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Investigation of mechanical and durability properties of concrete influenced by copper slag and marble sludge powder

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Abstract: Concrete is a composite material composed mainly of water, aggregate, and cement. It is an indispensable material of today's construction world has gone through stages of development. It is difficult to find another material of choice to concrete owing to its versatility. The sustainable development in construction involves use of waste materials and by-products. The concrete produced with cement contain pores, in order to squeeze the pores, use of industrial by product like Marble Sludge Powder as a filler material and Copper Slag as partial replacement of sand. For this research work M30 grade of concrete were prepared in various proportions. Copper slag was used constant replacement of sand. The copper slag is replaced by 20 % of total weight of sand and MSP were used in different proportions 0.3%, 0.5%, 0.7%, 0.9% (out of 2% voids) as filler. The strength properties was determined such as compressive and split tensile strength test and also the durability properties was determined such as water absorption and sorptivity. The benefits of using MSP in cement concrete as mineral filler 0.5% gave the optimum results compared to the other proportions.

Keywords: Copper Slag, Marble Sludge powder, Compressive Strength, Split Tensile Strength test, Partial Replacement andDurability.

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