

# Digital Work Preparation Tool for Sub-Surface Construction Work in Mines - An Approach to Optimization

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## ABSTRACT

The focus of sustainability and efficiency enhancement of projects underground, shifts more and more towards the conduction of sub-surface construction work. Underground operations can be defined in a wide range of various projects, from underground mining tasks to the construction of engineering structures. Within these projects the conduction of construction work can not only be defined as absolutely necessary, but also as optimizing for underground processes (e. g. installation of sub-surface workshops to support sustainable mining processes). Even though the conduction of underground construction work might cause positive outcomes concerning the productivity, it also tends to be challenging due to local (sub-surface) conditions and influences. To minimize the risk of failure and sudden events while conducting construction work underground, the tool “work preparation” shall be used. Under the given constraints, such as local influences, expected construction work and a set time frame, the conduction of the construction work will be planned digitally in advance with explicit consideration of the construction logistics as well as the selection of a fitted construction technique (incl. choice of equipment). This paper will discuss the coherences between elements of work preparation and modern digital approaches, such as Building Information Modeling (BIM) to optimize processes generally. The research approach will be conducted as described: Under the consideration of sub-surface conditions and influences as well as project restrictions, the work preparation for construction work underground will start with planning the logistics and the choice of technique. Furthermore, these core elements of work preparation will set the foundation for the building site setup, work calculation and the process planning. This approach shall be used in the future to achieve the goal of risk minimization and efficiency enhancement of construction work underground and mining processes. Enhanced sustainability outcomes shall be achieved by optimized supporting processes, such as construction work.