ANALYSIS OF THE STABILITY VARIATION OF A SLOPE CROSSED BY FOREST FIRE

ROMINA SECCI, SERGIO V. CALCINA, GAETANO RANIERI & GABRIELE URAS

Department of Civil Engineering, University of Cagliari, Environmental Engineering and

Architecture DICAAR, Cagliari, Italy

ABSTRACT

This paper deals the study of the stability variation of a hill slope crossed by a forest fire. In order to perform the stability analyses, two geotechnical models were derived by the integration of the results of geotechnical surveys (NSPT measurements and direct shear tests) with electrical resistivity tomographies. Classical approach based on Limit Equilibrium Method is used to determine the safety coefficient. Furthermore, the effects of the forest fire on the slope stability have been discussed modifying the 2D models and introducing an ultra-shallow thin layer with the shear strength parameters determined on burned soil samples, collected after the fire crossing. In particular, this analysis has shown a marked reduction of safety factor at the interface between the burned soil layer and the underlying material for both geotechnical models, considering the infinite slope method with several saturation conditions of the shallow layer.

KEYWORDS: Electrical Resistivity Tomography, Fire Effect, Geotechnical Modeling, Slope Stability, Soil Erosion