

Mechanical Properties of Sustainable Concrete using Local Limestone Powder as Partial Replacement of Cement

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ABSTRACT:

This experimental study was done to quantify the mechanical strength resulting from the presence of limestone powder as partial replacement of cement in the mixture of mortar and concrete. Mortars and concretes were made by using limestone powder with various replacement levels of the ordinary Portland cement (OPC) by mass: 0%, 5%, 10%, 15%, 20%, 25%, and 30%. Samples of mortar and concrete cubes, concrete cylinders and prisms were made to measure the limestone mortar compressive strength, and the limestone concrete compressive, splitting-tensile, and flexural strengths with various replacement levels of limestone. The development of strengths was studied and the modulus of elasticity of limestone concrete was also measured. The experimental results show a reduction in the mechanical properties of limestone concrete with the increase of limestone powder replacement level. Some experimental results obtained by other researchers have been compared with this study and discussed.