Title: Use of plastic fibers in Concrete to alter its mechanical properties and reduce environmental pollution

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I. Abstract Body

Plastic pollution is currently one of the global emergencies and is an unavoidable externality. The present study investigated about the use of plastic fibres in the concrete. The aim of the study is to use plastic materials in concrete to improve its mechanical properties. It helps in reducing the litters and solid wastes produced by plastic materials.

In this research the compressive behavior of a fiber reinforced concrete was investigated through a uniaxial compression test in which the variables were concrete compressive strength and plastic fiber aspect ratio (length to diameter). In order to minimize the effect of specimen size on fiber distribution, 42 cylinder specimens 150 mm in diameter and 300 mm in height and 42 cube specimen of 150 mm length were prepared and then subjected to uniaxial compression. The cost efficiency due to the use of plastic fiber reinforced concrete instead of normal concrete in construction of a three storied residential building has also been compared. The use of plastic fibers in conventional concrete increases its strength and enhances the serviceability behaviors. From the test results, it is seen that the compressive strength increases by23.05% due to plastic fibers of aspect ratio 150. The finding might be useful in cost effective constructions as the addition of 1% by volume into the concrete mix can cause immense variation in its mechanical properties. According to the estimation, we can save up to 15% of fund in rebar using plastic fiber.

It is also found that to construct a 3 story normal residential building almost 3600 kg of plastic is required. It obviously helps to reduce plastic waste and results in pollution control.

II. Image:



Mixing of Plastic fiber by 1% of volume



Testing of Cylindrical specimen

III. Reference:

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IV. Biography:

Vimesh Paudel has completed his Msc degree at the age of 27 years from Tribhuvan University Nepal. He is currently the Lecturer of Kathmandu University. He has conducted several research oriented projects including the research maintained above. He is currently supervising two thesis research works in Maser's in Structural Engineering of Kathmandu University.

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