To Enhance the Characteristics of Agricultural Waste Based Concrete with Different Parameters

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Abstract **- The research was conducted with M20 grade concrete. The compressive strength test was performed on 90 number of concrete cube of size 150 mm × 150 mm × 150 mm. The study is done with Sugarcane Bagasse Ash 0%,10% , 20% ,and 30% Rice husk ash 0%,10%,20% and 30% For each replacement percent of cement total 09 number of cube were tested 03 numbers of cube for 07 days ,03 number of cube for 14 days and 03 numbers of cube for 28 days. The test of compressive strength of concrete has been done and result are show in graph between the compressive strength and percentage of Sugarcane Bagasse Ash and Rice husk ash. This research has show that the Sugarcane Bagasse Ash and Rice husk ash have potential to produce high performance of concrete and it will also improve the properties fresh and hardened concrete.**

Index Terms **- Rice husk ash (RHA), Sugarcane Bagasse Ash (SBA), cement replacement, Compressive strength, Workability.**

INTRODUCTION

There has been alarming rate of increase in the price of building materials in the recent past. This has necessitated government, private and individuals to go in research for locally sourced materials to supplement (replace-fully or partially) the conventional materials. The increasing demand for cement and concrete is met by the partial replacement of cement. The whole concept of this idea is to ensure that an average working class citizen of India will be able to own a house. Concrete is a composite material which consists eccentrically of a binding medium. Concrete is no longer made of aggregate Portland cement and water only. Often but not always it has to incorporate at least one of the additional ingredients such as admixture or cementations material to enhance its strength and durability. Within which are embedded particles or fragments of relative inert filler in Portland cement concrete. The binder is a mixture of Portland cement. The filler may be any of a wide variety of natural or artificial. Fine and coarse aggregate; and in some instances, an admixture. Concrete is presently one of the most popular materials used in building construction and other civil engineering works. When reinforced with steel, it has a higher capacity for carrying loads.

OBJECTIVE OF THE STUDY

The object of the present work was to find the strength value of concrete by replacing it using waste product.

1. To find of the underneath most Strength esteem by exploitation of reused total.
2. To Find the compressive pressure strength all through 7, 14 and 28 Days. \
3. To discover the different strength of shaft and shape for substantial utilizing reused total.

MATERIALS AND METHOLODOGY

Ordinary Portland Cement of 43 Grade confirming to IS: 8112-1989 was used in the investigation. very good adhesive and cohesive properties which makes it possible to bond with other materials to form compact mass.

Bagasse ash is a valuable pozzolanic material and it can potentially be sold at a price similar to that of slag and fly ash. It reduces negative environmental effect and landfill volume, which is required for eliminating the waste of ash. Partial replacement of cement by SCBA increases workability of fresh concrete. Low weight concrete produced in the society with waste materials (SCBA). It will increase the compressive strength, tensile strength and also flexure by the replacement of 10 % of SCBA at 28 days. Bagasse ash is very light material. It is clear that presence of oxides and carbon in the ash will make it suitable for refectory

and ceramic products such as insulation, membrane filters and structural ceramics. With fine particle size characteristics, implies that, bagasse ash can be used as facing sand molding during casting operations. The ash is used on the farms as a fertilizer in the sugarcane harvests.

India has a major agribusiness sector which has achieved remarkable successes over the last three and a half decades. Agricultural waste or residue is produced up of organic compounds from organic sources such as rice straw, oil palm empty fruit bunch, sugar cane bagasse, coconut shell, and others. Rice husk from paddy is one model of alternative material that delivers a big potential. Rice husk a major byproduct of the rice milling industry is one of the most commonly available lingo cellulosic materials that can be converted to different types of fuels and chemical feedstock's through a sort of thermo chemical conversion processes.

The Aggregate which is passing through 4.75mm sieve is known as fine aggregate. Locally available river sand which is free from organic impurities is used. Sand passing through 4.75mm sieve and retained on 150micron IS sieve is used in this investigation.

LABORATORY TESTS

The aim of this experimental investigation is to study the variation in strength characteristics of concrete structural elements, for the proportion of M20 grade. In each mixes containing different percentages of Rice husk ash (RHA) and sugarcane bagasse Ash (SBA) is replaced by means of cement starting from 0% as normal concrete, i.e. controlled concrete 10%, 20%, and 30%, .The number of specimens casted for each case is as follows.

1. Workability of concrete test like slump cone test and compaction factor test.
2. Mechanical properties like Compressive strength.

OBSERVATION AND CALCULATION

Properties of Fine Aggregate:

Fineness modulus of fine aggregate = cumulative percentage weight retained/100

Fineness modulus = 288.864/100
= 2.88

Specific gravity = 2.68
Water absorption = 0.86%
Silt or clay content = 0.5%
Bulk density = 1520kg/m^3
Grading = well graded (zone II).

Properties of Coarse Aggregate:

Fineness modulus of coarse aggregates = cumulative percentage weight retained/100

Fineness Modulus = 512.40/100
= 5.12
Specific gravity = 2.7
Water absorption = 1.12%
Impact value = 11.76%
Bulk density = 1440kg/m^3.

Water used for both mixing and curing should be free from injurious amount of deleterious materials such as acids, alkalies, salts, organic materials etc. Potable water is generally considered satisfactory for mixing and curing concrete. In present work potable tap water was used.

Slump Cone Test

This is a test used extensively in site work all over the work. The slump test does not measure the workability of concrete although ACI 116R – 90 describes it as a measure of consistency, but the test is very useful in detecting variations in the uniformity of a mix of given nominal proportions. The slump test is prescribed by IS: 456 (2000), ASTM C 143 90A and BS 1881 Part 102:1983. The mould for the slump test is a frustum of a cone, 300mm (12inch) high. It is placed on a smooth surface with the smaller opening at the top and filled with concrete in three layers.

Workability of various concrete mixes design for slump cone test

Mix design codes	Slump cone test in mm.
M1-MIX	38
M2-MIX (10% RHA)	42
M3-MIX (20% RHA)	43
M4-MIX (30% RHA)	45
M5-MIX (10% SCA)	47
M6-MIX (15% SCA)	48

Compressive Strength of Concrete
(IS: 516-1959):

The compressive strength of concrete is one of the most important Properties of concrete in most structural application concrete is implied primarily to resist compressive stress.

In the investigation, conventional concrete Rice husk ash(RHA), Sugarcane Bagasse Ash (SBA), composite, concrete cubes of 150mm x 150mm x 150mm sizes were used for testing the compressive strength. The cubes are tested in a compression-testing machine of capacity 2000kn. The load has been applied at a rate of 315kn/mm. The load applied in such a way that the two opposite sides of the cubes are compressed. The load at which the control specimen ultimately fail is noted. The average of three cubes is taken as compressive strength.

RESULTS AND DISCUSSION

1.Compressive strength of cement blends made with and without rice husk debris and sugarcane refuse. debris with various rate were resolved at 7, 14, and 28 days of relieving. The test outcomes are given in table and displayed in figure. The most extreme compressive strength was gotten for a blend having a 10% rice husk debris of 10% sugarcane refuse.debris by weight and expansion in strength over plain concrete .

2.The multi day compressive strength of rice husk debris and sugarcane refuse.debris concrete was discovered to be high as 17.9 Mpa. Which is more than conventional cement. Additionally multi day compressive strength was discovered to be about 27.5 Mpa which is more than that of customary cement.

CONCLUSION

The aftereffect of study shows that there are acceptable possibilities of utilizing Rice husk Debris (RHA), Sugarcane Refuse. Debris (SBA) as a pozzolana mix with standard Portland concrete (OPC) in the Substantial shape. M-20 grade substantial 3D shape is casted and its compressive strength and usefulness is resolved. The mix of 10%, 20% and 30% concrete substitution Blend is set up by utilizing farming waste. Usefulness of the substantial expanded with the expanded level of Sugarcane Refuse Debris in concrete and diminished with expanded level of Rice husk. It has been seen that Sugarcane Refuse. gives excellent functionality when they supplant concrete in concrete.

Compressive Strength of cement expanded with expanding rate blend give great compressive strength. At the point when Rice Husk Debris supplant concrete in substantial it has been seen that its 10% and 20% blend gives great compressive strength.

Concrete is an adaptable structure material which is to a great extent utilized in development. At the point when concrete is supplanted by these waste material upto 30%. By utilizing these waste material INR 94.5/ - can be saved money on per pack of concrete for example 30% of the expense.

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