

Material and fracture characterization of sisal fibre concrete

Yasin Naku Ziraba

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Abstract

The study had a two-fold objective: (a) materials study, including development and durability characteristics, of sisal fibre reinforced concrete and (b) fracture characterization of such a material. In the development and characterization phase of the material, the effect of reinforcing cement mortar with sisal fibres on the flexural and compressive strength was investigated, with the conclusion that best fibre utilization is when long individual fibres are used in thin sections. Several techniques for improving the durability of sisal fibres in concrete were tried out with the most promising being (a) sulphur infiltration and (b) rice husk addition.

In the second phase of the study, a fracture model for cement mortar reinforced with random short sisal fibres was developed in order to predict the crack resistance response of the material and a measure was made of its fracture toughness.