



INTISARI

Pembangunan Jalan Baru Kretek–Girijati sebagai bagian dari Jalur Jalan Lintas Selatan (JJLS) menghadapi tantangan geoteknik berupa kondisi topografi perbukitan yang berpotensi menimbulkan ketidakstabilan lereng. Salah satu upaya yang diterapkan untuk mengurangi risiko longsor adalah penggunaan perkuatan gabion (bronjong). Meskipun begitu di lapangan sering terjadi kerusakan timbunan akibat pengaruh curah hujan yang tinggi, sehingga diperlukan penambahan material limestone sebagai lapisan pelindung timbunan. Penelitian ini bertujuan untuk mengevaluasi ulang dinding gabion dengan material tambahan limestone terhadap nilai faktor keamanan (*Safety Factor/SF*) serta mengoptimalkan ketebalan material tersebut. Analisis stabilitas lereng dilakukan menggunakan metode *Finite Element Method* (FEM) dengan mempertimbangkan kondisi eksisting dan kondisi gempa menggunakan pendekatan *pseudo-static*. Parameter tanah diperoleh dari data uji laboratorium dan data *Standard Penetration Test* (SPT) yang dikorelasikan sesuai kondisi lapangan. Hasil analisis menunjukkan bahwa penggunaan gabion mampu meningkatkan stabilitas lereng secara signifikan, dengan nilai SF pada kondisi statis memenuhi kriteria keamanan. Penambahan lapisan limestone pada timbunan gabion tidak berpengaruh signifikan kepada dinding gabion, serta masih memungkinkan untuk optimasi desain dengan ketebalan material yang lebih efisien. Penelitian ini diharapkan dapat menjadi referensi dalam perencanaan dan evaluasi perkuatan lereng menggunakan gabion pada proyek jalan di daerah perbukitan dengan kondisi geoteknik yang kompleks.

Kata Kunci : Gabion (Bronjong), Stabilitas Lereng, *Limestone*, Faktor Keamanan, Metode Elemen Hingga (FEM), Analisis *Pseudo-statik*



ABSTRACT

The construction of the Kretek–Girijati New Road, as part of the Southern Cross Road Corridor (JJLS), faces geotechnical challenges due to hilly topographic conditions that have the potential to cause slope instability. One of the measures implemented to reduce landslide risk is the use of gabion reinforcement. However, in field conditions, embankment damage frequently occurs as a result of high rainfall intensity, necessitating the addition of limestone material as a protective layer for the embankment. This study aims to re-evaluate the gabion retaining wall with the addition of limestone material in relation to the Safety Factor (SF) and to optimize the thickness of the added material. Slope stability analysis was conducted using the Finite Element Method (FEM), considering both existing conditions and seismic conditions through a pseudo-static approach. Soil parameters were obtained from laboratory test results and Standard Penetration Test (SPT) data, which were correlated to represent field conditions. The results indicate that the use of gabions significantly improves slope stability, with the Safety Factor under static conditions meeting the required safety criteria. The addition of a limestone layer to the gabion embankment does not significantly affect the performance of the gabion wall and still allows for design optimization with a more efficient material thickness. This study is expected to serve as a reference for the planning and evaluation of slope reinforcement using gabions in road projects located in hilly areas with complex geotechnical conditions.

Keywords : *Gabion, Slope Stability, Limestone, Safety Factor, Finite Element Method (FEM), Pseudo-static Analysis*