

Experimental Project on Partial Replacement of Cement By Bamboo Stem Ash Powder

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Abstract: *This project investigates the partial replacement of cement with bamboo stem ash (BSA) in M20 grade concrete. Bamboo stem ash is obtained by burning dry bamboo stems at controlled temperatures. It contains silica and alumina, which provide pozzolanic properties similar to cement. Concrete mixes were prepared with 0%, 5%, and 10% replacement levels of BSA. Tests were conducted to determine workability and compressive strength. The slump cone test showed a slight reduction in workability with increased ash content. Compressive strength tests indicated that 5% replacement performs close to normal concrete. Beyond 10%, a noticeable reduction in strength was observed. The study concludes that up to 5% replacement is suitable for structural use. Using bamboo stem ash helps reduce cement usage and supports sustainable construction.*

Keywords: Bamboo Stem Ash (BSA), Cement Replacement, Sustainable Concrete, M20 Grade Concrete, Pozzolanic Material, Compressive Strength, Workability, Eco-friendly Construction Waste Utilization, Green Building Materials

