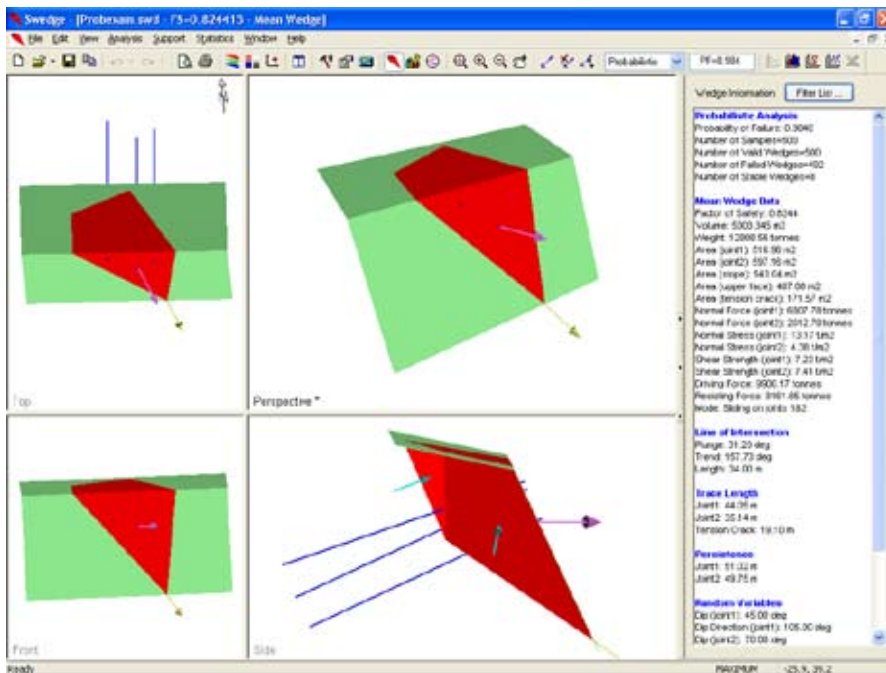


Swedge 5.0

Surface Wedge Stability Software

Swedge is an easy to use analysis tool for evaluating the geometry and stability of surface wedges in rock slopes. Wedges are defined by two intersecting discontinuity planes, the slope surface and an optional tension crack.



Orthogonal (top, front, side) and perspective views of the model are displayed in a 4-view split screen format. This example shows rock bolts and various external forces applied to the wedge.

Analysis Options

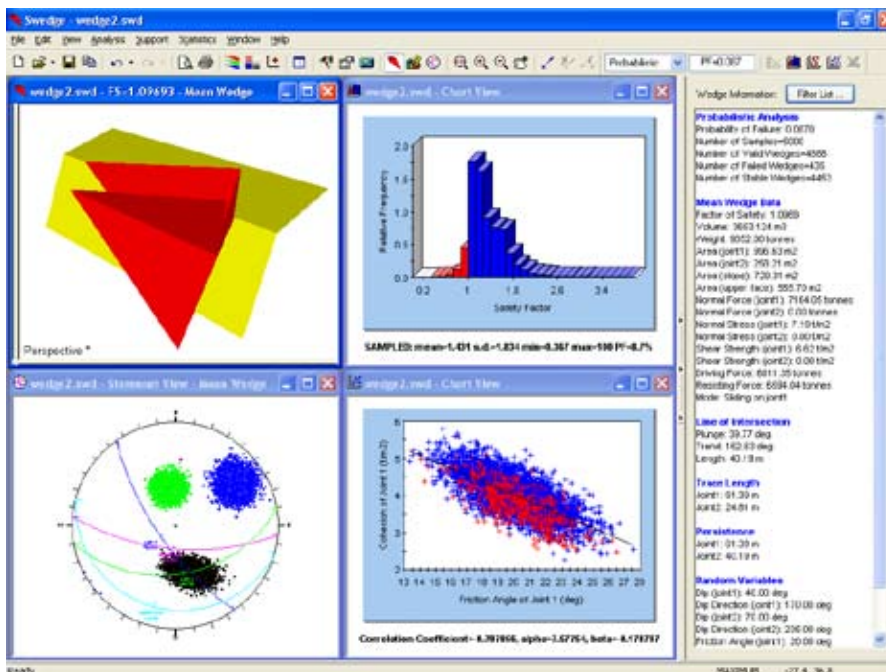
Swedge 5.0 offers a variety of analysis options including Deterministic, Probabilistic, Combination, Sensitivity and Persistence analysis. For a Deterministic analysis, Swedge computes the factor of safety for a specific wedge. Sensitivity analysis allows you to determine the effect of individual variables on safety factor. For a Probabilistic analysis, statistical distributions can be defined for input data and a probability of failure is calculated.

Support & Loading

Rock bolts, shotcrete or support pressure can be applied to increase the wedge safety factor. Bolt orientation can be optimized with a mouse click, and the support capacity for a required factor of safety can be determined. The Pressure option can be used to simulate pattern bolt application or surcharge loading. De-stabilizing forces due to water pressure on the joint planes, seismic loads or external forces can also be easily modeled.

Import from Dips

Swedge 5.0 provides improved integration with the Dips program. With the new Combination analysis option, a complete Dips file can be imported into Swedge. Any number of discrete joint planes can be defined, and Swedge will compute all possible combinations of joint intersections which can form a wedge. Joint set statistics (Fisher Distribution) can now be imported from Dips for a Probabilistic analysis.



Probabilistic or combination analysis results can be plotted on histograms, scatter plots and the stereonet. Failed wedge data can be highlighted in red.

Slope

- dip/dip direction of slope plane and upper face
- slope height
- bench width
- overhanging slope
- metric or imperial units

Joints

- dip/dip direction of joint planes
- shear strength – Mohr-Coulomb, Barton-Bandis, Power Curve
- waviness angle
- import planes from *Dips*

Tension Crack

- optional tension crack plane
- arbitrary orientation
- location – user-defined or automatic

Wedge Size

- scale wedge size by slope height, slope length, bench width, trace length, persistence, wedge weight, volume
- truncate wedge with tension crack
- persistence analysis (probabilistic)
- minimum wedge size

Probabilistic Analysis

- define statistical distributions for input variables
- distributions – normal, uniform, triangular, beta, exponential, lognormal, gamma
- Fisher distribution for joint orientations
- import joint set statistics from *Dips*
- Monte Carlo or Latin Hypercube simulation
- random or pseudo-random sampling
- shear strength – define variability of mean strength envelope or individual strength parameters

- correlation coefficient for cohesion and friction angle
- histogram, cumulative and scatter plots
- best fit distribution, regression line
- highlight failed wedges on plots
- calculate probability of failure, reliability index
- select random wedges

Combination Analysis

- unlimited number of joints
- analyze all possible combinations
- find minimum safety factor wedge
- import joints from *Dips*
- view results on histogram, scatter plot, stereonet

Sensitivity Analysis

- determine effect of individual variables on safety factor
- multiple variables on one plot

Persistence Analysis

- randomly vary wedge height and/or joint persistence
- allowable persistence determines if wedge can form

Support

- rock bolts
- shotcrete
- pressure
- active or passive support
- optimize bolt orientation
- calculate support force for required safety factor

Loading

- water pressure on joints
- seismic coefficient
- external forces
- pressure (surcharge or support)

Stereonet View

- plot great circles, poles
- show joint intersections
- highlight failed data
- equal angle / equal area

Import from *Dips*

- import mean planes
- import joint set statistics (probabilistic analysis)
- import all planes (combination analysis)

Analysis Results

- sidebar information panel
- Info Viewer analysis summary
- one-click export of data and charts to Excel

Viewing Options

- 3D wedge view (top, front, side and perspective views)
- interactively rotate, zoom, pan
- move wedge along sliding planes
- shaded or wireframe viewing
- customize display options
- copy to clipboard
- export image files

Price & Licensing

Swedge 5.0 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