CPillar
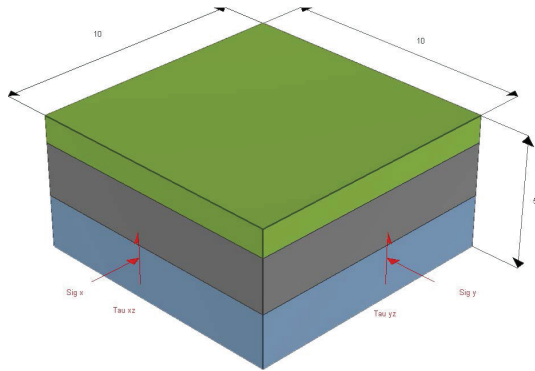## Crown Pillar Stability Analysis

Model of a crown pillar with water

What is CPillar?

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

CPillar offers three different limit equilibrium analysis methods: rigid plate analysis; elastic plate analysis; and Voussoir (no tension) plate analysis. Additionally, users can choose 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.

Software Highlights

Analysis Methods

- CPillar offers three different limit equilibrium analysis methods: Rigid plate analysis, Elastic plate analysis, and Voussoir (no tension) plate analysis. CPillar further allows users to choose either Deterministic or Probabilistic analysis. While Deterministic analyses do not inherently model the variability of materials, Probabilistic analyses can be used to define statistical distributions of input data and calculate probability of failure. Furthermore, sensitivity analysis can be performed 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.

Plans & Pricing

Personal License: Locked to one computer.

- Lease: **USD $395/year**
  Leased annually. Includes Maintenance+.

- Perpetual: **USD $795**
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Contact us at **software@rocscience.com**

Find more details: rocscience.com/software/cpillar

Analysis Methods

- Analysis Methods
- Rigid plate analysis
- Elastic plate analysis
- Voussoir (no tension) plate analysis
- Deterministic or probabilistic analysis type
- Sensitivity analysis

Failure Modes

- Shear (vertical slippage at abutments)
- Elastic buckling
- Arch snap-thru (buckling due to gravity)
- Localized crushing failure

File Output

- Save processed file
- Export to Excel
- Export image
- Copy to clipboard

Geometry Definition

- Pillar length
- Pillar width
- Pillar height
- Rock unit weight
- Overburden unit weight
- Water unit weight
- Permeable or impermeable pillar
- Face dip (Voussoir)

Interface

- 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
- Three-dimensional pillar display
- Auto-compute results checkbox

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)

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

Shear Strength Criterion

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

Statistical Distributions

- Normal
- Uniform
- Triangular
- Beta
- Exponential
- Lognormal
- Gamma