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Department of *Civil Engineering* Presents,
3rd International Conference on

“Revolutionary Technology in Civil Engineering”

on 15th & 16th December 2023



(ICRTCE-2023) **PROCEEDINGS**

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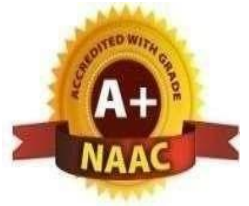
3rd International Conference on “Revolutionary Technology in Civil Engineering”



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Department of Civil Engineering

3rd International Conference on

"Revolutionary Technology in Civil Engineering"

(ICRTCE–2023)

15th & 16th December 2023

Patron, Program Chair & Editor in Chief

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Group Director, SMEC

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Prof. Sandhya Kiran J.K
Head, Dept. of CE, SMEC

Co-Convener

Mr. P. Guruswamy Goud

Asst. Professor, Dept. of CE, SMEC

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Sri Marri Laxman Reddy Garu

Chairman



MESSAGE

I am extremely pleased to know that the Department of Civil Engineering, of SMEC is organizing “3rd International Conference on Revolutionary Technology in Civil Engineering” organized by the Departments of Civil Engineering on 15th and 16th Dec 2023. I understand that the large number of researchers have submitted their research papers for presentation in the conference and also for publication. The response to this conference from all over India and Foreign countries is most encouraging. I am sure all the participants will be benefitted by their interaction with their fellow researchers and engineers which will help for their research work and subsequently to the society at large.

I wish the conference meets its objective and confident that it will be a grand success.

M. Laxman Reddy

Sri Marri Laxman Reddy

Chairman

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Sri Chandrashekar Yadav Garu

Executive Director



MESSAGE

I am pleased to state that “**3rd International Conference on Revolutionary Technology in Civil Engineering**” organized by the Departments of Civil Engineering on 15th and 16th Dec 2023. For strengthening the “MAKE IN INDIA” concept many innovations need to be translated into workable product. Concept to commissioning is a long route. The academicians can play a major role in bringing out new products through innovations.

I am delighted to know that large number of researchers have submitted the papers on Interdisciplinary streams. I wish all the best to the participants of the conference additional insight to their subjects of interest.

I wish the organizers of the conference to have great success.

Sri Chandrashekar Yadav

Executive Director

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Dr. P. Santosh Kumar Patra

Group Director



MESSAGE

I am delighted to be the Patron & Program Chair for “**3rd International Conference on Revolutionary Technology in Civil Engineering**” organized by the Departments of Civil Engineering on 15th and 16th Dec 2023. I wish with strong desire that the conference to unfold new domains of research among the Civil Engineering fraternity and will boost the knowledge level of many participating budding scholars throughout the world by opening up plethora of future developments in the field of Civil Engineering.

The Conference aims to bring different ideologies under roof and provide opportunities to exchange ideas, to establish research relations and to find many more global partners for future collaboration. About 70 research papers have been submitted to this conference and this itself is a great achievement and I wish the conference a grand success.

I appreciate the faculties, coordinators and Department Heads of Civil Engineering for their continuous untiring contribution in making the conference a reality.

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Dr. P. Santosh Kumar Patra
Group Director



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Dr. M. Srinivas rao
Principal



MESSAGE

Contemporary Society is technological and relies on technology for various aspects of daily life. There is no life without digital platforms, Internet, apps, codes, etc. Navigating the complexities of a technological society requires a balance between embracing innovation and addressing the challenges that come in the way. Considering the immediate needs of the technical Society, SMEC has been organizing International Conferences every year which really help a candidate in acquiring technical skills and making themselves familiar with the new inventions.

International Conferences are a Perfect Platform for enthusiastic researchers to come up with their innovative ideas, and I am delighted that Department of Civil Engineering is organizing 3rd International Conference on “**Revolutionary Technology in Civil Engineering**” (ICRTCE-2023) on 15th and 16th of December 2023 to enhance the skills of desiring participants. The showcase of new ideas and the latest technological advancements through this Conference would facilitate the transfer of technology, helping participants to get updated with the latest tools and methodologies. I firmly believe that this Conference serves as the catalyst for change by bringing attention to pressing issues in different fields, encouraging discussions, fostering collaboration, and promoting initiatives that address different challenges on a global scale. It is an excellent opportunity to broaden our knowledge, establish meaningful connections, and contribute to advancing engineering research. I assure you that the commitment to excellence in education and research is reflected in this Conference, providing a unique platform for learning and growth. Around 70 research papers were submitted to this Conference. I wish the authors a promising future and the Conference a grand success.

I appreciate the continuous efforts and dedication of the HOD,CE and faculty members for their invaluable contribution to advancing global discourse. My most profound appreciation to the organizers and coordinators for organizing a conference of such caliber.

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Dr. M. Srinivas Rao
Principal



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Dr. Sanjay Kumar Suman

Dean R&D



MESSAGE

Research, curiosity and discovery has been in existence ever since man's presence on this planet millions of years ago, civilization has been characterized by curiosity and discovery. Therefore, the curiosity to explore what will happen, how it happens, is there a better way to do it, has been the driving force behind all research efforts. During the past few decades, the engineering faculties have taken a number of initiatives to reorient the engineering machinery to play leading roles in the industrial development process.

I am delighted to acknowledge the 3rd International conference on “**Revolutionary Technology in Civil Engineering**” organized by the Department of Civil engineering. I appreciate organizing team for showing their keen interest in organizing a successful conference to provide a platform for contributors to explore new ideas and exchange research findings among researchers. I thank the support of all students, authors, reviewers, conference team, faculty members, and conference Convenor for making the conference a grand success.

Best Wishes

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**Dr. Sanjay Kumar
Suman**

Dean R&D

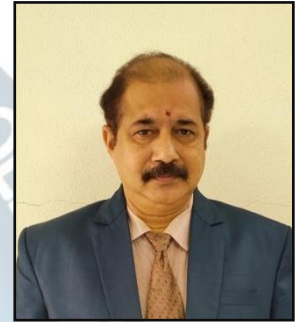


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Dr. S V S Rama Krishnam Raju

Dean Academics



MESSAGE

It gives me immense pleasure to know that St. Martin's Engineering College, Department of Civil Engineering is organizing 3rd International Conference on “**Revolutionary Technology in Civil Engineering**” ICRTCE-2023. I am sure that this conference will provide a forum to national and international students, academicians, researchers and industrialists to interact and involve in Research and Innovation. Such academic events benefit the students, teachers and researchers immensely and widen the horizons of their knowledge and work experience in the field of Building Materials, Water Resource Engineering, Geotechnical Engineering and Innovation.

I sincerely appreciate the humble efforts of the Institute in providing a platform for students, academicians, researchers and industrialists to share their ideas and research outcome through the forum of this Conference.

I give my best wishes to all delegates and organizing committee to make this event a grand success.

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Best Wishes

Dr. S V S Rama Krishnam Raju

Dean Academics



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Dr. D V Sreekanth

Dean Administration



MESSAGE

The 3rd International Conference on “**Revolutionary Technology in Civil Engineering**” ICRTCE-2023 has concluded its work successfully on 15th & 16th Dec, 2023 in St. Martin's Engineering College (SMEC), Hyderabad, India. The ICRTCE-2023 was organized online by the Department of Civil Engineering, and the objective of this conference was to bring together experts from academic institutions, industries, research organizations for sharing of knowledge and experience in the recent trends and revolutionary technologies in civil engineering. The conference programme featured a wide variety of invited and contributed lectures from national and international speakers with expertise in their respective fields. The ICRTCE-2023 has become one of the most extensive, spectacular international events hosted by St. Martin's Engineering College (SMEC), for its high-level quality and the large size of participation. Well-known international and national invited speakers addressed the audience, shared knowledge, and rich experiences on Revolutionary Technology in Civil Engineering.

I am sure that this conference will provide a forum to national and international students, academicians, researchers and industrialists to interact and involve in Research and Innovation. Such academic events benefit the students, teachers and researchers immensely and widen the horizons of their knowledge.

Best Wishes

Dr. D V Sreekanth
Dean Administration



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Prof. Sandhya Kiran J K

Convener and Head of the Department



MESSAGE

The world is always poised to move towards new and progressive engineering solutions that results in cleaner, safer and sustainable quality products for the use of mankind. India too is emerging as a big production center for world class. Civil Engineering plays a vital role in this endeavor.

The aim of the 3rd International Conference on “ **Revolutionary Technology in Civil Engineering**” being conducted by the Departments of Civil Engineering of SMEC, is to create a platform for academicians and researchers to exchange their innovative ideas and interact with researchers of the same field of interest. This will enable to accelerate the work to progress faster to achieve the individuals end goals, which will ultimately benefit the larger society of India.

We, the organizers of the conference are glad to note that 125 papers have been received for presentation during the online conference. After scrutiny by editorial board 70 papers have been selected, and the authors have been informed to be there at the online platform for presentations. Steps have been taken to publish these papers with ISBN number in the Conference Proceedings and all the selected papers will be published in Scopus/ UGC recognized reputed journals.

The editorial Committee and the organizers express their sincere thank to all authors who have shown interest and contributed their knowledge in the form of technical papers. We are delighted and happy to state that the conference has moved towards a grand success with the untiring effort of faculties and staff members of SMEC and with the blessing of the Principal and Management of SMEC.

Prof. Sandhya Kiran J K
Convener and Head of the Department

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UGC AUTONOMOUS

FLOOD WATER THREATS TO LIFT IRRIGATION PUMPS AND PROTECTION MEASURES FOR THE GIANT KALESHWARAM

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ABSTRACT

Kaleshwaram Projects is planned as a multi stage lift irrigation scheme with an investment of Rs. 80,190 crores, having seven links and various Civil and Electro Mechanical components viz barrages (3), reservoirs (24) with 141TMC storage capacity, tunnels (203 km), pressure pipe lines (93 km), gravity canals (1531 km), pump houses(21), electric sub stations (21) which spread in 13 districts and benefit 2.5 crore population in 23 districts of Telangana State. It lifts Godavari waters from 100 m to 618 m MSL. Apart from providing irrigation and drinking water facilitates to 45 lakh acres, Kaleshwaram project will have manifold impacts on development of inland fisheries, inland navigation, eco and temple tourism, water sports, industries, urban development and sustainability, improving bio diversity and possibility of storing 450 TMC in the existing reservoirs within the radar of Kaleshwaram Project, Kaleshwaram Project is now termed by the engineering experts as the largest Multi Stage Lift Irrigation Scheme in the world having manifold development impacts. Thus, it is treated as Growth Engine of Telangana State with a comprehensive Godavari Basin Development Plan.

Keywords: kaleshwaram, TMC, Godavari basin development plan.

UGC AUTONOMOUS

ANALYSIS OF MATERIAL PROPERTIES OF INDUSTRIAL WASTE-BASED GEO POLYMERS FOR ASSESSMENT OF THEIR USABILITY IN CONSTRUCTION

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ABSTRACT

Nowadays, the world is facing serious environmental problems. The huge emission of CO₂, the enlarging consumption of water and the quantity of discarded waste are one of the existing threats. Scientists are looking for new, environmental friendly solutions in many branches. The concrete manufacture is responsible for significant amount of released CO₂ and consumed water. The part or total replacement of concrete by other materials in some investments is one of the possible ways to help the environment. The geopolymer, material created by mixing of an aluminosilicate powder (precursor) and liquid activator, is considered as an excellent alternative for a concrete. Geopolymer has similar mechanical properties and can be casted, but its manufacture requires less water and emits less CO₂. Moreover, the production of geopolymer enable to reuse the various types of waste. This, recently extensively explored material, has a long history and numerous potential applications such as in the role of a building material, in restoration of monuments, in stabilization of hazardous waste, in reparation of existing structures, in 3D printing, in self-repairing materials and in protection of concrete or steel structures.

Keywords: Geo polymer, alumini silicate, CO₂.



UGC AUTONOMOUS

EXPERIMENTAL AND ANALYTICAL INVESTIGATION OF FERROCEMENT WATER PIPE

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ABSTRACT

Ferrocement is a composite building material that has attracted a lot of attention since it has excellent quality properties such as strength, hardness, fracture control, durability, and impact. Layers of reinforcing wire mesh strengthen the filler material. The current research investigates the performance of ferrocement pipes reinforced with a variety of metallic and non-metallic materials. The primary goal of this study is to predict the structural behavior of the ferrocement water pipelines. Twelve pipes were subjected to experimental testing. The pipes have parameters of 150 mm outer diameter, 50 mm thickness, and 1000 mm length, but with varied layer numbers built of different mesh kinds. At all phases of loading, cracking patterns, tensile and compressive stresses, failure mechanism, elastic stiffness, and energy absorption are observed and quantified. Using (ANSYS 2015) software, the experimental findings are compared to analytical models. The study also demonstrates the effectiveness of the expanded metal mesh, welded- steel- mesh, and fiber-glass-mesh utilized in reinforcing the pipes. Furthermore, the created ferrocement water pipes have exceptional strength, making them equally effective in industrialized and developing countries. In comparison to the experimental data, the finite element simulations produced better outcomes.

Keywords: ferrocement, filler material, steel mesh



UGC AUTONOMOUS

BALLAST LESS TRACK SYSTEM

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ABSTRACT

Abstract Up to now most of the ballast less track systems, which have been built on earthworks consist of a structure with a continuously reinforced concrete pavement (CRCP) or an asphalt pavement, both supported by a hydraulically or bituminous treated layer. For concrete road construction thick concrete pavements on unbound base layers had been established during the last years as an alternative technical and economic solution. General designs of ballast less track systems with asphalt or concrete pavements on unbound base course layers were investigated based on comparative calculations according to the required layer thicknesses as well as according to the layout. Ballast less track systems using discrete rail seats as well as systems with sleeper panels resting directly on an asphalt or concrete pavement or monolithically fixed, respectively, have been investigated according to their suitability for unbound base layers. Not only the loading of the ballast less track by traffic but the loading and the impact of construction work on the unbound base layer are decisive. Loading of the unbound base layer or of the earthwork by construction traffic can be significantly higher than the expected loads born by regular trains. The performance should be evaluated based on first test sections. Potential future ballast less track design can also be done based on the jointed plain concrete pavement technology, which is approved for road construction. But ballast less track systems using discrete rail seats would require a constructive reinforcement within the slabs.

Keywords: ballast less, asphalt pavement, monolithically



UGC AUTONOMOUS

INFRA-RED THERMOGRAPHY FOR DEBONDING DETECTION IN PRESTRESS PAVEMENT

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ABSTRACT

Use of pre stressed post-tensioned concrete pavements has been suggested for many years to obtain extended pavement service life in a cost-effective manner. Conventional concrete pavements are designed on the basis of concrete's relatively low flexural and tensile strengths without effectively utilizing the natural advantages of its high compressive strength. In pre stressed pavements, pre-compression in the concrete due to pre stressing allows for increased allowable tensile and flexural stresses, thereby permitting use of thinner and longer concrete slabs. Transverse joints in pre stressed pavements may be spaced at about 91.5 to about 183 m. Although several experimental pre stressed pavements were constructed in the US, the US experience is based on six large-scale highway projects (Virginia, Pennsylvania (2), Arizona, Mississippi, and Texas), and two airport projects (Chicago O'Hare and Rockford, Illinois), all constructed since 1971. The oldest project, built along an access road to Dulles International Airport near Washington, DC, is almost 30 years old and the youngest project, built along a taxiway at Greater Rockford Airport in Northern Illinois is about 7 years old. All of these projects, except for the one in Arizona, are still in service. The Arizona highway project was reconstructed recently as part of major intersection realignment at the project site. This paper presents an update on the performance of these eight pre stressed pavements. Design, construction, joint hardware and pre stressing details are summarized for each project

Keywords: post-tension, pavement, pre-stress, infrared thermography.

UGC AUTONOMOUS

SPENT COFFEE GROUNDS INFUSED WITH M-30 GRADE CONCRETE

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ABSTRACT

In the last years, an increase of coffee beverages consumption has been observed all over the world; and its consumption increases the waste coffee grounds which will become an environmental problems. Recycling of this waste to produce new materials like sand concrete appears as one of the best solutions for reduces the problem of pollution. This work aims to study the possibility of recycling waste coffee grounds (Spent Coffee Grounds (SCG)) as a fine aggregate by replacing the sand in the manufacturing of dune sand concrete. For this; sand concrete mixes were prepared with substitution of sand with the spent coffee grounds waste at different percentage (0%, 5%, 10%, 15% and 20% by volume of the sand) in order to study the influence of this wastes on physical (Workability, bulk density and porosity), mechanical (compressive and flexural strength) and Thermal (Thermal conductivity and thermal diffusivity) properties of dune sand concrete. The results showed that the use of spent coffee grounds waste as partial replacement of natural sand contributes to reduce workability, bulk density and mechanical strength of sand concrete mixes with an increase on its porosity. However, the thermal characteristics are improved and especially for a level of 15% and 20% of substitution. So, it is possible to obtain an insulating material which can be used in the various types of structural components. This study ensures that reusing of waste coffee grounds in dune sand concrete gives a positive approach to reduce the cost of materials and solve some environmental problems.

Keywords: spent coffee ground, thermal conductivity, recycling.

UGC AUTONOMOUS

STUDY ON PAPER MILL EFFLUENT TREATMENT BY UPFLOW ANAEROBIC BIO-REACTOR

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ABSTRACT

This study investigated the performance of an upflow anaerobic fixed-bed bioreactor (UAFB) with a quarry dust filter for pollutant removal from paper mill effluent at different hydraulic retention times (HRTs). The objectives were to reduce the contaminants in wastewater by an alternate treatment method and to reduce effluent parameters to meet the CPCB standards. The UAFB reactor was packed with quarry dust, a low-cost and locally available material. The reactor was operated at HRTs of 12, 18, and 24 hours. The results showed that the UAFB reactor was effective in removing pollutants from the paper mill effluent. The removal efficiencies of chemical oxygen demand (COD), total suspended solids (TSS), and color were 70-75%, 60-65%, and 65-70%, respectively, at all HRTs. The quarry dust filter further improved the removal efficiency of TSS and color to 80-85% and 75-80%, respectively. The treated effluent from the UAFB reactor with quarry dust filter met the CPCB standards for discharge into inland surface waters. The study concluded that the UAFB reactor with quarry dust filter is a promising technology for the treatment of paper mill effluent.

Keywords: Up flow anaerobic fixed-bed bioreactor, quarry dust filter, paper mill effluent, pollutant removal, CPCB standards

UGC AUTONOMOUS

STUDY ON SPECIAL EPOXY POLYMERIC SAND

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ABSTRACT

Epoxy polymeric sand is a versatile and durable material with excellent physical and chemical properties. It is well-suited for a variety of applications, including pavers, pathways, landscaping, and construction. A study on special epoxy polymeric sand was conducted to assess its material properties, performance in various applications, and comparison with conventional sand alternatives. The epoxy polymeric sand was found to have a fine grain size distribution, uniform color retention over time, and a smooth texture suitable for jointing applications. It also exhibited excellent durability, resistance to wear, abrasion, and environmental factors such as freeze-thaw cycles. The epoxy polymeric sand demonstrated high bonding strength in different applications, such as pavers and pathways. It also remained stable and functional under diverse environmental conditions, including exposure to water, sunlight (UV radiation), and temperature fluctuations. In addition, the epoxy polymeric sand maintained its integrity and functionality over an extended period of time. The cost-benefit analysis revealed that the epoxy polymeric sand is more expensive than traditional sand, but it offers a number of long-term benefits, such as reduced maintenance and longevity. The epoxy polymeric sand is also relatively easy to install and requires less maintenance than traditional sand. The results of the study indicate that epoxy polymeric sand is a high-performance material with excellent physical and chemical properties. It is well-suited for a variety of applications, including pavers, pathways, landscaping, and construction. While the initial cost may be higher than traditional sand, the long-term benefits of epoxy polymeric sand may justify the investment.

Keywords: epoxy resin sand, UV radiation, durability, temperature.

UGC AUTONOMOUS

PERFORMANCE OF BITUMEN USING CRUMBLED RUBBER AND GLASS POWDER

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ABSTRACT

The use of waste materials in bitumen production is a promising approach for reducing the environmental impact, cost, and durability of road construction and maintenance. It is a sustainable approach that can help to conserve natural resources, preserve ecosystems, and create jobs. The addition of waste materials to bitumen can improve the performance of the mixture in a number of ways, including increased elasticity, flexibility, and durability. This can lead to reduced maintenance costs over the lifetime of the pavement. Additionally, the rubber particles in bitumen mixtures with waste materials can help to absorb sound waves, reducing noise pollution from traffic. The improved skid resistance of bitumen mixtures with waste materials can also improve the safety of roads for drivers and pedestrians. By reducing the amount of waste that goes to landfills and incinerators, the use of waste materials in bitumen production can help to reduce greenhouse gas emissions, water pollution, and air pollution. It can also support the development of local economies by creating jobs in the waste management and construction industries. Waste materials such as crumbled rubber, glass powder, fly ash, and ground tire fabric are being used in bitumen production to improve the performance, durability, and cost-effectiveness of roads. Crumbled rubber from scrap tires can improve the elasticity and flexibility of bitumen mixtures, making them more resistant to cracking and rutting. This can lead to a longer pavement lifespan, especially in high-traffic areas. It can also help to reduce the amount of bitumen required, which can lead to cost savings. Fly ash from coal-fired power plants can be used to fill voids in bitumen mixtures. This can also help to reduce the amount of bitumen required.

Keywords: crumbled rubber, bitumen, gas emissions, and pavement.

UGC AUTONOMOUS

CHARACTERIZATION OF MORTAR MADE WITH CEMENT AND SLUDGE FROM THE LIGHT EMITTING DIODE MANUFACTURING PROCESS

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ABSTRACT

Cement-sludge mortar is a promising sustainable building material that can reduce the environmental impact of the construction industry by utilizing industrial waste products. Cement-sludge mortar is prepared by blending cement with sludge ash, a residue generated from the incineration of sewage sludge. Sludge ash contains high amounts of silica and alumina, which can react with cement and water to form cementitious compounds. However, the presence of heavy metals and other contaminants in sludge ash can affect the mechanical properties and durability of cement-sludge mortar. This research study aims to evaluate the mechanical strength, environmental sustainability, and microstructure of cement-sludge mortar to assess its potential as a sustainable building material. An LCA will be conducted to assess the environmental impact of cement-sludge mortar over its entire life cycle, from raw material extraction and manufacturing to transportation, construction, use, and end-of-life disposal. The results will be compared to those of conventional mortar to identify any environmental benefits of using cement-sludge mortar. Scanning electron microscopy (SEM) and X-ray diffraction (XRD) will be used to analyze the microstructure of cement-sludge mortar and identify any structural alterations caused by the presence of sludge ash. The results will be used to assess the long-term durability and performance of cement-sludge mortar.

Keywords: Rain Water Harvesting, Street water filtration, Gravity Filter, Water Treatment and Turbidity.

UGC AUTONOMOUS

ANALYSIS OF CONCRETE CONTAINING ALUMINUM DROSS AS PARTIAL REPLACEMENT OF CEMENT

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The amount of waste, associated waste disposal costs, and environmental contamination may be minimized by identifying effective recycling approaches. These promising approaches will also lead to the protection of natural resources and economic gains. One example of waste disposal may be by using it as a filling material or as a pozzolanic material for the production of concrete. In this regard, this study proposes to partially replace cement with aluminum dross and fly ash, and partially replace natural sand with quarry dust. Aluminum dross, cement, sand, and quarry dust were used in a variety of proportions with a constant percentage of fly ash for the design of nine concrete mixtures. Aluminum dross was replaced by 5, 10, 15, and 20% of the cement mass. At first, the optimum replacement of aluminum dross without using quarry dust was determined at a constant percentage of fly ash-15% based on the strength results. Later, by introducing the optimum substitution of aluminum dross with cement and fly ash, the quarry dust was partially replaced at 10, 20, 30, and 40% of river sand to determine the overall optimum mix. The mechanical and durability characteristics of the concrete using the three mixtures were analyzed. It has been observed that the mechanical and durability characteristics of a concrete mixture incorporating a fly ash-15%, aluminum dross-10%, and quarry dust-20% are better than that of standard concrete. Production of concrete using industrial waste can minimize infrastructure construction costs and reduce environmental impacts.

Keywords: Aluminum dross, pozzolanic, fly ash, quarry dust.

UGC AUTONOMOUS

PREDICTION OF COMPRESSIVE STRENGTH OF GEOPOLYMER CONCRETE USING DEEP LEARNING TECHNIQUES.

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ABSTRACT

The prediction of compressive strength in geopolymer concrete is a critical aspect of optimizing construction materials for sustainable and durable infrastructure. In present study artificial neural networks is employed to forecast the compressive strength of geopolymer concrete. Geopolymer concrete, an ecofriendly alternative to traditional Portland cement-based concrete, poses challenges in predicting its compressive strength due to its complex composition. ANNs are employed as a powerful tool to model the intricate relationships between various input parameters such as mix design, curing conditions, and curing time, and the resulting compressive strength. The study involves collecting a comprehensive data set of geopolymer concrete mixtures and their corresponding compressive strengths, followed by training the ANN model. The model's performance is evaluated and finetuned to ensure accurate predictions. This research aims to enhance our understanding of geopolymer concrete behaviour and provide a practical tool for engineers and construction professionals to optimize mix designs, and enhance sustainability by mixing over-engineering. The utilization of ANNs demonstrates their potential as a valuable predictive tool for optimizing geopolymer concrete formulations, ultimately contributing to more sustainable and resilient infrastructure.

Keywords: Geopolymer concrete, ANNs, Compressive Strength.



UGC AUTONOMOUS

INVESTIGATION OF BACTERIAL CONCRETE'S STRENGTH AND DURABILITY PROPERTIES

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ABSTRACT

Concrete is the most recognised building material for its unfavorable strength and durability features. It has extremely high compressive strength and very weak in tension, owing of which reinforcement is employed in concrete to take the stress. As the concrete is brittle, it always results in the production of fractures in the stress zones upon loading and leads to the durability difficulties by limiting the life time of the buildings. To address such durability difficulties standard repair procedures like crack filling with epoxy injections and use of extra reinforcement for minimizing the crack width were in use which entailed a lot of economics. This led to the invention of a self-healing concrete idea employing some bacteria mixing in the concrete and the crack produced will be self-healed by bacteria as a consequence of reproduction of the bacteria. In the current study, it was explored to determine the strength and durability qualities of the M30 grade concrete by adding bacteria called Bacillus Subtilis as at varied percentages like 5ml, 10ml, 15ml and 20ml for 500ml of water to be combined in concrete. It was shown that at 10 ml of bacteria for 500ml of water produces better strength qualities when compared with the standard concrete. As part of durability investigations, when the cubes are submerged in 5 percent H₂SO₄ , at 10ml of bacteria it exhibits superior performance than the ordinary concrete.

Keywords: Concrete, Bacteria, Cracks, Self-healing, Durability.

UGC AUTONOMOUS

REASSESSING ADVANCEMENTS IN LAND USE AND LAND COVER CHANGE RESEARCH AND SELECTION OF STUDY AREA

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ABSTRACT

Progress in land use and land cover change research has been a critical focus in recent years, as these changes have far-reaching implications for the environment, society, and sustainable development. This provides an overview of the research advancements in this field, highlighting key findings, methodologies, and emerging trends. It underscores the importance of understanding the dynamics of land use and land cover change to address pressing environmental challenges and make informed policy decisions. This review encompasses studies on various scales, from local to global, and emphasizes the interdisciplinary nature of this research, incorporating insights from geography, ecology, remote sensing, and social sciences. This research ultimately underscores the significance of on-going research efforts and their potential to shape our understanding of the complex interactions between humans and their environment.

Keywords: remote sensing, land use and land cover, GIS, ecology, environment.



UGC AUTONOMOUS

EXPERIMENTAL STUDY ON THE POROUS CONCRETE

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ABSTRACT

Pervious concrete, porous concrete, or water permeable concrete is a kind of concrete having a high void content that enables water and air to flow through. When water from precipitation and other sources are allowed to flow through pervious concrete (also known as a high-porosity concrete, permeable concrete, no-fines concrete, or porous pavement), it reduces runoff and allows groundwater to be recharged. Large particles are used in pervious concrete, whereas small aggregates are used sparingly. The aggregates are then coated with the concrete paste, which enables water to travel through the slab. It's a crucial application for sustainable building, and it's only one of several low-impact development approaches that builders utilize to maintain water quality. Porous Concrete, also known as dry concrete other, than shattered concrete, no fines concrete, and porous concrete, is an exceptionally robust structure used in the construction industry. A significant component is water. Penetrable concrete is a unique kind of strong made up of concrete, coarse aggregates, water, and, if needed, admixtures and specialty cements. In addition, there was research that investigated porous concert applications.

Keywords: Concrete, Water.



UGC AUTONOMOUS

ANALYSIS OF EPOXY-COATED BAMBOO REINFORCED CONCRETE BEAMS

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ABSTRACT

These days, the production of steel is implanting numerous hazards on Mother Nature. The cost of steel has been ever-increasing. Bamboo, also referred to as “Green Steel” is an affordable, natural resource which is a potential substitute for construction steel as it has higher tensile strength and flexural strength. New researcher being developed to preserve the mechanical properties of Bamboo with different engineering coatings. In this paper, the Bamboo coated with epoxy resin and wrapped with glass fibre was made as a composite material to enhance the bonding and boost tensile strength. On replacing steel with Bamboo, the performance of the Bamboo-Composite Reinforced Cement Concrete (BCRCC) beam has been analyzed. Compared with conventional Reinforced Cement Concrete (RCC) beams, BCRCC beam is found to be greatly compatible in strength and extremely low in cost. This approach can be suitably used in the construction of structural components like beams, slab, columns, walls and footing. Keywords: Bamboo, green steel, epoxy, glass fiber, bamboo-composite, low cost.

Keywords: Bamboo, green steel, epoxy, glass fiber, bamboo-composite, low cost.

UGC AUTONOMOUS

A NEW APPROACH FOR GEO-MONITORING USING MODERN TOTAL STATIONS

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ABSTRACT

Image Assisted Total Stations (IATS) integrate the geodetic accuracy of total stations (TS) with the areal coverage of photos. A calibrated system permits the representation of observed pixel locations on the image sensor as field angles in the object space. Captured pictures are instantly geo-referenced and may be utilized for direction measurements with no requirement for object control points or subsequent orientation operations. Photogrammetric image measuring techniques in order to identify signalized as well as non-signalized objects may be integrated with functions of the base total station, such as exact angle and distance measurements. In this study present the innovative technique for geo-monitoring utilizing contemporary total stations.

Keywords: modern, station, monitoring, geo-monitoring.

UGC AUTONOMOUS

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TO ANALYZE THE STANDARD PROCTOR TEST ON BLACK COTTON SOIL STABILISATION USING SOME CHEMICALS USED FOR ROAD BUILDING

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ABSTRACT

The black cotton soil is a form of soil that expands rapidly and begins to inflate when it gets moist. Because of this, the soil's strength and several other attributes are severely lacking. With varied quiet stabilizers, expansive soil behaves in an unexpected way. Soil stabilization is also a method for treating soil in order to care for, change, or enhance soil performance. In this study we have discussed about the stabilization, need for stabilization, black cotton soil, properties of black cotton soil, terrazymeasa B.C soil stabilizer in road construction, standard proctor test for soil which conclude that in addition to reducing swelling, Hypo sludge and Terrazyme strengthen black cotton soil, making it an excellent Sub-base for a road pavement construction.

Keywords: Black cotton soil, stabilize, standard proctor, road building.

UGC AUTONOMOUS

A REVIEW OF THE EFFECTS OF CONCRETE STRENGTH ON SIZE, SHAPE, AND LOAD

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ABSTRACT

Concrete characteristics are the most significant and crucial physical material property when reinforced concrete constructions are planned. Because of the development and in kinds and nature of material utilized to increase the concrete innovation, materials\ sand mix proportions, test measure, mixing strategy, and testing condition have notable affects on highlights of concrete strength, in view of the fact that the control specimen sizes and shapes could be distinct in relation from State to State. Testing of mechanical characteristics (particularly compressive strength and tensile strength) of concrete is one of the most urgent phases of development. To regulate the nature of the concrete, there are several molds used for pouring concrete samples according to various orientations in different nations. Many studies have noticed that the exact shapes and sizes of concrete samples might produce distinct sorts in the repercussions of compressive strength or tensile strength. The relationship between the compressive strength of the concrete cube and the cylinder is complicated. In this paper discuss the Size, Shape and Load Effect on Strength of concrete.

Keywords: Concrete, size, shape, effect, strength.

UGC AUTONOMOUS

UTILIZATION OF WASTE PLASTIC BOTTLES FOR MANUFACTURING OF BLOCKS

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ABSTRACT

Plastic is light weight and resistant material capable of being fabrication in various ways. Nowadays, large number of plastic bottles are useful. Waste plastic bottles provide thermal comfort while being sustainable. Waste plastic bottles are non-biodegradable and its disposal has always been a problem therefore utilizing the waste plastic bottles for manufacturing of concrete block, we are using the plastic bottles in the form of crushed mixed in the concrete material in three different grades (M15, M20, M25). And filled in the mould having specific size 150 mm x 150mm x 150mm and preparing the block test is conducted after 3 days, 7 days and 28 days in the UTM. After that the comparison made with the standard concrete cube strength and waste plastic concrete blocks with concrete material cubes as results.

Keywords: Waste Plastic Bottles, Concrete, Grades, UTM, Strength.



UGC AUTONOMOUS

EXPERIMENTAL INVESTIGATION OF FERRO CEMENT WITH PARTIAL REPLACEMENT OF CEMENT AND NATURAL SAND BY WASTE BRICK POWDER AND M-SAND

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ABSTRACT

The aim of the research was to investigate the performance of ferrocement by using waste brick powder as a partial replacement of cement and using M sand as a partial replacement of sand. By using the M sand in the construction erosion of river can be greatly reduced. Study was conducted to perform the various test on the ferrocement by making the panels of ferrocement. And then The various test like flexural test, impact test, tensile test. To minimize environmental pollution resulting from carbon dioxide (CO₂) emissions during cement manufacturing processes and disposal of waste brick. For this purpose firstly optimum percentage of waste brick powder as a partial replacement to the cement was obtained by making the cube with replacement of cement by waste brick powder from the demolition work in different percentage like 0%, 5%,10%,15% and 20%. The optimum replacement level of brick powder was obtained by performing compressive strength test on these cubes. After obtaining the WBP percentage sand was replaced by M sand in different percentage of 25%,50%,75%,100% and replacement percentage were found out. The conclusion is that the brick powder can be used as a partial replacement in the concrete and mortar up to 15 %

Keywords: Ferro cement, Waste Brick Powder, M-Sand, Environmental pollution

UGC AUTONOMOUS

IDENTIFICATION OF THE ALTERNATIVE MATERIALS FOR RIVER SAND FOR BRICK MASONARY CONSTRUCTION

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ABSTRACT

The construction industry is a key sector that provides a basic human need, such as shelter or building infrastructure. The public sector construction industry constructs constructions such as roads, dams, bridges, and health care facilities. Building materials, which constitute the backbone of construction operations, are in high demand due to the requirement for numerous activities. River sand is a common building material used in construction. River sand is used in many forms for various construction activities. Masonry mortar, concrete manufacture, plastering work, road construction, and many other key construction operations. Because construction activity has grown so quickly during the past ten years, the demand for river sand has multiplied many times over. Traditional sources of natural sand include rivers, where fine aggregates are created over time by physically and chemically altering rock particles. River sand is now scarce due to both legal and illicit mining, which has had negative effects on natural sources of fine aggregate. Since river sand cannot be replenished, it must be preserved for the future. Hence, alternatives that can replace the usage of fine aggregates partially or entirely are required. To substitute natural sand in various construction projects, many alternative materials were investigated for their qualities. M-sand (manufactured sand) from aggregate manufacturing plant, slag sand (waste produced from steel industry), Construction & Demolition waste(waste generated after demolition of buildings) are bi-products of their respective industries. All these alternatives were considered to be waste product and were dumped in landfills. According to literature reviews, these wastes' characteristics are comparable to those of fine aggregate. Numerous alternative research programmes have advised using the substitutes as fine aggregate in a set replacement percentage. Since these substitute materials are less expensive to produce or process, they can economically replace the fine aggregate. Because to the decrease in transportation to landfills and subsequent reduction in CO₂ emissions, using such alternatives is a practise that is environmentally benign. Effective alternatives will aid in reducing the issues with landfills. It is sustainable to use these substitutes in place of fine aggregates. Thus, government should promote and support the adoption of alternatives. It is best to replace these alternatives in construction activities. Strength behaviour of brick masonry specimens made with alternatives is examined i.e. compression, tensile and flexural behaviour of brick masonry. Based on the experimental results, best suitable alternative is recommended as an approach towards sustainability.

Keywords: River sand, M sand , Slag sand ,C & D Waste

***EARTHQUAKE ANALYSIS OF ELEVATED WATER TANK WITH VARIOUS ARRANGEMENTS TO FIND BEST POSSIBLE SOLUTION**

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ABSTRACT

A Water tank means a container to store water in a huge amount of capacity. As known from experience, liquid storage tanks collapsed or are heavily damaged during earthquakes all over the world. The economic lifetime of ESR is generally around 40 to 65 years. Damage or collapse of the tanks causes some unwanted events such as shortage of drinking and utilizing water, uncontrolled fires, etc. Therefore, to avoid all those disadvantages numerous or various studies are being carried out regarding tanks. In this study, I have compared reinforced cement concrete Elevated Service Reservoir (E.S.R) of Square & Circular shape of 1 lakh capacity and a total height of 12.6m with 3m staging in Earthquake Zone II, III, IV, and V by Equivalent static analysis using ETABS software for base shear and deflection guidelines for the design of the tank and IS 1893 - 2016 code. It can be seen that a Circular water tank is more economical and preferable.

Keywords: ESR – elevated service reservoir, max displacement, base shear, ETABS.



UGC AUTONOMOUS

MATHEMATICAL MODELING AND ANALYSIS OF SLABS

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ABSTRACT

This paper presents mathematical demonstrating of slabs, direct displaying and dissecting of two way section in a limited component based programming software RISA 3D and in comparing with SAP for exactness, The distinction in outcome was subsequently mediocre. Taking into account of this, in demonstrating nonlinear modeling and analysis is done by same software. For one way and two way rectangular sections, which incorporate both material and mathematical modeling of the slabs. Flexural load is applied for examination of one way and two-way lab. The uprooting form and break example o slab is introduced which shows the proper way of behaving of slabs.

Keywords: Slabs, Nonlinear Modelling, Analysis, RISA3D.



UGC AUTONOMOUS

FLEXURAL SHEAR BEHAVIOUR OF GEOPOLYMER CONCRETE BEAMS WITH WEB REINFORCEMENT

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ABSTRACT

Concrete is a new development in the field of building constructions in which cement is totally replaced by pozzolanic material like fly ash, GGBS etc. and activated by an alkaline solution. The present study involves flexural shear behaviour of geopolymer concrete beams with web reinforcement constituting of both Fly ash and GGBS. For varying shear span (a_v) to effective depth (d) ratios 3, 3.5 changes in flexural shear behaviour is to be analysed for two different grades of concrete M40 & M45. An alkaline solution of Sodium hydroxide (NaOH) and Sodium silicate (Na_2SiO_3) with molarity 12M will be used in concrete mix instead of water. Mechanical properties of developed concrete such as compression test, split tensile test, young's modulus, and flexural strength will be performed. Shear parameters & crack morphology will be studied at end of the project.

Keywords: Fly-ash, GGBS, NaOH, Na_2SiO_3 , compressive strength, splittensile, flexural strength.



UGC AUTONOMOUS

INNOVATIVE UTILIZATION OF CONSTRUCTION AND DEMOLITION MATERIALS IN PAVEMENT CONSTRUCTION

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ABSTRACT

This research explores the sustainable integration of construction and demolition (C&D) materials in pavement construction, aiming to address environmental concerns and enhance infrastructure resilience. Through a comprehensive literature review, we identify gaps in current practices and propose a novel methodology for incorporating recycled C&D aggregates into pavement mixtures. The study employs advanced testing methods to assess the mechanical and environmental performance of these mixtures. Results reveal promising outcomes in terms of strength, durability, and reduced environmental impact. This research contributes to the ongoing discourse on sustainable infrastructure development by presenting practical insights into the effective utilization of C&D materials in pavement construction.

Keywords: construction waste, demolition waste, pavement, environmental impacts



UGC AUTONOMOUS

BENEFITS AND CHALLENGES OF GREEN ROOFS ON PUBLIC AND COMMERCIAL BUILDINGS

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ABSTRACT

Over the last two decades, major research have been made about green roofs, this project will raise more awareness on green roof components and its many benefits (environmental, social and economic) that are related with the green roof technology. This project also places emphasis on how green roofs works in different areas, their overall performance in reducing storm water and energy costs, and improving air and ecological performance. The benefits of green roof shows that it plays an important role in making cities more secure, sustainable and resilient to local climate change. However, huge construction costs, excessive renovation costs and roof leakages are the primary challenges associated with the application of green roofs. These challenges can be overcome with new cost effective green roof layout that can work successfully and efficiently in any area. Advanced amendments and traits of green roof application are also covered in this project. Green roofs are multi layered having membranes such as water proofing membrane, root barrier, drainage layer, optical water retention layer, filter fabric and plants. In this project, a new water barrier will be provided in order to avoid the water penetration through the slabs leading to leakage and cracks in the slab systems. Green roofs are gaining interest as nature-based solutions (NBS) to counteract with several environmental and socio-economic problems associated to urban sprawl and climate change. The challenge is to transform the built environment through the inclusion of NBS. Taking advantage of the existing space in the top of the buildings, the integration of green roofs will support the cities' transition towards circularity and resilience. They provide several ecosystem services and can act as multifunctional and decentralized units. In order to boost these services, green roofs need to be effectively incorporated and replicated in the urban landscape. Different configuration of systems may be considered depending on the challenges that the city foresees. To fully implement green roofs, it is important that (i) barriers are identified and overcome, (ii) standardization is set to grant liability, (iii) policies, incentives, and strategies are properly established, (iv) organizations delivering NBS services are leveraged, and (v) awareness and dissemination promotion, as investment in education, are considered. This paper intends to give an overview of the importance of green roof integration in the urban environment considering the dimensions of the building and the city, having underlined their contribution to circularity and cities' resilience.

Keywords: Green roof, Components, Benefits, Promotional policies, Advanced modification

DESIGN AND CONSTRUCTION OF RAYON SOIL REINFORCEMENT SYSTEM

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ABSTRACT

The natural fibers are innately different from such synthetic material whereas behavior of fiber reinforced soil is influenced not only by physical-mechanical properties but also by biochemical properties. In the present review, the applicability of natural plant fibers as oriented distributed fiber-reinforced soil (ODFS) and randomly distributed fiber-reinforced soil (RDFS) are extensively discussed and emphasized the inspiration of RDFS based on the emerging trend. Review also attempts to explore the importance of biochemical composition of natural-fibers on the performance in subsoil reinforced conditions. The treatment methods which enhance the behavior and lifetime of fibers, are also presented. While outlining the current potential of fiber reinforcement technology, some key research gaps have been highlighted at their importance. Finally, the review briefly documents the future direction of the fiber reinforcement technology by associating bio-mediated technological line. The main objective of this study is to investigate the use of waste fiber materials in geotechnical applications and to evaluate the effects of composite on shear strength of unsaturated soil by carrying out direct shear tests and unconfined compression tests on two different soil samples. The results obtained are compared for the two samples and inferences are drawn towards the usability and effectiveness of fiber reinforcement as an alternative to regular ground improvement techniques.

Keywords: stabilization, unconfined compression, fibers, direct shear, bearing capacity.



UGC AUTONOMOUS

REDUCTION OF GREEN HOUSE EMISSION BY COOL ROOFING TECHNOLOGY

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ABSTRACT

In India, nearly half a billion people live in rapidly urbanizing cities, with sky-rocketing development, that converts open space into paved, heat-trapping roofs and roads. More than 60% of roofs are made from metal, asbestos, and concrete trapping heat inside buildings. These hot surfaces worsen the heat island effect, drive temperatures higher, and lead to poor air pollution with greater energy needed to keep cool with fans and air-conditioning. Due to this global temperatures continue to rise and urban populations expand, the need for sustainable and energy-efficient solutions has never been greater. One such innovation is the cool roof, which not only saves energy but also reduces the urban heat island effect. The greenhouse gas emission reduction potential by the cool roofs is by energy saving which leads to reduced energy demand and hence cutting down the emissions. Cool roofs offer a simple and cost-effective solution to urbanization challenges.

Keywords: Sky Rocketing Development, Paved, Emission, Sustainable Development, Urbanization.



UGC AUTONOMOUS

THE EFFECT OF PERIWINKLE SHELL ASH AND DUST ON COMPRESSIVE STRENGTH OF CONCRETE

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ABSTRACT

The study examined the partial replacement of Ordinary Portland Cement (OPC) with Periwinkle shell Ash (PSA) and Periwinkle Shell Dust which was obtained from burning of Periwinkle shell at 600°C and grinding with ball mill respectively. Concrete cubes were prepared from design mix with target strength of 20N/mm², 25N/mm², 30N/mm² and 40N/mm² and the replacement of the PSA and PSD were 0%, 5%, 10% and 20% respectively. The chemical analysis of both samples indicated that CaO content in PSA is higher than PSD leading to quick reaction with water. The presence of organic calcium in PSD was responsible for slowing setting of the concrete and subsequently leading to disintegration of the paste at 20% replacement when tested for soundness. The workability test indicated that as the percentage replacement of PSA and PSD increases the slump test value decreases, while compressive strength decrease with increasing replacement and increase with curing age. The design compressive strength was attained at 5% and 10% replacement for both PSA and PSD based on the 75% strength of OPC recommended by ASTM C618 for grades of concrete at 28days.

Keywords: Concrete, Partial Replacement Periwinkle Shell Ash, Compressive Strength, Workability.



UGC AUTONOMOUS

EXPERIMENTAL STUDY ON SELF-HEALING CONCRETE

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ABSTRACT

Concrete will continue to be the vital component for infrastructures due to its first-rate properties such as easy availability, low cost, durability, strength and convenience to cast. It can withstand the compressive forces but it is prone to cracking due to tensile forces which in turn results in the reduction of the overall life as well as increase in the vulnerability of the concrete structure. Curing of the concrete increases the possibility of cracking due to the fluctuations in the humidity and temperature. With the aging of the structure, brittleness increases as the moisture content decreases. Retrogression of the reinforcement steel bars due to introduction of corrosive chemicals through cracks, frost damage and water leakage are some of the problems encountered thus pinching the pockets and making the maintenance and repairs costlier. An expeditious self-healing crack mechanism is required which causes the decline in the chemical intrusion, thus dwindling the corrosion and thereby increasing the service life of the concrete structure. In this paper, an attempt has been made to re-mediate the cracks and fissure in the concrete by employing Microbiologically Induced Calcite Precipitation (MICP). The method results in enhancing the strength and durability of the structures by healing the cracks through microbial activities which happens to be eco-friendly. A review of this technique for future commenced use has been discussed.

Keywords: Self-healing concrete, Microbiologically Induced Calcite Precipitation (MICP), chemical intrusion, eco-friendly.



UGC AUTONOMOUS

FLOATING SOLAR POWER PLANT ON NARMADA RIVER & GENERALIZED PROPOSAL FOR ALL OTHER RIVERS OF INDIA

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ABSTRACT

As a result of the rising demand for energy in our century, we have turned to renewable energy sources, such as solar energy, which can meet this need. The goal of this research is to review the capacity of the floating solar plant on Narmada river near Omkareshwar dam. Solar power generation space can be saved by floating power plants. The availability of land, its development and acquisition, evacuation, as well as prompt clearances for the project on land, are limitations to power plant built on land. These represent obstacles to the project's execution. Since solar energy is an indirect energy source, we require two primary components: a collector to gather solar radiation and transform it into electrical energy, and a storage unit since solar radiation has a wide range of characteristics. Solar energy will be a great way to address the current energy issue, however installing a land-mounted solar system is quite expensive and difficult to acquire. Narmada floating power plant project cost is 3000crores which is funded by international finance corporation and world bank. The power generation capacity of this power plant is 600MW, it is spread over 2000hectare water area.

Keywords: Renewable energy, power plants on land, solar power plants, area covered.

UGC AUTONOMOUS

RCC BRIDGE DECK USING INFRA-RED THERMOGRAPHY

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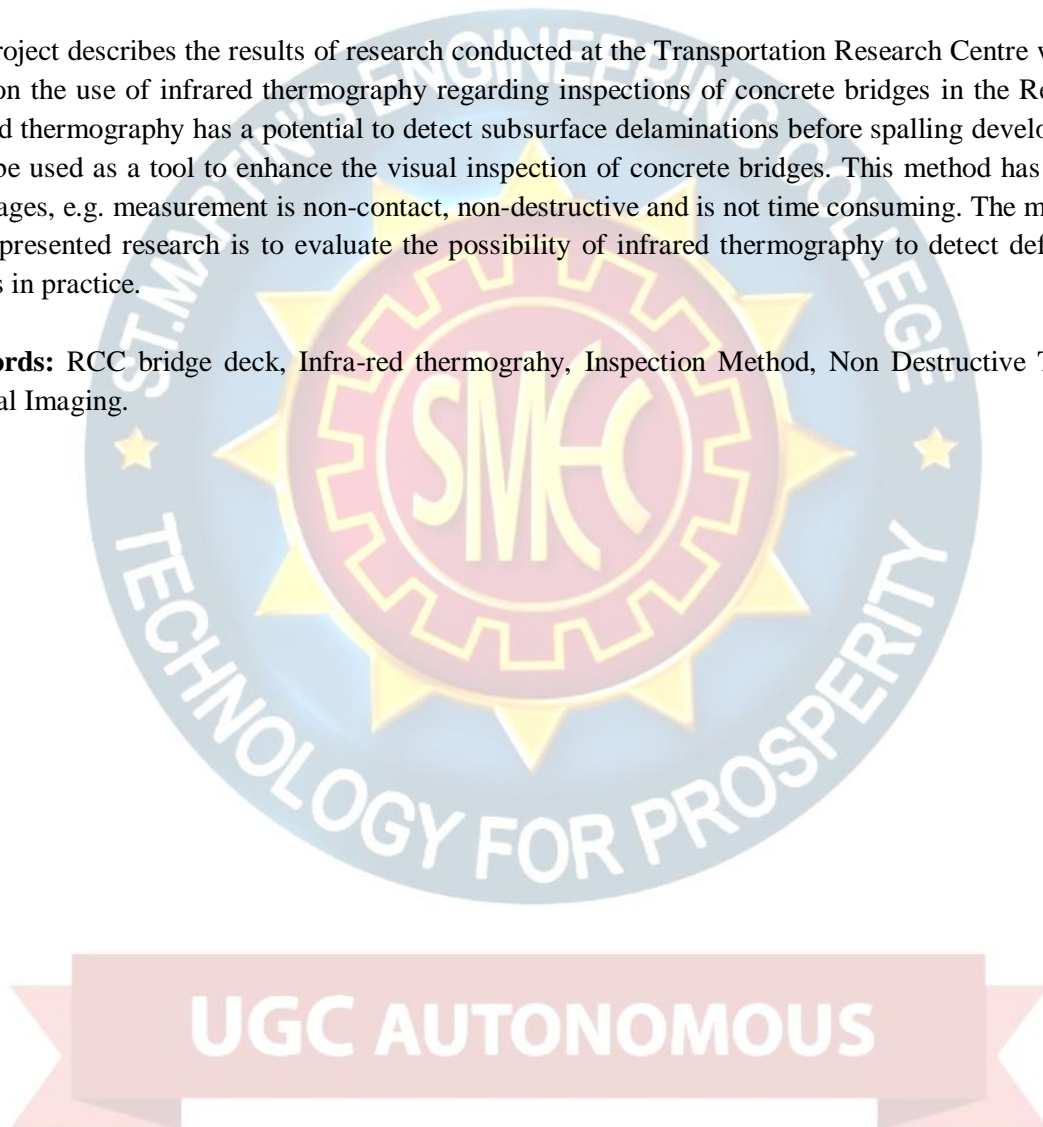
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ABSTRACT

This project describes the results of research conducted at the Transportation Research Centre with the focus on the use of infrared thermography regarding inspections of concrete bridges in the Republic. Infrared thermography has a potential to detect subsurface delaminations before spalling develops, and could be used as a tool to enhance the visual inspection of concrete bridges. This method has several advantages, e.g. measurement is non-contact, non-destructive and is not time consuming. The main aim of the presented research is to evaluate the possibility of infrared thermography to detect defects on bridges in practice.

Keywords: RCC bridge deck, Infra-red thermography, Inspection Method, Non Destructive Testing, Thermal Imaging.



STUDY ON MANAGING TRAFFIC CONGESTION AT AFZALGUNJ ROAD

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ABSTRACT

The traffic in Afzalgunj Hyderabad is rapidly increasing day by day because of population growth and migration of population from rural areas to urban areas this leads to the growth of vehicle ownership and usage. Afzalgunj Hyderabad is the hub of IT sector, business sector, shopping malls, education institutions etc. The traffic congestion is possible for any mode of transportation particularly we focused on traffic congestion on roadways due to automobiles. Traffic congestion on road networks is categorized based on the following factors i.e., lower speed, longer trip time and queuing of the vehicle for a longer duration. In this paper the causes for traffic congestion such as illegal parking, Disobeying traffic rules, Seasonal factors, Pavement failures, encroaching of footpath, Festival and Occasional congestions, Passage of heavy vehicle on narrow roads, Accidents and Improper Lane management are identified and remedial measures to minimize the traffic congestion were discussed briefly on the study area of Afzalgunj Hyderabad.

Keywords: Traffic Congestion, Encroaching of Footpath, Pavement Failures, Accidents, Lane Management.



UGC AUTONOMOUS

MAPPING OF DAMPNES IN BUILDING

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ABSTRACT

Dampness is a very common problem in both public and private buildings in Hyderabad. Dampness has existed in residential buildings in Hyderabad for many years and a lot concerns have been raised on the problem. This study presents the results of a questionnaire survey of construction professionals (Architects, Quantity Surveyors and Site Engineers) to assess their perceptions on causes and symptoms of dampness in residential buildings in Hyderabad. The results showed that most of the respondents were experienced on the issues of dampness and they demonstrated in-depth knowledge of the problem of dampness in residential buildings. The results also showed that rising dampness, flooding, leakages, water penetration and construction water are the five major causes of dampness in residential buildings in Ghana. Furthermore, the results showed that surface efflorescence just above skirting/floor, stains especially in horizontal band, dampness at the base of walls up to 1.5m in horizontal band, softening and deterioration of plaster and blistering and flaking of paint are the five main symptoms associated with dampness. The study recommends actual laboratory tests and further analysis on samples from affected buildings to have a better understanding of how to remedy the problem of dampness.

Keywords: architects, building construction, dampness, quantity surveyors, site engineers.



UGC AUTONOMOUS

ECO-EFFICIENT BLENDED CEMENTS WITH HIGH VOLUME OF SUPPLEMENTARY CEMENTITIOUS MATERIALS

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ABSTRACT

The ways of reducing CO₂ Emissions in the cement industry were analyzed for the purposes of implementation of the low carbon development strategy. The optimal solution to this problem is the technologically optimized blended cements with high volume of supplementary Cementitious materials of various genesis and fineness. The design of eco-friendly blended cements was achieved by a synergistic combination of the main constituents such as granulated blast furnace Slag, superfine zeolite, fly ash and limestone, as well as by optimization of their granulometric Composition, taking into account their bimodal particle size distribution by volume and surface area. Moreover, the article presents the technical, environmental and economic benefits of using Ecoefficient blended cements.

Keywords: eco-efficient blended cements, supplementary cementitious materials, super-fine zeolite, particle size distribution.



UGC AUTONOMOUS

COMPARATIVE STUDY ON PERFORMANCE OF CONCRETE WITH NATURAL SAND AND MANUFACTURED SAND

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ABSTRACT

Concrete is the most widely used composite construction material. Due to the continuous mining of sand from riverbed led to the depletion of river sand and it became a scarce material. As a substitute to river sand, manufactured sand has been used. In the present experimental study a comparative study has been carried out to check the usability of manufactured sand in place of natural sand. This study involves determination of some major properties of concrete like compressive strength, made of both the river sand and manufactured sand. In this present experimental study a comparative study has been carried out to check the usability of manufactured sand in place of natural sand. This study involves determination of some major properties of concrete like compressive strength, made of both the River sand and manufactured sand. Based on proposed studies, quality of manufactured sand is equivalent to natural sand in many respects, such as cleanliness, grading, strength, angularity, specific gravity. Conclusion have been arrived that manufactured sand produced from VSI(vertical shaft impactor) is a suitable and viable substitute to river sand and could be effectively used in making concrete which provides adequate strength and durability for the concrete. In the design of concrete structures, concrete is taken into account by taking its compressive strength value. The compressive strength of the concrete made of manufactured sand is observed to be very nearer to the strength of the concrete made of natural sand in the present investigation, there by 100% replacement is reasonable.

Keywords: Concrete, natural sand and manufactured sand.

UGC AUTONOMOUS

STABILIZATION OF SUBGRADE USING GEOSYNTHETICS

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ABSTRACT

Geogrids and geotextiles are used routinely to stabilize weak subgrade soils during road construction. Typical subgrade stabilization applications are temporary haul roads or unpaved low-volume roads, but can also include paved roads built on poorer foundation materials. Full-scale test sections were constructed, trafficked and monitored to compare the relative operational performance of geosynthetic used as subgrade stabilization, as well as determine which material properties were most related to performance. Unpaved test sections were constructed using twelve geosynthetics consisting of a variety of geogrids and geotextile. Multiple control test sections were also built to evaluate the effect that subgrade strength, base course thickness, and/or presence of the geosynthetic had on performance. Even though the geotextile materials used during this study showed good performance as subgrade stabilization, material properties associated with their performance was difficult to establish due to the limited number of test sections and lack of relevant tests to properly characterize these types of materials for this application.

Keywords: Geosynthetics, geotextiles, geogrids, geocells, stabilization, polymers.



UGC AUTONOMOUS

SOIL FOUNDATION REPORT PREDICTION USING ARTIFICIAL INTELLIGENCE

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ABSTRACT

Finding land consisting of soil with sound engineering properties has become a rare phenomenon in the present scenario, it has become inevitable to avoid the poor performing soils. So are the modern evolving trends in Civil Engineering being developed to mitigate this hindrance. The key to the success of any construction project (or) infrastructure project lies in the good selection of right foundation and comprehensive knowledge of the soil at the construction site. To sum up for selecting a good (or) right foundation, one must have a proper soil report, that sheds light over the complete data of the construction soil and Ground Conditions. The current study aims to design an algorithm that is capable of analyzing the input soil resource data and predicting the right type of foundation matching the input given, the algorithm used here is the manifestation of machine learning approach which has datasets extracted from various projects in the region and in confirming with the Indian Standard code provisions gives out a predicted dataset of the targeted site soil. Further using this created dataset to propose the right type of foundation using AI.

Keywords:- Artificial neural network, Regression, Support vector machine, Mean Absolute Error, Root of the Mean square error, Mean square error, R2 Square Error

UGC AUTONOMOUS

EXPERIMENTAL STUDY ON UTILIZING ARTIFICIAL AGGREGATES IN LIGHT WEIGHT

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ABSTRACT

The inclusion of an artificial aggregate manufactured using plastic waste to develop a light-weight concrete was studied. Five separate mixes were designed, progressively increasing the amount of artificial aggregate, and measuring the fresh and hardened concrete properties, and it was found that the slump and density of the concrete decreased as the amount of artificial aggregate in the concrete increased. Both the compressive and the tensile Then the mix that was most suitable to the requirements of the study in terms of density and compressive strength was chosen for further investigation in stage two. Fifteen percent of the natural aggregate by weight was replaced in this optimal mix, which equals more than thirtyseven percent of the volume given the lower density of the manufactured aggregate compared to natural aggregate. A larger number of specimens and more detailed testing was undertaken for stage two when compared to stage one, including establishing the compressive stress strain relationship and the modulus of elasticity of the newly developed concrete mix. The results indicated that plastic aggregates manufactured following shredding, palletization and extrusion processes can be used to obtain a lightweight concrete (1800 Kg/m³) while having relatively good compressive strength properties (20 MPa at 28 days). These results were higher than other results previously reported in the literature on the replacement of coarse aggregate with plastic but were marginally lower than results reported in the literature for studies where fine aggregate was replaced with plastic. It was concluded that the concrete mix reported herein can be used for a wide spectrum of applications such as non-structural facades and sound barriers for highways. Further research is required to investigate the durability of concrete with the artificial aggregate included in the mix, especially if the product is to be subjected to wear and tear such as in driveways or warehouse slabs.

Keywords: Light weight concrete, drive ways, shredding, palletization, extrusion, warehouse Slabs.

UGC AUTONOMOUS

ZERO WASTE SYSTEM BARRIERS AND MEASURES OF RECYCLING THE CONSTRUCTION AND DEMOLITION WASTE

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ABSTRACT

Urbanization, population growth, increased consumption, infrastructure, and housing needs are some of the factors that result in increased waste. Recycling has been a crucial way to reduce the amount of materials that end up in disposal sites and is how citizens, more aware of the impacts on the environment, participate in some of the schemes to reduce waste. This study is done to overcome those barriers in the construction sector and to propose measures to increase the recycling rates. In order to achieve the objective, construction companies, cement producers, and all other companies are trying their best to reduce the wastage. In order to achieve the objective, construction companies, cement producers, waste managers, personnel of refuse material facilities, waste transformers, construction material distributors, and a director of the Ministry of Health were interviewed to determine the challenges in the valorization of concrete, wood, metal, and packaging waste materials. This article reports the findings, which include, among others, the fact that most construction companies dispose the waste without any separation, except for metals. The cement producer companies do not participate in any form of collection system in spite of the available technology and equipment and the absence of innovative technologies for the transformation of materials.

Keywords: zero waste barriers; construction industry; recycling; measures for the construction waste.

UGC AUTONOMOUS

REUSE OF NON-DEGRADABLE WASTE PET BOTTLES FOR GROUND IMPROVEMENT

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ABSTRACT

This study explores the innovative application of non-degradable waste PET (Polyethylene Terephthalate) bottles for ground improvement purposes. The increasing environmental concerns associated with plastic waste have necessitated sustainable and eco-friendly solutions for their management. In this research, PET bottles were repurposed as ground improvement materials to enhance soil properties and mitigate subsurface challenges. Through laboratory testing and field investigations, the geotechnical performance of PET bottles was evaluated in comparison to conventional ground improvement techniques. The findings demonstrate the feasibility and effectiveness of utilizing PET bottles as a viable alternative for ground improvement, offering an eco-conscious approach to address both waste management and geotechnical engineering challenges. This research contributes to the growing body of knowledge on sustainable construction practices and encourages the reutilization of non-degradable waste materials for environmental and engineering benefits.

Keywords: Waste PET bottles, ground improvement, pavements, Geosynthetics, Sustainable Construction.



UGC AUTONOMOUS

COARSE AGGREGATE REPLACEMENT WITH JHAMA BRICKS IN CONCRETE

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ABSTRACT

The use of concrete is truly large and day by day the cost of the conventional material cost is also rising due to depletion of natural resources. So, it is beneficial to use the arbitrary materials for making the concrete. This project mainly focuses on replacement of coarse aggregate in conventional concrete. In this project work, the study has been done on the replacement of coarse aggregate with demolished brick aggregate known as jhama brick. The Jhama brick has irregular shape and it has also been used as coarse aggregate in some places where the stone aggregate is not effortlessly available or if available, its cost is high. These rejected bricks can also be an implicit source of coarse aggregate. It's partly or completely replacement of the conventional material. We replaced the coarse aggregate in ratios of 15%, 25% and 35% in M25 grade of concrete. A complete fifty-four numbers of concrete samples are cast with and while not crushed jhama bricks. Tests are conducted on fresh and hardened cement concrete, such as, compressive strength test at 7 days and 28 days of curing period. Usage of Jhama bricks as coarse aggregate efficiently would reduce the overall cost of the concrete, by conferring equal or more strength and durability compared to conventional concrete.

Keywords: Jhama brick, Compressive strength test.



UGC AUTONOMOUS

SEISMIC VULNERABILITY ASSESSMENT OF EXISTING BUILDINGS

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ABSTRACT

Assessment of seismic vulnerability, underlying weakness and openness of building stock are the primary parts in the seismic gamble evaluation of an area. India has encountered nine harming tremors in the beyond twenty years, with huge endanger to lives, properties and financial exercises. The high seismic weakness of its lodging stock was obvious in the Bhuj tremor in 2001. Methodologies that are fit for anticipating precise and dependable evaluation of seismic weakness of the current structure stock in ongoing tremors are central in the planning of chance evaluation and retrofitting procedures. This project will present a survey of the current methods what's more, strategies that have been created/proposed for the appraisal of seismic weakness of existing reinforced concrete (RC) outlined structures. The critical variables of the approaches, including assessment of seismic situations and ground movement power measures; inspecting of structures; characterization of building boundaries; decision of investigation strategies and underlying models; impact of neighborhood soil profile and soil-structure interaction (SSI) on the structure execution and assessment of harm levels are examined. The reasonableness of the current approaches for seismic situations in India is contemplated. The relevance of Geographical Information Systems (GIS), as an instrument to evaluate the seismic weakness for expedient age and refreshing of the risk guides of the areas, with the improvement of stock information bases of the structure stock will likewise be assessed.

Keywords: Vulnerability, Soil Structure Interaction, and Seismic Analysis.

UGC AUTONOMOUS

KNOW YOUR WATER-LAKE WATER ANALYSIS FOR HYDERABAD METROPOLITAN

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ABSTRACT

Every year, millions of tons of plastic waste pour into the ocean, much of coming from about 1,000 hyper-polluting rivers. And with overall waste generation poised to increase over 75% by 2050. Companies around the world have turned their attention to the problem of river waste, building various barriers, fences, and wheels that help to contain and remove trash as it flows downstream. Water purity is a complex term and is often approached in a subjective manner. Water supply companies achieve healthy water by identifying the unhealthy contaminants in their water and then taking action to remove them. Consumers can further purify if they wish. This project aims to set up a platform in order to locate the drinking water supply, pumping and distribution systems within the locality. It has been coined with the terminology “Know Your Water”. The study explores how different drinking water treatment plants, distribution system network and sewerage systems and treatment systems. This study will prescribe a path way for setting up educational camps and government body, for general public.

Keywords: Water Supply System, Water Treatment, Sewarage and Government body.



UGC AUTONOMOUS

FORENSIC ANALYSIS OF DAM SAFETY PROTOCOLS- TIGHRA DAM GWALIOR; MADHYAPRADESH DAM BREAK ANALYSIS

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ABSTRACT

This study presents a comprehensive analysis of dam safety protocols with the aim of safeguarding critical infrastructure and protecting downstream communities and the environment. Dam safety analysis is a critical to assess the stability of dams, ensuring their structural integrity and ability to withstand potential hazards and extreme events. By using advanced computational methods and finite element analysis are commonly utilized to simulate dam behavior and identify potential weak points. The abstract also touches upon the significance of dam safety management throughout the dam lifespan. Regular inspections and periodic safety evaluation are necessary to adapt to changing conditions and evolving safety standards. These analysis summarizes the key components and methodologies involved in conducting dam safety analysis iize ranging from 0µm to 45µm, the filling effect of the granite stone powder can be utilized.

Keywords: Dam, safety protocol, analysis and environment.



UGC AUTONOMOUS

CONSTRUCTION OF BUILDING WITH INTERLOCKING BRICKS AT LOW BUDGET USING LESS AMOUNT OF CEMENT

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ABSTRACT

Brick that is installed in an interconnected fashion is known as interlocking brick and is used as wall filler. When compared to employing red bricks, the usage of interlocking brick can save money and time. Traditional bricks are the most basic building supplies used to construct homes. However, the modern construction industry's explosive expansion has compelled civil engineers to look for a new building method that may replace the traditional brick with one that is more durable, efficient, and economical. Additionally, one of the factors driving modifications to the traditional masonry systems is the rising desire for quick, inexpensive, and labour-efficient construction methods. The basic idea was to build a wall without cement and to bind the bricks together by their interlocking properties. New interlocking mortar-less concrete masonry blocks are a structural element that must be produced in the construction of masonry buildings, and in recent years, there has been a global interest in the creation of this kind of brickwork. Despite being employed in other nations, the mortarless interlocking block building technology has not yet gained popularity in India. In this project, the design aspect of the interlocking bricks will be considered and modified to that of normalized interlocking bricks and conventional shape of burnt clay bricks available in the market. The economical aspect of interlocking bricks being cheaper compared to conventional burnt clay bricks will be analyzed thoroughly.

Keywords: Burnt Clay Bricks, Interlocking Bricks and Low Budget.

UGC AUTONOMOUS

SHEAR BOND BEHAVIOUR AND SPLIT BOND STRENGTH BETWEEN CONCRETE AND HYBRID FIBRE REINFORCED ECC

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ABSTRACT

In this modern scenario, expectations from concrete have increased exponentially. Various physical parameters of concrete like strength, durability, serviceability and expected service life improvement. This deals with the study of the strength parameters of concrete by partial replacement of cement by ground granulated blast furnace slag (GGBS) and Nano silica. The partially replaced concrete showed an increase in strength as compared to conventional concrete. Various mix combinations with a partial replacement of 0.8%, 1%, 1.2% of GGBS taken. The test results show that the partial replacement of cement has an increase in strength of concrete. The steel fibre was used to increase the toughness of the concrete. Various strength parameters such as compressive strength, split tensile strength of concrete was tested and recorded. Hybrid fibre-reinforced cementitious composites (HFRCC), with high toughness and ductility, have great potential for repairing damaged concrete in service environments.

Keywords: Engineered Cementitious composites, Nano Silica, and Fibre reinforced concrete.



UGC AUTONOMOUS

ANALYSIS OF AUTOCLAVED AERATED CONCRETE BLOCKS WITH CONVENTIONAL BRICK BLOCKS

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ABSTRACT

The traditional bricks are the main building materials that are used extensively in the construction and building industry. Autoclaved Aerated Concrete blocks are recently one of the newly adopted building materials. The Autoclaved aerated concrete (AAC) is a product of fly ash which is mixed with lime, cement, and water and an aerating agent. The AAC is mainly produced as cuboid blocks and prefabricated panels. The Autoclaved aerated concrete is a type of concrete that is manufactured to contain lots of closed air voids. The AAC blocks are energy efficient, durable, less dense, and lightweight. It is manufactured by adding a foaming additive to concrete in different sizes of molds as per requirement, then wire-cutting these blocks or panels from the resulting ‘cake lump’ and ‘heating them with steam. In this paper, an overview of AAC blocks with reference to its potential and sustainability as a novel building material has been presented. The paper also presents a comparative cost analysis of AAC Blocks with the Red clay bricks and its suitability and potential use in the construction in the building industry.

Keywords: AAC blocks; Performance, Potential, Walling system; Sustainability.



UGC AUTONOMOUS

DRONE APPLICATIONS IN CONSTRUCTION UNMANNED AERIAL MANIPULATORS ITS OPPORTUNITIES AND CHALLENGES

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ABSTRACT

Drone technology has been rapidly advancing in recent years, and its application in the construction industry has become increasingly popular. Unmanned aerial manipulators, or drones, have the potential to revolutionize construction by performing tasks that were previously too dangerous or difficult for humans. Research on Unmanned Aerial Manipulators has been growing in the last few years. The applications of UAMs in terms of sensor installation, inspections, door opening, valve turning, pick and drop, etc. have been studied for the oil and gas industry, and civil applications, etc. However, there is a lack of studies in understanding applications of UAMs and their capabilities in construction and in advancing construction activities. The goal of this research is to explore the opportunities and challenges of drone application in construction, with a focus on unmanned aerial manipulators. These Drones or Unmanned Aerial Manipulators have been used in the construction industry to collect visual data in form of images, videos, or to map surveys, and visually inspect the structures.

This project will provide a comprehensive overview of the opportunities and challenges of drone application in construction, with a focus on unmanned aerial manipulators. The project starts with an extensive survey where in problems and challenges at a construction industry are identified, further a summary report will be derived. The findings of this study can help to promote the safe and effective use of drones in construction projects and pave the way for further research and development in this area.

Keywords: Drones, Unmanned Aerial Manipulators and Construction Industry.

UGC AUTONOMOUS

MOISTURE ENTRAPMENT IN SOIL SYSTEM

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ABSTRACT

Air entrapment refers to the phenomenon where air or gas is trapped within a liquid or solid material. An example to air entrapment is the Carbon capture, also known as carbon sequestration. It is a process that involves capturing carbon dioxide (CO₂) emissions from various sources, such as power plants and industrial processes by either reusing or storing it to prevent its release into the atmosphere. Air ensnarement in soil is normal in instances of farmland flood water system or serious downpour. A straightforward, genuinely based model would be more helpful than the complicated two-stage (vaporous and fluid stage) stream model to portray water penetration in layered soils with air capture. In current study moisture entrapment in a soil system is envisioned which refers to the process where water is retained in the soil voids. Soil system is designed to trap the water from the moisture content present in the atmosphere. This study will propose a Modified Green-Ampt Model (MGAM) to reproduce water penetration in layered soils with thought of entrapped air.

Keywords: Air entrapment, Moisture Content, Modified Green-Ampt Model and Soil System.



UGC AUTONOMOUS

STRENGTH CHARACTERISTICS OF HIGH STRENGTH CONCRETE DESIGNED USING BLENDED FORM OF ADMIXTURES

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ABSTRACT

Energy saving in building technology is among the most critical problems in the world. Thus it is a need to develop sustainable alternative to conventional concrete utilizing more environmental friendly materials. One of the possibilities to work out is the massive usage of high strength concrete to turn them to useful environmental friendly and technologically advantages cementitious materials. In the present study a concrete mix is designed such that it is characterized as a substantial heterogeneous material which uses squander material as no less than one of its parts, or its creation interaction doesn't prompt ecological obliteration, or it has elite execution and life cycle supportability. In order to create such concrete, Metakaolin and Ground Granulated Blast furnace slag (GGBS) are used to produce high strength concrete. The high strength concrete specimens with varying proportions of Metakaolin and GGBS were cast and tested for compressive strength for 7 and 28 days cured at ambient temperature. In order to know the durability of such concrete, sulphate attack test was carried out and compared to that of conventional concrete.

Keywords: High Strength Concrete, Metakaolin, Ground Granulated Blast furnace Slag and Sulphate attack



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EFFECTS OF COMPRESSIVE STRENGTH AND DIRECT TENSILE STRENGTH OF ENGINEERED CEMENTITIOUS SELF COMPACTING CONCRETE

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ABSTRACT

Self-Compacted Concrete (SCC) is a specialized type of concrete known for its ability to flow and fill formwork without the need for external compaction. In recent years, the use of supplementary cementitious materials, such as Silica Fume (SF) and Ground Granulated Blast Furnace Slag (GGBS), in combination with admixtures, has gained attention as an effective approach to enhance the mechanical properties of SCC. This research study aims to investigate the compressive strength and tensile strength of SCC using Silica Fume, GGBS, and admixtures. In this experimental study, different mix designs of SCC will be prepared, incorporating varying proportions of Silica Fume and GGBS. Admixtures will also be added to the mix to optimize workability and flow ability. The compressive strength and tensile strength tests will be conducted on the SCC specimens to evaluate the impact of Silica Fume, GGBS, and admixtures on these mechanical properties.

Keywords: Self Computed Concrete, Self Compacting Concrete, GGBS, Silica fume.



UGC AUTONOMOUS

DEVELOPMENT ON LIGHT WEIGHT CONCRETE USING PUMICE STONES AND MARBLE STONE POWDER

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ABSTRACT

Leaving on the waste materials to the climate straightforwardly can cause ecological issue. Consequently the reuse of waste material has been underlined. Waste can be utilized to create new items or can be utilized as admixtures so normal assets are utilized all the more proficiently and the climate is shielded from squander stores. Marble stone industry creates more strong waste which is harmful to climate. This undertaking makes sense of about the investigation of marble stone powder as complete substitution of fine aggregate in concrete, 10% and 20% of coarse aggregates substituted by utilizing pumice stones, by growing light weight substantial which has high water retention energy. The use of light weight concrete helps in reducing of self weight of concrete and which is easy to construct. Strength properties of light weight concrete by replacing aggregates with varying proportions of pumice stones and marble stone powder are compared with conventional light weight concrete. In order to attain durable concrete out of it, durability for this concrete will also be compared.

Keywords: Self weight, solid waste, Marble stones, Pumice stones.



UGC AUTONOMOUS

CRACK DETECTION IN CONCRETE STRUCTURES USING DEEP LEARNING

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ABSTRACT

This research paper presents a comprehensive AI-based methodology for crack detection and prediction of length, width, and depth using a Convolutional Neural Network (CNN). Leveraging image data of cracks and their corresponding depth measurements, the CNN model is trained and evaluated to accurately analyze crack dimensions. The proposed approach involves data preprocessing, model architecture design, and training, followed by thorough evaluation using regression metrics. The results demonstrate the effectiveness of the CNN in real-time crack detection and depth estimation, showcasing its potential for enhancing infrastructure maintenance and safety through non-destructive evaluation techniques.

Keywords: crack detection, convolution neural network, image processing, deep learning, damage detection.



UGC AUTONOMOUS

STUDY ON BONDING PROPERTIES OF RECYCLED CONCRETE ON FLEXURE BEAM STRUCTURE

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ABSTRACT

This paper reports on a research program designed to investigate the structural behavior of reinforced concrete beams prepared by replacing different percentages of natural coarse aggregates (NCA) with recycled coarse aggregates (RCA), sourced from tested concrete cylinders in Ready/Mix plants. One objective was to recycle and reuse the crushed concrete cylinders in the construction industry and mitigate its negative environmental impact. The variables were the percentage replacement of NCA with RCA [0(control), 40, or 100%] and the mode of failure of the tested beams (flexure, shear, or bond splitting of the concrete cover in the splice region). The significance of the study stems from the source of the recycled aggregates, the fact that the reported research covers the three structural modes in one program, and that all reported bond tests in the literature investigated the pullout strength of bars anchored in RCA specimens or bond strength of reinforcement in beam-end specimens rather than the actual bond splitting behavior of bars spliced in RCA structural beams. Experimental results showed minimum difference in the peak load and load-deflection histories attributed to the percentage replacement of NCA with RCA. Results were compared with theoretical values computed using the ACI Building Code and with results of few previous research programs. Moreover, nonlinear finite element models were built to validate the experimental test results. The experimental and numerical results were comparable.

Keywords: Recycled aggregate concrete (RAC), Sustainable materials, Reuse of waste products, Structural behavior, Numerical modeling.



UGC AUTONOMOUS

SELF STABILIZATION STRATEGIES OF RAILWAY TRACK

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ABSTRACT

India is having the second one largest network of railway within the world. It’s far the most likely transportation medium compare to other, therefore important of railway is increasing every day, due to which the duty of this sector is greater compare to other. The obligation comprises of comfort and protection, consequently the proper attention ought to accept to that elements. The traditional technique and method of creation aren't sufficient to avoid the problem like intense coincidence because of derailment, rail-failure, vibration and shocks from rail-wheel coaches-passengers. New methods adopted to minimize above mention trouble to a degree, that new method is call self stabilization strategies of railway track. Which aims to reduce or even eliminate the problem of ballast being de-compacted and dispersing under the action of vibrations set up by moving trains . In this project, both the track systems are tested for stability and compared further. The ballast in this system is laid on the track bed pre-compacted with constraining 'cages' that hold large amounts of ballast together. These cages or ballast elements are of several modular shapes, 'L' or 'T', etc., and is placed in interlocking ways on the track bed. The effect is not only to prevent the ballast from spreading under the action of vibrations, but to improve ride quality by changing the vibration characteristics since the inertial mass responding to the impact from the train is larger. A thin sheet of rubber or polyethylene between the sleepers and the top of the track bed further modifies the vibration characteristics. The ballast elements are constructed of such a shape that the vibrations tend to wedge them more firmly together. The expectation is that ballast maintenance will be much reduced for such tracks.

Keywords: Track misalignment, finding zone, solutions, type of failures and strategy.



UGC AUTONOMOUS

EXPERIMENTAL STUDY ON INFLUENCE OF GRANITE POWDER ON MECHANICAL PROPERTIES OF CEMENT MORTAR

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ABSTRACT

Solid waste management is a global challenge. Unwanted waste/material generated from granite processing industries is one of the major sources of total solid waste production. This project aims to study on recycling and utilizing the wastages and the impact of incorporating granite powder as a partial replacement in cement mortar on its mechanical properties. Based on the size distribution of granite powders is specified by the laser particle size analyzer, the study on the influence of granite powder on the mechanical properties of cement mortar will be carried out through the scanning electron microscopy (SEM) analysis. This study involves the tests to be conducted in preparing cement mortar mixes with varying percentages of granite powder are compressive strength of the cement mortar. The test result for the compressive strength of cement mortar with replacement rate of granite stone powders of 10% is the highest when the same particle size of granite stone powder is incorporated. When the replacement rate of granite powders is the same, the smaller the particle size of granite stone powder is, the higher the compressive strength of cement mortar is. When the replacement rate of granite powders is 10%, with the particle size ranging from 0 μ m to 45 μ m, the filling effect of the granite stone powder can be utilized.

Keywords: Granite Powder, Cement Mortar, Mechanical Properties, scanning electron microscopy.

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STUDY ON STRENGTH CHARACTERISTICS OF CONCRETE WITH TITANIUM DIOXIDE

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ABSTRACT

In today’s world one of the major problems is pollution. In order reduce the pollution we need sustainable solution this sustainability includes socio economical equity. and environmental protection. To achieve sustainable solution, these three issues must be solved. Titanium dioxide blended concrete is the most promising solution for this ever increasing problem. This concrete has the same structural properties to normal concrete but because of the presence of titanium dioxide in the concrete which removes the pollutants effectively. This solution provides a viable option to high traffic volume roads or areas. The smog absorbing or photo catalytic concrete acts as pollution reducer. It means which converts harmful pollutants into harmless pollutants. In our project we are making concrete blocks by adding the cement with titanium from 2% to 4% and we tested the blocks for compressive strength and smog absorbing test to know the number of pollutants absorbed by the concrete blocks by using Multi Gas Analyser machine and we compare the results with normal concrete. In our Project we are aiming to make a ‘Smog Absorbing Concrete’, which contains Titanium dioxide in addition to the conventional ingredients. Titanium dioxide is already commonly used to coat surfaces that are hard to clean -- it is a component in some paints because it functions as a selfcleaning chemical, meaning the new concrete has the additional advantage that it breaks down algae and dirt so its surface stays clean. The concrete is made up of traditional cement mixed with titanium dioxide. This unique mixture allows air to pass through while simultaneously capturing nitrogenoxide particles, a main component of smog. Titanium dioxide functions as a catalyst to the chemical reaction which is activated by UV light. Not only does it filter the air, but the collected smog residue washes off with a light rainfall.

Keywords: environmental protection.

The logo consists of a pink ribbon-like banner with the text "UGC AUTONOMOUS" in white, bold, uppercase letters. The banner is set against a background of a large, faint watermark seal of St. Martin's Engineering College, which includes the text "ST. MARTIN'S ENGINEERING COLLEGE" and "HYDARABAD" around a central emblem.

INTRICATE FEATURES OF GEOGRAPHIC INFORMATION SYSTEM FRAME WORK

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ABSTRACT

A geographic information system (GIS) is a computer system for capturing, storing, checking, and displaying data related to positions on Earth’s surface. By relating seemingly unrelated data, GIS can help individuals and organizations better understand spatial patterns and relationships. GIS can use any information that includes location. The location can be expressed in many different ways, such as latitude, longitude, address, or zip code. Many different types of information can be compared and contrasted using GIS. The system can include data about people, such as population, income, or education level. It can include information about the landscape, such as the location of streams, different kinds of vegetation, and different kinds of soil. It can include information about the sites of factories, farms, and schools, or storm drains, roads, and electric power lines. With GIS technology, people can compare the locations of different things in order to discover how they relate to each other. For example, using GIS, a single map could include sites that produce pollution, such as factories, and sites that are sensitive to pollution, such as wetlands and rivers. Such a map would help people determine where water supplies are most at risk. According to the GIS principle, we should be able to add new features to applications easily, but we should not introduce breaking changes to the existing code. GIS consists of mainly three components hardware, software, and data.

Keywords: Spatial data, vegetation, landscape, sites.

A red ribbon-style banner with the text "UGC AUTONOMOUS" in white, bold, uppercase letters. The banner is centered at the bottom of the page.

BAMBOO AS A BUILDING MATERIAL

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ABSTRACT

Bamboo is a renewable and versatile resource, characterized by high strength and low weight, and is easily worked using simple tools. It is widely recognized as one of the most important non-timber forest sources due to the high socio-economic benefits from bamboo based products. Bamboo is the world’s fastest growing woody plant. Bamboo grows three times faster than most other species. Housing is one of the priority items and sensing the current shortage of the dwelling units, the present administrative leaders around the world find it tough to hit upon a solution for. Apart from the other substances already in practice, bamboo appears to be the most promising material. Bamboo building construction is characterized by a structural frame approach similar to that applied in traditional timber frame design and construction. In this case, the floor, the wall, the roof elements are all interconnected and often one dependent on the other for overall stability. The use of bamboo for foundation is rather restricted. This is mainly due to the fact that like timber when in contact with damp ground, they deteriorate and decay very quickly unless treated with some very effective preservatives. The most extensive use of bamboo in construction is for the walls and partitions. The major elements, the posts and beams, generally constitute part of structural framework. The roof offers protection against extremes of weather including rain, sun and wind, and to provide shelter, clear and usable space beneath the canopy. Above all it must be strong enough to resist the considerable forces generated by wind and roof coverings. In this respect, bamboo is ideal as a roofing material- it is strong, resilient and light weighted. Bamboo will continue to play an important part in the development of enterprises and the transformation of rural environments.

Keywords: Flattened Bamboo, Composite Bamboo, Corrugated Sheets.



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SEWAGE TURBINES: HYDROPOWER OPPORTUNITIES FROM TREATED SEWAGE WATER

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ABSTRACT

Urban Migration is one of the principle reasons for generation of large volumes of sewage water, which has led to the establishment of numerous Sewage treatment plants, based on the nature, and source of generation. Wastewater treatment processes are energy intensive and account to nearly 20% of the total power consumption. Hence it becomes imperative to determine an alternative, cost effective and sustainable way for reducing the power consumption. Sewage Treatments plants can be considered to be a source of renewable energy, which can be harnessed to produce Hydropower. Major Explorations have been made in Micro hydropower generation, giving an overall view for utilizing/converting Municipal sewage water into a primary source of energy, with comparison of the materials and the instruments that can be used for its installation, the advantages and disadvantages of its installation, however showcases a theoretical case study, with design of its components, along with cost-benefit ratio. This project attempts to explore the opportunities of hydropower from treated sewage water, through performance evaluation by comparative studies of fresh water and different stages of treated water, and to estimate the maximum power that could be generated through prototype construction.

Keywords: Urban Migration, Sewage treatment plants, Hydraulic Parameters.

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FLOOD CONTROL MANAGEMENT

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ABSTRACT

The various aspects related to water resources engineering are discussed. Water resources engineering includes hydrologic, groundwater and hydraulic analysis of the planning and design of remediation, flood control, and water supply. It also includes different types of hydraulic structures, surface and ground water flow, environmental impacts, and quality monitoring. The engineering discipline also includes fluid mechanics, open channel hydraulics, sediment transport, and water supply systems. The world is changing rapidly. This is also the case for the water industry, which has adapted to increased population pressure, lack of finances, and climate change. Traditional water resources engineering solutions are often expensive and unsustainable for many case studies. Therefore, there is considerable pressure on industry and academia to develop sustainable water management strategies and technologies.

The basis of water resources engineering is a good understanding of applied hydrology. The recognition that droughts and floods will put more strain on society should motivate engineers to find alternative sustainable solutions to wastewater treatment and recycling. Recycling of wastewater such as urban water will certainly help to address water shortages in agriculture. The challenge is to produce crops that require less water and do not pose any health risks to the public and animals. On the other hand, new strategies to learn to live with flooding need to be developed. It must be recognized that watercourses have multipurpose usages, and that stakeholders must share these resources more in the future. The same is the case for smaller water bodies such as ponds in urban areas. An integrated approach to urban water management is likely to benefit society in the long-term.

Keywords: Flood Control, Ground Water, Hydraulic Structures, Water Management, Increased Population Pressure, Climate Change.

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SILICA FUME AS PARTIAL REPLACEMENT OF CEMENT IN CONCRETE

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ABSTRACT

In the recent past, there have been considerable attempts for improving the properties of concrete with respect to strength and durability, especially in aggressive environments. High performance concrete appears to be better choice for a strong and durable structure. A large amount of by-product or wastes such as fly-ash, copper slag, silica fume etc. Are generated by industries, which causes environmental as well as health problems due to dumping and disposal. Proper introduction of silica fume in concrete improves both the mechanical and durability characteristics of the concrete. This paper present literature review on replacement of Cement by Silica Fume which includes current and future trends of research.

Keywords: Silica fume, Cement, Pozzlanics.



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DAM BREAK AND FLOOD ANALYSIS AT SOFTWARE APPLICATION FOR SUSTAINABLE WATER RESOURCES MANAGEMENT

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ABSTRACT

In Dam Break analysis provides the generating the flood inundation maps of Umrar dam and its downstream. Flood inundation maps utilized to protect against the loss of life and property damage from maximum flood. The hydrologic engineering centre’s river analysis system (HEC-RAS) can be used to develop a dam failure mode. For extract geometric information from digital terrain modes Google Earth Explore is used and then imported in to HEC-RAS used for the unsteady flow simulation of dam break is performed and results are mapped in the ARC-GIS. In this thesis inundation mapping of water surface profiles provides a preliminary assessment of the flood hazard. The process of gathering data and preparing data and analysis of unsteady flow model in HEC-RAS, entry of dam breach parameters, performing the failure analysis and flood mapping in ARC-GIS is discussed. This Thesis mainly provides an overview of the methods used to predict the breach outflow hydrographs with a detailed case study of “Umrar dam” using HECRAS software. This Dam breaks are analysed for failure with comparison of the hydrographs at different downstream locations by changing its breach parameter using HECRAS. The parameters describing a breach are typically taken to be the breach depth, width, side slope and breach formation time.

Keywords: Dam Break, RAS Mapper, HEC-RAS, Inundation Mapping, DEM

UGC AUTONOMOUS

USE OF GEOSYNTHETICS IN ROAD CONSTRUCTION

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ABSTRACT

Geo textiles, which is now an effective engineering technology, has acquired wide spread applications in pavement construction. Geo textiles are most widely used under paved and unpaved roadways, and this is referred to as the application of separation / stabilization. In addition, geo textiles used in paved and unpaved roads provide many advantages: separation, stabilization, strengthening and filtration. Road and railway stabilization is the use of geo synthetic reinforcing elements to strengthen the ground in order to work on very soft and weak ground in the construction of asphalted or unpaved vehicle roads and rail systems. The geo synthetics increase the performance and design life of highways and railway construction structures in applications such as geo grids, roads, railways, airports and other earth works with poor ground strength. Geo synthetics offer a much higher value than traditional road construction products and the fast, simple installation process greatly reduces the construction process. On highways, geo synthetics are placed on the weak base floor before the geo synthetic granular substrate is placed. Geo synthetics protect the Structural integrity of the slab and prevent the granular sub-base material from slipping into the weak substrate. The use of geo synthetics extends the maintenance requirement of the flooring that is built on the weak sides of the road.

Keywords: geo textiles, engineering, geo synthetics, filtration, strength, construction.



UGC AUTONOMOUS

RAINWATER HARVESTING AND WATERWASTE REUSE IN PERI-URBAN AREAS

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ABSTRACT

Over the past decade, approaches to improve urban water cycle management have included water-saving devices inside the home, the use of rainwater tanks, reuse of treated wastewater and water sensitive urban design (WSUD) principles to manage stormwater runoff. When several integrated water cycle management (IWCM) options are implemented in unison at an allotment-scale, various levels of mains water savings, wastewater flow reductions and stormwater runoff reductions can be obtained. However, few studies in the literature have evaluated the impacts of implementing wastewater options for a non-sewered area already using rainwater tanks and onsite septic systems discharging to the environment. These scenarios are typical of peri-urban communities existing near sensitive coastal/estuarine environments. This investigation primarily reports on wastewater reuse options being introduced to a non-sewered area already using rainwater tanks and onsite septic systems. The PURRS (Probabilistic Urban Rainwater and wastewater Reuse Simulator) (Coombes, 2002) model was utilised to continuously simulate demand management (water saving devices) and the performance of rainwater harvesting and wastewater reuse to explore the reductions in rainwater tank demand, wastewater discharges and stormwater runoff that occur at an allotment-scale. This study highlights how the introduction of wastewater reuse in the study area significantly decreases wastewater flows from the allotment, increases stormwater runoff volumes from the allotment and reduces the efficacy of existing rainwater harvesting systems at the allotment-scale. Significant variations in the efficacy of rainwater harvesting were observed when increasing levels of wastewater reuse were simulated, highlighting the importance of maximising use from the rainwater tank to optimise rainwater harvesting potential, particularly in moderate to high rainfall areas. This is an important insight into the fundamental paradigm of integrated water cycle management.

Keywords: Storm water, Septic systems, Allotment-scale, Harvesting potential.

EXPERIMENTAL STUDY ON BACTERIAL CONCRETE WITH PARTIAL REPLACEMENT OF CEMENT BY FLYASH

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ABSTRACT

One of the most common problems developed in concrete is about cracks. Cracks are unavoidable in concrete and make the concrete elements weak. Cracks allow water and other salts to seep through them and make the concrete weak and reduce the life of concrete. Corrosion of steel due to salts weakens the reinforced concrete in tension as well. So there is need to develop the methods for curing the cracks and regaining the strength of concrete structures. Currently synthetic polymers can be used to repair the cracks which are harmful to environment which lead to develop biological treatment techniques. In this study, a biological repair technique was used in which bacteria of 10⁵ cells/ml were mixed with concrete to heal the cracks. The experiments were carried out to evaluate the effect of Bacillus subtilis on the compressive strength, Tensile strength and Flexural test for 3, 7 and 28 days. In addition to above technique flyash was partially added in the place of cement. The flyash (0, 10 and 30%) was added by weight of cement in concrete mix and experiments were carried out. The experimental results show that 10 % fly ash replaced concrete with and without bacteria has more strength when compared to the conventional concrete.

Keywords: flyash, synthetic polymers.

UGC AUTONOMOUS

RAILWAY TRACK SUBSTRUCTURE FAILURE

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ABSTRACT

Railway engineering-related topics have been addressed by many studies, but there is a paucity of research focusing specifically on railway track substructure failures. Through adopting a systematic literature review (SLR) as the main methodology, this paper conducts an investigation and presents a review of selected published research about railway track substructure failures. We start by giving a brief about track substructure, categorizing the track substructure components, and its widely accepted functionality in the railroad industry. Key substructure failures are identified through critical examinations. The paper then investigates the nature of the occurrence of identified substructure failures together with an assessment of their probable causes. In addition, practical evaluation approaches and remedial techniques of the failures are identified together with any advancement in the evaluation and remedial procedures either in the laboratory or field setting. The paper concludes with recommendations that include encouraging future work to fully develop a cause-and-effect diagram and criteria of the occurrences track substructure failures and to improve track drainage for improved functionality of sub-ballast and subgrade.

Keywords: Railway track, Railway substructure, Ballast failures, Sub-ballast failures, Subgrade failures, Track failures.



UGC AUTONOMOUS

TERRACOTTA AIR CONDITIONING

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ABSTRACT

In India heat waves are common throughout the summer and in much of the nation, going outside in the sun will result in sunburn. It is common for temperatures to reach 40 degrees Celsius. Because of this, it is challenging for people to tolerate the intense heat. If the heat from the sun is insufferable, picture getting fried during the hottest month of the year. So our project Terracotta air conditioning is an economical solution for such crisis. The beehive's structure served as the basis for this design. Beehive's structure developed a method that is both practical and aesthetically pleasing at the same time by using eco-friendly materials to build an artistic work of art. The cone structures are arranged in a desired pattern to fulfill bee hive structure for a greater surface area and a greater cooling effect, cylindrical cones are used. In addition to being creative and environmental friendly, the solution uses traditional artisan techniques. Using porous terracotta and its innate cooling capabilities it enables a low maintenance, affordable and sustainable option by transforming the hot air from the generator set into a nice breeze. This installation not only provides the solution in the simplest possible way, but it also offers a scalable and practical alternative that may be viewed as an artwork. The installation can also be made into a zero-energy prototype. It is a versatile and scalable module. It can be altered to fit specific requirements as an art installation. There are several factories all around the nation that have comparable DG set problems and need such homegrown, environmentally friendly solutions.

Keywords: Beehive's structure, eco-friendly, porous terracota.



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ABOUT CONFERENCE

International 3rd Conference on “Revolution Technology in Civil Engineering” (ICRTCE-2023)” will be organized by Department of Civil Engineering, St.Martin’s Engineering College, Secunderabad, Telangana, India on 15th & 16th December, 2023. ICRTCE-2023 will serve as a colloquy for sharing the proficiency among academicians, researchers, scientist and industrial personnel from all over the world in the areas of engineering and technology.

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