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Experimental Studies On Mechanical And Durability Properties Of Aerated Concrete

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Abstract - Concrete is one of the most widely used construction materials in the world today. It is made by mixing small pieces of natural stone (called aggregate) together with a mortar of sand, water, Portland cement and possibly other cementations materials. Properly designed and constructed, concrete structures compare favorably with regard to economy, durability and functionality with structures made from other structural materials, such as steel and timber. One of the advantages of concrete is that it is readily moulded into virtually any required shape. Concrete is the preferred construction material for a wide range of buildings, bridges and civil engineering structures. It is the second most widely consumed substance on earth, after water. Therefore, in concrete construction, self-weight represents a very large proportion of the total load on the structure, and there are clearly considerable advantages in reducing the density of concrete. The chief of these are the use of smaller sections and the corresponding reduction in the size of foundations. Furthermore, with lighter concrete the form work need withstand a lower pressure than would be the case with ordinary concrete, and also the total weight of materials to be handled is reduced with a consequent increase in productivity, light weight concrete also gives better thermal insulation than ordinary concrete, the practical range of densities of lightweight concrete is between 300 and 1850 kg/m³, the weight reduction of a concrete structure would require less structural steel reinforcement. An attempt is made in this paper to review various methods of reducing the weight of concrete and to make a comparative study among the methods. Further the detailed comparison with regards to physics, chemical and mechanical (Strength and durability) properties of light weight concrete versus conventional concrete is presented. Various experiments are conducted and the results are reported. The major contribution of present work is to conduct experiments on aerated and conventional concrete and the identify the advantages offered by light weight (aerated) concrete over conventional concrete.