ICCSDC-2021

International Conference on *"Computing for Sustainable Development in Civil Engineering"*

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on 24th & 25th June 2021

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Editor in chief
Dr.P.Santosh Kumar Patra

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Departments of Civil Engineering

Online "International Conference on Computing for Sustainable Development in Civil Engineering" during 24th & 25th June 2021 (ICCSDC – 2021)

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Sri. M. LAXMAN REDDY
CHAIRMAN

MESSAGE

I am extremely pleased to know that the Departments of Civil Engineering, of SMEC is organizing Online **"International Conference on Computing for Sustainable Development in Civil Engineering"** during 24th and 25th of June 2021. I understand that the large number of researchers has 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

M.LAXMAN REDDY
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Sri. G. CHANDRA SEKHAR YADAV
EXECUTIVE DIRECTOR

MESSAGE

I am pleased to state that the Departments of Civil Engineering of SMEC is organizing Online **"International Conference on Computing for Sustainable Development in Civil Engineering"** during 24th and 25th of June 2021. 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 there are 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.

G. CHANDRA SEKHAR YADAV
Executive Director

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Dr. P. SANTOSH KUMAR PATRA
PRINCIPAL

I am delighted to be the Patron & Program Chair for the Online **"International Conference on Computing for Sustainable Development in Civil Engineering"** organized by the Departments of Civil Engineering on 24th and 25th of June 2021. I have 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 a plethora of future developments in the field of Civil Engineering.

The Conference aims to bring different ideologies under one roof and provide opportunities to exchange ideas, to establish research relations and to find many more global partners for future collaboration. About 200 research papers have been submitted to this conference, 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 inmaking the conference a reality.

(Dr. P. Santosh Kumar Patra)
Principal

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CONVENER

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

The aim of the online **"International Conference on Computing for Sustainable Development 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 200 papers have been received for presentation during the online conference. After scrutiny by editorial board 147 papers have been selected, and the authors have been informed to be there at the online platform for presentations. Steps have been 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 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 is moving towards a grand success with the untiring effort of Head of the department, faculties and staff members of SMEC and with the blessing of the Principal and Management of SMEC.

Prof. Sandhya Kiran J.K
Convener, ICCSDC-2021
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Abstract Proceedings of Online "**International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021**

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Characterization of GFRP Material

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ABSTRACT

Glassfibre Reinforced Polymer (GFRP) composite materials have developed economically and structurally viable construction materials for buildings and bridges over the last 20 years. FRP composite materials used in structural engineering typically consist of glass, carbon encased in a matrix of epoxy, polyester, vinyl ester thermosetting resins that have fiber concentrations greater than 30% by volume. They have been used in structural engineering in a variety of forms: from structural profiles to internal reinforcing bars for concrete members to strips and sheets for external strengthening of concrete and other structures. Depending on the form of the FRP product used in structural engineering, the FRP material is supplied either as a ready-to-use structural component such as a wide flange profile or a reinforcing bar or it is supplied in its constituent forms as dry fiber and liquid polymer resin and formed and cured in situ to create a structural component.

Keywords: Reinforcing fibres, Polymer resigns.

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CNN Based Crowd Monitoring and Management System Analysis and Performance

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ABSTRACT

Crowd monitoring and management system (CMMS) is very important for the protection of public place. Developing a strong CMMS is a task full of many challenges as distribution of irregular object. currency estimation, density variation, occlusion etc. The crowd accumulates in various play as Park, Airport, stadium, Hospital, religious and cultural points. Mostly crowd are monitored by CCTV cameras. The CCTV cameras are having Installation proem, high power consumption, Limited coverage area, moving and continue monitoring resource. Therefore, many researchers have turned towards machine learning and computer vion issues for monitoring and management in crowd. The paper provides different machine learning methods and techniques for crowd monitoring and crowd management.

Keywords: Crowd Management, Crowd Monitoring, Crowd Density, Crowd Counting, Crowd Behaviour, Convolutional Neural Network.

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Feasibility Study on Tuned Mass Dampers Surrounded by Fluid Media in Structures Subjected to Excitation

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ABSTRACT

Dynamic excitation, such as seismic and wind loads, is a concern for modern-day structures. High-rise buildings when exposed to strong earthquake or wind forces, experience large induced acceleration causing extreme vibration-related problems. Over the decades, one of the most effective displacement control measures used is Tuned mass dampers (TMD). TMD is used to limit the magnitude of oscillation to permissible limits. But in many instances, the displacement undergone by the tuned mass dampers itself exceeds permissible limits and the confines of its enclosure. To limit displacements, secondary dampers are used. In this research, an experimental study to assess the frame structure with tuned mass dampers surrounded by different fluid media is done. The fluid media would act as a replacement to conventional secondary dampers (Inerter) for the tuned mass damper. The objective of the study is to establish the relationship between the behaviour of the frame structure and the tuned mass dampers surrounded with fluid. It was found that the TMD surrounded by liquid (water and oil) media can be effective in mitigating the vibration of that structure considerably and also increases the damping capacity of the structure. The frame structure subjected to harmonic excitation and with a tuned mass damper has a maximum percentage reduction of 68.68% and 63.56% for water and oil respectively in Fourier amplitude. The frame structure subjected to arbitrary excitation and with a tuned mass damper has a maximum percentage reduction of 69.47% and 73.42% for water and oil respectively in Fourier amplitude.

Keywords: Tuned Mass Dampers, Inerter, Fluid Media, Passive Vibration Control, And Arbitrary Excitation.

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Secondary Flow Effect in Discharge Prediction for Smooth and Rough Open Channel Flow

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ABSTRACT

Secondary flows are considered as an important aspect in river engineering. Secondary flows are commonly present in open channel flows and create complexity in flow prediction methods. Secondary flow are generated and modified due to the anisotropy of turbulence, caused by the boundary conditions of the bed, side wall and the free surface, as well as the aspect ratio of the cannel. The secondary flows have less contribution to the total flow as compared to the primary flow but producing three dimensional flow structures. Experimental investigations have been performed in a tilting flume, to perceive the influence of secondary flow in channels having smooth and rough boundaries at Hydraulic Engineering Laboratory, NIT, and Rourkela. Various flows are sampled using three dimensional Acoustic Doppler Velocimeter (ADV). The turbulence intensifies over rough bed surfaces and inhibit over smooth surfaces. The sign of secondary flow, Γ, will be demonstrated from the location and rotation of the secondary current cells. The variations of this secondary flow structure across the cross channel distance for each flow depth and roughness have been observed. In this paper, mathematical relationships have also been developed for accurate estimation of secondary flow coefficients for constant and variable flow depth domain of an open channel flow under different flow and geometry conditions which cover the ranges of Reynolds number from 8923 to 3.69×10^3 and aspect ratio ranging from 2.13 to 30.61.

Keywords: Secondary flow, secondary current cells, depth averaged velocity, boundary shear stress

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Develpoment of Thematic Maps Using GIS Showing Contamination of the Environment due to Solid Waste Dumping at Jawaharnagar Dump Yard, Hyderabad, Telangana

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ABSTRACT

Jawaharnagar Dumping Yard has been causing great inconvenience to the locals in and around Jawaharnagar. GHMC generates 5,500 to 6,000 metric tones of waste per day which is dumped at 135-acre dumping yard. It is polluting the soil, air and groundwater. To analyze the extent of the problems being caused due and to estimate its impact on the environment and illustrate the pollution levels accumulated in the groundwater, and the loss of soil fertility Thematic Maps using ArcGIS software have been developed. The pollution can be controlled by developing a sustainable mechanism for processing waste.

Keywords: Geographic Information System (GIS), ArcGIS, Landfill Capping, Leachat

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Experimental Study on Mechanical Properties of High Strength Reinforced Concrete Using Mineral Admixtures

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ABSTRACT

High strength concrete is used in the construction in recent days due to rapid developments this is done by replacing ordinary Portland cement by mineral admixtures and super plasticizer that is Master Glenium. Mineral admixtures are used to replace the cement content in the mix. Chemical admixtures used to decrease the water content in the concrete such that its workability is improved even at low water cement ratio and increase the compressive strength of concrete. In this investigation M_{100} grade concrete mix is designed by adding s. The specimens are tested for compressive strength, split tensile strength, flexural strength at 7, 28, 56, 90 days and the obtained results are compared with that of the normal concretes.Based on experimental values, it is clearly identified that all the mixes were obtained target mean strength. Among this the mix of concrete that was added by alccofine with robo sand combination is has got 22% higher values than the target mean strength at the age of 28 days. Mechanical parameters like split tensile strength, flexural strength and compressive strength are also increased slightly.In this project work, s of polypropylene was also used. Concrete is weak in tension so to overcome this fault s are added to the concrete can increase the tensile behaviour of the concrete beam. Experimental data shows that using content from 0.5% to 1% can increase all mechanical properties but using more than above mentioned content will leads to decrement of strength parameters.

Keywords: High Strength Concrete, Split Tensile Strength, Flexural Strength, Compressive Strength, Target Mean Strength, GGBS, Alccofine, Micro Silica

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Evaluation of Electro Coagulation and Reverse Osmosis Process in The Removal of Dye From Plastic Waste Water

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ABSTRACT

Electrocoagulation (EC) is a powerful and environmentally friendly technology for the treatment of plastic dye, reactive dyes and etc, EC is one of the attractive methods for treating waste water because it is simple, economic and less sludge production technology. DC current is to be supplied for the treatment of the water. Different cathodes and anodes are to be used in the process. Effects of various operating parameters like pH, the nature of water, plastic dye concentration, initial concentration of water, density of water, exposed area of electrodes, material of electrodes, temperature of solution and their optimum ranges for dye removal from the waste water are different parameters which decide the current to be induced for the water treatment and the plastic dye removal from the water. Technological advancements have resulted in a greater water demand by various industries. In addition, there is an increase in quantum of waste water, with diversified pollutants generated and discharged from these industries.

Keywords: Electrocoagulation, pH, plastic dye concentration

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Effect of Crack Propagation of Corroded Steel in Concrete

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ABSTRACT

Concrete has been proved to be a vital element in the construction field since majority of the construction industry involves design of reinforced concrete structures to accommodate with the convenience of every sections of human habitants and the materials of which is easily and widely available in the market. Reinforced concrete members are made up of three main ingredients: coarse aggregate, fine aggregate, and cement. Corrosion is similar to cancer for the reinforced concrete structure because it degrades reinforcement which affects its strength, life span. Because of corrosion, the rust product formed in the surrounding zone of reinforcement occupies a larger volume leading to a development of tension cracks in that zone leaving behind a reason for sudden collapse or menace to the structure. Different type of concretes need different type of precaution depending upon the climatic and material factors. As time and load increase, durability of structure decreases because of the action of salts, climatic condition, corrosion etc.

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Bearing Capacity of Reinfforced Layered Soil Bed with Inclined Reinforcement

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ABSTRACT

In general, Geosynthetic reinforced soil bed consists the reinforcement in the form of horizontal layer(s). The reinforcement restrains the tensile strain developed in soil by interfacial friction between the reinforcement and surrounding soil limited to its own tensile strength. This paper presents analytical and experimental investigation to study the effect of inclined reinforcement on bearing capacity of layered soil bed. To study the effect of inclined reinforcement on bearing capacity of soil, model tests were conducted with square footing resting on a reinforced CNS soil bed as the top layer and homogeneous soft clay soil as the bottom one. The CNS soil bed is reinforced with geotextile by placing inclinedly downward from the edges of the footing and the inclination of reinforcement varied from 0° to 15°. A parametric study has been carried out with different inclinations of reinforcement, lengths of reinforcement and unit weights of CNS soil bed. The effect of inclined reinforcement results in increased bearing capacity of soil bed and the comparison of results was good in agreement.

Keywords: Reinforced foundation bed, bearing capacity, horizontal and inclined geosynthetic reinforcement.

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Comparison of Test Results of Pervious Concrete with Silica Fume and Polypropylene Fiber

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ABSTRACT

Pervious concrete is a unique kind of concrete with high porosity. That reduces the water runoff particular site and promote to ground water recharge. In this project Silica Fume (S.F) be used in percentages as (0.5%,5% and 10%) the mechanical properties were studied. Moreover, (0.05%, 0.1% and 0.15%) are the proportions of polypropylene fibers (P.P.F) by volume, which used to improve the pervious concrete mechanical properties. To study the physical and mechanical properties of hardened concrete containing compression strength, flexural strength and split tensile strength

Keywords: Porous concrete, Silica fume, Polypropylene fibers, MIX proportion, Flexural strength, Compressive strength, Split tensile strength.

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A Study on Enhancement of Shear Capacity of Slab-Column Joint in RCC Flat Slab Building

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ABSTRACT

The need for beam-less space structures has been increasing globally in recent times, to meet this demand a new construction method is being popularly used known as Flat slab. The height of a multistorey building is reduced by providing flat slabs to the maximum possible extent. Flat Slab has many advantages like easier formwork, more space to occupy, and shorter duration for construction. To construct a commercial building mostly flat slabs are economical when compared to conventional slabs. In this present study, an attempt was made to enhance the shear capacity of the slab-column joint by the provision of shear reinforcement. The analysis was performed on Reinforced Concrete Flat Slab-Column Connections with shear reinforcement using Finite Element Analysis (FEA) package ANSYS in accordance with IS Codal provisions. Three Interior Flat Slab-Column Joints were modelled and analyzed in which, one slab was without drop and shear reinforcement and the second was with drop and without shear reinforcement and the third was without drop and with shear reinforcement. Similarly, six more Flat Slab Column joints were modelled and analyzed at Exterior and Edge positions. The analytical results obtained indicated that the provision of Slab drop and shear reinforcement enhances the shear capacity of the Flat Slab-Column Joint at all positions. It was also observed that provision of shear reinforcement significantly improved the shear capacity compared to Slab drop.

Keywords: Flat Slab, slab column Joint, ANSYS

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Study on Strengthening of RC Beam Using FRP Sheet

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ABSTRACT

In this project, we are going to construct a beam and wrap FRP (fiber reinforced polymer) sheet to the beam by using epoxy resin as bonding material. This project provides a more economical and technically superior alternative to the traditional techniques in many situations as it offers high strength, low weight, corrosion resistance, high fatigue resistance, easy and rapid installation and minimal change in structural geometry. Although many in-situ RC beams are continuous in construction, there has been very limited research work in the area of FRP strengthening of continuous beams and simply supported beams.We are using FRP sheet as the external bonding agent for maximum utility of the beam .This FRP sheet is easily obtained and budget friendly to the construction process.

Keywords: FRP (fiber reinforced polymer), corrosion resistance, FRP sheet.

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Experimental Investigation on The Strength Properties of High-Performance Concrete Using Metakaolin, M Sand and Puverized Fuel Ash

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ABSTRACT

Concrete is the most commonly used construction material in the world. The introducing of mineral admixtures in cement has gradually increased as due to advancement in concrete industry, as due to concern of cost saving, energy saving, environmental safety and maintenance of resources. However, environmental concerns both in terms of damage by extraction of raw materials and carbon di oxide emission during cement manufacture have brought pressure to reduce the cement consumption by the use of supplementary materials. High Performance Concrete (HPC) is the latest development in the concrete. It has become more popular these days and is being used in many prestigious projects. Study has been carried out to assess the strength properties of HPC by replacement of cement by Metakaolin with three proportions that is 0%, 10% and 20% Natural Sand by M-Sand (Manufactured Sand) by six proportions that is 20%, 40%, 60%, 80% and with same aggregate binder ratio of 2.5 and various water binding ratios of 0.30, 0.35 and 0.40 evaluating its compressive strength, split tensile strength. Metakaolin used as a partial replacement of cement which was treated as an economical and due to its pozzolanic action increases strength and durability properties of concrete. Pulverized fuel ash is waste material from quarry industry not disposed properly in to the land used in the concrete replaced for the sand. The test results obtained indicates that M-Sand of marginal quantity as the partial sand replacement has beneficial effects on the mechanical properties.

Keywords: Manufactured Sand, Metakaolin, pulverized fuel ash, Super Plasticizer, Strength properties, High performance concrete.

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Experimental Investigation on Organosilane Treated Oil Palm Kernel Shell as a Partial Replacement of Coarse Aggregates

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ABSTRACT

This project reports on compressive strength of concrete an experimental program to investigate the effect oil palm kernel shell and Fly Ash. Oil palm kernel shell is used as material for replacement of coarse aggregate in concrete and constant proportion Fly Ash is used as material for replacement of cement in concrete. In this work, concrete grade M30 was used and IS method was used for mix design. The properties of material for cement, fine aggregates, coarse aggregates and oil palm kernel shell were obtained by material testing and mix design. The compressive strength was studied for various replacements of coarse aggregate by oil palm kernel shell in proportions of 0%, 10%, 20%, 30% and 40%. The Fly Ash was constant proportion 5% by weight of cement. The test was carried out to obtain a characteristic strength of 30N/mm^2.The compressive strength was obtained at 7, 14 and 28 days. The maximum compressive strength of concrete was attained 30% replacement of coarse aggregates at 7,14and 28 days. When 5% of Fly Ash was added maximum compressive strength was obtained.

Keywords: Oil palm kernel shell, Fly Ash, Compressive Strength.

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Study on Strength of Laterite Soil Using Bitumen Emulsion and ESP, CSA (Egg Shell Powder and Coconut Shell Ash)

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ABSTRACT

The civil engineers must study the properties of soil, such as its origin, grain size distribution, and ability to drain water, compressibility, shear strength and load bearing capacity. The civil engineering proposes the soil is unboned (un-cemented) material. The foundation of structure is most important of entire structure. The foundation must have more strength to support the entire structure. The stability of the structure of depends upon the soil which one is used as the foundation. Therefore, the sub-grade soil normally replaced with stronger soil which is not economical. In this project an attempt has been made to increase the soil strength by adding the various admixtures which are available like egg shell powder and coconut shell ash replacing the soil. In this project we had made an attempt to find out the comparative results of various strength increasing tests on laterite soil by using the admixtures bitumen emulsion and also egg shell powder and coconut shell ash. The admixture bitumen emulsion is added at 5%, 10%, & 15% proportions. Similarly egg shell powder and coconut shell ash are also added at the same proportions. The initial strength of the laterite soil is determined through various tests like Sieve Analysis, Plastic Limit, Liquid Limit, Specific Gravity, Compaction, Unconfined Compression, California Bearing Ratio and Direct Shear tests. The same tests have been conducted with laterite soil added with bitumen emulsion and laterite soil added with egg shell powder and coconut shell ash. The results obtained are then compared with initial laterite soil and laterite soil added with admixtures.

Keywords: Laterite soil, admixtures, shear strength, California bearing ratio, Compressibility.

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Experimental Study on Super Plasticizer and Water Based Curing Compound

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ABSTRACT

This paper presents the results of an experimental research on the workability and compressive strength of ordinary and standard concrete. Superplasticizers are commonly known as High Range Water Reducers (HRWRs) because it permits low water cement ratio as well as the workability also affected. In this paper the properties of concrete mixtures with three different do sages of superplasticizers SNF have been investigated.In this experimental programme super plasticizer fosracconplast 430 wp of basically modified naphthalene/melamine formaldehyde sulphonate dispersion and having brown liquid confirming to IS: 9103- 1999 &IS: 2645, ASTM C 494/C494M, Type F has been used. The properties investigated are workability on the fresh state and compressive strength on the hardened state of concrete byusing three mixes with three superplasticizer dosages (0.8%, 1% ,1.5%and 2%) is used. concrete mix M-20 by IS10262:2009,Concrete Mix Proportioning-Guidelines.Compressive strength at 7,14 and 28 days was also determined. The graphs between different percentage of superplasticizers with W/C ratio and compressive strength are plotted. Overall 16 specimens (concrete cube) with the dimension of 150 mm x 150 mm x 150 mm were fabricated atlaboratory.The effectiveness of water-based curing compound (WBCC) applied to concrete surface at different elapsed time from casting on the various properties of OPC, silica fume (SF) and flyash (FA) concrete. It also signifies the importance of utilizing moist curing prior to applyingWBCC. A series of OPC cylindrical concrete specimens made with a constant water-binder ratio of 0.50 were prepared. For the first series ,the casting surfaces were sprayed with WBCC after various elapsed periods from casting, 1, 2, 3, 4,24 hrs, while, for the second series, the casting surfaces werepre-cured with water for1,3and7days prior to the application of WBCC. The third and four the series of samples were exposed to air and water curing regimes, respectively, until the age of testing (28 days). Various test techniques, namely strength, hardness, capillary absorption and porosity, were applied on the series of samples to assess their mechanical and durability related properties. It was found that the efficiency of WBCC is significantly dependent on the time of its application, used blending material, period of pre-water curing specified prior to its application and considered property of concrete.Increasing the time of application of WBCC from casting can lead to diminishing the possible positive effect of using suchregime of curing

Keywords: Silica Fume, Sorpivity, Micro structure of Concrete, Admixture Modified Poly Carboxylate Concrete

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A Review Paper on Porous Concrete as Multipurpose and Endurable Pavement

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ABSTRACT

Porous Concrete (PC) pavements have gained much attention in recent years due to various advantages they contribute, especially in urban areas. They can make less severe the water and air environmental effects caused by conventional roads and increase driver safety. Nevertheless, consistent with these research results, their use remains limited since preliminary studies address them comprehensively, mainly due to the shortage of awareness about their potential benefits. Therefore, this paper reviews the essential properties of PC mixture that gives designing multipurpose and endurable pavement. To this end, the research works carried out during the last decade (2009–2018) on this topic were analyzed in detail for knowing areas where they are widely studied, analyzed, and predicted their potential future developments. One hundred seventy-one publications within the topic were found in the Scopus database, where hydraulic capacity and mechanical are the two main properties studied in PC pavements, 41% and 36%. In Continuation to this additional, a predicted growth for 2019–2030 is 2.53 % (4.30 PC publications per year) expected.

Keywords: Porous Concrete Pavement, Skid resistance, Heat island mitigation, Sustainability, Sound absorption

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Seismic Behavior of Flat Slab Buildings Resting on Sloping Ground a Comparison Between Theconventional Building to Flat Slab Building

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ABSTRACT

Construction of RC framed buildings onhill slopes has a popular and pressing demand, due to itseconomic growth and rapid urbanization. Since there isscarcity of plain ground in hilly areas, it obligates the construction of buildings on slopes. On other hand innovative construction technology such as flat slab building, it is more popular in the recent time constructionindustry due to rapid increasing urbanization and attract to provide more use of space, easier form work and shorter construction time. However, past earthquake studies show that many buildings with flat slabs building have per formed poorly on plain ground because of more flexible for lateral loads thentraditional RC frame system and that make the system more vulnerable under seismicevents. The flat slab building in sloping ground or hillyarea may be lack of resistant to resist lateral forces. Thisstudy can helpful to understand the seismic behavior offlat slab building in hillyarea, threemodels of three-dimensional G+3building selected. In this paper, a comparative analysis can be done between conventionalbuilding to the flat slab building for G+3 RC building at an angle 0^0, 5^0, 10^0, 15^0. The main objective of the present work is to compare these is mic behavior of G+3RCbuildings having conventional RC frame and flat slab withand without drop and also study the effect of the slope ofbuilding. The response spectrum analysis is carried outforseismiczone-5andlineardynamicanalysisfordifferent earthquake ground motion is carried out andcomparesitsresponses.

Keywords: Flat Slab, Conventional frame, ETABs, Linear dynamic analysis, Earthquake ground motions.

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Effect of Shear Walls on Seismic Analysis of a Multi-Storeyed Building Resting on Sloping Ground

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ABSTRACT

In the present scenario, most of the buildings are often constructed on sloping ground due to increase in population and expansion of cities and lack of plane ground. The behaviour of building during earthquake depends upon distribution of stiffness and mass in vertical and horizontal planes, both of which vary in case of building resting on sloping ground. These buildings situated on hill slopes in earthquake prone areas are generally irregular, torsionally coupled and hence susceptible to severe damage when affected by earthquake ground motion. The shorter columns in such buildings attract relatively higher magnitude of forces when compared to the longer columns when subjected to earthquake. These unsymmetrical buildings require great attention in the analysis and design. In this thesis, seismic analysis of a 10 storeyed RC framed building resting on sloping ground model is carried out. Seismic response of the building is carried out using Linear Static Analysis and Linear Dynamic Analysis (Response Spectrum Method and Time History Method) using a commercially available finite element software. The scope of the project includes comparison of the RC framed building resting on plane ground and building resting on sloping ground with and without provision of two lateral load resisting systems, i.e, Shear walls. Comparison of different parameters like storey shear, storey drift, mode periods, modal participation factors etc., is studied. It is found that the building with RC shear walls could able to resist the earthquake forces effectively and satisfying the requirements of Bureau of Indian Standards

Keywords: shear walls, seismic analysis, slope ground

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Green Roofs for a Better Environment

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ABSTRACT

A green roof is a vegetated roof or deck intended to provide urban greening for buildings, people, or the environment. As a plan of sustainable building design green roofing is gaining acceptance all over the world. However, there is little research done on the benefits of green roofing. Some of the significant benefits include greatly increased roof aesthetics, additional insulation to save energy costs, air pollution removal, increased wildlife habitat, urban heat effect control and a decrease of runoff to streams. Many of these benefits are currently greatly appreciated. However, these benefits will continue to gain importance to society as the awareness of environmental issues grows. This study aims mainly to determine the environmental benefits of installing green roofs by reducing the urban heat island effect and also by reducing the carbon footprint in the area. The carbon footprint is a measure of the influence of anthropological activities on the environment in terms of the amount of greenhouse gases produced, measured in tonnes of carbon-dioxide. From the studies carried out it is seen that there is a temperature difference of 2 degrees per day after implementation of the green roof. With this difference there is a considerable reduction in the consumption of energy due to lesser use of cooling devices. By just reducing the usage of fan there has been a great difference in carbon footprint. The carbon footprint reduction is observed to be 79.78 equivalent CO_2 tonnes. Hence this gives enormous environmental benefits to the country.

Keywords: carbon footprint, green roof, heat island effect, sustainable building

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Experimental Investigation of Concrete by Replacement of Cement with Nano Silica

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ABSTRACT

River sand is the most commonly and widely used material for constructions. But now-a-days this has been expensive due to excessive cost of transportation from natural sources and also large-scale depletion of these sources creates environmental problems. As environmental transportation and other constraints make the availability and use of river sand less attractive, a substitute or replacement product for concrete industry needs to be found. As it is the most commonly used fine aggregate in the production of concrete, it poses the problem of acute shortage in many areas. The continuous usage of it has started posing serious problems with respect to its availability, cost and environmental impact. In such a situation the Fly ash and finely grinded plastic waste can be an economic alternative to the river sand. Among the waste material, plastic is the material that is the major concern to most of the environmental effects. There are different types of plastic which are classified on the basis of the physical property. As the plastic waste is non-degradable, it must be recycled or reused. The objective of study is to study the behavior of the concrete which is made of the recycled plastic materials along with the study of the some of the physical properties that are related. Usually M25 grade of the concrete is the most commonly used in the constructional works, hence in this study M25 cement concrete is considered in which the recycled plastic waste is used as the replacement of fine aggregate in the concrete.Fly ash, also known as "pulverized fuel ash" is one of the coal combustion products, composed of the fine particles that are driven out of the boiler with the flue gases.The use of fly ash in concrete formulations as a supplementary cementitious material was tested as an alternative to traditional concrete. The cement has been replaced by fly ash accordingly in the range of 0% (without fly ash), 5%, 10%, 15% & 20% by weight of cement and the sand has been replaced by plastic waste accordingly in the range of 0%(without plastic), 3%, 6%, 9% & 12% for M-25 mix. The specimens have been cured for 7 and 28 days. Compressive strength and tensile strength test of concrete were conducted. As the melting temperature of the plastic is low thus it is susceptible to temperature. So, it is important to focus on the impact of heat in concrete strength when using grinded plastic. Post-heat compressive strength test was also conducted. After obtaining the data, they were analyzed by comparing with a controlled specimen. Result had showed that there was slight reduction in strength with the mix proportion of 3%, 6% and 9% of grinded plastic wastes, combined with 5%,10% and 15% of fly ash mix proportion.

Keywords: Non-biodegradable materials; plastic waste; compressive strength; tensile strength; temperature; Controlled Concrete.

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Study of Concrete by Using Zeolite

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ABSTRACT

This study focuses on the use of zeolite powder in concrete as partial replacement ofcement.The purpose of this research is to find the suitability of Zeolite with the highperformance concrete M30 grade.Zeolite is a popular type of natural pozzolanic materialwhich has been widely utilized in constructions since ancient times and zeolite is thelargest group of silicate minerals. In this study the application of natural zeolite as a partialsupplementary cementitious material has been carried out. .To this aim some castingss ofconcrete made with 5%, 10%, 15% replacement of cement with zeolite are studied. Themechanical properties such as compression strength of concrete were carried out.A freshconcrete test was made to study the workability properties of partial replacement of zeoliteconcrete and conventional concrete using slump cone test.We found the compressivestrength of zeolitic concrete when we replace cement with zeolite powder and curing isdone for 7,14,28 days.

Keywords: Zeolite, Compressive strength, slump cone test.

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Multi Objective Optimization for Sustainable Groundwater Management in Semi Arid Regions

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ABSTRACT

Quantitative techniques such as simulation modelling and optimization play a vital role in the management of complex ground- water systems. This study demonstrates the combined use of groundwater-flow and resource optimization models to scientif- ically deal with the water insufficiency problem in well-based command areas during a case study in eastern India. A momentary simulation-optimization model was developed for the study area by means of Visual MODFLOW (groundwater-flow simulation tool) and the response-matrix procedure to maximize pumping from the obtainable tube wells. The optimized greatest pumping rates obtained from the integrated simulation-optimization model were further used in linear programming-based optimization models to determine most favorable cropping patterns for the wet, normal and dry scenarios. The net annual income from the optimal cropping patterns for the wet, normal and dry scenarios were estimated at Rs. 81.8 million, Rs. 76.4 million and Rs. 71.6 mil- lion, respectively. The results of simulation-optimization modelling indicated that if the suggested optimal cropping patterns are adopted in the study area, the net annual irrigation water requirements will be reduced by 28, 35 and 40%, and net yearly income will be increased by 28, 23and17%through wet, normal and dry scenarios, respectively

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Analysis of Base Isolated Building System in Structural Building

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ABSTRACT

Increasing buildings resistance to earthquake forces is not always a desirable solution especially for the building contents that are irreplaceable or simply more valuable than the actual primary structure (e.g. museums, data storage Centre's, etc.). Base isolation and seismic dampers can be employed to minimize inter-story drifts and floor accelerations via specially designed isolation and dampers system at the structural base, or at higher levels of the superstructure. In this research, examine the response of buildings isolated using isolation system hybrid consisting of Lead-Rubber Bearings (LRB), with the addition of Rotation Fiction Damper (FD) at the base, then compare the results with buildings that have traditional foundation, in terms of the (period, displacement and distribution shear force and height of the building). It conducts RESPONSE SPECTRUM seismic analysis for some varying height buildings, with help of ETABS software. The results show that the use of insulation system Hybrid has had a significant impact on improving the performance of origin in terms of reducing displacements and base shear with increasing height of the building.

Keywords: lead rubber isolator, base shear, displacements

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Retrofitting of Reinforced Concrete Beam with High Modulus Carbon Fibres

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ABSTRACT

In this experimental study, the flexural performance of reinforced concrete beams made with M30 grade concrete is investigated for using of Carbon Fiber Reinforced Polymer (CFRP) composite in RC beams for strengthening and retrofitting of structural elements. The flexural strength results showed load carrying capacity of the beams with CFRP layers significantly increased compared to beams without CFRP layers. The deflection was reduced in all beams made with CFRP layers and the lowest deflection was observed in the beams of specimen S4, S5, S6 strengthened with CFRP. It can be concluded that providing a layer of CFRP composites has resulted in achievement of improved load carrying capacity of the entire strengthened specimens.

Keywords: Fibre Reinforced Concrete (FRC), Fibre Reinforced Polymer (FRP), Carbon Fibre Reinforced Polymer (CFRP), Aspect Ratio (l/d), Carbon Fibres etc.

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Traffic Delay in Hyderabad City

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ABSTRACT

Traffic delay plays a major role in defining road capacity, its speed, density, level of service at intersections and traffic flow of a city. In India, so many cities are facing traffic delay problems because of high vehicular population, dense city area and narrow roads .Hyderabad is also one of the cities with high rated traffic delay problems. Traffic delay problems in Hyderabad can be studied by identifying localities, junctions having heavy traffic activities.The traffic delay management can be done at junctions located in Hyderabad area. The project involves identifying traffic areas, studying of existing traffic delay control measures, finding the causes of traffic delay and proposing alternate solutions .Jubliee Hills, Punjagutta, LB Nagar and Tirumulgiri are some of the main junctions in Hyderabad city having huge traffic problems. These areas are daily visited by employees, customers, workers and students attached by IT hub centers, shopping malls, colleges, film studios etc.The traffic delay management of above said junctions is done by conducting surveysbased on the delay conditions such as collection of traffic data, delay based on speed ,geometrical measurements, volume count, network intersection .Based on the above data the traffic delay managements were done at junctions in the form of traffic delay solutions, delay strategies and recommendations suitable for Hyderabad city. Also by analyzing various remaining areas of Hyderabad, We can achieve the city without traffic delay problems.

Keywords: Speed, Level of service, Traffic etc.

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An Experimental Investigation of Corrosion Effect on Steel, Fe-415 and Fe-500 in Presence of Carbon Dioxide and Dissolved Oxygen

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ABSTRACT

The corrosion effect on High Yielding Strength Deformed Steel (HYSD) Fe 415 and Thermo Mechanically Treated (TMT) Fe 500 steel bars in acidic Carbon dioxide (CO_2) and dissolved oxygen (DO) water environment in cyclic conditions were investigated. Based on the IS code 456 and literature, CO_2 acidity 50, 100, 150, 200 mg/l and dissolved oxygen 8, 12, 16, 20 mg/l were selected. Fe 415 and Fe 500 steel bars were immersed in CO_2 and dissolved oxygen waters. A set (3 bars) of each grade of steel bars from each concentration was taken out at the end of 1st and 3rd month and were exposed to the atmosphere. Remaining steel bars were continually kept in acidity and dissolved oxygen waters. In this study, at the end of every month, corrosion and tensile strength of steel bars were determined P^H, CO_2, DO, concentrations of curing water is determined and temperature was also measured for every week. The experimental study was carried out for 3 months. Results revealed that CO_2 is more effective than dissolved oxygen in the corrosion; Corrosion is more on bars which were kept continuously in CO_2 and dissolved oxygen water than the bars kept alternative months in the same waters. Reduction in tensile strength is proportional to the corrosion.

Keywords: Corrosion, Carbon dioxide, Dissolved Oxygen, Acidity, Steel, Fe 415, Fe 500 Tensile strength.

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Durability Study of Concrete Using Foundry Wastesand

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Abstract

This paper deals with the comparative study of concrete blocks by replacing the natural fine aggregate by foundry waste sand. There is less availability of the natural sand so there is need to find the replacement of the natural sand. Day by day the cost of natural sand is increasing. The waste of the industries is becoming a major problem and the deposing cost the waste is also high and very much difficult. Metal foundries use large amounts of sand as part of the metal casting process. When the sand cannot be reused in the foundry, it is removed from the foundry and is called as "waste foundry sand." so that, we decided that using the foundry waste as a replacement to the natural aggregate is much needed for the environment and making the construction cost lesser by using it. In the present work, experimental investigation were performed such as compressive strength of concrete for M20 grade of concrete, porosity,water absorption, permeability and effect of alternate heating and cooling, alternate wetting and drying, effect of accelerated curing(440C and 550C) and acid attack test on concrete for 100% replacement of foundry waste sand in place of fine aggregate. curing is choosen was 28 days. The results of compressive strength were in range of 27.758 to 28.049 N/mm2 .The results of porosity and water absorption were in the range of 17.90% to 16.00% and 2.149% to 1.958%. The results of permeability were in the range of 4.38 to 1.85 cm. The results of alternate heating and cooling and alternate wetting and drying were in the range of 33.572 to 26.595 N/mm2 and 28.212 to 38.676 N/mm2.The results of accelerated curing were in the range of 31.950 to 35.456 N/mm^2 to 37.496 N/mm2.Foundry waste sand (Weathered sand, Burnt black sand), Porosity and Water absorption, Permeability, Compressive strength, Acid attack.

Keywords: Foundry waste sand (Weathered sand, Burnt black sand), Porosity and Water absorption, Permeability, Compressive strength, Acid attack.

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Analysis and Design of G+15 Residential Building Using Staad

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ABSTRACT

The principle objective of this project is to analyse and design a multi-storeyed building [G + 15 (3 dimensional frame)] using STAAD Pro. The design involves load calculations manually and analysing the whole structure by STAAD Pro. The design methods used in STAAD-Pro analysis are conforming to Indian Standard Code of Practice. STAAD Pro features a state-of-the-art user interface, visualization tools, powerful analysis and design engines with advanced finite element and dynamic analysis capabilities. From model generation, analysis and design to visualization and result verification, STAAD Pro is the professional's choice. We analysed and designed a G + 15 storey building initially for all possible load combinations [dead, live, wind and seismic loads under load cases details].The structure is built up using Autodesk AutoCAD 2015. This structure is saved as a DXF file and is imported into STAAD Pro. The wind load values were generated by considering the given wind intensities at different heights and strictly abiding by the specifications of IS 875. Seismic load calculations were done following IS 1893-2002/2005.The materials were specified and cross-sections of the beam and column members were assigned. The supports at the base of the structure were also specified as fixed. The codes of practise to be followed were also specified for design purpose with other important details. In the post-processing mode, after completion of the design, we can work on the structure and study the bending moment and shear force values with the generated diagrams. We may also check the deflection of various members under the given loading combinations. The design of the building is dependent upon the minimum requirements as prescribed in the Indian Standard Codes. The minimum requirements pertaining to the structural safety of buildings are being covered by way of laying down minimum design loads which have to be assumed for dead loads, imposed loads, and other external loads, the structure would be required to bear. Strict conformity to loading standards recommended in this code, it is hoped, will ensure the structural safety of the buildings which are being designed. STAAD Pro provides us a fast, efficient, easy to use and accurate platform for analyzing and designing structures.

Keywords: STAAD Pro, wind analysis, autocad

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Dynamic Analysis of an Irregular RC Structure Using Etabs

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ABSTRACT

Many buildings in the present scenario have irregular configurations both in plan and elevation. This in future may subject to devastating earthquakes. So it is necessary to analyze the structure. Our aim is to study irregularity of an RC structure as per clause 7.1 of IS 1893 (part1)2016 code. Analysing an RC (Reinforced Concrete) Building with vertical irregularity using ETABS software, The main objective of the project is to obtain the seismic response of the structure i.e., Storey Displacement, Storey Overturning Moment, Story Drift and Story Shear for G+15 RC building by using ETABS software.The analysis of model was performed by dynamic analysis i.e., Response Spectrum Analysis.

Keywords: Dynamic analysis, ETABS, Response spectrum analysis

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Static Analysis and Design of G+20 RCC Framed Structure by Using ETABS Software

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ABSTRACT

Structural Design is the primary aspect of Civil Engineers and its Analysis is backbone of Civil Engineering. The improper Analysis and Design leads to failure of Structure resulting loss of life. To perform accurate Analysis, the Structural Engineer is able to analyze the Structure considering different constraints like to satisfy the Serviceability and Deformability etc., by following IS Codes. Though conventional method is still practicing, our technology is upgrading equally or even more based on latest softwares due to time parameter. ETABS is the present day leading software in market which is to be updated by Civil Engineers along with conventional method.

Keywords: Static Analysis, Etabs, Framed Structure

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A Comparative Evaluation of Various Additives Used in the Stabilization of Expansive Soils

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ABSTRACT

This paper investigates the effectiveness of using cement by-pass dust, copper slag, granulated blast furnace slag, and slag-cement in reducing the swelling potential and plasticity of expansive soils. The soil used in this study was brought from Al-Khod (a town located in Northern Oman) where structural damage was observed. The first stage of the experimental program dealt with the determination of the chemical, mineralogical, and geotechnical characteristics of the untreated soil. The soil was then mixed with the stabilizers at 3, 6, and 9% of the dry weight of the soil. The treated samples were subjected to liquid limit, plastic limit, swell percent, and swell pressure tests. Furthermore, the cation exchange capacity, exchangeable cations (Na+, Ca++, Mg++, and K+), and pH of the treated samples were also measured. The study showed that copper slag caused a significant increase in the swelling potential of the treated samples. Other stabilizers reduced the swelling potential and plasticity at varying degrees. The study further indicated that cation exchange capacity and the amount of sodium and calcium cations are good indicators of the effectiveness of chemical stabilizers used in soil stabilization.

Keywords: Expansive Soils, Copper Slag, Granulated Blast Furnace Slag

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Experimental Analysis on Self Compacting Concrete by Using Nano-Silica Gel

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ABSTRACT

In the present era, concrete is mixed, transported, placed, compacted, and finished. In spite of all the activities done through checking with high standard quality with tight schedule of work, there occur marginal errors, such as honey combing, voids in concrete, and could not achieve desired values. So the traditional concerte is replaced with the new technique called SCC that is Self Compaction Concrete. The workability properties of SCC show significant increase in strength and workability properties. Self Compacting Concrete has segregation resistance evaluated using workability tests, such as slump flow, V funnel, and L-Box tests. The present work deals with addition of nano-silica to concrete as partial replacement to cement in dosages of 1%, 1.5%, and 2% by weight of cement. Based on early research, M25 grade concrete has been chosen for this work. The mix design was prepared using IS: 10262-2009 guidelines for concrete mix design proportioning. In the present work, 24 numbers of cube moulds and 12 numbers of cylinder moulds were casted with addition of nano-silica with different proportions, which are tested for compressive strength and split tensile strength. Addition of nano-silica to normal cement concrete show increase in compressive strength and decrease in splitting tensile strength.The compressive strength of cement concrete can be increased considerably by the addition of nano-silica. Based on the experimental results, use of nano-Silica as partial replacement of cement in small quantities is advantageous on the performance of concrete. Nano-Silica added in small quantities can improve the compressive strength.

Keywords: Self Compacting Concrete, Flowability, Passing Ability, Nano Silica, Super Plasticizer

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Colourful Tiles from Plastic Wastages

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ABSTRACT

The present investigation aims at manufacturing floor tiles using waste plastic in different proportions with sand, without use of cement and comparing it with the normal cement tiles. To evaluate different physical and mechanical properties,tests like water absorption test, transverse resistance, resistance to impact and abrasion resistance tests were carried out as per IS specifications on the plastic tile and these test results were compared with the normal cement tiles.The results obtained have shown better results as compared to the normal cement tiles.As per this study it can be considered to use plastic waste as a binding material instead of cement in the manufacture of floor tiles. Now a day's most of the plastic is wasted and thrown in garbage which causes lot of pollution to environment, to reduce this we can reuse plastic waste as colourfull floor tiles.

Keywords: plastic waste, Tiles

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Sustainable Use of Mine Waste and Iron Ore Tailings in Flexible Pavement

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ABSTRACT

Rapid growth of infrastructure in road construction need natural resources.There is a need to explore the feasibility of use of iron ore tailings and mine waste in road construction. Utilization of mine waste rocks and iron ore tailings in bitumen as aggregates will help in sustainable & greener development. This literature shows the potential use of iron ore tailings as a replacement of natural fine aggregates &mine waste as a replacement of coarse aggregates. As natural resources are depleting day by day, there is a need for substitution for aggregates in bitumen. A comprehensive overview of the published literature on the use of iron ore tailings &mine waste in bitumen is being presented. The various effects of various properties such as penetration, softening point, ductility, and specific gravity, flash &fire point of bitumen have been presented here. In this paper the properties of fine aggregates, properties of coarse aggregates, and marshal stability values are determined.

Keywords: Minewaste; iron ore tailings; fine aggregates; coarse aggregates; marshal stability.

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Abstract Proceedings of Online "**International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021**

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Characteristics of High Performance Concrete Using Metakaolin

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ABSTRACT

Concrete is that the most normally used material for construction. The global production of cement has substantially collected on account that 1990.Production of cement results in plenty of environmental pollution because it includes the emission of CO2 gas. Supplementary cementatious materials like silicon oxide fumes, fly ash, slag, Rice Husk Ash and Metakaolin are utilized in recent years as cement alternative material for growing HSC with progressed workability, energy and durability with decreased permeability. Metakaolin is a dehydroxylated aluminium silicate. From the recent analysis works exploitation Metakaolin, it's glaring that it is a completely effective pozzolanic cloth and it correctly complements the power parameters of concrete. High overall performance concrete (HPC) is that the trendy improvement in concrete. It is emerge as highly regarded and is getting used in several prestigious projects such as Nuclear strength projects, flyovers, multi-storeyed homes.In this thesis paper, research on partial substitute of cement with metakaolin as completely extraordinary share in HPC. The replacement levels had been 0%, 5%, 10%, 15%, and 20% (by using weight) for Metakaolin. The end result obtained (compressive strength, split tensile power, flexural strength, Durability) are compared with the ordinary specimens.

Keywords: High performance concrete, Metakaolin

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Interlinking of Krishna and Godavari Rivers: an Irrigation Project

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ABSTRACT

The rivers play a vital role in the lives of the Indian people. The river systems help us in irrigation, potable water, cheap transportation, electricity as well as a source of livelihood for our ever increasing population. Indian agriculture largely depends upon Monsoon which is always uncertain. This problem of the irregular distribution of water can be overcome to a greater extent by interlinking of rivers. The interlinking of rivers is a major endeavor to create additional storage facilities and transfer water from water-surplus regions to more drought-prone areas through inter-basin transfers. Interlinking of major rivers in India, aims at modifying the acute spatial inequity in the availability of water resources in India. Some of the benefits due to interlinking of rivers are in the area of irrigation, flood prevention, hydropower generation, navigation etc., whereas the area of concerns are ecological issues, deforestation, aqua life, submergence of habitable or reserved lands, displacement of people, etc.The Godavari has been characterized as a 'surplus' basin whereas the Krishna Basin as a 'deficit' one. As the water availability in the Krishna river was becoming inadequate to meet the water demand, Godavari River is linked to the Krishna river by commissioning the Polavaram right bank canal with the help of Pattiseema lift scheme in the year 2015. The main objective of this present study is to independently evaluate the water availability as against the water demand in one of the NRLP links i.e., from the Godavari River (at Polavaram) to the Krishna River (at Vijayawada).In the Krishna-Godavari link at Polavaram command area, groundwater is the most dominating form of irrigation. The present paper is an attempt to study issues and challenges in interlinking of rivers in India from the point of view of society at large.

Keywords: Increasing population, Interlinking, Availability, Water demand, Ground water.

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Flow Computation through Conveyance Estimation System

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ABSTRACT

The paper deals with flow computation through Conveyance Estimation System (CES). This paper presents results, calculated from field measurements taken in several frequently flooded natural rivers, which include stage-discharge relationships, variation of flow resistance with depth of flow, the apparent friction factor, and the composite friction factor for flooded natural rivers. The results obtained have shown the complexity of flow resistance in natural rivers due to the interaction between the main channel and floodplain flow. The estimation of conveyance is a core component of flood management, water level prediction and flood defense design. All rivers modelling software includes one or more methods for conveyance estimation, usually based upon methods dating from research completed more than 50 years ago with little or no account taken of recent advances in knowledge and understanding. In 2001 the Environment Agency commissioned a scoping study on reducing uncertainty in conveyance estimation. The paper describes some of the conclusions of that scoping study including the needs of different users, the diversity of current knowledge and provides the outline for a targeted programme of research to make a step forward in the management of river capacity. This Targeted Programme is now underway involving a partnership between academic researchers, experts and users. Particular issues of concern are the effects of riverine vegetation, the influence of natural shaped (and re-naturalised) channels and the interaction between river channels and flood plain flows. The output from the programme will be a new Conveyance Estimation System (CES) as open code and enabled for use within modelling packages. The CES includes a roughness advisor to provide access to the wide body of knowledge on the estimation of river resistance. The flow parameters such as depth averaged velocity, bed shear stress distribution curve along with stage-discharge, Fr, average velocity conveyance against flow depth has been plotted and discussed. The variation of the flow parameter has ben found with different river conditions.

Keywords: Flow Resistance; Friction Factor; Conveyance; Natural River; Overbank Flow; depth averaged velocity; bed shear stress distribution.

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Developing Boron World Mineral Map Using Arc Gis and Studying Enormous Health Benefits of Boron Added to Water.

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ABSTRACT

Boron concentration in produced water is significantly high. Produced water is water trapped in underground formation that is brought to surface along with underground water.Because this water has been in contact with the hydrocarbon formation for centuries. Concisely, boron concentration in produced water makes different benefits for the people who are consuming it. The World Health Organization (WHO) regulation guidelines for discharge of water into the environment set boron concentration at 0.5 mg L-1 for potable water. Many technologies have been developed to trace boron from underground water. However, there have been series of reported limitations based on the molecular weight of boron as well as its toxicity but more than that the health benefits of boron consumption are enormous because according to the medico-biological investigations, boron compounds belong to the second class of the health benefits. Research suggests that boron is involved in vitamin D and estrogen metabolism and may influence cognitive function. In alternative medicine, boron supplements are sometimes said to help with bone mineral density and prevent and/or treat various health diseases. The purpose of this study is to make an extensive mapping using ARC GIS for tracing of boron, determining the chemistry of boron, daily dosage of boron compostion in drinking water and also to study various benefits for humans who are consuming it.

Keywords: Boron mapping, WHO, GIS, Enormous health benefits.

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Experimental Investigation on Mechanical Properties of Geopolymer Concrete When River Sand Replaced with Manufactured Sand in Fine Aggregate

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ABSTRACT

Applications of polymer based binder material can be an ideal choice in civil infrastructural applications since the conventional cement production is highly energy intensive. Moreover, it also consumes significant amount of natural resources for the large-scale production in order to meet the global infrastructure developments. On the other hand the usage of cement concrete is on the increase and necessitates looking for an alternative binder to make concrete. Geo-polymer based cementitious binder was one of the recent research findings in the emerging technologies. More studies in the recent past showed a major thrust for wider applications of geopolymer binder towards a cost economic construction practice. This also envisages the reduction of global warming due to carbon dioxide emissions from cement plants. The present study is aimed at providing a comprehensive review on the various production processes involved in the development of a geopolymer binder.

Keywords: Geopolymer concrete, compressive strength, split tensile strength, workability

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Experimental Study on Partial Replacement of Cement by Coconut Shell Ash in Cement Bricks

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ABSTRACT

This is a study on CSA Cement bricks made by using an agricultural waste i.e., coconut shell ash as partial replacement of cement. The cement is the main ingredient used for cement brick. The production of cement gives rise to CO2 emissions generated by the calcinations of CaCo3 & by the fossils, being responsible for about 5% of the Co2 emissions in the world. Cement bricks were produced by using replacement levels of 5 and 10 percent of cement with CSA in cement bricks. The CSA cement bricks produced have good results in the tests like size test, shape test, structure test, impact test, soundness test, hardness test and efflorescence test. For replacement of 5% and 10 % of cement with CSA in CSA bricks the water absorption is found to be 11.5%, 12.8% and compressive strength is 8.3N/mm^2, 9.4N/mm^2 respectively. These results showed CSA bricks have slightly better performance compared to regular red bricks and similar performance compared to flyash bricks

Keywords: coconut shell ash, cement bricks, agriculture waste

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Seismic Analysis of Reinforced Concrete Frame with Different Bracings

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ABSTRACT

Structures are highly susceptible to serve damages in earthquake scenario, choosing an appropriate lateral force resisting bracing systems will have a significant effect on performance of the structure. The present study is aimed to evaluating and comparing various types of concentric steel bracings for G+9 storey RC frame building with different configurations.In this three types of bracing systems are considered i.e. X-Bracing, inverted V bracing and V bracing. The modeling & analysis is carried by using E-Tabs software. The models are compared for different aspects within the structure, such as the maximum storey displacement, storey drift and storey shear, the structure is analyzed for seismic zone V and medium soil condition as per IS 1893:2002 using ETABS software.

Keywords: RC frame; X, V and Inverted V Bracings; Response spectrum analysis;

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Abstract Proceedingsof Online "**International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June2021**

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Analysis of RC Building Frame for Seismic Analysis for Zone-V

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ABSTRACT

The response of building when subjected to seismic excitation can be evaluated in several ways. Structural analysis methods can be mainly divided into four categories Equivalent Static Analysis, Linear dynamic analysis, Nonlinear Static Analysis, Nonlinear dynamic analysis. Equivalent Static Analysis method or linear static analysis, defines a series of forces acting on a building to represent the effect of earthquake ground motion. In this method, the design base shear is computed for the whole building, and it is then distributed along the height of the building. The response spectrum analysis determines the natural frequencies and mode shapes via Eigen value analysis. It is used to estimate the peak response whereas the time history analysis provides a method for obtaining the exact response of a structure as a function of time. The response-history is normally determined using step by step numerical integration of the equation of motion. In nonlinear dynamic analyses, the detailed structural model subjected to a ground-motion record produces estimates of component deformations for each degree of freedom in the model.

Keywords: RC Frame Building, Seisimic analysis, zone V, linear static method, non- linear dynamic method.

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GIS and It's Applications in Flood Management-Tufanganj, Cooch Bihar, West Bengal, India

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ABSTRACT

Flood is a natural hazard resulting from extreme geophysical events to create an unexpected threat to human life and property. Flood risk steams from the likelihood that a major hazards event will occur unexpectedly and that it will impact negatively on the people and their welfare. Flood management planning is a very important which helps to rescue the flood affected people to mitigate the problem of flood and to take necessary preventive measures .As occurrence of floods become frequent in the city Tufangunj, Cooch Behar, West Bengal, India. GIS becomes preferable tool for planners for effective flood management. GIS helps in creating land suitability analysis and flood zone mapping of towns and cities, which, if, incorporated in preparation of master plans can help in flood management in urban India. The present study attempts to study the impact of floods in the Tufangunj city, Cooch Behar, West Bengal, India. Data used in the present study was, DEM map downloaded from Bhuvan website ISRO. For analysis DEM was generated for the region of the city. DEM was processed for the fill; sink for the using SAGA GIS. The study describes an efficient & scientific approach with suitable illustrations of map and real time flood inundations. The areas, which are highly flood affected, are delineated. So that, the flood affected people can be rescued from inundation and can be evacuated to different safe places.

Keywords: GIS, Flood management, natural hazard

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Abstract Proceedings of Online "**International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June2021**

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Supplication of Oil Palm Boiler Clinker Aggregates in the Production of Structural Light Weight Concrete

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ABSTRACT

Industrial waste has many functional and economic benefits when used as a building material for environmentally friendly structures. Oil-palm-boiler clinker is a waste product produced by burning solid waste during the extraction of palm oil. This project summarizes the research done over the last two decades on the use of oil-palm-boiler clinker as a lightweight aggregate in structural lightweight aggregate concrete. The compression strength of oil-palm-boiler clinker concrete is discussed. In this investigation M20 grade is used and coarse aggregate was replaced by 0%, 20% and 40% percentages of OPBC. The compressive strength of lightweight concrete could be greatly improved by partially replacing it with oil palm boiler clinker.

Keywords: Industrial Waste, Light Weight Concrete, Palm oil

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Experimental Study on Precast Compound Wall Manufactured from Plastic Waste

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ABSTRACT

Plastic is a very common material that is now widely used by everybody in the world. Plastic plays a predominant role in reusable in this era, as it is compact and light in weight. Common plastic items that are used are covers, bottles, and food packages. The great problem with plastic weis its decomposition. Plastic is made of polymer chemicals and they are non-biodegradable. This means that plastic will not decompose when it is placed in earth. Though plastic is very useful material that is flexible, robust and rigid they become waste after their use and they pollute the air and land. Recycling is processing use waste materials into new products to prevent waste of potentially useful materials. The increase in the popularity of using ecofriendly, low cost and lightweight construction materials inbuilding industry has brought about the need to investigate how this can be achieved by benefiting to the environment as well as maintaining the material requirements and their standards. From the advantages of plastic recycling procedure is used. For the production of plastic precast compund wall is an optimal method for controlling the problem by decomposition of plastic waste and also it costs economical for the production of building materials. In this study, plastic waste from factories will be used to incorporate with cement and sand to produce a plastic wall. The plastic wall will then be tested to study the compressive strength, efflorescence and water absorption. In the recent past research, the replacement and addition have been done with the direct inclusion of polyethylene, polyethylene terephthalate (PET) bottles in shredded form, chemically treated polyethylenefibre, PET in small particles form by replacing natural coarse aggregate. Most of replacements ave been done by volume calculation, and showed the decreased in compressive strength as the increased plastic waste. In this study, recycled plastic waste have been introduced in the form of crushed. The replacement of plastic waste material has been done by weight. Plastic precast compound wall is versatile, aesthetically attractive, functional, and cost effective and requires little or no maintenance if correctly manufactured and laid. Most concrete compound walls constructed in India also has performed satisfactorily but two main areas of concern are occasional failure due to excessive surface wear, and variability in the strength of compund wall. Natural resources are depleting worldwide at the same time the generated wastes from the industry and residential area are increasing substantially. The sustainable development for construction involves the use of Non- conventional and innovative materials, and recycling of waste.

Keywoards: concrete, flexible, recycling, polyethylene,plastic

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

Paper ID: ICCSDC-21-1051

Analysis of High Rise Building Including Wind Load

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ABSTRACT

A high-rise building of height – 183 m was employed to evaluate similarities and differences of wind load calculations done by using five major wind codes and standards. Evaluation was done in both ultimate and serviceability limit conditions. Member forces in columns, and beams, compressive stress in shear walls and support reactions obtained from finite element modelling was used to assess building responses in ultimate limit condition. Along and across wind, accelerations and drift indices were engaged to estimate serviceability limit state performances. Available 3 second gust wind speeds are converted into mean hourly and 10 minute averagewind speeds to calculate wind loads on building. Wind speeds with 5 years return period was used in building acceleration calculation. The simultaneous use of higher terrain-height multiplier and importancefactormaybeleadtooverdesign, even in cyclone prone areas.The use of post disaster Wind speed does not exceed the drift limit butexceeds threshold acceleration value in across insert wind acceleration.

Keywords: Wind loading standards, Design wind speeds, Along-wind acceleration, Across-wind acceleration, Drift index.

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Experimental Study on Strengthening of Concrete by Replacing Turritella and Bentonite

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ABSTRACT

Self-compacting concrete, also referred to as self-consolidating concrete, is in a position to go with the flow and consolidate under its personal weight and is de-aerated almost definitely whilst flowing in the formwork. The goals of this lookup is blended effects of turritella and bentonite included in self compaction concrete in order to make bigger in strength and a higher bonding between combination and cement paste. SCC has an advantage over conventional concrete in that it can be easily placed without vibration or mechanical consolidation. Turritella and bentonite is used to replace cement in stepped concentration of 0 %, 5%, 10%, 15%, and used to gain characteristic compressive strength of m30 grade concrete mix and cured normal water and nitric acid solution (HNO3) in for different ages (7 days and 28 days) were determined. Nitric acid used for the curing of normal water in the concentration of 1% and 5%. This lookup is aimed to look at the degradation of self-compacting concrete (SCC) due to nitric acid assault particularly based totally on measurement of compressive energy loss. Trial mixes with the various water cement ratio, substitute percentage, extent of notable plasticizer and viscosity bettering agent, have been equipped and tested. The test results for acceptance characteristics of self-compacting concrete such as slump flow and t50cm, v-funnel, t5 minutes and l-box are presented.

Keywords: Bentonite, compressive strength test, nitric acid, super plasticizer, self-compacting concrete, turritella.

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Water Quality Monitoring System by Using Internet of Things

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ABSTRACT

Water pollution is one of the biggest fears for the green globalization. In order to ensure the safe supply of the drinking water the quality needs to be monitor in real time. In this paper we present a design and development of a low cost system for real time monitoring of the water quality in IOT(internet of things).The system consist of several sensors is used to measuring physical and chemical parameters of the water. The parameters such as temperature, PH, turbidity, flow sensor of the water can be measured. The measured values from the sensors can be processed by the core controller. The Arduino model can be used as a core controller. Finally, the sensor data can be viewed on internet using WI-FI system.

Keywords: IOT, water quality, PH, turbidity and temperature

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Comparative Analysis of Seismic Performance on RC Structure with Outrigger and Belttruss System

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ABSTRACT

Tall building development has been rapidlyincreasing worldwide introducing new challenges that needto meet through engineering decision. As the height of the structure in creases the stiffness of the structurere duces.Hence to develop the performance of the structure under seismic loading, Outrigger and Belt truss system is proposed in the current study of work. The main objective of this research is to compare models with outrigger, belttruss, outrigger with belttruss and bare frame model.In this research work, the structure be analysed for a 40 storeyre sidential building,there are three types of modeling arrangements and one bare frame model for comparison ofparameterslikestoreydisplacement,storeydrift,naturaltime period and base shear. Models of only outrigger, modelsof only belt truss and models with outrigger and belt trusssystem at three different positions 1/4,1/3,1/2 of the storey height is considered for analysis. A 40 storey structure is subjected to static and dynamic analysis (response spectrummethod) as per IS 1893 (Part1): 2016 using finite elementsoftware "ETABS" Program. Present study concluded that in condition of only outrigger, only belttruss and outrigger with belt truss system, it can be predicted that building withoutrigger and belt truss system performs better compared tothe other two models. The comparative results shows that allthe results obtained are within the limits as per the codallimitations.

Keywords: Outrigger, Belttruss, Tall Building,Storey displacement, Base shear,Storey drift and ETABS

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Assessment of Devasting Floods of 2020 Occured in India and Analysing their Characteristics Using Python Panda's

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ABSTRACT

Flood has been considered as one of the most frequent disaster in the world. India has continuously suffered by many floods in the year of 2020 which claimed huge loss of life and economy. This project is dealing with the 4 states Assam, Bihar, Kerala and Uttar Pradesh which has claimed huge loss of life and economy due to floods in the year of 2020. On August 24, 2020, 5.69 million people in Assam were affected during the 2020 monsoon. From July 13, 2020, floods affected people in Bihar. By the third week of August, the flood affected 8.36 million people in 16 regions of Bihar . The recent heavy rain triggered the second stage of flooding in Uttar Pradesh (UP), affecting 1,090 villages in 16 districts .On 6 August, a landslide occurred in the Pettimudi settlement in Rajamala, near Munnar, in the Idukki district of Kerala, killing 52 people and 19 others missing. In this project we enhance data of different floods that has occurred in the year of 2020 and present their common characters and damages that has occurred during floods and also calculating the return period and probability by using python.

Keywords: Floods, Python

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Evaluation of Electro Coagulation and Reverse Osmosis Process in the Removal of Dye from Plastic Waste Water

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ABSTRACT

Technological advancements have resulted in a greater water demand by various industriesand vast amount of waste water is produced by this industries.In addition, there is an increase in quantum of waste water, with diversified pollutants generated and discharged from these industries.Hence, treatment of waste water generated from industries before release into the environment has become a grand challenge.Different techniques came into existence for the treatment of waste water produced like, to remove dyes from waste water produced by plastic industries, plastic industries and etc. Different methods like electrolysis, electro coagulation, reverse osmosis were used in this process every techniques has there different process and results. Thus the waste water can be treated purified and reused to decrease the pollution.

Keywords: Purification of water, Electro coagulation, Reverse Osmosis and plastic industries, black dye

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June2021

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Experimental Investigation on Lightweight Concrete Containing Oil Palm Kernel Shell as Replacement of Coarse Aggregate and Binding Material with Fly Ash

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ABSTRACT

Oil palm kernel shell (OPKS) totals can be utilized as a substitute of coarse total in cement to deliver lightweight cement. Operations are found to assimilate more water, contrasted with typical total. Thus, surface treatment is completed on OPKS and the impact of water-concrete proportion on strength of cement is examined. This paper presents X-beam diffraction examination did for treated and non-treated OPS (NTOPS) total to discover the mineralogical attributes. Microstructural examination and interfacial progress zone are explored for, treated and NTOPS utilizing advanced picture preparing or computerized magnifying instrument. The consequence of examination is contrasted and ordinary, cement.

Keywords: miniature design, interfacial change zone, treated oil palm shell, non-treated oil palm shell, lightweight concrete, customary concrete, surface treatment

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Experimental Investigation on Partial Replacement of Coarsr Aggregate with Ceramic Waste and of Steel Fibre as Reinforcing Agent in Concrete

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ABSTRACT

Construction industry is consuming the planet's resources at a rapid rate to meet the demands of the economy which is expensive and putting a lot of stress on the environment waste disposed and is not recycled. In this project, we are proposing to use the broken ceramic tiles as a partial replacement to the coarse aggregate which forms the bulk of the concrete and addition of steel fiber for reinforced concrete. The comparison between fresh, mechanical and bond properties of grade M25 concrete will be similar to the partially replaced ceramic waste. For this project, ceramic waste which varies will be partially replaced in place of coarse aggregate by 5%, 10% and 15% and addition of 2% of steel fiber. All kinds of experimental investigations will be done on the concrete and the variations in compression strength, tensile strength, flexural strength of the concrete will be noted and a report will be submitted.

Key words: Ceramic waste, steel fibre compressive strength test, split tensile strength, flexure strength, super plasticizer

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June2021

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An Experimental Analysis on Self Compaction Concrete Using Nano Silica Material

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ABSTRACT

In this study, the mechanical properties of concrete composites containing Nano silica were investigated to produce more flexible and highstrength concrete. For this purpose, the different content of Nano-silica powder was added to concrete. The mechanical properties and the morphology of the sample were investigated. The mechanical properties such as flexural, tensile and compressive strength were significantly improved by incorporating the Nano-silica. Optimum composition containing 2.5 wt. % to 3.5 wt. % of nano silica was obtained, in which the tensile strength, compressive strength and flexural strength were expected increase for 0.25% to 1.28% respectively compared to the next concrete. Scanning Electron Microscope images showed that introducing the nano-silica into concrete improved the interfacial transition zone inbetween the cement particles. When SCC compared with Nominal Concrete, there is significant increase in workability and compressive strength. And also Normal SCC (without NS) is compared with Different small dosages of SCC with NS powder, there will be a significant increase in strength. Indexed Terms- Self Compacting Concrete, Filling ability, passing ability

Keywords: self compaction concrete, nano silica material

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Effect of Metakaolin and Pre-Treated Oil Palm Shell in Light Weight Concrete

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ABSTRACT

Oil palm shell (OPS) is a bio solid waste in palm oil industry in the tropical countries which could be used as aggregate in concrete mixture.The project study with the special concrete such as light weight concrete by using oil palm shell as a replacer to the coarse aggregate light weight concrete having low density, reduction of dead load.The reduction in density produced by using oil palm shell as a partial replacement of coarse aggregate in concrete.A literature review suggests that excessive use of OPS as replacement of coarse aggregate will not show the satisfying results.We tried using replacement of coarse aggregate by replacing 0%, 20%,40% and 50%. Then determine the compression test to check the favorable replacement of OPS concrete. Finally, the results are compared with the nominal concrete.

Keywords: Aggregates, Concrete, Metakaolin, Oil palm shell.

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June2021

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Increasing Compressive Strength of Concrete Using Fibres

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ABSTRACT

In conventional concrete, micro-cracks develop before structure is loaded because of drying shrinkage and other causes of volume change. When the structure is loaded, the micro cracks open up and propagate because of development of such micro cracks, results in inelastic deformation in concrete. In the FRC, a number of small fibres are dispersed and distributed randomly in the concrete at the time of mixing, and thus improve concrete properties in all directions. The fibers help to transfer load to the internal micro cracks. FRC is cement based composite material that has been developed in recent years. It has been successfully used in construction with its excellent flexural-tensile strength, resistance to spitting, impact resistance and excellent permeability and frost resistance. It is an effective way to increase toughness, shock resistance and resistance to plastic shrinkage cracking of the mortar. These fibres have many benefits. Steel fibres can improve the structural strength to reduce in the heavy steel reinforcement requirement. Freeze thaw resistance of the concrete is improved. Durability of the concrete is improved to reduce the crack widths. Polypropylene and Nylon fibres are used to improve the impact resistance.

Keywords: FRP, Composite material, Polypropylene ,Nylon fibres

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Evaluation of Engineering Properties of Soil Sample

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ABSTRACT

The soil testing costs are only a fraction of the structure's contrition costs. Whether the soil is a testing agent for the soil, it has to be the first stage construction of the building or any structure, whether sand, clay, gravel, silt or loom soil. In this study various soil tests such as differential free swell, specific gravity, standard proctor test and California bearing ratio were conducted. From the results it was found that the soil is inorganic clay with medium stuff and it can be used for building construction with suitable stabilization.

Keywords: Soil, California bearing ratio, stabilization

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Effective Planning and Scheduling of 4M Using or Technique and MS Project at RMC Plant

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ABSTRACT

Ready mix concrete (RMC) is not new topic in India. Before three decades ago first RMC plant was introduced in country for commercial use. Now a days most of construction projects are depends on RMC plants for fulfil their needs related to concrete activities. To building and operating RMC plant is very costly so every builders or developers can't afford it. RMC plant needs special attention for smooth management. RMC plant handling becomes challenging task when multiple sites depends on one single plant. On RMC plant many things to manage at a time like finance management, human resource management, quality management, transportation management, material management, production, scare resources management and maintenance. When RMC plant supplying concrete to two or multiple sites in a day at different location or large concrete supply on single site than at that time many problems related to resources, delivery and scheduling is arise. Due to these problems a sites gets delayed and not getting concrete on time. This delay give huge loss in terms of money and time. Delay increase labour cost, equipment rent, form work rent and many more expenses. This research work is mainly contains of experimental work based on past literature, problems faced by RMC plants, application of mathematical model and utilization of management fundamentals in management and resources planning of RMC plant. On basis of research outcomes there may be possibilities of optimization of many problems and factors faced by RMC plant engineers and users. That can be solved by applying Mathematical approach and Project management software in planning and scheduling of resources of RMC.

Keywords: Construction, Management, Optimization, Resources, RMC

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Quality Control and Monitoring by ITS Solution for Better Application of TQM

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ABSTRACT

Project quality management is one of the key elements of project management and project completion. With good construction quality control, the amount of faults and rework in a project can be decreased. Quality management in the building industry has traditionally been done in a number of ways, such as manual inspection or sampling, is labor-intensive and may easily result in undetectable and irreversible defects. Better and more efficient quality management ensures higher-quality services and products. A questionnaire survey was used in this study to find the major issues caused by poor/traditional quality control and described an IT approach for improving quality control and monitoring in construction projects. The QM software was introduced to the selected construction firm and feedback was carried out to demonstrate the benefits of using software. The new quality management platform helps in streamlining, centralizing, and formalizing content from across the supply chain, allowing for cross-functional cooperation and interaction. The quality control software is a web-and mobile-based solution that allows quality control teams to increase the reliability of quality control inspections, operations and, as a result, ensure high quality standards across all goods and services. The necessary inspections and actions are performed on the inspector's mobile devices and desktops, and the results are reported in real time. The platform transforms safety audits and construction site inspections by allowing users to create checklists, inspect sites, and produce audit reports all from the comfort of their mobile device.

Keywords: Construction quality, Inspection, Quality control, QM software, Total quality management.

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Agile Project Management in Construction Industry Using Agile Software Development Tools

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ABSTRACT

The construction industry is dynamic in nature because it involves a wide number of stakeholders, such as consumers, manufacturers, consultants, regulators and others. Construction projects face many obstacles and dynamic performance problems, such as poor planning, task delays, and target adjustments. A comparison of traditional and modern project management techniques in building projects is being investigated. The study was carried out through feasibility study of usage of project management tools there features and limitation by questionnaire and finding out critical success factors that are mostly affects for success of construction project. The adoption of the Agile project management methodology as a modern project management strategy, as well as the structure, had an impact on the outcomes of construction projects. With the use of Agile software development tools comparison of individuals experts and team solutions will be analyzed and evaluate optimum solutions and their comparison with traditional project management tools. In traditional project management. Jira and Trello applications can be used for project management as agile software development tools. The study will compare traditional and agile project management tools and will propose the best solution to any issues that might occur during the construction process to the project management team.

Keywords: Agile methodology, Kanban, Scrum, Traditional methodology, Waterfall methodology

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Construction Safety Management for Prevention and Minimization of Accidents in Construction Project

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ABSTRACT

As demand for infrastructure, homes and offices continues to increase, the construction industry is growing. Because construction is so dynamic, it is susceptible to a variety of risks to health. Protecting is thus a top priority for a healthy working environment in the building sector. Security experts have found that the vast majority of workplace injuries are caused by risky behaviors and that controlling such behaviors is one of the keys to effective accident prevention and low accident rates. Safety is much more important in the construction industry. This review will improve the safety of the construction industry. The primary aim of the study is to define the critical success factors affecting building safety management implementation. This review paper identifies and solves major building issues with various work-related solutions affecting the performance of project security. A large number of deaths and long-term injuries occur thanks to the lack of knowledge and awareness. As a result of the increasing amount of information available, data available have faced traditional construction safety management challenges. A new wave of construction safety management techniques is thought to include sensor-based technology, because it is an effective way of gathering, identifying and processing data. The reason for this review paper is to recognize and evaluate the safety control of construction projects to reduce and control health and safety among construction workers (H&S). This paper outlines the different accident safety and control measures in building projects to mitigate accidents using sensor-based technology. and discuss causes of accidents and the use of Drone in building safety.

Keywords: Civil Engineering, Construction Management, Inspection, Drones, Unmanned Aircraft System

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Analysing Practices, Needs and Delivery Methods of Micro, Small and Medium Sized Enterprises (Msmes) of Construction Industry

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ABSTRACT

Construction Micro, Small, and Medium Enterprises (MSMEs) are an important sector of the economy, and they handle a large share of the construction activity. The value of productive MSMEs has long been recognised and cannot be understated. MSMEs in the construction industry, on the other hand, confront numerous challenges that limit their long-term growth and development. As a result, having a better understanding of management plans and needs will help to improve the construction industry's standards. To begin, a comprehensive examination of the literature was done to establish the elements that drive the growth of construction MSMEs. Then, by analysing existing practises and the needs of construction MSMEs, a questionnaire survey was performed to gather information on the prevalent causes. The findings indicate that, due to a lack of competence and abilities, MSMEs' business practises are mostly devoid of the most up-to-date management practises. The bulk of the businesses used traditional project management techniques. MSMEs were able to use and distribute their specialised expertise to other enterprises through subcontracting. Some of the primary obstacles that needed to be rectified in order for construction MSMEs to thrive included a lack of adequate planning at all levels of organisations, a lack of adequate staff training programmes, and a lack of separation of the owner's fund from the firm's fund.

Keywords: Micro industry, MSME.

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An Experimental Study on Ternary Blended Polypropylene Fiber Reinforced Concrete

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ABSTRACT

Concrete has been extensively used in construction for many years especially. Cement, fine aggregate, coarse aggregate, admixtures, and water are all used to make concrete. Cement manufacture requires very high temperatures and the release of pollutant gases such as CO_2 and NO. The introduction of greenhouse gases, such as CO_2, into the atmosphere cause environmental issues such as global warming and climate change. This form of problem is solved by replacing concrete with various alternative materials. Due to its great tensile strength and density, dolomite powder is utilized in building. The use Dolomite Powder to partly substitute cement by 5%, 10%, and 15% based on cement weight. Rice husk ash has a high concentration of amorphous silica, which is used as a substitute cementing element in concrete due to its pozzolanic reactivity. It has environmental, economic, and technical benefits when used in concrete. The use RHA to partly substitute cement by 9% by weight of cement Polypropylene fiber reinforced concrete is stronger than regular concrete and has reduced cracks due to shrinkage and ability to enhance the strength. Polypropylene fiber was incorporated into concrete in the following proportions 0%, 0.15%, 0.30% and 0.45% by the volume of concrete. This investigation was carried out on M_{20} concrete grade. strength parameters, concrete grade for each proportion, cubes, prisms, and cylinders are casted for 3, 7 and 28 days. The Mechanical propertieslike Compressive Strength, Split tensile Strength and Flexure strength are determined and contrasted to find the best possible dosage amount.

Keywords: Rice Husk Ash, Dolomite Powder, Polypropylene Fiber, Global Warming and Mechanical Properties.

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Influence of Taper Angle and Bell Angle on Lateral Resistance of Belled-Wedge Piles in Sands

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ABSTRACT

Foundations of offshore structures generally experience larger lateral loads than the onshore structures. Hence, this attempt is to study the lateral resistance of the belled-wedge pile which can carry larger lateral loads than the regular pile. Very few researches have been carried out experimentally and numerically in determining lateral capacity of Belled-wedge pile. Belled-wedge pile is a combination of belled pile and tapered pile. In the present paper, a series of model tests were conducted in a model box to investigate the influence taper angle (α) and bell angle (ɵ) on the lateral resistance of belled-wedge pile embedded in sand for two taper angles of 1° and 2° and also for relative densities of 35% and 55%. The effects of taper angle and bell angle were tested for ɵ value of 30˚, 45˚ and 60˚ by varying the bell to shaft diameter ratios (D_b/D_s) of 1.5 and 2. To compare with Belled-wedge pile results, tests were also conducted on tapered pile for different combinations. It was found from the present study the optimum bell angle is equal to 45˚. It was also concluded that with increase in relative density and D_b/D_s ratio the lateral resistance was found to increase. It was found that when compared to tapered pile alone belled-wedge pile is more efficient in resisting lateral loads.

Keywords: Lateral load, Taper angle, Bell angle, Relative density, Deformation

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Comparative Study between Hybrid Annuity Mode (Ham) and Engineering, Procurement, Construction (Epc) Based on Contract Agreements Issued by Ministry of Road Transportation and Highway (Mort and H)

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ABSTRACT

India has consisted of huge road networks and it is second largest in terms of road network in the world. The road network is basically consists of National Highways, Expressways, State Highways, Major District Roads, Other District Roads and Village Roads. Road Transport is a critical infrastructure for the economic development of a country. It impacts the pace, structure, and pattern of development. Historically, the government has made investments in the transportation sector. However, the Ministry has issued thorough policy guidelines for private sector participation in the construction of National Highways and improved management of assets associated to them from time to time in order to stimulate private sector participation.Currently, the Ministry of Road Transportation and Highways is working on national highway projects using the EPC, HAM, BOT (TOLL), and BOT (Annuity) contracting methods. Since its beginning, MORTH has placed a strong emphasis on EPC and HAM contracts.This study examines the factors that may influence the execution of EPC and HAM contracts on various highway projects, taking into account their applicability. The study also identifies potential changes in the scope, time extensions, and project financing, as well as challenges associated with them.Interviews and questionnaire surveys were used to conduct research on various ongoing and completed EPC and HAM projects in order to discover the key issues that arose during the execution and effective contract management of NH projects for successful completion.

Keywords: Annuity, Built Operate Transfer (BOT), Engineering Procurement and Construction (EPC), Hybrid Annuity Mode (HAM), MoRTH,

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Performance of Concrete Using Calcite Precipitating Bacteria: A Review

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ABSTRACT

Non-reacted limestone with calcium-based nutrients produces calcite precipitating bacteria. This literature study reports the progress upon the existing techniques and innovating new techniques for performance measurement of calcite precipitating bacteria. The study works on issues associated with bacterial self-healing concrete and examines how it may be a part of the composition for construction material effectively and efficiently. Researchers have interest in this area for the last decades but lack of comprehensive resources and lack of knowledge is the major obstruction that limits the study for this area. Since no any IS code is available for bacterial concrete so there is no particular test which we can perform. That's why this technique is still striving for widespread use. An idea to develop the tests for the bacterial concrete to check the healing depth and healing efficiency in terms of internal crack repair is suggested in this paper along with some important reviews of past papers. The selection of healing agents to crack repairing mechanism and a comparison of bacterial concrete of different concentrations with conventional concrete is also present in this paper that will work as a catalyst for the scholars in their research. In this study all the techniques of applications and mechanism of calcite forming then healing is arranged in a chronology that will not only help to conclude this idea of healing as a game-changer but also motivates for further research in this area.

Keywords: calcite precipitating bacteria, innovative, calcium, crack

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Study and Behavior of wind - Structural Interaction at Terrain Category II Using Ansys

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ABSTRACT

In this paper, the approach of wind-structure interaction for tension, compression members of structures with displacements and stresses are presented with different varying load conditions. Thefirst component can be regarded as steady interaction process. The suitable method for static and steady reciprocal action of structure is CFD simulation, in which intensity of wind changes deformation of the structural is considered for a model having a 5m x 5m plan along with the structural members like columns, beams, and slabs having 5 floors with a height of 3m each floor is carried out finally.

Keywords: Wind-structure interaction, CFD simulation, compression and tension members.

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Identification of Potential Sites for Rainwater Harvesting

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ABSTRACT

In this study, rainwater harvesting is introduced briefly which is having scope to improve the water scarcity problems among nations. It is significantly approached by many agencies and is introduced in various projects. The author(s) approached to GIS and Remote sensing techniques, the findings of the study is identification of potential sites for rainwater harvesting, by using freely imaginaries/remote sensing data and data from other sources as well. In this approach, various thematic maps were prepared by using Qgissoftware, the layers of surface elevation (ASTER DEM) Digital elevation model, contour, land use land cover, soil map, slope map, runoff depth, and drainage network map are integrated eachotherand further analyzed to obtain site suitability map for the Vellore district, Tamil Nadu. A possible site suitability map was derived by using a weighted overlay average analysis in QGIS 3.18 software. The SCS CN method has been used to derive the total runoff depth. The suitability map is divided into five main classes i.e. Restricted, Not suitable, suitable, moderate suitable and high suitable. The rainwater harvesting is recommended in high suitable locations namely Ammur, Gudiyatam, Katpadi, Vaniyambadi and Ambur.

Keywords: DEM; GIS; curve number; thematic maps; Rainwater Harvesting; remote sensing.

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Static Analysis of Laminated Composite Plate with Different Loading Conditions Using ABAQUS

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ABSTRACT

Composite materials are heterogeneous in nature for example they are by and large the combination or can be called the combination of two materials in a specific way, the fundamental benefit of these materials is their flexibility as indicated by our need and specific use. It for the most part, contains fiber as their essential support and network material. Covered composite plates have high strength and solidness under in-plane bending and loading. These plates having diverse use in composite airplane, marine structures, Etc. Laminated plates as SHELL STRUCTURE in this paper the loading conditions like Sinusoidal loading , Patch loading , Point loading, Uniform varying loading, Uniform distributed load under Four boundary conditions like SSSS, SCSC, SFSF, CCCC, is being done. The required estimation of central displacement, the normal pressure stress, tangential pressure is been made on three diverse a/h proportion of 10, 50, and 100. Where a is the length and h is the thickness of the material. The examination is been completed utilizing ABAQUS software. The ABAQUS simulates FEA (FINITE ELEMENT ANALYSIS).in limited component investigation the reenactment is been done on the composite materials for the various conditions to do the rough arrangement of the issue in the genuine world. The necessary arrangement as PDE (incomplete differential condition) is been done for the necessary reenactment and give the closest by through combination hypothesis, so the get together is in the specific extent to its designing properties under various stacking conditions with various circumstance and we get the most plausible outcome.

Keywords: Finite element analysis, shell structures, composites, abaqus softwere

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Laboratory Investigation of Hot Mix Asphalt Containing Copper Slag

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ABSTRACT

Copper slag (CS) is an industrial waste generated during the production of copper. This paper investigated the suitability of using granulated CS in hot mix asphalt (HMA). Marshall Procedure was executed to determine the optimum bitumen content (O.B.C) of hot mix asphalts containing CS proportions of 0, 10, 20, 30, and 40% by total weight of aggregate. Results based on Marshall Stability and tensile strength ratio (TSR) suggested that 20% of CS in HMA improved the Marshall performance and moisture susceptibility of the mix.

Keywords: Hot mix asphalt, Copper slags, sustainable pavements

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Abstract Proceedings of Online "**International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021**

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M-Sand, an Alternative to the River Sand in Construction Technology

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ABSTRACT

Concrete is a generally utilized material on the planet More than ten billion tons of cement are devoured yearly Conventional cement is a flexible material and it is a combination of concrete sand total and water Sand is the most broadly utilized fine total during the time spent assembling concrete The stream beds are the principle hotspots for the regular sand These common assets are getting exhausted exceptionally quick due to over misuse and defilement by synthetic substances and waste from close by businesses The normal sand is moved from its accessible spots to the building destinations Transporting waterway sand to the building locales expands its deal cost fundamentally The essential utilization of sand is in the production of concrete and solid items The made sand which is accessible in abundance in different quarries is one of the significant elective material that can be utilized rather than characteristic sand in concrete The made sand is a side-effect of the pounding and screening measure in the quarries.

Keywords: concrete, manufacturing sand, construction

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June2021

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Design of Urban Road Using Infraworks 360 Software

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ABSTRACT

The main objective of the paper concentrates on bringing a conceptional design of a highway 3D representation model to evaluate the feasibility of Sight distance.Geometric design as per the guidelines and recommendation by using the Infraworks 360 software tool.The evaluation of Sight distance with design speed in terms of Sight clear, Sight failure and Sight obstructions from the tool. The paper also aims on validating the Infraworks software by determining factors of highway geometric design standards.

Keywords: Highway 3D model, Sight clear, Sight failure, Sight obstructions, Design speed.

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Abstract Proceedings of Online "**International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021**

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Physical Characteristics of Municipal Solid Wastes of Perungudi Landfill Dump Site for Its Sustainability

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ABSTRACT

The aim of the present study is to determine the physical characteristics of municipal solid waste (MSW) from an open dump site located in perungudi, Chennai, Tamilnadu (India) for the analysis of degradation level. Fresh and degraded waste was tested for unusual heavy rainfall occurred during the month of January which represents the winter season and degraded waste was collected and tested after 45 days in the month of March which represents the summer season. The physical characterizations were performed to determine the composition of waste and its degraded level. The presence of moisture content in the fresh waste and degraded waste were 62.33% and 14.60 % respectively. The specific gravity of fresh and old waste were 1.09 and 1.31 in uncompacted condition and 1.19 and 1.48 in compacted condition respectively. The maximum dry weight was observed to be 37.67Kg for fresh waste at the optimum moisture content (OMC) of 45 % and 85.40 kg for degraded waste at OMC of 32%. The unit weight of fresh waste in uncompacted and compacted condition were observed as 346.70 kg/m^3 and 509.16 kg/m^3 and in degraded waste it is observed as 642.42 kg/m^3 and 1223.33 kg/m^3.

Keywords: Municipal Solid Waste, Degradation, Fresh Waste, Physical Properties, Unit Weight, Moisture Content.

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Abstract Proceedings of Online "**International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021**

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Types and Behaviour of Shell Structures – A Review

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ABSTRACT

Shell structures are lightweight structures that are widely used as roof elements in various buildings. Due to reduction in the construction material, thin shells are preferably used in the construction field leading to an economical construction. Based on the geometry and behaviour, the thin shells are classified into various types. The continuity and curvature of shell structures makes it ideal in structural and aesthetic point of view. Some of the major shell structure types and behaviour were studied by various researchers and reported. The vital idea of this study is to compile different types and behaviour of shell behaviour under one roof from various studies with few real examples.

Keywords: Thin shells, Types, Behaviour, Literatures, Examples.

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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An Overview on Research Status of Light Weight Coconut-Shell Aggregate Concrete in Trusses

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ABSTRACT

The most commonly used technique for supporting long-span roofs in commercial structures suchas warehouses and aircraft hangars are steel trusses. Steel trusses have a number of advantages, including their light weight, simplicity of handling and erection, and geometric flexibility. They do, however, have certain disadvantages, including high material and maintenance costs, as well as inadequate fire resistance. In this paper a light weight concrete truss has been proposed as an alternative material of steel trusses. In construction using of light weight concrete has grown rapidly over the years. This paper reviews the status of light weight concrete research and implementation in trusses, the theory and development of truss structures, and the status of truss optimization research, as well as the prospects of light weight aggregate concrete in trusses.

Keywords: Light weight concrete, truss optimization, Concrete trusses, steel trusses, of single-post trussand double-post truss.

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Study on Flexural Behaviour of R.C Beam Using Graphene Oxide Reinforced Cement Composites

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ABSTRACT

The utilization of nanomaterial plays a major role in improving the fresh and hardened properties of cement composites. This research presents the flexural behavior of R.C beams fabricated with Graphene oxide cement composites. Graphene oxide of 0.06% by wt was taken for this study. Concrete mix proportioning was done as per IS 10262(2009). Grade of concrete used for this investigation was M20 and M30 to study the flexural behavior of RC beams. A total of six beams were cast, two beam specimens are of the control specimen and the remaining specimens are reinforced with GO. A two-point load test was conducted to investigate the flexural behavior of the RC beams. The compressive strength, ultimate load, energy absorption capacity, first crack load, and mode of failure was investigated.

Keywords: Graphene oxide, Nanomaterial, Cement, ultimate load, energy absorption capacity, mode of failure

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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A Brief Review on the Comparative Study of Essential Oil Compounds Extracted from Lemongrass (Cymbopogon Citratus) Using Microwave Assisted Distillation and Solvent Free Microwave Extraction

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ABSTRACT

This is a review of a comparative study for the performance of three different essential oil extraction techniques on the grounds of the yield and time of extraction of lemongrass oil (Cymbopogon Citratus) from its leaves using the Microwave assisted Hydro-distillation (MAHD), and Solvent free microwave extraction. Isolation of lemongrass oil with Solvent Free microwave extraction offers a slight advantage over MAHD when collated on the basis extraction yield. Solvent free microwave extraction was found to be superior and produced better oil quality. Solvent free microwave extraction came out as a green technology causing least adverse effects on the environment and yielding top grade oil.

Keywords: Solvent free microwave extraction; essentialoil; Microwave assisted Hydro distillation, Lemongrass

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Characterization of Stabilized Adobe

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ABSTRACT

Soil is one of the main material which is abundantly available on the earth. Depending upon the topographical feature there are different types of soils available on earth in which some of the soils are suitable for preparing blocks. There are different techniques of preparing soil blocks. In this study, an attempt is made to prepare a soil block by pugging method known as adobe block which is a eco-friendly and cost effective. The adopted pugging method to obtain adobe block is more suitable for rural areas. The procured soil is reconstituted by using M-Sand to reduce clay content and to eliminate development of cracks in the block on drying. To achieve strength, stabilizers like cement and lime are added. This paper presents the study on strength properties of Soil stabilised adobe block like density, compressive strength, water absorption and Initial Rate of Absorption (IRA). From the study, adobe block with cement as stabilizer shows increase in density, and increase in compressive strength in both wet and dry state, and least water absorption compared to the adobe block with stabilizers, lime alone and combination of cement and lime. However, the adobe block with lime as stabilizer shows least Initial Rate of Absorption

Keywords: Soil Stabilized Adobe , pugging, stabilizers

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

Paper ID: ICCSDC-21-1104

An Overview of Disputes and Different Alternative Dispute Resolution (ADR) Methodologies

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ABSTRACT

Construction industry in India is one of the largest contributing sectors to the economy. The ever developing infrastructure not only enhances technological advancement but also provides enough scope for innovation. Construction projects have various problems which halt the development. Most common ones are claims and disputes. There is a visible change in the way claims and disputes are getting innovative (complex) but the possible solutions have remained the same, often litigation. In most cases delay in solving a dispute results in cost escalation of the project and in worst case the project gets terminated. As construction industry is experiencing advancement and innovation, it's absolutely vital that the dispute solving process also has a similar change. The need for Alternative Dispute Resolutions (ADR) has been often unknown or ignored. ADR is not an entirely new concept but its minimal implementation has compelled to perceive it as a new technique. This paper studies the different types of ADR methodologies used all over the world.

Keywords -Claims, Contracts, Dispute Resolution, Alternative Dispute Resolutions (ADR), Artificial Intelligence

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Comparative Study of Outrigger With Framed Tube System by Performing Time History Analysis

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ABSTRACT

It has been observed that the development of tall buildings is rapidly increasing worldwide introducing new challenges. As the height of the structure increases, the stability of structure reduces under the influence of seismic loads with gravity loads. Taking into consideration, the construction of high-rise structures involves a variety of methods. In this paper a comparative study of outrigger and framed tube structural system has been done on 50 multi-storey building subjected to lateral loads has been modelled, analysed and presents the results by comparing different parameters such as joint displacement, time period, mode shapes, story drift and base shear by performing time history analysis using the software ETABS V17.

Keywords: High-rise building, Outrigger, Framed tube, Time history analysis.

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Self Healing Concrete-Bacterial Approach by Bacilus Subtilis

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ABSTRACT

Self-healing concrete (SHC) is not only eco-friendly but also important biological systems of regeneration.By mirroring this type of effect, to the concrete to provide healing the damaged area of the structure. Concrete expands and shrinks with changes in moisture and this tendency to shrink and expand causes cracks in concrete Microbiologically induced calcium carbonate precipitation (MICCP) is suggested as eco-friendly and harmless with huge potential for growth in this field. SHC is the effect of the biological response of non-reacted calcareous and calcium-based nutrients to cure the cracks.Different perspectives of carbonate precipitation by bacteria is observed. This paper investigates the suitability of calcium perception in concrete, compressive strength by varied concentrations of the bacterial solution of 15, 30, 45 ml and these results were compared to conventional concrete.This also include the bacteria isolation process for bacterial concrete using scanning electron microscope (SEM) and Energy Dispersive Spectrometer (EDS) analysis.

Keywords: MICCP, bacteria, self-healing, SEM, EDS

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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The Effects of Nano Zro_2 Particles on Durability Properties of Ultra High Performance Concrete

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ABSTRACT

In the present study, durability characteristics such as abrasion resistance, electrical resistivity, RCPT, drying shrinkage, water absorption, sorptivity, water penetration and fire resistance of ultra high performance concrete specimens containing nano ZrO_2 particles have been investigated. Here, the cement was partially replaced by 1, 2, 3, 4 and 5% nano ZrO_2 particles by weight. Results clearly show that the inclusion of 3 wt % nano ZrO_2 particles was found to be the optimum dosage for UHPC, which achieved a higher performance in abrasion resistance, electrical resistivity, rapid chloride penetration, water absorption, sorptivity, water penetration and fire resistance of UHPC. On the whole, it is concluded that the durability performance of UHPC has enhanced with the content of nano ZrO_2 particles, which is due to its smaller size, higher specific surface area and high pozzolanic reactivity.

Keywords: Nano ZrO_2, UHPC, abrasion resistance, electrical resistivity, RCPT, water transport properties, drying shrinkage and fire resistance.

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Stabilization of Coastal Slope at Baga Hill

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ABSTRACT

The stability of rigid retaining structures in protection of coastal slopes has become a problem in many countries. The main reason for this is failure due to erosion.Thispaper presents a study of slope failure and suggests possible sustainable remedies to be undertaken at Baga Hill. The study area is a coastal slope popularly known as "Bagahill," located in Bardez taluka, 18 Km away from Panjim, the capital city of Goa, India. The Baga hill is surrounded by beaches on three sides and an approach road on the entrance sides, leading to the hill's top. During peak monsoon, three consecutive Landslides occurred in August 2020, subjecting this slope to further vulnerabilities. Site visit indicated poor drainage conditions and inadequately designed concrete gravity wall as the basis for failure. This study gives two sustainable alternatives for stabilizing the failed slope; gabion wall and reinforced soil wall. The reinforced soil wall displays better results as compared with gabion wall.

Keywords: coastal slope, retaining structures, erosion

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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An Experminetal Study on Compressive Strength of Concrete Using Structure Water and Normal Water

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ABSTRACT

Concrete is the combination of Cement, Fine aggregates, Coarse aggregates and portable water. The total volume of water on earth is 1.386 billion km^3, In which 97.5% is non portable water and 2.5% being fresh water. Scarcity of the portable water is an critical environmental issue world wide. In order to overcome the problem an alternative solution is been approached by changing the physical properties of non portable water for the production concrete, This study adopts the experimental approach performed in laboratory, in order to find how physical qualities of water used in casting and curing plays a vital role in compressive strength of concrete. To asses the impact,two different water samples are to be tested by casting the concrete cubes . The sources of sample are, Borewell water, industrial water.The comparative assessment is been performed on these water samples to find out the impact of structure water and compared by making the same water as structure water. Concrete cubes were casted with the samples of water of mix design M20 and M30 grade concrete. Compressive strength of the cube is been observed for 7,14 and 28 days. However, Concrete cubes casted with Structure water gained more strength by 16.6% with structured borewell water, 11.67% with industrial structure water in M20 grade in 28 days, 14% structured borewell water and 10.23% with industrial structure water in M30 grade concrete in 28 days.

Keywords: Structure water, Physical quality, Compressive strength, Concrete.

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Development of Flood Forecasting Model for Godavari Sub Basin Using Mike 11

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ABSTRACT

Floods are natural disaster event by the nature. If may destroy the agriculture land, public and private properties and infrastructure or other developed area or land. Hydrological modelling of large river catchment has become a challenging risk due to its complexity in collecting and handling of both spatial and non spatial data, to generate a model we are using a conceptual modelling using MIKE 11. This software includes rainfall runoff modelling using GIS, hydrodynamic flow rooting calibration and validation of the model with observed three years field data. In the total stretch of Godavari basin were carried out of these two points are discussed in this paper i.e (perur & badarachalam).The results observed in the real time and model generated are approximately same. The model output of surface water elevation vs. time interval has been plotted as flow hydrographs. These are compared by modelling and statistical analysis

Keywords: Flood forecasting model, Mike 11, hydrodynamic flow rooting

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Dielectric Measurements and Modelling of Rubber Vegetation at C- B and Microwave Frequency

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ABSTRACT

Dielectric behavior of vegetation canopy at microwave frequency provides significant information for remote sensing. Microwave measurements of dielectric constant of freshly cut rubber vegetation as a function of moisture content was conducted at C- band microwave frequency and at room temperature (30^0 C). The measured laboratory data is compared with theoretical models available for prediction of dielectric properties viz. Carlson formula, Matzlers model and Debye Cole dual dispersion model. Von Hippel method is used to perform the dielectric measurements for which C-Band bench set up is automated. A waveguide sample cell with movable reflector is fabricated especially for compactness of vegetation sample. Least square fitting technique is used to calculate real and imaginary part of complex dielectric constant and errors in its measurements. Radiometric emissivity and brightness temperature are calculated from measured dielectric properties at different angle of incidence for both dry and moist samples using Fresnel equations. These parameters are important for interpretation and application of passive and active remotely sensed data.

Keywords: Rubber vegetation, Dielectric constant, Emission, Von Hippel.

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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M5 Pruned Tree Model Based Predictive Modelling of Road Accidents on Different Road Stretches of Haryana

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ABSTRACT

By creating accident frequency prediction models, the study aims to identify several factors that influence the frequency of pedestrian accidents on Haryana's non-urban road lengths. Comparative performance of different pedestrian accident predictive models is also discussed in this study. To get pedestrian accident frequency, the different types of accidents was aggregated per year for all the road sections. The resulted data contained a total of 268 distinct samples out of which 178 samples were utilized for training and rest of 90 samples were adapted for validation of prediction model. As per available data and literature review, 14 input significant variables namely average daily traffic (ADT), carriageway width (CW), section length (SL), number of horizontal/ vertical curves (HVC), number of Minor access points (MA), 98th percentile Speed (98ps), median openings (MO), Shoulder width (SW), length of service road on the highway section(LSR), median width (MW), and bridges and culverts (BC) were used for prediction of pedestrian accident frequencies (A). For accident frequency prediction, three statistical measures viz. CC, RMSE and MAE were used. Keeping in view the robust performance of non-parametric models in pedestrian accident prediction as reported in literature, M5 pruned model and REP model were used. REP regression model was developed using IBM SPSS software whereas WEKA software was used for M5 model.

Keywords: M5 model, SVM model, APM, pedestrian.

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Structural Application of Fly Ash Based Composite

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ABSTRACT

Fly ash is the finest particle generated by burning of coal in thermal power plants. We all know that it is very harmful for the environment. Around 60%-65% of fly ash produced is mostly dumped in landfills and around 30% is reused in making bricks or other purposes. Remaining is mostly left in open fields. Various studies had been done to increase the reusage of fly ash. Various composites are being made using fly ash. in this paper we will be reviewing the various uses of structural application of fly ash based composites

Keywords: fly ash, coconut fibre, geopolymer.

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Abstract Proceedings of Online "**International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021**

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Experimental Investigation on Flexural Behaviour of RC Beam Using Hybrid Fibre with Copper Slag as Partial Replacement

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ABSTRACT

This study present's the experimental behaviour of modulus of rupture of reinforced concrete beam of grade M20.The fibre reinforced concrete is melded with cement concrete mortar with copper slag,suspended,distinct and regularly distributed appropriate fibre.The fine aggregate is partially replaced with copper slag insame constitution as 40%. Steel fibre and banana fibre is added to the concrete as discrete and then by blending them (i.e., hybrid fibre reinforced concrete) the resistance of beam (flexural study) is done against deformation. The banana fibre used trimmed for 50mm and steel fibre of 30mm is used. The steel fibre and banana fibre are added in 0.5%,1% and 1.5%.

Keywords: Copper Slag, Steel Fibre, Banana Fibre, Modulus of rupture, Fibre reinforced concrete.

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Analysis of Labours Psychology in Construction Industry of Nasik City After Covid 19 Pandemic Situations

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ABSTRACT

Since the World Health Organization (WHO) declares the coronavirus 2019 (COVID-19) outbreak as a pandemic, many countries have declared a complete national lockdown after a remarkable spike in COVID 19 cases. These decisions have restricted the movement of people and closed down of many businesses across many sectors. With few expectations, the construction industry has been completely shut down as a key driver of economy's growth. All the developments and projects were scheduled until further notice. The questionnaires were distributed to the Project Manager, Project Engineer, consultants, clients, and others. The purpose is to study the effects of COVID 19 on labours psychology of the construction industry. The heavily impacts labours and their psychology.The study includes method of Data collection and Analysis. This paper focuses on if a situation arises in future, labours are how to face for this situation in future and optimistic approach and steps taken in that direction can save the construction sector. These included safety measures such as requiring labours to wear face coverings, implementing social distancing guidelines, adopting COVID-19- related safety training etc. The COVID-19 is all over the country and has affected our personal, family, social and social work. A good analysis should be made of how this error occurred and how to minimize the recurrence of this error. This will help the contractor, consultants and clients to work on time, avoiding delays and also it will help to complete project on time.

Keywords: Construction industry, Covid 19, pandemic situations, labours psychology, one-way ANOVA test.

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Review of Difficulies Faced During Major Metro Projects in India

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ABSTRACT

Increased population, urbanization and industrialization have demands advances in transportation system as well. Metro is adopted by many countries in order to curtail the transportation time and connect the part for increased speed of trading, communication. However construction of metro involves many issues such as economical, construction on site difficulties, and also the complex layout and structural design of members. Every metro project is unique due to variation in soil, layout adoption, various construction and design methods adopted. Despite the difficulties encountered at various stages, metro project proves to be beneficial due to its long term benefits.

Keywords: Urbanization, Metro project, Site difficulties, Industrialization.

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Energy Optimization Techniques for Low Cost Building Using Design Builder

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ABSTRACT

Dynamic excitation, such as seismic and wind loads, is a concern for modern-day structures. High-rise buildings when exposed to strong earthquake or wind forces, experience large induced acceleration causing extreme vibration-related problems. Over the decades, one of the most effective displacement control measures used is Tuned mass dampers (TMD). TMD is used to limit the magnitude of oscillation to permissible limits. But in many instances, the displacement undergone by the tuned mass dampers itself exceeds permissible limits and the confines of its enclosure. To limit displacements, secondary dampers are used. In this research, an experimental study to assess the frame structure with tuned mass dampers surrounded by different fluid media is done. The fluid media would act as a replacement to conventional secondary dampers (Inerter) for the tuned mass damper. The objective of the study is to establish the relationship between the behaviour of the frame structure and the tuned mass dampers surrounded with fluid. It was found that the TMD surrounded by liquid (water and oil) media can be effective in mitigating the vibration of that structure considerably and also increases the damping capacity of the structure. The frame structure subjected to harmonic excitation and with a tuned mass damper has a maximum percentage reduction of 68.68% and 63.56% for water and oil respectively in Fourier amplitude. The frame structure subjected to arbitrary excitation and with a tuned mass damper has a maximum percentage reduction of 69.47% and 73.42% for water and oil respectively in Fourier amplitude.

Keywords: Tuned Mass Dampers, Inerter, Fluid Media, Passive Vibration Control, Arbitrary Excitation.

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Mechanical Properties of Binary Blended Cement Composites Using Graphene Oxide as an Additive

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ABSTRACT

This paper presents the effect of the influence of GO on flyash-based cement composites. The increase in the consumption of cement increases the productivity of cement and thus leads increase in the production of cement will cause a considerable amount of CO_2 emission to the environment. The emission of CO_2 to the environment will cause global warming. To reduce the utilization of cement in this paper flyash was used along with the nanomaterial Graphene oxide. GO of dosage 0.02%,0.04%, and 0.06% by wt of cement was used for this investigation. To enhance the sustainability of the environment instead of river sand manufactured sand was used for this study.Flyash was replaced with 30% by wt of cement. M30 grade of concrete was designed as per IS 10262(2009). Compressive strength, split tensile strength, flexural strength test was conducted to study the mechanical properties of the concrete.

Keywords: GO, cement, flyash, river sand, manufactured sand, concrete

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Principal Component Analysis for Modelling the Performance of a Domestic Water Demand

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ABSTRACT

Providing a reliable model in prediction of accurate domestic water demand is essential for effective water resources planning and management. In current study develops a regression model integrated with principal component analysis to predict the domestic water demand in low lying and slum area of Ajmer City, Rajasthan (India). In this study, thirteen domestic water demand variables are identified in a low lying and slum area of Ajmer City. The collected data of thirteen variables was used in the factor analysis of principal component analysis and new four PCs (principal components) were formed. Based on these four PCs variables, a multi linear regression called PCR (PCs) best goodness-fit model was developed. This model (M4) gives the maximum value of regression coefficient R^2 = 0.76. Further, this newly proposed model PCR (PCs) was training and testing with artificial neural network (Multilayer Perceptron) based on same four PCs whose regression coefficient was R^2 = 0.82, which is higher to the value of regression coefficient obtained from PCR (PCs) modelling. The results also represented that both the model PCR (PCs) and MLP (NN) PCs showed prediction better and therefore, can serve as reliable models. The outcome may give of above modelling of water demand parameters and provide a standard benchmark for management of domestic water demand in low lying area of city, Ajmer.

Keywords: Domestic water demand, Principal components analysis (PCA), Principal component regression (PCR) Neural Network.

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Performance of Pendulum Tune Mass System-a Laboratory Experimental Study

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ABSTRACT

Dynamic behaviour can be studied both analytically and experimentally of any structural system. Both types of studies have their advantages and disadvantages. However, for many practical situation, analytical solution is difficult to derive therein experimental study is necessary. Apart, experimental study can help to better understand the behaviour of any structure as compared to analytical solution. Verification of reduction in structural response due to implementation of various control mechanism in any structure subjected to dynamic excitation can be done by conducting experiment on suitable scale model in laboratory. Due to modernization in the materials, the use of lighter and flexible structures has been increased in construction. These types of structures are vulnerable to the dynamic loadings like wind, earthquake etc. Therefore, it is essential to determine dynamic properties of the structures such as Natural Frequency, Time-Period, Displacement and Damping etc. Dynamic properties and response of any structure can be obtained by preparing a suitable model of the structure and testing it using shake table by providing free vibration. In the present study the response of SDOF model, which represent small scale building system is tested under the sinusoidal loading. Apart, to prevent the effect of lateral load on Building system many system has been evolved. In present study passive damping devices Tune Mass Damper (TMD) and Pendulum Tune Mass (PTMD) has been considered. Response quantity of structure such as maximum displacement, damping ratio and stiffness under dynamic loading is evaluated experimentally through horizontal shake table by providing free vibration. Result indicates good performance of the structures with addition of TMD and PTMD.

Keyword: Damping, Stiffness, Single Degree of Freedom, Tuned Mass Damper, Pendulum Tuned Mass Damper, Accelerometer.

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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A Shear Frame Analysis of 2D & 3D Structure by Modal Superposition Method

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ABSTRACT

In the present study, a normal mode is used to transform the system of coupled differential equation into a set of uncoupled differential equation in which each equation contain only one dependent variable. Thus the modal superposition method reduces the problem of finding response of multi degree of freedom system to the determination of the response of a single degree of freedom system. Analysis of undamped multi degrees of freedom system is expressed in terms of free modal vibrations. To determine the natural frequencies, mode shapes, time period, and modal mass contribution, and mode participation factors of structures under free vibrations. Two cases are considered in the present study, first a single storey, single degree of freedom system (SDOF), & in the second case a three-dimensional three-storey multi degrees of freedom (MDOF) building modeled as a shear building, idealized as a lumped spring-mass model. A modal analysis of shear frame for single and multi degrees of freedom (MDOF) structures are studied, and the results are compared first theoretically, secondly by MATLAB program, and finally by ETABS software. First case a single storey reinforced concrete 2D frame of 6m wide, 3m high & the dimension of each column and beam is 300 mm square section. Second case, a three-dimensional three-storey is considered, the effective length of beam in the X-direction is 3.6m and 4.7m along the Y-direction and the column's height is 3m. The effective slab thickness is 120mm, and the grade of concrete f_{ck}=25N/mm^2.

Keywords: Lumped mass model, Natural frequency, Mode period, ETABS, MATLAB

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Impact of Lockdown on Air Quality Parameters in Bengaluru City Using GIS Technology

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ABSTRACT

The coronavirus disease 2019 (COVID-19) was declared a global pandemic by the World Health Organization (WHO) on March 11,2020. The outbreak was a result of man-made disaster. A large number of countries including India imposed lockdown to curb the exponential transmission of this virus. The objective of this study is to examine the status of air quality in Bengaluru region during Pre lockdown, lockdown and Post lockdown phases and to recommend some long term sustainable eco-friendly suggestions. The data of pollutants CO, NOx, SO_2, PM2.5 and PM10 have been obtained from monitoring stations namely Hebbal, NIMHANS, Silkboard, Jayanagar, and KAVIKA. The spatial variation of these pollutants in Bengaluru region is generated using the QGIS platform. Weighted Overlay Analysis is conducted by providing suitable weightage to these pollutants and Weighted Overlay Maps were generated for the above mentioned phases. The results depict that the pollutants like CO, NOx, PM2.5 and PM10 have significantly decreased while the SO_2 level shows a marginal decrement. This desirable shift in the quality of air owes to the complete halting of vehicular emissions, burning of biomass, dust particles from construction works and industrial emissions. This study can further be extended to find out the implications on health caused due to the variation in these parameters.

Keywords: COVID-19 , Air Quality , Bengaluru , Lockdown , Weighted Overlay Analysis.

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Solar Irrigation

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ABSTRACT

Solar energy has emerged as viable source of renewable energy over the past few decades and is now used for various applications such as emergency lighting, water heaters, and industrial application. It is a cheap source of energy. Unlike hydroelectricity it does not cause national or any conflicts because sun is the only renewable source which is available to everyone. This paper proposes a solar based automatic irrigation system. The main objective is to design an low cost and time based irrigation system with the help of microcontroller. Irrigation Scheduler measures various parameters such as humidity, temperature and soil moisture. In this paper the new type of solar panel is used i.e.. Spin Cell, which produces 20 times more current than the traditional flat panels and also in the irrigation system the irrigation pump controlled in two modes :- Automatic mode and GSM mode

Keywords: solar energy, GSM mode, Irrigation pump

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Evaluate and Quantify the Cost of a Single Bedroom House

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ABSTRACT

The objectives of this paper are to introduce building cost estimation.The cost estimation is done before the construction begins while the cost control is performed during the construction period. For a project to be successful, accurate cost estimation during the design phase is very important. An estimate is the anticipated or probable cost of work and is usually prepared before the construction is taken up. It is indeed calculations or computations of various items of an engineering work. The rates of various items of works, materials to be used in the construction and the wages of different categories of labor (skilled and unskilled) for preparing an estimate. An estimate of the cost of a construction job is the probable cost of that job as computed from plans and specifications. A case study was conducted with single bedroom residence building project.The cost is being estimated through different sources. A location is selected in nearby and a single bedroom house cost of construction will be evaluated and estimated to quantify the cost of construction. The brief details of cost of the materials and equipment for construction is estimated.

Keywords: Estimation of cost, singe store building, analysis of quality building

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Replacement of Cement with Sugar Cane Baggase

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ABSTRACT

The researches has shown that every one ton of cement manufacture releases half ton of carbon dioxide, so there is an immediate need to control the usage of cement. On the hand materials wastes such as Sugar Cane Bagasse Ash is difficult to dispose which in return is environmental Hazard. The Bagasse ash imparts high early strength to concrete and also reduce the permeability of concrete. The Silica present in the Bagasse ash reacts with components of cement during hydration and imparts additional properties such as chloride resistance, corrosion resistance etc. Therefore the use of Bagasse ash in concrete not only reduces the environmental pollution but also enhances the properties of concrete and also reduces the cost. This project mainly deals with the replacement of cement with Bagasse ash in fixed proportions and analysing the effect of magnesium sulphate on SCBA blended concrete. The concrete mix designed by varying the proportions of Bagasse ash for 0%, 5%, 7%, 10%, 12% the cubes are been casted and cured in normal water for ages of 7, 28 and 60 days, the properties like slump cone test and compaction factor test for fresh concrete and compressive strength for hardened concrete are verified and results are analysed.

Keywords: Sugar Cane Bagasse Ash, blended concrete, magnesium sulphate

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

Paper ID: ICCSDC-21-1138

Use of Waste Marble Dust for Stabilization of Clayey Soil

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ABSTRACT

The main objective of this research is to investigate the possibility of utilizing waste marble dust in stabilizing problematic soils (especially swelling clays). The research work was divided into two sections. The first section deals with the shear strength parameters and swelling characteristics, the second section deals with the micro structural investigation of the improved problematic soils. The marble dust addition ratios which have been studied were 0 %, 5 %, 10 %, 20 % and 30 % by weight. Physical, mechanical and chemical properties of soil and marble dust samples were investigated. In addition, SEM analyses were performed on the specimens. Test results indicate that marble dust addition improved the shear strength parameters and reduced the swell potential of the tested clay samples. Marble dust had a noticeable role in the hydration process because of high calcium content. Obtained results showed that marble dust addition to the clay samples will reduce the cost of constructing structures on problematic soils, and finding new utilization areas for waste marble dust will decrease environmental pollution. Utilizing waste marble dust materials in problematic soils will have great contribution to the economy and conservation of resources.

Keywords: Marble dust, clay soil, SEM analysis

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Textile Reinforced Concrete

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ABSTRACT

This study deals with the experimental investigations on the effects in Textile Reinforced Concrete (TRC) as reinforcing material and conventional concrete. In this study, M25 grade concrete is used for nominal mix design. High strength high modulus polyester filament yarns are used to study its effects in reinforcing concrete mixes and to obtain basic strength. For the concrete to achieve its maximum strength and longevity, curing must be carried out for a suitable period of time. In this study, the curing is done by preventing excessive loss of moisture from the concrete either by leaving formwork in place, covering the concrete with impermeable membrane after the formwork has been removed by the application of suitable chemical curing agent (water based), or by combination of such methods. Curing by continuously wetting the exposed surface prevents the loss of moisture from it. The compressive, flexural strength tests were performed by placing the textile in the form of layers 1, 2 and 3. As a result, it had been found that the use of polyester textile material considerably increases the flexural strengths. It is also observed that there is a sudden decrease in flexural strength and compressive strength when textile is placed in 3 layers. The maximum flexural and compression strength is obtained by placing the textile in the form of 2 layers and found to be economical. Eventually it has been observed that, there has been an increase in flexural strength for about 48%.

Keywords: Compressive Strength, Flexural Strength, Membrane Curing, Textile Reinforced Concrete.

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Rain Water Harvesting

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ABSTRACT

Rain water harvesting (RWH) is the collection and storage of rain, rather than allowing it to run off. Rainwater is collected from a roof-like surface and redirected to a tank, cistern, deep pit (well, shaft, or borehole), aquifer, or a reservoir with percolation, so that it seepsdown and restores the ground water.There are various types of rainwater harvesting they are surface runoff harvesting. In urban area rainwater flows away as surface runoff, Rooftop rainwater harvesting, Rooftop Rainwater Harvesting System

Keywords: RWH, rainfall runoff

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Drought Analysis and Assessment Under Godavari Riverin the Telangana Region Using Geospatial Techniques (Adilabad, Karimnagar & Nizamabad)

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ABSTRACT

The river Godavari is passing through the districts Karimnagar, Nizamabad and Adilabad. Although the river Godavari is passing full fletched, the drought is present in these districts. The drought percentage is calculated in these districts. The research is carried out by the name "Drought Analysis and Assessment under Godavari River in the Telangana Region Using Geospatial Techniques".The amount drought of the study area is calculated in the software ArcGIS 10.2.1 by study of Drainage map, Slope map, Digital elevation model, Land use/Land cover map, Forest area map, agricultural land map, rainfall map. The causes for the drought in the study area are extracted from the study of the maps mentioned above.As a result, it is concluded that, significant changes has been occurred on the natural land cover between the years 1980 - 2019 in the study area and its surroundings. The proposal of percolation tanks, check dams, reservoirs are shown in a solution map based on the catchment area and the number of stream flows in the catchment area. The remedies of how to overcome the drought by agricultural practices, rain water harvesting, etc.

Keywords: Drought analysis, ArcGIS

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Non-Linear Static Analysis for RC Framed Residential Building Using Sap2000

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ABSTRACT

This research presents the steps used in performing a pushover analysis of a simple three-dimensional building of existing five storiedLocated in seismic zone-v. SAP2000, a state-of-the-art, general-purpose three-dimensional structural analysis program, is used as a tool for performing the Pushover Analysis. According to pushover analysis the vertical distribution of static monotonically increasing Lateral loads is applied to a mathematical model of the structure. The loads are increased until the peak response of the structure is Obtained on a base shear versus Roof displacement plot. From this plot, and other parameters representing the expected, or design, Earthquake, the maximum deformations the structure is expected to undergo during the design seismic event can be estimated. After Completion of pushover analysis, the performance point and developing of plastic hinges for each storey can be identified.

Keywords: SAP 2000, Lateral loads, Push over analysis

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Analysis and Design of Circular Water Tank Using Staad Pro

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ABSTRACT

Water tanks are the storage containers for storing water. Elevated water tanks are constructed in order to provide required head so that the water will flow under the influence of gravity the construction practice of water tanks is as old as civilized man. The water tanks project have a great priority as it serves drinking water for huge population from major metropolitan cities to the small population living in towns and villages. A different topic like Construction Aspects, Design Parameters, Details of Formwork, Details of reinforcement, Process of Water Treatment Plant and Execution have been dealt with in the course of our mini project.

Keywords: water tank, staad pro

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Seismic Analysis of Multistoried Building in Different Zone

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ABSTRACT

Construction of building requires proper planning and management. Building are subjected to various loads such as dead load, live load ,wind load and seismicload .seismic load has extreme adverse effect on building so it is necessary to perform seismic aThis paper describe about the response of building when it is subjected to seismic load , this response can be shown by story drift and base shear .seismic analysis has been performed on (G+8) building which is located in zone 2 & 4 using STAAD Pro software. Analysis has been performed according to IS 1893PART 1 (2002).

Keywords: seismic, response spectrum, story drift,base shear

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Global Warming

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ABSTRACT

Global warming is the result of a natural process occurring warning in atmosphere is called Greenhouse Effects. This is caused by the addition of a range of gases to the atmosphere as a result of domestic and industrial activities. And Especially Climate change has been recognized as the foremost Environmental problems of twenty-first century and has Become a subject of Considerable debate. The earth's climate in response to External forcing, including changes Variations in its Orbit around Sun, Volcanic eruptions, and atmospheregreenhouse gas concentrations.Climate change is the variation in the earth's global climate of in regional climates over time. The presence of the gas in the atmosphere keeps some of the radiant the energy received by forth from being returned to space 1 thus producing the so-called these changes in global warming greenhouseeffect are due to temperature increases from 0.053°c to 0.84°C. This is caused primarily by increases in "Greenhouse effect" (gases) such as Carbon dioxide (10). Climate change is an Emerging human health to global public health and is predicted to threat to

Keywords: Climate change, Global warming, Greenhouse effect

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Abstract Proceedings of Online "**International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021**

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Floating Concrete Technology

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ABSTRACT

The rising population of India has led to the unmanageable use of land which ultimately leads to the destruction of our environment. Population is on the rise with each day passing and it is becoming a huge concern for the world. As per latest data (2017), population has already crossed 753.04 crores in the world. This paper presents the study concerning floating buildings to counter the ill effects of growing population in terms of energy efficiency performance and improving awareness to build them.

Keywords: Floating Structure, Energy Efficiency, Global Warming, Urbanisation, Concrete, waterproofing

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Design and Estimation of Rainwater Harvesting Pit for Kamala Nehru Polytechnic College for Women

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ABSTRACT

Water scarcity is serious problem throughout the world for both urban & rural community. Urbanization, industrial development & increase in agricultural field & production have resulted in overexploitation of groundwater & surface water resources and resultant deterioration in water quality. The conventional water sources namely well, river and reservoirs, etc. are inadequate to fulfil water demand due to unbalanced rainfall. While the rainwater harvesting system investigate a new water source. The aim of the present study is to use rainwater and thus taking close to the concept of nature conservation. In this study, the rain water harvesting (RWH) system is analyzed as a alternative source of water at campus of Kamala Nehru Polytechnic for women college, Hyderabad, INDIA. The developed system satisfies the social requirements and can be implemented in rural areas by considering almost all the technical aspects.

Keywords: Rain water harvesting

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

Paper ID: ICCSDC-21-1151

Analysis of Self Compacting Concrete

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ABSTRACT

Self compacting concrete is a highly flowable, yet stable concrete that can spread readily into place and fill the formwork without any consolidation and without undergoing any significant separation. In general SSC results in reduced construction times and reduced noise pollution. This paper deals with the history of SSC development and its basic principle, different testing methods to test high-flowability resistance against segregation and possibility. Different mix design methods using a variety of methods has been discussed in this paper, as the characteristics of materials and the mix proportion influences self-compactability to a great extent.

Keywords: Self compacting concrete, mix design, super plasticizer, water-powder ratio, flowability

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Physico-Chemical Analysis of Ground Water Toopran, Tellapur, Praganyapur, Lingampally, Kompally Zones of Secunderabad, Telangana State

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ABSTRACT

Ground water samples were collected from different locations (toopran, tellapur, praganyapur, lingampally, kompally) of Telangana State. These water samples were analyzed for their physicochemical characteristics. Laboratory analyses on samples were performed for pH, Colour, Odour, Hardness, Chloride, Alkalinity, Total Dissolved Solids (TDS) and others. On comparing the results against drinking water quality standards laid by Indian water quality index and World Health Organization (WHO), it was found that some of the samples were non-potable for human consumption due to high concentrations of some of the parameters determined. An attempt was made to find whether or not the quality of ground water in the areas of study suitable for human consumption. But as Water quality index(WQI)=W*Q/Q for following samples Sample1=102.99 Sample2= 93.59 Sample3 =99.24 Sample4=107.50 Sample5=95.40 Water quality status correspondingly was obtained as poor good good poor good DBPs (Disinfection by products) analysis is required to corroborate the presenstudy.

Keywords: Groundwater, TDS

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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A Review on Sustainable Erection-Green Buldings

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ABSTRACT

In today's domain, contamination is increasing at afrightening rate which has given rise to many complications like global heating, acid rain, and also health threats to all the individuals exposed to such high pollution percentage. The influence of this will be very high in the near future. Hence, green building structure is enhanced effects on it. "Green Building" is a process for making buildings and supporting infrastructure that curtail the use of resources, reduce damaging effects on the environment and build healthier environments for societies. In instant, the vital features of a green building will comprise the following rainwater harvesting; high level of energy efficiency; use of renewable energy; small footprint; water efficient, low maintenance landscaping; recycling and using of gray water, conservation of water by using low flow plumbing fixtures, usage of durable, low maintenance materials, optimized material usage;locally produced materials, recycled/recyclable materials; natural lighting and usage of high efficiency lighting fixtures, usage of control systems to automate lighting systems; provision of natural ventilation, and so forth. Building green does not contain any radicaldeviations in our construction methods. It only needs small alterations to the thought behind our constructions. Our country must go green for a better India. The initial budget of the green building is approximately 10% extra than the normal conventional building because of the extra essentials which are added for preserving the room temperature and the amount is payback within 3 to 4 years since the energy consumption is nearly 25% to 40% reduced. So let us join together to share and care to make our mother Earth live lengthier. We can reduce, reuse and recycle everything that we take from Earth.

Keywords: Energy consumption, green building, natural lighting, Resources

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Self-Healing Concrete

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ABSTRACT

Self-healing concrete is a term that is used for cement-based materials that repair themselves after the material or structure gets damaged due to some sort of deterioration mechanism.Usually Self-healing concrete consists of Portland cement, water and other filling materials, like sand and grit. The hydrated cement in the vicinity of the crack hydrates and the hydration product fill the crack.It is a special type of concrete invented by a group of microbiology researchers under the head of Henkjonkers.Self-healing concrete is also known as "Bio Concrete" or "Bacterial Concrete".It is specially made to increase the life span and the durability of concrete structure by self-healing action of that concrete

Keywords: self-healing concrete, bacterial concrete, bio concrete

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Prediction of Compressive Strength, Ultimate Load and Durability Characterisitics of High Performance Concrete by Artificial Neural Network

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ABSTRACT

Neural networks have recently been widely used to model some of the human activities in many areas of Civil engineering applications. In the present project, the models in artificial neural networks (ANN) for predicting compressive strength of cubes , ultimate load of beams, columns and durability of concrete containing metakaolin with fly ash and silica fume with fly ash have been developed at the age of 3, 7, 28, 56 and 90 days. For purpose of building these models, training and testing using the available experimental results for required number of specimens produced with 7 different mixture proportions were used. The data used in the multilayer feed forward neural networks models are arranged in a format of eight input parameters that cover the age of specimen, cement, metakaolin (MK),fly ash(FA), water, sand, aggregate and superplasticizer and in another set of specimen which contain SF instead of MK. According to these input parameters, in the multilayer feed forward neural networks models are used to predict the compressive strength and ultimate load values of beams and columns concretes. The training and testing results in the neural network models have shown that neural networks have strong potential for predicting 3, 7, 28, 56 and 90 days compressive strength values and ultimate load values of beams and columns of concretes containing metakaolin ,silica fume and fly ash.

Keywords: Compressive strength, high performance concrete, building materials, silicafume, Artificial Neural networks.

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Organic Agriculture in India: A Review

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ABSTRACT

The advancement of technology and development in agriculture has enabled our country to provide food security. But every coin has two sides; this all advancement in agriculture has directed to imbalance our ecosystem. Under such condition, serious concerns have been expressed regarding the use of heavy chemicals, pesticides and fertilizers in agriculture in terms of their negative impact on the human health and the environment. The phenomenon of 'Organic Agriculture' is the only solution to nurture the land and to regenerate the soil by going back to our traditional method of farming i.e., free from chemicals, pesticides and fertilizers. This is a possible step for sustainable development by choosing not to use chemicals, synthetic materials, pesticides and growth hormones to produce high nutritional quality food and in adequate quantity. This article provides an overview of organic agriculture, its present scenario in India, the main principles of organic agriculture and constraints faced in practicing organic agriculture in India.

Keywords: Development, Fertilizers, Heavy Chemicals, Organic Agriculture and Pesticides.

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

Paper ID: ICCSDC-21-1167

A Review on: Wastewater Treatment

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ABSTRACT

Wastewater treatment is a process used to remove contaminants from wastewater or sewage and convert it into an effluent that can be returned to the water cycle with acceptable impact on the environment or reused for various purposes (called water reclamation).The treatment process takes place in a wastewater treatment plant(WWTP), also referred to as a Water Resource Recovery Facility (WRRF) or a Sewage Treatment Plant (STP) in the case of domestic wastewater. Pollutants in wastewater are removed, converted or broken down during the treatment process.The importance and necessity is to increase the efficiency of cleaning process of the residual waters from industry. There are presented the methods of treatment of residual wastewaters, in order to find the best condition and parameters treatment process.

Keywords: Wastewater, Sludge process, Reactors, Toxicity factors, Biomass.

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Effluent Treatment Plant

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ABSTRACT

The work, "Design of an Effluent Treatment Plant for treating industrial effluents" taken up in M/s Bharat Heavy Electricals Limited, Hyderabad. The present method of discharging effluents from various process units like, metal plating, vehicle washings, etc in the Industrial sewer treating these effluents combined with township sewage in Township sewage treatment plant has problems associated with heavy metals and oil & grease. To overcome this problem separate treatment plant is envisaged for Factory final outlet and also isolated treatment plants for processes like chromium plating and vehicle washings thereby reducing the toxic loads on the final factory effluent treatment.Design process design with identification of appropriate method of treatment carried out to comply with the norms as stipulated by Pollution Control Boards (General standards for discharge of Environmental pollutants, Ref. Schedule-VI, Environmental (Protection Rules, AP. P. State Act 1974).Structural designs of treatment units, preparation of plant layout and construction drawings taken up to enable site construction. Future study proposed for reuse of this treated water for horticulture purpose saving equal amount of fresh water resources and also achieving Zero Discharge from Factory premises, Industrial production globally has grown more than 50 fold over the past century. Four fifth of this growth has taken place only in the later half of this century. This rapid industrialization has a profound impact on environment all over the world. The industries which are dependent on natural resources and in turn more polluting are growing rapidly. The Government of India has been increasingly concerned about the control of environmental pollution especially due to increased industrial activities.The present study was carried in the company, Bharat Heavy Electricals Limited (BHEL), a public sector undertaking engaged in the manufacturing of equipment for power plant, industrial and oil sector. The BHEL Hyderabad unit was set up in 1963 and started its operations with manufacture of Turbo-generator sets and auxiliaries for 60 and 110 MW thermal utility sets. Over the years it has increased its capacity range and diversified its operations to many other areas.

Keywords: effluents, industrial waste

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Reuse of Plastic Waste in Paver Blocks

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ABSTRACT

The aim of this project is to replace cement with plastic waste in paver block and to reduce the cost of paver block when compared to that of convention concrete paver blocks. At present nearly 56 lakhs tones of plastic waste is produced in India per year. The degradation rate of plastic waste is also a very slow process. Hence the project is helpful in reducing plastic waste in a useful way. In this project we have used plastic waste in different proportions with quarry dust, coarse aggregate and ceramic waste. The paver blocks were prepared and tested and the results were discussed.

Keywords: Paver block, Plastic waste, Ceramic waste

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Effect of Wind on Tall Building Frames - Influence of Aspect Ratio

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ABSTRACT

Now a day's many tall structures and high rise towers are being built all around the world .Wind plays an important role in design of tall structures because of its dynamic nature. Effect of wind is predominant on tall structures depending on location of the structure, height of the structure. In this paper equivalent static method is used for analysis of wind loads on buildings with different aspect ratios. The aspect ratio can be varied by changing number of bays. Aspect ratio 1, 2, 3 were considered for present study. The analysis is carried out using STAAD PRO.

Keywords: Aspect Ratio, StaadPro, Tall Buildings, Wind Load.

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Feasibility Study on Concrete Technology

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ABSTRACT

Eight to 10 percent of worlds total carbon-dioxide emissions come from manufacturing cement. The global warming gas is released when limestone and clays are crushed and heated to high temperatures, but green concrete is defined as a concrete which uses waste materials as at least one of its components, or its production process does not lead to environmental destruction, or it has high performance and life cycle sustainability.The maintenance and repair of accumulated infrastructures to prolong their service lives is a major challenge in the construction field to achieve sustainability. Strengthening is often needed for deteriorated and inappropriately constructed structures. Structural ways and materials for strengthening. External bonding, as a way of strengthening, has introduced a new type of failure mode namely debonding strength are new to structural engineers. Strengthening materials as a substitute of steel , such as fiber reinforced polymers (FRP), have quite different material properties. Conventional concepts for structural design and material are no longer true for those materials. As a structural materials, durability is materials but not have enough data concerning the durability new strengthening materials. This paper explains the materials properties and conditions necessary for strengthening, and suggests the necessity between material scientists and structural engineers.The green concrete is prepared by the using many materials that includes of waste foundry sand (WFS), coal bottom ash (CBA), cement kiln dust (CKD) and wood low-strength materials (CLSM). The temperate climate, calls for satisfactory adjustment when adopted for tropical climates these are the challenges that we should include while preparing the green concrete. Methods to migrate the less desirable influences of temperature on specific applications are describe

Keywords: waste foundry sand, FRP, CBA, CKD, CLSW, green concrete

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Imperishable Use of Aggregates to Improve Sustainability

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ABSTRACT

With the appraise in requirement of environmental, economic and social objectives in projects intensifying, the need for integrating sustainability with project management has drawn attention in both academia and practice. Especially for large complex construction engineering projects, how to achieve sustainability-related objectives in project practices has been endowed with an irreplaceable significance. This study explores the use of project planning practices for integrating sustainability into project management practices of construction engineering projects.Aggregate scarcity is the biggest concern today in India. On environmental grounds, there have been strict dredging restrictions from various local authorities pertaining to taking out sea sand as well as river sand. This position is more prevalent in the states of central and southern part of India. In northern India, especially in the Indo-Gangetic plains, good quality sand (FA) is available in plenty. However, due to the alluvial terrain of this region coarse aggregates are not easily available. This challenge manifests on the opposite form in central & southern India where availability of good quality fine aggregate is a constraint. Reflecting upon the current scenario of India's construction field, we get to see the use of Crushed Rock Fines (CRF) replacing natural sand. Which negatively impacts on the lifespan of the project. The study investigates the use of crushed rock sand as viable alternative to Natural River sand that is being conventionally used as fine aggregate in cement concrete. Various mix designs were developed for different grades of concrete based on IS, ACI and British codes using Natural River sand and crushed rock sand. In each case, the cube compressive strength test, and beam flexure tests were conducted. The results of the study show that, the strength properties of concrete using crushed rock sand are nearly similar to the conventional concrete. The study has shown that crushed stone sand can be used as economic and readily available alternative to river sand and can therefore help to arrest the detrimental effects on the environment caused due to excessive mining of river sand.

Keywords: Sustainability, Crushed Rock fines, Crushed Sand, Natural Sand

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Stormwater Runoff

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ABSTRACT

Stormwater runoff has been identified by the Massachusetts Department of Environmental Protection as the major cause of Massachusetts waters failing to meet water quality standards. Due to increased regulations, municipalities have spent millions of dollars to mitigate stormwater runoff. The cost of stormwater management and its negative impact on natural hydrology has stormwater managers and regulators looking for lower cost alternatives and shared responsibility among contributors of stormwater runoff. Single family residential parcels developed with curb and gutter stormwater sewer systems contribute stormwater runoff to the municipal stormwater systems. Only impervious areas which are hydrologically connected generate the runoff contribution of residential parcels. To the extent residential impervious surfaces can be disconnected, impacts from stormwater runoff can be reduced and recharge of groundwater improved.This study analyses a 55acresneighbourhood in Dedham, Massachusetts using field survey and GIS to quantify the degree to which connected residential impervious surfaces could be disconnected from their municipal stormwater system and calculate the cumulative result possible in typical suburban setting. Fifty eight percent of the impervious cover in the study area was found to be connected, 22% as roofs and driveways, and 36% as roads. The remaining 42% were roofs and driveways already draining away from the municipal stormwater system. This analysis shows that Low Impact Development (LID) techniques, such as downspout extensions to lawn areas, dripline infiltration, rain barrels, rain gardens, drywells, trench drains, gravel swales and porous pavement could disconnect 29% of the study area's connected impervious surfaces from the stormwater system, for all storms producing up to an inch of runoff. This disconnection could result in a 24% reduction in total annual runoff volume, as it would be infiltrated onsite.

Keywords: GIS, Field Survey, Low Impact Development Techniques

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Study of Replacement of Natural Sand with Manufactured Sand in Concrete

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ABSTRACT

Concrete is the most widely used composite construction material. Fine aggregate plays a very important role for imparting better properties to concrete in its fresh and hardened state. Generally, river sand was used as fine aggregate for construction. Due to the continuous mining of sand from riverbed led to the depletion of river sand and it became a scarce material. Also, sand mining from river bed caused a lot of environmental issues. As a substitute to river sand, manufactured sand has been used.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, split tensile strength, flexural tensile strength and durability in acidic medium made of both the sands, 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: manufactured sand, vertical shaft impact,

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Evaluations of Sustainable Development in Concrete Technology

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ABSTRACT

While cement is the go-to construction material, it takes a mammoth toll on the environment. What the world needs, then, is widespread adoption of cement alternatives that are less harmful and greener. Instead of Portland cement, we can use green cement which produces less amount of carbon dioxide. This green cement is made of Fly ash, alongside micro silica fume and Nano-silica fumes. A major portion of this mixture consists of products that were otherwise going to cause carbon emissions. The invention focuses on the effect of cement replacement with this mixture in a combination of two additives. The combination of micro and Nano-silica fumes improves the mechanical properties of concrete and eventually the microstructure,The strength of eco-friendly cement, which can be up to 25% more than that of orthodox cement, depending on the proportions. There are several additional advantages of this cement, such as restriction of the structural horizontal building expansion. In conventional concrete structures, if the columns are reduced to occupy less space, the strength will also decrease. However, if we add eco-friendly cement, then even if the dimension (width) of the building is reduced, the strength will be the same as desired. This is beneficial in densely populated cities such as Delhi and Mumbai. Our cement can also be used to retrofit old houses. It will provide strength and make the houses more earthquake resistant. There will be no room for micro cracks and macro cracks to develop. The main disadvantage of using green concrete is that the structures which are constructed using green concrete have less life than the structures constructed by the orthodox concrete. As they have less life span they cannot be used for important structures like dams, bridges. But a solution will be found sooner than later to increase the strength of major constructions.

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Soil Stabilisation Using Marble Dust

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ABSTRACT

This research paper deals about the experimental study on the stabilization of soil using industrial wastes. Marble dust is used for the stabilization of soil. Marble dust is formed from cutting and polishing of marble stone. It is one of the industry generated waste material. Marble dust contains high amount of calcium, silica, alumina which aids in the stabilization of the soil. Marble dust is added in varying percentages (3, 6, 9, 12, and 15%) along with curing periods of (3, 7, and 14) days to the soil sample. Basic properties of soil like Atterberg limits, compaction characteristics and strength characteristics were determined.

Keywords: Marble dust, stabilization of soils

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

Paper ID: ICCSDC-21-1191

Reinforced Cement Concrete Partially Replaced with Coconut and Sugarcane Fiber

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ABSTRACT

Introduction of natural fibers concrete might be a huge impact on the modern world. Coconut fiber and sugarcane fibers are sustainable and abundant materials and are easily available at lower costs as compared to other material. This results in more balanced approach with environment. In addition, coconut and sugarcane are easily disposable materials that can reduce use of waste disposal infrastructure. Fibers being natural can bring down the global carbon footprint. Using a natural fiber to strengthen concrete is more preferable than other materials. Furthermore, the usage of natural fibers helps in reducing the environmental pollution.Coconut fiber improves various engineering properties in the concrete. Sugarcane fiber waste increases crack control and ductility. Sugarcane fiber helps improve tensile strength of concrete due to its limited tensile strength. Addition of coconut fiber to concrete increases compressive strength, tensile strength and flexural strength of the concrete. Addition of coconut fibers in different proportions as 1%,2%,3%,4%,5% of weight of cementis done and 0.5%,1% and 1.5% sugarcane fiber is mixed with the concrete. Hence 1% coconut fiber with respect to weight of cement and 0.5% of sugarcane resulted to be optimum. The problem of high rate of water absorption of fiber could be reduced by coating coconut fiber with oil. Coconut fibers decrease the landfills and incinerators. Rather than wasting these natural fibers, they can be used in construction material to save the bio reserves. Different tests are conducted so as to enhance the workability and strength properties by the addition of coconut and sugarcane fibers.

Keywords: coconut fiber, sugarcane fiber, workability

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Technical Attributes Requried for Launching Hybrid Cement

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ABSTRACT

Hybrid Cement (H-cement/HC) takes advantages of the material properties of cement and alkali activated cement with the resulting benefit on utility properties so that hybrid cement (pc) as follows:H-Cement is used by the same way as traditional cement;H-cement is suitable for use in ready -mixed concrete upto c30/37 strength class;H-cement has shrinkage reducing and alkali-aggregate-mitigating property;H-cement shows the same sulphate resistance with sulphate-resistant Portland cement with C3A=0;H-cement is a suitable binder for use in the concrete contain the swelling steel slag aggregates as a full replacement of natural aggregates.This low energy,low- cost and environmentally friendly hybrid cement belongs to the group of advanced cements in which parameters predetermine to overcome pc in certain applications.

Keywords: Hybrid Cement, Concrete, Durability, Alkaline properties

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Replacement of Fine Aggregate with Copper Slag and Adding Coconut Fiber in Concrete

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ABSTRACT

Copper slag is an excellent by-product or waste material which retains its original properties. Due to its chemical composition which includes high iron, silica and aluminum oxide content, it can be used as a partial replacement for sand in concrete mixes.Reinforcement of concrete is necessary to enhance its engineering properties. For this study, coconut fibers were used as they are freely available in large quantities. The study comprises of comparative statement of properties of coconut fiber reinforced concrete with conventional concrete based on experiments performed in the laboratory. The use of coconut fiber will also lead to better management of this waste fiber. The addition of coconut fiber improved the flexural strength of concrete by about 12%, they also formed good bonding in the concrete. The study found the optimum fiber content to be 3% (by weight of cement). Further work is required by changing the fiber content and aspect ratio to determine the optimum range of fiber content so that fiber reinforced concrete can be used where high flexural strength is required. Mix design of concrete is done on weight basis, by adding various percentages of copper slag (10%, 15%, and 20%) instead of sand and concrete mixtures were prepared based on it and here also adding the coconut fiber (2%,and 4%) with respect to the weights of cement. The cube, beam and cylindrical specimens were then prepared, demoulded after 24 hours and properly cured. The specimens were subjected to compression testing, split tensile strength testing and flexural testing at 7,14 and 28 days.

Keyword: coconut fiber, copper slag, compression test, split tensile strength test and flexural strength of concrete.

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Design and Construction of Low Cost Road Using Sustainable Material

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Abstract

Low CostRoad initiatives are often concerned with supporting of the sustainable improvements of roads and creating the basic access to support the poverty reduction initiatives in rural communities. In Southern Africa low cost roads are those build with thin asphalt surfacing for low volumes road traffic and also referred to as improved unpaved road. LCR can be build or kept maintained cost effectively buys using appropriate types of equipment suited to small scale contractors. The objectives of this essay are to evaluate alternative pavement solutions for low volume road. In order to evaluate the performance of different LCR, the Kenlayer program was used to evaluate the pavements. The deformation responses of unpaved and surface treated roads before and after surface treatments, at critical locations (bottom of base, top of selected subgrade and top of subgrade are nearly the same; that means, the use of surface treatment over unpaved roads, does not increase the structural capacity, but it may only improve the riding quality and the drainage of the roads. The comparison of the different LCR different pavement models (untreated, treated with Ecolopavi and treated with cement) found that the roads treated with Ecolopavi may cost less. Previous research has investigated the use of the Ecolopavi road treatment solution for improving roads and suggested, for consistency, further studies may be needed with an aim to investigate its use as an LCR alternative in Mozambican roads.

Keywords: sustainable materials, low cost road,

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Experimental Study on Partial Replacement of Course Aggregate With Ceramic Tiles in Concrete

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ABSTRACT

Due to the day-to-day innovations and development in construction field, the use of natural aggregates is increased tremendously and at the same time, the production of solid wastes from the demolitions of constructions is also high. Because of these reasons the reuse of demolished constructional wastes like ceramic tile has come into the picture to reduce the constructional waste and to reduce the scarcity of natural aggregates for making concrete. The ceramic tile waste is not only occurring from the demolition of structures but also from the manufacturing nit. This waste material should have to be reused in order to deal with the limited resource of natural aggregate and to reduce the construction waste. Therefore, reuse of these crushed tiles in concrete production could be an effective measure in maintaining a environment and improving the properties of concrete. In present study, a total twenty-four cubes with the same dimensions (150mmx150mmx150mm) were cast with four different proportions. Six cubes as one type of control proportion that is 0% of ceramic waste as partial replacement of coarse aggregate with M_{25}grade of concrete was designed and tested. The mix design of four types of mixes was prepared by replacing the coarse aggregates and at different percentages of crushed tiles. The concrete cube was tested like compression tests that to find out the compressive strength of specimens of hardened concrete at 7days, 14days and 28days. Before undergoing the destructive test, the performance of the concrete was determined by undergoing slump cone test, compressive strength test, Impact test, crushing test and absorption test.

Keywords: ceramic tiles, coarse aggregate

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Artificial Recharge of Groundwater

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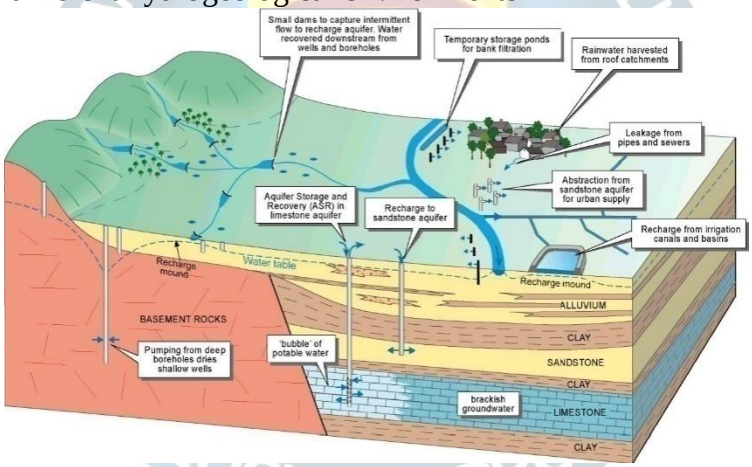
ABSTRACT

Artificial recharge of groundwater is achieved by putting surface water in basins, furrows, ditches, or other facilities where it infiltrates into the soil and moves downward to recharge aquifers. Artificial recharge is increasingly used for short- or long-term underground storage, where it has several advantages over surface storage, and in water reuse. Figure shows different artificial recharge methods in different hydrogeological environments



Artificial recharge requires permeable surface soils. Where these are not available, trenches or shafts in the unsaturated zone can be used, or water can be directly injected into aquifers through wells. To design a system for artificial recharge of groundwater, infiltration rates of the soil must be determined and the unsaturated zone between land surface and the aquifer must be checked for adequate permeability and absence of polluted areas. The aquifer should be sufficiently transmissive to avoid excessive buildup of groundwater mounds. Knowledge of these conditions requires field investigations and, if no fatal flaws are detected, test basins to predict system performance. Water-quality issues must be evaluated, especially with respect to formation of clogging layers on basin bottoms or other infiltration surfaces, and to geochemical reactions in the aquifer. Clogging layers are managed by desilting or other pretreatment of the water and by remedial techniques in the infiltration system, such as drying, scraping, disking, ripping, or other tillage. Recharge wells should be pumped periodically to backwash clogging layers.

Keywords: Ground water recharge, water quality

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Development of Mobile Application for Critical Implementation of Schedule and Management of Resources

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ABSTRACT

Construction Industry is known for its Raw or Traditional method of working. Though, the industry is making headway towards innovations advancements in functioning. The construction sector is adopting technology for its betterment and improvement by switching traditional methods to modern techniques. Mobile Computing is one of the modern instruments the industry has acquired. The only thing is to take the advantage of the technology which they offer. Using advanced Smartphone Applications to improve its efficiency and productivity. This paper introduces a development mobile application for the implementation of proper planning and scheduling. The company's calendar as per sequence is feed in the application for implementation of schedule according to plan. The mobile application will give the notification of the task before the set date to avoid delay of work. The Application will give the notification of the task which is to be completed as per the estimated schedule uploaded. The task or work is said to be completed only when the image of a particular task is updated. The efficiency of the construction project can be improved by processing according to the mobile application to avoid delays. Finally, a project report can be obtained to know the project performance. Comparing the reports of time required for the completion of project with scheduling mobile application and traditional method of scheduling.

Keywords: Construction Industry, Mobile Application, Scheduling.

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Abstract Proceedings of Online "International Conference on Computing for Sustainable Development in Civil Engineering" (ICCSDC-2021) Organized during 24th and 25th June 2021

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Smart Application for Labour Opportunity and Hiring on Site

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ABSTRACT

Construction is a sector with a different role to develop the organization. Along with the various resources in the construction industry, the human resource also plays an important role in productivity in construction. As of now hiring of labours is done through the on-site method by visiting the location and selecting the labour as per the requirement in construction. This paper aims to develop a mobile application through internet-based research and data collection with potential with various socio-economic issues. This provides us with new opportunities to collect, and analyze the data for the labour market issues as per the requirement of the employees. In this study, the aim is to give an online portal in the way of finding the labours required to work on-site. A large number of observations can obtain from online job portals. In this mobile application, the searcher will go through this application for easy finding of the labour which contractor wants on-site for any purpose. This study of mobile application in construction helped to know that this application has achieved smoothness in the work. This will increase the efficiency of work considering the labours. The labours will get the stage to forecast their work.

Keywords: Android Mobile Application, Labour hiring, Labour Opportunity

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Comparison of Fixed base and Flexible base Continuum model in SAP 2000V.19.2.1

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ABSTRACT

Conventional building plan chosen are regular or symmetrical building with fixed base. However practically speaking the building rests on soil where flexibility conditions are unusually neglected. In the present study soil structure interaction is considered for analyzing the building with soil base. In addition to this modeling the building using appropriate software plays a very important role as the model has to be modeled as a replica of realistic structure. In the present study a 10 storey, 3D building is modeled using SAP 2000 V19.2.1 software. Two models is selected one with fixed base and other with flexible soil base and both are subjected to Linear static analysis and Non linear pushover analysis. The results obtained are compared for fixed and flexible base for both linear and nonlinear analysis. The results shows the variation in displacement, base force and time period and can be said that symmetric building or regular building with fixed base analyzed by nonlinear analysis is found to be realistic and expected to afford economically better design in future.

Keywords: Soil structure interaction, Continuum method Fixed base, Pushover analysis

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Fire Proofing of Concrete Structure (by Sialon)

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ABSTRACT

In this study, we find a method to secure any concrete structure from any type of thermal shock up to the temperature of 1200ºC. We know that, Concrete is a fireproof material, but when the concrete structure catches fire and due to that fire the concrete structure starts to heat then after a temperature of between 400º to 500ºC, according to the previous studies on concrete we come to the result that concrete structure starts losing its strength up to 85% due to thermal effect and it will collapse after a time interval. Now, to protect the structure against thermal shock, we use material as an admixture in the concrete. The material is SIALON. Sialons were developed as a more cost-effective substitute for hot-pressed silicon nitride. It has complex chemistry and is considered a family of alloy with a broad range of properties. Sialons are formed when silicon nitride (Si3N4), aluminium oxide (Al2O3), and aluminium nitride (AlN) react.Sialon is a thermal resistance material therefore it also resists the heat to reach the bars, by which bars do not lose their strength. But still, if you have any doubt about the failure of the bar then you can use the TMX bars instead of TMT bars.When we mix the Sialon in concrete as an admixture it increases the thermal shock resistance of concrete approximately to the temperature of 1000ºC to 1200ºC.

Keywords: Sialon, thermal shock resistance, TMX bar, alloy, concrete structure.

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Strength Characteristics of Ternary Binders with C&D Aggregates

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ABSTRACT

Ternary blended C&D aggregate mixes were developed using modified dense mix design approach. The relative parameters influencing physical and mechanical properties of ternary blended concrete mixes will be evaluated in terms of strength activity index, binder replacement level, water to binder ratio and admixture. Concrete mixes were divided into three groups with variation in w/b ratio for flyash-slag, slag-silica fume and flyash-silica fume blended with cement at different replacement level. Test results revealed, slag-silica fume blended with cement high strength and better performance compared to other combinations due to early strength development and fineness of material making it more reactive during hydration. Compressive strength (42 to 80Mpa), split tensile (3.8 to 6.5MPa) and flexural strength (6.2 to 10.5MPa) were observed for the developed concrete mixes and ecological analysis have been carried out herein.

Keywords: Ternary binders; C&D aggregate; Modified dense mix design approach; Strength activity index; Ecological analysis.

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Comparative Study on Partial Replacement of Cement by Bauxite Residue and Zeolite in Concrete

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ABSTRACT

Cement is important material in the construction and the advanced technology in construction leads to introduce a new material which helps in development and invention in concrete technology. Cement has high manufacturing energy consumption and its production produces enormous carbon-di- oxide which in turn spoils the atmosphere. Faster production of cement leads to more discharge of waste products which causes environmental hazards. In this situation few wastes can be added to conventional material which can be utilized in production of cement. Zeolite absorb harmful gases in turn helps nature. Concrete with zeolite as a partial replacement material helps in absorbing harmful gases and give high strength in compression. In this research work, bauxite residue (red mud) and Zeolite is replaced with cement in different proportions varying from 0% to 20%. The solution can be made by utilizing partially red mud and zeolite with cement in concrete construction. Bauxite residue (red mud) and Zeolite has a cementitious property which may give the more strength than conventional.

Keywords: cement, zeolite, Bauxite residue (Red mud).

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Land Suitability Analysis for Industry Sewage Wastewater Treatment Plant Using GIS

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ABSTRACT

Sewage is a main and important source of pollution. Need for fresh water could be managed byimproving water use efficiency and demand management. The main reason behind river and canals in Tamil Nadu getting polluted and facing moderate to severe water shortages, brought on by the continuous effects of agricultural growth, industrialization and urbanization. The discharge of industrial wastewater without treatment into river basins and ground water extraction has caused an unpleasant effect for the health and safety of people. Other than health effects, it also affects human productivity and land productivity. So, it is always important to treat the water before its discharge into river basin. Therefore, wastewater is blooming as potential source for demand management after essential treatment. Mainly industry wastewater must be treated before its disposal into river basin, so in order to find the site suitability for locating the industrial waste water treatment plant we are using GIS as a tool to locate the plant. In our project we have considered our study area as Coimbatore, and we are using GIS to locate industrial waste water treatment plant. Proposed sites for establishing the treatment plant are found out using suitability score based on organizing and designing constraints, which includes ground slope, landuse/landcover pattern, and distance to river and roads. Ground control point (GCP) is collected by ground point survey (GPS) and topographical map of the study area. The maps are prepared by overlay and site suitability analysis of geographic information system (GIS), remote sensing techniques and multi criteria analysis methods. The final map was prepared by overlay analyses on Arc map and ranges such as high, moderate, less suitable, and Unsuitable regions of the study area were identified. Hence, the use of GIS and remote sensing technology helps in the effective identification of suitable solid waste dumping site which will inturn reduce the environmental risk and human health problems.

Keywords: Wastewater, GIS, Suitability Analysis, Treatment plant.

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Paper ID: ICCSDC-21-1211

Combined Effect of Copper Slag and M-Sand in Mechanical Properties of Normal Weight Concrete

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ABSTRACT

Now days, river sand is extracting in huge quantities for usage in normal strength and light weight concrete. Also, the fine aggregate which is sand becomes more expensive due to its importance in making concrete. The conventional cement also releases huge amount of carbon dioxide which causes serious problems to environment. The present paper represents the experimental study on concrete by partially replacing river sand with the combination of manufactured sand and copper slag. Moreover, the conventional cement will also be partially replaced by GGBFS to reduce the effect of carbon dioxide in to the atmosphere. Different percentages of crushed stone aggregate, copper slag and GGBFS were used as a partial replacement for fine aggregate and cement in making concrete. Destructive and non-destructive tests were conducted for prepared specimens and the results obtained were found satisfactory for mix type M_2. The results obtained for destructive tests and non-destructive tests such as rebound hammer and ultrasonic pulse velocity methods are also plotted and mentioned in this paper.

Keywords: Manufactured sand, GGBS, ferrous slag, destructive and non-destructive.

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Paper ID: ICCSDC-21-1213

Analysis of Traffic Volume and Fly over Construction for Traffic Problems in Edayarpalayam Junction, Thadagam Road, Coimbatore Corporation

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ABSTRACT

The traffic engineers use engineering methods and techniques to attain the safe and time efficient movement of people and goods on roadways. The safe and time efficient movement of the individuals and time dependent on traffic flow, which is directly connected to the traffic characteristics, The three parameters of traffic flow are volume, speed and density. The amount of vehicle has enlarged expressively within the last decade due to increase of the economic status of people. In this study emphasis is given on traffic volume data collection and the different analysis is carried out. For better understanding of the existing status of traffic flow at the chosen junction Edayarpalayam junction, traffic survey is conducted, with the help of data collection, it has made clear to understand the traffic patterns during different time period. To diminish traffic congestion at an at-grade intersection in Edayarpalayam junction one of the way is construction a flyover bridge.This paper presents the problems that still exist at the flyover improved junction and makes suggestion to surge the benefits of the flyover such as creating phase times and improving the physical area under the bridge. Flyover bridge is planned using the popular drafting software AutoCADD 2D. It further designed and analysed using the premiere analysis software STADD PRO and creating 3D model of flyover bridge we used the animation software 3ds MAX. The sailent features of the flyover bridge are manually designed and estimate. Analysis from the present study are helpful in controlling the traffic flow at the intersection and also suggestion some traffic management measures to improve the traffic movement in this region.

Keywords: Traffic Volume, PCU (Passenger Car Unit)

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Paper ID: ICCSDC-21-1214

Attribution of Recycled Materials Forte on Behalf of Steel Besides Polypropylene Fibers

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ABSTRACT

Fiber concrete has higher flexural strength than unreinforced concrete and concrete reinforced with welded mesh. Use the best fibers in construction. In this study, patterned steel fiber and a recording polypropylene fiber with an aspect ratio of 30 were used. The purpose of this paper is studied in two categories. One is the strength characteristics of steel, polypropylene, and concrete. The mixing ratio of these steel and concrete is M25 polypropylene fiber. The steel bar is 1:2.25:4.26, the a/c ratio is 0.50, and it contains 0%, 0.25%, 0.50% and 0.75% of concrete fibers by volume. Analyse the results obtained and compare them with the control sample (0% dietary fiber). This paper also compares the resistance and cost parameters and finds that the optimal amount of steel fiber is 0.50%. Fiber concrete is a cast or cast composite material made of hydraulic cement, fine aggregates or fine aggregates, and coarse-grained materials. Discrete steel fibers with rectangular cross-sections are randomly distributed on the matrix. This significantly increases the ability of concrete to resist cracking, crushing, cracking, and fatigue. The cost of steel fiber is higher than that of polypropylene, but its strength is much higher than that of polypropylene. Under tension, cracks are formed in the structure. Internal micro-cracks formed by silicon stress in concrete can be minimized and prevented by adding fibers to the concrete. Second, the paper aims to improve the performance of concrete by introducing hybrid fibers that control the effects of cracks. The fiber dosage is 0%, 1%, 2%, 3%, 4% of the cement weight. The hybrid fiber used in this work combines synthetic polypropylene fiber with a length of 1-2 cm and natural GGBS fiber with 2-3 cm. Test the technical characteristics of the mixed fiber and traditional concrete samples, such as compressive, tensile, and flexural strength. A comparative study was made between mixed concrete and conventional concrete. Fragile plain concrete has disadvantages. Many researchers use different types of fibers of different grades in their work. Synthetic fibers, metal fibers, and natural fibers are added to traditional concrete in different proportions, and recommendations are made based on the research results. Concrete with different types of fibers helps to find the right solution for structural concrete production

Keywords: polypropylene fiber, steel fiber, compressive strength, tensile strength, flexural strength, GGBS fiber, split tensile strength.

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Attribution of Recycled Materials Forte on Behalf of Steel Besides Polypropylene Fibers

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ABSTRACT

Fiber concrete has higher flexural strength than unreinforced concrete and concrete reinforced with welded mesh. Use the best fibers in construction. In this study, patterned steel fiber and a recording polypropylene fiber with an aspect ratio of 30 were used. The purpose of this paper is studied in two categories. One is the strength characteristics of steel, polypropylene, and concrete. The mixing ratio of these steel and concrete is M25 polypropylene fiber. The steel bar is 1:2.25:4.26, the a/c ratio is 0.50, and it contains 0%, 0.25%, 0.50% and 0.75% of concrete fibers by volume. Analyse the results obtained and compare them with the control sample (0% dietary fiber). This paper also compares the resistance and cost parameters and finds that the optimal amount of steel fiber is 0.50%. Fiber concrete is a cast or cast composite material made of hydraulic cement, fine aggregates or fine aggregates, and coarse-grained materials. Discrete steel fibers with rectangular cross-sections are randomly distributed on the matrix. This significantly increases the ability of concrete to resist cracking, crushing, cracking, and fatigue. The cost of steel fiber is higher than that of polypropylene, but its strength is much higher than that of polypropylene. Under tension, cracks are formed in the structure. Internal micro-cracks formed by silicon stress in concrete can be minimized and prevented by adding fibers to the concrete. Second, the paper aims to improve the performance of concrete by introducing hybrid fibers that control the effects of cracks. The fiber dosage is 0%, 1%, 2%, 3%, 4% of the cement weight. The hybrid fiber used in this work combines synthetic polypropylene fiber with a length of 1-2 cm and natural GGBS fiber with 2-3 cm. Test the technical characteristics of the mixed fiber and traditional concrete samples, such as compressive, tensile, and flexural strength. A comparative study was made between mixed concrete and conventional concrete. Fragile plain concrete has disadvantages. Many researchers use different types of fibers of different grades in their work. Synthetic fibers, metal fibers, and natural fibers are added to traditional concrete in different proportions, and recommendations are made based on the research results. Concrete with different types of fibers helps to find the right solution for structural concrete production

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Assessment of Seismic Symmetric and Asymmetric Plane Geometry Multi-Storey R.C.C Framed Structure

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ABSTRACT

Due to the industrial revolution and employment the rural population is migrating to cities, making metropolitan areas very densely populated, land supply declining. To solve this problem, multi-storey buildings must be used, but this device will increase its weight and effective load as the seismic force increases. Multi-storey buildings are designed to withstand gravity and seismic loads. The bare frame is more flexible and requires a larger cross-section to withstand the induced force. The same situation can be minimized by making the structure more rigid. In this volume, the effort of preparatory work increases the stiffness of the structure: concrete beams, separated diagonals. Cross and diagonal support systems are used. Various configurations were compared and compared with frames without brackets. According to IS 1893: 2002, the lateral displacement is within acceptable values for all types of structures that serve specific economic types. It is found that the oblique structure is more effective than the traditional frame structure. In addition, the outer vertical columns have been eliminated, allowing more efficient use of space. This article introduces two different geometrical anatomical structure models, symmetrical and asymmetrical. The analysis results are shown in two models of shear soil, drift offset, and soil.

Keywords: Multi-storeyed, Braced frame, Shear force, Bending moment, Structural displacement, Storey drift.

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Flexural Behaviour of Structured and Non-Structured Water Fibrous Concrete

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ABSTRACT

The paper investigates about flexural behavior of different criteria of M_{25} grade of concrete like normal water concrete (NWC), normal water polypropylene fiber concrete (NWPPFC), normal water glass fiber concrete (NWGFC), magnetic water concrete (MWC), magnetic water polypropylene fiber concrete (MWPPFC) and magnetic water glass fiber concrete (MWGFC) by simulating beams using Ansys. The finite element analysis is done using Ansys 2020 R2-i.e. Release-2. Compressive strength values for these criteria of concrete are taken and young's modulus and Poisson's ratio are calculated which are given as inputs for simulation of beam in Ansys. The density of concrete taken is 2400 kg/m^3. Flexural strength was calculated by considering practical values, as per IS-456-2000, Cl.6.2.2, Case-1, i.e. finding loads using bending moment equation and calculating flexural strengths from that loads and Case-2, i.e. finding deflection using span/depth ratio and finding loads at that deflection and calculating flexural strengths at that loads for all criteria of concrete.

Keywords: Normal water concrete (NWC), Normal water polypropylene fiber concrete (NWPPFC), Normal water glass fiber concrete (NWGFC), Magnetic water concrete (MWC), Magnetic water polypropylene fiber concrete (MWPPFC) and Magnetic water glass fiber concrete (MWGFC), ANSYS.

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Parametric Study on Prestressed Concrete Beam Subjected to Elevated Temperature

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ABSTRACT

Prestressed concrete members are used for various applications in the recent days and uncertainties during its service life can lead to deterioration of prestressed members. One of the uncertainties that can damage the structure is fire accident. The elevated temperature can result in cracking and spalling of the concrete elements. In this study, prestressed concrete beam is exposed to high temperature and its behaviour is studied analytically using ABAQUS. Prestressed beams are analysed using coupled – temperature displacement analysis and its behaviour under elevated temperature are investigated. The parametric study is carried out by varying the level of prestressing and span by depth ratio. These parameters are analytically studied and it is that observed that the behaviour of prestressed beams is highly influenced by these parameters when the beams are exposed to high temperature.

Keywords: Coupled - temperature analysis, level of prestress, span by depth ratio.

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