International Conference on " Revolutionary Technology in Civil Engineering "

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" Revolutionary Technology in Civil Engineering "

on 10th & 11th March 2022

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Dr.P.Santosh Kumar Patra

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NIRF ranked

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(ICRTCE-22)

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Departments of Civil Engineering

Online "International Conference on Revolutionary Technology in Civil Engineering" during 10th & 11th March 2022

(ICRTCE – 2022)

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&
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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 Revolutionary Technology in Civil Engineering"** during 10th and 11th of March 2022. 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
Chairman

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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 Revolutionary Technology in Civil Engineering"** during 10th and 11th of March 2022. 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 Revolutionary Technology in Civil Engineering"** organized by the Departments of Civil Engineering on 10th and 11th of March 2022. 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 in making 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 Revolutionary Technology in Civil Engineering"** being conducted by the Departments of Civil Engineering of SMEC, is to create a platform for academicians and researchers to exchange their innovative ideas and interact with researchers of the same field of interest. This will enable to accelerate the work to progress faster to achieve the individuals end goals, which will ultimately benefit the larger society of India.

We, the organizers of the conference are glad to note that 200 papers have been received for presentation during the online conference. After scrutiny by editorial board 150 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, ICRTCE-2022
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SIGNIFICANCE OF SEQUENCING BATCH REACTOR FOR TREATING DOMESTIC SEWAGE WATER AND ALLIED SLUDGE DISPOSAL ANALYSIS IN LAND PIT FOR CONTROLLING THE GROUND POLLUTION

[1]SANDHYA KIRAN J. K.

[1,] Professor, Department of Civil Engineering, St. Martin's Engineering College, Dhulapally, Kompally, Secunderabad, Telangana, India

ABSTRACT

The steady increment in the city population results in the increase of domestic sewage generation. On the basis of life cycle cost, the most economical option for treating the domestic sewage is sequencing batch reactor (SBR) technology method. SBRs are variations of the activated sludge process that operates on a fill-and-draw basis. Sewage is treated to make it suitable for its intended use for irrigation. If needed, sewage also undergoes a tertiary treatment to meet the demand of the drinking water supply.

The SBR technology mainly consists of three main processes in the cyclic technology (C-TECH) tanks. Aeration by giving the air, settling particles in the tank and decanting process in the c - tech tanks, these three processes will be run in the sequencing order one after other. This process removes 75% – 95% of BOD. The water is then disinfected, mostly by chlorination, and released into flowing lakes and rivers. Also, our main focus is on the analysis of the sludge (solid waste) which is available at the plant after treatment. It can be used as manure in the agricultural purposes.

Keywords: sequencing batch reactor, BOD, cyclic technology

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STUDY ON BLACK COTTON SOIL STABILIZATION BY USING TERRAZYME IN KOMPALLY VILLAGE

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ABSTRACT

Stabilization of black cotton soil (B C) is studied by using terrazyme BC soils are highly clayey soils (montmorillonite clay mineral). The moisture change in BC soils, compressibility and last- plasticity nature can be greatly improved with the addition of terrazyme. This paper includes the evaluation of soil properties like optimum moisture content, dry density and strength parameter (California bearing ratio valve). Different quantities of terrazyme (% weight) are added to the BC soil and the experiments conducted on these soils mixes. The results show that the use of teraenzyme increases the California bearing ratio valves i.e the strength of soil to a great extent.

Keywords: Terrazyme, soil stabilization, Black cotton soil, California Bearing Ratio (CBR)

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EXPERIMENTAL STUDY ON POLYMER MODIFIED BITUMEN FOR FLEXIBLE PAVEMENTS

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ABSTRACT

Flexible pavements with bituminous surfacing are widely used in India. Exponential increase in traffic, overloading of commercial vehicles and significant variations in daily and seasonal temperatures have shown some limitations of conventional bitumen performance. Early developments of distress symptoms like cracking, rutting, raveling, undulations, shoving and potholing of bituminous surfacing have been reported for flexible pavements. A bituminous mixture needs to be flexible enough at low service temperatures to prevent pavement cracking and to be stiff enough at high service temperature to prevent rutting. Bitumen modified with polymer offers a combination of performance related benefits as the physical properties of the bitumen is improved without changing the chemical nature of it. This paper presents the experimental study carried out conventional bitumen and polymer modified binder. It has been shown that rutting resistance, indirect tensile strength and resilient modulus of the bituminous concrete mix with polymer modified bitumen is significantly improved.

Keywords: Flexible pavement, modified polymer, rutting resistance, resilient moduluss

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NON-DESTRUCTIVE TESTING METHODS FOR EVALUATION OF FLEXIBLE PAVEMENTS AND DESIGN OF OVERLAYS

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ABSTRACT

In the present project the overlay thickness required to be laid is designed for the existing pavement based on its evaluation by using non-destructive testing methods which are generally desirable to minimize disruption to traffic. Evaluating the pavement condition is a pre-requisite to choose the improvement technique that has to be adopted to enhance its quality. Pavement evaluation should be done to know the nature, severity and extent of the road deterioration caused due to harsh climatic conditions, low quality control during construction and high axle loads coming on to it due to traffic. Roughness survey of pavement gives the functional condition of the pavement whereas the deflection survey gives the information regarding the structural condition of the existing pavement.

In India "Benkleman Beam" and "5th Wheel Bump Integrator" are mostly used by all the firms to conduct the deflection and roughness surveys respectively on the existing pavement for its evaluation that are non-destructive in nature which are adopted even in the present project.

In the present project the section on National Highway No.-9 from Km.240 to Km.270 i.e. from Hyderabad to Vijayawada is evaluated and the required overlay thickness is determined.

Key words**: **Benkleman Beam, Wheel Bump Integrator.

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A REVIEW ON SIGNIFICANT USE OF BANANA STEM FIBER IN CONCRETE

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ABSTRACT

In recent decades, composite materials have mostly been used in a variety of applications. There are many types Plastic natural fibers such as flax, flax, jute, wood fiber, rice bran, wheat straw, oats, bagasse, barley, cane, collar fiber and oil, empty palm fruit bouquet, coconut fiber, sisal, cotton, kelp, remy, centella asiatica, mulberry leaf, siba, abaca, pineapple leaf fiber. Output annual banana production in India is 13.5 million tons. As a result of banana formation more biomass is discarded. The aerial parts such as pseudo-bone and tibia are the main sources of fiber. Used as a raw material in industry to support collar fiber produces hard leaves, tea bags and coins as polymer compounds. Natural fiber is used as an alternative resource for synthetic fibers. Strengthening of fiber as well as polymeric composite materials and their production is economical, renewable and environmentally friendly. Natural fibers are cheaper, denser and less durable than synthetic fibers, but with the help of mechanical fiber treatment. The properties of natural fibers are improved. In this document, collar fibers are compared in their application, usage and features and so on. It was concluded that collar fibers provide better texture and chemical properties.

***Key words**: Banana stem fiber, Eco friendly material, Agro waste*

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DESIGN AND ANALYSIS OF ELEVATED WATER TANK

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ABSTRACT

Elevated water tanks are one of the most important lifeline structures in earthquake prone regions and also in rural areas. The elevated water tank is an integral part of water supply scheme, these structures have large mass concentrated at the top of slender supporting structures are especially vulnerable to horizontal forces due to earthquake. All over the world, the elevated water tanks were collapsed or heavily damaged during the earthquake because of unsuitable design of supporting system or wrong selection of supporting system underestimated demand or strength. So it is very important to select proper supporting system and also need to study the response of elevated water tank to dynamic forces by both equivalent static or dynamic method and to find out the design parameters for seismic analysis. It is also necessary to consider the sloshing effect on container roof slab. This sloshing of water considerably different the parametric value used in design and economical in construction. This paper present the study of seismic performance of the elevated water tank for various seismic zones of India for same heights and capacity of elevated water tanks for the same soil condition on earthquake forces.

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EXPERIMENTAL STUDY ON PRECAST COMPOUND WALL MANUFACTURED FROM PLASTIC WASTE

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ABSTRACT

The aim of this project is to replace cement with plastic waste in compound wall and to reduce the cost of compound wall when compared to that of convention concrete compound wall. 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 plastic compound wall were prepared and tested and the results were discussed Plastic waste used in this work was brought from the surrounding areas. Currently about 56 lakh tones of plastic waste dumped in India in a year. The dumped waste pollutes the surrounding environment. As the result it affects both human beings and animals in direct and indirect ways. Hence it is necessary to dispose the plastic waste properly as per the regulations provided by our government. The replacement of plastic waste for cement provides potential environmental as well as economic benefits. With the view to investigate the behaviour of quarry rock dust, recycled plastic, production ofplastic compound wall from the solid waste a critical review of literature was taken up from the observations of test results, PET can be reused with 50% of fine aggregate 50% coarse aggregate in Plastic precast compound wall. The physical and mechanical properties of materials used in Plastic precast compound wall were investigated. For thetest 3 cubes cube were cast for measuring Compressive strength. The recycled plastic and aggregate are used in various proportions mix designs and check there stability.

Keywords: compressive strength, plastic waste, PET, recycled plastic

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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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EFFECT OF NANO SILICA AND HYBRID FIBRE BENDABLE CONCRETE STRUCTURAL BEHAVIOR OF REINFORCED CONCRETE STRUCTURES

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ABSTRACT

As we know concrete is widely used in today's construction industry, but the main problem with traditional concrete is that it cannot take much tensile stresses. The bendable concrete is a superior substitute for this problem. Bendable concrete is a special type of concrete that can take bending stresses. Engineered Cementations Composites (ECC) also known as bendable concrete or flexible concrete. In this concrete, we eliminate the coarse aggregate. Instead of that, we use hybrid fibre such as as Steel fibre and a Natural fibre combination to provide flexibility to concrete. It also acts as a reinforcement material in the concrete. It is 500 times high resistant to cracking and 40% lighter in weight. The flexible concrete is used to construct many structures. Concrete is the most convertible material due to the continuous demands made on concrete, Engineers are continually working the limits to enhance its performance with the help of innovative admixtures as super plasticizers and supplementary cementitious materials like nano silica fly ash, silica fume, granulated blast furnace slag and steel slag etc. In this paper strength characteristics of different `bendable concrete mixtures are evaluated by incorporating supplement cementitious materials such as nano silica in cement and in fine aggregate incorporating river sand and recycled aggregate combinations and hybrid fibres such as steel fibre and natural fibres combinations . To improve the workability of concrete super plasticizer is used. To evaluate the structural behaviour of concrete of Reinforced cement concrete beam is preparing as a size of 115X 280 X 1650mm using M25 grade of concrete with the use of nano silica (2%, 4%, 6%, 8%, 10%) as partial replacement of cement and in fine aggregate river sand and recycled aggregate (10%, 20%, 30% and 40%) and hybrid fibres steel fibres and natural fibres (0.1%, 0.2% and 0.3%). Structural behaviour RC beam is found in two different stages 1) Full beam with ECC 2) ECC on tension zone because RCC beam low in tensile strength capacity there is chance in failure due to cracking. In this paper we are evaluating initial crack load and ultimate loads and also comparing results with ANSYS analytical tool.

Key words: Nano silica Bendable concrete, Recycled aggregate, fibres

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EXPERIMENTAL INVESTIGATION OF CONCRETE BY REPLACEMENT OF CEMENT WITH NANO SILICA

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ABSTRACT

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.

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EXPERIMENTAL INVESTIGATION ON MECHANICAL PROPERTIES OF RECYCLED AGGREGATE CONCRETE IN CONVENTIONAL CONCRETE AND SELF – COMPACTING CONCRETE

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ABSTRACT

The objective of the present investigation is M25, M30 grades concrete has been considered. Compressive strength spilt tensile strength and Flexural strength of conventional as well as self-compacting concrete was investigated. The Development of this strength with different age of curing is investigated.

The properties of recycled aggregate differed from those natural aggregate. For the production of concrete for both conventional and self-compacting concrete, these recycled aggregates are replaced by normal concrete, always in ascending order of 10%, 20%, 30%. However, these changes did not affect the properties of the recycled aggregate, both in the normal case and in the self-compaction of the concrete. However, in the case of self-compacting concrete, it has been observed that the quality of the concrete deteriorates after a certain percentage of recycled aggregate with natural aggregate. The high water absorption of the recycled aggregate is ensured by the process before wetting, whereby the recycled aggregate becomes functional as a natural inert substance.

Keywords: Compressive strength, Tensile Strength, Flexural Strength.

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COMPRESSION TESTING ON CONCCRETE USING ARTIFICIAL FIBRES

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ABSTRACT

Piled raft foundation is the combination of raft and pile group, where the load carrying capacity of both raft and pile group are taken into consideration. Piled raft foundation system is economical than the conventional methods, since the combined effect of raft and pile group is taken into consideration. The combined effect of raft and pile in piled raft system results in decreasing the settlements and increase in the load carrying capacity. Mainly the differential settlements are minimized. In order to understand the differential settlement behavior of piled raft, load-settlement analysis was done on raft, piled raft of square and diamond arrangement subjected to eccentric loading. The loading was applied at the centre, one way eccentricity and two way eccentricity of e = B/7.5. The differential settlements of piled raft of square and diamond arrangement were studied

Keywords: Raft, piled raft of square arrangement and diamond arrangement.

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STRENGTH DIFFERENCE OF CONCRETE BY FRACTIONAL SUBSTITUTE OF FLYASH AND GGBS

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ABSTRACT

Concrete is mostly arranged into three sorts in light of the thickness. Concrete containing normal sand and rock or pulverized shake total and water, when set in the skeleton of shape and permitted to cure, turns out to be hard similar to stone. By and large weighing around 2400kg/m3 is called "ordinary weight cement" and it is the most normally utilized cement for auxiliary purposes. The term lightweight cement is utilized for solid that weightless than 1800 kg/m3. Substantial weight concrete utilized for radiation protecting, is a solid delivered from high thickness total and for the most part measure more than 3200kg/m3. Our point it is to think about the properties of cement by incompletely supplanting bond by fly fiery debris and fine total (sand) by granulated impact heater slag. In this examination, Cement was in part supplanted by Fly Ash and Fine total were in part supplanted by Granulated Blast Furnace Slag in concrete. A blend configuration was improved the situation M20 review of cement by utilizing IS technique. The use of fly-cinder and impact heater slag in concrete as halfway substitution of bond and fine total (sand) is increasing tremendous significance in the present solid works, for the most part by virtue of the change in long haul toughness alongside biological advantages. Three levels of conventional port land concrete (OPC) in particular: 33, 43 and 53 as ordered by authority of Indian Standard (BIS) or generally utilized as a part of development industry. Presently in this venture just 53 review of concrete is utilized. This paper reports relative investigation on impacts of solid properties by in part supplanting of OPC of 53 grades with fly fiery debris and sand were incompletely supplanted by impact heater slag. The principle variable explored in the investigation of variety of fly fiery debris measurements of 10% and slag dose of 10%, 20%, 30%, fly cinder dose of 20% and slag dose of 10%, 20, 30%, fly powder dose of 30% and slag dose of 10%, 20%, and 30%. The compressive quality and split elasticity and corrosive assault of cement were for the most part considered. A test outcome demonstrates that, incorporation of fly fiery remains and GBFS for the most part enhances the solid properties up-to certain level of substitution in 53 review of bond.

Keywords: OPC of 53 grades, Fly Ash, Granulated Blast Furnace

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AN OVERVIEW ON TRANSLUCENTCONCRETE & CHARACTERISTICS

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ABSTRACT

The concrete currently used in the construction industry generally consists of at least cement, water and aggregates (fine or coarse). As is well known, traditional concrete has a greyish colour, and its high density prevents the passage of light through it, which means that it is also impossible to distinguish bodies, colours and shapes through it. A scan be imagined, concrete with the characteristic of being translucent will permit a better interaction between the construction and its environment, thereby creating ambiences that are better and more naturally lit, at the same time as significantly reducing the expenses of laying and maintenance of the concrete. Along with the translucent characteristics, the paper confines its area towards the reinforcement method of this type of concrete such that they can be practically implemented as a load bearing structure. This new kind of building material can integrate the concept of green energy saving with the usage self-sensing properties of functional materials

***Keywords**: glass fiber, green energy saving ,characteristic of translucent concrete*

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ANALYSIS OF TEXTILE MILL WASTE WATER

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ABSTRACT

In this chapter, the collection, preservation, analysis method, and report of physicochemical and microbiological parameters of textile wastewater are mentioned. Principle, apparatus, interface, limitations, pre-treatment, and procedure in short and detailed forms of 22 parameters are summarized. Water quality parameters are divided mainly into two parts: (i) titrimetric method [pollution-indicating parameters like chemical oxygen demand (COD) and biochemical oxygen demand (BOD), colour, total hardness, magnesium hardness, and calcium hardness] and (ii) instrumentation parameters (pH, colour, metals, etc.). The analysis report of 22 parameters for combined textile wastewater before treatment, collected from July 2021 to July 2022 bimonthly at GIDC Pande sara, Surat, Gujarat, is included. These parameters are compared with permissible limits of parameters for textile wastewater given by various firms including Central Pollution Control Board and US Environmental Protection Agency, which shows that COD and BOD values are 5 and 10 times, respectively, higher than limits. Characteristics of textile wastewater that were investigated and analysed by different scientists are well fitted with one another. It shows that textile wastewater is highly polluted and treatment is necessary prior to discharge of it in environment.

Keywords: textile waste water, bod, cod, total hardness, magnesium hardness, calcium hardness

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TYPES AND BEHAVIOR 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 behavior under one roof from various studies with few real examples.

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

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MANUFACTURING OF BIO BRICKS USING SUSTAINABLE METHODS

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ABSTRACT

Building construction is one of the fastest growing industries in India and it puts a huge burden on its limited natural resources. Fired clay bricks are one of the major constituent materials for the construction industry and it produces a huge amount of in northern India which causes severe air pollution. Due to its low density, it reduces dead load greenhouse gases. This research tries to highlight the use of alternative materials and how they can be modulated to suit the Indian construction industry. Bio-brick oragro-waste based brick is one such material that has the potential to be a sustainable and cost-effective solution. It acts as good heat and sound insulator and at the same time has overall negative carbon footprint. Additionally, it also acts as a deterrent to stubble burning, prevalent in high rise structures, thereby making RCC construction more economical. The study also highlights the use of Bio-brick in various areas of a structure. Another important objective of this research is to inspire and motivate architects, designers, researchers and builders to encourage and support the development of such sustainable and eco-sensitive material in construction industry.

Key words: Sustainability, Eco design, Bio brick

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EFFECT OF STEEL FIBERS AS REINFORCEMENT IN SELF COMPACTING CONCRETE

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ABSTRACT

Summary -Self-compacting concrete is a type of cement that flows under the influence of gravity without segregation and is used in highly reinforced structural elements. Avoid the need for vibration equipment. Steel fibers can improve cracking resistance, impact resistance and fatigue, reducing shrinkage and hardness. This project explores the strength studies of self- compacting concrete using steel fibers as reinforcement to improve mechanical properties. Several tests will be performed to determine the properties of fresh and hardened cement, such as workability test, compression test, bending test and tensile test. The concept of the mixture for SCC was obtained according to EFNARC guidelines.

Keywords: Self-compacting concrete; gravity; segregation; vibration equipment; EFNARC European Federation of National Associations for Concrete Representation

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REINFORCED CEMENT CONCRETE BEAM TEST WITH DIFFERENT GRADES OF STEEL AND CONCRETE MIXTURES

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ABSTRACT

Concrete is the material which is rapidly used in various conditions to sustain the compression loads and the corresponding bending and shear stress due to the applied compressive loads. The major drawback in concrete is that it is poor in tension though it is very efficient in compression. Hence to overcome this major drawback the concrete must be reinforced such that to make a homogeneous substance which can sustain both tension and compression. Steel is the material use as reinforcement for concrete. The stress strain behavior for both concrete and steel are mostly similar. Hence in the combination of both that is in reinforced cement concrete the maximum stress point within the elastic will reach simultaneously. Structural stability is majorly influenced by strength of concrete. Flexural strength is a measure of the tensile strength of concrete, in other words it is a measure of a resistance against failure in bending. The main aim of this study is to analyze the strength, experimentally, of RCC beams using Ordinary Portland Cement (OPC). Beam specimens are prepared using M15, M20, M25 grade concrete for OPC. Beam specimens casted are tested as simply supported beam in specially prepared loading set up and load deflection behavior is studied.

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SOIL STABILIZATION BY USING WASTE MATERIAL "COPPER SLAG"

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ABSTRACT

Soil stabilization is used to improve the strength of weak soil and bearing capacity. For stabilization varieties of materials are used for improving the soil like wood ash, many fibre polymers, fly ash, lime, etc.., in this study the waste material (Copper Slag) used for stabilization. It is the utilization of waste material and reduction of waste material disposal Copper Slag is a by product of copper extraction by smelting, during the process of smelting impurities become slag which float on molten metal while drawing metal out of copper ore refineries produce a large volume of non metallic dust and rock collectively these materials makes up slag the slag is considered as the potential natural hazard which can cause damage to structures which is not treated properly. This paper will discuss about the engineering behaviour of clay stabilized with copper slag. The maximum strength is obtained when the local clay material is mixed up with 60% of slag (40%+60%).

Key words: Copper Slag, soil stabilization, strength properties

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DESIGN OF STRING BRIDGE USING STAAD-PRO

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ABSTRACT

Structural design requires a full understanding and knowledge of all the components comprising the structure. Bridge is a structure for carrying the road traffic or other moving loads over a depression or obstruction such as channel, road or railway. The structure which is supported and constructed with the strings joined to central chord and the mechanical anchorages is known as String Bridge. Steel and reinforced concrete are used in the construction. The project is about to design a string bridge using Staad-pro. Staad-pro is an engineering software product that caters a structure analysis and design. The bridge models are defined parametrically, using common bridge engineering terms such as layout lines, spans, bearings, bents, hinges and post-tensioning. The parametric model is managed through the bridge object model. The bridge object model is a finite element assemblage of components making up the entire analytical model including the deck sections, diaphragms, bearings, restrainers, foundation springs, superstructure variation, bents, hinges, tendon layouts and more. Bridge models can be analyzed when distributing loads for concrete slab flexure and shear ratings, the section is always treated as one beam; all load demands are distributed evenly. A bridge is a device that supports the strings on a stringed musical instrument and transmits the vibration of those strings to another structural component of the instrument typically a soundboard, such as the top of a guitar or violin which transfers the sound to the surrounding air.

Key words: Bridge, String, Bents, Hinges, Span, Deck, Beam, Bearing, Girder, Pier, Headstock, Staad-pro

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MEANS AND WAYS OF USING CONSTRUCTION WASTE IN CONCRETE AND STUDY OF IT'S STRENGTHING PROPERITIES

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ABSTRACT

Recycling of construction debris can make a contribution to reduce the total environmental impact of the building sector. To increase the scope for recycling in the future, aspects of recycling have to be included in the design phase. Besides, aggregate sources near metro cities are almost depleted, so aggregates have to be brought from far quarries consequently reclaiming aggregates from concrete debris would lead to environmental and economic benefits. This experimental study Aim to use crushed construction debris as alternative coarse aggregate in a mortar mixture. A conventional mortar mixture will be compared to concrete debris mixture of the same proportions. The concrete and construction waste can be recycled by sorting, crushing and sieving into recycled aggregate. Construction waste that emerges from construction site has become a major concern to the nation due to its negative footprints on the environment. Undeniably, huge amounts of construction waste will cause destructive effects on the environment if they are not managed properly. Therefore, the productions of construction waste need to be controlled and managed by the stakeholders in the construction industry. Our proposed system is adding waste aggregate to original aggregate up to 50%.

Key words: Recycling, Demolition, Construction, Conventional concrete, Aggregate, Construction debris

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APPLICATION OF GIS FOR CIVIL ENGINEERING, BLOCK IN 2D

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ABSTRACT

GIS, geographical information system is a software to analyse & manage geospatial data. It has many applications in many fields. In the field of civil engineering, combining a GIS model in construction with its surrounding topography by linking 2D drawings and databases of activities or components of a building can produce a safe execution sequence. Geographical Information System can be used for scientific investigations, resource management, asset management, environmental impact assessment, urban planning, cartography, criminology, history, sales, marketing, and logistics. There two different types of GIs software's and are QGIS and ArcGIS. GIS is more applicable for everything outside the building. GIS combined with building drawing has taken this software further by aiding to easy navigation into the building and helpful in digital visualization. QGIS functions as geographic information system (GIS) software, allowing users to analyse and edit spatial information, in addition to composing and exporting graphical maps. QGIS supports both raster and vector layers; vector data is stored either point, line or polyline features. ArcGIS provides a strong set of tools for describing, analysing, modelling natural system process and functions. Interaction and relationship among diverse system components can be explored and visualised using the powerful analytical and visualisation tools that GIS software provides. In this mini project presented the GIS application for the Civil Engineering, block in 2D which enables to navigate every nook and corner of the block. The Project is executed in QGIS software.

Key words: QGIS, 2D Civil Engineering, block map, Google earth.

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DESIGN & ANALYSIS OF MULTI STOREY BUILDING USING DIAGRIDS IN GATED COMMUNITY BY USING ETABS

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ABSTRACT

Construction of multi-storey building is rapidly increasing throughout the world. Advances in construction technology, materials, structural systems, analysis and design software facilitated the growth of these buildings. Diagrid buildings are emerging as structurally efficient as well as architecturally significant assemblies for tall buildings. Recently the diagrid structural system has been widely used for tall buildings due to the structural efficiency and aesthetic potential provided by the unique geometric configuration of the system. Generally, for tall building diagrid structure steel is used. In present work, concrete diagrid structure is analyzed. Structural design of high-rise buildings is governed by lateral loads due to wind or earthquake. Lateral load resistance of the structure is provided by interior structural system or exterior structural system. Analysis and design of multi storey diagrid RCC frame building is presented. ETABS software is used for modeling and analysis of RCC frame members. All members are designed as per IS 456:2000 considering all load combinations.

Key words: Diagrid, Lateral Load Resistance, Geometric Configuration

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APPLICATIONS OF GOOGLE EARTH SOFTWARE IN RIVER INTERLINKING

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ABSTRACT

Google Earth and GIS, software's based on satellite's images and database of navigation, gains features of high resolution, integrated images, quick update, convenience, simpleness, and free cost. Practice of these software's shows that it plays an important role in mapping, construction and river research. The results of Google Earth and GIS satellite's higher solution images and image overlay functions make it easy for users to quickly navigate river, determine the type of river, track the river flows, and measure the terrain slope. India is prone to several natural disasters such as floods, droughts, cyclones, landslides and earthquakes on account of its geo-climatic conditions. But the most frequent and prominent disasters are floods and droughts. So to reduce the impact of floods and droughts in India, interlinking of rivers is one of the best solutions to transfer the surplus flood waters to deficit/drought prone areas. Geospatial modelling provides a comprehensive approach to generate probable interlinking routes of rivers based on existing geo informatics tools and technologies. The basic idea behind river interlinking is to provide water in the region which faces worst water scarcity is most part of the year. The concept through which this river interlinking project is undertaken is to divert some water from heavy discharged rivers into dry rivers. Such that interlinking of rivers will create a network of navigation channels, the interlinking of rivers has the potential to irrigate lands in the water-scarce regions. The interlinked rivers have the potential to generate a total power of 34000 MW (34GW).

Key words: Google Earth, GIS, Inter-linking, Geospatial modelling

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RCC BEAM TESTS USING VARIOUS GRADE OF STEEL AND CONCRETE MIX

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ABSTRACT

This research/project evaluates the flexural behaviour of reinforced concrete beams with different grades of steel and concrete confinement in the compression region. Three beams were constructed by placing stirrups in every 150mm inside the confinements of those beams. Also, the three beams were varying from the confinement pattern at the compression regions and then the beams were subjected to a gradually increasing loads using universal beam tester. The results, shows the ultimate load against the deflection, were compared with the previous empirical results. Those experiments employed several concrete beams, which has multiple stirrups equally spaced 75mm, 100mm and 125mm from each other, and those beams were subjected to same test using the same apparatus that employed in the current experiment. Furthermore, in both current and previous experiments couple of T10 steel bars were placed in tension zone prior to the construction of each beam. Then both sets of results, which are obtained from previous, and currents experiments were compared each other. The load deflection behaviour is discussed in the later part of this study. In the previous experiment nine tests were conducted using nine different beams and in the present experiment three tests were conducted and there were twelve results to compare each other. Experimental results from those twelve experiments were compared to identify a relationship between load and deflection. Hence, the comparison has proved that the ultimate strength capacity, ductility and overall curvature is increasing proportionally to the longitudinal reinforcement at the compression region of the reinforced concrete beams.

Key words: Reinforced concrete beam (RC Beam), Confinement in compression zone, Strength, stirrup, Deflection, Ultimate moment of resistance

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STUDY OF BEHAVIOUR OF FIBRE REINFORCED CONCRETE

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ABSTRACT

The use of fiber reinforced concrete can be seen in the field of construction. Due to its availability and contributing to the strength of the concrete. This paper prophesies the stress behavior of M25 grade concrete reinforced with glass fibers. The optimal glass fiber volume fraction is 2-3% and length 20 mm. In this study, The behavior of reinforced concrete to stress have been observed. Internal micro cracks are inherently present in concrete and its poor tensile strength is due to propagation of such micro cracks. Fibers when added in certain percentage in the concrete improve the strain properties well as crack resistance, ductility, as flexure strength and toughness. Mainly the studies and research in fiber reinforced concrete has been devoted to steel fibers. In recent times, glass fibers have also become available, which are free from corrosion problem associated with steel fiber. Modern technology has made it possible to extract fibers economically from various plants such as jute and bamboo. The present trend in concrete technology is towards increasing the strength and durability of concrete to meet the demands of the modern construction. The main aim of the study is to study the effect of glass fiber, steel fiber, natural fiber in the concrete. Glass fiber has the high tensile strength and fire-resistant properties thus reducing the loss of damage during fire accidents. A unique aspect of the natural fibers is the low amount of energy required to extract these fibers. In this study, tests have done for the concrete with glass fiber, steel fibers and natural fibers with 1% of cement.

***Key words**: Glass fiber reinforced concrete(GFRC), Natural fiber reinforced concrete (NFRC), Steel fiber reinforced concrete(SFRC), High strength concrete*

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AN EXPERIMENTAL STUDY OF NATURAL FIBER REINFORCED CONCRETE

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ABSTRACT

From the past few years, there have been many investigations about usage of natural fibres in reinforced concrete because of their abundant availability in local premises. Several factors like low cost, low environmental impact, improved strength serve as the main reasons for this prolonged research. This project mainly concentrates on the effects and importance of using fibre reinforced concrete. Concrete is one of the most widely recognized development material for the most part delivered by utilizing locally accessible ingredients. The present trend in concrete technology is towards increasing the strength and durability of concrete to meet the demands of the modern construction. In this experimental study, we will investigate the strength parameters like i.e., flexural strength, compressive strength and spilt tensile strength which can be achieved by the usage of natural fibres. The comparison of performance of conventional concrete with fibre reinforced concrete is studied and observed experimentally by performing required laboratory and field tests. By using cubes of size (150*150*150) in mm with M25 grade of conventional concrete and fibre reinforced concrete. Using natural fibres like coconut coir, banana which are easily available.

Key words: Natural Fibres, Conventional concrete, Fibre Reinforced Concrete, Flexural strength, compressive strength, Split tensile strength.

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ANALYZING CHENNAI FLOODS-2021 AND DESIGN WITH DUCKBILL WEIR CONCEPT

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ABSTRACT

Chennai floods 2021 had a massive effect on life and environment of human life and other lives including property and other ill effects. When in depth analysis of causes of inundation areas being analyzed the vulnerability in Chennai 2021 cause was due to effect on three major resources listed as Chembarambakkam reservoir, Puzhal reservoir, Poondi reservoir and on the Adyar river severely effected the villages Kundrathur and Thiruneermalai and to rectify the occurrence of such damaging flood design concept such as Duckbill Weir and Valves are being studied to reduce the vulnerability of effects and safeguard the property, lives. Technology used in this project is GIS and HECRAS software. Duckbill weir can be defined as the one type of long crested weirs which passes more flow with less head variation on the weir than standard weirs. Structural weirs are often a favorable design option to regulate upstream water elevations and increase flow capacity; nevertheless, it can be difficult to engineer an optimal design due to the complex flow characteristics and the many geometric design variables of Structural weirs. A method for the hydraulic design and analyses of Structural weirs is presented. Discharge coefficient data for quarter-round and half-round Structural weirs are offered for $6° \leq$ sidewall angles $\leq 35°$. Cycle efficiency is also introduced to aid in sidewall angle selection. Parameters and hydraulic conditions that affect flow performance are discussed. The validity of this method is presented by comparing predicted results to data from previously published Structural weir studies. A standard geometric design layout for arced Structural weirs is presented.

Key words: GIS, HECRAS, Duckbill, Weir, Vulnerability

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Paper ID: ICRTCE-22-1030

SOIL STABILIZATION USING WASTE MATRIAL COPPER SLAG

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ABSTRACT

Soil stabilization is used to improve the strength of weak soil, bearing capacity and its engineering properties. For stabilization various types of materials are used like wood ash, fly ash, many fiber polymers, lime etc.., In this study the waste material copper slag is extracted by smelting the copper ore is used. It reduces the quantity of waste material disposal without affecting the environment. Copper slag is a glassy granular and the specific gravity is high. The increase in the percentage of copper slag increases the dry density of the soil and the plasticity decreases. By this we can avoid the shrinkage of expansive soil and swelling. The more utilization of copper slag in the road construction will reduces the disposal problem of the industries. The various experiments to be conducted are Direct shear test, Unconfined compressive strength, Sieve analysis, Specific gravity and Proctor compaction test.

Key words: Copper slag, Copper ore, Soil stabilization, Strength properties

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DESIGN OF MAHATMA GANDHI BLOCK IN SMEC USING ETABS

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ABSTRACT

Most buildings with horizontal beams and vertical columns have straight forward geometry. Although it is possible to configure any building in 2009 with ETABS, in most cases a simple grid system described by horizontal and vertical column lines will achieve a minimal effort for the geometry of the building. Most buildings have a similar floor level. This function can be used to reduce modelling and design times drastically. The present work deals with the study, design and use of the most economical column beam approach to a multi-story residential building MG Block. Dead load & living loads have been applied and E-TABS' concept for beams, columns, base has exceeded its predecessors by its data sharing. With its current characteristics. The main principal purpose is to construct a multi-storey building that is secure and cost efficient against conditions of gravity loading and to serve the role for which the structures were planned. The dead load and live load are taken into account in the design of the structure. The structure analysis and design is performed using the ETABS software kit. We have followed a state-limited method of analysis in this multi-story project. IS 456-2000 verified the build. The results of analysis are used to check the fitness of structure for use. Computer software for the determination of force, timing of bending, tension, strain & distortion or distortion for a complex structural structure is often used. The principal aim of this project is to comparison ETABS 2009 with manual calculations of the design and analysis of a multi-story building MG Block.

Key words: Gravity load, Hostel, building E-tabs, Design

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INTELLIGENT TRANSPORTATION BY AUTOMATED HIGHWAY SYSTEM

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ABSTRACT

Automated highway system is an intelligent system that uses computers, sensors, and artificial intelligence and communication technologies to provide safe travel to the driver. It provide safety against collision and reduce travel time and congestion between the vehicles. Due to the advancement of technologies the vehicles the vehicles need to be partially or fully automated. Besides this is a certain degree of infrastructure is also made automatic so that Vehicles are coordinated with infrastructure and move smoothly and safely along the road without involving any collision. Automated highway system (AHS) concepts define a new relationship between vehicles and the infrastructure in which vehicles moving on lanes limited roadway on which specially equipped vehicles are operated under completely automatic control.

Key words: Automated highway system

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ECONOMIC ANALYSIS OF URBAN PUBLIC TRANSPORTATION-BY USING ROLLING BARRIERS

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ABSTRACT

The latest emerging technologies for road safety focuses on finding ways to avoid or minimize road accidents to road users with special concern by reducing the causes of road accidents. As depicted by data of certain advanced countries like Korea, Malaysia, Australia, United States of America, the major number of accidents causing death was very high during a previous couple of years due to the increased number of vehicles on road, which is getting unmanageable. However, Urethane Rollers invented in Korea has served to re-direct the uncontrolled moving vehicles and to balance it again causing reduction of accidents. Here a study has been carried out to explain its need in India, which has minimized the accidents rate in the above-mentioned countries. Rolling barriers provides cushioning effect during a crash, reduces the high-speed effect, constitutes material resilience with stiffness and have other performance characteristics that reduce injury to occupants and damage to the vehicle. The roller barriers are extremely effective and its implementation has given signified results in reducing the road accidents at different types of roads.

Key words: Rolling barriers system, rolling barriers, accidents, horizontal curve, rolling barriers on horizontal curve

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GIS DATA BASED MORPHOMETRIC ANALYSIS : TAKIGUDA WATERSHED IN ADILABAD DISTRICT OF TELANGANA STATE, INDIA

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ABSTRACT

Morphometric analysis of a Watershed is the best method to identify the relationship of various aspects in the area. It is a comparative evaluation of different Watersheds on various geomorphologic and topographical conditions. The Morphometric analysis was key role in the Watershed evaluation, planning, such as runoff, soil erosion, and sediment yield. The analysis of Morphometric parameters with the help of Geographic Information System (GIS) would prove a viable method of characterizing the hydrological behavior of the Watershed. It is also well observed that remote sensing satellite data is emerging as the most effective, time saving and accurate technique for Morphometric analysis of a basin. We are now dealing with the water within Watershed the main source of water is due to precipitation. The water as per as water concern with respect to precipitation even though we classify in terms of Watershed or particular river basin or drainage basin. A watershed describes an area of land that contains a common set of streams and rivers that all drain into a single larger body of water, such as a larger river, a lake or an ocean. A watershed can cover a small or large land area. Small watersheds are usually part of larger watersheds. All the streams flowing into small rivers, larger rivers, and eventually into the ocean, form an interconnecting network of waterways. Not only does water run into the streams and rivers from the surface of a watershed, but water also filters through the soil, and some of this water eventually drains into rivers.

Key words: GIS, QGIS, drainage basin, geometrical alignment.

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ARTIFICIAL PREPARATION OF COARSE AGGREGATE

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ABSTRACT

The ever-increasing population of world in general developing countries in particular there is tremendous surge in the demand for construction materials. This increases the pressure on Civil Engineering, to develop for cost effective ad Eco friendly materials to suffice the needs of mankind. fly ash an industrial by product, whose use and production have increased many folds during last three decades and can be exploited to the best advantages and can be used for the development of eco-friendly material fly ash, cement, sodium hydroxide solution, sodium silicate solution nowadays a fourfold issue reduction in air/water pollution. Beneficial conversion of waste into wealth.

Key words: eco-friendly, sodium hydroxide solution

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Paper ID: ICRTCE-22-1036

DESIGN MIX PROPORTION OF PERVIOUS CONCRETE

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ABSTRACT

Current climatic changes are occurring due to various human and industrial activities. In particular, the effects of urbanization and growing threat of global warming have likely caused increasing precipitation in many geographic regions. Pervious concrete is a unique sort of concrete with a high porosity used for concrete flatwork applications that permits water from precipitation and other sources to pass directly through, thereby reducing the runoff from a site and permitting groundwater recharge. In addition, Pervious Concrete can reduce the absorption of solar radiation and urban heat storage potential which can lead to temperate urban conditions, and thus protecting the environment and health and safety of living things. However, Pervious Concrete requires regular maintenance to prevent any clogging of the pores by sediments and vegetation. The design procedures are developed based on research performed by the collective pervious concrete community in the United States, and from across the world. The mostcommon design is for parking areas and are aided by the included computer program, which optimizes mixtures for local materials. This type of concrete contains little or no fine aggregates such as sand, and is referred to as 'No fines' concrete. Proportion of cement, aggregate and water incorporated using the India Standard Code (IS: 10262: 2009). By using aggregates of a selected size and adjusting the concrete mix proportion, strength and abrasion resistance can be significantly improved.

Key words: Pervious concrete, Mix proportion, Permeability, Infiltration, Porosity.

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Paper ID: ICRTCE-22-1037

TIME AND COST ESTIMATION OF G+1 BUILDING USING PRIMAVERA P6

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ABSTRACT

Any construction project to begin with starts with the Layout of the building or structure followed by Design and Analysis of the structure which is succeeded by cost estimation and planning for the said project. This project involves the layout, design, analysis, planning and cost estimation of a G+1 residential building located in Chegunta, Telangana. The layout of the proposed G+1 residential building is based on a plot of size 50' x 40 according to the new plan it will be used as a multi-storeyed residential building. The ground floor of the building will be used as parking and shop including 1BHK while the 1st floor will be divided into 2 portions. All the drafting was done using AutoCAD. The analysis and design of the entire structure has been completed using STAAD pro. Also using the software we got the concrete take-off as well as the weight of the various reinforcement bars thus easing the load of cost estimation. Primavera P6 has been used for planning the various activities that surround the construction of a building. Using primavera we were able to formulate a working schedule and also a progress bar for constant monitoring of the project. Using primavera we were able to assign various resources as well as responsibilities on various people related to the various stages of the project there by increasing accountability. The progress and the relationship between various activities has also been shown in the form of an animated Gantt Chart. This chart also helps the Project manager to explain to his clients the various aspects as well as progress of the project. The cost estimate for the project has been calculated using Centre Line Method in Microsoft Excel. For the Abstract cost CPWD Schedule of rates has been followed and a total cost of Rs 31,84,480 has been calculated.

Key words: Planning, Scheduling, activity, Primavera P6, AutoCAD, STAAD pro

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DESIGN OF WATER DISTRIBUTION NETWORK USING EPANET SOFTWARE

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ABSTRACT

The water Supply Network is one of the most important aspects for a community. The main Aim of water supply network is to provide safe drinking water to its community in sufficient Quantity. It is very essential to provide the uniform Quantity of water through the designed network is necessary. This current work utilizes software named EPANET to design a water Distribution Network. This project aims to design the water supply network economically using surveying data and population data of the VB CITY. Population data is used to find the water demand of the City at the end of design period. By using this data better water supply network is designed using EPANET2.2 software. Estimation of head loss is done by Hazen-William's Equation. By using EPANET Software the design of the Water Supply Scheme for proper supply of water is efficient. By using this EPANET Software provides the information about various demands, losses and uses of the public. The design of a new network supply will bring out an improvement in the existing network. The details are provided from Hyderabad metropolitan water supply and sewage board.

Key words: EPANET2.2, Hazen-William's Equation, Head loss, Population and Survey data, Water Supply Network

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LAND USE AND LAND COVER ANALYSIS CHANGE DETECTION AND EVEN FUTURE PREDICTION USING GIS SOFTWARE

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ABSTRACT

Land is becoming a scarce resource due to population growth and industrialization. Rapid growth of construction activities can also be attributed as one of the reasons for decrease and degradation of land. Thus, it becomes an important task to regulate mine area for sustainable development and environmental protection. Usually, minerals occur under features such as forest area or agricultural land and thus mining activities are to be undertaken at the cost of degrading this forest or agricultural area. Therefore, it becomes indispensable to supervise such changes on the earth's surface. Land use is defined as the total arrangements, activities and inputs that people undertake in a certain land type whereas, land cover is the physical material at the surface of the earth. Land use and land cover are not synonymous. Economic development and population growth have triggered a rapid change to earth land cover. The remote sensing and geographical information system have proved to be very important in assessing and analyzing land use and land cover change. This study deals with the land use and land cover analysis by using geographical information system.

Key words: land use, land cover, change detection, future prediction, GIS

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STABILIZATION OF BLACK COTTON SOIL BY USING CALCIUM CARBIDE RESIDUE

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ABSTRACT

Stability of any construction-related structure directly or indirectly depends on soil stability. Stability of soil depends on soil properties. Swelling and shrinkage are the properties of the black cotton soil. These properties may cause damage to the structure and ultimately hazard to the mankind. In such case, there is an extreme need for soil stabilization and hence to find and introduce cheap and easily adoptable stabilizing agent. Calcium carbide residue (CCR) which is by product of acetylene gas manufacturing industry due to its alkaline properties can be effectively used as stabilizing material and is taken into the frame. Introducing CCR in BCS increase the strength and swell properties of soil. for this CCR fixation point was determined by sequentially adding 1%-10% CCR to BCS and studying properties like PH and consistency limits. Strength and swell pressure of BCS were checked with varying percentage of CCR. To study strength properties unconfined compression test is conducted and to examine swell properties a portable and in-house fabricated swell pressure measuring device was used.

Key words: black cotton soil, calcium carbide residue, stabilization.

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Paper ID: ICRTCE-22-1041

STUDY OF BEHAVIOUR OF BLENDED SELF CURING CONCRETE USING SILICA FUME AND COPPER SLAG AS PARTIAL REPLACEMENT

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ABSTRACT

Self-curing is done in order to fulfill the water requirements of concrete. This investigation is aimed to utilize the benefits of reduce water for curing process to save the water. The use of self-curing agent viz., polyethylene glycol (PEG) molecular weight 400 (PEG-400) for dosage ranging between 0.5 to 1% by weight of the cement added to mixing water. Thy comparative studies were carried out for compressive strength for convention concrete to self-curing. Concrete is a material composed of cement, fine aggregate, coarse aggregate and water. There is a continuous depletion in natural resources and some environmental problems. Because of these reasons, there is need to search for alternate materials for concrete. Silica fume is used as a partial replacement for cement in concrete. Copper slag is used as a partial replacement for fine aggregate in concrete. These two compounds are replaced at variable proportions individually and together and experimented to obtain the optimum results leading towards sustainable engineering. Further addition of self-curing compounds to overcome the issues of improper compacting and curing. Concrete tests are conducted on the concrete samples at the specific ages. The comparison made on the basis of compressive and tensile strength performance of copper slag and silica fume. Respective graphs and discussion will be made to find out the optimum result and make it more sustainable product to be used for the construction.

Key words: Self curing, Polyethylene Glycol (PEG), Copper Slag, Silica Fume.

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SMART MATERIALS FOR NOVAL CONSTRUCTION IN CIVIL ENGINEERING

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ABSTRACT

Smart materials technology enables us to adapt to environmental changes by activating its functions. Multifunctional materials, sort of smart materials, can be activated by electrical stimuli so as to produce its geometry change or property change. The effective use of locally available waste materials had certainly a great importance in civil engineering. In recent years the various materials such as fly ash, silica sand, ceramic dust, steel scrap from lathe, etc. were used as a smart material to decrease the various problems that occur during and after the construction. It has incredible range of applications in electronics, material science, energy management and many other fields. In construction they are used for vibration control, noise mitigation, safety, and performance. The present study describes the use of smart materials and their importance. Smart materials are the materials that have to respond to stimuli and environmental changes and to activate their functions according to these changes. The stimuli like temperature, pressure, electric flow, magnetic flow, light, mechanical, etc. can originate internally or externally. Smart materials play a vital role in the construction works for example in the design of smart buildings, these smart materials are used for vibration control, noise mitigation safety and performance. To increase the compressive and flexural strength of concrete, study the effect of using material on concrete compressive and Flexural strength. To reduce the usage of reinforcement in R.C.C, decrease the total dead load, eliminate the water used for curing of concrete.

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FLEXURAL BEHAVIOUR OF LIGHTWEIGHT CONCRETE

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ABSTRACT

The project study with the special concrete such as light weight concrete by using oil palm shell.One of the vibrant disadvantages of nominal concrete having high dead load (self weight). This heavy self weight will make it to extent an uneconomical structural material. Light weight concrete having low density, reduction of dead load and to increase the thermal insulation .The reduction in density produced by using oil palm shell as a limited replacement of coarse aggregate in concrete. In this investigation an attempt has been made to compare the nominal concrete and lightweight concrete using M20 grade .This project aims to study the flexural behaviour of oil palm shell concrete and to check its flexural strength and also to check whether this material is structurally recommended or not.

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GREEN ROOF AND CARBON FOOTPRINT CALCULATION FOR A BETTER ENVIRONMENT

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ABSTRACT

At present, the world is facing many hurdles due to the adverse effects of climate change and rapid urbanization. Besides, the buildings and the construction sector are responsible for high levels of raw material consumption and around 40% of energy- and process-related emissions. Consequently, the interest in defining the carbon footprint of buildings and their components is on the rise. This study assesses the carbon footprint of a green roof in comparison to a conventional roof in a tropical climate with the aim of examining the potential carbon emission reduction by a green roof during its life cycle. A green roof is a vegetated roof or deck designed to provide urban greening for buildings, people, or the environment. However, there is little research done on the benefits of green roofing. To conduct this research we plan to install a section of extensive green roof of native plants on a small room of 0.8 x 0.8 m. dimension. This project will investigate the rough average temperature reduction obtained by installation of green roofs, including energy savings that ultimately result due to temperature decrease. This project 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 impact human activities have on the environment in terms of the amount of greenhouse gases produced, measured in tonnes of carbon dioxide. The temperature reduction that is observed after installation of the green roof is noted down. Assuming an approximate decrease in energy usage we calculate the rough carbon footprint reduction.

Key words: carbon emission; carbon footprint; energy consumption; green roofs; heat transfer urbanization.

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Paper ID: ICRTCE-22-1045

DESIGN OF CIRCULAR WATER TANK USING STAAD. Pro

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ABSTRACT

The water is one of the most essential to a life on the earth. Daily consumption of water about 235litres/head/day and Water is also used agricultural and industrial sectors. Water demand is one of the key issues in water supply planning. Elevated circular water tank is the most effective storing facility used for domestic or even industrial purposes. Elevated circular water tank is the most effective storing facility used for domestic or even industrial purpose. The design and construction methods in reinforced concrete are influenced by the prevailing construction practices, the physical property of the material and the climatic conditions, linings, the ground conditions i.e. type of soil, soil bearing capacity etc The present project is about the designing and analysis of the elevated circular water tank by using STAAD Pro. For designing procedure of elevated circular water tank LIMIT STATE METHOD from IS-3370:2009 is used. In IS-3370:2009, limit state method considering two aspects mainly limits the stress in steel and limits the cracking.

Key words: Limit state method, IS-3370:2009, STAAD.pro.

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Paper ID: ICRTCE-22-1046

DEVELOPMENT OF MIX DESIGN OF SELFCOMPACTING CONCRETE

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ABSTRACT

Self-compacting concrete, also called self-consolidating concrete can flow downstream and collect under its own weight and flows almost as smoothly. Self reinforced concrete (SCC) has improved properties and performance as well as improved working conditions by relieving compression. SCC is suitable for placement in reinforced structures with no vibration and helps to achieve high surface quality. This project deals with the Mix design of Self-Compacting concrete. The highlight of this project is, simplest process of Mix design according to Indian Standard Code of Mix design (IS-10262) and It follows all the design conditions in line with Indian Standard Code of Reinforced Concrete Structure (IS:456). Generally, in construction industry (Pre-cast & Ready-mix Industry) there are mainly two methods of mix design are used.(1) Okamura-Ozawa proposed method (1986) & (2) Nan-Su method (2001). These two methods are tedious, and it required expertise in the Field of mix design. This is an extended part of Brite-EU ram Project. But EFNARC does not provide how to do SCC Mix design step by step. In India no specific Mix design process is available or adopted, based on climatic condition of country and in consideration with standard structural code provisions. Proposed mix design is as per Indian standard code and the output of research is matching with the EFNARC guidelines & Okamura-Ozawa proposal. However, rice husk ash (RHA), Fly Ash, and super plasticizer are used as a mixture as the effective mixture for Pozzolan, resulting in a significant improvement in pore structure as well in compatibility. It is essential to develop the SCC blend design process. In this project it presents an experimental procedure for design of Self compacting concrete mixes

Key words: EFNARC, IS Code of Mix Design: 10262, IS code of Reinforced Concrete

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EXPERIMENTAL STUDY ON M60 GRADE SCC USING TURRITELLA

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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. It is cohesive enough to fill the spaces of almost any size and structure barring segregation or bleeding. This makes SCC in particular really helpful at any place putting is difficult, such as in heavily-reinforced concrete contributors or in complex work forms. The goals of this lookup are blended effects of turritella included in self-compact. Self-compacting concrete (SCC) is a special type of concrete which can be placed and consolidated under its own weight without any vibration effort due to its excellent deformability. The goal is to lookup the properties of the self-compacting concrete when turritella is added to replace cement in stepped concentration of 0%, 5%, 10% and 15%, and used to gain characteristic compressive strength of M60 grade concrete mix and cured in normal water for different ages (7 days and 28 days) were determined in strength, workability, and other properties. Turritella is used to replace cement in stepped concentration of 0 %, 5%,10%, 15%, and used to gain characteristic compressive strength of M60 grade concrete mix and cured in normal water for different ages (7 days and 28 days) were determined 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.

Key words: compressive strength, Super plasticizer, Self-compacting concrete

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DETAILED ANALYSIS ON CONSTRUCTION OF VDCC ROAD

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ABSTRACT

Bad roads lead to many fatalities every year globally. Therefore, it is important to search for innovative ways for maintaining the sustainable management of good roads. According to a report of Ministry of Road Transport and Highway, about 3000fatalities occur annually in India. Thus, in any road construction, flooring work plays an important role and should be in fact time efficient with medium to high workability. In the present paper, an attempt has been made to understand a safe, healthy and comfortable concrete flooring through a technique called vacuum dewatering concrete flooring (VDF) technology. This process efficiently removes excess water from newly placed, compacted and levelled concrete surfaces. This dewatering will help in better compaction, improve physical behaviour of concrete and also aid in better performance of the road post construction. This method is nowadays widely used in warehouse concrete flooring, concrete road, parking area, production area in industrial buildings etc. This paper also provides a review on concrete flooring of roads using vacuum dewatering concrete technique/tremix method along with its advantages & disadvantages.

Key words: vacuum dewatering concrete; civil structure; technologies; tremix method

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Paper ID: ICRTCE-22-1049

EXECUTION OF BOX DRAIN WORK FOR SEWARAGE AND EXCESS STORM WATER

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ABSTRACT

Box drain is a closed chamber consists of various parts like raft, drain wall and slab which are laid on PCC (Plain Cement Concrete) constructed below the ground level. The infrastructure of box drain is designed to dispose of sewage and excess storm water as quickly as possible from permeable and impermeable surfaces. The importance of box drains is having lesser chances of spreading diseases like malaria and dengue. Also, it will increase the life span of the infrastructure and protect road deterioration from water. The box drain carrying sewage and excess storm water is connected to main culvert or cross drainage structure at the end. Box drains are commonly used both as cross-drains to relieve drainage of ditches at the roadside, and to pass water under a road at natural drainage and stream crossings. The box drain selection is based on several factors including requirements for hydraulic performance, limitations on upstream water surface elevation, and roadway embankment height. This experimental study will provide good infrastructure to the society and to introduce the modern technology to the sewerage system. The climate change has become more critical issue, particularly in low lying coastal areas, exposed to sea level rise, increase in rainfall and temperature, storm surges, and more frequent and intense storm events. The climatic change adaptation into the drainage is important in formulating appropriate management and mitigation solutions to remove or reduce climate risks. This has direct bearing on the success and sustainability of the drainage network.

Key words: Box drain, storm water, sewerage system, Plain cement concrete

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DESIGN AND ANALYSIS OF (G+5) COMMERCIAL BUILDING USING WITH STAAD Pro.& COMPARISION WITH MANUAL CALCULATIONS

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ABSTRACT

The multi-storeyed commercial building having mixed stories with shopping complex and office space. This project will help to built buildings within the limited area satisfying each and every need of people and it is designed in a way that it would be economical and time saving. This project work involves planning, analysis and drawing of a typical (G+5) commercial building using STAAD Pro. & it involves analysis various load cases & load combinations are included, RCC framed structure is used for commercial multi-storeyed buildings, structure design is to be done using limit state method and comparing it with manual calculations. And it is mandatory to do the seismic analysis and design to structural against collapse. It is highly impossible to prevent an earthquake from occurring, but the damage to the buildings can be controlled through proper design and detailing. Designing a structure in such a way that reducing damage during an earthquake makes the structure quite uneconomical, as the earth quake might or might not occur in its life time and is a rare phenomenon. In order to compete in the ever growing competent market it is very important for a structural engineer to save time. The dead load &live loads are applied and the design for beams, columns, footing is obtained STAAD.Pro with its new features surpassed its predecessors, and compotators with its data sharing capabilities with other major software like AutoCAD, and MS Excel. We conclude that STAAD.Pro is a very powerful tool which can save much time and is very accurate in Designs. Thus it is concluded that STAAD.Pro package is suitable for the design of a multi storied commercial building.

Key words: RCC structure, STAAD.Pro, Manual calculations.

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EXPERIMENTAL STUDY ON RECYCLED AGGREGATES

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ABSTRACT

In the current era, the present day world has witnessed a phenomenal rise in construction activities over decades. The demolition of existing old structures inevitably results into the generation of construction and demolition (C&D) waste, the disposal of which is a problem causing environmental hazards. The prime objective of the present work is the effective utilization of this material as recycled aggregate by replacing normal aggregate in defined proportions so that a durable M25 grade concrete is produced. In order to achieve this objective, the characteristics of recycled aggregates procured from ten different places from Western Maharashtra have been studied. It is observed that due to lower specific gravity and higher water absorption of recycled aggregates on account of adhered mortar, the concrete prepared with such recycled aggregates adversely affects compressive strength. The replacement of 0, 50, 60 and 100 percent of normal aggregates by recycled aggregates have been studied by testing 186 specimens. Substitution of 60% of normal aggregate with recycled aggregate of 20 mm maximum size gives rise to desired compressive strength when mix design methodology as devised in the present work is adopted. Durability of 105 specimens of such recycled aggregate concrete has been examined by conducting typical tests, namely rapid chloride permeability, water permeability, drying shrinkage, modulus of elasticity and creep. The results of these tests inferred that recycled aggregates behave like normal aggregates when processed for removal of adhered mortar and also provide a durable M25 grade concrete, thus vindicating the objective in its entirety.

Key words:Mix proportions, compressive strength, chloride permeability, shrinkage, rapid permeability.

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PROPERTIES AND BEHAVIOUR OF HYBRID FIBRE REINFORCED CONCRETE

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ABSTRACT

Hybrid fibre-reinforced concrete (HFRC) is a type of fibre-reinforced concrete characterised by its composition. It contains at least two or more types of fibres of different sizes, shapes or origins. This paper studied experimentally the synergic mechanical properties of hybrid fiber reinforced concrete with different kinds and percents of steel fibers and polypropylene fiber, to find out the higher performance of mechanical properties of hybrid fiber reinforced concrete mixtures. In a hybrid fibre reinforced concrete two or more different types of fibres are rationally combined to produce a cementations composite that derives benefits from each of the individual fibre to that concrete mixture. This study aimed to discuss the suitability of hybrid fibres addition in conventional concrete to improve its mechanical properties. In this we are going to use two types of fibres are double hooked end steel Fibre (SF) of length 30mm, diameter 0.6mm & aspect ratio is 50 and polypropylene Fibre (PPF), individually to the concrete mixture and then they were added together to form a hybrid fibre reinforced concrete. Here, we are going to finding the properties of concrete like compressive strength, split tensile strength and stress strain curve was made individually by varying polypropylene fibre percentages of the total volume specimens (0.1%, 0.2%, 0.3%), varying percentage of steel fibre of the total volume of specimens (1.0%, 1.5% and 2.0%) and hybrid fibre incorporation.

Key words: Steel fibres, polypropylene fibres, split tensile test, flexural test, compression test, reinforced concrete

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COMPARATIVE ANALYSIS OF MULTI STOREY BUILDING FOR EARTHQUAKE ZONES II AND V

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ABSTRACT

The seismic analysis of the multi storyed building in the different zones of the India with the different magnitude under different loading to analysis the structure in those particular zone like Ⅱ and Ⅴ which are the low and high magnitude. In India places like Hyderabad is zone Ⅱ area where the chances of getting earthquake is less and places like northern states are zone Ⅴ aeras have chances to get the earthquake to know the behaviour of the structure in this zones the seismic analysis is needed to done. They are different techniques to the analysis Pushover analysis, Fragility curve analysis, Time history analysis, Response spectrum analysis. To construct the shear wall to resist the seismic load by the structure. ETAB is the structural software to design and to do analysis for different types of structure which gives the detailed analysis of the structure in different zones under loading/according to IS1893:2002 the factors will be taken for the calculation for seismic loading. The maximum storey drift, maximum storey displacement, stiffness of structure can be obtained for structure.

Key words: Shear wall, Seismic analysis, Pushover analysis, Fragility curve analysis, Time history analysis, Response spectrum analysis, Lateral load

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Paper ID: ICRTCE-22-1055

STUDY ON TERNARY CONCRETE CONSISTING OF GRANULATED BLAST FURNACE SLAG AS A PARTIAL REPLACEMENT TO FINE AGGREGATE

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ABSTRACT

Concrete is a combination of cement, fine aggregate, coarse aggregate, water and admixtures. According to world coal association survey over 4.1 billion tons of Ordinary port land cement (OPC) was used across globally in 2020 and also use of OPC emits CO2 to the atmosphere. In order to overcome the problem, a search for alternative materials is the need of the hour and apart from cement, fine aggregate is also important additive to concrete. Due to the speedy construction rate deficiency of materials occurs reduction in natural aggregates causes problems like dredging of sand in large scale which creates environmental imbalance. The solution is utilization of Fly ash, silica fume, Ground granulated blast furnace slag (GGBS) which are comes under Industrial by-products. In this present study silica fume, fly ashes are replaced in OPC and fine aggregate with Granulated blast furnace slag (GBFS). The experimental work executes in order to determine mechanical properties such as compression, split tensile and flexural strength of concrete with age 3, 7 and 28 days at various combinations of cement with fly ash varies 20%, 30%, 40% and constant 8%of silica fume and fine aggregate replaces with Granulated blast furnace slag of 30%, 40% and 50% in M40 grade concrete with water-cement ratio 0.38. As per experimental results conclusions were drawn.

Key words: Concrete, Granulated Blast furnace slag, Industrial by-products, Mechanical properties, partial replacement.

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Paper ID: ICRTCE-22-1056

RCC BEAM TESTS USING VARIOUS GRADE OF STEEL AND CONCRETE MIX

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ABSTRACT

This research/project evaluates the flexural behaviour of reinforced concrete beams with different grades of steel and concrete confinement in the compression region. Three beams were constructed by placing stirrups in every 150mm inside the confinements of those beams. Also, the three beams were varying from the confinement pattern at the compression regions and then the beams were subjected to a gradually increasing loads using universal beam tester. The results, which shows the ultimate load against the deflection, were compared with the previous empirical results. Those experiments employed several concrete beams, which has multiple stirrups equally spaced 75mm, 100mm and 125mm from each other, and those beams were subjected to same test using the same apparatus that employed in the current experiment. Furthermore, in both current and previous experiments couple of T10 steel bars were placed in tension zone prior to the construction of each beam. In the previous experiment nine tests were conducted using nine different beams and in the present experiment three tests were conducted and there were twelve results to compare each other. Experimental results from those twelve experiments were compared to identify a relationship between load and deflection. Hence, the comparison has proved that the ultimate strength capacity, ductility and overall curvature is increasing proportionally to the longitudinal reinforcement at the compression region of the reinforced concrete beams.

Key words: Reinforced concrete beam (RC Beam), Confinement in compression zone, Strength, stirrup, Deflection, Ultimate moment of resistance

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STUDY ON DIFFERENT COMPRESSIVE STRENGTH FIBRE REINFORCED CONCRETE

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ABSTRACT

Concrete is one of the most widely recognized development material for the most part delivered by utilizing the locally accessible ingredients. The development of concrete has brought about the essential need for additives both chemical and mineral to improve the performance of concrete. Hence varieties of admixtures such as fly ash, coconut fibre have been used so far. Hence an attempt has been made in the present investigation to study the behaviour of glass fibre in concrete. Plain concrete possesses very low tensile strength, limited ductility and little resistance to cracking. Internal micro cracks are inherently present in concrete and its poor tensile strength is due to propagation of such micro cracks. Fibre, when added in certain percentage in the concrete improves the strain properties as well as crack resistance, ductility, flexural strength and toughness. Mainly the studies and research in fibre reinforced concrete has been devoted to Steel fibres. In recent times, glass fibres have also become available, which are free from corrosion problem associated with steel fibre. Modern technology has made it possible to extract fibres economically from various plants such as jute and bamboo. The present trend in concrete technology is towards increasing the strength and durability of concrete to meet the demands of the modern constructions. The main aim of the study is used to study the effect of glass fibre, steel fibre and natural fibre in the concrete. Glass fibre has the high tensile fire resistant properties thus reducing the loss of damage during fire accidents.

Keywords: Glass Fibre Reinforced Concrete (GFRC), Natural Fibre Reinforced Concrete (NFRC), Steel Fibre Reinforced Concrete (SFRC), High Strength Concrete

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AN EXPERIMENTAL STUDY OF STRENGTH OF PLASTIC FIBER REINFORCED CONCRETE

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ABSTRACT

From past few years, we are facing a lot of problems regarding environmental safety. Many things which are invented for our luxurious life are responsible for polluting environment due to improper waste management technique. One of them is a plastic fiber. This project mainly concentrates on the evaluation of different strength properties of plastic reinforced concrete when compared to the normal conventional concrete. In this experimental study, we will use plastic fiber and investigate the strength parameters like i.e., flexural strength, compressive strength and spilt tensile strength. The comparison of performance of conventional concrete with plastic fiber reinforced concrete is studied and observed experimentally by performing required laboratory and field tests. By using cubes of size (150*150*150) in mm with M20 grade of conventional concrete and fiber reinforced concrete using plastic fiber to find out the strength characteristics. The aspect ratios used were 30, 50, 70, 90 and 110 and the various volume fractions of fibres adopted were 0.25, 0.50, 0.75, 1.00, 1.25 and 1.5. All the results were compared with reference specimens of plain concrete. M25 grade of concrete was designed as per IS10262-2009 code of practice which was adopted for all experimentation. Strengths was tested by compression test, split tensile test and flexural strength test.

Key words: Plastic fibers, Flexural Strength, Comparison

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MULTIPLE STRATEGIES APPROACH FOR URBAN FLOOD MITIGATION FOR FLOODS OCCURING IN HYDERABAD, TELANGANA, INDIA -2021

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ABSTRACT

Our cities represent progress and development and there is a need to study the urban floods and the causes of urban floods is important to make our cities flood mitigation measures robust and flood resilient. Frequent flood devastation is part of monsoons in major cities of our country. In this study, preferred theoretical way to explain about urban floods. In case of Hyderabad floods are caused due land use changes and poor governance and policy implementation and the diversity of the factors contributing to the flood. This study of urban floods focuses on lake systems in Hyderabad. The purposive sampling method was utilized for this study and the ongoing pandemic which limited the scope of field research. In this study, inundation maps of various lakes, around the city and hydrology maps are explained to understand the intensity of recent Hyderabad floods. Lakes in the various areas of the city were inundated and in this part of analysis, emphasized on old city of Hyderabad and maps of this area are extensively utilized, as per the data released by NRSC and local government, this section of city has experienced high intensity flood during recent floods in 2020. And comparatively explained the changes in the inundated areas, for the study of individual lake we have analyzed gurram Cheruvu Lake has devastated the old city of Hyderabad during recent floods and this lake has been in the news for the land use changes around the lake and the shrinking of the lake area and ecological damage

Key words: Urban floods, Land use, Mitigation techniques, Organisations, QGIS

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Paper ID: ICRTCE-22-1060

SOIL STABILIZATION OF BLACK COTTON SOIL USING FLY ASH

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ABSTRACT

Nearly 51.8 million hectares of land area in India are covered with Expansive soil (mainly Black Cotton soil). The property of these expansive soils, in general, is that they are very hard when in dry state, but they lose all of their strength when in wet state. In light of this property of expansive soils, these soils pose problems worldwide that serve as challenge to overcome for the Geotechnical engineers. One of the most important aspects for construction purposes is soil stabilization, which is used widely in foundation and road pavement constructions; this is because such a stabilization regime improves engineering properties of the soil, such as volume stability, strength and durability. This mainly includes the stabilizationof black cotton soil with the admixture fly ash. It is very important to know the behavior of black cotton soil and its problems so that construction could be done efficiently. This research paper examine the behavior of black cotton soil stabilized with different proportion 15%, 20% and 25% of fly ash added to the black cotton soil. The admixtures used in this are easily available and are economical beneficial. The various tests on black cotton soil with addition of fly ash are performed after developing the samples. The main aim of this research was to find the optimum percentage of mixing fly ash with the black cotton soil. The results obtained from the experiments are compared to the black cotton soil with the admixture fly ash. The results will obtain in terms of liquid limit, plastic limit, shrinkage limit, plastic index, maximum dry density and optimum moisture content.

Key words: Black cotton soil, stabilization techniques, fly ash stabilization, hydration of fly ash

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Paper ID: ICRTCE-22-1061

MAKING OF BRICKS BY USING PLASTIC AND RICE HUSK

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ABSTRACT

The plastic waste is the hazardous problem in today's world. This is most dangerous problem in front of humanity. The most hazardous type of wastes are HDPE and PTE and the plastic below 50micron is also causing a serious problem. These plastic mixed in the soil, it directly effects on fertility of the soil. Nowadays, the large amount of plastic is deposited into sea. This plastic wastes gives hazardous effect on the aquatic life and quality of seawater also polluted by this plastic. So, we try to finding efficient way to solve this problem of plastic waste. So, we added this plastic wastes into the bricks and create the bricks by using plastic wastes. It is most economical solution present in the construction industry and it is also economical and environment friendly solution of the plastic wastes. In addition other agriculture waste such as rice husk, had been investigated in some previous researches to be used in the innovation of building materials. Rice husk as the supporting materials would increase the porosity of the materials and absorb the outdoor air temperature. It is most economical solution present in the construction industry and it is also economical and environment friendly solution of the plastic wastes. This project aims to find the composition of plastic waste which was combined with rice husk to become an alternative brick material as thermal insulation for the building. A recommendation of plastic waste and rice husk composition was to use a ratio of 40:60 , 30:70, 20:80, 50:50.The bricks are manufactured by heating waste plastic to temperature range of 120 to 150 degree centigrade. The bricks produced are light weight, have smooth surface and fine edges, do not have cracks and have high crushing strength and very low water absorption.

Key words: Plastic wastes, rice husk, compressive strength and water absorption

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Paper ID: ICRTCE-22-1062

INTELLIGENT TRANSPORTATION BY AUTOMATED HIGHWAY SYSTEM

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ABSTRACT

The design and analysis of RCC structure supported on single column is done in this project. Structural comparison is done between RCC single column and RCC multi column structure with G+5 Building. This project presents structural modeling, stress, Bending moment, Shear force and displacement design considerations for a structure and it is analyzed using ETABS. Various steps involved in designing of RCC structure supported on a single column using ETABS are Geometric modeling, providing material properties and section properties, fixing supports and boundary conditions, providing loads and load combinations, special commands, analysis specification and Design Command. The modeling of single column structure is done by using ETABS software. The height of the structure is taken as 18.0 m. Structure is supported on a single column. It is a 5 storey building. Height of each storey is 3 m. First storey starts at a height of 3.5m above ground level. Single column keeps the building at a height of 3 m above ground level. Width and breadth of each storey is 16 m. Column is provided at the center of structure starting from ground level to a height of 18 m above ground. The influence of plan geometry has an important role in static analysis. Maximum values of stresses, bending moments, shear forces and displacements are presented. The acting loads considered in the present analysis were self-weight, floor load, wind load and earth quake load. In these cases the floor load was applied perpendicular to the RCC structure. Comparison of RCC single column and RCC multi column is done.

Key words: RCC structure, ETABS, single column, earth quake load etc

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ANALYSIS AND COOLING OF HYPERBOLIC COOLING TOWER

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ABSTRACT

Cooling tower are the biggest heat and mass transfer devices that are in wide spread use. It works on the temperature difference between the air inside the tower and outside the tower. In this study cooling tower in analysed under the effect of earthquake forces using STAAD pro software. The parameters considered are top diameter and height of cooling with constant thickness under different zones of India. It is observed from the analysis that maximum displacement, support reactions support moments stresses and bending moments in plates due to seismic loading on a hyperbolic cooling tower is continuous function of geometry. Based on these results, salient conclusions are drawn. Hyperbolic cooling towers are large, thin shell reinforced concrete structures which contribute to environmental protection and to power generation efficiency and reliability. Inlet water temperature and mass flow rate of water and air are having main influence on the performance of counter flow induced draft cooling tower. In cooling tower water is made to trickle down drop by drop, or form a thin layer over flat surface so that it comes into direct contact with air moving upwards in opposite direction. The heat transfer from the water to the air steam raises the air's temperature and its relative humidity to 100% and this air is discharged to the atmosphere. In this study we will perform dynamic analysis of a tall tower considering thermal effect over the inner layer of the tower and wind pressure to determine its stability in terms of temperature, cracks, stability, resistivity, forces and displacement.

Key words: Cooling tower, Modelling, Earthquake, Stresses, Temperature, STAAD pro

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Paper ID: ICRTCE-22-1064

DESIGN OF RAIN WATERSHED (RWS) FOR A POPULATION OF 10LAKHS WITH RAINFALL OF 100MM IN EACH MONSOON

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ABSTRACT

A watershed describes an area of land that contains a common set of streams and rivers that all drain into a single larger body of water, such as a larger river, a lake or an ocean. A watershed can cover a small or large land area. Small watersheds are usually part of larger watersheds. All the streams flowing into small rivers, larger rivers, and eventually into the ocean, form an interconnecting network of waterways. Not only does water run into the streams and rivers from the surface of a watershed, but water also filters through the soil, and some of this water eventually drains into rivers. All lands on earth are part of one watershed or other. Watershed is thus the land and water area, which contributes runoff to a common point. For example, the watershed of a lake would include not only the streams entering that lake but also the land area that drains into those streams and eventually the lake. The process of creating and implementing plans, programs, and projects to sustain and enhance watershed functions that affect the plant, animal, and human communities within a watershed boundary is known as watershed management .Watershed management is the integrated use of land, vegetation and water in a geographically discrete drainage area for the benefit of its residents, with the objective of protecting or conserving the hydrologic services that the watershed provides and of reducing or avoiding negative downstream or groundwater impacts. Fresh water, and freshwater ecosystems, is the most basic components of watershed management

Key words: soil and water conservation, water distribution, watershed development

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Paper ID: ICRTCE-22-1065

ANALYSIS OF A MULTISTOREY BUILDING AT DIFFERENT TERRAIN CONDITIONS

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ABSTRACT

Any tall structure can vibrate with wind and wind flow. New, Tall buildings built to meet the criteria for lateral drift can also be extreme during wind tempests. As Taller and Taller buildings are more likely to oscillate at tall winds, these waves can trigger certain threats to Tall building. Sometimes, such swings may also cause pain in the occupants, although they are not threatened by the structural harm. A detailed measurement of the building motion therefore constitutes a necessary serviceability requirement. The Tall buildings have few answers to wind loads. In the form of a particular direction, the wind is a preceptible normal air transition to the surface of earth. The greatest damage to Civil Engineering, systems lies in loading all items. The wind in robust ground blows at lower speed in flat ground and high speed. In this text, the wind in various business categories for Tall Rise buildings with the drifting past and of tale sheering and support reactions of several structures over various levels. Current study is a good source of information on drift volatility, shear in contrast with enhanced model height and drift percentage, shear in the same model across different field groups.

Key words: eco-friendly, sodium hydroxide solution

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ANALYSIS AND DESIGN OF I GIRDER BRIDGE USING STAAD PRO

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ABSTRACT

The bridges are the super passage or a pathway over the obstacle without changing the alignment of the way beneath. For important and significant reasons, the design of bridges has become very important. Bridge is a structure for carrying the road traffic or other moving Loads over depression or obstruction such as channel, road or railway. The bridge in which girders are used for supporting its deck is called the girder bridge. Girder is a term used in construction to refer to a supporting, horizontal beam that can be made from a variety of construction materials such as stainless steel, concrete, or a combination of these materials. This project looks on the work of analysis and design of girder bridge on software staad pro v8i. The present study considers the design of bridge girders both longitudinal girders and cross girders. The span of the bridge is taken as 25m in which girders are constructed. The size of longitudinal girders is taken as2000x500 mm and cross girders is 1500x250 mm. There are three longitudinal girders are considered having spacing 2600 mm c/c and cross girders are considered as 5000mm c/c. The design of girders is carried out using the software STAAD Pro. In this study of bridge girder design, three same models are prepared in the STAAD pro and then their loadings are changed according to IRC codes, Euro codes and AASHTO specifications respectively. According to these different loading we found the shear force, bending moment and area of steel in longitudinal girder as well as cross girder. The analysis is conducted in STAAD Pro and analysis results are compared with tables and graphs.

Key words: Bridge, Girder bridge, Longitudinal Girders, Cross Girder STAAD Pro

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EXPERIMENTAL STUDY ON USE OF BANANA STEM FIBER TO REDUCE

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ABSTRACT

The use of local materials such as natural fiber in construction of buildings is one of the best way to support sustainable development. Use of natural fiber is becoming more popular due to economic cost and eco-friendly. Fibers extracted from banana stem present important characteristics such as low cost, light weight, high stiffness, high tensile strength. These kind of residue has a greater chance of being utilized for different application in construction as composite building materials. The proposed mortar consists of cement, fine aggregate and fibre. Banana fibres are widely available worldwide as agricultural residue after banana harvesting. Result of this study is focused on the use of banana fibre and its effect on the plastic shrinkage cracks and drying shrinkage cracks in plastering.

Key words: Banana fibre, Plastic Shrinkage, Drying Shrinkage, Sustainable, Strength

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Paper ID: ICRTCE-22-1068

FLOW COMPUTATION OF RIVER USING FLOOD ANALYSIS SOFTWARE

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ABSTRACT

River flooding affects more people worldwide than any other natural hazard, with an estimated global annual average loss of USD 104 billion.1 Such damages are expected to increase as a result of continued economic growth and climate change.2, 3 Severe rainfall conditions that lead to floods are associated with atmospheric instability which, in mainland Portugal, usually occurs from autumn to spring. However, the climatic change is precipitating the river flooding events in Europe, particularly in Western Europe, according to a study published in Science. 4 Constant modifications in soil use (including deforestation and the urbanization of flood zones) can also increase the impacts from flooding. In this study on urban floods in Hyderabad I found factors like, lack of infrastructure and the poor governance and inefficient town planning as the important factors leading to massive floods. Which could have been averted by sound planning and governance as most of the experts participated have pointed out same views. By using Flood analysis Software to understand and compute the factors leading to the cause of flood in a river and also design a plan for avoiding or mitigating the effects of flooding.

Key words: Flood analysis software

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ANALYSIS AND COMPARISION OF EXTRADOSED RCC BRIDGE AND STEEL ARCH BRIDGE BY STAAD PRO

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ABSTRACT

Bridges are the structures that are being constructed to cross natural or manmade obstacles by using various types of materials. In ancient days bridges were constructed with wood and stone later on by using lime. Among the various types of bridges, two types of bridges were taken for this study. They are Extra dosed RCC bridge and Steel Arch bridge. A bridge deck is constructed by pre-cast box girders which are supported by cables that are connected to pylons is known as Extra dosed bridge. The arch bridge is one of the oldest and most effective types of bridge with high ground clearance. A comparative study and analysis of the Extra dosed bridge and the Steel Arch Bridge to know the structural analysis like moments, forces and deflections in the bridges by using Staad.pro software. These two bridge models are analyzed for various load combinations and to observe the deflections, ultimate stresses and moments of both the bridges for same conditions to know the efficiency of the bridges. Such that the recently developed bridge and the oldest bridge type are compared for efficiency of load-carrying capacity.

Key words: Moments, Staad.pro software, arch bridge, Extradosed bridges, cable supported bridge

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Paper ID: ICRTCE-22-1070

EFFECT OF RANDOM INCLUSION OF FIBRES ON THE STRENGTH BEHAVIOUR OF CLAYEY SOIL

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ABSTRACT

Construction of building and other Civil Engineering, structures on weak or soft soil is highly risky on geotechnical grounds. Because such soil susceptible to differential settlements, poor shear strengths and high compressibility. Hence it is necessary to stabilize the soil and to improve the bearing capacity of the soil for construction purpose. The use of fiber in soil for improving their properties is one of the recent methods, as they are advantages because they are cheap, locally available, biodegradable and ecofriendly. Polypropylene is a synthetic fiber is used to improve the engineering properties of the soil. To study the effect of polypropylene fiber on the strength of soil California bearing ratio test is conducted. Inclusion of fiber to the soil increases compressive strength and decreases swelling. The behaviour of polypropylene reinforced the fine grained soil and reported that the unconfined compression strength tended to increase when the polypropylene fibre content was increased and the strengthening of soil will be improved by using the polypropylene fibre and also by using the polypropylene fibre in large extent it was found that unconfined compressive strength and California Bearing Ratio (CBR) ratio increased appreciably.

Key words: soil stabilization, clayey soil, polypropylene

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Paper ID: ICRTCE-22-1071

EXPERIMENTAL INVESTIGATION ON IMPACT OF NANO-SILICA ON STRENGTH AND PROPERTIES OF BENDABLE CONCRETE

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ABSTRACT

As we know concrete is widely used in today's construction industry, but the main problem with traditional concrete is that it cannot take much tensile stresses. The Flexible concrete is a superior substitute for this problem. Flexible concrete is a special type of concrete that can take bending stresses. Bendable concrete also known as "Engineered Cementations Composites" (ECC). In this concrete, we eliminate the coarse aggregate. Instead of that, we use fibres such as silica fibre, steel fibres, Asbestos fibre, polyvinyl alcohol fibres etc. to provide flexibility to concrete. It also acts as a reinforcement material in the concrete. It is 500 times more resistant to cracking and 40% lighter in weight. Nano technology is one of the most promising areas of science. The use of nano materials in concrete is new revolution. Nano materials like nano silica, nano titanium oxide, carbon nano tubes, nano alumina etc… which are presently used in concrete to modify its strength properties. In the present study strength properties such as compressive strength, split tensile strength and flexural strength of M25 grade of concrete with the use of nano silica (2%, 4%, 6%, 8%, 10%) as partial replacement of cement were studied. It was found from the experimental study that concrete composites with superior properties can be produced using nano silica.

Key words: Bendable concrete, Engineered Cementations Composites, Nano silica, Flexibility.

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Paper ID: ICRTCE-22-1072

STRUCTURAL PERFORMANCE OF BUILDINGS IN SEISMIC ZONES USING ETABS

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ABSTRACT

An earthquake occurs in the form of seismic waves due to sudden release of energy and results in ground shaking. During earthquake, seismic waves propagate through the soil which results in structural damage due to movements within the earth's crust. When earthquake occurs, the behaviour of a building depends on distribution of mass, strength and stiffness. Generally, the buildings are subjected to various types of forces throughout their existence. The forces can be static forces due to dead and live loads and dynamic forces due to earthquake. In this study, the analysis is carried out for seismic response of residential building for different zonal regions using "ETABS".

Key words: Seismic waves, ETABS.

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Paper ID: ICRTCE-22-1073

DURABILITY AND BOND PROPERTIES OF STRUCTURAL LIGHTWEIGHT CONCRETE

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ABSTRACT

The use of lightweight concrete for structural application has attracted great interest due to its significant benefits in terms of design flexibility and overall coasting. A chemical aspect of durability is the stability of the material itself, particularly in the presence of moisture. Concrete made with lightweight aggregate exhibit a higher moisture movement than is the case with normal weight concrete. Based on the 24hr absorption test, lightweight aggregate generally absorb from 5 to 20 % by weight of dry aggregates, depending on the pore structure of the aggregate. Rate of absorption in lightweight aggregates is a factor which also has a bearing on mix proportioning, handling, and control of concrete, and it depends on the aggregate particle surface pore characteristics. Since insufficient reinforcement concrete bonding could result in structural deficiency of reinforced concrete elements. Lightweight aggregate concrete,foamed concrete and no fines concrete and the various factors influencing bond behaviour .This shows that generally the bond behaviour of LWC complied with bond requirements in codes of practice without the need of safety factors, and this could further enhance the feasibility of LWC for structural applications.

Key words: lightweight aggregates, lightweight concrete, normal weight concrete

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ANALYSIS OF STUDY FLOW BY USING HEC-RAS SOFTWARE

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ABSTRACT

Water is one of the essential components for living. With the increase in population there is also increase in water requirement. Floods have been a recurring occurrence in the studied area. Heavy precipitation, usually occurring near the conclusion of the summer season and accompanied by a sudden cloudburst, causes significant flooding in the study region. The river's catchment region has already been saturated, and the excessive runoff has swollen the rivers past their limit. The current research describes the use of the HEC RAS Model for flood simulations in the river valley. The peak flood records were placed into the HEC RAS model to determine the expected flood levels.

Key words: Surface Flow , Catchment area , HEC – RAS model , HEC-RAS software

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GEOSPATIAL TECHNOLOGIES AND GIS SCIENCE IN SPATIAL ANALYSIS AND MAPPING

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ABSTRACT

The Geospatial Technology is an emerging field of study that includes Geographic Information System (GIS), Remote Sensing (RS) and Global Positioning System (GPS). Spatial analysis is the process of extracting or creating new information about a set of geographic features to perform routine examination, assessment, evaluation, analysis or modelling of data in a geographic area Geospatial technology enables us to acquire data that is referenced to the earth and use it for analysis, modelling. Geospatial information is geography and mapping. Geospatial analysis is the gathering, display, manipulation of imagery, GPS, satellite photography and historical data. This project deals with Hill shade analysis using geospatial techniques and GIS software.

Key words: GIS, Spatial Analysis & Techniques, Mapping

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EXPERMENTAL STUDY ON MECHANICAL PROPERTIES OF HIGH STRENGTH FIBER RENFORCED CONCRETE USING MINERAL ADMIXTURES

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ABSTRACT

High Strength Concrete (HPC) is being widely used all over the world for construction purpose in high rise buildings, long span bridges, mega structures and in repair and retrofitting of existing structures. The increased use of high strength concrete consequently increases the Portland cement consumption. Moreover, the increase of the cement consumption causes more CO2 emission from concrete industry which contributes to global warming. Hence, significant reduction in cement consumption by replacing part of cement using mineral admixtures will be environmentally beneficial. The use of high strength concrete in structures is observed to be technically and economically advantageous. The high strength concrete is characterized by low water/ cement ratio and greater cement content when compared to ordinary concrete. The low workability of HSFRC by virtue of reduced water content is overcome by addition of either mineral or chemical admixtures. The commonly used pozzolanic mineral admixtures include fly ash, rice husk ash and metakaolin, to achieve the desired workability. In this project, M100 grade concrete mix is designed by adding GGBS (Ground Granulated Blast Furnace Slag) and Alco fine as Mineral Admixtures and Polypropylene as Fiber by varying its proportion from 0.5%-1.5%. Samples of compressive strength, tensile strength, flexural strength are tested at 7, 28, 56 and 90 days, and the results obtained are compared with ordinary concrete. Mechanical parameters like split tensile strength, flexural strength and compressive strength are studied.

Key words: High Strength Concrete, Split Tensile Strength, Flexural Strength, Compressive Strength, Target Average Strength, GGBS, Alccofine.

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USE OF STAADPRO FOR THE REMODELLING OF A GRAVITY DAM

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ABSTRACT

Dams are important structures where safety is of utmost importance. They are complex structures subjected to various forces. Stability is one of the most important factors governing the design of dams. In this paper a 3 dimensional finite element model of an overflow dam is created using solid elements in STAADPro. All the forces are calculated and applied as loads and load combinations for most adverse cases. The objective of the study is to check the stability of the dam for various load combinations mentioned in IS 6512-1984. The model is analysed considering both static and dynamic conditions. The results show that the dam is safe against overturning, sliding and uplift. In this project we are dealing with the remodelling of gravity dam using STAAD PRO V8i software A gravity dam is a solid structure, made of concrete or masonry, built throughout a river to create a reservoir on its upstream. The segment of the gravity dam is approximately triangular in shape, with its apex at its pinnacle and most width at backside. The phase is so proportioned that it resists the numerous forces acting on it by using its very own weight. In this paper analysis of dam is achieved the use of STAAD.pro software program. STAAD.pro is extensively used for multi-storied homes with beam and columns. But STAAD.pro can examine any form of element which include, plate, shell or strong further to beam individuals. So, in the software with appropriate facts, dam is modelled with stable factors. Result of stresses and pressure contours are defined on the end of paper. The goal of paper is to modelling of koyna dam using STAAD.pro .STAAD.pro is computer software, which is used for stability and stress analysis of structures.

Key words: gravity dam, STAADPRO V8i software.

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EXPERIMENTAL ANALYSIS ON POLYMER MODIFIED BITUMEN IN ROAD CONSTRUCTION

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ABSTRACT

The road transport facilities play a vital role in deciding a countries economy status. Developing countries like India mainly depends upon their road networks for transportation. To provide a road network which can perform for a longer period is the need of the hour. The main failure of a pavement is due to its permanent deformation, which is a result of the poor performance of the bitumen used as a binder. The Development of polymer modified bitumen composites gaining momentum due to its vast application in the field of flexible pavements, since it can produce pavements with longer life. A series of polymer modified bitumen samples were prepared using different varieties of polymer like PVP and PVA in different percentages of polymers starting from 3% to 7% and for WP its in the range of 1% to 5%. These polymer modified bitumen was characterized for its physical properties using some advanced analytical tools. Basic empirical tests were also carried out to check whether it obeys the basic properties of the binder. The polymer modified bitumen was also subjected to study its mix characteristics. The tests result concludes that there is a notable improvement in the properties of the bitumen when it is modified with polymers. A detailed discussion of the results obtained were also done in this project work. The study also concludes that the research on polymer modified bitumen paves a newer way in the area of flexible pavement construction.

Key words: bitumen, PVA, PVP, WP, Polymer modified bitumen.

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A DETAILED EXPERIMENTAL ANALYSIS ON DENSE BITUMEN MACADAM AND BITUMINOUS CONCRETE

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ABSTRACT

A Concrete made with bituminous material as a binder for sand and gravel is called bituminous concrete. It is made from a blend of stone and other forms of aggregate materials joined together by a binding agent. This binding agent is called bitumen and it is a by-product of petroleum refining. Dense bituminous macadam is a binder course used for roads with more number of heavy commercial vehicles and a close graded premix material having a voids content of 5-10 percent. Dense bituminous Macadam provides a good quality smooth surface and improved skid resistance. The bituminous mix design aims to determine the proportion of bitumen, filler, fine aggregates and coarse aggregates to produce a mix which is workable, strong, durable and economical.

Key words: Bitumen macadam, Bituminous concrete

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Paper ID: ICRTCE-22-1080

DESIGN AND ANALYSIS OF TELECOMMUNICATION TOWER USING ETABS

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ABSTRACT

Communication towers are classified among the tallest man-made structures and can be discovered standing high on each piece of the globe with various statures and purposes. Towers are the tall steel structure development utilized for various purposes for example, mobile tower, radio transmission, and power transmission, aviation authority and so forth. Towers are subjected to gravity burdens and loads. The loads which are considered for plan of these towers are self-weight, wind load , seismic load, dead load (such as communication devices, antenna etc).Towers are designed with combination of different bracings. In this project, the analysis and design of communication tower is carried out by using "ETABS".

Key words: loads, displacement, types of bracings, ETABS.

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Paper ID: ICRTCE-22-1081

STUDY OF USE OF PLASTIC WASTE IN PAVEMENT CONSTRUCTION

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ABSTRACT

The plastic road was invented by Rajagopalan Vasudevan, an Indian scientist, who was born in Tamil Nadu. Rajagopalan Vasudevan has mainly worked in waste management and is currently a professor at Thiagarajar College of Engineering. Nowadays we are getting snacks in plastic, food items packed in plastic , clothes packed in plastic everything is packed in plastic! The increasing dependency on plastic is a warning bell for use its harmful for humans and animals because plastic is a non biodegradable solid waste .but how much do we really think about getting rid of the plastic waste but there is a person who has thought of a 2 in 1 idea to get rid of plastic waste . The person is rajagopal vasudevan who made roads out of waste plastic that too without spreading polution and is called(plastic man of India). to make a 1km of one single lane your required 10 ton bitument but our plastic man used 9ton bitument and 1ton plastic .1ton plastic menas 10 lakhs carry bags the plastic takes time 1000 yes to decompose we can use to make a roads because a great help to the environment . It's not required to take a maintenance for 10 years and given this invention to government of india free of cost ,about 11 states are laying plastic of roads . Tamil Nadu, Kerala, Andhra Pradesh, Karnataka, Goa, Maharashtra ,Madhya Pradesh, Delhi, Himachal Pradesh, Jharkhand and Meghalaya. Plastic road is a such invention which changing the earth future and nowadays are using plastic waste in construction field , to make a plastic brick and to laying of plastic road.

Keywords:M2O, plain cement concrete, waste plastic, technology, construction, rain water

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TENSILE STRENGTH OF CONCRETE

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ABSTRACT

Tensile strength is one of the important mechanical proper-ties of concrete. Indirect methods have been used up till now for its measurement. These methods though widely accepted, do not furnish the true tensile strength of concrete. In this paper, a compression to tensile load transformer device is developed to determine direct tensile strength of concrete. The cubic concrete samples with dimension of 15*19*6 cm containing internal hole with dimension of 75mm is prepared using the mixture of cement, fine sand and water. This model is subjected to direct tensile loading by special loading device. a series of finite element analysis were performed using franc2d to analyze . The effect of hole diameter on the stress concentration around the hole and to render suitable criteria for determination of real tensile strength of concrete. Concurrent with direct test is performed to compare the results of two methods. Results obtained by this test are quite encouraging and shows that the direct tensile strength is clearly lower than the Brazilian test. The difference between the Brazilian and direct tensile strengths is about 33%.

Keywords Tensile strength, High-strength concrete , Shear Strength, Inclined Cracking.

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STUDY OF COMPRESSIVE STRENGTH OF CONCRETE

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ABSTRACT

Metakaolin is a highly pozzolanic material. It is obtained by calcinations of Algerian kaolin at 700˚ C for 7 hours. It Is derived from the calcination of a high-purity kaolin clay. The product is then ground to between 1 – 2 µm (about 10 times Finer than cement). The silica and alumina contained in the metakaolin are active and react with free lime to form C-S-H and Alumina-silicates which greatly improve the strength. A number of studies have been carried out to investigate the possibility of utilizing a broad range of materials as Partial replacement material for cement in the production of concrete. The use of supplementary cementitious material in Production of concrete can result in major saving of energy and cost. It also helps to improve strength, durability, impermeability and chemical resistance of concrete. The present study investigates the effects of Metakaolin & Super plasticizer on strength Properties of M-35 grade concrete. The experimental program is designed to find the compressive strength of concrete by Partially replacing the cement in concrete production. The replacement levels of cement by metakaolin are selected as 4%, 8%,12%, 16% and 20% for constant water-cementitious material ratio of 0.43. For all mixes compressive strength is determined at 3,7, 28 days for 150 X 150 X 150 mm size cubes. Current experimental study shows that 12% replacement of cement by Metakaolin gives higher strength.

Keywords: Broad Range of Materials, Chemical Resistance of Concrete, Cementitious Material

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DURABILITY STUDY OF CONCRETE USING FOUNDRY WASTE SAND

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ABSTRACT

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(44^0C and 55^0C) 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/mm^2 .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/mm^2 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}and 33.940 to 40.380 N/mm^2 respectively. The results of acid attack test were in the range of 24.852 to 37.496 N/mm^2.

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

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EXPERIMENTAL STUDY ON DIFFERENT GRADES OF STEEL & CONCRETE

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ABSTRACT

This paper discussed an experimental study of M30 Grade of concrete using fly ash, steel fiber, cement, coarse aggregate and fine aggregate. Aim of the experimental work was to achieve a proportion of ingredients and obtain strength of M30Grade. To achieve this aim experiments were designed to vary the content of fly ash and steel fiber in cement and other ingredients (fine aggregate and coarse aggregate). The moulds were prepared using coarse aggregate, fine aggregate and the quantity of cement was gradually reduced by adding fly ash and amount of steel fiber was also varied. Two sets of fly ash were varied from 10% to 30% in step to 10% keeping the steel fiber content fixed. In the other set the amount of steel fiber was varied from 0.5% to 2% in step of 0.5% keeping the other parameter fixed. A number of combinations were tried, molded, cured as per prescribed norms and tested as per prescribed norms ((IS Code 456-2000). It was observed that 6.3 kg of cement, 15 kg of fine aggregate, 24.6 kg of coarse aggregate, 0.486 kg of steel fiber, 2.7 kg of fly ash produces the desired strength of M30 Grade of concrete. It is expected that practicing engineer will find this combination to be suitable and use it to construct building with a low cost.

KEY WORDS: Grade of concrete, Mechanical Properties, Elevated Temperature, NTD, Modulus of rupture, Rebound Hammer Test, cooling Regime ,Water Quenching.

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STUDY OF COMPRESSIVE STRENGTH OF MOTOR

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ABSTRACT

In the present work ,the statistical dispersion of the mortar compressive strength as a function of the geometric parameters of the specimens as well as the effect of the mortar workability difference on the compressive strength was investigated .for the purpose ,specimens were prepared for six types of mortars : two conventional mortars in the proportions of 1:1:6 and 1:2:9 of cement ,hydrated lime, and sand, respectively, two with clay replacing lime, and two with marble waste in place of lime The results confirm the difference between the results found for the two geometrics due to the differences in the heights of the molding layers and show that the workability of the mortar modifies the resistance properties , especially in the cylindrical model where the modelling of the specimens is more complex .by comparing the difference between the destructive test results and those defined by the finite element modelling (FEM) for conventional mortars ,it was clear that the effect of excess material in the sample during the compression tests did not change the strength properties studied .this facilities the performance of the assay as specimens may be used excessively on the side without the need for sample rectification .

Key words: Motor, Strength of mortar, Replacement.

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EFFECTS OF FLY ASH ON THE DURABILITY OF CONCRETE

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ABSTRACT

Utilization of fly ash as a supplementary cementitious material adds sustainability to concrete by reducing the CO2 emission of cement production. The positive effects of fly ash as a partial replacement of cement on the durability of concrete are recognized through numerous researches; however, the extent of improvement depends on the properties of fly ash. In this study, durability properties of high strength concrete utilizing high volume Class F fly ash sourced from Western Australia have been investigated. Concrete mixtures with fly ash as 30% and 40% of total binder were used to cast the test specimens. The compressive strength, drying shrinkage, sorptivity and rapid chloride permeability of the fly ash and control concrete specimens were determined. The 28-day compressive strength of the concrete mixtures varied from 65 to 85 MPa. The fly ash concrete samples showed less drying shrinkage than the control concrete samples when designed for the same 28-day compressive strength of the control concrete. Inclusion of fly ash reduced sorptivity and chloride ion permeation significantly at 28 days and reduced further at 6 months. In general, incorporation of fly ash as partial replacement of cement improved the durability properties of concrete

Keywords:- chloride permeability; drying shrinkage; durability; fly ash; sorptivity.

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CELLULAR LIGHT WEIGHT CONCRETE

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ABSTRACT

Lightweight concrete (LWC) has been successfully used since the ancient Roman times and it has gained its popularity due to its lower density and superior thermal insulation properties. Compared with normal weight Concrete (NWC), LWC can significantly reduce the dead load of structural elements. This makes it especially attractive in multi-storeyed buildings.However, most studies on LWC concern "semi-lightweight". Concrete, i.e., concrete made with lightweight coarse aggregate and natural sand to manufacture the "total lightweight" concrete, more environmental and economical benefits can be achieved if waste materials can be used to replace the fine lightweight aggregate. With increasing concern over the excessive exploitation of natural aggregates, synthetic lightweight aggregate produced from environmental waste is a viable new source of structural aggregate material. The uses of structural grade lightweight concrete reduced considerably the self-load of a structure and permit larger pre-cast units to be handled. The mechanical properties of a structural grade lightweight aggregate made with fly ash and clay will be presented.

Key Words: Lower density, thermal insulation, eco-friendly, economical benefits, fly ash, clay

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Paper ID: ICRTCE-22-1089

EFFECT OF ADMIXTURES AND PVC POWDER ON THE COMPRESSIVE STRENGTH OF CONCERTE

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ABSTRACT

In this study super plasticizers admixtures were used for the three grades of concrete 15, 25 and 40N/mm² to improve the properties of fresh and harden concrete in hot weather to achieve these properties in the summer season of Sudan : Increase the Workability, Increase the compressive strength by adoption super plasticizers admixtureswhich increase the Workability and hence the strength is increased through the reduction of water content. Reduce the cement content and hence cost saving. The experimental work was divided into two phases :Tests on basic materials (cement, aggregate, sand, water) and the effect of recommended dose of admixture on the properties of fresh and hardened concrete. The results of tests for the basic materials were carried to ensure that results confirming to their standards and can be used.

Keywords : Split tensile strength, Silica fume, Compressive strength, PVC waste powder.

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INVESTIGATION OF CRACKS IN BUILDINGS

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ABSTRACT

Building cracks are most common problem found in any type of building. We all love to have a house which structurally safe and beautiful but it is not so easy, one has to overcome natural calamity, soil failure, construction faults, improper design, and inadquate joints causing to develop cracks on the building.

Though the cracks in concrete cannot be prevented entirely but they can be controlled by using adequate material and technique of construction and specific design criteria. On timely identification of such cracks and adopting preventive measure are essential. Active cracks causes seriously problem and they need special attention as they are structurally hazardous. So, it is important to understand the types of cracks, crack patterns and their causes and the preventive measures to be taken to control the cracks.

Key words: Natural calamity, Structurally hazardous, Inadequate joints.

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Paper ID: ICRTCE-22-1091

STUDY OF COMPRESSIVE STRENGTH ON PERVIOUS CONCRETE

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ABSTRACT

Pervious concrete is a type of lightweight concrete that is porous, obtained by detaching sand from the normal concrete mix. Furthermore, it really is known as no-fine concrete. The advantages of this type of concrete are lower density, less cost due to lower cement content and no use of fine aggregates, relatively low drying shrinkage, lower thermal conductivity, no capillary movement of water and better insulating characteristics than conventional concrete because of the presence of large voids. This paper presents the end result of the relative learn of different researches, to find out the optimum compressive strength of concrete mix made without fine aggregates. As well as, to look for the after effect of aggregate/cement proportion, w/c ratio, and3 size of aggregates on the compressive strength of pervious concrete. It absolutely was found that the strength of no-fines concrete is significantly less than that of conventional concrete, but sufficient enough for structural use. The compressive strength generated by 1:6 (cement: coarse aggregates) having a w/c proportion of 0.40 and aggregate size of 9.375mm at 28 days was 10.8MPa. Which is greater than the compressive strength of first-class brick (10.297MPa).Therefore, the suggested mixer can be used for cast-in place load bearing walls of single and multistory houses (later plastered to reduce air and water permeability).Pervious concrete can be used for a number of applications, but its primary use is in road pavement such as in rural areas. This report will focus on the pavement applications of the concrete, which also has been referred to as porous concrete, permeable concrete, no-fines concrete, gap-graded concrete, and enhanced-porosity concrete.

Keywords: Pervious concrete, no fines, Permeable, Sustainable, Storm Water, Drought, Permeability, Porosity.

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BAMBOO AS BUILDING MATERIALS

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ABSTRACT

Bamboo is one of the oldest traditional building materials used by mankind. They are the largest members of the grass family and are the fastest-growing in the world. In fact, within a significance in South Asia, Southeast Asia and East Asia, being used for building materials, as a food source, and as a versatile raw product. Bamboo has a higher compressive strength than wood, brick or concrete and tensile strength that rivals steel. This is a substitute building material, which is renewable, environment friendly and widely available, as the wood resources are diminishing and restrictions are imposed on felling the natural forests. Due to its rapid growth, its adaptability to most climatic conditions and due its properties, bamboo emerges as a very suitable alternative. Industrially treated bamboo has shown great potential for production of composite materials and components which are cost-effective and can be successfully utilized for structural and non-structural applications in construction. Bamboo has several unique advantages like ability to grow fast with a high yield and also it matures quickly. Additionally, bamboo can be grown abundantly and that too at a lower cost which makes it more economical. This article deals with why and how bamboo is used as a building material, some of the main properties, construction details and the major uses of bamboo etc.Also to inspire all for saving nature and to suggest them to use eco-friendly materials and techniques, which are cost-effective and grown abundantly and focuses on sustainable buildings to fit into natural surroundings.

Key words: Bamboo, Renewable, Environment, Cost-Effective, Economical, Building Material.

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FLEXURAL STUDY OF STRENGTH OF CONCRETE

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ABSTRACT

Flexural strength is an indirect measure of the tensile strength of concrete. It is a measure of the maximum stress on the tension face of an unreinforced concrete beam or slab at the point of failure in bending. It is measured by loading 150 x 150-mm (or (100 x 100-mm) concrete beams with a span length at least three times the depth.

The flexural strength is expressed as Modulus of Rupture (MR) in MPa and is determined by standard test methods ASTM C78 (third-point loading) or ASTM C293 (center-point loading). The specimen size and type of loading doesImpact the measured flexural strength and comparisons or requirements should be based on the same beam size and loading configuration. The MR measured by third-point loading (ASTM C78) is lower than that determined by center-point loading (ASTM C293), sometimes by as much as 15 percent. It is also observed that a lower flexural strength will

Be measured with larger beam specimensFlexural strength is about 10 to 15 percent of compressive strength depending on the mixture proportions and type, size and volume of coarse aggregate used.

Key words : flexural strength , concrete

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CYCLONIC RESISTANCE BUILDING CONSTRUCTION

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ABSTRACT

Cyclonic storms subject buildings to extreme winds which if the buildings are not able to withstand, They collapse leading to huge losses during cyclones. Hence the wind load codes of every country provide Guidelines for the design of cyclone-resistant structures. In India, IS 875-3(1987) & IS15948-2004 describes the Wind loads acting on each and every element of the building individually.

For a building to be safe during wind-Induced disasters, the foundation, the walls as well as each connection have to be well-built. Hence in this paper The main area of concern will be to tackle the vulnerable areas and design of the elements in order to make them Less vulnerable to the high-speed winds.

Keywords: Cyclones; Wind;Pressure; Suction; Disaster

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DURABILITY PROPERTIES OF OIL PALM SHELL

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ABSTRACT

Environmental degradation resulting from waste disposal from coal industry and palm oil mills along with greenhouse gasses released by cement manufacturing industry needs to be resolved. Realizing that the use of free granite lightweight aggregate concrete is rewarding in terms of environmental sustainability and construction cost reduction through reduced foundation size, the present research delves further in oil palm shell (OPS) lightweight concrete research.

The influence of fly ash as partial cement replacement on compressive strength, porosity and acid resistance of OPS lightweight aggregate concrete were investigated. Five types of concrete mixes were casted by replacing fly ash from 0%, 10%, 20%, 30% and 40% by weight of cement. All the cubes were subjected to air curing for 28 days.

The compressive strength and porosity of concrete were conducted 28 days of curing age. The acid resistance of concretes was evaluated by measuring the mass loss of the cubes after immersed in sulphuric acid solution for 1800 h. The findings show that OPS lightweight aggregate concrete exhibit strength reduction and increment in porosity value when more fly ash is used. Concrete produced with lesser quantity of fly ash experience lower mass loss and strength drop after immersed in acidic environment

Keywords: oil palm shell, light weight concrete, silica fume, fly ash.

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HOUSE LIFTING BY JACKING TECHNOLOGY

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ABSTRACT

This project gives knowledge on the advancement of structures. Lifting a structure is to raise a structure above its existing foundation and build a new foundation. The house elevation technique gained currency several decades ago; the structures are often lifted to minimize damage that may be caused by storms and floods. In the United States, agencies like the Federal Emergency Management Agency (FEMA) advise raising houses in susceptible areas to a desired Flood Protection Elevation (FPE) and also determines to which point the owners should elevate their homes by calculating the base flood elevation (BFE) the base line where a flood would hit during a super storm. In some cities, homeowners have been prevented from having available space two feet below the BFE thereby making it mandatory for them to employ agencies and raise the houses over the FPE.With today's technology you can easily raise the level of your home. And it is also without any accidents. It's time to save money and live in the same house you used to live in. This method also helps to save a construction material which indirectly helps in conserving the natural resources of the environment.

Keywords: buildings, weight lifter (jock technology), downstream areas and flood zone areas.

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NON DESTRUCTIVE TESTING OF CONCRETE

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ABSTRACT

Non-destructive testing (NDT) methods of concrete structures as utilized by the structural engineering industry. The fundamentals of NDT methods are explored in regards to their potential, limitations inspection techniques and interpretations. The factors that influence the success of NDT methods are discussed and ways to mediate their influence are recommended .Reference is made to standard guidelines for the application and interpretation of the acceptance NDT methods. NDT of concrete was found to be gaining increasing acceptance as a means of evaluating the strength. uniformity, curability and other properties of existing concrete structures. Perceptions of NDT inadequacies were attributable to lack of understanding construction materials and NDT methods themselves. The intent of this paper is to address these concerns by identifying and describing the most common successful methods of NDT as applied to concrete structures.

Key words : Penetration method, Rebound hammer method Pull-out test method, Ultrasonic pulse velocity method, Resonant frequency method.

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COMPRESSION TESTING ON CONCCRETE USING ARTIFICIAL FIBRES

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ABSTRACT

Fiber Reinforced concrete (FRC) is a combination of concrete and randomly distributed discrete fibers. Use of fibers in concrete enhances its mechanical properties. Fibers are basically distinguished on basis of its origin. Various papers have been published before on use of artificial fibers in concrete. An experimental study is carried to analyze the strength of concrete by using fibers from different origin. We are unaware of fact that these materials can be used in concrete to enhance its properties. We have used polypropylene as artificial fiber. We further experimented with artificial fibers. Our basic aim was to increase compressive strength of concrete and to make it more crack resistant. The properties studied include compressive strength and workability. The studies have been conducted as per recommended procedures of relevant IS codes on M40 mix. Fractions of 0.5%, 1.0% and 1.5% of fibers by weight of cement have been used for comparative study of compressive strength of concrete and results are obtained.

Key words**: **Reinforceded Concrete, Fibers, , Fiber reinforced concrete and Hybrid Fiber reinforced Concrete

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ADVANCE TECHNOLOGY IN WASTE WATER TREATMENT AND NUTRIENT REMOVAL

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ABSTRACT

In India the effluent and sewage discharged from industries and urban settlements are the major source pollution of surface water bodies like rivers, lakes, wetlands etc., resulting their environmental degradations. Therefore proper collection, treatment and disposal of industrial wastes and domestic sewage is an essential pre-requisite for conservation of aforesaid natural water bodies in order to maintain their environmental. Sustainability which is also related to the general health of the public and the improvement of quality of life. As per study carried out in 2003-04 by Central Pollution Control Board (CPCB), In India, the total waste water generation from class-l and class-towns was 29000 million liters per day (MLD) in which only 6000 MLD received after treatment. The municipal wastewater treatment capacity developed so far in India is about 7000 MLD accounting for 24% of wastewater generation in these two classes of urban centers showing a huge gap between the sewage generation and treatment capacity. Treated or partly treated or untreated wastewater is disposed into natural drains joining rivers or lakes or used on land for irrigation/fodder cultivation or disposed into the sea or a combination of them. The problem of treating sewage to the desired standards does not end with the construction of treatment plants. it is important that the assets created are operated and maintained properly.

Key words: Activated sludge, Floc, Chlorination Aeration, Coagulants, Disinfection

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CEMENT STABILIZED MASONRY INTERLOCKING BLOCKS

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ABSTRACT

The requirements of construction materials are increasing day by day due to the continued infrastructural growth. Because of this large quantity of waste is also generated every year. Waste generated from the aluminum industries like aluminum hydroxide and many more wastes are generated from the industries while processing the raw materials. These wastes generated from the industries create serious problems. Disposal of this waste requires huge space and also pollutes the environment. So, these materials can be used in a proper way to lessen the pollution to the environment Aluminum hydroxide is added asa stabilizer in cement and as a flocculating agent in soil. It is also used as fire-retardant as it is sensitive to the moisture content variations; Granite processing industries generate waste in the form of slurry. From this slurry granite powder following components are obtained, Sio2, Ca0 and even it possesses cementitious properties. So, by using these materials we can produce cement stabilized masonry interlocking blocks. Studies can be made to know the optimum mix proportion soil, aluminum hydroxide, granite powder, and cement to attain a good strength.

Keywords: Granite powder, Aluminium hydroxide, Cement, soil stabilization

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SELF HEALING CONCRETE

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ABSTRACT

Buildings and structures made of concrete that can "magically" seal and fully repair cracks caused by tension? What may have seemed a utopian scenario just a few years ago will soon become reality. The Dutch researcher set out to develop the bio-concrete of the future- with limestone-producing bacteria that can survive in a concrete structure or up to 200 years, and which "awaken" when damage occurs, enabling them to heal the cracks. In Europe, where concrete makes up 70 per cent of infrastructure, Jonkers ground-breaking innovation promises to reduce the costs of concrete production and maintenance, as well as curb resultant carbon dioxide emissions. The positive side-effect of this property: the bacteria consume oxygen, which in turn prevents the internal corrosion of reinforced concrete However, the bacteria do not pose a risk to human health, since they can only survive under the alkaline conditions inside the concrete. Based on these findings. Jonkers and his team of researchers developed three different bacterial concrete mixtures: self-healing concrete, repair mortar, and a liquid repair system. In self-healing concrete, Bacterial content is integrated during construction, while the repair mortar and liquid system only come into play when acute damage has occurred on concrete elements. Self healing concrete is most complex of the three variants. Lated within two-to four-millimeter wide clay pellets and added to the cement it separate nitrogen, phosphorous and a nutrient agent This innovative approach ensures that bacteria can remain dormant in the concrete for up to 200 years. Contact with nutrients occurs only il water penetrates into a crack and not while mixing cement This variant is well-suited lor structures that are exposed to weathering, as well as points that are difficult to access for repair workers. Thus, the need for expensive and complex manual repairs are eliminated.

KEY WORDS: Self-healing, Micro-Cracks, $CaCo_3$precipitation, Bacteria, Hydration, Bacillus pasteuri, Autogenous, Autonomous, micro silica.

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STABILIZATION OF SOIL BY USING FLY ASH

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ABSTRACT

In Generally Soil is a peculiar material. The Fly Ash use to make the soil to be stable. It can increase the physical and chemical properties of the soil. Some expecting properties to be improved are liquidity index. Plasticity index unconfined compressive strength and specific gravity etc. For any type of structure, the foundation is very important and it has to be strong to support the entire structure. In order for the strong foundation the sol around it plays a very critical role. To work on soils, we need to have proper knowledge about their properties and factors which affect their behavior. These problems are manifested through swelling Shrinkage and unequal settlement. In the stabilized soil materials have a higher strength, Lower permeability and lower compressibility. The Test were conducted on the soils-Fly Ash mixtures prepared at optimum water content at 9%.A study is carried out to check the improvements in the properties of expansive soil with fly ash and lime in varying percentages. The increase of dry density compromises higher strength. Several methods have been suggested to control this problem. The most commonly used method is addition of stabilizing agents, such as fly ash to the expansive soil. One of the most effective and economical method is addition of stabilizing agents such as lime or fly ash to expansive soil. Expansive soil was stabilized with various proportion of any ash Le. 0%,5%,10%,15%,20% .Addition of fly ash to clay reduces the optimum moisture content but the dry density increases up to fly ash con tent of 20%, thereafter, the same decreases with further increases in fly ash content.

Key Words: Optimum moisture content, stabilization, compressive strength

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G+2 RESIDENTIALBUILDINGUSING E-TABS

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ABSTRACT

Structural Analysis is a branch which involves in the determination of behavior of structures in order to predict the responses of different structural components due to effect of loads. Each and every structure will be subjected to either one or the groups of loads, the various kinds of loads normally considered are dead load, live load, earth quake load and wind load. ETABS (Extended Three Dimensional Analysis of Building System) is a software which is incorporated with all the major analysis engines that is static, dynamic, Linear and non-linear, etc. and especially this Software is used to analyze and design the buildings. Our project "Analysis and Design of Commercial building using ETABS software is an attempt to analyze and design a commercial building using ETABS. A G+2 storey building is considered for this study. Analysis is carried out by static method and design is done as per IS 456:2000 guidelines. Als0 an attempt has been made to design the structural elements manually. Drawing and detailing are done using Auto CAD as per SP 34.

Key Words: E TABS, Three dimensional, Earthquake, structural analysis

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REPAIR AND STRENGTHENING OF REINFORCED CONCRETE STRUCTURER

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ABSTRACT

Maintenance, repair and strengthening of existing concrete structures, either reinforced or prestressed, are important activities of civil engineers. A variety of engineering tasks are required in practice to effectively repair and strengthen concrete structures. Concrete structures are found in large numbers all over the world. Many are at or near the end of their service life. Although highly durable, concrete structures start showing the signs of deterioration in the course of time. Maintenance of concrete structures should be regular and preventive. Regular maintenance is the most effective measure against structural deterioration from the technical, economic and organizational points of view. Concrete structures should be replaced only when it has been established that repair or strengthening measures are not technically feasible or economically reasonable.

Key Words: RC beams and Columns, Glass Fibre Reinforced Polymer, Ultimate Strength.

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STABILIZATION OF LATERITE SOIL USING SISAL FIBER

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ABSTRACT

The preliminary investigation conducted on the lateritic soil collected at Shika, Zariashows that it falls under A-7-6 (10) classification for AASHTO (1986) and CLaccording to unified soil classification system USCS (ASTM 1992). The soil was treatedwith both wood saw dust ash (WSDA) and treated sisal fiber, in stepped concentration of 0,2,4,6, and 8% for WSDA and 0, 0.25, 0.5, 0.75 and 1% treated sisal fibre by dry weight of soil using Standard proctor. The Sisal Fibre was treated with Sodium Borohydride (NaBH) (1% wt/vol) for 60 minutes at room temperature to remove the cellulose content present in the Fibre. Statistical analysis was carried out on the obtained results using XLSTART 2017 software and analysis of variance with the Microsoft Excel Analysis Tool Pak Software Package. The liquid limit (LL) of the soil was found to be 48% while the plastic limit(PL) is 21.27%. The maximum dry density(MDD)however, decreases generally from a value of 1.85 Mg/nm' to 1.68Mg/m at 0.25% sisal fiber content 0% WSDA. It has its least value of 1.57Mg/m' at 1% sisal fiber and 8 WSDA. The OMC increased from 18 % of the natural soil to 23.7% at 0.75% sisal fiber/ 6% WSDA content. There was a general increase in the value of UCS of the soil-sisal fibre mixture with WSDA content from kN/m> of the natural soil to 696 kN/m^2 at 0.75 % sisal fibre content/ 69% WSDA. The UCS value met the standard of 687-1373 kN/m^2 requirements of sub base for adequate lime and cement stabilization, respectively.

Keywords:Lateritic soil; Wood saw dust ash; Sisal fibre; Sodium Borohydride (NaBHA); Analysis of variance.

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APPROACHESOF GREEN BELT DESIGN

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ABSTRACT

The industrial development of industrial cities in ecologic ally fragile regions mostly relying on superior resources is rapid, while due to the restriction of geographic location and natural environment, these cites are aways faced with problems including tightened resource constraints, serious environmental pollution and ecological degradation, the fundamental survival requirements or these cites not only carry the function of regional social and economic development, but also bear the important mission of regional ecological security and sustainable development which is more urgent. Taking Jinchang as an example, this paper tries to establish the construction model of green bet on the basis of ecological civilization-orientated value, and also explore necessary measurement and developing routes to maintain the ecological security pattern of industrial cities in the ecologically fragile regions by executing the goal and core spirit of the green belt construction.

Keywords: ecologically fragile region; industrial city. green belt; Jinchang

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Paper ID: ICRTCE-22-1111

USE OF RECYCLED MATERIALS IN ROAD CONSTRUCTION

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ABSTRACT

In this project we are using the recycled materials for road construction. The road industry and growing traffic on roads is raised the development materials needed for construction of highways is decrease as a result of the supply material is a smaller amount, that's why during this project we have a tendency to use the recycled materials for road construction. The theory were the scarcity of typical natural materials and therefore the threaten environment that have underpinned the tendency towards analysis of other materials resources to be in built in the road construction. The involvement of such materials is several secondary and tertiary materials. Several waste by-products and materials are investigated, evaluated for utilizations within the field. Depending on the characteristics of the recycled material, the usage of materials in highway construction varies. The recycled materials having good strength and is satisfaction within the field. The various recycled materials are recycled concrete aggregates, Reclaimed asphalt pavement, mine wastes, scrap tires. plastic wastes, foundry sand, recycled crushed glass,combustion product as bottom ash, pond ash and fly ash, oil sand, oil shale sand, steel slaglateritic soil. During this project we have a tendency to identifying the properties of recycled materials. This project present on the lowermost available recycled materials contently in practice by the industry and it aims towards developing a better involvement of a recycled material in the road construction.

Keywords: Asphalt pavements-Aggregates-Asphalt binder-Recycling -Waste by products.

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STUDY OF HIGH STRENGTH FIBRE REINFORCED CONCRETE

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ABSTRACT

The use dl High Strength Concrete (HSC) is increased now a days. It's observed that HSC relatively Brittle material. Fibers are added to improve its ductility. Experimental study is carried out to assess mechanical properties of high strength fibre reinforced concrete (HSFRC) of grade M80, In addition to normal materials, silica fume, fly Ash and two types of fibres viz. polypropylene fibre and at steel fibre are used. The content of Silica fume and fly a share 5% and l0%respectively by weight of cement, water to Cementous material ratio Was 0.25.Mixes are produced by varying types of fibres and for each type of fibre its volume fraction is varied from 0.5% to 4.0 %with an increment of 0.5% by weight of Cementitious materials. 153specimens each of cubes (100 100 100mm), cylinders(100 200mm) and prisms (100100 500mm) are tested to study the effect type and volume fraction of fibres on compressive strength, split tensile strength and flexural strength of HSPRC. The results indicated significant improvement in mechanical properties of HSFRC.

Keywords : Flat Steel Fibres, Polypropylene Fibres, High Strength fibre Reinforced Concrete, Compressive Strength, Split Tensile Strength, Flexural strength

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Paper ID: ICRTCE-22-1113

GLASS FIBER REINFORCED CONCRETE

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ABSTRACT

Concrete is most widely used construction material in the world. Nowadays the world is witnessing the construction of more and more challenging and difficult Engineering structures. So, the concrete need to possess very high strength and sufficient workability. Researchers all over the world are developing high performance concrete by adding various fibers, admixtures in different proportions. Various fibers like glass, carbon, Poly propylene and aramid fibers provide improvement in concrete properties like tensile strength, fatigue characteristic, durability, shrinkage, impact, erosion resistance and serviceability of concrete.

Because of such characteristics Fiber Reinforced Concrete has found many applications in Civil Engineering, field. Glass Fiber Reinforced Concrete (GFRC) is a recent introduction in the field of concrete technology. GFRC has advantage of being light weight, high compressive strength and flexural strength. To improve the long term durability an Alkali resistance glass fiber reinforced concrete is also invented. The aim of the work is to study the properties of the effect of glass fibers as reinforcement in the concrete for different proportions from the research work which is already carried out by the researchers.

Keywords: Glassfiber, compressive strength, flexural strength, alkali resistant.

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COMPARISON OF NORMAL CONCRETE AND DESIGN MIX CONCRETE BY USING RMC

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ABSTRACT

Ready mix concrete is a material which is a mixture of cement, sand, aggregate and water. RMC is a type of concrete which is mixed in Batching plant to its specification of customer and delivered to the site by use of transit mixer and it is away from construction site. RMC is readily available product at any time and now a days in major metros and towns across India is replacing traditional site mixed concreting at construction site due to its various advantages of customer mindset that large number of concrete users are migrating the ready mixed concrete from the traditional site mixed concrete and not much importance being given to the cost factor and easy availability in all important cities across India. The ready mixed concrete in India on commercial basis started in 1994 and achieved 2% conversion from the site mixed concrete in 2001. Initially Ready mixed concrete is not adopted by contractor because its costly due to its large equipment and machineries and also have high tax on RMC and easily available at cheaper rate and required less time , less man power and high strength as compared to SMC. Ready mixed concrete is eco-friendly as it reduces the noise and air pollution because it is done in a closed chamber as compared to site mixed concrete

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SOFTWARE DEVELOPMENT FOR COST ESTIMATION OF BUILDING

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ABSTRACT

The objectives of this paper are to introduce building cost estimation. 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. Software has always satisfied almost all the needs of the user, and now days the use of computer has been done for all such applications and needs. The work includes the study of static analysis of estimating and costing of various types of buildings. it includes quantity of materials also. A computer program using visual basic is prepared to calculation of different materials used in building and costing.

Software aimed at assisting the construction industry. It is useful for Architects, Engineers, and Builders engaged in the construction industry, especially cement-concrete buildings. It can also be extended for use in water works, and sewerage as well. It also helps in material planning (cement, sand, bricks, etc.). It is most important function, which use full any construction site and that effect economic of construction cost and project duration .it also helpful consume manpower and money. Now in a day's quantity of complex structure is difficult. Therefore, it can help to make them easy.

Key words: Cost Estimation, Computations, Anticipation

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LOW COST ROOFING TILES USING AGRICULTURAL WASTE

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ABSTRACT

The scenario of living in huts in slum areas is becoming very difficult day by day due to vast change in climate. Replacing the ordinary huts and conventional poor class roofs with much efficient alternate roof cover is being the most required. On the other side, proper and efficient disposal of agricultural wastes is being the key factor in solid waste management in most of the Indian States .Having both the problems in a single line, in this project we have prepared and evaluated the performance of low cost roofing tiles using agricultural wastes as raw material. Based on the results, it is suggested that we can efficiently replace significant quantity of river sand in making roofing tiles with the corn cob powder and rice husk powder in appropriate propositions which gave compressive strength as similar as before replacement. By replacing the river sand in making roofing tiles would reduce its manufacturing cost as well as selling price and makes it more affordable. Thus preparation of such sand replaced roof tiles will significantly reflect healthy environmental and economic benefits.

Key words: Economic Benefits, Roofing, Conventional

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INSPECTION OF RECYCLED BRICK CONCRETE

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ABSTRACT

An unharming issues of environmental impact on concrete production is to include specific amount of residuals within the dosing, limiting the replacement percentages to avoid crucial losses within the mechanical properties of the final material. The substitution of cement & aggregate by waste material improves the mechanical properties also improves the compressive strength, flexural strength, tensile strength, etc. In this experimental work, strength of Concrete made up of recycled bricks has been determined. Which will contribute greatly towards the sustainable utilization of waste litter which is easily available construction site. Substitution of course aggregates by 10%, 20% & 30% of bricks on M-25, M-30 & M-35 grade of concrete is done and its effect being analyzed for 7, 14, 28 and 50 days. Investigation shows that workability of the concrete decreases with the increment in percentage of replacement of the bricks in the concrete. However, Compressive strength has increased from 10% to 20% replacement but it decreases at 30% replacement..

Keywords: Workability, Recycled Bricks, Workability, Compressive Strength, Flexure Strength, Split Tensile Strength.

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RE-USE HAZARDOUS WASTE IN CIVIL ENGINEERING

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ABSTRACT

Disasters occur due to both the natural and man-made activities. Hazards and Disasters are categorized into four groups, viz., Natural events, Technological events, Man-made events and Region wise events. The adverse impacts caused due to the indiscriminate disposal of Hazardous Wastes (HWs) come under the category of Environmental Disasters. Hazardous Waste Management (HWM) is a very important issue and is assuming significance globally. Very few industries in India, mostly in large scale and a few in medium scale, own proper treatment and disposal facilities. A common waste treatment and disposal facility such as Treatment, Storage and Disposal Facility (TSDF) for management of HWs generated from industries, is one of the useful options under such conditions. Few Guidelines issued by Ministry of Environment and Forests under Hazardous Wastes (Management & Handling) Rules, 1989 promulgated under Environment (Protection) Act, 1986 are available in India for selection of best site for TSDF. The planning for HWM comprises of several aspects ranging from identification and quantification of HW to development and monitoring of TSDF. This report work aims at studying various methods used in managing hazardous wastes which can be effectively applied in developing countries like INDIA.

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ADVANCED PAVEMENT DESIGN IN CIVIL ENGINEERING

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ABSTRACT

The contribution of a cement-stabilized base course to the strength of the rigid pavement structure is poorly understood. The target of this examination was to get information on the reaction of the inflexible asphalt piece joint-establishment framework by leading research facility scale probes jointed inflexible asphalt models and to build up an extensive three-dimensional (3D) limited component model of the unbending asphalt section joint-establishment framework that can be executed in the propelled asphalt plan ideas as of now a work in progress by the Federal Aviation Administration. Proof from tests directed on six research facility scale jointed unbending asphalt models recommends that the joint productivity relies on the nearness and state of a balanced out base. The limited component show created in this exploration shows that a far-reaching 3D limited component displaying method gives a judicious way to deal with demonstrating the basic reaction of the jointed inflexible airplane terminal asphalt framework. Displaying highlights which are required incorporate express 3D demonstrating of the section continua, stack exchange capacity at the joint (displayed springs between the pieces), unequivocal 3D displaying of the base course continue total interlock ability over the splits in the base course (once more, demonstrated by springs over the break), and contact association between the pieces and base course. The contact collaboration demonstrate include must enable holes to open between the chunk and base. Moreover, where the sections and base are in contact, exchange of shear worries over the interface by means of contact ought to be demonstrated.

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SOLAR POWERED INTELLIGENT DRIP IRRIGATION SYSTEM FOR SUSTAINABLE IRRIGATION SERVICES

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ABSTRACT

There is global consensus on food security challenges and increasing crop production to meet the demand across globe, especially in African countries and some parts of Asia and Europe as well. Population growth, increasing water stress and climatic variability, stresses on finding ways of getting more crop per drop to meet our food needs. All these factors increased pressure on natural resources, particularly water and land that leads to complex challenge with land-water-energy which cannot be achieved with traditional approaches and thus needs a multi-dimensional approach. In the conventional drip irrigation system, the farmer has to keep watch on irrigation timetable, which is different for different crops. In this paper, an automated intelligent drip irrigation system is proposed which saves time and does not require constant vigilance. This is achieved by installing sensors in the field to monitor the temperature, humidity and soil moisture which transmits the data to the developed software for estimation of crop water demands. Based on this sensor based real time feedback, a control system is designed which monitors and controls all the activities of drip irrigation system efficiently. In addition, a revolution is taking place in how water is being pumped in remote locations beyond the reach of electric power lines. Solar power has proven to be an ideal way to lift water for drinking, sanitation, stock tanks, and irrigation. Solar powered pump which are no longer an expensive, experimental energy source is also being used for pumping the water. Using this system, one can save energy, manpower and most importantly water to improve the crop production and ultimately profit.

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COMPARISON BETWEEN SEISMIC ANALYSIS AND NON-SEISMIC ANALYSIS OF G+10 BUILDING

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ABSTRACT

Many high-rise buildings are designed with basement. In general, we assume thata building is fixed at the ground level. The seismic loads applied to a building structure will affect the member forces in the basement. Thus, it is recommended to include the basement in the analysis of high-rise building structures. The effect of the basement is investigated based on the seismic response of high-rise buildings and an efficient analysis method to account for the effect of the basement was proposed in this study. Most of the degrees of freedom in the basement are eliminated by the matrix condensation procedure using a rigid diaphragm for each floor in the basement in part or in full. This procedure for design is known as Capacity based design which would be the future design philosophy for earthquake resistant design of multi storey multi bay reinforced concrete frames. Reinforced Concrete Frames are the most commonly adopted buildings construction practices in India. With growing economy, urbanization and unavailability of horizontal space increasing cost of land and need for agricultural land, high-rise sprawling structures have become highly preferable in Indian buildings scenario, especially in urban. With high-rise structures, not only the building has to take up gravity loads, but as well as lateral forces. Many important Indian cities fall under high risk seismic zones; hence strengthening of buildings for lateral forces is a prerequisite. In this study the aim is to analyze the response of a high-rise structure to ground motion using Earthquake Analysis (i.e Seismic Analysis). In the G+10 building with seismic resistant and without seismic resistant analysis shall be done and models, that is, bare frame, brace frame are considered in Staad Pro V8i. And change in the time period, stiffness, base shear, storey drifts and top-storey deflection of the building is observed and compared.

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DIFFERENT PROPORTIONS OF CONCRETE

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ABSTRACT

The various approaches, established for concrete mix design, are not universal be-cause design mixes are explicit to local climate, available materials, and type of expo-sure. The new-generation mix design method should be developed based on the performance criteria. This study was carried to compare the proportioning of concrete mixes obtained by following procedures of Indian Standard (IS), American Concrete Institute (ACI) and British Standard (BS) of concrete mix design without the use of admixtures to validate for use in a moderate climate like Kashmir, India. The concrete mixes have been prepared with the necessary 28 days resistance in compression as "15 MPa, 20 MPa, 25 MPa, 30 MPa and 35 MPa". The assessment of water-cement (w/c) ratio; cement, water, fine aggregate (FA) and coarse aggregate (CA) proportion was carried. The w/c ratio among all formulated mixes is significantly high in the BS method and low for IS method. In addition, the ratio of total aggregate content (TAC) and the aggregate-cement ratio is higher in BS design method as compared to IS and ACI design methods. The aggregate content in ACI mix design appears to be consistent and it added to the relative high compressive strength. The specimens cast following BS guidelines failed to attain the target mean strength (TMS) due to a higher volume of aggregate content, high w/c proportion, less quantity of cement in the mix.The cost analyse per cubic meter of concrete revealed that IS and ACI mix proportioning are expensive than BS method.It is expected that with a comprehensive investigation on selected design parameters concentrating more on local challenges, the present study will floor the way for the development and adoption of performance-based design mix selection for moderate Climate.

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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 form work 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.

Key Words: Self compacting concrete, Mix design, Superplasticizer, Water – Powder ratio, Flowability

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LINEAR PROGRAMING MODEL FOR AGRICULTURAL LAND

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ABSTRACT

In real scenario farm planning in terms of water management, the type of crop to be grown, the crop combination and different agricultural techniques applied to increase the farm production are the challenges faced by decision makers. These challenges are further being associated with socio -economic development and the scarcity of resources in particular region. To overcome these problems faced by farm linear programming technique is applied in order to optimize the farm's returns by allocating the available farm resources optimally.

The aim of the study is to develop a farm model for Jaipur District of Rajasthan by using linear programming in order to determine the feasible optimal crop combination and how these crops will be allocated to increase the production.

Keywords-crop combination, farm planning, linear programming

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DESIGN OF EFFICIENT WATER SURFACE AERATOR FOR WASTEWATER TREATMENT

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ABSTRACT

Water is vital for sustaining all forms of life on earth. The growth of human population has led to industry development which means, in addition to producing necessary goods, the consumption of natural resources, including water. Wastewater is the liquid end product or by-product of a municipal, domestic or industrial activity. The most efficient way to control and limit pollution is wastewater treatment before discharge into the receiving water course. Wastewater contains constituents that, if present in excess, will affect the quality of groundwater and other nearby water sources, and in the same time, will affect human life. The purpose of wastewater treatment is to improve water quality, so that it can be discharged into the environment without harming environmental factors. In wastewater treatment, for certain specific treatments, the processes of transfer in/of water of gaseous components are important. Among these, the most representative treatment, widely used in practice, is the introduction of gaseous oxygen in the effluent, in order to remove organic impurities under the action of a biomass of aerobic bacteria. The oxygen comes most often from the atmosphere, and in this case the process is called water aeration. To protect the environment, and especially the emissary, the soil and the air, the process of wastewater treatment should provide favorable conditions for further use of treated water in domestic, industrial or agricultural activities. Untreated wastewater discharged into rivers has a devastating impact.

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FIBRE REINFORCED CONCRETE

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ABSTRACT

Fiber reinforced concrete to put it simply is concrete with fibers which contribute to its strength and increase its structural integrity. The fibers in this context refer to materials like steel fibers, glass fibers, synthetic fibers etc,. This method is very useful in cases where conventional reinforcement cannot be added due to various reasons. Fibers help in providing additional tensile strength to the concrete specimen. These fibers also increase resistance to plastic shrinkage during curing and increase the shear capacity of reinforced concrete beams .The fibers may be randomly oriented in various sections of the specimen. Concrete as widely known is found to be strong in compression but weak in tension which makes it vulnerable in large scale projects without the provision. One of the ways to counter this is to provide reinforcement consisting of fibers. These fibers may refer to steel, synthetic or glass fibres or any other fibrous materials which contribute to the strength of a structure. For instance, glass fibres are used to give form to a composite material named glass-reinforced plastic which is also widely known as fiberglass. This has specific resistance greater than that of steel thus useful in creating high performance concrete. Different fibrous materials satisfy different needs and thus the options are very broad to select from.

Keywords: Compression, Compressibilty, Conventional Reinforcement

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FLY ASH UTILIZATION IN CONCRETE

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ABSTRACT

Fly ash utilization in concrete as partial replacement of cement is gaining importance day by day. Technological improvements in thermal power plant operations as well as collection systems of fly ash improved the quality of fly ash. To study the use of fly ash in concrete, cement is replaced partially by fly ash in concrete.

In this experimental work concrete mix prepared with replacement of fly ash by 0%, 25%, 50%, 75% and 100%. Effect of fly ash on workability, setting time, compressive strength and water content are studied. To study the impact of partial replacement of cement by fly ash on the properties of concrete, experiments were conducted on different concrete mixes.

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UTILIZATION OF WASTE PLASTIC – IN MANUFACTURING OF BRICK

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ABSTRACT

Plastic waste is a non-biodegradable waste which cannot decompose and this creates water, land pollution and air pollution. Also, while we burn the plastic waste in Dumping Ground, the percentage of plastic waste is increasing rapidly. It is estimated that the plastic waste will double after a decade as we use hundreds grades of plastic in our daily life. We can recycle, reuse the plastic waste.

As a civil engineer we have to innovate something new related to this, which is a boon for civil engineering. So, here we try to do something innovative as PLASTIC SAND BRICKS/ TILES. Basically in bricks and tiles, we used earth based clay. Due to excessive use of the clay, it shows the result of resources depletion and environmental degradation. (Polyester resin) etc. In this, we get to crush the plastic waste into fine particles and heated on a furnace (Bhatti). We use stone dust as fine aggregates (size below than 4.75mm),heated on a furnace (Bhatti). Now, we mix heated plastic waste and heated stone dust and pour into mould and form bricks and tiles. We observed that the characteristics of bricks and tiles is far much better than normal bricks and tiles as minimum water absorption, highly compressive strength, smooth surface, unbreakable, less weight etc.

Key words: non-biodegradabale , environmental degradation, compressive strength, water absorption.

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ARCHITECTURAL DESIGN CONSIDERATION IN CYCLONE PRONE AREAS

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ABSTRACT

Tropical cyclones are one of the worst natural hazards faced by India. This paper provides mitigating efforts to cope up with the moderate disasters in the coastal areas. These natural hazards can never be prevented from occurring hence we should learn to leave with them until we are able to modify them to such an extent. There is a great need to modify a cyclone in present to reduce the collateral losses. Construction of structures against natural hazards has always been encouraged. Planning and development of new construction requirements for buildings are recommended to reduce the risk of structural damage in future. A brief introduction to the design of different structural parts of a building to be safe in coastal areas as such as roof, foundation, walls, etc is given. Some techniques of reducing the intensity of cyclone and modification of its path are also discussed .This paper collects the ongoing efforts related to cyclone mitigation from structural point proposing some recommendation for design of building cyclone prone areas. This paper also provides little introduction to modification of intensity of cyclone.

Keywords: Tropical cyclones, Mitigating efforts, Minimum design standards, Cloud seeding, Dyn-o-mat

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STUDY ON SUSPENSION BRIDGE: ANALYSIS AND CONSTRUCTION CRITERIA

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ABSTRACT

A bridge is a structure built to span a valley, road, body of water, or other physical obstacle, for the purpose of providing passage over the obstacle. Nowadays suspension bridges are the pioneers in bridge technology. Of all the bridge types in use today, the suspension bridge allows for the longest span ranging from 2,000 to 7,000 feet.

This type of bridge has cables suspended between towers & the cables support vertical suspender cables that carry the weight of the deck below. This arrangement allows the deck to be level or to arc upward for additional clearance. They are ideal for covering busy waterways. In this paper limitation, assumption analysis, how it can be constructing and loads acting on the bridge is described.

Keywords :Loads, suspension bridge, advantages, assumption, construction, types, history

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SELF COMPACTING CONCRETE

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ABSTRACT

Concrete is one of the versatile construction materials which are used worldwide. Self compacting concrete is a type of concrete which is capable of flowing into the form work uniformly, without segregation and bleeding, better finishes, easier placement, thinner concrete sections, no vibration, safer working environment without any application of vibration.

Due to many advantages like faster construction, reduction in site for thinner concrete section, improved durability, suitability for congested reinforcement, this concrete becomes popular in Civil Engineering, construction.

Hence, a review is presented to make use of those waste products in the self compacting concrete.

Keywords : versatile, segregation, bleeding

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ADVANCED TECHNOLOGY IN SURVEYING

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ABSTRACT

Although surveying techniques have always played a primary role in collecting data for mapping, recently new Instruments and methods for data capture and processing have introduced the chance to increase mass and the variety of achievable information. Nowadays real-time monitoring systems based on robotic total stations and GPS, digital photogrammetric techniques, high resolution satellite imagery, satellite, airborne and terrestrial laser scanners devices are able to give a set of powerful tools for the geometric surveying and modeling.

The paper focuses the new trends in surveying gadgets and their applications in mine surveying, which has been pushed up in the latest years by the diffusion of the information technology.

Technological developments in the field of computer science, information technology and satellite technology have created new hopes for surveying and geoinformatics.

Keywords: Total station, GPS, GIS, Drone Arial Survey, Maps

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GROUNDWATER QUALITY ASSESSMENT FROM A GRANITIC REGION OF SOUTHERN INDIA

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ABSTRACT

Musi River is flowing through Hyderabad which is having a population of about 6.7 million and a metropolitan population nearly of about 7.75 million, it is the fourth most populous city and sixth most populous urban area in India and its area covers nearly 2219 km2 and falls in the Survey of India Toposheet No. 56 O/4. Due to industrial and urbanization activities resulted in the contamination of the Musi River.

To study the influence of contaminated river on groundwater and surface water,20 water samples were collected from a part of the river flowing area and analyzed for major ions and trace metals. Various widely accepted methods such as Sodium Absorption Ratio (SAR), residual sodium carbonate, salinity, soluble sodium percentage, permeability index and water quality index are used to classify groundwater and surface water (stream) for drinking as well as irrigation purposes (Sadashivaiah, 2008 #31). Besides this, Piper trilinear diagram, geochemical controls using various statistical parameters, and hydro-geochemistry of groundwater and surface water samples were studied.

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PREDICTION OF COMPRESSIVE STRENGTH AND SPLITTING TENSILE STRENGTH OF CONCRETE USING ARTIFICIAL NEURAL NETWORK

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ABSTRACT

Artificial Neural Networks (ANNs) are extensively used in Civil Engineering, for the prediction of the performance of some engineering materials like compressive strength, tensile strength and durability. In this research work, an Artificial Neural Network (ANN) model is developed to foresee the compressive strength and tensile strength of Concrete with Manufactured Sand (MSC) in distinct age of curing varied from1 to 388 days referred to the research article "Experimental study on tensile strength development of concrete with manufactured sand. The dataset containing 11 input parameters and 2 output parameters were considered to assess the accurateness in the forecast of compressive strength and tensile strength of MSC using the Levenberg-Marquardt back propagation algorithm. The results show that the neural networks are very efficient in foreseeing the compressive strength and tensile strength of concrete with good accuracy.

Keywords: Tensile strength, Artificial Neural Network (ANN), Compressive strength, Concrete with Manufactured Sand (MSC).

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ASSESSMENT OF EFFECT OF RECYCLED AGGREGATE WITH ACID TREATMENTS ON CONCRETE

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ABSTRACT

The increasing global needs in construction sector, leads to the demand for natural aggregates. The use of recycled concrete aggregates collected from demolished concrete construction is a solution of waste disposal problem and also reduce the gap between demand and supply of natural aggregate. Many researchers state the untreated recycled aggregate have high water absorption and crushing index. As a result, it lowers the strength and leads to transition zone weaker in the concrete using recycled aggregate. The untreated recycled concrete aggregate possesses inferior quality, mainly due to adhered mortar. The effective utilization of recycled concrete aggregate is achieved by the quality and the properties improvement of the Recycled Concrete Aggregate (RCA). Different treatment techniques of recycled concrete aggregate are based on two concepts such as removing the attached mortar and enhancing the quality of the attached mortar were investigated. This paper reviews the effects of various acid treatment of recycled concrete aggregate.

Keywords: **Recycled concrete aggregate, Pre-soaking acid treatment, properties of aggregate and concrete**

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PREDICTION OF ROAD ACCIDENTS USING MACHINE LEARNING TECHNIQUE – A REVIEW

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ABSTRACT

Nowadays, in India the drastic boom in population influences the severe increase in automobiles. As technology grows highly equipped automobiles which attempts to bring safety measures even though accidents are quite common due various reasons. In this paper a survey on accident prediction and they have come up with various machine learning methods to predict accidents. Although automobiles and road conditions are not only the factors for causing accidents other influencing factors place a vital role.

Keywords: Machine Learning Techniques, Roadways, Accidents, Prediction

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DEVELOPMENT OF PRECIPITATION-RUNOFF MODELLING AND REAL TIME HYDRAULIC CHARACTERISTICS FOR CANAL AUTOMATION SYSTEM USING ARDUINO BASED MODULE

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ABSTRACT

Study of the real-time hydrologic and hydraulic characteristics has been performed. Conventional method for precipitation-runoff modelling and a system of canal automation has been set up and developed using arduino based module for the sustainable efficient and effective management of water throughout the basin. The present development aims to establish and develop the system in which the management is done with the help of arduino based module and different real-time hydraulic characteristics such as velocity discharge has been computed and calculated. Precipitation-Runoff model is attempted to be developed for the region. The study area has been taken as Mahi region for precipitation-runoff modelling and Mahi left Bank canal for the system of canal automation. A system is developed which gives a promising results over the study area. For real-time measurement, Precipitation-Runoff modelling is developed using the conventional LR technique for the region. The system aims to be used in the real-time hydraulic characteristic management in any of the canal network. The precipitation in an area results to immense stream flow which needs to be managed. Study on the various types of canal management system has also been performed and the present proposed system has been found suitable for implementing in the real-life situations. P-R model validation has been for the area has been done. The data of the station has also been analysed using HEC-RAS software. The study is suitable for the modern approaches in Canal management within the watershed.

Keywords : Irrigation, Canal, Precipitation, HEC RAS , Arduino

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GEOSPATIAL TECHNOLOGY IN LAND CLASSIFICATION ANALYSIS FOR H.D KOTE TALUK OF KARNATAKA STATE, INDIA

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ABSTRACT

Accurate and reliable information about Land Use Land Cover (LU/LC) patterns are very much necessary in monitoring and updating the specified area. Over the past two decades, the earth's surface features modified rapidly by global warming, over exploitation of economic deposits, increase in mining activities, construction of dams, industrialization and population explosion (Manjunatha and Basavarajappa, 2021a). Synoptic view and multispectral information of satellite images produce crucial data in optimum planning of LU/LC conditions of the country. The study aims to map and monitor the existing LU/LC classification systematically using geospatial tools in database generation, analyses and information extraction. Thematic maps of H.D (Heggada Devana) Kote are prepared using satellite images in conjunction with collateral data of Survey of India (SoI) toposheets, forest and wasteland maps. Level-I, Level-II and Level-III LU/LC classes has generated through NRSC guidelines (2011) using GIS software's with limited field survey. The results support for optimal and sustainable land use implementation and management strategies.

Keywords: Land Classification; LISS-III Image; H.D. Kote taluk, Geospatial technology.

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TRAVEL DEMAND AROUND VVCE CAMPUS, MYSURU USING SPSS SOFTWARE

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ABSTRACT

In the process of urbanisation, transportation is critical. In India, road transit is a popular method of transportation. Cities in India have exploded in size during the last two decades. The combination of population expansion and increasing urbanisation is posing significant transportation problems. The need for public transportation is increasing as the population grows. In order to plan, develop, evaluate, and regulate transportation and supply chain systems, accurate forecasting of total passenger and freight demand, as well as complementary connections across transport models, is required. The ability to accurately forecast travel demand is beneficial to transportation planning. Travel demand modelling is an important element of transportation planning for public transportation. The SPSS software package is used to create travel demand modelling. Multinominal logistic regression was the statistical method used to create and interpret the model. The research is being carried out in an area where public transit is inconvenient. For the students who study in the neighbourhood, it has been a source of contention. As a result, a practical transit model that can anticipate the exact requirement for public transportation is required. This project's research focus is on developing such a model. The model is built by taking into account the aforementioned data in order to forecast the exact demand for public transportation.

Keywords: Travelling Demand, SPSS software, Public transit.

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NON-DESTRUCTIVE EVALUATION OF ALKALI ACTIVATED CONCRETE CONTAINING RAP AGGREGATES USING ULTRASONIC PULSE VELOCITY

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ABSTRACT

Ultrasonic pulse velocity is one of the most popular non-destructive techniques used in the assessment of concrete properties. This research article shows the relationship between ultrasonic pulse velocities of normal concrete and alkali activated concrete containing RAP aggregates of different percentage replacement with natural aggregates. The specimens used in this study are one is normal concrete and the other is alkali activated concrete specimens. So, in the alkali activated concrete we have replaced the natural aggregates by RAP aggregates with variation of 100%, 75%, 50%, & 25% replacement of both fine and coarse aggregates separately for M40 grade concrete. Na2O dosage of 4.5% and activator modulus of 1.25 is taken and kept constant throughout the study. The specimens are casted and cured and tested for 28days. The UPV values vary for different percentage variation of RAP aggregates and the results compared with the normal concrete.

Keywords: Non-destructive evaluation, Testing concrete, Ultrasonic pulse velocity, RAP reclaimed asphalt pavement aggregates, Alkali activators, Normal concrete

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A REVIEW ON THE USE OF CALCIUM CARBIDE RESIDUE WITH VARIOUS CEMENTATIOUS MATERIALS IN GEOPOLYMER CONCRETE

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ABSTRACT

We know that cement is the second most needed material in the construction industry after water. The over-increasing demand of the modernization and growth mostly in the developing countries, the demand of cement production has increased rapidly. We know that 1 ton of cement nearly produces 1 ton of carbon dioxide in the atmosphere. This in turn is a very large contributor of global warming. Hence, it is a very challenging role for the industrialists and the researchers to replace cement or to minimize the production in order to maintain a climatic balance in the ecosystem. One solution offered is the use of Geopolymer Concrete (GPC) in the construction purposes. Another industrial waste i.e., Calcium Carbide Residue (CCR) which is a by-product of the acetylene gas manufacturing industry can be used with various cementitious materials like Fly ash (FA), Silica fumes (SF), Ground Granulated Blast Furnace Slag (GGBS) etc. to form the GPC with similar properties with that of ordinary concrete. In this article, we will review that how the use of CCR effects the properties of GPC when incorporated with other cementitious materials.

Keywords: Geopolymer Concrete, Calcium Carbide Residue, Carbon dioxide Emission, Cementitious Materials.

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SELECTION OF THE EFFECTIVE RESOURCE MANAGEMENT FOR CONSTRUCTION PROJECT USING MCDM TECHNIQUE

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ABSTRACT

Construction industry is the biggest industry next to agriculture with tremendous resources. Construction projects refers to high stake endeavour employing diverse resources such as men, materials, equipment's, etc. achieving predetermined performance objectives using management techniques. Resource management is one amongst the issues faced day to day in a construction project.

As the real-world problems are so tangled, therefore the task of deciding related to them is equally complex. Therefore, some efficient techniques are required which limelight the simplest solution. For the selection of the optimal selection with reference to the given criteria, they're several major and useful techniques of Multiple Criteria deciding (MCDM), namely, WSM (Weighted Sum Method), AHP (Analytic Hierarchy Process) and TOPSIS.

In this project we used AHP (Analytic Hierarchy Process) method for selecting the most efficient and successful resource management for the construction project by comparing different criteria among different companies. In this project we have collecting data by questionnaire survey from different companies. By using AHP method we are evaluated the different types of criteria of 15 construction companies. These companies are categorized into 3 groups which are small scale, medium scale and large-scale construction companies. By evaluating the different criteria among different scale of construction companies we selected the best effective resource management system for the construction of project between the small scale, mid-scale and large scale.

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THE EFFECT OF COPPER SLAG ON THE PROPERTIES OF MUD BASED GEOPOLYMERIC MASONRY BLOCKS BLENDED WITH GGBFS

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ABSTRACT

This study deals with the effect of copper slag on the properties of mud-based geopolymeric masonry blocks blended with Ground Granulated Blast Furnace Slag (GGBFS). These blocks are produced with red soil, GGBFS, and copper slag added to an alkaline activator solution. The quantity of GGBFS was kept constant (30%) for all the mixes. The copper slag was replaced with the soil from 0% to 30% with the incremental order of 5%. The properties of the cured specimens were evaluated by various tests on strength and durability. The results show that block matrix contains 25% of copper slag, 30% of GGBFS and 45% of the soil (i.e., mix SGCS25) was an optimum, which enhance all the properties of mud blocks.

Keywords: Red soil, GGBFS, copper slag, alkaline activator solution, and Geopolymer blocks.

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BEHAVIOUR ANALYSIS OF MUD-BASED GEOPOLYMERIC MASONRY BLOCKS WITH INDUSTRIAL SLAGS

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ABSTRACT

The recycling and reuse of waste materials have substantially boosted the usage of sustainable and green materials. Geopolymer technology is a new type of binder that is more environmentally friendly than cement binders. The main goal of this research is to assess the role of steel slag and GGBFS in mud-based geopolymer blocks as alternative materials. A constant proportion of 30% GGBFS is used for all mixes. Steel slag is replaced with soil in proportions ranging from 0% to 30%, in the 5 % increment. Dry and wet compressive strengths, water absorption, Ultrasonic Pulse Velocity (UPV), Spray erosion, efflorescence, and dimensionality tests were all performed on the specimens. The microstructure of the specimens was studied using Scanning Electron Microscopic Images (SEM). According to the findings, 20% steel slag, 30% GGBFS, and 50% soil was found to be optimum. The optimum amount of industrial wastes improved the behaviour of mud-based geopolymer masonry blocks under both curings.

The experimental and microstructural results confirmed that the mix SGSS20 had better results and good geopolymer formation in its interior composition due to more significant dissolution of silica and alumina particles present in the slags, which improved the density reduced pores.

Keywords: Red soil, GGBFS, Steel slag, alkaline activator solution, and Geopolymer blocks.

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INFLUENCE OF PLAN IRREGULARITY ON RESPONSE DEMANDS OF A 9-STOREY RC BUILDING SUBJECTED TO SEISMIC LOADS

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ABSTRACT

It is very difficult always to construct buildings that are regular in plan due to various functional needs to perform effectively. This aspect prompt architects to design buildings functionally and aesthetically appealing, leading to creation of asymmetric structure. In the present study seismic response of irregular structures having three different shapes in plan is studied using Etabs 2018 structural software and compared with a regular model. A 9-storey commercial building having unsymmetrical shapes is selected to perform bare frame analysis using response spectrum method as per is 1893-2016 (Part 1) provisions. Physical models of shape C,T and L are compared with regular square model for displacement, drift, torsional irregularity, acceleration, story shear, torsional moment and over turning moment. These stiffness and strength parameters are further compared with a/l ratio, natural period and eccentricity to quantify the influence of plan irregularity. All the earthquake zones and soil type-II as per the Indian standard are considered to calculate demands of different parameters, also variation of all the parameters along the height of the building and the limitations of the code are discussed.

Keywords: plan, regular, irregular, response spectrum, shape, bare frame, a/l ratio, eccentricity, stiffness, strength, zones, height

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A LABORATORY STUDY ON THE CONSOLIDATION CHARACTERISTICS OF MARINE CLAY TREATED WITH FLY ASH AND ADDITIVES

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ABSTRACT

India being a peninsular country has large area coming under coastal region and also it has been the habitat for considerable percentage of population. The marine clay deposits are generally found in the states of West Bengal, Orissa, Andhra Pradesh, Tamilnadu, Kerala, Karnataka, Maharashtra and some parts of Gujarat. The Marine clays are suffering from low shear strength and compressible in nature. As there is a global occurrence of marine clay, it is essential to control the compressibility of such soils which can damage foundations and pavements.

In this investigation, the fly ash, which is an industrial by product, has been used along with lime and calcium chloride to improve the consolidation characteristics of the untreated and treated marine clay. It observed that the treated marine clay has exhibited a remarkable improvement with the addition of optimum percentages of admixture and chemicals.

Keywords: Marine clay, stabilization, consolidation characteristics, Fly ash, chemicals

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PAPER ID: ICRTCE-22-1174

HYDRO CHEMICAL INVESTIGATION OF GROUNDWATER QUALITY AND DEFLUORIDATION BY HERBAL METHOD

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ABSTRACT

Hydro chemical investigation of the regions which are affected by concentration of more amount of fluoride content in groundwater is required to be examined. To remove fluoride content present in water by different methods of defluoridation. Here one of the most efficient methods is being implemented, that is herbal method. Which turns to be more economical and easily handled by anybody. Tridox procumben plants are being used for better results. These are locally available and these can be afforded by the village people to implement in the groundwater sources to get potable water for drinking purpose. In the present study water sample is being collected from 5 different places. Based on the experiment carried it is evident that the recommended effective contact time for the activated carbon for fluoride removal is 6 hours. And the time required for filtration process of 1 liter of water is 18 minutes which can remove 35% of fluoride content.

Keywords: Hydro chemical, defluoridation, Tridox procumben plants.

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EFFECT OF HYBRID FIBRE ON MECHANICAL PROPERTIES AND DURABILITY CHARACTERISTICS OF TERNARY BLENDED CONCRETE

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ABSTRACT

Concrete is an extensively used construction material for its various advantages such as low cost, ease of production etc. But it cannot be used alone everywhere because of its low tensile strength. So fibres both natural as well as artificial are used as resistance strengthening of concrete specially against cracking. Researchers all over the world are attempting to develop high strength concretes by using fibres and other admixtures in concrete up to certain proportions.The Hybrid fibres are dispersed and distributed randomly in the concrete during mixing and thus improve concrete properties in all directions. help to improve the post peak ductility performance, pre-crack tensile strength, fatigue strength, impact strength and eliminate temperature and shrinkage cracks. This study has been conducted for understanding the effect of Hybrid fibre in mechanical and durability characteristics of ternary blended concrete replacing 20% cement with fly ash 15% and 5%silica fume, studies were conducted on the compressive, flexural and tensile strengths of concrete by varying the polypropylene fibre percentage from 0 to 1% by volume of concrete by fixing the steel fibre at 0.5% in concrete. The obtained results where then compared with M30 ternary blended concrete.An increase of 39.23%, 47.28% & 20.72% over M30 ternary blended concrete at 28 days was registered for compressive, flexure and split tensile strength respectively. For durability, the results of TBSFRC (M2) shows better results in adding 0.5% steel fibre without polypropylene fibre by volume of concrete compared to other concrete mixes.The results of Sorptivity and water absorption of TBSFRC (M1) shows better results in adding 0.5% steel fibre without Polypropylene fibre by volume of concrete compared to other mixtures.

Keywords: Hybrid fiber, Silica fume, Ternary blended concrete, Flexural strength, Durability

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IMPROVEMENT OF MECHANICAL PROPERTIES OF LATERITE SOIL TREATED WITH ADMIXTURES

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ABSTRACT

The mechanical strength of laterite soil treated with mechanical and chemical admixtures by weight of dry soil to meet the desired engineering properties. Tests was conducted in order to achieve index and engineering properties of the natural and treated soil. In this study problematic laterite soils are stabilized with the various percentages of mechanical and chemical admixtures and prepared with different molding water contents were investigated by means of compaction test and unconfined compressive strength (UCS). It concludes that The compaction test results obtained that the maximum dry density of laterite soil increases with addition of 12% of Sodium Sulphate for corresponding 15.38 percent optimum moisture content the maximum dry density value is 1.98 gm/cm^3.The optimum moisture content of Laterite soil decreases from 15.15% to 13.4% by the addition of 4% of Cement and there is no increment in the MDD values. The compaction test results obtained that the maximum dry density of laterite soil increases with addition of 12% of Calcium chloride for corresponding 15.38 % optimum moisture content the maximum dry density value is 1.95 gm/cm^3.The compaction effect leads to increase in strength of soil by addition of admixtures to the Laterite soil, increase in unconfined compressive strength (UCS) value because of the gradual formation of cementitious compounds due to the reaction between the Cement and Sodium sulphate.The unconfined compression strength of Laterite soil increases with addition of 12% of Sodium sulphate. From the results of unconfined compression test it is observed that the maximum unconfined compression strength is obtained by addition of 12% of Sodium sulphate is 18.43kg/cm^2 for 14 days curing. The unconfined compression strength of the soil increases with increase in the curing period of 14 days after that there is no increment in 21 days curing.

Keywords: Lateritic Soil, UCS: Unconfined Compression test, Mechanical Strength, OMC: Optimum Moisture Content, MDD: Maximum Dry Density

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A REVIEW ARTICLE ON PALM OIL FUEL ASH-BASED ECO-FRIENDLY CONCRETE COMPOSITE

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ABSTRACT

Concrete consumption has risen as a result of rapid global infrastructure development and increased material science, among other causes. Cement, an essential component of concrete, bonds the various solid components together to produce a cohesive mass. Cement manufacture produces a significant amount of greenhouse gases, accounting for about 10% of global carbon (IV) oxide (CO2) emissions. This, combined with a rise in environmental activism, has resulted in the creation of a number of novel solutions & supplementary cementitious materials. Palm oil fuel ash (POFA) is a unique industrial byproduct that results from the burning of palm oil wastes in power plants for electricity generation. It is a highly reactive substance with strong pozzolanic tendencies and adequate micro-filling capacities. A review of concrete strength as influenced by the use of POFA as a partial replacement for cement in concrete is offered in this research. The compressive strength of concrete as effected by the % replacement & fineness of POFA in concrete is mainly explored here, based on data published in the literature on the utilisation of POFA in blended concrete. The benefits & drawbacks of POFA in concrete are also discussed.

Keywords- Palm Oil Fuel Ash; Concrete, Physical and Chemical Properties Of POFA, Fineness Effect Of POFA, Strength Development Of Concrete

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ANALYSIS OF BLACK SPOT USING ACCIDENT SEVERITY RATE

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ABSTRACT

The number of urban motor vehicles continues to rise in tandem with the rapid growth of the economy and urbanisation. While urban commuting is more convenient, traffic safety issues are becoming more prevalent. The spatial location of a concentrated distribution of traffic accidents is known as a traffic accident black spot. The reduction of accident black patches is one of the most essential road safety improvements. The identification of these places is the initial stage in this approach. There are various methods for accomplishing this, however the majority of them are already obsolete. The primary goal of our five-year project was to adapt data collection and analysis methods in response to three recent developments: (1) the widespread use of GPS technology, (2) the use of tablets and smart phones, and (3) the existence of large amounts of unintentionally collected data.

The aim of this research is to identify the black spot in the study area and construct a prediction model based on accident severity rate. Five black spot zones were created in the research area. The data collected in these zones are split into two categories: primary and secondary data. Surveys around the black spot zone are used to collect primary data, which includes spot speed studies, volume counts, pavement condition indexes, and geometric features. The gathering of FIR copies from the corresponding police station of the defined black spot zone is considered secondary data. To construct a model based on accident severity, the collected data was sorted, coded, processed, and analyzed. From the analysis of primary and secondary data, some of the interpretations are made.

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TECHNICAL PAPER ON DUCTILE IRON DOUBLE CHAMBERED THRUST RESTRAINING JOINT AND ITS COMPARISON WITH CARBON FOOTPRINT OF THRUST BLOCK

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ABSTRACT

Technical Paper on Ductile Iron Double Chambered Thrust Restraining Joint and its comparison with Carbon Footprint of Thrust Block.

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STABILITY ANALYSIS OF GRAVITY DAM USING 3D FINITE ELEMENT METHOD AND PSO

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ABSTRACT

Structural stability analysis is the key aspect of a gravity dam. The safety of a dam relies on its capabilities to handle all external static and dynamic forces acting on it. This study includes stability analysis of the non-overspill section of gravity dam using the three-dimensional Finite Element Method (FEM) extended by the Particle Swarm Optimization algorithm (PSO) method. The quadrilateral modal element analysis carried out using the FEM. PSO method for stability analysis of gravity dam as it has very few parameters to adjust during analysis. In this study, structural stability analysis executes a 33.5 m high non-overspill section of the gravity dam named "Ban Sujara Project, located in Madhya Pradesh." The analysis of the dam was executed with a height to width ratio of 1.236, which comes under seismic zone II. The results obtained by using 3D FEM. and PSO satisfy structural safety evaluation limits as per standards specified in codebooks. It is found that in FEM., virtual scale modelling is difficult and time-consuming to find an error and fix compared to PSO. PSO provided an efficient and accurate solution and presented as a point or be extended to n-dimensional space. The structural stability safety checks results are graphically presented for the accuracy of manual calculations. The result obtained by FEM and PSO is 92% and 96%, respectively, of limiting values as per the Indian Standard codebook. Eventually, it is found that PSO is more efficient and accurate than FEM.

Keywords: Gravity dam, Structural Stability, Particle Swarm Optimization, Finite Element Method, Scale modelling, n-dimensional space.

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DEVELOPMENT OF FLEXURAL MEMBER ON REPLACEMENT OF FINE AGGREGATE BY M SAND AND FOUNDRY SAND AND PARTIAL REPLACEMENT OF CEMENT BY FLYASH

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ABSTRACT

Concrete is used as a very strong and versatile moldable construction material. It consists of cement, fine aggregate, coarse aggregate and water. Usually, the use of river sand (fine aggregate) in our country is very huge in the construction industry. Therefore, the use of river sand can be replaced with other materials to protect the environment of the river as well as prevent erosion and flooding. M sand and foundry sand is one of the alternatives for the reduction of usage of river sand. River sand will be replaced with M sand and foundry sand in accordance with a specified percentage of 50 equally with M sand and foundry sand. The present study was carried out by replacing the river sand with M sand and foundry sand. The M sand and foundry sand was tested as per codal provisions to obtain fineness modulus, specific gravity, bulk density and pH. River sand is replaced with M sand and foundry sand with percentage 50 for obtaining the flexural strengths of M50 grade of concrete at the age of 28 days of curing. Cement is one of the important construction material which is used as a binding material. In this case the flyash can be replaced because it has same cementacious properties. in this project we are partially replacing cement with flyash in percentages of 25, 50 and 75. In this project we carried out the test in fully replaced river sand with M sand and foundry sand in reinforced beam.

***Key words**: Fine aggregate , M sand , Fly ash and Foundry sand*

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STUDY ON DURABILITY OF SELF COMPACTING CONCRETE WITH RCA AND STEEL SLAG

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ABSTRACT

This present research work is a study on durability properties of self-compacting concrete (SCC) that is incorporated with recycled coarse aggregates and steel slag (GBS). Natural coarse aggregates have been replaced with recycled coarse aggregates in these SCC mixtures at levels of 0,20,25,30 and 35% by weight, and the natural fine aggregates has been replaced by steel slag at levels of 0 and 100%, and also cement is partially replaced with GGBS.

The feasibility study is further extended on the effect of partial substitution of cement with GGBS and NFA with steel slag on the fresh workability properties (i.e., Slump flow, V-funnel, U-box, J-ring tests), mechanical and durability properties of concrete are assessed. The durability studies include study of the resistance to sulphates, water absorption and penetration depth into the concrete have been measured. Also, the correlation between compressive strength and durability strength properties are assessed. The results demonstrated that a mix containing up to 30% RCA with 100% GBS had better resistance to water absorption (WA), acid attack, and water permeability than a similar combination for conventional concrete

Key words**: Self Compacting Concrete, Recycled Concrete Aggregate, Granulated Blast furnace Slag, Durability

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