ABSTRACT

Slope failure cases that is happened in this residential location is situated on the banks of the river bend. In analyzing for the causes of this failure, the author tries to simulated field conditions into the finite element software Midas GTS (trial version) with two cases. The first case is the slope with the original conditions and the second case it is the slope disturbed by the condition of the river water flow. By using the advantages of this software, the author also simulated the slope conditions in order to compare the three-dimensional finite element simulation for each of these case. For the validation of the finite element analysis, the author also simulate slope with Slope/W software that use conventional two-dimensional methods of analysis.

From the finite element analysis to simulate the two-dimensional original slope author get safety factor values 1,137 and at the end of the slope, the deformation values is 0.8 m. For slopes with disturbed water conditions the author get the same safety factor that is equal to 1,137 and the maximum deformation at the end of the slope is 1.13 m. For the three-dimensional simulation of the original slope author get safety factor values 1,062 m with a maximum deformation at the end of the slope is 4.8 m. For slopes with eroded conditions author also get a number equal to two-dimensional safety factor value 1,062 and a maximum deformation at the end of the slope is 4.8 m. As a validation to the original slope with conventional slices analysis methods author get the value of safety factor 1.013, for Janbu method is 1.018 and for Bishop methods is 1.03.

From these results it can be concluded that the pre-disturbed watershed slope is ensured to fail due to the unstable condition of the slope. It is because the soft soil layer is very deep more than 10 meters from the ground.The slope failures can be classified as a base failure. It can be seen from the movement of the soil that the soil movement below the surface is greater than 15 meters from the edge of the slope.