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Characteristics of Different Volumes of Waste Cellular Concrete Powder-Cement Paste for Sustainable Construction

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Abstract : Cellular concrete powder (CCP) is not used widely as supplementary cementitious material, but in the literature, its efficiency is proved when it used as a replacement of cement in concrete mixtures. In this study, different amounts of raw CCP (CCP as a waste material without any industrial modification) will be used to investigate the characteristics of cement pastes and the effects of CCP on the properties of the cement pastes. It is an attempt to produce green binder paste, which is useful for sustainable construction applications. The fresh and hardened properties of a number of CCP blended cement paste will be tested in different life periods, and the optimized CCP volume will be reported with more significant investigations on durability properties. Different replacing of mass percentage (low and high) of the cement mass will be conducted (0%, 10%, 15%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, and 90%). The consistency, flexural strength, and compressive strength will be the base indicator for the further properties' investigations. The CCP replacement until 50% have been tested until 7 days, and the initial results showed a linear relationship between strength and the percentage of the replacement; that is an optimistic indicator for further replacement percentages of waste CCP.

Keywords : cellular concrete powder, supplementary cementitious material, sustainable construction, green concrete
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