Geophysical Research Abstracts
Vol. 16, EGU2014-332, 2014
EGU General Assembly 2014
© Author(s) 2013. CC Attribution 3.0 License.

An investigation on possible stability problems of rock masses during Elmadag tunnel excavation, Turkey

Şaziye Özge Dinç and Celal Tunusluoğlu
Canakkale Onsekiz Mart University, Engineering Faculty, Geolgical Engineering, Turkey (osgedc@gmail.com)

Our research project presents possible stability problems of rock masses of Elmadag- Ankara tunnel as one of the sections along the high speed railway system between Ankara and Sivas. The length and diameter of the tunnel will be 2975 m and 12.5 m, respectively. The studies of the tunnel excavation area at predesign stage were carried out both in the field and laboratory. The results of engineering mapping, core drilling and mineralogical-petrographic analysis indicated two rock formations, called Elmadag (metasiltstones, Triassic age) and Artova (serpantinites, Cretaceous age). Data from laboratory tests (permability, point load strength index, unit weight, uniaxial compressive strength tests, elasticity modules) and boring logs (TCR, RQD, weathering degree, fracture frequency, ground water depth) were used to identify rock mass quaility in excavation area. These data are combined to calculate the strengths of rock masses by empirical approaches in literature. However, the strength values were predicted less than 0.1 MPa that needs more investigations to determine excavation material as highly jointed rock or soil. Additionaly, preliminary results of numerical anaysis showed that the radius of plastic zone (approximately 26.11 m- 27.01 m) is more than allowed value (rplastik$\leq$ 2r) that causes inevitable stability problems needed to estimate before tunnel construction.