

INTISARI

Desa Giritirta, Kecamatan Pejawaran, Banjarnegara, Jawa Tengah memiliki geometri lereng batuan yang terjal. Lereng batuan kawasan ini dijadikan lokasi penambangan batuan. Adanya rencana pembangunan infrastruktur PLTMH di Giritirta menjadi pertimbangan untuk dilakukan perbaikan stabilitas lereng. Hasil investigasi didapat curah hujan yang tinggi serta perubahan derajat kejenuhan merupakan faktor pendorong terjadinya gerakan tanah. Pada penelitian ini dilakukan analisis stabilitas lereng pada beberapa titik lokasi infrastruktur PLTMH.

Penelitian ini didahului dengan pengujian terhadap geometri serta profil lapisan penyusun lereng. Pengujian pendahuluan terdiri dari *Measured Stratigraphic* dan pengambilan sampel tanah dengan alat *hand auger*. Tahap analisis dimulai dari estimasi *soil water characteristic curve* dan *hydraulic conductivity* dengan SoilVision. Pemodelan menggunakan Slide dan Plaxis untuk mengetahui tingkat kestabilan lereng. Pemodelan dilakukan pada berbagai kondisi yaitu kondisi eksisting, dengan adanya rencana galian tanah PLTMH, penambahan beban dinamis, dan perubahan derajat kejenuhan tanah.

Stabilitas lereng pada kondisi eksisting tidak memenuhi persyaratan faktor aman dan *displacement* terhadap gerakan tanah. Adanya rencana galian tanah berpengaruh terhadap stabilitas lereng STA 0+210 dengan *displacement* sebesar 11,8 cm. Adanya koefisien percepatan gempa (k_g) sebesar 124 cm/s^2 membuat lereng sangat rawah terhadap pergerakan. Turunnya derajat kejenuhan pada tanah jenuh dan mendekati jenuh signifikan terhadap naiknya SF dan turunnya nilai *displacement*. Rekomendasi perbaikan pada area penambangan dengan *soil removal works* dan penambahan drainase horizontal merubah SF menjadi sebesar 1,360 dan *displacement* 0,451 cm. Pada lereng area pembangunan *power house* rekomendasi yang disarankan adalah *soil removal works*. Menurut Bowles hasil tersebut dapat dikatakan relatif aman terhadap longsor.

Kata kunci : stabilitas, bidang gelincir, faktor aman, *displacement*, *soil water characteristic curve*

ABSTRACT

Giritirta is a village in Pejawaran District, Banjarnegara, Central Java has steep cliffs that have high rainfall intensity. Rock hill in this area used to be a mining site. Due to infrastructure development plan including micro-hydro power plants, it is necessary to considerate the slope stability improvement. Increase of soil degree of saturation and the addition of cutting the hill, are some of driving factors causes the slope movement. In this research, slope stability on the several micro hydro infrastructure's point will be analyzed.

This study was preceded by geometry and slope profile constituent layers test. This preliminary test consists of Measured Stratigraphic and soil sampling using hand auger. The analysis started by estimating the soil water characteristic curve and hydraulic conductivity using SoilVison. Slope stability have been modelling using Slide and Palxis, which aimed to find out slope stability. The modeling will concern in several conditions: existing condition, with the additional of micro-hydro power plants load, dynamic load, and the change of soil degree of saturation.

Slope in the existing condition not yet meet the requirements of safety factor and displacement, the slope has landslide potential. The results indicate that addition load on STA 0+210 affect the slope stability with displacement equal to 11,8 cm. Adding seismic acceleration coefficient (k_g) of 0,322g resulted in decreasing value of safety factor and increasing displacement. The slope becomes very vulnerable to movement of rock. By conditions in saturated soil due to decrease degree of saturation, safety factor seemed to have been increased and the displacement decreased. Recommendations for improvement the mining area by soil removal works and horizontal drain increase the safety factor of slope stability up to 1,36 and displacement about 0,451 cm. Recommendations for improvement the power house area by soil removal works. These results are slope relatively capable of withstanding the force due to landslides.

Keywords: stability, sliding plane, safety factors, *displacement*, *soil water characteristic curve*