

CPillar is a quick, interactive and simple to use analysis tool for evaluating the stability of surface or underground crown pillars, and laminated roof beds.

Analysis Methods

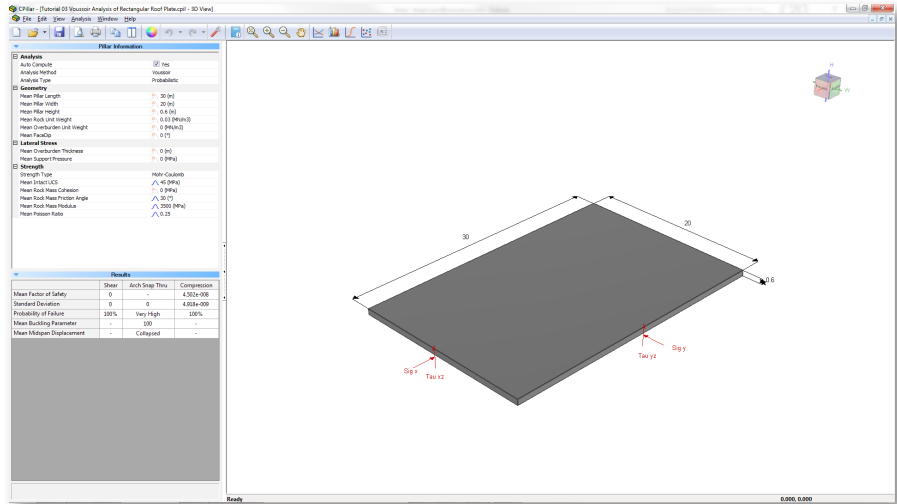
CPillar 4.0 offers three different limit equilibrium analysis methods: Rigid or Elastic plate analysis, and Voussoir (no tension) plate analysis. Additionally, there is an option between a Deterministic or Probabilistic analysis. Probabilistic analysis allows you to define statistical distributions of input data and calculate probability of failure. Furthermore, sensitivity analysis allows you to determine the effect of individual variables on safety factor.

Failure Modes

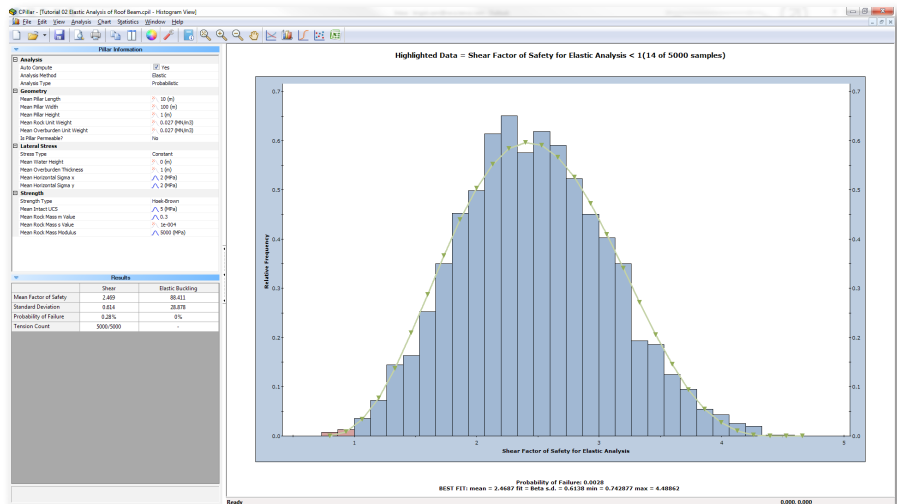
Failure modes include Shear, Elastic, or Gravity buckling, as well as Compression. A Rigid analysis considers the Shear (vertical slippage at abutments) failure mode. An Elastic analysis considers the Shear and Elastic buckling failure modes. The Voussoir analysis considers the Shear, Arch snap-thru (buckling due to gravity), and localized crushing failure modes.

Probabilistic Analysis

In a Probabilistic Analysis, you can define statistical distributions for input parameters, to account for uncertainty in the values of input parameters. When the analysis is computed, this results in a safety factor distribution from which a probability of failure (PF) is calculated. A Monte Carlo or Latin Hypercube sampling method is selected. The data can be viewed in histograms, cumulative plots, and scatter plots.



Voussoir Analysis of Rectangular Roof Plate. Three failure modes considered: Shear, Arch Snap-Thru (Gravity), and Compression.



Shear Factor of Safety for Elastic Analysis: A factor of safety histogram resulting from a probabilistic analysis. Probability of Failure: 0.28%.

Analysis Methods

- rigid plate analysis
- elastic plate analysis
- Voussoir (no tension) plate analysis
- deterministic or probabilistic analysis type
- sensitivity analysis

Geometry Definition

- pillar length
- pillar width
- pillar height
- rock unit weight
- overburden unit weight
- water unit weight
- permeable or impermeable pillar
- face dip (Voussoir)

Lateral Stress Definition

- stress type: Constant or Gravity
- water height
- overburden thickness
- horizontal sigma x; horizontal sigma y (constant stress)
- horizontal/vertical Kx; horizontal/vertical Ky (gravity stress)
- support pressure (Voussoir)

Shear Strength Criterion

- Mohr-Coulomb
- Generalized Hoek-Brown (GSI, mi, D)
- Generalized Hoek-Brown (mb, s, a)
- Hoek-Brown

Failure Modes

- shear (vertical slippage at abutments)
- elastic buckling
- arch snap-thru (buckling due to gravity)
- localized crushing failure

Statistical Distributions

- normal
- uniform
- triangular
- beta
- exponential
- lognormal
- gamma

Probabilistic Analysis

- probability of failure
- Monte Carlo or Latin Hypercube sampling method
- histogram plot
- cumulative plot
- scatter plot
- highlight failed cases with a factor of safety below a certain value
- plot regression line

Results

- (mean)* factor of safety
- (standard deviation)
- (probability of failure)
- (mean) buckling parameter
- (mean) midspan displacement
- (tension count)
- *Results in brackets above are probabilistic only

File Output

- save processed file
- export to Excel
- export image
- copy to clipboard

Interface

- version 4.0 of CPillar has been converted from DOS to the Windows operating system
- Info Viewer provides a comprehensive summary of model input data and analysis results, in a formatted text listing
- Display Options allows for customized colours, fonts, significant digits, view controls
- tile windows vertically
- 3-dimensional pillar display
- auto-compute results checkbox

Price & Licensing

For pricing and license options, please refer to the New Rocscience Shopping Cart document on your USB information key.

For further information, please contact us at:

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