

ANALYSIS OF EFFECT OF RICE HUSK ASH IN PROPERTIES OF CONCRETE

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Abstract: This paper summarizes the study of using rice husk ash on the cement in order to ease the availability, quality, strength and pollution issues. Solid concrete cube size 150 X 150 X 150 mm in size of M20 Grade were casted by the replacement of cement to Rice Husk Ash (RHA) by weight at 0% , 5% , 7.5% , 10% , 15%. The rice husk contains near about 85 to 90 percent amorphous silica. Cubes were made ready for testing after 7 days and 28 days curing in water. Testing was included for the compressive strength, workability. The test results revealed that the workability and compressive strength are slightly better than the standard or normal fresh concrete. The strength is increases high when 5% RHA is replaced with cement in concrete.

I. INTRODUCTION

Civil work is a very essential movement for the growth. The present civil work for create any road and rail network work is the cement reinforcement concrete. This cement reinforcement concrete contains cement, fine and coarse aggregates and steel . The manufacture of these material shall produce the significant quantity of dangerous waste. Therefore for sustainable development moreover the manufacturing of the constructional materials need toward to be reduced or usage of local throw away material has been used . Concrete is a combination of cement, fine aggregate (sand), coarse aggregates (gravel or crushed stone), and water. Concrete is the most generally used construction material in the whole world. Rice husk ash is an experimented for the replacement of cement. It is reported in that locally available rice husk ash could be used as partial replacement for ordinary Portland cement. Rice husk mostly are the coatings of seeds or grains of rice. Rice husk protects the seeds during the growing season , since it has been formed from hard materials ,including silica and lignin. The husk is generally indigestible to humans as well as for the environment. By using rice husk ash in concrete as replacement the emission of green house gases could be decreased to a greater amount , as a result there is greater risk to gain extra number of carbon credit.

II. MATERIALS USED

RHA – Rice husk ash is obtained from local rice mill in SirsaHaryana . Chemical composition of RHA are affected due to the burning process and temperature. Silica content in ash increases with higher the burning temperature.

Cement – Cement is the mainbuilding material that is used for construction that sets , hardens and adheres to other materials , blinding them together. Cement is rarely used exclusively, but is use with the sand and aggregate together.

In this research we used ultratech OPC cement that is easily available in the market.

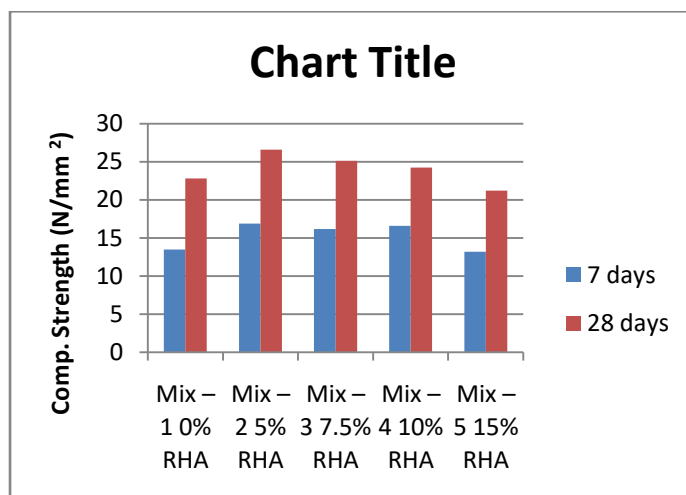
Fine aggregate – Aggregate is the inert material such as sand , gravel , broken stones , etc used in concrete or mortar, wherein the cement paste binds the aggregate to form concrete or mortar. Fine aggregate or crushed stone which passes through 4.75 mm sieve is called fine aggregate .IS 10262:2009 design code is used for fine aggregate standards.

Coarse aggregate – Aggregate is the inert material such as sand , gravel , broken stones , etc used in concrete or mortar, wherein the cement paste binds the aggregate to form concrete or mortar. The size of the fine aggregate is limited to maximum 4.75 mm beyond which it is known as coarse aggregate.IS 10262:2009IS 10262:2009 design code is used for fine aggregate standards.

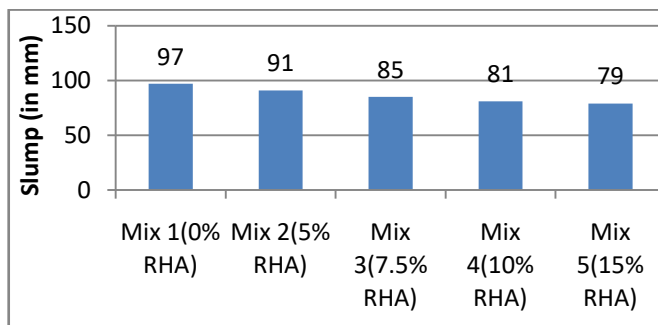
Water – The water used in the mix or in curing is free from dust and other impurities and fulfills the requirement of Indian Standard design codes. Generally clean water is used in the mix as well as for the purpose of curing.

III. RESULTS AND DISCUSSION –

Mix design % RHA	Mix – 1 0% RHA	Mix – 2 5% RHA	Mix – 3 7.5% RHA	Mix – 4 10% RHA	Mix – 5 15% RHA
Curing (in days)	Comp. strength (N/mm ²)	Comp. strength (N/mm ²)	Comp. strength (N/mm ²)	Comp. strength (N/mm ²)	Comp. strength (N/mm ²)
7 days	13.49	16.9	16.16	16.6	13.2
28 days	22.80	26.60	25.14	24.25	21.20



Serial No.	Design Mix	Slump (in mm)
1	Mix 1 (0% RHA)	97
2	Mix 2 (5% RHA)	91
3	Mix 3 (7.5% RHA)	85
4	Mix 4 (10% RHA)	81
5	Mix 5 (15% RHA)	79



IV. CONCLUSION

- The concrete mix with rice husk ash is economical than normal cement concrete mix. Due to the use of rice husk ash in mix, there is decrease in overall cost to 5% according to its use.
- If we use rice husk ash concrete mix, the weight of concrete is reduced therefore, for light weight construction material it can be used. The weight of concrete reduces due to the light weight of rice husk ash as compared to cement.
- By addition of rice husk ash, concrete becomes cohesive and more plastic and therefore permits easier placing and finishing of concrete. It also increases the workability of concrete.
- From this experimental study rice husk ash can be used as alternative material to cement up to 5 percent.
- The workability of rice husk ash is decreased with the increase in percentage of rice husk ash in the concrete mix

Future scope of study

Advanced study or investigation is required to know the behavior of rice husk ash concrete whether it is suitable for pumping purpose because now a days pumping of concrete is done at very large extent at large heights. There are many tests related to the durability aspects like water permeability, corrosion of steel in RCC, resistance to sulphate attack in under water concreting etc. has also been studied in detail in future to enhance the properties of rice husk ash in concrete.

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