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Experimental Analysis on Bella Stone Powder with Partial Replacement of Cement in Concrete

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Abstract: *This study examines the impact of partially replacing cement with Bella Stone Powder on the mechanical properties of M30-grade concrete. The main objective is to assess changes in compressive strength and split tensile strength with varying Bella Stone Powder content. Cement was replaced by Bella Stone Powder at levels of 0%, 5%, 10%, 15%, 20%, and 25% by weight. Concrete cubes and cylinders were cast and tested at 7 and 28 days to evaluate mechanical performance. Results indicated that a 10% cement replacement with Bella Stone Powder produced the highest compressive and split tensile strengths, marginally surpassing the control mix. Beyond this level, strength began to decrease, likely due to the dilution of cementitious material and reduced bonding efficiency. The study concludes that Bella Stone Powder can be effectively utilized as a partial cement replacement up to 10%, enhancing mechanical properties and supporting sustainable construction practices*

Keywords: Concrete, Cement Replacement, Bella Stone Powder, Sustainable concrete, Compressive Strength, Split Tensile Strength

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