ANALISIS STABILITAS *SABO DAM* RRC 4 KALI OPAK KABUPATEN SLEMAN

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ABSTRAK

Bangunan *Sabo Dam* RRC 4 Kali Opak merupakan salah satu bangunan pengendali sedimen yang berada di aliran Sungai Kali Opak. *Sabo Dam* RRC 4 Kali Opak selesai dibangun pada tahun 2022. Tujuan dari penelitian ini adalah untuk menganalisis stabilitas bangunan terhadap gaya guling, gaya geser, daya dukung fondasi, lintasan kritis, dan efektivitas *Sabo Dam* dengan percobaan debit tahun rencana 50 tahun. Hasil perhitungan debit kala ulang 50 tahun menggunakan metode HSS *Nakayasu*, debit aliran dikali dengan konsentrasi sedimen didapat hasil sebesar 1636,751 m^3/s, dan Analisis stabilitas terhadap gaya guling 2,30 > 2 (aman), geser 5,04 > 1,5 (aman), gaya dukung tanah fondasi maksimum dan minimum 37,49 dan 12,67 < 100 (aman) dan panjang lintasan kritis 1,86 < 9 (aman), dimana dari perhitungan tersebut dinyatakan aman berdasrkan SNI 2851-2015-tentang Desain Bangunan Penahan Sedimen. Hasil dari analisis ini menunjukkan bahwa *Sabo Dam* RRC 4 Kali Opak dinyatakan stabil dan efektif dalam menahan sedimen yang terbawa saat terjadi banjir lahar dingin kedepannya.

Kata kunci: Daya Dukung Tanah Fondasi, Panjang Lintasan Kritis, Sungai Kali Opak, *Sabo Dam* RRC 4, Stabilitas Guling, Stabilitas Geser.

ANALYSIS OF THE STABILITY OF SABO DAM PRC 4 OPAK RIVER, SLEMAN DISTRICT

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ABSTRACT

The Sabo Dam RRC 4 Opak River building is one of the sediment control buildings in the Kali Opak River. Sabo Dam RRC 4 Opak River will be completed in 2022. The aim of this research is to analyze the stability of the building against overturning forces, shear forces, foundation bearing capacity, critical path, and effectiveness of the Sabo Dam with discharge experiments for the 50 year planning year. The results of the 50 year return period discharge calculation using the HSS Nakayasu method, the flow discharge multiplied by the sediment concentration resulted in a result of 1636.751 m^3/s, and the stability analysis of the rolling force was 2.30 > 2 (safe), shear 5.04 > 1, 5 (safe), the maximum and minimum foundation soil bearing force is 37.49 and 12.67 (safe) and the critical path length is 1.86 (safe), which from these calculations is declared safe based on SNI 2851-2015-on the Design of Sediment Retaining Buildings . The results of this analysis show that Sabo Dam RRC 4 Opak River is declared stable and effective in retaining sediment carried away during future cold lava floods.

Keywords: Foundation Soil Bearing Capacity, Critical Path Length, Opak River, Sabo Dam PRC 4, Rolling Stability, Shear Stability.