

## Sustainable Reinforcement: Investigating the Mechanical Properties of Concrete with Recycled Aggregates and Sisal Fibers

**Authors :** Salahaldein Alsadey, Issa Amaish

**Abstract :** Recycled aggregates (RA) have the potential to compromise concrete performance, contributing to issues such as reduced strength and increased susceptibility to cracking. This study investigates the impact of sisal fiber (SF) on the mechanical properties of concrete, with the objective of utilizing sisal fibers as a reinforcing element in concrete compositions containing natural aggregate and varying percentages (25%, 50%, and 75%) of coarse recycled aggregate replacement. The investigation aims to discern the positive and negative effects on compressive and flexural strength, thereby assessing the viability of sisal fiber-reinforced recycled concrete in comparison to conventional concrete composed of natural aggregate without sisal fiber. Test results revealed that concrete samples incorporating sisal fiber exhibited elevated compressive and flexural strength. Comparative analysis of these strength values was conducted with reference to samples devoid of sisal fiber.

**Keywords :** sustainable construction, construction materials, recycled aggregate, sisal fibers, compressive strength, flexural strength, eco-friendly concrete, natural fiber composites, recycled materials, construction waste management

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