

INTERAKSI ANTARA GAYA AKSIAL DAN MOMEN PADA KOLOM BETON DENGAN TULANGAN BAMBU

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Abstrak: Penggunaan tulangan bambu dalam beton bertulang masih perlu diteliti secara ekstensif. Material ini diharapkan nantinya dapat digunakan sebagai pengganti baja tulangan dalam kondisi-kondisi tertentu. Penelitian ini dilakukan untuk mengetahui kapasitas kolom beton bertulangan bambu dalam hal kapasitas gaya aksial dan momennya beserta interaksi dari gaya-gaya tersebut.

Sebanyak 12 buah benda uji kolom beton bertulang bambu dibuat dan diuji. Dimensi kolom adalah 150 mm x 150 mm x 900 mm dibuat dengan beton yang memiliki kuat tekan 15 MPa dari hasil pengujian silinder beton standar ASTM pada umur 28 hari. Dua grup benda uji berdasarkan luas total tulangannya yaitu 400 mm² dan 600 mm². Enam buah variasi dibuat untuk setiap grup benda uji sesuai dengan variasi eksentrisitas beban aksial yang diaplikasikan selama pengujian yaitu 0 (aksial murni), 70 mm, 100 mm, 150 mm, 200 mm dan ∞ (lentur murni).

Hasil pengujian menunjukkan bahwa interaksi antara gaya aksial dan momen kolom beton bertulangan bambu hasil pengujian mendekati hasil analisis berdasarkan teori untuk kolom beton bertulangan baja. Dengan mengambil kekuatan tarik bambu sebesar 50% dari kuat tarik putusnya memberikan kapasitas kolom hasil eksperimen mendekati hasil analisis.

Kata kunci: tulangan bambu, kolom, diagram interaksi, beton bertulang

INTERACTIONS BETWEEN AXIAL FORCES AND MOMENTS OF R/C COLUMN REINFORCED WITH BAMBOO

Abstract: The use of bamboo reinforcement in reinforced concrete structure has not been investigated extensively. The material is expected as an alternative of steel reinforcement in a certain condition. Therefore, this research is conducted to investigate the capacity of columns reinforcing using bamboo in term of their axial strength and moment as well as their interactions.

Twelve columns reinforcing of bamboo are made and tested. Column dimensions of 150 mm x 150 mm x 900 mm were cast using 15 MPa concrete obtained from ASTM standard cylinder test of age of 28 days. Two group specimens based on its total reinforcement areas were made namely 400 mm² and 600 mm². Six variations were made for each group to incorporate variation of applied load eccentricities during the test. The load eccentricities were 0 (pure axial), 70 mm, 100 mm, 150 mm, 200 mm and ∞ (pure bending).

Test results show that the experimental interaction between axial force and bending moment of the column reinforced with bamboo agree well with the analytical results following the expression for column reinforced with steel reinforcement. Taking the tensile strength of the bamboo 50% of the rupture strength, give the experimental column capacities were close to the analytical results.

Keywords: bamboo reinforcement, column, interaction diagram, reinforced concrete

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