Recycled glass as a partial replacement for fine aggregate in structural concrete – Effects on compressive strength

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ABSTRACT: Waste management is becoming a major issue for communities worldwide. Glass, being non-biodegradable, is not suitable for addition to landfill, and as such recycling opportunities need to be investigated. Due to the high material consumption of the construction industry, the utilisation of waste glass as a partial replacement for fine aggregate in structural concrete is particularly attractive. This project aimed to determine the level of glass replacement resulting in optimal compressive strength. Three concrete samples were tested at 7 and 28 days, for glass replacement proportions of 15, 20, 25, 30 and 40%. Compressive strength was found to increase up to a level of 30%, at which point the strength developed was 9% and 6% higher than the control after 7 and 28 days respectively. This demonstrates that concrete containing up to 30% fine glass aggregate exhibits higher compressive strength development than traditional concrete.

Keywords: Waste Management, Concrete, Compressive Strength, Waste Glass