Major Project_2022-23

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3	21025104	GGV/21/01904	Anamika Mishra	11-14
4	21025105	GGV/21/01905	Deepak Kumar	15-19
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6	21025109	GGV/21/01908	Prashant Lahre	24-27
7	21025110	GGV/21/01909	Rohan Dewangan	28-32
8	21025112	GGV/17/1213	Shivendra Singh	33-38
9	21025114	GGV/21/01912	Tarun Kumar Sahu	39-43

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EFFECT OF COW DUNG ASH AND PULVERIZED EGGSHELL IN CONCRETE PROPERTIES

Stage I evaluation report of Dissertation work Submitted in Partial Fulfilment of Academic Requirement for the Award of the Degree of

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ABSTRACT

During the world, concrete is presence broadly used for the structure of the greatest of the buildings, bridges etc. Presently, the complete construction industry is in exploration of an appropriate and operative unused product that would greatly minimize the use of cement and eventually decrease the creation cost. Such a substitute materials are pulverized eggshells and cow dung ash. The greatest egg shell waste is willing in landfills short of any pre-treatment since it is conventionally unusable and eventually makes thoughtful eco glitches. Therefore, proper alternative is required to manage the wastes in eco-friendly way. The goal of this investigation work is to use the egg shell powder, cow dung ash as a limited additional of cement. Pulverized eggshell is replaced by 5%, 10% and 15% in addition with the cow dung ash by 5 %, 10 %, and 15 % of weight of cement. An experimental research demonstrates the strength features such as split tensile strength, compressive strength, and flexural strength, modulus of elasticity test of egg shell and cow dung ash based concrete were investigated. It is found the strength of the concrete rises with the adding of pulverized eggshell and cow dung ash and finally the comparison is made for the egg shell and cow dung ash added strength of concrete.

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MECHANICAL PROPERTIES OF SELF-CURED RECYCLED AGGREGATE CONCREETE

Stage I evaluation report of Dissertation work Submitted in Partial Fulfilment of Academic Requirement for the Award of the Degree of

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ABSTRACT

Concrete is most widely used construction materials due to its strength, permanence and durability. Since the concrete is open to atmosphere, the water used in concrete evaporates and the water available in concrete will not be sufficient for effective hydration .If the hydration is to continue unabated, extra water must be added to replenish the loss of water on account of absorption and evaporation. Alternatively, some measures must be taken to prevent the loss of water from the surface of concrete. Therefore, the curing can be considered as creation of a favorable Environment during the early period for uninterrupted hydration. The present study involves the use of shrinkage reducing admixtures like POLYETHYLENE GLYCOL (PEG 400) as internal curing compound .This curing compound used in concrete which helps in self curing and helps in better hydration and hence good compressive strength. They trap the moisture within the structure and prevent it from evaporation which normally occurs due to the hydration process.

This study consist of two stages:-

Stage-1:The effect of curing compound on workability (slump and compaction factor) and compressive strength is studied. In this study the percentage of PEG by weight of cement from 0% to 2% as the dosage of internal curing compound was fixed. The test results were studied both for M25 mixes of control concrete and self cured concrete. It is found through this experiment study that PEG 400 help in self curing by giving strength at par with that of the conventional curing method and also improved workability.

Stage-2: Recycled aggregate is utilized as a partial replacement for natural aggregate in the second stage, and several tests are carried out to determine the best percentage replacement for self-curing concrete. These tests include workability, compressive, split tensile, flexure strength, rebound hammer, and UPV.

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EFFECT OF COW DUNG ASH AND SAW DUST ON MECHANICAL PROPERTIES OF CONCRETE

Stage I evaluation report of Dissertation work Submitted in Partial Fulfilment of Academic Requirement for the Award of the Degree of

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ABSTRACT

Saw dust is a waste material from the saw milling industrial. It is causing an immense challenge to producers in relation to its massive disposal problems. Further studies on the impact of the improper disposal of sawdust on the environment revealed a worrying outcome of which some of them are pollution of the soil with phenol compounds which in tend reduces the soil productivity and the direct contamination of lakes, water bodies and the associate impurities which have negative impacts on the living ecosystem.

Sawdust is cheap, waste material from the lumber industries and readily available. The advantage of using this waste product is two fold, firstly to reduce the waste which is a headache to the industries and secondly would help to produce an innovative building material at a low cost for low cost housing.

This research project presents the results on a comparative study for the use of Cow dung Ash and Wood ash as partial replacement in the production of Fly ash brick. Cow dung are often wont to manufacture bricks which are eco-friendly and far cheaper. Cow dung ash is obtained by drying cow dung under sun then burning it. Huge amount of ash generation are causing waste disposal problems. Cow dung is employed as fuel for the domestic purpose, which generates solid waste as ash. Wood ash is that the inorganic and organic residue remaining after combustion of wood or unbleached wood fiber. The physical and chemical properties of wood ash vary significantly counting on many factors. Through this study an effort was made to match the properties of the ash brick adding the wood ash and cow dung ash as a partial replacement. The method of manufacturing traditional bricks from kiln is expensive and causes pollution. Using cow dung ash and Wood ash the pollution caused by the development materials are often decreased to a far extent.

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MECHANICAL PROPERTIES OF SELF-CURED FLY ASH – LIME BASED GEOPOLYMER CONCRETE AT AMBIENT TEMPERATURE

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ABSTRACT

Geo-polymer concrete is totally different in materials and chemistry which is synthesized from waste material like fly-ash (Class F or C), rice husk along with binding solution which is free of cement. The need to cure fly ash-based geopolymer at elevated temperatures has limited the practicability and sustainability of the composite. Self – curing method are implemented to get better properties of the geopolymer concrete, since heat curing method is more practically challenged. The use of lime powder in the geopolymer concrete gives better result without heat curing.

This experiment depends on the characteristics of daylight curing. The M25 grade geopolymer concrete plans with the addition of lime powder. The addition of lime powder is changed by 0%, 5%, 10%, and 15%. The compressive strength increases with addition of lime powder, but in the cases of 10% and 15% the workability gets hamper. And adding an admixture i.e., PEG-400 as a dosas 0%, 0.5%, 1.0% and 1.5%, the workability of concrete increases with the addition of PEG-400 and compressive strength is also slightly increases.

Till date it was seen that the strength of geo-polymer concrete mostly depends on the molarities of the alkaline liquid (NaOH or KOH) and ratios of SiO2and Na2O, H2O and Na2O, Si and Al, water to geopolymer solids by mass in the total alkaline solution.

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PLASTIC WASTE AS AN ALTERNATIVE BINDER FOR PAVING BLOCK

Stage 1 Evaluation Report of Dissertation Work Submitted in Partial Fulfilment of Academic Requirement for the Award of the Degree of

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DECLARATION II

CERTIFICATE III

ACKNOWLEDGEMENT IV

ABSTRACT V

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Background of the Study

Plastic Scenario

Research Aim and Objective

Organization of Thesis

2. LITERATUREREVIEW

General

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Research Gap

3. MATERIAL AND METHODOLOGY

Waste Plastic

Sand

4. TESTS AND RESULT

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ABSTRACT

Recycling of plastic waste (PW) is one alternate approach to reduce the adverse impact on environment despite many control measures adopted around the world. Current study introduces various types of PW as a binding material to completely substitute cement to produce cement-less paver blocks. The constituent of paver block comprises of mixture of different types of PW in different proportion mixed with natural fine aggregate. PW in varying proportions of 30%, 40%, 50%, 60% and 70% were used to replace cement and investigated to ascertain achieving satisfactory physical and mechanical properties considering temperature effects. The compressive strength increases with increase in the proportion of plastic content. However, when exposed to very high temperature, its strength is reduced by 31.17%. According to the test results, the plastic paver block has a low water absorption potential. The average initial and final setting time of the binder was 19 and 24 minutes respectively. Abrasion test indicated low surface wear, displaying high durability with maximum of 2.56% wear. A trial foot path pavement was constructed using cement-less paver blocks and evaluation of its performance are discussed. The production of one cement-less paver block utilizes 1.8 kg PW. As per the economic assessment, an average unit cost of cement-less block is evaluated to be .....% less than concrete paver block. The findings indicate cost benefit of ..... to .....% when PW is utilized in construction. To evaluate the sustainability, an "Environmental Suitability Index" (ESI) is developed based on three parameters: embodied energy, life-cycle costs (LCC) and re-usability based on literature review. Three additional parameters: fire resistance, social impact and labour efficiency are introduced to further enhance the ESI in the current study.

DESIGN OF A MASS DAMPER SYSTEM FOR STRUCTURAL STRENGTH ANALYSIS

Stage I evaluation report of Dissertation work Submitted in Partial Fulfilment of Academic Requirement for the Award of the Degree of

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ABSTRACT

Abstract

Modeling the dynamics of different types of systems, including structures, bridges, vehicles, and airplanes, is a common application for mass-spring-damper systems, which are utilized extensively in a variety of engineering disciplines, including aeronautical, mechanical, and civil engineering. Finding the values of system parameters like mass, stiffness, damping coefficient, and excitation frequency that minimizes a given objective function like displacement, acceleration, or energy is a necessary step in the optimization of Mass-Spring-Damper systems. This step involves finding the optimal values of the system parameters.

Formulating the problem as an optimization problem, selecting an appropriate optimization algorithm, and solving the problem iteratively until equilibrium is obtained are the typical steps involved in the optimization process. To resolve Mass-Spring-Damper systems, several different optimization algorithms have been developed, such as genetic algorithms, particle swarm optimization, simulated annealing, and gradient-based techniques.

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Influence of Composite Cement, Ceramic Waste & Stone Dust on the Strength of Concrete

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ABSTRACT

Concrete is a versatile widely used construction material. Researchers have been trying to improve its quality and enhance its performance. Recent changes in construction industry demand improved durability of structures. Composite cement concrete has performance and environmental advantages. It also makes concrete sustainable and eco-friendly. In India presently less than 50% of fly ash and blast furnace slag produced is consumed. The most popular construction material, involves use of cement which is responsible for 7% of total world's carbon dioxide emissions. Carbon dioxide is the main threat in causing global warming of the environment. The attempts have been made to reduce CO_2 emissions in environment by use of industrial waste as cement constituents. This research aims at discussing the use of composite cement, ceramic waste and stone dust in construction as a solution to address two environmental problems - one, disposal of huge amounts of wastage from industrial and demolition causing environmental degradation through large areas of landfills and two, high percentage of carbon dioxide emissions in atmosphere from construction industry.

This project investigates the strength properties of composite cement concrete in which natural coarse aggregate is replaced with 10%, 20% & 30% of ceramic waste aggregate and fine aggregate is replaced with 10%, 20% & 30% of stone dust. Water to cement ratio was maintained at 0.484 for all trial mixes. M25 grade of concrete specimens were prepared and tested for compressive, split tensile & flexural strength at 3, 7 & 28 days of curing. The trial mix with 20% of stone dust gave better result for compressive strength as compare to conventional concrete. The outcomes indicated that the addition of ceramic waste aggregate and stone dust in composite cement concrete enhances not only the mechanical strength but also workability which eventually improves the properties of concrete. The simplified mix design presented may be extended to more number of concrete specimens with more number of replacements to achieve high strength in concrete.

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EFFECT OF FIBERS ON PROPERTIES OF GEOPOLYMER CONCRETE WITH RECYCLED COARSE AGGREGATE AT BOTH OVEN AND AMBIENT CURING

Stage I evaluation report of Dissertation work Submitted in Partial Fulfilment of Academic Requirement for the Award of the Degree of

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In

STRUCTURAL ENGINEERING

Submitted By

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ABSTRACT

Due to rapid growth in the construction industry, the consumption of cement is substantially increased in the recent times and the cement manufacturing industry produces annually about 1.35 billion tons of the greenhouse gas emissions which are about 7% of the total greenhouse gas emission by man-made to the atmosphere. Simultaneously, large quantity of fly ash has been generated by the thermal power plants, which is not being recycled properly. This builds huge liability on solid waste management. Hence, to reduce the emission of CO_2 from the cement industry and to increase the utilization of fly ash, a geopolymer technology is one of the viable solutions. In terms of global warming, the geopolymer technology based on fly-ash activated by alkaline activators not only has the potential to significantly reduce the carbon footprint of ordinary Portland cement concrete but also shows considerable promise for applications in the concrete industry as an alternative binder to the Portland cement.

In the present study, an attempt has been made to study the influence of glass fiber steel fiber and woolen fiber on the properties of fly ash-based geopolymer concrete with recycled coarse aggregate. In the present work, M25 grade of OPC concrete is designed in accordance with the guidelines of IS: 10262-2019. Since no standard guidelines are available in the literature for GPC, the same mix proportion was adopted for the M25 grade of GPC. Further, the GPC mixes are prepared with 12M of NaOH and an alkalinity ratio (NaOH: Na_2SiO_3) of 1:1.5 at 90°C temperature for 48 hours of curing and at ambient curing. 50% and 100% recycled coarse aggregates are replaced with natural coarse aggregates in GPC mixes. The workability, compressive strength, tensile strength, flexural strength, water absorption, rebound hammer value, and ultrasonic pulse velocity of all the mixes have been studied. From the experimental results, it is observed that the test results of fly ash-based geopolymer concrete with recycled coarse aggregate are comparable with OPC concrete.

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EFFECT OF DOLOMITE & GLASS FIBER ON PROPERTIES OF SELF HEALING CONCRETE

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ABSTRACT

By enhancing the bio-concrete because of its strength and long-term durability, concrete is one of the most important construction materials. Because of the brittleness that happens when concrete structures are strained, their ductility and cracking decrease. On a daily basis, a range of enhancements are being produced based on continuing research throughout the world to solve the inadequacies of cement-concrete construction. This paper presents the results of an experimental investigation carried out to evaluate the Effect of Dolomite & Glass Fiber on Properties Of Self-Healing Concrete. Cement was integrated with Dolomite (5%, 10% & 15%) by weight. Three different proportion 1%, 2%, 3% of bacteria (Bacillus subtilis) were used in making the concrete mixes and 5% of glass-fiber is used. Tests were accomplished for compressive strength, split tensile strength, XRD, SME, water absorption and permeability at the age of 3, 7 and 28 days. The main provident of this project is determined the healing ability of Bacillus subtills in this proportion changes.

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