

Landslides Reduction Using Grouting Method, Case Study in Indonesia Enlarge Union Industry Company, Candi Industrial Area, Semarang, Central Java

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Abstract

Indonesia is country which anxious to mass movement disaster. It is often happened in any area, especially when it is rain season. PT. Uni Enlarge Industry Indonesia, Candi Industrial Estate, Semarang, Central Java, is one of the location that face this local mass movement problem. Here, it is happened ruins in the embankment at east of the factory. Soil material in the research location are carbonate clay as an original soil and sandy clay as a mould. The conditions of soil material and slope which is so steep (about 85o), become the control factors of the mass movement. This research aims to know the type of mass movement, the reason and the trigger of mass movement in the research location, and the success level of grouting method for solving.

Resesarch method used here are descriptif and experimental methods. The anlysis of slope stability is done by using Fellenius method accounted with computerization by using GeoStudio 2007 software.

From the investigation result in the field, the type of mass movement occurred in the research location is slump, triggered by hard rain and development activities in Candi Industrial Estate Semarang. According to analysis of slope stability, the slope condition after grouting has factor of safety value for 1,812 with the cohesion in the sandy clay layer for 21,637 kPa and carbonate clay layer for 30,466 kPa. To know the condition of slope when mass movement occurred, it is done a slope stability simulation by changing the cohesion parameter step by step. The simulation purpose to find the factor of safety value and cohesion of soil in the research location when mass movement occurred. Based on the result of slope stability simulation, it is found the cohesion value when mass movement occurred ($F_s = 1$) in the sandy clay layer for 10,167 kPa and carbonate clay layer for 19,036 kPa. From this simulation result, it is known that after grouting, the soil cohesion is growing up to 11,47 kPa and the slope safety factor is growing up to 0,812.

By notice the cohesion changing level, the slope factor of safety and the number of safety factor value after grouting, so that the use of grouting method to solve the mass movement in the research location is successful.

Keywords: mass movement, grouting, slope stability analysis, factor of safety