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HIGH PERFORMANCE CONCRETE USING RICE HUSK ASH

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Abstract - When it comes to determining the structural strength of a structure, strong material is critical. The fact that India is a growing country with a Mega structure and ranks among the world's strongest nations. For a study form, the material strength must be sufficient.

What if the concrete used has a high level of power and we can shop the material and make environmentally friendly? That is a better way to think about making the structure eco-friendly and reducing the amount of material used. The major purpose of the project is to use High Performance Concrete to accelerate infrastructure improvement. One of the main benefits of the project is that we may use waste material created at some point during the farming process to improve material power and use it in the construction section of giant constructions.

***Key Words*: Strength, Improvement, giant construction**.

1. INTRODUCTION

Rice production in the globe is estimated to be at 580 million tonnes per year , and this figure is rising as the world's population and rice consumption grow. Rice husk is produced during the processing of rice and is a waste product. Rice husk is produced at a 20% rate by weight of the rice handled on a regular basis. A considerable amount of the husk is burned or discarded. The consumption of the husks creates trash at a rate of 18% by weight of the husks on average. RHA was typically formed before 1970 by uncontrolled burning, and the debris delivered was mostly glass like due to growing environmental concerns and the need to ration energy and assets, efforts have been made to devour the husk at a regulated temperature and climate, and to use the debris thus given as a valuable establishing material. Cement's three main features are utility, strength, and sturdiness.

1.1 SILENT FEUTURS

In comparison to regular concrete cement, concrete with RHA is more resistant to extreme conditions.

It has a higher efficiency than regular concrete cement.

It broadens the scope of cement's utility.

RHA concrete becomes more hard and plastic as a result of its expansion.

The mass thickness of RHA content decreases as RHA content increases.

The use of RHA as a method of solidification reduces consumption and increases considerable strength.

2. MATERIAL PROPERTIES AND MIX DESIGN

2.1 Physical properties of RHA

Sr.no	Perticulers	properties
01	Colour	grey
02	Shape texture	Irregular
03	mineralogy	Non crystaline
04	Particle size	< 45 micron
06	Odour	Odourless
07	Specific gravity	2.3

Table -1: Physical properties of RHA

2.2 Chemical properties of RHA

Sr.no	particulars	Properties
01	Silicon dioxide	86.94%
02	Aluminum oxide	0.2%
03	Iron oxide	0.1%
04	Calcium oxide	0.3-2.2%
05	Magnesium oxide	0.2-0.6%
06	Sodium oxide	0.1-0.8%
07	Potassium oxide	2.15-2.3%

Table -2: Chemical properties of RHA

2.3 Mix design

Mix	Cement	Sand	Coarse Aggrigate	Water
Ratio	1	1.632	2.353	0.46
Quantity	442 kg/m3	734.9 kg/m3	1048.53 kg/m3	176.5 kg/m3

Fig -1: M40 mix design

2.4 PERFORMANCE ANALYSIS

2.4.1 RESULTS OF SLUMP TEST

MIX	RHA Replacement	Slump value (mm)
M1	0%	77
M2	5%	72
M3	10%	66
M4	15%	60
M5	20%	50

2.4.2 compressive strenght

Mix	RHA Replacement	Compressive Strength n/mm2	
		7 days	28 days
M1	0%	33.5	47.6
M2	5%	36.7	49.1
M3	10%	34.6	46.2
M4	20%	31.9	40.1
M5	25%	27.4	35.3
M6	30%	21.1	27.4

3. CONCLUSIONS

- Rice Husk Ash is a highly responsive pozzolanic material that can be used as a strengthening establishing material to create high-performance concrete.
- The compressive strength of the substantial containing up to 15% RHA was higher than that of the control Portland concrete cement. With decreasing w/(c + RHA), the substantial's strength grew.
- The considerable integrating RHA required larger measures of the super-plasticizer and the air-entraining admixture than the control Portland concrete and silica smoulder cements to get a similar rut and air content due to the RHA's large explicit surface.
- The setting times of the RHA concrete were slightly longer than those of the control and silica seethe cements. It didn't matter if the considerable integrating RHA was drained.
- When compared to the control concrete, the RHA concrete had superior compressive properties at ages as long as 180 days, but lower values than the silica smolder concrete.

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