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A review paper on green concrete

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ABSTRACT

The Concrete used is made by the use of inorganic waste is called as Green Concrete. There are a more of eco-friendly, and is used as a means to promote the sustainable development of our planet. This paper is parallel to the Possibility of the use of by-products such as fly ash, pozzocrete, used foundry sand, etc., in the implementation of the programme. Green concrete which is formed by the partial replacement of cement and fine Aggregate by their respective switches. This paper is concerned with the effect on the compressive strength of the concrete when the cement is partially replaced with pozzocrete P60, up to 30% by weight of cement and fine aggregate is replaced with the used foundry sand is a by 10%, 25% and 50% by Weight of cement. For this study, five sets of mixing ratios were prepared. This study was carried out in order to study the function of the advantages of the partial replacement of cement and fine aggregate By their country.

Keywords – Blast to the plate, and the Co2-Emissions, environmentally-friendly concrete, fly ash, Green Concrete, Silica fume.

1. INTRODUCTION

Concrete is more durable, and in terms of energy consumption and carbon dioxide emissions per unit of volume, compared to other materials, such as steel, [1], as shown in Fig. 1. However, with the high-volume consumption of concrete in comparison with other construction materials are neglected, this is a lasting benefit. The production of ordinary Portland cement (OPC), which is the main binder of concrete, contributing to 8% of global anthropogenic carbon emissions, And uses up approximately 3% of the energy [2]. Even in the concrete Industry, which is the highest consumer of natural stone in fresh water [3,4]. The increase in the production of concrete, in the future, it will Lead to a significant depletion of natural resources and the pollution of the environment [5,6]. Therefore, the need for Green concrete is of paramount importance in order to meet the future needs of the concrete, while at the same time preserving the natural resource base. Green concrete can be Considered as a concrete which has less embodied energy and carbon dioxide, as compared to the conventional OPC concrete. In addition, the green Concrete is, in essence, provides a variety of waste as a binder and the aggregate.

2. OBJECTIVE GOALS

- The replacement of fly ash in place of cement in Conventional concrete.
- Of equal or greater strength than the Conventional concrete.
- The determination of the mix design to the green, concrete.

3. REVIEW OF LITERATURE

In 2014, the Day of S. Ghutke, et al. has been studied for silica fume, and came to the conclusion that the large amount of silica fume, it Is a better replacement of cement. The rate of strength gain of the silica-fume concrete is very high. After the completion of the tests, and the analysis of the results, the following conclusions can be derived: 1. With the increase of the w/c ratio, Strength of concrete is reduced. 2. This is the highest value of compressive strength can be reached in a 10% Replacement of silica fume. 3.

The effect of a 15% replacement of cement by silica fume is more than that of ordinary Concrete. The optimum silica fume replacement percentage, ranging from 10% to 15 % replacement level.

In 2015, Arun Borsaikia, et al. has been studied for silica fume and properties, and are coming to the conclusion that there are a wide Variety of both fresh and hardened concrete is becoming increasingly changed, as a result of the silica fume content. The following conclusions can be drawn from them. 1. The workability of the concrete is improved by the addition of silica fume up to a Certain limit. 2. The ultimate compressive strength of the concrete increases with the replacement of cement with silica gel, to a Certain extent. 3. The increases with the increase of the compressive strength in the first place, and it Decreases with an increase in compressive strength due to the development of micro-cracks in the concrete.

In 2015, Kasi Rekha et al4 studied the bricks of the waste, and it was found that the recycled brick, concrete and was designed for the production of low-quality Recycled aggregate is suitable for use in concrete production. The results showed that the use of recycled brick, concrete performed better than that of the granite and Concrete at high temperatures. The resistance of the recycled brick, Concrete is better than that of the fire resistance of granite or concrete.

In 2015, Dhiraj Kumar Tiwari et al5., studies on the green, concrete and green concrete capable for sustainable development is characterized by the Application of the waste in order to reduce the consumption of natural resources and Energy and pollution of the environment. The application of green concrete is the most effective Way to reduce the pollution of the environment, and in order to improve the durability of concrete under extreme conditions. Green concrete has good thermal and fire.

In 2016, Anita Bhatia, et al1 published a paper on green concrete, in which it is stated that the green concrete of very low consumption of energy and other resources, and have no pollution to the Environment, and sustainable development. It can be seen that it is to Overcome the above-mentioned points, this will help to ensure that the use of green cement and ready-mixed concrete, with A range of new eco-friendly in the world.

In 2016, Praveer Singh et al. 2 studied over silica fume, and came to the Conclusion that the cement was in short supply throughout the world, due to the increase in demand on a daily basis. The use of silica fume as a pozzolana material has been Increasing over the last few years because of the fact that, when mixed in a certain proportion, it can improve the Properties of both fresh and hard concrete.

In 2016, Tae Hyoung Kim et al3 to do the research on the CO₂ emissions of Concrete, and it was found that the concrete is a common building material, it is a well-known fact that a large amount of hazardous waste in the processes Related to the manufacture, production, installation, maintenance, and demolition work. The CO₂ that is Emitted in a particular production, the effects of acid rain, and global warming.

4. APPLICATION OF GREEN CONCRETE

- It is used in the construction of bridges
- It is widely used in the construction industry
- It is used in building construction.
- It can be used in the construction of roads,

5. ADVANTAGES OF GREEN CONCRETE

- This concrete has good thermal and fire resistance .
- It has good acid resistance.
- It reduces the effects of shrinkage and creep.
- It uses reused or recycled materials in concrete.
- Reduction of energy consumption in the cement.
- It can reduce the pollution of the environment.
- Flexural and compressive strength is equal to conventional concrete.
- It is mix design is easier for handling.
- Reduces the dead weight of the structure.
- It's economical as compared to conventional concrete.

6. DISADVANTAGES OF GREEN AND CONCRETE

- This is the structure of a building.
- It's tensile strength is less than conventional concrete. .
- Water absorption is more than conventional concrete.
- The cost of reinforcement increase as it uses Stainless Steel.
- Life is less than structure as compared to conventional concrete.

7. METHODOLOGY

With the help of the Geopolymer Concrete: from this point on, the level of innovation in the concrete with the help of a wide range of geopolymer. The use of Portland cement can be avoided by the use of a combination of any of these materials, with a variety of materials, such as slag , fly ash, etc, etc, etc, etc. Geopolymer has a high resistance to corrosion, according to the sources, but it has

also been shown to have a strong and long service life. The most important advantage of Using geopolymer of concrete is that it allows for a significantly improved fire resistance, as compared with Portland cement to make concrete. In addition, the Geopolymer concrete has a zero-alkali-aggregate extension.

Ash: ash is a very fine powder. Fly ash improves the one of the most important characteristics of concrete is that it is only the Force. It is suitable for mass production, it is, in the actual application, if that is the case, it has a lot less moisture, the heat of the moment. Another good thing is that the fly ash is That it is available on a large scale, and there is no time, fly ash is used, it is still less expensive than portland cement. The performance of the Concrete is improved by the use of fly ash in a concrete and in an optimal ratio. We're going to be able to use theoretical, and will be replaced with% to 100% of the Portland cement with fly ash, but we do have a chemical activator of the replacement levels of up to 80% off.

Ground granulated blast furnace slag, is a large, cementations materials. The slag is obtained by dividing the break-up of the molten iron, and that it is nothing more than a product Of the iron and steel industry, the creation of a new blast furnace in water or steam, with a grained glassy product that is then dried and ground into a fine powder. Similar to the fly ash particles, including GGBFS, and generates less heat of hydration of the skin. GGBFS) is Responsible for the improvement of the durability and the mechanical properties of the concrete.

8. MATERIAL USED

- (a) Fly ash
- (b) Recycled concrete aggregate
- (c) Recycled demolition aggregates
- (d) Glass aggregates
- (e) Manufactured sand
- (f) Rice husk ash
- (g) Blast furnace slag (BFS)
- (h) Ground granulated blast furnace (GGBS)
- (i) Silica fume
- (j) Metakaoline.

9. CONCLUSION

- There is significant potential in waste materials to produce green concrete.
- The replacement of traditional ingredients of concrete by waste materials and by products gives an opportunity to manufacture economical and environment friendly concrete.
- Partial replacement of ingredients by using waste materials and admixtures shows better compressive and tensile strength, improved sulphate resistance, decreased permeability and improved workability.
- The cost per unit volume of concrete with waste materials like quarry dust is lower than the corresponding control concrete mixes.
- A detail life cycle analysis of green concrete by considering various parameters is very much necessary to understand the resultant concrete properties.
- Green concrete is having good thermal and fire resistant.
- In this concrete recycling use of waste material such as ceramic wastes, aggregates, so increased concrete industry's use of waste products by 20%.
- Hence green concrete consumes less energy and becomes economical.
- So definitely use of concrete product like green concrete in future will not only reduce the emission of CO₂ in environment and environmental impact but also economical to produce.

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