Studi Modulus Elastisitas Dan Kekakuan Bambu Isi Beton

Study of the Modulus of Elasticity and Stiffness of Bamboo Filled with Concrete

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Abstrak

Kemajuan teknologi pemerintah memprogramkan swasembada pangan melalui peningkatan pelayanan irigasi bidang pertanian. Salah satu kegiatan adalah pembangunan bidang sumber daya air seperti normalisasi jaringan irigasi dan pembangunan bendung dan bendungan. Permasalahan yang sering terjadi ialah pelaksanaan pembangunan bendung khususnya bendung moduler sering terjadi letak bendung pada lapisan tanah lunak. Jenis tanah lunak sangat rentan terhadap penurunan tanah. Oleh karena itu, perlu mendesain bendung agar mampu menahan gaya-gaya yang mungkin akan terjadi sesuai perhitungan beban, baik berupa gaya vertikal maupun gaya horizontal. Penggunaan cerucuk bambu isi beton merupakan salah satu konstruksi yang akan digunakan dalam menahan beban-beban pada bendung, baik beban vertikal maupun beban horisontal. Adapun metode yang dilakukan dengan membandingkan pengujian material beton dan material bambu tali dengan mutu beton masing masing K-175, K-225, K-300 kemudian dianalisa modulus E dan pola retak. Berdasarkan hasil analisis diperoleh Bambu K-175 memiliki nilai modulus elastisitas sebesar 24421.2 N/m,

bambu K-225 memiliki nilai modulus elastisitas sebesar 19378.1 N/m, sedangkan bambu K-300 memiliki nilai modulus elastisitas sebesar 17587.4 N/m dan Bambu isi beton K-175 memiliki kuat tekan beton tertinggi, yaitu 397.06. dengan proporsi perbandingan semen 1.5 kg/12.0% semen, pasir 3.9 kg/31.7% pasir, kerikil 5.9 kg/47.5% kerikil, dan air 1.1 ltr/8.8%.

Kata Kunci : Cerucuk Bambu, Betob, Modulus Elastisitas, Pola Retak.

ABSTRACT

Technological advances, the government is programming food self-sufficiency through improving irrigation services in the agricultural sector. One of the activities is development in the water resources sector, such as the normalization of irrigation networks and the construction of weirs and dams. The problem that often occurs is that in the implementation of weir construction, especially modular weirs, the weir often occurs in soft soil layers. Soft soil types are very susceptible to soil subsidence. Therefore, it is necessary to design the weir so that it is able to withstand the forces that may occur according to the load calculation, both in the form of vertical forces and horizontal forces. The use of bamboo cerucuk filled with concrete is one of the constructions that will be used to support the loads on the weir, both vertical loads and horizontal loads. The method used is to compare the testing of concrete materials and bamboo rope materials with the respective concrete grades K-175, K-225, K-300, then analyzing the E modulus and crack patterns. Based on the analysis results, it was found that K-175 bamboo had an elastic modulus value of 24421.2 N/m, K-225 bamboo had an elastic modulus value of 19378.1 N/m, while K-300 bamboo had an elastic modulus value of 17587.4 N/m and concrete filled bamboo. K-175 has the highest concrete compressive strength, namely 397.06. with a proportion of 1.5 kg/12.0% cement, 3.9 kg/31.7% sand, 5.9 kg/47.5% gravel, and 1.1 ltr/8.8% water.

Keywords: *Bamboo Cerucuk, Betob, Modulus of Elasticity, Crack Pattern.*