

The Effect of Bagasse Fiber Material with Pumice as A Partial Substitution of Coarse Aggregate to Increase Compressive Strength and Tensile Strength on Lightweight Concrete

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Abstract

Based on data from the Indonesian Sugar Plantation Research Center (P3GI) bagasse produced 32% of the weight of ground sugar cane. Data obtained from the Indonesian Sugar Expert Association (IKAGI) shows the number of sugar cane milled by 57 sugar mills in Indonesia reaches around 30 million tons, so the bagasse produced is estimated to reach 9,640,000 tons. However, as much as 60% of the sugarcane bagasse is used by sugar factories as fuel, raw material for paper and others. Therefore, it is estimated that 40% of the sugarcane bagasse has not been utilized. In this research bagasse fiber used as a material with partial substitutions of pumice (bagasse) with coarse aggregate to increase compressive strength and tensile strength of lightweight concrete. lightweight concrete. The test is conducted on specimens with a diameter of 15 cm and a height of 30 cm at the age of 28 days. Result of test shows lightweight concrete with 0.25% sugarcane bagasse reach optimum compressive strength at 13.74 MPa, compare to 12.83 MPa without sugarcane bagasse; 13.40 MPa with 0.5% sugarcane bagasse, and 11.61 MPa with 1% sugarcane bagasse. Furthermore, the results of the tensile strength test shows a significant increase up to 0.25% bagasse fiber reach 1.81 MPa, compare to 1.51 MPa without sugarcane bagasse; 1.72 MPa with 0.5%; and 1.56 MPa with 1% sugarcane bagasse. **(Approx. 223 words)**

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