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Original Article

HYPO SLUDGE – AN INNOVATIVE AND SUSTAINABLE APPROACH

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ABSTRACT

The increasing amount of wastes is a concerning reality that has arose the sustainability issues for the environment. Large amount of wastes such as fly ash (from thermal plant), hypo sludge (from paper mill industry) etc. are generated annually. Their disposal generally by landfills leads to environmental pollution. Also, the production of cement accounts the global warming by releasing carbon dioxide. Therefore an innovative use of the industrial wastes in concrete formulation as the supplementary cemetatious material can help in minimizing the environmental problem. This research work is concerned with the experimental investigation of the strength of concrete blended with hypo sludge. The cement has been replaced by hypo sludge in the range of 0%, 5%, 10%, 15% and 20% for M-20 mix. Concrete mixtures were produced, tested and compared with the conventional concrete mix in the terms of workability, compressive strength and splitting tensile strength. The tests were carried out after 7, 14 and 28 days. The workability of concrete decreases with the increase in content of hypo sludge The gradual increase was seen in compressive strength and splitting tensile strength of concrete blended with 0% to 10% of hypo sludge content for all curing ages. Beyond that there is a significant reduction in strength. The maximum compressive strength and splitting tensile strength were 27.62 N/mm^2 and 3.79 N/mm^2. Also the cost analysis indicates that with incorporation of hypo sludge decreases the cost of concrete, but at the same time strength also decreases. 20% replacement of cement with hypo sludge leads to 18.35% reduction in cost.

KEYWORDS: Hypo Sludge, Workability, Compressive Strength, Splitting Tensile Strength, Cost

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