

# RocFall 4.0

## Statistical Rockfall Analysis Software

**Determine rockfall risk and design remedial measures using this easy to use statistical analysis program. RocFall 4.0 offers fast, flexible analyses, a comprehensive array of statistics and presentation-quality output, making it an invaluable tool for projects where rockfall may occur.**

### Easy Input, Fast Output

Input of slope geometry, material properties and rock locations is straightforward; perform a full analysis in seconds. There are no restrictions on slope geometry - add any number of overhanging sections or barriers at any angle/location on a slope. For each simulation, a comprehensive set of graphs and statistics is generated, allowing users to quickly determine risk and design remedial measures. Add a remedial measure, re-run the simulation and graphs update instantly. The Drawing Toolkit allows importing of bitmap files, and includes multi-line text-boxes that can be auto-filled with data, and axes that can be dragged and dropped to show coordinates. Output of graphs, statistics and raw data is available in a variety of formats.

### Variety of Analysis Options

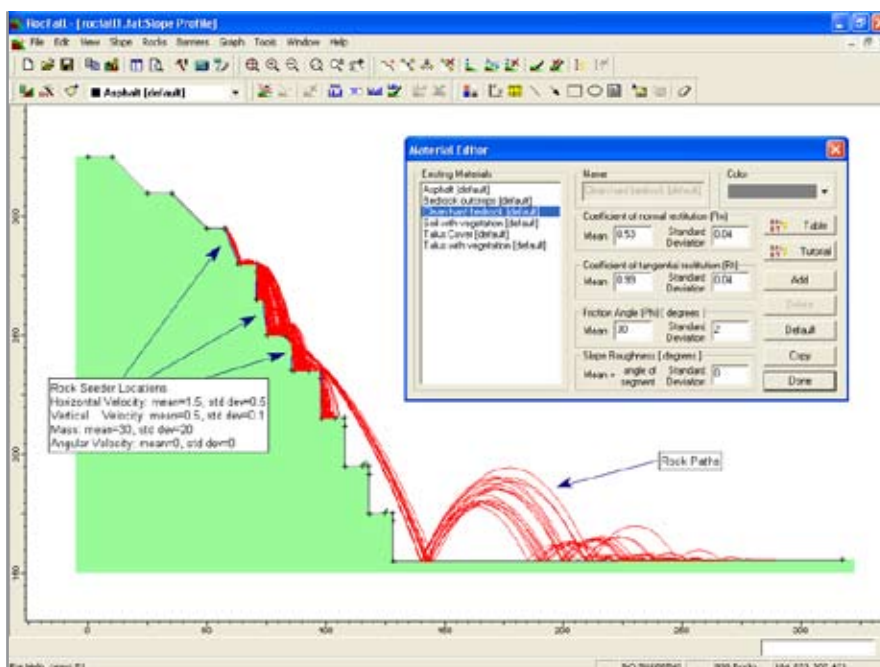
A histogram showing the location of rock endpoints is generated, as well as energy, velocity and bounce height envelopes for the entire slope profile. Distributions of energy, velocity and bounce-height are calculated along the slope profile and can be easily graphed. Statistics are calculated automatically, enabling interactive display of energy and bounce height distributions - so you can quickly determine where these are at a minimum, and place barriers in the optimal location. RocFall 4.0 includes an extensive table of coefficients of restitution (RN, RT) consisting of data from journal articles and field-tested values contributed by other RocFall customers. The software also has a Material Wizard for the back-calculation of RN for any material, based on the location of rock endpoints.

### Design Reliable Remedial Measures

RocFall 4.0 helps users design remedial measures: the material properties of slope segments can be changed and simulated (e.g. placing loose gravel on a bench) to facilitate results comparison. Graphs and statistical summaries of the kinetic energy and location of impact on a barrier can help determine the capacity, height and location of barriers. Once a measure is applied, a new simulation can be run with one mouse click - graphs automatically reflect the new data. Rock paths can be filtered - right-click on a barrier and select paths with the highest velocity on impact to see where the rocks originated.

### Presentation Quality Reporting

RocFall 4.0 offers high quality graphs and printing. Graphs can be exported to Excel with one-click, and slope and rock-paths can easily be exported to a DXF file for import into a CAD program. Input and output data (formatted in tabular form) and screen captures can be pasted into a word processor or saved to an image file for speedy report writing. RocFall 4.0 also allows raw data to be pasted into a spreadsheet for more detailed analysis (e.g. for determining what fraction of impact locations were above a certain height or for fitting a probability distribution to the data).



Rockfall analysis of open pit mine slope, studying the effect of bench geometry.

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## Technical Specifications

### Slope

- no restriction on slope geometry (e.g. overhanging sections)
- statistically defined material properties
- rocks can slide, after coming to rest
- statistically define slope vertices
- vary slope angles randomly (i.e. simulate slope roughness)
- import/export material properties
- import DXF, CRSP (version 3 & 4) files
- import BMP images
- Material Wizard to assist back-calculation of coefficients of restitution

### Coefficients of Restitution

- table of coefficients of restitution included

### Barriers

- unlimited number of barriers
- define barrier response (RN, RT)
- breakable barriers

### Rock Starting Location

- specify single location and line seeders
- unlimited number of starting locations
- probability settings for each seeder
- random/pseudo-random number generation

### Data Collectors

- gather information/statistics at any location

### Filters

- pick particular rock paths to create statistics/graphs
- pick paths graphically or by distinguishing value (e.g. endpoints right of x=43.2)

### Graphs

- histogram of rock endpoint locations
- envelope graphs (energy, velocity, bounce height, etc.)

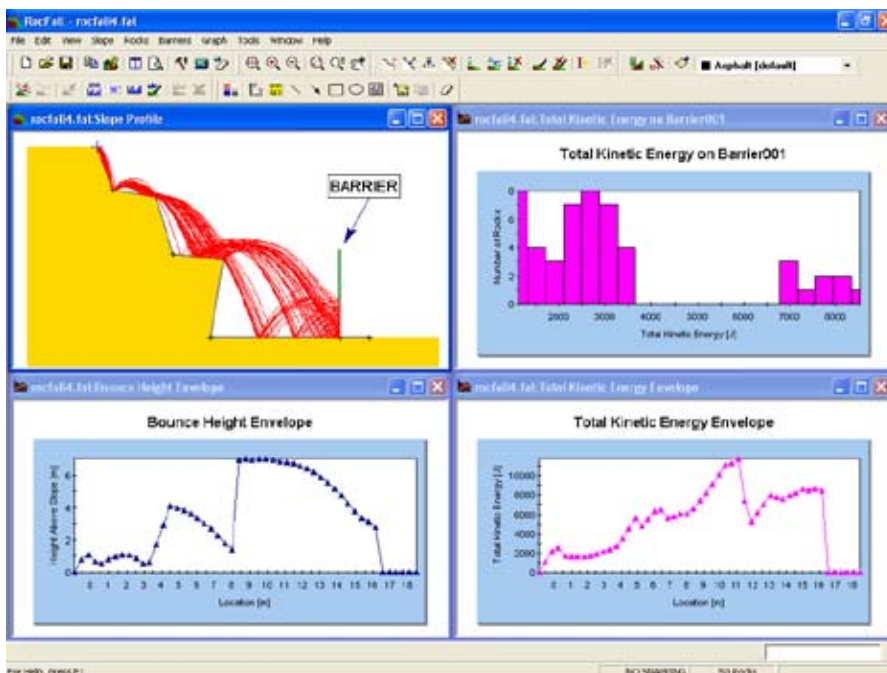
- distribution graphs show distribution at specific locations (same data as envelope graphs)
- create histograms (impact locations, energy, etc.)
- statistics generated for graphs, best fit distribution (normal, beta, triangular, uniform, exponential)

### Output

- copy graphs/plots to clipboard
- transfer plots to Excel with one click
- export rock paths to DXF format
- copy geometry/parameters to clipboard
- InfoViewer
- one click gray-scale
- save screen to image file (.bmp, .jpg, .wmf, .emf)
- slope and slope/chart views are easily added to, scaled
- fill/hatch area below slope to improve presentation

### Verification

- extensive verification manual
- detailed hand-calculations also shown



Rock slope with overhang. Graphs depict bounce height and kinetic energy envelopes of falling rocks, and the impact energy on the vertical barrier.

### Price & Licensing

RocFall 4.0 is sold as single licenses, which are purchased outright, for \$795 US (\$955 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](mailto:software@rocscience.com) for more information.

[www.rocscience.com](http://www.rocscience.com)