Joel Andersson

Geomechanical Engineer

Expertise	Rock mechanics
Education	M.Sc. Civil Engineering (Rock Mechanics), 2018 Luleå University of Technology, Luleå, Sweden.

Professional Experience

2018 – Present	*Itasca Consultants AB, Stockholm, Sweden* *Geomechanical Engineer*
2018 – 2018	*Projektengagemang, Stockholm Sweden* *Soil engineering*

Project Experience

Soil engineering:
Evaluation of soil properties from different field investigations. Analysis of expected settlements for two preschools in Stockholm.

Mining:
2D numerical analysis and evaluation of slope stability in Aitik. Kinematic analysis of bench stability in Aitik.

Three-dimensional continuum analysis of mining of the 91 m level at Rana Gruber (sublevel caving) to evaluate stability of mining infrastructure when opening a deeper mining level. This also included detailed analysis of different mining sequences for the N91 m level and their impact on the stability of drifts and other infrastructure.

Simulations of hydraulic fracturing in mining using hydraulic-mechanical numerical modeling with discrete fracture network (DFN). The purpose of the analysis was to provide recommendations as to alternative hydraulic fracturing intervals and fracturing fluid with the given knowledge of the geomechanical environment.

Geomechanical study as a part of rock mechanics feasibility study for a sublevel-stoping mine. Conducted work includes 3D numerical analysis and evaluation of (i) stope dimensions (ii) suitable dimensions of the sill pillar (iii) large scale stability (iv) suitable distances of infrastructure from the mining stope.

Update of geomechanical design parameters for Kaunis Iron's Taupuli open pit mine. Conducted work included (i) creation of a new geomechanical model based on results from core logging. (ii) creating new recommendations of design parameters for new heights and angels for benches, inter ramp slopes and the overall slope, and (iii) providing recommendations for monitoring of slope stability.

2D numerical analysis and evaluation of feasible overall pit slope angles for the Viscaria mine.

Analysis of alternative resumption options for the Kiirunavaara mine after a significant mining induced seismic event including determination of safe dimensions for the final Kiruna mine barrier pillar.

Analysis of effect of alternative mining rates and seismic response at the Malmberget and Kiirunavaara mines.

Mine-scale modelling of impact from using the alternative raise caving mining method at the Kiirunavaara mine using hybrid-mesh models in *FLAC3D*. Caveability study of the raise caving stopes and crown pillar during production using coupled (*FLAC3D-CAVESIM*) model.

Three-dimensional continuum analysis of a study evaluating reduction of seismic potential at the Kiirunavaara mine with a concept involving "yielding pillars" and a "chevron shaped mining sequence."

Analysis of potential critical pillar widths between drifts in the Kiirunavaara mine with regards to seismic events. The project involved three-dimensional continuum analysis and calibrations against seismic events around the pillars.

Infrastructure:
Geometry setup and three-dimensional discontinuum analysis for new railway tunnel and station for the Korsvägen station in Gothenburg.

Design of temporary rock support as a part of the expansion of SKB's final repository for short lived radioactive waste. Conducted work include (i) design of rock bolts and wire meshing to ensure a safe working environment in existing rock vault while the construction of the new one is ongoing.

Numerical modelling in the BeFo financed project entitled "Efficient simulation of failure probability.

Field work:
Geomechanical core logging (RQD-, RMR-, and Q-characterization) for various mining and civil engineering projects.

Continuous field mapping of joint orientations and rock conditions during production phase for the expansion of the Renström hydro powerplant.

Project lead for a geomechanical core logging campaign for Kaunis Iron's Sahavaara orebody.