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Replacement Of Natural Concreting Materials To Environmental Waste To Produce Eco Friendly Concrete – A Review

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***Abstract*— Concrete is one of the most widely used building materials in the world. In addition, concrete is the second most widely used material in the world after water. About ten billion tons of concrete are produced annually. Annual production represents one ton per person in the world. There are negative impacts on the increase in tangible production as the continued depletion of natural resources from natural resources will lead to depletion and environmental inequality. So many researchers want to replace solid concrete with concrete to save concrete and promote sustainable development. This environmental factor has caused a great deal of concern in the world of infrastructure development. The role of sugarcane, pieces of wood, plastic waste, textile waste, polyethylene, rice ash, rubber tires, vegetable fibers, paper and pulp waste in the industry, vegetable fibers, paper and pulp waste, shellfish. Other conditions for changing aggregates in concrete**

Keywords—Coconut shell, LWC, Rice husk ash

I. INTRODUCTION

Concrete is the main building material that incorporates natural integration. Due to the rapid growth of industry and construction in a developing country like India, natural resources are dwindling. Finding other concrete materials is an important requirement in the current situation. Restrictions on environmental issues in access to the environment and natural resources or waste disposal are becoming increasingly important. Coarse aggregate is a major component of concrete in a variety of construction activities, including infrastructure development, low-rise and high-rise buildings and housing development. It is a man-made product, which actually combines a mixture of cement, compounds, water and a mixture. Non-corrosive granular materials such as sand, crushed stone or large stones are part of aggregates. Traditionally aggregates were readily available in economic values and attributes to suit all objectives. However, the continued use of broad-based approaches to environmental standards is questionable due to declining standards of quality and beyond environmental awareness.

LIGHT WEIGHT CONCRETE

A lightweight concrete mix is made of a solid non-abrasive compound and sometimes a partial or complete compound may be easier than conventional mixing. Simple structural concrete has a unit weight by order of 90 to 115 lb. / ft³ (1440 to 1840 kg / m³). Normal concrete weighs 140 to 150 lb / ft³ (2240 to 2400 kg / m³) concrete

However, a high compression strength of 7000 to 10,000 psi can be achieved with lightweight concrete. However, this can disrupt the compaction of the mixture as it requires the addition of more pozzolans and water-reducing compounds to the concrete. . It has gained popularity due to its low density and extremely high temperatures. Many architects, engineers, and contractors are aware of the benefits and benefits of this material, as evidenced by the many impressive non-lightweight concrete (LWC) designs found around the world.

LIGHT WEIGHT CONCREATING MATERIALS

a) Rick husk
b) Volcanic cinders
c) Saw dust
d) Diatomite

e) Pumice
f) Coconut shell
g) Glass powder
h) Granite powder

Krishkumar Patel et al., 2019, investigate the strength of concrete and its features produced using crushed granite shells instead of coarse organic compounds. Various tests at various parameters included the physical properties and concrete properties of the coconut shell were performed and concluded that the coconut shell could be used instead of coarse material to produce concrete for a lightweight structure. Coconut shells are used as part replacement as aggregate concrete cracks. [2]

Asif Hussain et.al, 2021, used coconut shell in cement concrete and concluded to reduce waste pollution. There is a need to promote the use of such waste as building materials in affordable housing. As his experiments and research he concluded that concrete strength decreases as the value of the coconut shell increases, but he also concludes that when I added 5% and 10% coconut shell to the concrete, there was a slight difference in strength. When I added a 15% coconut shell to the strength of the concrete it was down. That is why there is an end to the conversion of the coconut shell to concrete; we concluded that a 10% coconut shell replacement is best for concrete construction. [3]

Pushpa et.al, 2016, prepared a mixture using an M15 concrete sheet with a water content of 0.60 as the weight of the joint. He concluded that the performance of concrete has increased with an increase in the percentage of sand exchange with rice husks. Similarly, water absorption also increases during density, compressive strength and flexibility of samples decreasing with the increasing amount of rice husk content in the mixtures. Studies have suggested that up to 10 percent instead of sand with rice husks, the produced concrete may be used to create pressure if the components are flexible. [4]

Sanjay et.al, 2017, said fine fly ash ash with Pozzolana material can be used as a binding material in concrete instead of cement. Effective, stressful and robust diagnostic tests were evaluated in previous research papers on the 7th, 14th and 28th day of healing. 5% and 10% replacement of fly ash provides better results and 15% less fly ash reduction. Then to improve the strength of the concrete by 5% and 10% conversion of fly ash to cement was done by adding natural coconut coir fiber 6mm and 12mm length by 0.15% and 0.25% by weight of cement at M20 level concrete. [5]

Vipul et.al, 2019, explained the need for concrete replacement and waste management to match the public need for safe and economic disposal. Waste management saves resources and waste disposal and helps keep the environment clean. Current concrete construction is unsustainable. Tests are performed on disposal such as rubber tire, e-waste, dirty plastic, dirty water etc. Currently in India, about 960 million tons of solid waste are produced annually as an agricultural product, mining, municipal and other resources. About 600 million tons of waste processed in India comes from agricultural sources alone. Lots of agricultural waste bag of sugarcane, paddy and wheat grass and husks, jute fibers, coconut shells, coconut shells etc. The coconut shell contains 15% of the total weight of the coconut. According to 2018 reports, India produces 11.9 million tons of coconut. Thus a total of 1.78 million tons of coconut shells are produced. [6]

Sanjay et.al, 2019, read M - 20 marks using natural aggregates 0%, 5%, 10%, 20% and 30%, by weight with coconut shell. The pressure of the coconut shell concrete was tested for 7, 14, 21 and 28 days. The compressive strength of the coconut shell concrete was reduced as the percentage increase increased. Concrete mixtures were tested and compared according to the compressive strength of conventional concrete. Research results indicate that Coconut Shell Concrete (CSC) can be used as a lightweight concrete. The use of coconut Shell instead of aggregate will not only be more efficient and eco-friendly, but also help solve common deficiencies such as strong aggregate. The use of such materials also reduces the risk of waste disposal. [7]

Ankita et.al, 2019, . compared to 25% of the weight of rice husk ash and also disposed of as waste. This ash contains amorphous silica which can be used as a pozzolana to make concrete and cement instead of discarding it. without compromising on concrete or concrete structures when exchanging a certain amount of concrete or material. In this study the standard Portland cement is replaced at a different rate and RHA finds strong concrete and structures that are comparable and satisfactory to those of ordinary concrete. Selected conversion rates ranged from 2.5% from 5% to 15% and carved concrete was tested. Under pressure at different ages and the results obtained are compared with standard concrete of the same grade and always concluded that the results are comparable. [8]

Al-jburi et.at,2019, explained the problem of landfills now does not provide a friendly environment, because discarded glass particles do not rot. In addition, the chemical composition and pozzolanic properties of the waste

glass promote the use of this waste in the cement and urban industries and provide a more environmentally friendly solution for the glass and cement industries. Therefore, it can be used as a concrete replacement for Portland cement concrete or as a replacement for stained glass powder (WGP) or as a stained glass (WGS). The use of Glass Powder in Portland cement concrete has a negative impact on concrete areas; However, the garbage can in its crushed state can be used almost 100% and can still be a real work in progress [9]

Hamdule et.at, 2018, explained about the pozzolanic behavior of waste glass more refined than the 600µm indicator. It mixes with lime at the beginning of the irrigation phase and forms an additional CSH gel and forms a dense cement matrix. Therefore, the first use of alkali in glass particles helps to reduce the reaction of alkali-silica which is why it improves the strength of concrete. The test value was designed to study the effect of 0%, 10%, 20%, 30% and 40% instead of cement with glass foil in operation and compression strength. The results showed that a significant increase in concrete strength occurred when 20% instead was made of glass powder. [10]

CONCLUSION

The literature reviewed above presented above presented papers of various authors who investigated various materials replacements to generate ecofriendly concrete by reducing agriculture waste and various other materials and tested them under various parameters to make them workable for industrial use and use in replacement of natural materials to conserve natural materials and use waste materials.

Above researches stated when various light weight concrete tested under various parameters results when materials added at different percentages gives different results.

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