



TECHNICAL COLLABORATION IN COMPUTATIONAL GEOTECHNICS

Advanced numerical modelling · Constitutive modelling · Calibration

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I specialise in advanced numerical modelling in geotechnical engineering, constitutive modelling and numerical-method development. I collaborate on non-standard geotechnical problems, constitutive-model calibration and implementation, extensive parametric studies and custom numerical solutions.

CONSTITUTIVE MODELLING

- Hypoplasticity · Hardening Soil
- UMAT/UDSM implementation and modification
- Calibration from laboratory data
- Statistical parameter analysis and machine learning

NUMERICAL MODELLING

- Cyclic loading and soil–structure interaction
- Slope, embankment and waste-dump stability
- Tunnelling, excavations, fills and consolidation
- Numerical-method development
- Parametric and sensitivity analyses

EDUCATION

2014 – MSc (Ing.), CTU in Prague, FCE

*“Modelling of the Evropská access tunnel
using a hypoplastic model for fine-grained soils”*

2019 – PhD, CTU in Prague, FCE

“Parameters identification of advanced constitutive models of soils”

PROJECT EXPERIENCE | BÍLINA MINE 2019–2024

Within my academic work, I performed stability analyses of the Bílina Mine waste dump. I developed detailed 3D models for individual mining stages and implemented a new strength-reduction approach using a hypoplastic constitutive model. The analyses were carried out in PLAXIS 3D with more than one million elements.

COLLABORATION OPTIONS

- Extend PLAXIS 2D models to 3D
- Build on existing design models
- Independent review of complex analyses
- Develop and verify non-standard methods
- Contract / applied research

HARDWARE

- EPYC · 128 cores · 256 threads · 512 GB RAM
- Threadripper · 32 cores · 64 threads · 128 GB RAM

SOFTWARE

- PLAXIS 2D · PLAXIS 3D · Tochnog
- Fortran · C# · F# · Python · MATLAB