

Master Thesis (MA, 30 ECTS)

Aspects of steel – rock contacts in TBM tunneling

Description

New contractual developments set a focus on the effect of shield friction in hardrock TBM tunneling. Low speed and low stress contacts between steel and rock have not been explored a lot so far and the goal of this study is to focus on geometrical and mineralogical aspects of contact points between tunnel boring machine (TBM) shields and the tunnel wall. Research questions that need to be answered are for example: What are the contact points between a TBM shield and the tunnel wall in slanting and curved driving conditions? Which mode of TBM driving is most unfavorable in terms of expected frictional resistance? Are there correlations to standard abrasivity tests such as the Cerchar abrasivity? Methodologically the thesis should contain theoretical work, analog models, and geotechnical laboratory work (abrasivity tests). The master thesis is part of a currently ongoing bigger research endeavor on this matter.

Workflow:

1. Literature study on the effect of shield friction in TBM tunneling.
2. Digital and analog modelling of contact points between TBMs and tunnel walls.
3. Execution and analysis of Cerchar abrasivity tests.
4. Result assessment and evaluation.
5. Compiling and summarizing the results in the final Master's thesis.

Start: immediately

Supervisor	Affiliation	Contact
Georg Erharder	Institute of Rock Mechanics and Tunnelling	erharder@tugraz.at
Robert Goliash	Strabag	robert.goliash@strabag.com
Thomas Marcher	Institute of Rock Mechanics and Tunnelling	thomas.marcher@tugraz.at