



## Effect of Rice Husk Ash and Water-Cement Ratio on Strength of Concrete

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### Abstract

In present status quo, number of researcher are working on waste materials as potential supplement for any of the constituent of concrete to cope with sustainable development. As, the ingredients which constitute the body and give strength to concrete are natural available limited material and has to deplete one day. Thus, there is desperately need of alternate that may replace the limited natural resources. In this regard, this study focuses the rice husk ash (waste stuff) as partial replacement of cement and its possible impact on strength of concrete. In addition, this research work also this research work is conducted to investigate the effect of water-cement ratio on the strength of concrete at 10% partially replacement of Rice husk ash (RHA) by the weight of cement. RHA is a mineral admixture obtained by burning husk at certain temperature. Since as per pervious researches, the physical and chemical properties of RHA are very reactive Pozzolans and possess binding properties so can be used as cement supplement. Therefore, for laboratory experimental work, total 144 cubical and 72 cylindrical. In this research, number of concrete specimens were cast and tested at 1:2:4 mix ratio with various w/c ratios i.e. 0.45, 0.50 and 0.60. Further, at each specified water-cement ratio, two mechanical properties (compressive and splitting tensile strength) were determined in Universal Testing Machine (UTM). These physical properties of concrete were investigated at 7, 14, 28 and 56 days curing period. The experimental results show that the compressive strength gets increased up to 14.51% and tensile splitting test strength increased up to 10.71% at the w/c ratio of 0.45. The workability of plain fresh concrete at all w/c ratios is slightly greater than the workability of concrete blended with 10% RHA. Thus, RHA improves the properties of concrete when used in specific amount. As a result, it can reduce the overall cost of construction and it will reduce the adverse environmental effect.

**Keywords:** RHA; W/C Ratio; Strength of Concrete; Environmental Pollution.

### 1. Introduction

Conventional materials of construction like cement, sand and granite are highly pre-requisites in construction industry, of which concrete is the basic and widely used cementitious material in civil engineered structures. Since concrete is far more in need and is amply consumed industrially material world-wide, its versatile nature, inevitable dependence and economic feasibility to quench the requirements has placed it as the top most building material [1-3]. With the development around the globe, the use, production and the environmental hazardous in making of cement industrially has surpassed an alarming limits which, if other alternative and environmental friendly materials are not made in practice, would be greatly detrimental to the environment, and the living beings as a result; because cement manufacturing contributes over 5% of global CO<sub>2</sub> emissions which with more dependence would augment [4]. With the

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