

## SARI

Secara administrasi, daerah penelitian berada di Kecamatan Patuk, Kabupaten Gunungkidul, D.I. Yogyakarta pada koordinat UTM 913020-9134210 mN, 448370-452370 mE dengan datum WGS 1984 Zona 49S dengan luas area 16 km<sup>2</sup>. Tingginya aktivitas warga di daerah dengan kelerengan yang cukup terjal menjadi dasar dari dilakukannya penelitian di daerah ini. Penelitian ini bertujuan untuk mengetahui kondisi geomorfologi, geologi, sifat-sifat keteknikan tanah dan batuan, struktur geologi, dan kondisi hidrogeologi. Penelitian ini juga mengamati kestabilan beberapa lereng yang dijumpai. Pengambilan data dilakukan dengan pemetaan geologi permukaan serta pengambilan sampel tanah dan batuan. Pengamatan lapangan yang dilakukan berupa pengamatan sebaran litologi, tingkat pelapukan, pengambilan nilai *Geological Strength Index* (GSI) batuan, *Rock Mass Rating* (RMR), dan *Slope Mass Rating* (SMR). Analisis laboratorium yang dilakukan berupa analisis petrografi, uji kuat tekan, uji sifat indeks, uji distribusi ukuran butir, dan uji batas-batas *Atterberg*. Daerah penelitian dibagi menjadi 3 satuan geomorfologi, yakni satuan punggung aliran piroklastik, satuan dataran aliran piroklastik, dan satuan dataran fluvial. Litologi daerah penelitian dibagi menjadi 4 satuan, yakni satuan perselingan lapili tuf dan tuf, satuan lapili tuf lensa breksi andesit piroklastik, satuan breksi andesit piroklastik, dan satuan lapili tuf sisipan tuf. Gaya utama yang bekerja pada daerah penelitian terbagi menjadi 3 arah yang berbeda, yakni arah timurlaut-baratdaya, utara-selatan, dan baratlaut-tenggara. Struktur geologi yang ditemukan berupa kekar gerus, sesar normal, dan sesar geser sinistral. Airtanah pada daerah penelitian berada jauh di bawah permukaan tanah. Analisis laboratorium menunjukkan bahwa tanah pada daerah penelitian terbagi menjadi tanah jenis *sandy silt* dan *sandy elastic silt* yang memiliki distribusi ukuran butir baik hingga senjang serta memiliki kadar air, porositas, dan saturasi air yang tinggi. Lereng-lereng pada daerah penelitian terbagi menjadi lereng sangat stabil, lereng stabil, lereng stabil sebagian, dan lereng tidak stabil.

Kata kunci: Nglanggeran, GSI, RMR, karakteristik geologi teknik, sudut aman pemotongan lereng.

## ABSTRACT

Area of research is located administratively at Patuk, Gunungkidul, Special Region of Yogyakarta, at the coordinate of UTM 913020-9134210 mN, 448370-452370 mE with WGS 1984 Zone of 49S as the datum. The social activity around the area with fairly steep slope become the reason why this research is held. The purposes of this research are determining the engineering characteristics consists of geomorphology, geology, geological structure, and hydrogeology conditions, and also determining the safe cut slopes and the slopes stability. The datas are collected from the field observations, surface geological mapping, and collecting the rock and soil samples. Field observations are consisted of the lithology distribution, weathering rate, measurement of Geological Strength Index of rocks, Rock Mass Rating, and Slope Mass Rating. Laboratory analysis are consist of petrography, point load test, index properties of soil test, particle size analysis, and Atterberg limits. Research area is divided into 3 geomorphological units, there are pyroclastic flow ridge unit, pyroclastic flow plain, and fluvial plain. Lithological units of research area are lapilli tuff interlude with tuff unit, lapilli tuff with pyroclastic andesitic breccia lens unit, pyroclastic andesitic breccia unit, and lapilli tuff with tuff insertion unit. The main force acting on this research area are divided into 3 directions, there are the northeast-southwest direction, north-south direction, and northwest-southeast direction. The geological structures found in this research area are shear joint, normal fault, and sinistral strike-slip fault. The groundwater in this area is too deep in subsurface. The laboratory analyses show that the soil of the research area is divided into sandy silt and sandy elastic silt which have well graded and gap graded particle size distribution. The moisture content, porosity, and water saturation of the soil is high. The slopes of research area are divided into very stable slope, stable slope, partially stable slope, and unstable slopes.

**Keywords:** Nglanggeran, GSI, RMR, engineering geology characteristics, safe cut slope.