

EXPERIMENTAL INVESTIGATION TO STUDY THE EFFECT OF REPLACEMENT OF FINE AGGREGATES WITH POND ASH AND SUGARCANE ASH ON THE MECHANICAL PROPERTIES OF CONCRETE

Name : Harvinder Singh

Branch : Structure

Roll. No. : 100236482034

Guide : K. S. Bedi

Abstract

Cement Concrete is prepared by mixing up fine aggregates, coarse aggregates, admixtures, cement and water. The engineers are capable to produce properties like its durability and reliability, strength, speed of construction. But now, the engineers are facing a problem of using one of the most crucial content i.e. Sand to make concrete. The demand for sand is huge in India as the country is still developing. The uncontrolled extraction of river sand is causing serious threat to environment like depletion of vegetation on basin, river bank sides, alarming the aquatic life. The further advancement in construction behavior in the country lead to shortage of concrete making materials especially sand, resulting in a drastic increase in price of sand. So, there is need to carry out research on different substances that can replace sand without losing the basic properties of a concrete and to utilize that stuff having similar composition can be replaced by weight of sand in concrete and then also the cost could be reduced without affecting its quality. Already number of raw materials, Construction material wastes and industrial wastes are successfully used in the replacement of sand in partial and full proportions. In this study an attempt was made to replace sand (by weight) by two different industrial wastes in equal proportion which were already used in concrete industry alone, but for the first time an effort was made, to use both the materials as a one mix which was named as Pond Ash (PA) and Sugarcane Ash (SA), individually and in combination of different proportion of 10%, 20%, and 30% respectively. The cement concrete of M20 grade was prepared by concrete mix design and then four mixes were prepared in which, first is control mix and other three mixes were those in which the sand is partially replaced by different percentages of Pond Ash, Sugarcane Ash and combination of Pond Ash & Sugarcane Ash, then various tests were conducted on concrete according to its properties, for fresh concrete properties such as Slump test for workability and for hardened properties Compressive Strength, Split Tensile Strength and Flexural strength values were obtained after the casting and the curing of the specimens under standard curing conditions at 7, 14, 28, and 56 days. From the above investigation it is concluded that the combination of Pond Ash & Sugarcane Ash can be used as a sand replacement up to 20% successfully.