

ANALISIS STABILITAS LERENG BENDUNGAN SERMO KABUPATEN KULON PROGO

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ABSTRAK

Waduk Sermo merupakan sebuah waduk yang berada di Kabupaten Kulon Progo, Daerah Istimewa Yogyakarta, Indonesia. Waduk ini dibangun mulai tahun 1994 dan diresmikan oleh Presiden Soeharto tahun 1996. Tujuan pembangunan waduk ini adalah untuk suplesi sistem irigasi daerah Kalibawang yang memiliki cakupan areal seluas 7.152 Ha.

Tujuan dari penelitian ini yaitu mengetahui besarnya nilai keamanan stabilitas lereng bendungan hulu dan hilir dalam kondisi selesai konstruksi, kondisi air langgeng dan dalam kondisi air surut cepat. Analisis ini akan mencari perbandingan hasil stabilitas lereng dengan dua metode yaitu antara metode Bishop dan metode Janbu, untuk menganalisis stabilitas lereng bendungan digunakan *software* Geo-Studio SLOPE/W 2012. Bendungan Sermo menjadi objek yang dipilih dikarenakan sudah diketahui data parameter tanah urugan yang digunakan pada bendungan tersebut, sehingga penulis tidak perlu melakukan pengujian tanah terlebih dahulu.

Dari hasil analisis didapatkan nilai stabilitas dalam kondisi selesai konstruksi menggunakan metode Bishop mendapatkan nilai faktor keamanan lereng hulu = 1,799, lereng hilir = 1,619. Nilai stabilitas dalam kondisi selesai konstruksi menggunakan metode Janbu mendapatkan nilai faktor keamanan lereng hulu = 1,788, lereng hilir = 1,616. Nilai stabilitas dalam kondisi aliran langgeng menggunakan metode Bishop mendapatkan nilai faktor keamanan lereng hulu = 1,773, lereng hilir = 1,572. Nilai stabilitas dalam kondisi aliran langgeng menggunakan metode Janbu mendapatkan nilai faktor keamanan lereng hulu = 1,712, lereng hilir = 1,536. Nilai stabilitas lereng hulu dalam kondisi surut cepat menggunakan metode Bishop mendapatkan nilai faktor keamanan 1,748. Nilai stabilitas lereng hulu dalam kondisi surut cepat menggunakan metode Janbu mendapatkan nilai faktor keamanan 1,677.

Kata Kunci : *Bendungan Sermo, Lereng,, Faktor Aman, Stabilitas, Bishop, Janbu,, Geo Studio Slope-W.*

SLOPE STABILITY ANALYSIS OF THE SERMO DAM, KULON PROGO DISTRICT

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ABSTRACT

Sermo Reservoir is a reservoir located in Kulon Progo Regency, Yogyakarta Special Region, Indonesia. This reservoir was built starting in 1994 and inaugurated by President Soeharto in 1996. The purpose of this reservoir development is to supply the irrigation system in the Kalibawang area which covers an area of 7,152 hectares.

The purpose of this study is to determine the value of the safety value of the slope stability of the upstream and downstream dams in conditions of completion of construction, lasting water conditions and in conditions of fast receding water. This analysis will seek to compare the results of slope stability with two methods, namely the Bishop method and the Janbu method. To analyze the stability of the dam slope, the Geo-Studio SLOPE / W 2012 software was used. Sermo Dam was the object chosen because the data on the backfill soil parameters used in the dam were already known, so the authors did not need to do soil testing first.

From the analysis, it was found that the stability value in the finished construction condition using the Bishop method obtained the value of the upstream slope safety factor = 1.799, downstream slope = 1.619. The stability value in the finished construction condition using the Janbu method gets the value of the upstream slope safety factor = 1.788, the downstream slope = 1.616. The value of stability in a perpetual flow condition using the Bishop method gets the value of the safety factor of the upstream slope = 1.773, the downstream slope = 1.572. The value of stability in a lasting flow condition using the Janbu method gets the value of the upstream slope safety factor = 1.712, downstream slope = 1.536. The stability value of the upstream slope under fast receding conditions using the Bishop method obtained a safety factor value of 1.748. The stability value of the upstream slope under conditions of rapid receding using the Janbu method obtained a safety factor value of 1.677.

Keywords: Sermo Dam, Slope, Safe Factor, Stability, Bishop, Janbu, Geo Studio Slope-W.

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