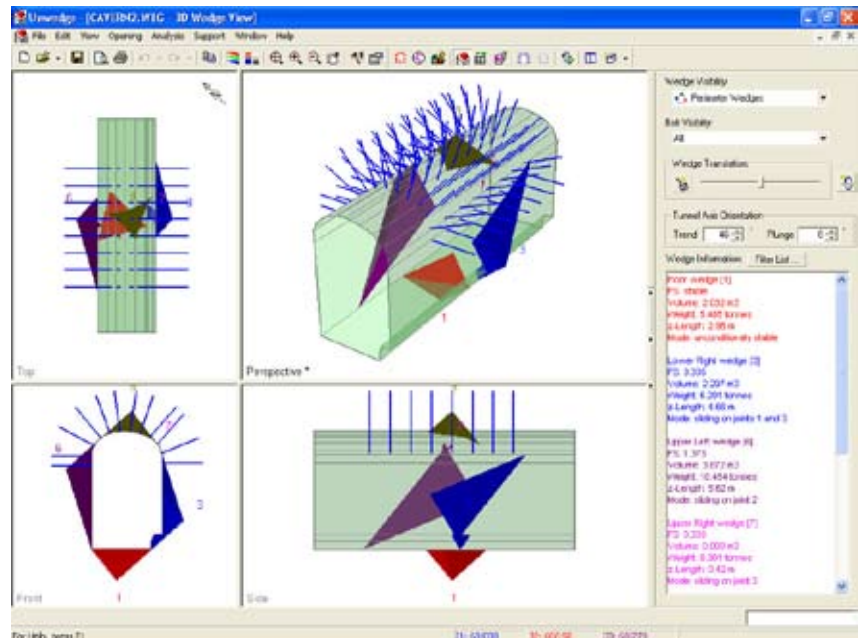
New features also include pseudo-static seismic load and a boundary element stress analysis option that allows users to determine how stress affects the stability of wedges. Scaling of wedges now more accurately reflects the values defined for trace length and persistence and Unwedge will also work to determine

the maximum volume wedge with user defined trace lengths.

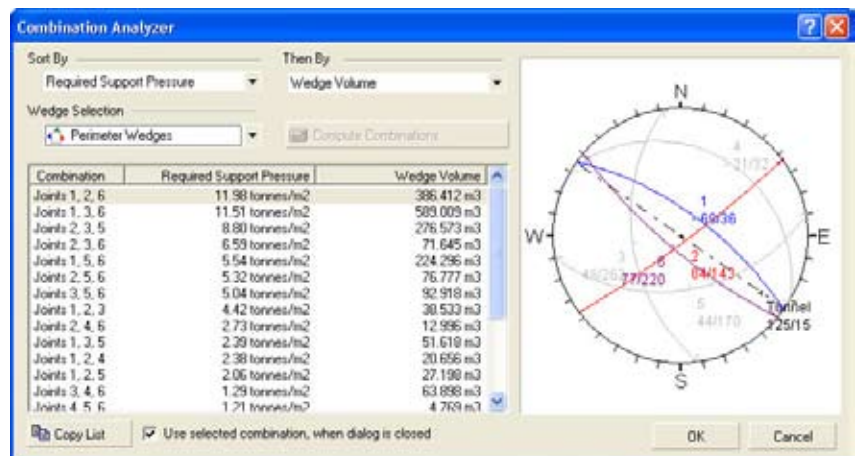
Dozens of Useful Additions

Editing support is easier than ever before. Unwedge 3.0 contains a new Integrated Stress Analysis module and the Tunnel

Axis Plot shows how results change as tunnel orientation changes. The Joint Combination Analyzer will automatically analyze multiple combinations of three different joint sets. New clipboard support means users can easily create screen captures to illustrate their reports.



The new Unwedge interface provides orthogonal and perspective views of the model and a wedge information panel summarizing results. In this example, pattern bolts have been added to support the roof wedge.



The Joint Combination Analyzer automatically determines the most critical joint combinations if more than 3 joint orientations are defined.

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Technical Specifications

Excavation

- define opening section
- interactive editing (add, move, delete vertices)
- import/export in DXF format
- axis trend/plunge
- analyze tunnels, caverns, shafts, intersections

Joints

- orientation (dip/dip direction)
- import from *Dips*
- stereonet view
- multiple joint combinations
- Joint Combination Analyzer
- assign properties
- shear strength (Mohr-Coulomb, Barton-Bandis, Power Curve)
- waviness
- water pressure

Wedges

- tetrahedral or prismatic wedges using Goodman/Shi block theory

- perimeter wedges
- end wedges
- failure modes – falling, sliding, lifting, stable
- scale wedge size

Analysis Information

- wedge information panel
- Info Viewer
- interactive Data Tips
- measure lengths and angles

Support

- 2D design views
- pattern bolting
- shotcrete
- pressure
- spot bolting
- bolt models – anchored, grouted dowel, cables, Swellex, split sets, user-defined
- bolt orientation efficiency
- interactive editing
- bolt force diagrams

Loading

- seismic loading
- field stress
- pressure
- bolt force
- water pressure

Viewing Options

- 3D wedge view (orthogonal and perspective views)
- multi perspective view
- end wedge view
- wedge visibility
- move wedges
- easily rotate, zoom, pan
- animation
- display options

Stress Analysis

- constant field stress
- gravity field stress
- advanced analysis options
- view stress contours

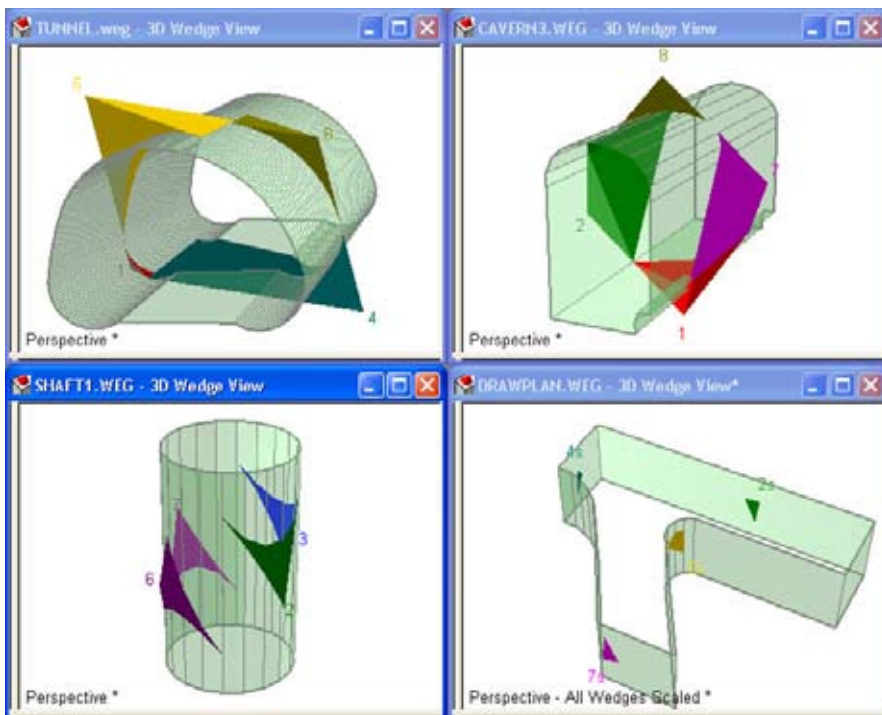
Tunnel Axis Plots

- optimize axis orientation
- vary trend and/or plunge
- contour plots or 3D charts
- 2D charts with secondary data
- user defined data

Price & Licensing

Unwedge 3.0 is sold as single licenses, which are purchased outright, for \$1195 US (\$1435 CDN).

Network licenses are also available; they are sold as a yearly subscription, with price based on the number of concurrent users. Please contact software@rocscience.com for more information.
www.rocscience.com



Excavation models – tunnel, cavern, vertical shaft, intersection.