

STRENGTH PERFORMANCE OF CONCRETE USING BOTTOM ASH AS FINE AGGREGATE

REMYA RAJU¹, MATHEWS M. PAUL² & K. A. ABOOBACKER³

¹Post Graduate Student, Department of Civil Engineering, Mar Athansius College of Engineering,
Kothamangalam, Kerala, India

²Professor, Department of Civil Engineering, Mar Athansius College of Engineering,
Kothamangalam, Kerala, India

³Consultant, Structural Engineer, Structural and Foundation Engineer, Kochi, Kerala, India

ABSTRACT

Concrete is the most important engineering material and the addition of some other materials may change the properties of concrete. Studies have been carried out to investigate the possibility of utilizing a broad range of materials as partial replacement materials for cement and aggregate in the production of concrete. The present experimental study was conceived following the general purpose of testing new sustainable building processes and modern production systems, aims not only at saving natural raw materials and reducing energy consumption, but also to recycle industrial by-products. The objectives of this study was to investigate the effect of use of coal bottom ash as partial replacement of fine aggregates in various percentages (0–30%), on concrete properties such as compressive strength, splitting tensile strength test, flexural strength and modulus of elasticity and also the effect of microsilica in bottom ash concrete having maximum compressive strength. The test results of this research work indicates that at fixed water cement ratio, workability decreased with the use of coal bottom ash as a replacement of fine aggregate in concrete. Compressive strength of bottom ash concrete at the curing age of 28 days was increased compared to control concrete. Splitting tensile strength of concrete improved at percentages of replacement of bottom ash. The modulus of elasticity decreased with the use of coal bottom ash at all replacement levels.

KEYWORDS: Coal Bottom Ash, Concrete, Compressive Strength, Splitting Tensile Strength, Flexural Strength, Modulus of Elasticity