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Review on Utilization of Partially Replacement of Cement and Sand by using Paper Mill Sludge and Sugarcane Bagasse in Concrete

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Abstract - *This paper covers the literature review of the utilization of industrial and agricultural waste produced by industrial processes has been the focus of waste reduction research for economical, environmental, and technical reasons the Sugar-cane bagasse is a fibrous waste-product of the sugar refining industry, along with ethanol vapor This waste product (Sugar-cane Bagasse ash) is already causing serious environmental pollution, which calls for urgent ways of handling the waste and also Paper mill sludge is a major economic and environmental problem for the paper and board industry. The material is a by-product of the deinking and re-pulping of paper thus In this paper, Bagasse ash and paper mill sludge has been chemically and physically characterized, and partially replaced in the ratio of 0%, 5%, 15% and 25% by weight of cement in concrete. Fresh concrete tests like compaction factor test and slump cone test were undertaken was well as hardened concrete tests like compressive strength, split tensile strength, flexural strength and modulus of elasticity at the age of seven and 28 days was obtained*

Key Words: Bagasse Ash, Paper sludge, materials, compressive strength

1. INTRODUCTION

Present days because low accessibility of natural resources, the ordinary Portland cement and natural sand is being used rapidly in the world, because of construction of industries, residential buildings and other concrete based structures .So, the production and utilization of concrete and sand has been rapidly increased, So due to that lot of heat is emitted into the atmosphere due to hydration action of cement. So to reduce the amount of cement in concrete as well as reduction the impact of using natural sand in concrete we are using byproduct of paper industry for cement and Sugarcane bagasse ash (SCBA) for sand. While producing paper the various waste come out from various processes used in paper industry. Paper making Industries generally produce large amount of solid waste. The only way of disposal of this paper mill sludge is dumping which is dangerous for environment. Paper fibers can only be recycled to limited number of times. From paper manufacturing processes three types of sludge are obtained namely lime sludge, ETP sludge, De-linking sludge .In our project we used lime sludge as a partial replacement of cement. Each Indian paper mills produces an average of over 40 tons of sludge per day. The specific gravity of hypo sludge is generally 2.80 but it is very slightly higher when silica content is low. This value can be compared with specific gravity of cement which is 3.15. The Sand has been replaced by waste Sugarcane baggase ash and cement by paper mill sludge accordingly in the range of 0% (without Hypo sludge), 10%, 20% & 30%, by weight for M-20 mix. These tests were carried out to evaluate the mechanical properties like compressive strength, split strength & Flexural strength up to 14 & 28 days are taken. As a result, the Strength in hypo sludge and Sugarcane baggase ash reduces the strengths gradually. This research work is concerned with experimental investigation on strength of concrete and optimum percentage of the partial replacement.

METHODOLOGY FOR RESEARCH

- Collection of material
- Mix proportion(after testing of materials)
- Cube casting
- Curing (7,14,28Days)
- Testing of cubes
- Result and analysis

2. LITERATURE REVIEW

SugerCane Bagasse

Prashant O Modani, research about Utilization of Bagasse Ash as a Partial Replacement of Fine Aggregate in Concrete this shows the fraction of fine aggregates i.e. 10% to 20% can be effectively replaced with a bagasse ash (untreated) without a considerable loss of workability and strength properties. ii) The compressive strength results represent that, the strength of the mixes with 10% and 20% bagasse ash increases at later days (28 days) as compared to7 days that may be due to pozzolanic properties of bagasse ash..[I]

R Srinivasan, Experimental Study on Bagasse Ash in Concrete and his found It is found that the cement could be advantageously replaced with SCBA up to maximum limit of 10%. Although, the optimal level of SCBA content was achieved with 1.0% replacement. Partial replacement of cement by SCBA increases workability of fresh concrete; therefore use of super plasticizer is not substantial. The

density of concrete decreases with increase in SCBA content, low weight concrete produced in the society with waste materials (SCBA). [II]

Sajjad Ali Mangi Utilization of sugarcane bagasse ash in concrete as partial replacement of cement this paper conclude that SCBA in concrete gives the higher compressive strength as compared to the normal strength concrete, hence optimal results were found at the 5% replacement of cement with SCBA. The usage of SCBA in concrete is not only a waste-minimizing technique, also it saves the amount of cement

Paper mill sludge

Manpreet Kaur he was shows the various percentage required for an replacement i.e The maximum compressive strength of concrete increased by 55% at 40% replacement of fine aggregate by copper slag, and up to 75% replacement, concrete gain more strength than control mix concrete strength. 7. In case of Sugercane Bagasse ash, the cement can be replaced by 10%. 8. The compressive and tensile strength is increased up to 20% by replacing fine aggregates with foundry sand up to 30 – 40% [III]

Priya R, Experimental Study on Partial Replacement of Cement by Hyposludge in Concrete this experiment found that the maximum compressive strength for 7 days and 28 days is achieved for 15% replacement of cement and starts decreasing in strength from 20% to 30%. The maximum spilt tensile strength for 7 days and 28 days is achieved for 15% replacement of cement and starts decreasing in strength from 20% to 30%. The strength of concrete is attained in 15% replacement of hypo sludge with cement as compare to conventional concrete

3. CONCLUSIONS

Overview of literature that shows the project will be done with various mixes with curing periods of 14 days & 28 days by Partial replacement of cement and sand by using paper mill sludge and sugarcane bagasse ash (SCBA). Testing of cubes, beams and Cylinders are yet to be done achieve Maximum Strength For an Proper replacement of paper mill sludge and sugercane bagasse

In this study attempt have been made to obtain the strength by using varying proportion of these materials

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