

INTISARI

Pembangunan Jalan Baru Kretek–Girijati bertujuan untuk meningkatkan konektivitas antara Kabupaten Gunungkidul dan Kabupaten Bantul. Jalan ini dibangun melalui topografi yang curam, melibatkan pemotongan bukit hingga kedalaman 25 meter. Lokasi pembangunan berada di dekat Sesar Opak, sehingga analisis ketahanan lereng menjadi sangat penting. Penelitian ini bertujuan untuk mengevaluasi karakteristik geologi dan geologi teknik, menentukan parameter kekuatan geser lereng yang mengalami keruntuhan, serta menganalisis kestabilan lereng menggunakan metode kinematika dan kesetimbangan batas. Metode penelitian meliputi pemetaan lapangan untuk identifikasi litologi, struktur geologi, muka air tanah (MAT), serta kualitas massa batuan menggunakan *Geological Strength Index* (GSI). Sampel batuan diuji di laboratorium dengan uji *point load* dan uji sifat fisik. Data sekunder diperoleh dari laporan penyelidikan geoteknik oleh PT Waskita dan PT PP, meliputi data bor inti, uji laboratorium tanah, dan MAT. Hasil penelitian menunjukkan bahwa lokasi berada pada satuan dataran lava sangat landai (8%), punggung lava sangat curam (51%), dan perbukitan karst curam (41%). Litologi didominasi oleh andesit (72,2%) dengan tingkat pelapukan tinggi (IV) hingga rendah (II), dan *floatstone* (36,8%) dengan pelapukan sedang (III). Struktur geologi yang berkembang meliputi kekar orientasi gaya tektonik menunjukkan timur laut–barat daya dan sesar turun. Analisis gempa menghasilkan koefisien horizontal sebesar 0,2987g. MAT tidak diperhitungkan karena berada sangat dalam dan zona lereng tersusun oleh lapisan akuafug. Lereng longsor bertipe *non-circular* dengan keruntuhan membidang, memiliki kohesi 5,28 kPa dan sudut gesek dalam $36,27^{\circ}$ – $36,30^{\circ}$ hasil dari analisis balik. Analisis kinematika menunjukkan potensi keruntuhan membidang, membaji, dan mengguling. Berdasarkan analisis kesetimbangan batas, lereng pada STA 1+650, STA 1+750, STA 1+850, STA 3+450, dan STA 3+550 berada dalam kondisi stabil baik secara statis maupun dinamis. Oleh karena itu, semua lereng berada dalam kondisi yang stabil dan aman.

Kata kunci: Kestabilan lereng, *Geological Strength Index*, analisis balik, metode kesetimbangan batas, analisis kinematika.

ABSTRACT

The construction of the Kretek-Girijati New Road aims to improve connectivity between Gunungkidul Regency and Bantul Regency. The road was constructed through a steep topography, involving hill cuts up to 25 meters deep. The construction site is located near the Opak Fault, making slope resistance analysis very important. This research aims to evaluate the geological and engineering geological characteristics, determine the shear strength parameters of the failure slope, and analyze the slope stability using kinematics and limit equilibrium methods. The research methods include field mapping for identification of lithology, geological structure, groundwater level (MAT), and rock mass quality using Geological Strength Index (GSI). Rock samples were tested in the laboratory with point load test and physical properties test. Secondary data were obtained from geotechnical investigation reports by PT Waskita and PT PP, including core drilling data, soil laboratory tests, and MAT. The results showed that the site is located in a unit of sloping lava very plains (8%), very steep lava ridges (51%), and steep karst hills (41%). The lithology is dominated by andesite (72.2%) with high (IV) to light (II) weathering, and floatstone (36.8%) with moderate weathering (III). The developed geological structures include northeast-southwest oriented tectonic force oriented bridges and descending faults. Earthquake analysis resulted in a horizontal coefficient of 0.2987g. MAT is not taken into account because it is very deep and the slope zone is composed by aquafug layer. The landslide slope is non-circular with a plane collapse, has a cohesion of 5.28 kPa and friction angle of 36.27°-36.30° from the back analysis. Kinematics analysis showed the potential for plane, wedge, and overturning collapse. Based on the boundary equilibrium analysis, the slopes at STA 1+650, STA 1+750, STA 1+850, STA 3+450, and STA 3+550 are in stable condition both statically and dynamically. Therefore, all slopes are in a stable and safe condition.

Keywords: Slope stability, Geological Strength Index, back analysis, limit equilibrium method, kinematics analysis.