PERENCANAAN GROUNDSILL BATANG AIR DINGIN KOTA PADANG

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Abstrak

Groundsill adalah bangunan yang dibangun melintang sungai yang bertujuan untuk mengurangi kecepatan arus dan meningkatkan laju pengendapan sedimen di bagian hulu groundsill. Hal ini dimaksudkan untuk mengamankan pondasi jembatan atau bangunan yang ada di hulu groundsill, sehingga struktur bangunan yang berada di bagian hulu sungai seperti jembatan atau bangunan air lainya aman terhadap erosi. Perencanaan groundsill sungai batang Air Dingin ini direncanakan dengan menggunakan tipe Ambang Pelimpah dengan kondisi Geologi daerah kemiringan dasar sungai terlalu curam dan sungai membawa sedimen kasar berupa pasir dan kerikil. Dalam pembuatan Tugas Akhir ini dilakukan perhitungan-perhitungan seperti analisa hidrologi, perhitungan hidrolis groundsill, perhitungan dimensi groundsill dan perhitungan stabilitas groundsill. Data-data pendukung adalah peta topografi berskala 1:50.000 dan data curah hujan selama 13 tahun pengamatan. Groundsill ini direncanakan dengan debit banjir periode ulang 50 tahun. Dari hasil perhitungan didapat: luas catchment area seluas 129,20 km^2, debit banjir 50 tahunan (Q_{50}) = 830,615 m^3/dt. Lebar groundsill 80 m, tinggi groundsill diambil 1 m yang dianggap dapat mengamankan pondasi jembatan yang ada ± 21 m dibagian hulu groundsill dan tinggi energi (H_1) = 2,826 m. Pada perhitungan Stabilitas Groundsill dalam keadaan air normal didapat angka keamanan terhadap guling 4,36, angka terhadap keamanaan geser 3,57 dan angka terhadap keamaan daya dukung tanah $\sigma 1 < \sigma t = 3,23 < 9,9$ $\sigma 2 < \sigma t = 1,78 < 9,9$. Pada saat air keadaan banjir didapat angka keamanan terhadap guling 3,57, angka keamanan terhadap geser 3,68 dan angka terhadap keamaan daya dukung tanah $\sigma 1 < \sigma t = 3,36 < 9,9$ $\sigma 2 < \sigma t = 3,27 < 9,9$. Maka didapat kontruksi groundsill stabil.

Kata Kunci : Groundsill, Tipe Mercu, Catchment Area, Stabilitas Groundsill, Analisa Hidrologi.

PLANNING GROUNDSILL AIR DINGIN STEM PADANG CITY

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Abstract

Groundsill is building that build with crosswise the river with the intention for decrease the current speed and increase the sediment deposition ratein the part of groundsill headwaters. This matter for securing the bridge foundation or the building in the groundsill headwaters, so that the building structure in the part of headwaters like the bridge or another water's buildigsafe from erosion. Groundsill's plan of Batang Air Dingin's River has been planned with using type head work with condition geology of the area is slope of the riverbed is too steep and the river carries coarse sediment in the form of sand and gravel. the final project performed calculatings like a hidrological analyse, groundsill hidrological's calculations, groundsill dimensional calculations and stability groundsill calculations. Supporting data is a topographic maps with scale 1:50.000 and rainfall data during 13 years of observation. The groundsill has planned with floods discharge 50 years return period. from the calculation results have been obtained : catchment wide area 129,20 km^2, 50 years flood discharges (Q_{50}) = 830,615 m^3/dt. width groundsill 80 m, high groundsill taken 1 m which is considered to secure the foundations of the existing bridge ± 21 m upstream groundsill and high energy (H_1) = 2,826 m. the stability calculation groundsill in a state of normal water has obtainedsafe factor to bolster 4,36, figures against sliding security 3,57 and figures against soil bearing capacity $\sigma 1 < \sigma t = 3.23 < 9.9$ $\sigma 2 < \sigma t = 1.78 < 9.9$. When the water in flooding has obtained safe factor to bolster 3,57, figures against sliding security 3,68 and figures against soil bearing capacity $\sigma 1 < \sigma t = 3,36 < 9.9$ $\sigma 2 < \sigma t = 3,27 < 9.9$. So construction groundsill is stable.

Keywords: Groundsill, Type Mercu, Catchment Area, Stability groundsill, Hydrological Analysis.