Abstract

IDENTIFIKASI PENYEBAB DAN UPAYA PENANGANAN STRUKTURAL BENCANA LONGSOR
(Studi Kasus Longsor di Dusun Belakang Soya Kelurahan Karang Panjang Kota Ambon)

Iwan
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Telah dipertahankan di depan Dewan Penguji
Pada tanggal 20 Mei 2013

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The landslide occurring in Belakang Soya sub-Village, Karang Panjang Village, Ambon City caused the school fence and retaining wall to collapse and buried 2 residential houses. 12 People were reported dead. Based on this incident, a study in the form of slope modeling prior to the landslide is necessary to conduct to identify the causes of the landslide and its countermeasures.

In this research, a technical study based on the data obtained in the field; which are secondary data in the form of rainfall data, earthquake occurrence data, and geological data, and primary data in the form of result of topography survey, result of drilling, result of laboratory tests, and result of geoelectrical survey, is conducted. Based on these data, a numerical simulation of slope modeling is made using Plaxis software. Model-1 is the slope condition prior to the landslide, Model-2 is the slope condition after the landslide, Model-3 is the slope condition after a countermeasure namely gabion construction is built, and Model-4 is the alternative condition recommended in improving the slope stability which is slope re-profiling.

Based on the result of the simulation, it can be concluded that groundwater level highly affects the safety factor of slopes. The higher the groundwater level, the smaller the safety factor of the slope. In the condition where the groundwater level is -3 m below the soil surface, the safety factor value of Model-1 and Model-2 is < 1.2, however, the safety factor value of Model-3 and Model-4 is >1.3, which is considered safe. In Model-3, the value of the safety factor increases due to the effect of gabion while in Model-4, the safety factor increases to 1.341 due to slope re-profiling. In the simulation with earthquake load factor, the value of the earthquake load factor is 0.077g for Model-1 and 0.28g for Model-2, Model-3 and Model-4. In Model-1 with the combination of groundwater level -3 and earthquake, the slope condition becomes very critical with the safety factor value of 1.013, smaller if compared to the effect of groundwater level rise of -3 meter. In Model-2 and Model-3 the safety factor values are only 1.053 and 1.056 while in Model-4, the safety factor value increases to 1.06. Based on these results, the safest condition is in Model-4. Therefore, it is recommended that the slope stability in Belakang Soya sub-Village should be improved with slope re-profiling.

Keywords : *Landslide, slope stability, structural efforts, numerical modelling, geotechnical investigation.*