

Toward a Tool for Managing Uncertainty in Large Open Pit Modelling – Finite Element Analysis of Jointed Rock Masses

Hammah, R.E., Yacoub, T.E., Corkum, B. and Riahi, A.

Rocscience Inc., Toronto, ON, Canada

Curran, J.H.

University of Toronto & Lassonde Institute, Toronto, ON, Canada

Abstract

This paper explores the application of the Finite Element Method (FEM) with discontinuity networks and Shear Strength Reduction (SSR) analysis to analyze and design large open pit slopes. It discusses the uncertainties in the input parameters for an FEM model of a blocky rock slope, and describes the attributes of the modelling tools needed for practical open pit analysis. The paper then shows how the FEM, through scenario and probabilistic analysis, can be used to design optimal pit slopes under uncertainty.

Keywords: Rock Slopes; Large Open Pits; Probabilistic Analysis; Risk Analysis; Joint Networks; Discrete Fracture Networks; Jointed Rock Masses, Finite Element Method; Shear Strength Reduction Analysis