

Catrin Edelbro

Geomechanical Engineer

Expertise Rock Mechanics, Mining Engineering, Teaching, Project Management

Education Ph.D. (Rock Mechanics), 2008
Luleå University of Technology, Luleå, Sweden
Licentiate in Engineering (Rock Mechanics), 2004
Luleå University of Technology, Luleå, Sweden
Master of Science in Civil Engineering with specialization in rock engineering, 1999
Luleå University of Technology, Luleå, Sweden

Professional Affiliations Member: International Society of Rock Mechanics

Professional Experience

2017 – Present *Itasca Consultants AB, Luleå, Sweden
Geomechanical Engineer*

2015-2017 *Luleå University of Technology, Luleå, Sweden
Deputy Head at Department, part-time*

2015-2016 *EIT Raw Materials
Interim Education Officer, part-time*

2013-2017 *Own consultant company
Technical and management support consultant for short projects*

2012-2014 *Program coordinator of a 5 year national program: MSc Civil Engineering, part time*

2011-2012 *Program coordinator of a 2 year international program: MSc Mining and Geotechnical Engineering, part time*

2011-2017 *Luleå University of Technology, Luleå, Sweden
Ass. Professor and Senior Lecturer in Rock Mechanics and Rock Engineering*

2008-2012 *Head of student recruiting at the Department, part time*

2008-2011 *Luleå University of Technology, Luleå, Sweden
Lecturer in Rock Mechanics and Rock Engineering*

1999-2008 *Luleå University of Technology, Luleå, Sweden
Doctoral Student / Research Engineer, Division of Rock Mechanics*

1997 *Boliden
Trainee*

Project Experience*Hydropower:*

Study of rock foundation issues for the Suorva hydropower dam. Stability assessment of the rock abutment at the Vargfors hydropower dam including field observations and stability calculations in UDEC.

Mining:

Project leader of the project "Validation of numerical analysis (a feasibility study)" which was a 9 month project (2011-2012) funded by the Hjalmar Lundbohm Research Centre (HLRC). The objective was to increase the understanding of where, what, when, and how measurements should be performed in order to validate numerical analysis.

Project manager of "Underground ventilation (a feasibility study)" during parts of 2013-2014. The project was completed for Rock Tech Centre (RTC).

Researcher in the RTC project ORESC (2014-2015). The aim of the ORESC project was to improve the resource efficiency by more detailed resource characterization during all stages in mining.

Geomechanical core (oriented) mapping.

Geotechnical characterization and ground support design recommendations for future underground crusher facility at the Aitik open pit (2018).

Infrastructure (Tunneling):

Design work for one underground station and one tunnel of the extension of the Stockholm metro (2017-present). Design and analysis work for one underground railroad station in Gothenburg (2018-present). The design work includes rock mass characterization and classification, empirical- analytical and numerical analysis, ground improvement techniques, ground support design, risk identification and partial face tunnel construction technique.

Responsible editor (2018) for revision of the Trafikverket (the Swedish Road and Railroad Administration) handbook for underground constructions.

Nuclear Waste Disposal:

Development of design mapping procedures for rock characterization.

Project management and leadership:

Deputy head of the Civil, Mining and Environmental Engineering Department with more than 350 employees. Head of more than 20 education programs at the Department. Strategic program development, stakeholder meetings etc. was included in the role as head of education. Driver and member of the steering committee for implementation of Conceive Design, Implement and Operate (CDIO) at all engineering programs at LTU (2015-2017).

Head responsible for student recruiting for four years which included contact with staff, students and industry and with high focus on time planning and allocation of resources.

Leading coordinator for the EIT Raw Material funded project: "Implementation of CDIO in Raw Material MSc program" (2016-2017) with nine partners (LKAB, RISE, Rusal Aughinish, Clausthal TU, Delft TU, UP Madrid, Chalmers, U Limerick and LTU). The first initiative in the world to implement CDIO in Raw Material MSc programs. Supported the project, as an Itascan, with arranging a workshop, create a case from industry and a stakeholder meeting during 2017-2018.

Teaching and Academic Experience:

(all teaching experience at Luleå University of Technology, unless otherwise noted.)

Awarded as the best teacher at Luleå University of Technology in 2010.

Examiner for three to seven rock mechanics and rock engineering courses (2008-2017) per year. Due to close collaboration with the industry, laboratory tests, field studies, field works, etc., have been included in all of my courses. The courses have thus been a mix of theory and "practical" work, e.g., (i) the first-year students (about 100 students) have visited tunnels in Norway due to a great collaboration with Statens Vegvesen Norr; (ii) tunnel mapping have been performed in Rödbergsfortet in Boden, and (iii) the fourth-year students visit tunnels in Norway or Sweden and attends the rock mechanics and rock engineering conferences in Stockholm. Teacher in rock mechanics course and tunneling course at LTU, as an Itascan, during 2017-2018.

Instructor of undergraduate students in civil and mining engineering at Luleå University of Technology, including classes on fundamental rock engineering and rock mechanics, drill and blast unit operations, New Austrian Tunneling Method, basic mining methods, slope stability, engineering geology, tunneling, ground reaction curve, etc. (1999 to present).

Supervision of more than 20 undergraduate thesis projects – e.g., blasting of rock slopes, tunnel stability investigation, evaluation of smart cable bolts, improved tunnel contour, strength of backfilling, application of digital photogrammetry for underground tunnel mapping, geotechnical domaining, seismicity in the Fabian orebody, evaluation of oriented rock cores, comparison between 2D and 3D modelling, and underground mining design projects.

Coordinator and teacher of the Sandvik International Mining School (2012, 2013 and 2014). The main focus of the course was mass mining and rock mechanics. During my time as coordinator, LTU was ranked as the top University by the Sandvik students. Participating universities include the Montanuniversität in Leoben, Camborne School of Mines, the Colorado School of Mines, the Luleå University of Technology, the University of New South Wales, and the University of the Witwatersrand.

Teacher at a diploma programme (2015, 2016) given at distance (my own company). The focus area was rock and mining engineering such as drill and blast unit operations, ventilation etc.

Coordinator and teacher for contract education for the mining company LKAB (2012). The focus area was rock mechanics. Teacher at MiningTech, CENTEK, Luleå in 2000 and 2001.

Others

Council member of the Swedish rock engineering foundation (BeFo). In that role reviewer of research project proposals four times a year (2012-2017).

PhD project dealing with the strength of hard rock masses, including strength estimation and numerical modeling.