PERANCANGAN SISTEM MEKANIK MODEL ALAT UJI DINAMIK

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ABSTRAKSI

Fakta bahwa konstruksi bambu, dengan keunggulan pada kekuatan tarik searah serabut, memiliki ketahanan terhadap gempa meningkatkan penggunaan bambu pada berbagai konstruksi tahan gempa. Konstruksi bambu memiliki kelemahan pada sistem sambungan akibat dari variasi dimensi. Penelitian tentang desain sistem sambungan bambu menghasilkan sistem sambungan bambu yang sangat beragam, akan tetapi minimnya literatur tentang sifat mekanik (kekuatan tarik, bending, geser, fracture dan dinamik) sistem sambungan bambu menyulitkan perancang. Dalam analisis kekuatan konstruksi, beban dinamik lebih berbahaya dibanding beban statik. Perancangan sistem mekanik model alat uji dinamik sambungan konstruksi bambu bertujuan untuk mendapatkan karakteristik dinamik dari sistem sambungan konstruksi bambu. Beban dinamik akan sangat berbahaya apabila bergetar pada frekuensi yang sama/mendekati frekuensi pribadi sistem sambungan konstruksi bambu. Sehingga pengujian harus dilakukan pada frekuensi pribadi dari sistem sambungan konstruksi bambu. Beban dinamik dihasilkan dari gaya sentrifugal unbalance mass pada dua roda gigi kembar.

ABSTRACT

The fact that bamboo's construction, with the advantage it's tensile strength in the fiber direction, is reliable when the earthquake occurs increased the use bamboo's in earthquake-resistant construction. Bamboo's construction has a weakness in the connection system caused by the dimentional variations. Researches on the design of the connection system produce various bamboo's connection system designs, but the lack of literature on mechanical properties (tensile strength, bending, shear, fracture and dynamics) of bamboo's connection system went hard with the designer. The analysis of construction strength shows that dynamics load is more dangerous than statics load.
The design of mechanical system of dynamics model tester for the connection system of bamboo's construction intended to obtain the dynamic characteristics of the connection system of the bamboo's construction. Dynamic load will be very dangerous if it vibrates at the same frequency / close to the natural frequency of connection system of bamboo's construction. So the test should be conducted in the natural frequency of connection system of bamboo's construction. Dynamics load is resulted from the centrifugal force of the unbalance mass on the two twin gears.