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A Study on Durability of Concrete by Partial Replacement of Cement with Bentonite and Fly Ash

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Abstract: This experimental study focuses on the effects of durability of concrete using fly ash and bentonite as partial replacement of ordinary Portland cement (OPC) in mass concrete. Supplanting of OPC with supplementary solidifying materials, for example, fly ash or bentonite is one of the promising approaches to relieve warm cracking because of temperature differentials in mass concrete. The replacement percentages are 10%, 15%, 20%, 25% and 30% of bentonite and fly ash in equal proportions are replaced for the weight of cement added, comparisons were made control mix. The acidic solution (H_2SO_4) & base solutions (NaOH) of 10 molarity with 2% were used for durability studies. The compressive strength test were performed at age of 28 days. The durability tests were performed after 30 days H_2SO_4 and NaOH attacks followed by 28 days of water curing. Lower compressive strengths were observed in all blended mixes at 28 days of curing, higher compressive strengths was observed after durability attacks as a result of increase in number age of curing.
Keywords: Bentonite, Fly ash, partial replacement, compressive strength, H_2SO_4 attack, NaOH attack.

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