Sustainable exploitation of the subsurface: the geology, engineering and environment of our underground asset

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GeoBIM for optimal use of geo data

The geotechnical challenge at all stages, all the way from the design phase to construction of the actual tunnel, is to be confident on the best available geo model. The degree of confidence of for example the level of the bedrock or the shear strength of the clay is directly affecting the risk money in the project budget for the client. To keep the risk money to a minimum is what every project is aiming for. And to find the best geo model will optimize the whole design and hence optimize the resources at all levels. However, the underground is not seldom complex, the time schedule is often tight and the amount of data and number of data formats and data types is huge in a large infrastructure project. To keep full control of the data and give all project participants access to the same and most current data, interpretations and models is a challenge. And who will use the data? It is a broad group of people; geotechnical engineers and designers, tunnel designers, road planners, clients, politicians, society in general, media etc. How to make all these people with largely varying degree of understanding of the geo process understand the data in the right way for their respective needs?

In the TRUST project (Transparent Underground Structures) the concept of GeoBIM is developed for this purpose. The aim is to design a database that can handle all geo related data in an infrastructure project, which is not available today. In the TRUST GeoBIM project also tools for visualizing data and models are developed, using VR technique and cores from the computer game industry, in order to make the visualization of the interpreted models practically in real time. This has been shown is really powerful tool for communicating geo data in complex projects.

The paper will present the background and the aim of the TRUST GeoBIM project (budget 1 mill Euro, 2013-2016, gathering four Swedish universities and industry) and data and examples from implementation in three large infrastructure projects - the Varberg railway tunnel, a new metro line in Stockholm and the ESS (European Spallation Source) project.

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