Analysis and Prediction of the Behavior of the Landslide at Ain El Hammam, Algeria Based on the Second Order Work Criterion

Authors : Zerarka Hizia, Akchiche Mustapha, Prunier Florent

Abstract : The landslide of Ain El Hammam (AEH) is characterized by a complex geology and a high hydrogeology hazard. AEH's perpetual reactivation compels us to look closely at its triggers and to better understand the mechanisms of its evolution in mass and in depth. This study builds a numerical model to simulate the influencing factors such as precipitation, non-saturation, and pore pressure fluctuations, using Plaxis software. For a finer analysis of instabilities, we use Hill's criterion, based on the sign of the second order work, which is the most appropriate material stability criterion for non-associated elastoplastic materials. The results of this type of calculation allow us, in theory, to predict the shape and position of the slip surface(s) which are liable to ground movements of the slope, before reaching the rupture given by the plastic limit of Mohr Coulomb. To validate the numerical model, an analysis of inclinometer measures is performed to confirm the direction of movement and kinematic of the sliding mechanism of AEH's slope.

Keywords : landslide, second order work, precipitation, inclinometers
Conference Title : ICEET 2018 : International Conference on Civil, Environmental Engineering and Technology
Conference Location : Paris, France
Conference Dates : March 15-16, 2018