AVINASHILINGAM INSTITUTE FOR HOME SCIENCE AND HIGHER EDUCATION FOR WOMEN
COIMBATORE – 641 043

DEPARTMENT OF CIVIL ENGINEERING

CIVIL QUAD
2018-2019

SCHOOL OF ENGINEERING
AVINASHILINGAM INSTITUTE FOR HOME SCIENCE AND HIGHER EDUCATION FOR WOMEN
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Avinashilingam Institute for Home Science and Higher Education for Women,Coimbatore – 641 043

School of Engineering
Department of Civil Engineering

VISION OF THE DEPARTMENT

"To impart intellectual, value-based education for women Civil Engineering students and strive towards excellence for the sustainable development of the society"

MISSION OF THE DEPARTMENT

- To promote high caliber quality education with technical skills and develop women Civil Engineering students as best technocrats.
- To stimulate innovative and critical thinking in the minds of budding Engineers to face the challenges in the future of Civil Engineering.
- To shape the students with strong ethical values, to serve the society and nation as Civil Engineers.
- To inculcate, dynamic leadership qualities and make them as role models for challenging society.
- To eradicate inequality from the minds of women Civil Engineering students and make them as model Entrepreneurs

PROGRAMME EDUCATIONAL OBJECTIVES

A graduate of Civil Engineering Programme will be able to:

PEO 1: Demonstrate their professional skills and technical competence into actions to solve wide range of challenging problems in Civil Engineering.

PEO2: Effectively communicate in multidisciplinary team to understand, analyse, design and develop to lead projects in infrastructure development of nation.

PEO3: Engage in expanding their research in higher studies and knowledge in professional practice as Civil Engineers throughout their career

PEO4: Inculcate excellence, leadership, entrepreneurship, social, professional and environmental ethical responsibility in the fields of Civil Engineering

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CONTENT

Abstract of Final Year Projects

Study on Characteristic of Gas Emitted from Portable Incinerator

Dr.S.Maragatham,M.E., Ph.D.,Ms.P.T.Ayswariya Lakshmi ,N.S.Tharani, L.S.Aswathy and S.Preethi

Now-a-days the disposal of the sanitary napkins has been a major problem. In India, mostly the soiled napkins are disposed in lavatory trash can. So it leads to embarrassing visuals and bad odour and they are flushed in to the drain. These flushed napkins clog the drains. Such unhygienic disposing leads to more hazardous health related problems and it affects the environment. This issue can be reduced by the developing incinerator usage awareness. Napkin incinerator is useful to destroy soiled napkin waste in a very hygienic and scientific way. This is one of the better ways for sanitary napkin disposal. By using sanitary napkin incinerator, the soiled napkins are converted in to sterile ash. Sanitary incinerator is very suitable for all women's toilet and also to get a pollution free hygienic environment. The incinerator mould is made of GI sheet. The Geopolymer concrete is poured into the mould and can be detached. Final finishing of the incinerator is done by fixing catalytic filter. This filter absorbs the CO2, dioxins and furans. The used napkins can be disposed through the drop hole provided and a fired match stick is used as a firing agent. The vent provide at the top will eliminate the fume and the fired residue is settled in the ash tray provided below the incinerator which is detachable. The soffit of the incinerator is open for fixing the ash tray. The matrix of the incinerator is made of geopolymer concrete in which GGBS and Silica Fume are blended to the matrix as a setting agent. River sand depletion is also focused by making use of M-sand. The incinerator will be a very useful product to villages, institution and residence to dispose the used napkins in a hygienic manner. The incinerator will be a solution for various health issues and it forms a hygienic environment to the women folk. Unconcerned disposal of soiled napkins can be solved using this incinerator.

Structural Behavior of Hybrid Geo-Polycrete Composite Slab-Beam Panel

Dr.S.Maragatham, M.E., Ph.D.,Ms.P.T.Ayswariya Lakshmi ,D.Shalini,G.Anubaa and P.Ranjani

The present, construction scenario emerges with various building techniques. Regarding to this the composite structures formed an innovative method; it is the technique in which different materials used will reduce the depletion of natural resources as in the manufacture of concrete. In addition to this the construction time is considerably reduced as the structural components (beam & column) are fabricated at factories as per the requirements. The major advantage of this technique is the reduction of shuttering difficulties and deshuttering failure. The geopolymer concrete has a non-corrosive property and good durability. The composite slab panel is formed with the conjunction of a decking sheet in-between the beam and slab, over which the reinforcement is provided along with the studs as shear connectors. These shear connectors transfer the load from slab to beam. The corrugation in the decking sheet will act as a shear connector. The geopolymer concrete of M25 grade is tested for strength properties by casting test specimens. Then the concrete is poured to the mould of composite slab panel designed and specified with design parameters. The entire geopolymer concrete panel is tested for loading under a loading frame. The results are discussed for further study of the structural behaviour of the composite slab.

Study on Behaviour of Bacteria in Sand Replaced Concrete with Red Soil

Dr.R.Nithya, M.E., Ph.D.,T.Karunyaa, M.Priyadharshini, and S.Shanthini

Excessive mining on river beds to meet the increasing demand for sand that has led to severe ecological imbalance. The fact that rivers are running dry is being used as a reason to mine them for sand. In order to meet out the shortage of sand, in this study locally available red soil is partially replaced with different percentages from 0 to 40%. Cracks in building is another major problem that makes the structure odious. These cracks can be revamped by self-healing bacteria that is already present in red soil. In this study, Bacillus Sphaericus that is abundant in soil has been used to heal cracks. These bacteria are eco-friendly and can easily get contact with the atmosphere without harming the environment. In order to overcome these problems, there are many modern technologies to reduce the extent of cracking but we have introduced offbeat technique in fitting cracks with environmentally friendly biological process by adding a self-healing bacterium and to prolong the survival of bacteria we use buffer solution. The aim of our project is to replace sand by locally available red soil and develop the bacteria in red soil with varying percentages from 0% to 20% which can promote self- healing properties of concrete. To examine the study of bacterial growth the Scanning Electron Microscope and Digital Image processing is used. The grade of concrete used in our project is M20. Thus, this study showed that optimum percentage of red soil replacement is 30% and the addition of 20% of bacterial liquid showed increase in strength and bonding.

Optimization of Cost for Residential Building

Dr.R.Nithya,M.E., Ph.D. , S.Abinaya, V.Preeetha and T.Yamuna

This project covers the planning, aspects, layouts, analysis, structural design and materials that optimise the cost, time and labour of building. The important objective of every project is to complete the scope of work in time, within the budget and the quality. Time and cost are the important factors in every construction project which are crucial in achieving the project objectives. There is always a relationship between time, cost and material. Optimizing the time and cost is necessary in order to find out the optimum project duration corresponding to minimum total cost and this can be achieved with the help of reducing the duration of critical activities in the network in order to minimise the overall project duration.

Experimental Study on Energy Saving Analysis Using Day Lighting Device

Dr.N.Srimathi, M.E., Ph.D., K.N.ShakthiPriya ,S.Devadarshini and A.Akshaya

A tubular solar tube system in a building can create an energy efficient building reducing its energy costs. A tubular sky light or a solar tube system is a tubular vertical light guidance system that passively collects and transmits external natural daylight to building interiors for lighting purpose. It ensures good energy saving along with natural healthy working conditions. The use of such a solar tube system can reduce the use of electrical lighting expenses during daytime. The present paper focuses on the study of daylighting performance of tubular solar tube system. The importance of the study is to analyse the performance of solar tube that creates an energy efficient building that reduces the electrical lighting usage and saves its costs during day time

Experimental Study on Steel Encased GGBS Concrete Short Tied Column

Mrs. S.Shanthi,M.E., (Ph.D) ,S.Gowsalya, M.Madhuranthagi and R.Sivagami

Concrete is a mixture of cement, fine aggregate, coarse aggregate and water. Concrete plays a vital role in the development of infrastructure Viz., buildings, industrial structures, bridges and highways etc. leading to utilization of large quantity of concrete. On the other side, cost of concrete is attributed to the cost of its ingredients which is scarce and expensive, this leads to usage of economically alternative materials in its production. This requirement is drawn the attention of investigators to explore new replacements of ingredients of concrete. The present technical report focuses on investigating characteristics of concrete by replacing cement with fly ash and Ground Granulated Blast Furnace Slag (GGBS). The fly ash based Geopolymer concrete is an excellent Engineering material to reduce the greenhouse gas emission because the production of one ton of cement emits one ton of CO2. Most of the previous works on fly ash-based geopolymers concrete reveals that hardening is due to heat curing, which is considered as a limitation for cast in situ applications at low ambient temperatures. In order to overcome this situation, replacing the Ground blast furnace slag with fly ash for various proportions to achieve geopolymers suitable for curing without elevated heat. The major problem faced by reinforced concrete is spalling and congestion of reinforcement in the connection. Steel tubes prevents both

these problems particularly for seismic designs. When concrete and steel tubes are used together, the local buckling of the steel tubes is delayed by the concrete. Concrete-filled steel tube considered as an important structural element is largely used in constructing the composite structures, owing to their high strength and good deformability. Concrete- filled double skin steel tubular (CFDST) members that can be accepted as a new generation of traditional CFST members differ from the conventional ones. CFDST members include outer and inner steel tubes having a concrete infill between them, whereas the traditional CFST members are composed only of a steel tube and concrete infill. Although the double skin composite construction concept had firstlybeen designed for the utilization in submerged tube tunnels, later it was accredited as constructional member due to a potential which may be benefited for nuclear power plants, liquid and gas retaining structures, and blast resistant shelters. Moreover, CFDST members can be applied for vessels to resist the external pressure, for the legs of offshore constructions, for columns and structures with large diameters exposed to the loads caused by ice The scope of the project is to find optimization level of Ground Granulated blast furnace slag in geopolymer concrete for curing in ambient condition and also to analyse the compressive Strength of Concrete-filled double skin steel tube using fly ash based Geopolymer concrete.

Study on Paver Blocks with Partial Replacement of Cement with Nano Particle and Coarse Aggregate With C&D Waste

Mrs. S.Shanthi,M.E., (Ph.D) ,S.Kaviya, A.Sujitha and E.Renushri

This study investigates the properties of the construction demolished waste material as a coarse aggregate. The purpose is to recycle and reduce the amount of construction waste materials going to the landfill and dumping pits. Hence an attempt can be made to replace natural aggregate in construction by replacing coarse aggregate with CDW.M20 grade of concrete with water cement ratio 0.40 is done. Here comparison of concrete is made between 100% replacement of CDW and natural aggregate. Here along with CDW different percentages (1%,2 %,3%,4% wt., of mass of cement) of Nano-Fe3O4 is used as admixture to increase the strength of the concrete. The results show that optimum percentage obtained is 3% were the Compressive strength, durability, abrasion test of concrete where higher when compared to normal concrete. Since there is an increase in mechanical property it can also been used in industrial floorings a concrete tile.

CO_2 Absorbing Bituminous Pavement

Mrs.S.Premalatha, M.E., S.Anuprabha, M.Elakkiya and S.B.Yazhinishree

Carbon-di-oxide (CO2) emission is a major complication in the environment, which causes the rise in global temperature of the whole CO2 emission, under which 85% of pollution is due to transportation. At present scenario, India has a road network of over 5,908,293 km as on 31 January 2019 and it is the second largest road network in the world. In India, most of the roads are constructed with bitumen. Based on the current research works, it is found that Fumed silica is absorbing CO2 both in dry and humid air. Hence bitumen blended with Fumed silica can be taken as a passage to reduce the CO2 emission through transport. In this work, bitumen is blended with fumed silica to absorb CO2 from the environment during the construction of pavement. The CO2 absorption is determined by smoke testing meter.