

INTISARI

Bendungan Tiga Dihaji dibangun pada wilayah administrasi Desa Sukabumi, Kecamatan Tiga Dihaji, Kabupaten Muaradua, Provinsi Sumatera Selatan. Bendungan ini berfungsi sebagai bendungan *multipurpose* untuk mengairi lahan irigasi baru seluas 15.000 ha serta menghasilkan sumber energi listrik/ PLTA \pm 40 MW. Berdasarkan geologi regional, daerah penelitian termasuk ke dalam Formasi Gumai dan Formasi Ranau. Terdapat struktur geologi regional berupa sesar diperkirakan yang berada di sisi barat bendungan. Penelitian ini dilakukan untuk mengetahui tingkat kestabilan lereng di area bendungan dan sekitarnya. Dalam penentuan tingkat kestabilan lereng metode yang digunakan adalah metode SMR (*Slope Mass Rating*). Penyelidikan karakteristik geologi teknik serta pengelompokan kualitas massa batuan dilakukan berdasarkan GSI (*Geological Strength Index*). Tipe keruntuhan lereng ditentukan berdasarkan hasil analisis kinematika. Karakteristik geologi teknik daerah penelitian meliputi aspek geomorfologi, geologi, struktur geologi, dan hidrogeologi. Geomorfologi di daerah penelitian terdiri atas satuan geomorfologi perbukitan homoklin vulkanik dan perbukitan homoklin sedimen. Geologi di daerah penelitian tersusun atas satuan tuf dan satuan perselingan batupasir-napal sisipan batulanau. Struktur geologi di daerah penelitian berupa sesar diperkirakan dan kekar ekstensi yang ditemukan secara langsung di lapangan. Kedalaman muka air tanah di daerah penelitian diperkirakan berkisar 10 – 34 meter di bawah permukaan tanah. Kualitas massa batuan daerah penelitian terdiri atas batuan kualitas sedang (GSI 36-55), batuan kualitas baik (GSI 56-75), dan batuan kualitas sangat baik (GSI 76-95). Analisis tingkat kestabilan lereng berdasarkan SMR daerah penelitian tersusun atas lereng stabil sebagian (SMR 41-60), lereng stabil (SMR 61-80), dan lereng sangat stabil (SMR 81-100). Berdasarkan hasil analisis SMR, lereng stabil sebagian berada di lereng timur area pelimpah dan sisi barat as bendungan, sedangkan lereng stabil dan sangat stabil berada pada lereng barat area pelimpah, lereng *intake* terowongan pengelak, lereng as bendungan, dan lereng *output* terowongan pengelak. Rekomendasi rekayasa teknis ditentukan berdasarkan klasifikasi SMR setiap lereng, lereng kelas III (SMR 41-60) memerlukan pembuatan selokan kecil, *spot* atau *systematic bolting*, serta lubang drainase. Lereng kelas II (SMR 61-80) direkomendasikan untuk diberi *spot bolting* dan selokan kecil. Sementara itu, lereng kelas I (SMR 81-100) hanya memerlukan perawatan berkala seperti pembersihan tebing.

Kata kunci: Bendungan, GSI (*Geological Strength Index*), Karakteristik geologi teknik, SMR (*Slope Mass Rating*), Tingkat kestabilan lereng.

ABSTRACT

The Tiga Dihaji Dam is constructed within the administrative area of Sukabumi Village, Tiga Dihaji District, Muaradua Regency, South Sumatera Province. This dam functions as a multipurpose structure to irrigate 15,000 hectares of new agricultural land and generate hydroelectric power of approximately 40 MW. Based on regional geology, the study area is part of the Gumai Formation and Ranau Formation. A regional geological structure, interpreted as a fault, is located on the western side of the dam. This research is conducted to assess slope stability in the dam area and its surroundings. The method used to evaluate slope stability is the Slope Mass Rating (SMR) method. The investigation of engineering geological characteristics and the classification of rock mass quality are conducted using the Geological Strength Index (GSI). The types of slope failure are determined through kinematic analysis. The engineering geological characteristics of the study area include aspects of geomorphology, geology, geological structures, and hydrogeology. The geomorphology of the study area consists of volcanic homocline hill units and sedimentary homocline hill units. The geology of the area comprises tuff units and interbedded sandstone-marl units with siltstone layers. The geological structures in the study area consist of an interpreted fault and extensional joints observed directly in the field. The groundwater table depth in the study area is estimated to range between 10 and 34 meters below the surface. The rock mass quality in the study area consists of moderately good rocks (GSI 36–55), good rocks (GSI 56–75), and very good rocks (GSI 76–95). The slope stability analysis using the SMR method classifies the slopes in the study area into partially stable slopes (SMR 41–60), stable slopes (SMR 61–80), and very stable slopes (SMR 81–100). Based on the SMR analysis, partially stable slopes are found on the eastern slope of the spillway area and the western side of the dam axis, while stable and very stable slopes are located on the western slope of the spillway area, the intake slope of the diversion tunnel, the dam axis slope, and the output slope of the diversion tunnel. The engineering recommendations are determined based on the SMR classification of each slope. Slopes in Class III (SMR 41-60) require the construction of small drainage channels, spot or systematic bolting, and drainage holes. Slopes in Class II (SMR 61-80) are recommended to have spot bolting and small drainage channels. Meanwhile, slopes in Class I (SMR 81-100) only require periodic maintenance, such as slope cleaning.

Keywords: Dam, SMR (Slope Mass Rating), GSI (Geological Strength Index), characteristic geotechnic engineering, Slope stability.