ABSTRAK

Bendungan Sermo terletak di Desa Hargowilis, Kecamatan Kokap, Kabupaten Kulon Progo. Pada area sekitar tubuh bendungan terdapat batuan terobosan berupa andesit. Keberadaan batuan terobosan andesit ini mengakibatkan batuan penyusun daerah sekitar bendungan mengalami proses deformasi sekunder dan pengangkatan sehingga menimbulkan adanya struktur geologi. Pengaruh struktur geologi berupa kekar-kekar maupun sesar dapat menimbulkan adanya potensi kelongsoran pada lereng bendungan, sehingga hal ini menjadi latar belakang untuk dilakukan penelitian pada Bendungan Sermo Penelitian ini bertujuan untuk mengkaji serta mengetahui kontrol struktur geologi yang berpengaruh terhadap stabilitas lereng pada bendungan. Analisis dilakukan pada tiga lereng sekitar bangunan pelimpah.

Metode yang digunakan dalam penelitian ini yaitu pembobotan nilai RMR (*rock mass rating*) berdasarkan klasifikasi menurut Bienawski (1989), kemudian penetuan tipe longsoran berdasarkan analisis kinematik menurut klasifikasi Hoek & Bray (1981) dan pembobotan SMR (*slope mass rating*) menurut Romana (1993) kemudian dari hasil tersebut akan ditentukan nilai faktor keamanan lereng menggunakan metode grafik dari Hoek & Bray (1981).

Berdasarkan hasil analisis dan pengamatan di lapangan stratigrafi daerah penelitian terbagi menjadi beberapa satuan batuan yaitu Satuan Lava Andesit Kaligesing, Satuan Breksi Andesit Kaligesing, Satuan Andesit Hargowilis, dan Endapan Aluvial. Struktur geologi yang berkembang berupa Sesar Mendatar-Kanan Hargowilis (*lag right slip fault*) berarah baratlaut-tenggara dan kekar-kekar yang berarah baratlaut-tenggara, timurlaut-baratdaya, utara-selatan. Kondisi dan arah orientasi struktur kekar mempengaruhi stabilitas lereng. Pada lereng 1 orientasi kekar berarah baratlaut-tenggara searah dengan struktur regional Kulon Progo dan memiliki potensi tipe longsoran *wedge* dengan presentasi 9,78%, nilai FK adalah 7,7 lereng dalam keadaan aman. Pada lereng 2 orientasi kekar berarah timurlaut-baratdaya berlawanan dengan arah struktur regional Kulon Progo dan memiliki potensi tipe longsoran planar dengan presetasi 21,5%, tipe *wedge* dengan presentasi 11,95%, dan tipe *toppling* berupa *direct toppling* pada *base plane* dengan presentasi 42,11% dan *flexural toppling* dengan presentasi 2,63%, nilai FK adalah 4,16 lereng dalam keadaan aman. Pada lereng 3 orientasi kekar berarah timurlaut-baratdaya berlawanan dengan arah struktur regional Kulon Progo dan memiliki potensi tipe longsoran planar dengan presetasi 21,05%, dan tipe *wedge* dengan presentasi 14,56%, nilai FK adalah 1,97 lereng dalam keadaan aman.

Berdasarkan potensi tipe longsoran yang diperoleh maka pencegahan/mitigasi terbagi menjadi strukturan dan non-struktural. Mitigasi struktural yang perlu dilakukan berupa pemasangan *anchor wall* dan *wire mesh*. Pencegahan/mitigasi secara non-struktural dapat dilakukan dengan cara memberikan penyuluhan terkait dengan zona potensi rawan longsor sehingga masyarakat dan pengunjung wisata bendungan diharapkan bisa lebih berhati-hati.

Kata Kunci: Bendungan Sermo, Stabilitas Lereng, Longsor, Mitigasi.

ABSTRACT

Sermo Dam is located in Hargowilis Village, Kokap District, Kulon Progo Regency. In the area around the body of the dam, there is a breakthrough rock in the form of andesite. The existence of andesite breakthrough rocks causes the rocks that make up the area around the dam to undergo a secondary deformation and uplift process, giving rise to geological structures. The influence of geological structures in the form of stout and faults can cause potential landslides on the slopes of the dam, so this is the background for research on the Sermo Dam This study aims to examine and determine the control of geological structures that affect slope stability on dams. The analysis was carried out on three slopes around the spillway building.

The method used in this study is the weighting of the RMR (rock mass rating) value based on classification according to Bienawski (1989), then the determination of the avalanche type based on kinematic analysis according to the classification of Hoek & Bray (1981) and the weighting of SMR (slope mass rating) according to Romana (1993) then from these results will be determined the value of slope safety factors using the graph method from Hoek & Bray (1981).

Based on the results of analysis and observations in the stratigraphic field, the research area is divided into several rock units, namely the Kaligesing Andesite Lava Unit, the Kaligesing Andesite Breccia Unit, the Hargowilis Andesite Unit, and Alluvial Deposits. The geological structure developed in the form of the Hargowilis Horizontal Right-Fault (lag right slip fault) in a northwest-southeast direction and a stocky in a northwest-southeast direction, northeast-southwest, and north-south. The condition and direction of orientation of the stocky structure affect the stability of the slope. On slope 1 the stout orientation is northwest-southeast in the direction of the regional structure of Kulon Progo and has the potential for a wedge avalanche type with a presentation of 9.78%, the SF value is 7.7 slopes in a safe state. On slope 2, the stout orientation is in a northeast-southwest direction opposite to the direction of the regional structure of Kulon Progo. It has the potential for a planar avalanche type with a precedent of 21.5%, a wedge type with a presentation of 11.95%, and a toppling type in the form of direct toppling on the base plane with a presentation of 42.11%, and flexural toppling with a presentation of 2.63%, the SF value is 4.16 slopes in a safe state. On slope 3 the stout orientation is in a northeast-southwest direction opposite to the direction of the regional structure of Kulon Progo. It has the potential for a planar avalanche type with a precedent of 21.05%. A wedge type presenting 14.56%, the SF value is 1.97 slopes in a safe state.

Based on the potential type of avalanche obtained, prevention/mitigation is divided into structural and non-structural. Structural mitigation needs to be done by installing anchor walls and wire mesh. Non-structural prevention/mitigation can be done by counseling on potential landslide-prone zones so that the community and visitors to dam tourism are expected to be more careful.

Keywords: Sermo Dam, slope stability, landslide, mitigation.