GEOLOGI DAN ANALISIS KESTABILAN LERENG BERDASARKAN HUBUNGAN KADAR AIR TERHADAP KUAT GESER TANAH KALURAHAN JURANGJERO DAN SEKITARNYA, KAPANEWON NGAWEN, KABUPATEN GUNUNGKIDUL, DAERAH ISTIMEWA YOGYAKARTA

ABSTRAK

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Daerah penelitian terletak di Kalurahan Jurangjero, Kapanewon Ngawen, Kabupaten Gunungkidul, Daerah Istimewa Yogyakarta pada koordinat X min 461852 mT, X max 466852 mT dan Y min 9133190 mU, Y max 9138190 mU. Daerah penelitian terletak pada morfologi dengan relief curam hal ini membuat daerah penelitian menjadi daerah yang rawan bencana tanah longsor. Penelitian pada daerah ini dilakukan dengan metode pemetaan secara langsung dengan pengambilan data lapangan. Pengolahan data dilakukan analisis laboratorium dan diolah menggunakan *software slide 6.0* metode *Morgenstern Price*. Secara geologi daerah penelitian termasuk fisiografi Pegunungan Selatan. Pola pengaliran yang berkembang yaitu Paralel, Subparalel, Dendritik dan Subdendritik. Geomorfologi daerah penelitian terbagi menjadi Satuan bentuk lahan Dataran Alluvial (F1), Tubuh Sungai (F2), Perbukitan Bergelombang Lemah – Kuat Denudasional (D1), Dataran Denudasional (D2), Dataran Nyaris (D2), Lereng Struktural (S1), Garis Gawir Sesar (S2) dan Perbukitan Struktural (S3). Stratigrafi pada daerah penelitian dari tua ke muda meliputi Satuan perselingan batupasir dan batulanau Kebo Butak dengan litologi batupasir berumur N3 -N4 (Oligosen – Miosen Awal), Satuan tuff Semilir dengan litologi berupa tuff berumur N4 – N5 (Miosen Awal), Satuan breksi Nglanggeran dengan litologi breksi yang berumur N5 – N6 (Miosen Awal), Satuan batugamping Oyo dengan litologi batugamping berumur N8 – N10 (Miosen Tengah) dan Satuan endapan alluvial. Struktur geologi yang berkembang pada daerah penelitian yaitu kekar dan sesar. Struktur sesar yang berkembang yaitu *Left Slip Fault* Daerah Tegalrejo, *Left Reverse Slip Fault* Daerah Tancep dan *Normal Left Slip Fault* Daerah Karangasem. Faktor keamanan pada kondisi asli pada lokasi 1 didapat 2,75, lokasi 2 yaitu 1,054 dan lokasi 3 yaitu 2,088 Analisis hubungan kadar air terhadap kuat geser dilakukan pada 3 lokasi yang berbeda dan penambahan air masing masing 5%, 10% dan 15%. Hasil analisis didapat hubungan berbanding terbalik yang mana nilai dari kadar air semakin meningkat menyebabkan nilai dari sudut geser dalam semakin mengalami penurunan. Daerah yang rawan tanah longsor terdapat beberapa zonasi meliputi zona yang memiliki tingkat kerawanan longsor yang tinggi meliputi Kalurahan Tegalrejo, Kalurahan Tancep dan Kalurahan Kampung. Daerah yang memiliki tingkat kerawanan longsor rendah meliputi Kalurahan Ngerangan, Kalurahan Jarum, dan Kalurahan Beji.

Kata Kunci: Geologi, Kadar Air, Kuat Geser, Lereng

GEOLOGY AND ANALYSIS OF SLOPE STABILITY BASED ON THE RELATIONSHIP OF WATER CONTENT ON SOIL SHEAR STRENGTH IN THE JURANGJERO KALURAHAN AND SURROUNDIN AREA, NGAWEN KAPANEWON, GUNUNGKIDUL REGENCY, YOGYAKARTA SPECIAL REGION

ABSTRACT

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The research area is located in Jurangjero Village, Kapanewon Ngawen, Gunungkidul Regency, Special Region of Yogyakarta at the coordinates X min 461852 mT, X max 466852 mT and Y min 9133190 mU, Y max 9138190 mU. The research area is located on a morphology with swamp relief, this makes the research area an area that is prone to landslides. Research in this area was carried out by direct capture method with field data collection. Data processing was carried out in laboratory analysis and processed using slide 6.0 software, the Morgenstern Price method. Geologically, the study area includes the physiography of the Southern Mountains. Flow patterns that develop are Parallel, Subparallel, Dendritic and Subdendritic. The geomorphology of the study area is divided into Landform Units Alluvial Plains (F1), River Body (F2), Denudational Weak - Strong Wavy Hills (D1), Denudational Plains (D2), Nearly Plains (D2), Structural Slopes (S1), Escarpments Fault (S2) and Structural Hills (S3). Stratigraphy in the study area from old to young includes the Kebo Butak sandstone and siltstone alternation with sandstone lithologies of N3 -N4 age (Oligocene - Early Miocene), Semilir tuff unit with tuff lithology of N4 - N5 (Early Miocene), Nglanggeran breccia unit with breccia lithology aged N5 – N6 (Early Miocene), Oyo limestone units with limestone lithologies aged N8 – N10 (Middle Miocene) and alluvial sediment units. The geological structures that develop in the study area are joints and faults. The fault structures that are developing are the Left Slip Fault in the Tegalrejo Area, the Left Slip Fault in the Tancep Area and the Normal Left Slip Fault in the Karangasem Area. The safety condition factor at location 1 was 2.75, location 2 was 1,054 and location 3 was 2,088 Analysis of the relationship between water content and shear strength was carried out at 3 different locations and the addition of water was 5%, 10% and 15% respectively. The results of the analysis obtained an inverse relationship where the value of the water content increases causing the value of the inner shear angle to decrease. Areas prone to landslides have several zonations including zones that have a high level of landslide vulnerability including the Tegalrejo Village, the Tancep Village and the Kampung Village. Areas that have a low level of vulnerability to landslides include Ngerangan Village, Needle Village, and Beji Village.

***Keywords**: Geology, Moisture Content, Shear Strength, Slope*