

EFFECT OF ADDING MINERAL WATER PLASTIC BOTTLE WASTE ON COMPRESSIVE STRENGTH, TENSILE STRENGTH AND FLEXURAL STRENGTH OF CONCRETE

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Abstract

This study aims to analyze the effect of the addition of mineral water plastic bottle waste on the mechanical properties of concrete, namely compressive strength, tensile strength, and flexural strength. Plastic bottle waste is used as an additional material in concrete mixtures to reduce the environmental impact due to the accumulation of plastic waste and as an alternative to fillers. Variations in the percentage of plastic bottle waste addition to the weight of cement were carried out to evaluate its changes to the mechanical strength of concrete. The results showed that the addition of plastic bottle waste had a significant effect on the mechanical properties of concrete. In certain variations, the compressive strength and flexural strength of concrete decreased due to uneven distribution of aggregates, while the tensile strength of concrete can increase in the optimal amount of addition. Thus, the addition of plastic bottle waste can be one of the solutions in plastic waste management, but further testing needs to be done to achieve the ideal mix composition to still meet the expected concrete strength standards. As for the results of testing the bending strength of beams without a mixture of plastic bottle fiber is 2.92 MPa, while in a mixture of 5% plastic bottle fiber, the value of bending strength is obtained.

Keywords: plastic bottle waste, compressive strength, tensile strength, flexural strength, concrete