

SARI

GEOLOGI DAN ANALISIS STABILITAS LERENG AREA GENANGAN BENDUNGAN SEMPOR, KABUPATEN KEBUMEN, JAWA TENGAH MENGUNAKAN *LIMIT EQUILIBRIUM METHOD*

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Optimalisasi kinerja bendungan dapat dilakukan dengan memperhatikan lingkungan di sekitar bendungan, termasuk area genangan bendungan agar tidak terjadi bencana terutama longsor dan menimbulkan terjadinya *overtopping*. Mitigasi dapat dilakukan dengan analisis dan monitoring stabilitas lereng area genangan guna menjaga keamanan dan kinerja bendungan secara keseluruhan. Penelitian ini bertujuan untuk mengetahui kondisi geologi, kondisi stabilitas dan rekomendasi penguatan stabilitas lereng area genangan Bendungan Sempor. Metode penelitian meliputi pemetaan geologi dengan analisis data geomorfologi, petrofragi, dan analisis kondisi geologi teknik melalui *Rock Mass Rating* (RMR) dan *Geological Strength Index* (GSI), dan analisis stabilitas lereng menggunakan *Slope/W* pada *software* GeoStudio dengan *Limit Equilibrium Method*, metode perhitungan *Morgenstern Price* dan menggunakan material model Hoek-Brown. Berdasarkan analisis geomorfologi, daerah penelitian terdiri dari Satuan Waduk Antropogenik Sempor, Satuan Lembah Antiklin Sempor, Satuan Punggungan Homoklin Sempor, dan Satuan Lembah Homoklin Sempor. Secara stratigrafi daerah penelitian dari tua ke muda tersusun atas Satuan Batupasir Vulkanik, Satuan Breksi Andesit, Satuan Batupasir Karbonatan, dan Satuan Batulempung – Batupasir. Analisis stabilitas lereng area genangan Bendungan Sempor dilakukan melalui *Cross* 1 – 5 yang terdiri dari 2 lereng dan *Cross* 1 – 15 yang terdiri dari 3 lereng, analisis dilakukan pada dua keadaan yaitu bendungan kondisi kering dan bendungan kondisi teganang. Pada setiap keadaan ditambahkan *seismic load*. Berdasarkan hasil analisis stabilitas lereng area genangan Bendungan Sempor, seluruh lereng yang dianalisis dinyatakan aman atau stabil, sehingga tidak membutuhkan penguatan lereng secara struktural. Namun tetap diperlukan penguatan lereng secara non – struktural seperti penambahan saluran drainase sebagai antisipasi terjadinya *overtopping* saat hujan dan adanya kenaikan muka air waduk.

Kata kunci : Bendungan Sempor, Stabilitas Lereng, *Limit Equilibrium Method*

ABSTRACT

GEOLOGY AND SLOPE STABILITY ANALYSIS OF SEMPOR DAM COOMB AREA, KEBUMEN REGENCY, CENTRAL JAVA USING LIMIT EQUILIBRIUM METHOD

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Optimization of dam performance can be done by considering of the environment around the dam, including the dam coomb area to avoid disasters, especially landslides and overtopping. Mitigation can be done by analyzing and monitoring the slope stability of the coomb area to maintain the safety and performance of the dam as a whole. This study aims to determine the geological conditions, stability conditions and recommendations for strengthening the slope stability of the Sempor Dam coomb area. Research methods include geological mapping with geomorphological and petrography data analysis, analysis of engineering geological conditions through Rock Mass Rating (RMR) and Geological Strength Index (GSI), and slope stability analysis using Slope/W on GeoStudio software with Limit Equilibrium Method, Morgenstern Price calculation method and using Hoek-Brown material model. Based on geomorphological analysis, the research area consists of the Sempor Anthropogenic Dam Unit, Sempor Anticline Valley Unit, Sempor Homocline Ridge Unit, and Sempor Homocline Valley Unit. Stratigraphically, the research area from old to young consists of Volcanic Sandstone Unit, Andesite Breccia Unit, Carbonat Sandstone Unit, and Mudstone – Sandstone Unit. Slope stability analysis of the Sempor Dam coomb area was carried out through Cross 1-5 consisting of 2 slopes and Cross 1-15 consisting of 3 slopes, the analysis was carried out in two conditions, namely the dry dam and the flooded dam. In each condition, seismic load was added. Based on the results of the slope stability analysis of the Sempor Dam coomb area, all slopes analyzed were declared safe or stable, so that structural slope reinforcement was not required. However, non-structural slope reinforcement is still needed, such as the addition of drainage channels to anticipate overtopping during rain and an increase in the reservoir water level.

Keywords : Sempor Dam, Slope Stability, Limit Equilibrium Method