

Mattias Sjölander**Geomechanical Engineer****Expertise**

Rock Mechanics, Numerical Modeling

Education

M.Sc. Civil Engineering (Rock Mechanics and
Geotechnical Engineering), 2019
Luleå University of Technology, Luleå, Sweden

Professional Experience

2021 – Present	<i>Itasca Consultants AB, Luleå, Sweden</i> <i>Geomechanical engineer</i>
2020 – 2021	<i>AFRY, Luleå, Sweden</i> <i>Geomechanical engineer</i>
2019 – 2019	<i>LKAB, Kiruna, Sweden</i> <i>Rock Mechanics engineer, seismicity</i>
2018 – 2018	<i>LKAB, Kiruna, Sweden</i> <i>Rock Mechanics engineer, seismicity</i>
2017 – 2017	<i>ÅF-infrastruktur AB, Sundsvall, Sweden</i> <i>Internship, Geotechnical engineer</i>
2016 – 2016	<i>BDX-företagen, Luleå, Sweden</i> <i>Construction worker</i>
2015 – 2015	<i>Skanska Sverige AB, Östersund, Sweden</i> <i>Foreman</i>
2014 – 2014	<i>Skanska Sverige AB, Sundsvall, Sweden</i> <i>Foreman</i>
2011 – 2013	<i>Construction worker</i>

Project Experience*Infrastructure projects:*

Three-dimensional continuum analysis (*FLAC3D*) for pylon foundation and bridge cable foundation for the new Grenland bridge in Norway.

Three-dimensional continuum analysis (*FLAC3D*) and development of construction documents for tunnel underneath Lambarfjärden, Förbifart Stockholm. As part of the analysis, the planned excavation process and the required reinforcement (bolts, lining, and spiling) were studied.

Calibration study with three-dimensional continuum models (*FLAC3D*) for an already excavated ramp tunnel with low rock coverage, subproject South, Förbifart Stockholm. The purpose of the study was to determine if installed reinforcement is efficient by performing a calibration study with the help of convergence measurements.

Three-dimensional continuum analysis (*FLAC3D*) and development of construction documents for ramp tunnel with very low rock coverage in subproject Lovön, Förbifart Stockholm. The rock coverage in the area varies between 1.5–6 m, and with help of the models, the required bolts, lining, spiling, excavation process, and monitoring were determined.

Three-dimensional continuum analysis (*FLAC3D*) and development of construction documents for Air Exchange Stations (AES) in subproject Lovön, Förbifart Stockholm. In total, eight AESes at depths between 50–100 m was studied. The AES-design includes large roof-spans up to 35 m, complex geometries and a connected vertical shaft.

Three-dimensional continuum analysis (*FLAC3D*) and development of construction documents for vertical, 10 m diameter shafts in subproject Lovön, Förbifart Stockholm. The height of the shafts varies between 50–100 m, and the shafts are designed to carry a heavy concrete lining on rock shelves.

Three-dimensional continuum analysis (*FLAC3D*) for crossing between Kvarnberget and Götatunneln, Västlänken. The analysis studied widening of the existing Götatunnel together with new loads from the Kvarnberget concrete tunnel.

Design of reinforcement for train tunnels in the Ostlänken project. Early-stage project where Trafikverket wanted a preliminary reinforcement design to be able to estimate the costs for the construction of Ostlänken railway. The design process included a few basic two-dimensional continuum analyses in *FLAC*.

Hydropower projects:

Three-dimensional discontinuum analysis (*3DEC*) in Master Thesis project for excavation of new access tunnel in Krångede hydropower station. The analysis studied the influence of the new tunnel on the stress field around the turbine hall.

Mining projects:

Evaluation of the monitoring network for subsidence on the footwall of the Kiirunavaara mine to optimize and systematize their working methods.

Field work:

Measuring and evaluation of boreholes in Aitik, Boliden.

Inspection and control of loose rock in five winter sand silos for Svevia.

Geophysical resistivity measurements for new spillway in Storjuktan.

Construction work:

Three years' experience as a construction worker on different projects, with the majority being water supply and sewerage projects, but also park construction, footpath and cycle tracks construction, and excavation for fiber cables.

Soil Engineering:

Geotechnical engineering of several soil engineering projects with design work for roads, small bridges, and railways. The work included assessment of field and laboratory results and documentation in geotechnical reports and analytical calculations of soil stability.

Seismicity:

Monitoring the seismicity in LKAB mine in Kiruna.