

ANALISIS STABILITAS BENDUNG KAMIJORO DENGAN BEBERAPA DEBIT TAHUN RENCANA

Disusun oleh:

Bambang Zakki Wahyu Pamungkas
16510134001

ABSTRAK

Bendung dapat dikatakan aman apabila stabil terhadap bahaya dan gaya-gaya yang terjadi pada bendung. Tujuan penelitian ini adalah untuk mengetahui nilai angka aman bendung kamijoro terhadap bahaya penggulingan, pergeseran, erosi bawah tanah (*piping*) dan ditinjau daya dukung tanahnya.

Lokasi penelitian ini berada di Desa Sendang Sari, Pajangan, Bantul, Daerah Istimewa Yogyakarta. Data sekunder yang dibutuhkan yaitu data gambar dan spesifikasi bendung, data tanah setempat, dan data debit banjir.

Hasil analisis stabilitas bendung dan telah direkapitulasi maka didapat hasil sebagai berikut: angka keamanan untuk penggulingan yaitu Q_{100} SF = 157,43 > 1,5, Q_{200} SF = 157,93 > 1,5, dan Q_{1000} SF = 156,82 > 1,5. Untuk pergeseran yaitu Q_{100} SF = 18,82 > 1,5, Q_{200} SF = 19,46 > 1,5, dan Q_{1000} SF = 21,29 > 1,5. Pada tinjauan daya dukung tanah yaitu untuk debit banjir Q_{100} dihasilkan $\sigma_1 = 532,549 \text{ kN/m}^2 < 1867,68 \text{ kN/m}^2$ dan $\sigma_2 = 203,814 \text{ kN/m}^2 > 0$, untuk debit banjir Q_{200} dihasilkan $\sigma_1 = 535,077 \text{ kN/m}^2 < 1867,68 \text{ kN/m}^2$ dan $\sigma_2 = 205,993 \text{ kN/m}^2 > 0$, dan untuk debit banjir Q_{1000} dihasilkan $\sigma_1 = 538,464 \text{ kN/m}^2 < 1867,68 \text{ kN/m}^2$ dan $\sigma_2 = 209,456 \text{ kN/m}^2 > 0$. Dan untuk bahaya *piping*, diperoleh WCR = 9,55 > 5, untuk debit banjir Q_{200} , WCR = 9,15 > 5, untuk debit banjir Q_{200} , dan WCR = 8,33 > 5 (nilai WCR jenis pasir kasar). Dari persyaratan keamanan tersebut, dapat dikatakan bahwa Bendung Kamijoro aman terhadap bahaya penggulingan, pergeseran, *piping*, dan ditinjau dari daya dukung tanah.

Kata kunci: Bendung Kamijoro, debit rencana, stabilitas bendung

THE ANALYSIS OF KAMIJORO WEIR STABILITY BASED ON FLOOD DESIGNS DISCHARGE

By:

Bambang Zakki Wahyu Pamungkas
16510134001

ABSTRACT

A weir can be considered safe when it is stable in facing possible dangers and forces. The objective of this research is to find out the safety value that Weir Kamijoro has in overcoming the dangers of overtuning, sliding, and piping, by also observing the load-carrying capacity of the ground.

This research took place in Sendang Sari Village, Pajangan, Bantul, DIY. This research based on secondary data that covered the picture and the specification of the weir, the information about the local ground, and the maximum flood discharge.

The result of the weir stability analysis which had been recapitulated showed the following outcomes: the safety number for overtuning was $Q_{100} SF = 157,43 > 1,5$, $Q_{200} SF = 157,93 > 1,5$, and $Q_{1000} SF = 156,82 > 1,5$. The ones for sliding were $Q_{100} SF = 18,82 > 1,5$, $Q_{200} SF = 19,46 > 1,5$, and $Q_{1000} SF = 21,29 > 1,5$. In monitoring the load-carrying capacity of the ground, Q_{100} flood discharge resulted $\sigma_1 = 532,549 \text{ kN/m}^2 < 1867,68 \text{ kN/m}^2$ and $\sigma_2 = 203,814 \text{ kN/m}^2 > 0$, while Q_{200} flood discharge resulted $\sigma_1 = 535,077 \text{ kN/m}^2 < 1867,68 \text{ kN/m}^2$ and $\sigma_2 = 205,993 \text{ kN/m}^2 > 0$, and Q_{1000} resulted $\sigma_1 = 538,464 \text{ kN/m}^2 < 1867,68 \text{ kN/m}^2$ and $\sigma_2 = 209,456 \text{ kN/m}^2 > 0$. For piping dangers, the result was $WCR = 9,55 > 5$, for flood discharge Q_{200} , $WCR = 9,15 > 5$, for flood discharge Q_{200} , and $WCR = 8,33 > 5$ (WCR value of coarse sand type). According to the results of the safety condition, it can be concluded that Weir Kamijoro is safe from the dangers of overtuning, sliding, piping, and the load-carrying capacity observing.

Keywords: *Weir Kamijoro, discharge designs, weir stability*