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FACT SHEET to the research project HSSRM

SHORT TITLE / ACRONYM

HSSRM

LONG TITLE

Hard soil – soft rock modelling

DESCRIPTION

Hard soils and soft rocks (hereinafter referred to as 'HSSR') are part of engineering problems world-wide. They cannot be characterized by standard methods developed for soil or rock. The mechanical behaviour in the pre-peak range is strongly governed by the applied confining stress and localization occurs in the post-peak range in a brittle or ductile manner. The peculiar problem of modelling such HSSR materials is the main topic of this research subject. Both, existing data from literature review and in a further state own experimental data is used to elaborate the required modelling criteria.

The literature review on experimental data will focus on triaxial tests on marl-, weak sandstone- and stiff siltstone-specimens covering a wide range of confining pressures to find valid input parameters for numerical modelling. Subsequently, the deformation behaviour and the failure modes are discussed depending on the stress level and the specifics of the HSSR-material (e.g. strength/stiffness and consolidation history). The modelling is conducted to improve the understanding of the mechanical behaviour of HSSR-material. The investigations will be limited to isotropic and homogeneous ground, without any macro structure (e.g. stratification, schistosity or jointing), including the pre-peak behaviour under compression. The research activity involves the application and comparison of two constitutive laws described in different elasto-plastic frameworks: a hardening soil model, which empirically fits better to the behaviour of stiff soil and a concrete/shotcrete model, which should describe the behaviour of soft rock better.

The research goals are the identification of existing gaps in modelling of HSSR and the outline of strategies to overcome the main shortcomings in the development of future constitutive laws.

PROJECT COORDINATOR

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