Partial Replacement of Cement by Mixture of Rise Husk Ash and Sugarcane Bassage Ash

Mayur Pandagre[1] Vijaya Wanjari[2] Bhupesh J. Wasnik[3]
[1]Student [2]Assistant professor [3]H.O.D
[1,2,3]Department of civil Engineering
[1,2,3]VNIET, Nagpur

Abstract— In the most recent decade, the utilization of supplementary solidifying materials has turned into a basic piece of high quality and superior solid blend plan. These can be normal materials, by-items or modern squanders, or the ones requiring less vitality and time to create. A portion of the ordinarily utilized supplementary solidifying materials are fly cinder, Silica Fume (SF), Ground Granulated Blast Furnace Slag (GGBFS), Rice Husk Ash (RHA), Sugarcane Bassage Ash and so on. RHA is a by-item material got from the burning of rice husk which comprises of non-crystalline silicon dioxide with high particular surface range and high pozzolanic reactivity though Sugar-stick bagasse is a stringy waste-result of the sugar refining industry, alongside ethanol vapor. This waste item (Sugar-stick Bagasse fiery remains) is now creating genuine natural contamination, which calls for critical methods for taking care of the waste. Bagasse fiery debris essentially contains aluminum particle and silica. In the present study a diagram of the work completed on the utilization of blend of Rice Husk Ash (RHA) and Sugarcane Bassage Ash (SBA) as fractional substitution of bond in mortar and cement is introduced in which both the supplements are blended in equivalent extents. In this investigation the concrete was replaces somewhat by 5%, 10%, 15%, 20% and 25% and were further cured for 28 days and compressive quality tests were directed following 7 days, 14 days and 28 days curing and the outcomes were closed.

Key words: Rise Husk Ash(RHA), Sugarcane Bassage Ash (SBA)

I. INTRODUCTION

Activities are developing worldwide to control and direct the administration of sub-items, residuals and modern squanders so as to safeguard the earth from sullying. A decent answer for the issue of reusing of agro modern buildups would be by smoldering them in a controlled domain and utilize the cinders (waste) for more respectable means. Usage of such squanders as bond substitution materials may decrease the expense of solid generation furthermore minimizes the negative natural impacts with transfer of these squanders. Silica smolder, rice husk fiery remains, fly powder, met kaolin and ground granulated impact heater slag are entrenched squanders with pozzolans due to high silica content in their substance pieces. The calcium hydroxide (unfavorable item from the bond hydration) discharged amid the hydration of OPC responds with silica present in the pozzolans and water to shape extra calcium silicate hydrate which is in charge of the compressive quality in cement.

Customary Portland concrete is the most broadly utilized development material as a part of the world. Since the mid 1980's, there has been a gigantic interest for the mineral admixture and in future this interest is relied upon to increment much more. Likewise in this cutting edge age each structure has its own particular expected reason and thus to meet this reason change in customary bond concrete has ended up key. This circumstance has prompted the broad exploration on cement bringing about mineral admixture to be halfway utilized as concrete substitution to build workability in most basic application. In the event that some of crude material having comparable organization can be supplanted by weight of bond in solid then cost could be decreased without influencing its quality. Two supplements utilized as a part of present study for halfway substitution of bond are given beneath.

II. MATERIAL PROPERTIES

Parameters	Values
Silicon dioxide (SiO2)	87.10%
Aluminum oxide (Al2O3)	0.19%
Ferric oxide (Fe2O3)	0.15%
Calcium oxide (CaO)	0.52%
Magnesium oxide (MgO)	0.38%
Sulphur trioxide (SO3)	0.22%
Carbon (C)	5.95%
Loss on Ignition	5.41%

Table 1: Chemical Composition Of Rice Hush Ash (Rha)

Physical State	Solid – Non Hazardous
Appearance	Very fine powder
Particle Size	25 microns – mean
Color	Grey
Odour	Odourless

Table 2: Physical Properties Of Rice Husk Ash (Rha)

Fig. 1: RICE HUSK AND RICE HUSK ASH

COMPONENT	MASS %
SiO2	78.33%
Al2	8.51%
Fe2O	3.62%
CaO	2.16%
Na2O	0.17%
K2O	3.47%

MnO	0.12%
TiO2	0.51%
BaO	<0.15%
P2O5	1.07%
LOSS OF IGNITION	0.41%

Table 3: Chemical Composition Of Sugarcane Bassage Ash

Physical State	Solid – Non Hazardous
Appearance	Very fine powder
Particle Size	28 microns – mean
Color	Reddish Grey
Odour	Odourless
Blaine surface area	5130 cm^2/g

Table 4: Physical Properties Of Sugarcane Bassage Ash

Fig. 2: Sugarcane Bassage and Sugarcanebassage Ash

III. Experimental process

A watchful strategy was embraced in the clumping, blending and throwing operations.

The coarse totals and fine totals were measured first with a precision of 0.5 grams. The solid blend was set up by hand blending on a watertight stage. OPC grade 43 concrete (Birla GOLD) was utilized for throwing. Five extents of concrete are supplanted with blend of RHA and SCBA and completely blended. After that coarse totals and fine totals are added to it. At that point water was included painstakingly so that no water was lost amid blending. Three spotless and oiled molds for every classification were then set on the table individually for the cubical specimens for pressure quality testing were filled in three layers.

The examples were permitted to stay in the steel mold for the initial 24 hours at encompassing condition. After that these were demoulded with consideration so that no edges were softened and were set up the curing tank at the encompassing temperature for curing.

IV. Results

Results are as tabulated below-

RHA and SCBA content, %	Compressive		
	7	14	28
0%	26.66	31.41	37.42
5%	25.77	30.65	36.4
10%	26.65	31.14	37.47
15%	23.12	28.30	34.2
20%	25.77	30.51	36.70
25%	26.66	31.4	37.46

Table 5: Compressive Strength (MPA) of Concrete with RHA & SCBA

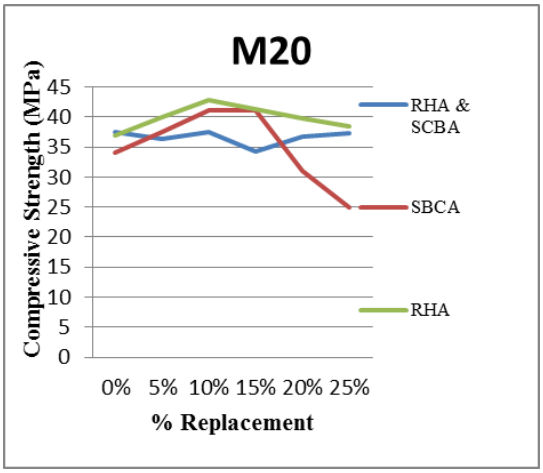

Fig. 6: Comparison Between RHA, SCBA, Mixture of RHA & SCBA of 28 Day Strength

V. Conclusions

[1] The optimum addition of mixture of RHA and SCBA as partial replacement for cement is in the range 0-25%.
[2] As the Rice Husk Ash and Sugarcane Bassagre Ash is waste material, it diminishes the expense of development.
[3] Because of expansion of rice Husk slag, concrete gets to be strong and more plastic and along these lines licenses less demanding putting and completing of cement. It likewise builds workability of cement.

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