SARI

Daerah penelitian terletak di Desa Kebonharjo dan Sekitarnya, Kecamatan Samigaluh, Kabupaten Kulon Progo. Daerah penelitian memiliki deret perbukitan dengan kemiringan lereng yang relatif curam, kondisi batuan yang lapuk, serta struktur geologi yang intensif sehingga rawan terjadinya gerakan longsor. Penelitian ini bertujuan untuk menentukan karakteristik geologi teknik, analisis kestabilan terutama pada area lereng, dan dilakukan perbandingan peta kerentanan longsor dengan Tangasa (2018) yang menggunakan metode AHP.

Data yang digunakan dalam penentuan karakteristik geologi teknik daerah penelitian, terdiri dari geomorfologi, batuan, struktur geologi, muka air tanah, tingkat pelapukan, dan kualitas massa batuan. Klasifikasi massa batuan *Geological Strength Indeks* (GSI) digunakan sebagai penentuan dalam kualitas massa batuan permukaan. Kriteria keruntuhan batuan *Generalized Hoek-Brown* dan metode kestabilan lereng digunakan berupa *Limit Equilibrium Method* (LEM). Metode penelitian yang digunakan berupa pemetaan geologi teknik tingkat pelapukan, kualitas massa batuan, dan tingkat kestabilan lereng dengan skala 1:25.000 khususnya pada area lereng serta pengujian sifat keteknikan pada sampel batuan untuk mengetahui sifat indeks dan kekuatan batuan.

Hasil penelitian diperoleh 3 (tiga) satuan geomorfologi, yaitu satuan perbukitan sisa gunungapi berlereng curam, perbukitan sisa gunungapi berlereng agak curam, dan perbukitan karst berlereng curam. Tingkat kemiringan lereng daerah penelitian berupa datar, agak miring, miring, sangat curam, dan sebagian besar agak curam serta curam. Daerah penelitian tersusun oleh satuan breksi andesit dan batugamping. Tingkat pelapukan batuan pada area lereng penelitian, yaitu breksi andesit lapuk sedang (30.4 – 169.8 MPa), breksi andesit lapuk tinggi (1.89 – 6.4 MPa), dan batugamping (75.5 MPa). Kualitas massa batuan terbagi menjadi 3 (tiga) zona dengan rentang nilai 21 – 35, 36 – 50, dan 51 – 65. Terdapat struktur geologi kekar gerus, sesar sinistral menurun, sesar dekstral menurun, sesar geser sinistral, dan sesar turun. Kedalaman muka air tanah pada area sekitar analisis lereng sekitar 1 – 5 m dengan elevasi 495 – 560 m. Berdasarkan analisis kestabilan pada area lereng penelitian terbagi menjadi 3 (tiga) tingkat, yaitu zona lereng stabil, kritis, dan tidak stabil. Hasil perbandingan peta tingkat kestabilan lereng dengan penelitian sebelumnya menunjukkan perbedaan yang signifikan. Terdapat zona lereng stabil sebanyak 9 (sembilan) yang berada pada zona kerentanan gerakan tanah sangat tinggi dan 6 (enam) pada zona kerentanan gerakan tanah sedang. Zona kritis sebanyak 2 (dua) yang berada pada zona kerentanan gerakan tanah sangat tinggi. Zona tidak stabil sebanyak 5 (lima) pada zona kerentanan gerakan tanah sangat tinggi dan 1 (satu) pada kerentanan gerakan tanah tinggi.

Kata kunci: *Generalized Hoek-Brown*, *Geological Strength Index* (GSI), Karakteristik geologi teknik, Kestabilan lereng, *Limit Equilibrium Methode* (LEM).

ABSTRACT

The research area is located in Kebonharjo Village and its surroundings, Samigaluh District, Kulon Progo Regency. The research area has a series of hills with relatively steep slopes, weathered rock conditions, and intensive geological structures that are prone to landslides. This study aims to determine the characteristics of engineering geology, analyze stability especially in the slope area, and compare the landslide susceptibility map with Tangasa (2018) using the AHP method.

The data used in determining the characteristics of the engineering geology of the research area, consists of geomorphology, rocks, geological structures, groundwater levels, weathering levels, and rock mass quality. The Geological Strength Index (GSI) rock mass classification is used as a determination of the quality of the surface rock mass. Generalized Hoek-Brown rock failure criteria and slope stability method used in the form of Limit Equilibrium Method (LEM). The research method used is a geological mapping technique of weathering level, rock mass quality, and slope stability level with a scale of 1:25,000, especially in the slope area as well as testing the engineering properties of rock samples to determine the index and strength properties of the rock.

The results of the study obtained 3 (three) geomorphological units, namely hilly volcanic remnants with steep slopes, volcanic remnant hills with rather steep slopes, and karst hills with steep slopes. The slope level of the research area is flat, slightly sloping, sloping, very steep, and mostly rather steep and steep. The research area is composed of andesite and limestone breccia units. The level of rock weathering in the study slope area, namely moderately weathered andesite breccia (30.4 – 169.8 MPa), highly weathered andesite breccia (1.89 – 6.4 MPa), and limestone (75.5 MPa). The quality of the rock mass is divided into 3 (three) zones with values ranging from 21 – 35, 36 – 50, and 51 – 65. There is a geological structure of scoured joints, decreased sinistral faults, decreased dextral faults, sinistral shear faults, and descending faults. The depth of the groundwater table in the area around the slope analysis is about 1 – 5 m with an elevation of 495 – 560 m. Based on the stability analysis, the research slope area is divided into 3 (three) levels, namely stable, critical, and unstable slope zones. The results of the comparison of the slope stability map with previous studies showed significant differences. There are 9 (nine) stable slope zones the very high soil movement vulnerability zone and 6 (six) in the moderate soil movement vulnerability zone. There are 2 (two) critical zones in the very high ground movement vulnerability zone. The unstable zone is 5 (five) in the very high ground movement vulnerability zone and 1 (one) in the high ground movement vulnerability.

Keywords: Generalized Hoek-Brown, Geological Strength Index (GSI), Engineering geological characteristics, Slope stability, Limit Equilibrium Method (LEM).