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Utilisation of Waste Plastic in Concrete Mix

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Abstract

Plastic pollution is a significant environmental problems caused by the accumulation of plastic waste in the environment, particularly in oceans, rivers and terrestrial ecosystem. It is a global issue with far-reaching consequences for ecosystems, wildlife and human health. Thus it is very necessary to reduce the use of the plastics either by recycling or reusing. Utilising waste plastic in concrete mix is one of the methods of recycling it.

In this study, the fine aggregate in the concrete mix is partially replaced by multi-layer plastic with a size of 5-7 mm. M20 concrete cubes of 150×150×150 mm were produced using a replacement weight of fine aggregate by plastic 0%, 2%, 4%, and 6%. To determine the strength parameter, 90 cubes were manufactured and put through a compressive strength test. The test result demonstrated that as the fraction of plastic increases, the compressive strength continues to decrease. The compressive strength increased slightly with the addition of admixture, but not significantly. When silica and additional additives were added to plastic mix concrete, the compressive strength test result showed an increase in comparison to regular M20 concrete's strength. In addition, it is discovered that, when compared to 4% and 6%, the 2%plastic substitution yields the best results. The investigation leads to the conclusion that using plastic in concrete helps gets rid of plastic trash.

Keywords: *admixture, compressive strength, concrete, fine aggregate, plastic waste, silica*