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Experimental Investigation on Partial Replacement of Eggshell Powder in Conventional Concrete

Anand Babu.A[1]*, Ramprasanth A A[2]., Shanmugavadivu V A[3]

Department of Civil Engineering, SNS College of Engineering, Coimbatore, Tamilnadu, India

Abstract : This paper reports the results of experiments evaluating the use of egg shell powder from egg production industry as partial replacement for ordinary Portland cement in cement mortar. The chemical composition of the egg shell powder and compressive strength of the cement mortar was determined. Calcium rich egg shell is a poultry waste with chemical composition nearly same as that of limestone. This paper describes research into use of poultry waste in concrete through the development of concrete incorporating eggshell powder (ESP). Different ESP concretes were developed by replacing 5-25% of ESP for cement. The results indicated that ESP can successfully be used as partial replacement of cement in concrete production. The data presented cover strength development and transport properties. With respect to the results, at 5% ESP replacement the strengths were higher than control concrete and indicate that 5% ESP is an optimum content for maximum strength. In addition, the performance of ESP concretes was comparable up to 10% ESP replacement in terms of transport properties with control concrete. Few of such products have already been identified like Rice Husk Ash (RHA), Fly Ash, Silica Fumes, Egg shell etc. Amongst these RHA and Egg shells are known to have good prospects in minimizing the usage of cement.

Keywords : Concrete, characterization, eggshell power (ESP), partial replacement, performance.

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