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SUSTAINABILITY PERSPECTIVE OF SAW-GANG GRANITE WASTE IN CONCRETE MIXES

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ABSTRACT

This paper highlights the sustainability benefit of using saw-gang granite waste with various proportions to substitute cement and fine aggregate in concrete with an aim to prevent the environmental pollution especially in the regions of excessive granite production.

Three concrete mixes of 5%, 10%, and 15% partially replacing cement by granite waste, and three mixes of 10%, 17.5% and 25% partially replacing fine aggregate by granite waste were studied for sustainability measures using the Sustainable Decision Support System (SDSS).

The study revealed that there is a directly proportional relationship between the percentage of granite waste added to the mixes and the sustainability measures as compared to the control mix. In general, sand replacement by 25% of saw-gang granite waste showed the highest sustainability measures when considering all SDSS factors. Whereas, cement replacement mixes showed more significant effect on sustainability measures when considering climate change, pollution, energy consumption and cost factors.

KEYWORDS: Granite Waste, Environmental Pollution, Recyclability of Construction Materials, Green Concrete, Low Consumption of Raw Materials