

ABSTRAK

Beton serat merupakan material konstruksi yang menggabungkan semen, air, agregat halus, agregat kasar, dan serat (fiber) untuk memperbaiki kekuatan tarik beton. Penelitian ini bertujuan untuk mengevaluasi penggunaan serat daun nanas sebagai penguat dalam beton bertulang untuk meningkatkan kapasitas lentur dan daktilitas. Serat daun nanas dipilih karena memiliki kuat tarik yang tinggi, yakni 35,4 MPa. Dalam penelitian ini, balok beton berukuran 1,1 m x 0,15 m x 0,075 m diuji dengan variasi campuran serat daun nanas sebanyak 0%, 1%, 1,5%, dan 2%. Metode penelitian dilakukan secara eksperimental di Laboratorium Beton Universitas Muhammadiyah Jember dengan pengujian three-point bending dengan dua tumpuan dan satu penekan. Hasil penelitian menunjukkan bahwa kapasitas lentur optimum ditemukan pada balok dengan campuran 1% serat daun nanas (BLK-1%), sementara performa paling rendah tercatat pada balok dengan 2% serat (BLK-2%). Daktilitas juga optimum pada BLK-1% dan menurun pada BLK-1,5%, namun meningkat lagi pada BLK-2%. Hasil ini mengindikasikan bahwa penambahan serat daun nanas dapat meningkatkan kapasitas lentur dan daktilitas beton hingga batas tertentu, namun penambahan berlebih justru dapat menurunkan performa material.

Kata kunci: Balok Bertulang Ganda, Beton Serat, Daktilitas, Kapasitas Lentur, Serat Daun Nanas.



ABSTRACT

Fiber reinforced concrete is a building material that combines cement, water, fine aggregates, coarse aggregates and fibers to improve the tensile strength of concrete. The objective of this research is to evaluate the use of pineapple leaf fibers as reinforcement in reinforced concrete to increase flexural strength and ductility. Pineapple leaf fibers were selected because of their high tensile strength of 35.4 MPa. In this research, concrete blocks measuring 1.1 m x 0.15 m x 0.075 m were tested with variations of pineapple leaf fiber blends of 0%, 1%, 1.5%, and 2%. The research method was carried out experimentally at the Concrete Laboratory of Muhammadiyah University Jember by testing three-point bending using two supports and one press. The research results showed that the optimum bending capacity was found in beams with 1% pineapple leaf fiber mixture (BLK-1%), while the lowest performance was found in beams with 2% fiber (BLK-2%). Also, the ductility is optimal at BLK-1% and decreases at BLK-1.5%, but increases again at BLK-2%. These results indicate that the addition of pineapple leaf fiber can increase the flexural capacity and ductility of concrete to a certain extent, but excessive addition can actually affect the material performance.

Keywords: *Double Reinforce Beams, Ductility, Fiber Concrete, Flexural Capacity, Pineapple Leaf Fiber.*

