ADITYA ENGINEERING COLLEGE (A)

SURAMPALEM

1st International Conference

on

Innovative Sustainable and Material Technologies (ICISMT - 2022)

Organized by

Department of Civil Engineering

October
14-15, 2022

1st International Conference

on

Innovative, Sustainable and Material Technologies

(ICISMT – 2022)

Oct 14-15, 2022

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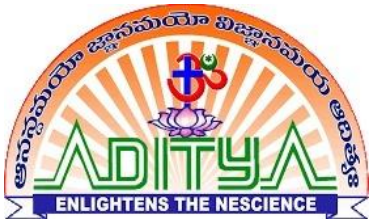

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1st International Conference on Innovative, Sustainable and Material Technologies (ICISMT – 2022)

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PREFACE

1st International Conference on Innovative, Sustainable and Material Technologies (ICISMT-2022) to be held during October 14 – 15, 2022, is the 1st international event of the Department of Civil Engineering of Aditya Engineering College (Autonomous) at its spacious and well-appointed campus. The International Conference on Innovative, Sustainable Materials and Technologies (ICISMT-2022) aims to bring together industrialists, academicians, and researchers to exchange and share their experiences and hard-earned technological advancement and application in modern construction industries. Growing concerns about sustainable, smart, and innovative materials have aroused interest in response to the critical issues on civil engineering applications. Developing countries like India face a huge challenge in technology upgradation and diversification of various construction industrial sectors. This conference will serve an imminent avenue of improving sustainable construction and applications of advanced materials to enable designers for developing better designs, also in-depth understanding of these subjects. The theme of ICISMT–2022 focuses on the domain of Sustainable Materials and Material Science, Innovative Material Technology, Smart Materials, and other emerging technologies. The event intends to provide participants with networking opportunities to discuss and exchange ideas. Despite its youth, the Department is actively engaged in the development of new laboratories, consulting, and research. A significant benefit of the conference will be the opportunity to interact with experts during the conference, which will aid in the focused development of a dynamic Department. The efforts of the conference panel reviewers enabled the publication of the conference proceedings. The Organizing Committee is grateful for their unwavering support. The Organizing Committee is extremely grateful to Management and Administration for their unending guidance, financial, and infrastructure support. The Organizing Committee wishes to thank Chief Guest and all the Keynote Speakers for graciously agreeing to share their valuable experience, as well as the Advisory Committee, Technical Committee, Generous Sponsors, Department faculty and staff, all the authors and delegates, and everyone else who has worked tirelessly to ensure the success of the conference.

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CONTENTS

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TRANSPORTATION VEHICLE FLEET MANAGEMENT SYSTEM: A REVIEW

Akshay G Parlikar[1], *, Dr.Sujesh Ghodmare[2], Dr. B.V. Khode[3]

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ABSTRACT

Difficulties with transportation, such as significant traffic congestion, high rates of traffic accidents, and high levels of air pollution and noise, are common in communities located in developing nations. Transportation, whether it be public or private, is a major contributor to many of these problems. The Fleet Management Control Systems (FMCS) oversee controlling vehicle operation and ensuring that scheduled services are carried out in the appropriate manner. Cars are under constant surveillance by an FMCS, which notifies users of any occurrences that take place. In general, Fleet Management Systems, often known as FMS, lower risks, improve service quality, and increase operational efficiency while simultaneously reducing costs. In this article, we will investigate the fundamentals of fleet management and the ways in which they may be applied to the reduction of the costs associated with the maintenance of commercial vehicles also to minimize fuel consumption in commercial vehicles, The study focuses on fleet management system for commercial transport vehicles on Nagpur Pune highway Maharashtra.

Keywords: Fleet Management System, Commercial Vehicles, Transportation

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COMPARATIVE ANALYSIS OF PERSONAL RAPID TRANSIT SYSTEM FOR INTERCONNECTING METRO STATION WITH AIRPORT

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ABSTRACT

PRT (Personal Rapid Transit systems) open a slew of new possibilities for solving airport-related transportation issues, both on the ground and in the air. The benefits and drawbacks of this mode of transportation for airport applications are compared. An implementation of the ULTra Personal Rapid Transit system to assist passenger and staff vehicle squares at Heathrow is used to showcase the work. The ULTra infrastructure's compact size and flexibility allow it to utilize tunnel side bores and integrate with the complex central terminal area in an unexpectedly straightforward manner. In comparison to present buses, detailed comparisons demonstrate a reduction in travel time and a reduction in operational costs. The research demonstrates that such modes of transportation are ideally suited to land-side airport uses. A summary of potential benefits for airside operations is also provided.

Keywords: Urban transportation, Personal rapid transit, Podcar, ULTra PRT, Intelligent transport system, Bus rapid transit system

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PARTIAL REPLACEMENT OF CEMENT WITH PALM OIL FUEL ASH (POFA) IN SELF COMPACTING CONCRETE

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ABSTRACT

Concrete is the most widely used construction material because of its mould ability into any required structural form and shape due to its fluid behaviour at early ages. For concrete to be workable and to have the necessary strength and durability, thorough compaction utilising vibration is typically necessary. Large numbers of voids are caused by inadequate concrete compaction affecting the structural strength and long-term toughness. Self-Compacting Concrete (SCC) offers a remedy for these issues. As its name suggests, it may compress itself without the need for additional vibration or compactive force. The lack of standardised mix design procedures and testing techniques has, however, limited the scope of applications for self-compacting concrete. Because there is no need for vibration and noise pollution, self-compacting concrete is becoming more and more popular. Using Ordinary Portland Cement, Palm Oil Fuel Ash as a mineral additive, and Polycarboxylate Ether as a super plasticizer, the study investigates the performance of self-compacting concrete. Palm oil fuel ash is substituted for cement in varying amounts (0%, 5%, 10%, 15%, 20%, and 25%). The slump flow test, V-funnel test, and L-Box test findings for self-compacting concrete acceptance characteristics are reported. For M30 grade concrete, compressive strength at 7 and 28 days of age is also calculated. This document also includes the test findings that were collected.

Keywords: Self-Compacting Concrete, Ordinary Portland Cement, Palm Oil Fuel Ash, Poly carboxylate ether.

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ACOUSTIC OR SONIC LOG ANALYSIS IDENTIFYING THE SUBSURFACE GEOPHYSICAL CHANGES IN HYDROCARBON BEARING ZONES IN OIL AND GAS POTENTIAL SEDIMENTARY BASINS

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ABSTRACT

The introduction of acoustic / sonic logs to Oil and Gas industry is barely decades of old. But, even within such a short span of time it has become an integral part of most of the modern logging programs. With the recent introduction of acoustic scope pictures, this may even hold a promise of making of the old dream of seeing the hydrocarbon in situ come true. In the following paper an attempt has been made to bring out the principles of instrumentation and interpretation and the applications of Velocity Logs. It has also been attempted to place before, the recent developments in this fields. However, because of space limitations they could not be discussed in detail in all aspects. The terms Sonic Log and Acoustic Log should be read as synonyms for the Velocity Logs.

Keywords: Sonic Log, Hydrocarbons, Cycle skipping, Resistivity and Wave frequency

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EFFECT OF SLAG ON VARIOUS PROPERTIES OF FLY ASH-BASED GEOPOLYMER COMPOSITES

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ABSTRACT

A novel building material called geopolymer concrete will be created through the chemical reaction of inorganic molecules. Otherwise known as an inorganic alumino-hydroxide polymer, geopolymer is made mostly from by-products like fly ash and geologically derived silicon (Si) and aluminum (Al) elements. It is a superior building material for the future because of its great mechanical qualities, significant chemical resistance (attack by magnesium or sulphate), low shrinkage and creep, and environmentally benign nature. It has been proven that geopolymer concrete is suitable for use in construction projects, including the building of walkways, prefabricated elements, and pavements. The current study intends to construct a road network using geopolymer concrete while sustainably utilising industrial by-products. A creative and environmentally sustainable alternative to conventional Portland cement (OPC) concrete is GC. In this study, the GC was produced using binders such fly ash (FA), ground granulated blast furnace slag (GGBFS), and cement. These binders were turned on by two different sorts of solutions (an alkaline solution which prepared in the laboratory and activator solution purchased commercially). The surface of the geopolymer concrete got denser, which decreased the permeability of chloride ions, water absorption, open porosity, and sorptivity values. The microstructural examination revealed distinct quartz, calcite, and C-A-S-H formations. The 0.45 S/B ratio mixes also showed greater Si/Al ratios and higher quartz and calcite percentages.

Keywords: Geopolymer composites, mechanical properties, microstructural properties, denser structure, and durability.

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MINERAL MAPPING IN PARTS OF KONIJERLA MANDAL KHAMMAM USING RS AND GIS TECHNIQUES

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ABSTRACT

GIS is a digital database, which facilitates the integration of various datasets for spatial analysis and modeling with a common spatial coordinate system. GIS is highly useful for handling images, maps, data tables, visualization, analysis, modeling, and spatial decision support. GIS is used to identify mineral potential zones. GIS is a tool for analyzing geological, geochemical, remote sensing data etc. It is extremely useful in generation of mineral potential maps. In recent years, few authors have discussed the role of GIS in mineral exploration. (Bonham-Carter, 1994)GIS also facilitates in organizing several variable datasets for querying, analysis and is thereby helpful in drawing meaningful inferences from the data generated. It is also useful in the identification of various parameters, which help in decision-making. It also emphasizes on the spatial context by focusing on geological features that may have localized mineral deposition. Several authors have studied on the importance of GIS in mineral exploration (Wilkinson, I, et al, 2001).

Keywords: GIS, Mineral Exploration, mineral potential maps, digital database.

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ARTIFICIAL NEURAL NETWORK MODELLING TO OPTIMIZE M-DRILLING PARAMETERS OF ECDM OF DEVELOPED NOVEL ZN/(AG+FE)-MMC

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ABSTRACT

Several engineering fields have increased their use of metal matrix composites (MMCs) in the last few years. Due to the increase in composites, the demand for accurate machining has also become important. While the near-net shape manufacturing process has advanced, metal matrix composites frequently require post-mold machining to achieve surface quality, and dimensional tolerances. As part of the current work, an artificial neural network (ANN) is implemented to model and optimize materials removal rate (MRR), overcut (Oc), and tool wear (TW) during electrochemical discharge machining (ECDM) of novel Zn/(Ag+Fe)-MMC. To obtain the response/output values, ECDM μ-drilling experiments were conducted under different input control factors such as pulse-on-time, current, pulse-off-time, and feed rate. It identified that 4-16-3-3 was the best architecture for the ANN model. A performance evaluation was conducted by using the root mean square error (RMSE) from the optimization model. Based on regression coefficients between experimental and model predictions and the correlation coefficient (R-value) between the ANN predictions and experimental results, the performance of the model was evaluated. 0.98722 was assessed as the overall R-index. ANN modelling and prediction analysis succeeded in replacing conventional method of regression analysis in field of machining hybrid materials.

Keywords: Artificial Neural Network, μ-Drilling, Optimization, Metal Matrix Composite, Electro Chemical Discharge Machining, Correlation Coefficient, Prediction.

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FLOW STRUCTURES AROUND PROPOSED BRIDGE PIERS

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ABSTRACT

Current study investigated the flow hydrodynamics around proposed bridge pier and made comparison with existing bridge pier. To quantify the flow structures around the piers, the flow and turbulence parameters are analysed to understand the interference of one bridge pier over another. The experiments were performed on recirculating channel of 15m long, 0.89m wide and 0.65m height. Instantaneous 3D velocity data was recorded by Acoustic Doppler Velocimeter at different radial planes $\alpha = 0°, 45°, 90°, 135°$ and 180° around the piers of both the bridges, where the distance (centre to centre) was maintained two times the dimeter of pier (d = 8.8 cm). The flow parameters, viz., velocity fields, vector patterns, distributions of Reynolds shear stress, turbulence intensity and turbulent kinetic energy are analyzed around the piers. The outcomes of proposed bridge pier are compared with existing one having same diameter under identical flow in the clear water condition. The result from the current study reveals, the flow velocity was decreased by 30% of the mean flow velocity at $\alpha = 180°$. Further, the turbulence was significantly reduced around proposed bridge pier with respect to existing, due to sheltering effect imposed by front pier. Turbulence intensities, turbulent kinetic energy and Reynolds shear stresses are decreased by 30%, 40% and 30% respectively due to the horseshoe vortex strength is reduced by 30% around new pier vis-à-vis old one. The present study recommends; the placement of new bridge pier should be 2- 3 time the diameter of pier to avoid more scouring.

Keywords: Proposed bridge, vector fields, turbulence intensity, Reynolds shear stresses, local scour.

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WATER QUALITY INDEX ASSESSMENT OF THE GROUND WATER OF INDUSTRIAL AREA

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ABSTRACT

Water plays a pivotal role in the existence in the human life. Water quality index assessing is the important parameter helps in improving the quality of drinking and ground water. Due to anthropogenic activities the quality of ground and drinking water is decreased. The main objective of research is to find the water quality index of the ground water and bore water in selected industrial area of the Kakinada and analyse the water quality index of it. The research results revealed that the sampling sites S-1, S-2 and S-3 is water quality index is less than 100 which is treated the poor quality of drinking water. The S-4, S-5, S-6, S-7, S-8, S-9, S-10, S-11, S-12 the water quality index is greater than 100 which is not suitable for drinking water. The water quality index observed at various stations shows that some places are not fits for drinking S1, S2 and S3 are below 100 are very poor and S4-S12 sites are more polluted and unfit for drinking. The ground water is needed to protect from pollution and govt need to take necessary measures to improve the quality of ground water.

Keywords: Water, WQI, ground water, drinking water, measures

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EFFECT OF THE CRIMPLED STEEL FIBERS ON FRESH AND MECHANICAL PROPERTIES OF SELF-COMPACTING CONCRETE

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ABSTRACT

It is proposed to study the flow and strength properties of the fiber-reinforced self-compacting concrete (SCC) with varying aspect (l/d) ratios of fibers. After achieving a satisfactory SCC mix, crimped steel fibers with l/d ratio 30 are designated as CSF30; with l/d ratio 40 are designated as CSF40, with l/d ratio 50 is designated as CSF50 and with l/d ratio 62.5 is designated as CSF62.5 fibers are added at a fixed percentage of 2 % by weight of cement. In this study diameter of fibers, 0.4 mm is constant, but lengths are varying as 12mm,16mm,20mm, and 25mm were added, and prepared different SCC-CSF mixes. Except for the blocking ratio, all other flow properties are within limits, when the aspect ratio of fibers is varied from 30 to 62.5. The up to l/d =50 blocking ratio is also within limits. If l/d =62.5, the SCC-CSF mix is failing in the blocking ratio test. There is a marginal increase in compressive strength and a considerable increase in split tensile strength and modulus of Rupture by adding different l/d ratios of fibers.

Keywords: Self-compacting concrete, Crimpled steel fibers, Mechanical properties, Non – destructive properties, and Statistical analysis.

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A COMPREHENSIVE REVIEW OF CONCRETE CONTAINING MAGNETICALLY TREATED WATER

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ABSTRACT

In Present scenario, Construction has benefited greatly from the characteristics of concrete and the magnetism of water. The procedure of permitting water to pass through the magnetic field is part of creating magnetized water, utilizing those properties of concrete that can affect such as compressive strength, workability, porosity, permeability, durability, water absorption capacity, hydration rate and aqueous ratio. Reduced cement usage and improved mechanical and technical qualities of concrete are the primary goals of switching from conventional water use to magnetic water. The addition of additives to concrete such as super plasticizers (SP), silica fume, natural zeolite steel fibers, Egyptian alumina, steel chips, silica fume, fly ash, pozzolanic materials, and blast furnace slag will increase concrete properties and effective for construction.

Keywords: Magnetizing, Concrete, Strength, Additives, Microstructure, Effective, Construction

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STRENGTHENING OF HYDRAULIC LIME WITH SYNTHETIC, ORGANIC & BIO-ADDITIVES: STATE OF THE ART REVIEW ON ECO-FRIENDLY CONSTRUCTION

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ABSTRACT

Cement is acknowledged to be one of the significant modern construction materials used all over the world because of its excellent properties. Though cement dominates the construction industry, the usage of lime binder is still replaceable because of the need of restoration and repair of existing heritage structures. Though lime offers several advantages such as "breathing", higher durability and deformability, the performance of the lime mortar is still mistrusted because of its poor compressive strength, long setting time etc. several researchers from the past have identified various techniques to improve the mechanical strength and fresh properties of the lime mortars. This paper attempted to review those significant literatures that were based on performance improvement of lime mortars in the aforesaid parameters. The notable research works include the additions of different herbs in the lime mortar, effects of different plants and animal extracts as additives in lime mortar and effects of different fibers include natural and synthetic fibers in the lime mortar, that are reviewed from various scrupulous literatures and the significant results and outcomes were identified and summarized in this review article. This research review article helps the researchers and practicing engineers to adopt the strengthening method of lime mortar which would be best suited for their restoration applications.

Keywords: Ancient Structures, Bio-additives, Cement-lime mortars, Eco-friendly additives, Lime mortar, Organic additives, Synthetic fibers

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MICROSTRUCTURE PROPERTIES OF GEOPOLYMER PASTE UNDER ELEVATED TEMPERATURES

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ABSTRACT

Geopolymer are commonly believed to have superior fire resistance due to their ceramic-like qualities. Previous studies on high-temperature geopolymers have mostly focused on metakaolin-based geopolymers. This paper presents the outcomes of a study on the influence of higher temperatures on geopolymer paste prepared with fly ash as a precursor. The micro-structural features of the geopolymers were investigated before and after exposure to escalating temperatures of 100, 200, 300, and 400°C with a rising frequency of 10 °C per minute, followed by a 90-minute calcination interval and natural convection cooling to ambient temperature. SEM analysis revealed that a considerable number of unreacted fly ash particles remained after heating to 100°C and that at 200°C new products developed on the surfaces of unreacted fly ash particles. There was less unreacted fly ash at temperatures between 300 and 400 °C.

Keywords: - Geopolymer, Microstructure, Elevated Temperatu

ISBN Number: 978-93-5773-984-9

A STUDY OF EFFECT OF PHYTOREMEDIATION OF DOMESTIC WASTEWATER USING PHRAGMITES AUSTRALIS IN CONSTRUCTED WETLAND

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ABSTRACT

The Aim of the project is to Study the effect of Phytoremediation of domestic wastewater using Phragmites Australis in constructed wetland and use that treated water for agricultural purpose and domestic usages after analysis. One of the current challenges due to the global population is providing clean water to the whole world. To provide a very effective, environmentally friendly domestic wastewater treatment phytoremediation using Constructed wetland is one of the best ways. Constructed wetlands are treatment systems that use natural processes involving wetland vegetation, soils and their associated microbial assemblages to improve water quality. Constructed wetlands are successful in removing organic matter, nutrients, suspended solids. Phytoremediation using constructed wetlands has become a logical solution to improve the quality of contaminated waters. It basically refers to the use of plants and associated soil microbes to reduce the concentrations or toxic effects of contaminants in the environment. Phragmites australis is the plant which is selected here for phytoremediation. Phragmites australis is also known as reed. It is often cheap and readily available as a raw material. It is found in wetlands throughout the temperate and tropical regions in the world. This plant has been used for many years in phytoremediation to purify various types of wastewaters. Phragmites australis has a high ability to accumulate various nutrients, heavy metals and micropollutants. It is superior toother aquatic plants.

Keywords: Phragmites Australis Plant, constructed wetlands, Domestic waste waters, chlorinated organic compounds, lack of awareness.

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DEVELOPMENT OF HIGH STRENGTH HYBRID FIBER REINFORCED ENGINEERED CEMENTITIOUS COMPOSITES USING SILICA FUMEPOLY VINYL ALCOHOL FIBRES

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ABSTRACT

To resist some seismic and earthquake calamities, the need of more tensile and flexural properties in high strength concrete is required. So, high strength concrete along with good ductility and bendability properties are required. Previous studies proved that polyvinyl alcohol fibers have good ductility and bend ability properties and other materials like silica fume sand steel fibers played a vital role in improving the strength performance of concrete, particularly the splitting tensile and the flexural strengths. This research aims to improve high strength to the concrete along with ductility and bend ability by replacing fine aggregates in concrete with poly vinyl alcohol fibers, silica fume sand steel fibers. Various methods and fibers are available to increase strength to the high-strength concrete. Utilizing the chemical properties of PVA fibers are added to increase the ductility and bend ability of concrete. Where silica fume sand steel fibers are for improve the strength performance of concrete, particularly the splitting tensile and the flexural strengths. But still further elaborated studies need with this new combination at various contents. The effect of workability, compressive, flexural, and tensile strength characteristic tests will be tested, investigated, and reported.

Keywords: Flexural properties, Calamities, Ductility, Bendability, splitting tensile and flexural strengths.

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INVESTIGATION ON FLEXURAL PERFORMANCE OF BEAMS PARTIALLY WRAPPED WITH GFRP AND CFRP

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ABSTRACT

Many structures getting damaged or deteriorated due to heavy loads, environmental effects, earthquake loads etc. and need repairs. Earlier these damaged structures were repaired either by replacing damaged parts, demolishing, or retrofitting the structures and these were uneconomical, time consuming and required more material and labor. Worldwide research has been done on plastic sheets, wraps concerning this issue and an effective material has been found out for repair and strengthening of reinforced concrete structures i.e., use of fiber reinforced polymer. The application of fiber reinforced polymers as sheets in civil engineering over life span has become economically viable alternative for traditional methods. Several fibers that are available are nylon, carbon, glass, polypropylene, basalt, steel etc. Glass fiber reinforced polymer sheets (GFRP) and carbon fiber reinforced polymer sheets (CFRP) possess several properties like high durability, high strength, stiffness, light weight, ease of installation, corrosion resistive, etc., due to which they have become effective in construction industry. In present investigative study a comparison of flexural strength behavior of partially wrapped RC beams using Glass Fiber Reinforced Polymer sheets (GFRPS) and Carbon Reinforced Polymer Sheets (CFRP) in three layers is done with controlled beams (CB) for 7 days and 28 days to find out the most economical and effective material.

Keywords: Retrofitting, Fiber reinforced polymer (FRP), Glass fiber reinforced polymer (GFRP), Carbon fiber reinforced polymer (CFRP), Durability, Flexure strength and Controlled beam (CB).

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A REPORT ON SPEED AND DELAY STUDIES AND TRAFFIC STUDIES OF ADB ROAD (RAJANAGARAM-KAKINADA PORT)

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ABSTRACT

There are various modes of study speed delay, time delay and travel time which makes one understand about design of intersections, rotaries, lanes, traffic signals in study areas in much proper, technical manner. Our team decided to take up one problem in the city and find out a solution that is feasible, economic, and easily adoptable. The one problem that we can think of while was a traffic jams that consume heavy time .causes for the traffic jam may be inadequate roads ,heavy traffic volume ,in-efficient signal system ,bad traffic management ,National Highways Authority of India and the Roads and Buildings Department to install signboards in place where repair works are under progress .Due to rapid urbanization and increase in population ,it is necessary to study the impact of traffic evaluation on different roads.

Keywords: Travel Time, Delay Study, Speed Delay, Traffic Engineering, Floating Car Method, Test Vehicle Method, Average Speed Method, Maximum Car Method.

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NONLINEAR PUSHOVER ANALYSIS AND SOFT STOREY EFFECT OF MULTI-STOREY STRUCTURE USING FGM

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ABSTRACT

Open first story and Floating column are typical features in the modern multi-storey constructions in urban India. Such features are highly undesirable in buildings built in seismically active areas; this has been verified in numerous experiences of strong shaking during the past earthquakes like Bhuj 2001. Soft-story buildings are characterized by an inadequate stiffness or flexibility of the ground floor, which is less resistant to horizontal seismic forces than the upper storeys. On the other hand, such inadequate stiffness causes disproportional displacement focused on that story. As a result, the ground floor becomes weak and susceptible to partial or complete damage to its structural elements, which in turn, results in collapse of the entire building. The results obtained from the performed linear and nonlinear push-over analyses show that the flexible story may result in a drastic change of the period of vibrations, which will further lead to a change of the seismic design force, the maximal relative story drifts, and ductility of the considered structure. In current study, A design and analysis of a multi-storey building having soft storey under the action of lateral loads is proposed. Identifying the failure pattern of multi-storey structure in extreme loads and replacing the members that failed due to inadequacy with the functionally graded material (FGM).

Keywords: Soft-storey, floating column, storey stiffness, pushover analysis, storey drift, relative displacement, functionally graded material

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ROBUSTNESS ANALYSIS OF TRANSMISSION LINE TOWER

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ABSTRACT

India has a large population residing all over the country and the electricity supply need of this population creates requirement of a large transmission and distribution system. Transmission line is an integrated system consisting of conductor subsystem, ground wire subsystem and one subsystem for each category of support structure. The transmission tower line system is very sensitive to wind loads due to its large span and high rise and being flexible many transmission towers are damaged due to strong wind loads. The supports of EHV transmission lines are normally steel lattice towers. In current study, A design and analysis of transmission line tower under combined action of wind and seismic loads are proposed. Identifying the collapse pattern of transmission line tower in extreme loads and replacing the members that failed due to inadequacy replaced with the functionally graded materials (FGM)

Keywords: Transmission line tower, robustness analysis, seismic force, pushover analysis

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INFLUENCE OF MAGNETIZED WATER ON STRENGTH AND DURABILITY PROPERTIES OF CONCRETE.

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ABSTRACT

It is expected that soon, the civil engineering community will have to produce structures in harmony with the concept of sustainable development using high-performance materials with low environmental impact that are produced at low cost. Magnetic water concrete, synthesized from the normal materials used for manufacturing of concrete, provides one route towards this objective. This project presents the effect of addition of magnetic water on workability, strength and mechanical properties of concrete tested show-encouraging results, and one can easily replace normal water with magnetic water by which quantity of cement used in any concrete mix reduces and can be made as new eco-friendly construction material for future decades.

Keywords: Introduction, literature review, objectives, scope, materials-cement, coarse aggregate, fine aggregate, water, magnetized water, References.

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ESTIMATION OF URBAN SPRAWL AND LU/LC CHANGE DETECTION OVER PAST THREE DECADES IN E.G. DIST: A CASE STUDY

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ABSTRACT

Urban sprawl is considered as growing infrastructure when concerned as a major resource for smart city initiatives and in developing nations. India is nation recognized to be an agriculture rich which is now in debt to loss in land in the form of urbanization. This paper aims in Change detection analysis that shows how much Built-up area has been increased over reducing agricultural and barren lands in a period using temporal data. A key element in current strategies for managing natural resources and tracking environmental changes is the shift in land use and land cover. Urban sprawl is responsible for a variety of urban environmental issues like decreased air quality, increased runoff and subsequent flooding, increased local temperature, deterioration of water quality, etc. In this work we have taken East Godavari district as case to study the urban expansion and land cover change over three decades from 1990to 2020. Remote sensing methodology is adopted to study the geographical land use changes occurred during the study period. For years 1990, 2000 and 2010 Landsat 4 images are used and for 2020 Landsat 8 images are used for LU/LC classification of East Godavari Dist., downloaded with 30 m resolution from the USGS Earth Explorer web site. Information on urban growth, land use and land cover change study are very useful to local government and urban planners for the betterment of future plans of sustainable development of the city.

Keywords: Urban Sprawl, Urbanization, Land use/Land cover, Remote, Landsat data.

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SUSTAINABLE PRODUCTION OF CONCRETE BY USING FLY ASH AND STEEL FIBERS

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ABSTRACT

The project is experimental study of M30 Grade of concrete by using fly ash, steel fiber, cement, coarse aggregate, and fine aggregate. Aim of the experimental work as to achieve a proportion of ingredients and obtain strength of M30Grade. To achieve this aim experiments will be designed to vary the content of fly ash and steel fibre in cement and other ingredients (fine aggregate and coarse aggregate). The moulds will be prepared by using coarse aggregate, fine aggregate and the quantity of cement which gradually be reduce by adding fly ash and amount of steel fibre. Three sets of fly ash will be varied from 10% to 30% in step to 10% keeping the steel fibre content fixed. In the other set the amount of steel fibre will vary from 0.5% to 2% in step of 0.5% keeping the other parameter fixed.

Keywords: Concrete, steel fibre, fly ash and compressive strength.

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MECHANICAL INVESTIGATION OF SELF COMPACTING LAYERED CONCRETE

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ABSTRACT

In Modern construction field concrete plays, a crucial role. Obtaining of an economical as well as low carbon emission concrete is the challenging task in modern construction field which leads to development of several types of concrete. Layered concrete is developed such that, the composition of material is varied in different layers to meet performance demands that alter within regions of a structural element. The development of gradation of concrete in one structural element is studied by many researchers and found that position and stability of layer is the main aspect to achieve good results. To maintain this and to meet the challenge of application in construction field, Self-compacting concrete (SCC) with different grades and different composition is used in layering so that no need additional compaction. Present study deals with Mechanical Investigation of Self compacting layered concrete. Tests on Mechanical properties is conducted. The study to achieve optimum proportion and layer of SCC has been studied and results are discussed.

Keywords: Self compacting concrete; Layered concrete; Mechanical properties.

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A REPORT ON SPOT SPEED STUDIES AT VARIOUS LOCATIONS OF ADB ROAD (RAJANAGARAM-KAKINADA PORT)

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ABSTRACT

Spot speed is the average speed of vehicles passing a point, or the time mean speed. Spot speed studies are conducted to estimate the distribution or speed of vehicles in a stream of traffic at a particular location on a highway. This is certified out by recording the speeds of a sample of vehicles at a specified location. Speed is an important transportation consideration because it relates to safety, time, comfort, convenience, and comfort. The data gathered in spot speed studies are used to determine vehicle speed-related decisions. The present spot speed studies are coordinated to assess the movement of rates of vehicles in a surge of activity at a particular region on a roadway. Our project is to study the spot speed and check the time to reach the target in off-peak and peak timings on a highway stretch (say from Rajanagaram to Kakinada port).

Keywords: Modal speed, 85th percentile speed, 98th percentile speed, Speed limit, Arithmetic mean speed.

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SPECTROPHOTOMETRIC DETERMINATION OF DYE REMOVAL USING THE UV/H2O2 PROCESS

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ABSTRACT

Dyes are complex organic compounds that are used by various industries to colour their products. The textile industry is important in most countries and consumes about 45-60 litres of water for every kilogram of fabric. The generated wastewater from the textile industry restrains the effect on photosynthesis and causes several effects on aquatic and humans. The objective of the study is to remove the dye from the aqueous solution using the UV/H2O2 process. The removal efficiency of the dye is determined by using the UV spectrophotometer. The effect of different parameters such as pH, H2O2 concentration, dye concentration, and time on the removal rate. In addition, the optimum conditions of the removal rate also investigate. The removal efficiency of dye will be noted and reported in the study.

Keywords: Adsorption, Coagulation, Reactive dye, Hydrogen peroxide (H2O2), spectrophotometer.

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DEVELOPMENT OF BILL GATES BHAVAN INTO AN EFFICIENT AND SMART STRUCTURE

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ABSTRACT

Power crisis is one of the most common problems in India. Consumption of electricity is largely increased due to the inefficient usage of electrical devices such as fans, lights etc. This project represents smart electric system design using PIR (passive infrared) motion detection sensor. This sensor can certainly minimize the consumption of electrical power. PIR sensor works based on motion and infrared radiation from objects in its field of view. This sensor sense movement of people, animals, and then gives high signal to the transistor and the transistor triggers the relay. Relay acts as a switch and controls lights and fans (whether to ON or OFF). So, the devices will be turned on only when a person or animal comes in the range of the sensor and will be turned off automatically when they leave the room. It is a low-cost device. So, this project is very low costing and also power saving. Making Bill gates bhavan into a smart building, also minimizes the electric bills of the college.

Keywords:Passive infrared sensor (PIR), Motion detection, Smart building, Energy conservation, infrared radiation

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SPECTROPHOTOMETER METHOD FOR REMOVAL OF PARABEN BY USING UV/H2O2 PROCESS

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ABSTRACT

Parabens are esters of para-hydroxybenzoic acid, with an alkyl (methyl, ethyl, propyl, or butyl) or benzyl group. They are mainly used as preservatives in foodstuffs, cosmetics, and pharmaceutical drugs. Parabens are present at low concentration levels in effluents of the wastewater treatment plant. These parabens have continuously entered the environment and cause serious threats to aquatic and humans. So, the elimination of parabens is important in wastewater. The study aims to remove the paraben from an aqueous solution using the UV/H2O2 process. The parameters vary such as pH, H2O2, pollutant concentration, and time. The simple, rapid, and sensitive UV spectroscopy method was used for the determination of paraben. Paraben was observed maximum at the absorbance of 254 nm. The results show that the maximum removal will be observed at the optimum conditions. The removal efficiency of paraben will be noted and reported in the study.

Keywords: Cosmetics, Aqueous solution, paraben, UV/H2O2, Spectrophotometer

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EXPERIMENTAL STUDY ON PARTIAL REPLACEMENT OF CEMENT WITH EGG SHELL POWDER AND SILICA FUME

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ABSTRACT

During any type of construction, concrete is presence broadly used for the structure of greatest of the buildings, bridges etc. Presently, the complete construction industry is in exploration of an appropriate and operative the unused product that would greatly minimalize the use of cement and eventually decrease the creation cost. Such a substitute material is eggshell powder and silica fume. Greatest of eggshell waste is willing in landfills short of any pre-treatment since it is conventionally unusable and eventually makes thoughtful eco glitches. Therefore, proper alternate is required to manage the wastes in eco-friendly way. The goal of this investigation work is to use the eggshell powder, silica fume as a limited additional of cement. Egg shell powder is replaced by 5%, 10% and 15% in addition with the silica fume by 2.5%, 5%, and 7.5% of weight of cement. Experimental research demonstrates the strength features such as split tensile strength, compressive strength, and flexural strength test of eggshell based concrete were investigated. It is found the strength of the concrete rises with the adding of eggshell powder and silica fume and finally the comparison is made for the eggshell and silica fume added strength of concrete.

Keywords: Egg shell, Silica fume, Cement, Compressive strength, Split tensile test, Flexural strength test.

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EXPERIMENTAL INVESTIGATION ON VITRIFIED POLISH WASTE AND RICE HUSK ASH AS A PARTIAL REPLACEMENT OF CEMENT

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ABSTRACT

Rigid pavements are considered superior to other types of pavements due to their ability to with stand traffic loads, thermal stresses acting on the pavement, high flexural strength, durability, and low maintenance cost when compared to flexible pavements. However, Rigid pavements are not a major component of India's transportation system of rules because their construction costs are very high, and cement is the primary ingredient. In this study to analyze the optimum replacement of cement with industrially produced materials such as vitrified polish waste (VPW), Rice husk ash (RHA). Mix design is progress for varying proportions of Rice husk ash (RHA) and Vitrified polish waste (VPW) as 0%, 5%,10% 15%, 20% to the replacement of cement.

Keywords: Vitrified polish waste (VPW), Rice Husk Ash (RHA), Rigid pavements.

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APPLICATION OF RS & GIS AND ESTIMATION OF RUNOFF OFEAST GODAVARI DISTRICT., INDIA

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ABSTRACT

Runoff is an amount of water flowing on the surface during and after rain fall estimation of run off involves in identification of volume of water available on surface as a resource. The current study area is about 12300 sq.km located in, East Godavari District, Andhra Pradesh. The rainfall data collected for the past 3 decades to predict the runoff of the east Godavari district by using SCS-CN method. SCS-CN method remains most used for predictability, proximity and acceptable in wide variety of soil groups. This method is applicable where the total precipitation is more as compared to the maximum retention of water percolating into soil strata. The inputs for SCS CN GIS tools capable of generating DEM, stream length, stream order, drainage density, stream frequency maps using Cart Odem 3D images. Runoff reveals the direct and predicted surface flows for the study area.

KEYWORDS: Run off, Percolation, DEM, Stream length, stream order, drainage density, stream frequency.

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STABILITY OF ELLIPTICAL TUNNEL IN COHESIONLESS SOIL SUBJECTED TO STEADY STATE SEEPAGE FORCES

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ABSTRACT

The seepage force can cause failure of the underground excavations and openings that are lying below the groundwater table (GWT). The present research work aims to estimate the support pressure for peripheral stability of elliptical tunnel in cohesionless soil below the GWT employing the principal of lower bound finite element limit analysis and second-order conic programming by using the software OPTUM CE. The seepage forces around the tunnel are computed from the total head distribution in the soil under steady-state seepage condition using finite element analysis. A uniform support pressure pa is applied at the tunnel periphery to resist the active state collapse of soil. The effects of various parameters such as depths of ground surface, depths of ground water table, shear strength and aspect ratio of the tunnel on the magnitude of the normalized support pressure at the tunnel periphery are studied thoroughly.

Keywords: Tunnel, Optum CE, Second order conic programming, seepage

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ELASTICITY AND IMPACT STUDY ON SELF-COMPACTED FUNCTIONALLY GRADED CONCRETE

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ABSTRACT

In this modern era, construction techniques are increasing with a focus on high strength, improved durability, and reducing cement consumption in concrete structures in order to meet economic criteria, which leads to the development of various types of concrete techniques in the construction field. Layered concrete (LC) is developed such that, the composition of material is varied in different layers to meet performance demands that alter with regions of a structural elements. Previous research investigations have demonstrated that optimal graduation or material composition resulted in superior outcomes, however placing the layered concrete (LC) in single element is a difficult task. To meet this challenge, self- compacting concrete (SCC) is used in layering concrete to prevent additional compaction. In this study the elasticity and impact study on self-compacted functionally graded concrete are examined. Results are compared for self-compacting bilayer concrete and convention concrete.

Keywords: Functionally graded concrete, Self-compacting concrete, Elasticity properties, and Layer concrete.

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DESIGN OF RIGID PAVEMENTS BY USAGEOF VITRIFIED POLISH WASTE ANDRICE HUSK ASH

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ABSTRACT

Rigid pavements are considered superior to other type of pavements due to their ability to withstand maintenance cost when compared to flexible pavements. However, rigid pavements are not a major component of India's transportation system of roots because their construction cost are very high and cement the primary ingredient. As per IRC 44 the components have been taken. The main reason behind this trend is the excessive production of waste like plastics, rice husk (RHA) which is not only hazards but also creating deposition problem. Analysis of mechanical properties of rice husk and vitrified polish waste has been replaced. Mix design is progress for varying proportions of Rice Husk ash [RHA] and vitrified polish waste [VPW] as [0%, 5%, 10%, 15%, 20%] to the replacement of cement. Although the cost of construction of rigid pavements is high, its long life, high load carrying capabilities and low maintenance cost will balance the initial cost aspect. Recently, many studies are being conducted on different pozzolanic admixtures which can be used as partial replacement of cement in rigid pavements, thereby reducing its cost and enhancing properties of the mix.

Key words: Vitrified Polish Waste (VPW), Rice Husk Ash (RHA), Rigid Pavement Design, Cost-Benefit Analysis.

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ZERO ENERGY BUILDING

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ABSTRACT

Amid growing concerns about rising energy prices, energy independence, and the impact of climate change, statistics show building to be the primary energy consumer in the U.S. This fact underscores the importance of targeting building energy use as a key to decreasing the nation's energy consumption. The building sector can significantly reduce energy use by incorporating energy-efficient strategies into the design, construction and operation of new buildings and undertaking retrofits to improve the efficiency of existing building. In this paper, concept for the net Zero-Energy Building (ZEB) is introduce by using Designing strategies and features that reduce the demand- side. Once building loads are reduced, the loads should be met with efficient equipment and systems. This Include energy efficient lighting, electric lighting controls, high-performance HVAC, and geothermal heat pumps. Further using On-site and Offsite Renewable energy and giving brief discussions on the benefits of the zero buildings. There are two case study which has achieved net zero energy building and some detail information of the project is Elaborated.

Keywords: Rising Energy prices, Climate change, Electric lighting controls, High performance HVAC, Heat Pumps.

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EXPERIMENTAL STUDY ON STRENGTH AND DURABILITY PERFORMANCE OF FLYASH BRICKS CASTED WITH PROPORTIONS OF CONSTRUCTION WASTE, CERAMIC, STEEL SLAG, LIME, AND GYPSUM

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ABSTRACT

This study aims to investigate the performance of strength and durability parameters of fly ash bricks by replacing quarry dust and sand with waste ceramic powder produced at the time of manufacturing ceramic products, steel slag, and construction waste. Because sand is a natural resource, it is being replaced. It may become exhausted if used continuously for construction. Quarry dust can be used as a basement filling material instead of sand. However, ceramic waste powder, steel slag, and concrete waste cannot be used where sand and quarry dust are used. We intend to make fly ash bricks from these waste materials because of this issue. We choose these waste materials because a large amount of them is generated in our country each year. "Indian power plants generate approximately 600,000 tons of fly ash per day," according to the Indian Power Plants Association. In India ceramic waste powder and steel slag, waste generation is more due more no. of Industries. According to the Building Material Promotion Council, the country creates an estimated 150 million tons of Construction & Demolition(C&D) waste each year. However, the stated recycling capacity is only 6,500 tons per day or roughly. 1%. After casting the bricks their strength, parameters will be tested.

Keywords: Fly ash, Gypsum, Lime, Ceramic Waste Powder, Steel Slag, Construction Waste. Compression strength, Water absorption, Efflorescence test.

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STRENGTH AND DURABILITY ANALYSIS ON BRICKS CASTED WITH PLASTIC AND INDUSTRIAL SLAG

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Abstract: The current study aims on Performance of Strength & Durability parameters of plastic bricks, by substituting the Waste plastic, Ceramic slag, and Steel slag with Construction waste. India generates around 3.6 lakh million tons of plastic waste of which 50% is recycled. After steel production, steel factory waste slag is placed in slag storage yards, occupies farmland, silts, and waterways, and pollutes the environment. National wide production of steel slag is almost 18.5 million tonnes, according to the Indian mineral book 2018. India produces around 100 million tons of Ceramic products per year and from which in manufacturing process around 25% of Ceramic slag is produced as a waste by-product. According to the Building Material Promotion Council, the country creates an estimated 150 million tons of Construction & Demolition(C&D) waste per year. However, the stated recycling capacity is only 6,500 tons per day or roughly 1%. In this study, there are three mix proportions P1, P2 and P3. After casting the bricks their strength parameters will be tested.

Key words: Waste plastic, Ceramic slag, Steel slag and Construction waste, Compression test, Water absorption test, Efflorescence test.

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TREATMENT OF INDUSTRIAL EFFLUENT USING TEAK LEAVES

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ABSTRACT

With the rapid development of industrialization and globalization in recent years, discharge of wastewater has increased into the environment. The purpose of wastewater treatment is to protect humans and the ecosystem from harmful and toxic elements found in wastewater. The conventional process used for treating wastewater in most of the industries releases undesirable and harmful by-products. Nowadays burnt activated teak leaves powder was found to be better bio-absorbent to remove the heavy metals from the industrial effluent. In this study it is proposed to treat the industrial wastewater using eco-friendly materials i.e., teak leaves (Tectona grandis). The main objective of this project is to purify the effluent and reduce toxicity of colour and heavy metals present in industrial effluent by physical adsorption on activated carbon, prepared by chemical activation of teak leaves. The wastewater effluent from the nearby textile and paper mill industries will be collected and tested based on APHA standards. Based on the results obtained from analyses, the efficiency and dosage of the teak leaves powder required to treat textile and paper mill industries effluent will be determined and reported.

Keywords: Activated carbon, Teak leaves, Chemical activation, Adsorption capacity.

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ANALYSISANDTREATMENTOFINDUSTRIAL EFFLUENT USING BANANA STEM

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ABSTRACT

Wastewater treatment is a process used to remove contaminants from raw water and converting it into an effluent that can reduced to the nature. The purpose of raw water treatment is to protect human and the eco system from harmful and toxic elements found in raw water. The process used for treating raw water that is produced by textile industries are an undesirable by-product. So, it is decided to treat the textile industrial raw water using eco- friendly material banana stem (Musa sapientum). Banana stem juice was considered as an effective bio-absorbent in the recent days to remove the dye from effluent. The aim of this project is to purify the effluent and reduce the toxicity of suspended solids, hardness, turbidity, color, and COD (chemical oxygen demand) present in textile industrial effluent by physical adsorption. The project study will be based on the APHA standards for raw wastewater.

Keywords: Reduce the toxicity of suspended solids, hardness, turbidity, color and

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EFFECT OF WET-DRY CONDITIONS ON THE SHEAR STRENGTH PROPERTIES OF BIOPOLYMER ADMIXED SOIL

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ABSTRACT

Ground improvement technique is the standard solution for enhancing the shear strength parameters of soil when it is not suitable to carry the structural load. Various methods and admixtures are available to enhance the shear strength parameters and the bearing capacity of the soil. Utilizing the chemical additives leads to endanger the ecosystem. Previous studies proved the biopolymers as a sustainable additive for the improvement of problematic soil but still their durability needs further elaborated studies. This study focusses on the durability nature (i.e, wet dry cycle studies) of three different gel type biopolymer admixed soil i.e., (xanthan gum, guar gum and gelatin admixed soil) at various biopolymer contents. Gel plug will be formed when these biopolymers admixed with the soil, which leads to fill the void spaces and enhance the shear strength parameters. The effect of 12 cycles of wet-dry on this shear strength properties will be investigated and reported.

Keywords: Ground improvement technique; Biopolymer; Durability; Wet-Dry Studies; Shear strength.

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FRESH AND STRENGTH PROPERTIES OF SELF COMPACTING BILAYER CONCRETE WITH STEEL FIBRES

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ABSTRACT

In this modern era, construction techniques are increasing with a focus on high strength, improved durability, and reducing cement consumption in concrete structures to meet economic criteria, which leads to the development of various types of concrete techniques in the construction field. Layered concrete (LC) is developed such that, the composition of material is varied in different layers to meet performance demands that alter with regions of a structural elements. Previous research investigations have demonstrated that optimal graduation or material composition resulted in superior outcomes, however placing the layered concrete (LC) in single element is a difficult task. To meet this challenge, self-compacting concrete (SCC) is used in layering concrete to prevent additional compaction. In this study the fresh and strength properties of Self compacting Bi-layer concrete with steel fibres are examined. Cubes and Prisms casted with layered self-compacting concrete in which Fibre reinforced self-compacting concrete is placed at bottom layer and checked for the layer stability and flexural strength of prisms.

Keywords: Layered Concrete, Self-Compacting Concrete, Fibre Reinforced Concrete, Steel Fibres.

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DURABILITY STUDY ON SELF COMPACTING BI-LAYER CONCRETE

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ABSTRACT

Obtaining of an economical as well as low carbon emission concrete is the challenging task in modern construction field which leads to development of several types of concrete. Layered concrete is developed such that, the composition of material is varied in different layers to meet performance demands that alter within regions of a structural element. The development of gradation of concrete in one structural element is studied by many researchers and found that position and stability of layer is the main aspect to achieve good results. To maintain this and to meet the challenge of application in construction field, Self-compacting concrete (SCC) with different grades and different composition is used in layering of concrete to avoid additional compaction. Present study deals with durability study of Self compacting Bilayer concrete. Tests on Durability of concrete are conducted for layered concrete and results are compared with conventional concrete.

Keywords: Durability, freezing-thawing, abrasion, weathering, exposure.

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LIGHT TRANSMITTING CONCRETE

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ABSTRACT

Due to globalization and construction of high-rise buildings result in the obstruction of natural light in buildings. Because of this problem, use of artificial light has increased in great deal and energy is consumed in large amount. This results in the introduction of innovative concrete, light transmitting concrete. Translucent concrete is a type of fiber reinforced concrete which is employed for aesthetical application by inserting the optical fibers in concrete. Both natural and artificial light passes through the translucent concrete due optical fiber's reflection property. This sort of concrete gives pleasing aesthetics to structures and energy saving construction material. Light-transmitting concrete can play a crucial part in construction and environment fields. The materials are used in this project are cement, fine aggregate, coarse aggregate, water, and optical fibers. The mix proportions are 1:1.5:3 for cement concrete, In this project we will use Ordinary Portland cement of 43 grade. The Optical Fibers are flexible, transparent fibers made up of glass as well as plastic. It transmits light between two ends of the fibers by process of total internal reflection. In this experimental work we will use 2 mm diameter of optical fiber with spacing of 5 mm and we will prepare a specimen of rectangular block and specimen of square block. And we will conduct the test on specimen of compressive strength and flexural strength for 7 days, 14 days and 28 days. The basic tests of Compression and flexural tests are conducted as per Indian standards IS: 516 - 1959 to study the behaviour of translucent concrete.

Keywords: Transparent Concrete, light-transmitting, optical fiber, binding material, Concrete, Transparent.

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SELF-COMPACTING CONCRETE BY USING E-WASTE AND COCONUT SHELL

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ABSTRACT

This experimental study looked at the effects of using coconut shell (CS) and electronic plastic waste (e-plastic waste) on mechanical qualities and strength characteristics. The test results were compared with those of ordinary M25 grade concrete and waste admixtures were utilized to substitute fine aggregate (FA) and coarse aggregate (CA). 10% of fine aggregate and 30% of the coarse aggregates were replaced by their volume in each variation. E-plastics and CS were shredded and gridded to produce sizes like those of natural aggregate in this concrete. The major goal of this comparative study is to determine the proper amount of CS and e-plastic waste to add to concrete without changing its durability and strength properties. We calculated the mixes' densities, compressive strengths, split tensile strengths, moduli of flexure, stress-strain behavior, bond strengths, and ultrasonic pulse velocities.

Keywords: Electronic plastic waste, Coconut shell, Compressive strength, Modulus of rupture, Workability, Bond strength hamster wheel generator, Energy, Environment friendly.

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DESIGN OF FRAMED STRUCTURES THROUGH STATISTICALAPPROACH

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ABSTRACT

Steel structure is a metal structure made of structural steel components connect with each other to carry loads and provide full rigidity. The aim of the project is to develop steel framed structure design through the statistical approach knowing the clear knowledge about the IS-Codes and mathematical expressions on spreadsheets is necessary. The main objective of this project to minimize manual interruption errors, cost effectiveness and reduce time complexity of the design. The methodology of this project is to design a structure through statistical approach, which means that conditional based mathematical equations given in the spreadsheets. For that characteristics values are given initially the design steps will be automatically generated with most possible safety consideration. The spreadsheets will read the giving working principles, dimensions & recommendations by mathematically that expressions will read itself through IS-code design steps. Finally get the require sectional member and dimensions as per the standard values.

Keywords: Statistical approach, buckling curve, Effective length, slenderness ratio, design compressive strength (f_{cd}), Yield strength, Ultimate strength, Loading conditions, Type of structure, Codal provisions, Section type, Strength of materials.

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COMPARATIVE STUDY OF MORPHOMETRIC ANALYSIS OF BASINS OF EAST GODAVARI

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ABSTRACT

The idea of this project is to study the behaviours of basins using RS and GIS so, that we can have information regarding behaviour of flow which helps in suitable planning and management of Water Resource developmental plan and land resource development plan and helpful in flood management. Using Remote Sensing and GIS we can have fairly accurate results with minimal cost. Morphometry is the science that deals with quantitative measurement of the Shape or Geometry of any landforms. A morphometric analysis of basins of East Godavari can be carried out using geoprocessing techniques in GIS. Remote sensing and GIS approach is an effective tool to determine the morphological characteristics of the basin. There are many geospatial datasets available these days in the form of various types of Digital Elevation Models (DEMs) that were released with varying resolutions. These datasets are used to study the physiographic features of hydrographic basins by tracing and extracting elevation points, watershed boundaries, streamlines, flow directions, and morphometric parameters. Many researchers have used these datasets to investigate and assess the hydrologic behaviour of the basins. Cartosat DEM of ISRO has launched Cartosat-1 on May 5, 2005, with prime objective of delivering high-resolution satellite data of 2.5 m in-track stereo. The Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER DEM) was launched on-board NASA's Terra spacecraft in December 1999 & made available in June 2009, was generated using stereopair image. Shuttle Radar Topographic Mission (SRTM 90m & 30m) was launched by NASA In February 2000, using radar interferometry, a 3-arc second (SRTM-3) DEM was produced covering almost 80% globe excluding Polar Regions. Since January 2015 NASA is providing the 1-arc second data. The data from DEM can be extracted using ArcGIS software. The extracted drainage network was to be classified according to Strahler's system of classification and it reveals the flow pattern. Comparison of previous year's morphometric data helps in revealing the changes and its effect on hydrological activities in that area.

Keywords: Morphometric analysis, Remote Sensing, Digital elevation model, ArcGIS, Geographical information system, Geoprocessing, Water Resource Development.

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SUSTAINABLE PRODUCTION OF CONCRETE USING STEEL FIBER & FLY ASH

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ABSTRACT

The quantity of fly ash produced from thermal power plants in india is approximately 80 million tons each year. The use of fly ash in concrete is found to affect strength characteristics adversely early age. One of the ways to compensate for the early-age strength loss associated with the use of fly ash is by incorporating steel fibres, which have been proved very efficient in enhancing the strength characteristics of concrete. The addition of steel fibres to concrete considerably improves its structural characteristics such as static flexural strength, impact strength, tensile strength, ductility, and flexural toughness.

Keywords: Sustainable production of concrete – Steel Fiber – Fly Ash – Structural integrity- Workability.

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REUSING PLASTIC BOTTLES AS BUILDING MATERIAL

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ABSTRACT

Nowadays, large number of plastic bottles are thrown away and wasted every day. People discard plastic bottles without considering their potential effects on the human's health and environment. Since plastic bottles cannot easily dissolve due to their chemical qualities, they are frequently found in waste and landfills and can last for up to 450 years before they decompose. Only a very small portion of plastic is recycled. Every year, India recycles between 15 and 25 percent of polyethylene terephthalate (PETE) plastic. A simple concept is that to use waste bottles as a construction material (Brick) with addition of a filling material. This filling material may vary according to the place of construction, type of construction etc. It can be effectively used to reduce its negative effects on the environment through reuse or recycling. For this study a model will be constructed, and the materials required for this study are Plastic bottles, fly ash, Nylon rope, Cement, Sand, coir, water. The compressive strength of the bottle brick will be examined and compared with the conventional bricks.

Keywords: Eco-Bricks, Compressive strength, Conventional bricks, Coir, PET bottles, Fly-ash.

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RAINWATER HARVESTING SYSTEM

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ABSTRACT

Water scarcity is serious problem throughout the world for both urban and rural community. So much of water is wasted for various purpose such as watering for plants and washing of vehicles etc. To avoid this wastage of water by using a technique which is known as rainwater harvesting system. The main aim of the project is reducing the water for different usages. In this system we collect water from the roof of the structure and stored in a tank and used for various purposes. Rainwater harvesting is defined as process of collecting the rainwater and using for the various purposes. In rooftop harvesting, the roof becomes the catchments, and the rainwater is collected from the roof of the house/building it can either be stored in a tank or diverted to recharge pit etc. This method is less expensive and very effective and if implemented properly helps in augmenting the ground water level of the area. The methods of rooftop rainwater harvesting are recharge pit, recharge trenches, storage tanks, abandoned dug wells, bore well. By this method we can utilize the rainwater effectively and increase the ground water levels.

Keywords: Construction process, Catchment, Filtration beds, Needs and Advantages.

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FOOTSTEP POWER GENERATION

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ABSTRACT

Nowadays energy and power are the one of the basic needs in this modern world. Energy demand is increasing day by day. On the other hand, the many energy resources are getting exhausted and wasted. Proposal for utilization of waste energy of foot power with human locomotion is very relevant in populated countries like India where roads, railway stations, bus stands, temples, etc. overcrowded and millions of people move around. this whole energy wasted. if this energy made possible for utilization it will be a great invention .in this project we are converting non-conventional from just walking footstep into electrical energy. This project uses simple drive mechanism such as rack and pinion assembly. The controller mechanism carries the rack and pinion and D.C generator output.

Keywords: Conventional Energy, Non-conventional energy system, D.C. Generator, Rack & Pinion

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STUDY ON RUBBER WASTE IN FLEXIBLE PAVEMENTS

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ABSTRACT

In this project, an attempt was made to analyse the modified bitumen of grade 60/70 with crumb rubber (i.e., the rubber obtained from the waste tires of vehicles). In developing countries like India, the network of road transportation is increasing rapidly. As the number of vehicles is increasing so are the heaps of discarded rubber tyres. In this project, an effort has been made to utilize these waste rubbers in flexible pavements. The crumbed rubber blended at specific temperatures of 150-160° c is used in the construction of flexible pavements. And Physical tests are to be performed that are used to determine the optimum bituminous pavement. In this study we used crumb rubber modifier in proportion 0%, 2%, 4%, 6%, 8%, 10%, 12% and 14% by the weight of VG-30 bitumen. In this study we are going to find out the percentage at which the optimum bitumen will produce. Physical tests include penetration test, softening point test, ductility test, flash and fire test, viscosity, specific gravity, and Marshall's stability test. The expectations from this study are to develop bituminous pavement with waste crumb rubber that would minimize the cost and provide better physical properties compared to normal conventional bituminous pavement based on the tests going to be conducted.

Keywords: Crumb rubber, VG-30 Bitumen, Flexible pavement, Marshall stability, Ductility.

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DESIGN AND CONSTRUCTION OF TECH PARK IN ADITYA ENGINEERING COLLEGE

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ABSTRACT

Parks are about a lot more than making a community more beautiful and live able, this Tech Parks also used to produce natural power and can promote a healthy ecosystem. The primary aim of the establishment of tech park is usually an advancement of scientific and Natural Techniques. The ultimate objective of a Tech Park is to provide an environment that will enable the local community people good surroundings here with manpower and natural techniques, we can produce some amount of electricity. It is a development that brings together nature and humans to enhance the operations of tech park, thereby providing various benefits. Finally, a small amount of electricity is being generated by this Tech Park.

Keywords: Power generation, Cycle Electricity Generator, Swing Electricity Generator, Environment friendly.

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AUTONOMOUS POWER-GENERATING AND ECO-FRIENDLY PARK

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ABSTRACT

The goal of the current paper is to present an environment that is created to produce electricity in a natural and eco-friendly manner by adopting various conventional ways and attract people to the park's alternative energy generation concepts, particularly those that are renewable in nature, like solar energy, and other that contribute to the dissemination of that knowledge. The proposed area, known as Autonomous Power-Generating and Eco-Friendly Park, will provide a pollution-free environment to the surrounding area. The park will be a component of a technology center, it will be accessible to people of all ages, primarily adults. Some equipment designed to produce energy when in use, and a prototyped dam with small whirlpool turbines are among the project that will be installed in the park, which is described in the article. While the people play, playground equipment like the slide, solar trees, swing, teeter-totter, and carousel are operated, and a power indicator shows how much energy is produced by their movement. These toys have electrical power conditioning systems that are used as energy conversion devices. The generated energy can be used to refuel guests' electronic portable gadgets (such as cell phones, notebooks, tablets, and so on.) and electrical appliances in the park. As a result, this concept will raise awareness among the public about the need for energy consumption as well as alternative energy sources, particularly solar energy.

Keywords: Autonomous power generation, Solar trees, whirlpool turbine, swing, Energy, Eco-friendly.

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RECYCLING OF DOMESTIC WASTEWATER USING CANNA INDICA IN CONSTRUCTED WET LAND

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ABSTRACT

Constructed wetland is an artificial wetland of treating municipal wastewater, grey water or run off. This uses natural components like vegetation, soil, gravel, and organisms to treat wastewater. The Constructed wetland acts as a bio filter that removes pollutants like organic matter, suspended matter and heavy metals like nitrogen, phosphorous. The objective of this is to analysis the wastewater generated and treat by effluents by wetland system and compare them with standard values. Our focus is treating the water coming from the drains of "Sri Lakshmi Aditya Hostel mess" in Aditya Engineering College, Surampalem, Andhra Pradesh. We have adopted species of vegetation i.e., is KAVALCHI (CANNA INDICA). After the constructed wetland treatment, the parameters like Turbidity, pH, E-Conductivity, TDS etc. are to be calculated and then compared with the standard values.

Keywords: Canna Indica, Constructed wetlands, wastewater, kavalchi, turbidity, pH, Conductivity, TDS, Standard value.

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COMPARISON OF GEO-POLYMER CONCRETE AT DIFFERENT TEMPERATURES USING DIFFERENT MOLARITIES ON MECHANICAL PROPERTIES

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ABSTRACT

This thesis presents an innovative approach towards the development of a green concrete. The Production of Portland cement causes the emission of pollutants and results in environmental Pollution. The usage of industrial by-products such as Fly Ash and GGBS reduce the pollution effect on environment. Geo-polymer concrete is such a one, and in present study the Portland cement is fully replaced by Fly Ash and GGBS and Alkaline Activator is used for binding of material. The alkaline liquids used in this study for the polymerization are the solutions of sodium hydroxide and sodium silicate. Five different molarities i.e., 8M, 9M, 10M, 11M, and 12M were taken to prepare the mix. The cube specimens are taken of size 150mm*150mm* 150mm are casted to test the compressive strength. Three different curing temperatures (ambient curing, oven curing at 65°C and 85°C) were adopted in this study. In total 120 cubes were casted for their compressive strength at age of 28 days respectively. The Geo-polymer concrete specimens are tested, and the test results are compared with conventional concrete. For this study M20 concrete mix was used for experimental work. It is observed that the strength of specimen is obtained at an early age for GPC and is economical compared to normal concrete. Thus, GEO-POLYMER concrete is an environmentally pollution free construction material.

Keywords: Geo-polymer, concrete, Fly Ash, GGBS, oven curing

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EVALUATION OF MECHANICAL PROPERTIES GEO-POLYMER CONCRETE AT DIFFERENT TEMPERATURES USING DIFFERENT BINDER RATIOS

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ABSTRACT

This paper presents the experimental investigation done on performance of geopolymer concrete subjected to severe environmental conditions. The grades chosen for the investigation were M-30, M-40, M-50 and M-60, the mixes were designed for molarity of 8M and 12M. The alkaline solution used for present study is the combination of sodium silicate and sodium hydroxide solution with the ratio of 2.50 and 3.50. The test specimens were 150x150x150 mm cubes, 100x200 mm cylinders heat-cured at 60°C in an oven. The geopolymer concretes (GPCs) have inorganic polymer of alumina-silicates as the binder whereas the conventional concretes have Portland cement (P-C) generated C-S-H gel (beside free lime). It is well known that mechanisms of attack by sulphuric acid and magnesium sulphates are different. Conventional concretes are generally not resistant to prolonged exposure to very high concentrations of these solutions because decalcification of C-S-H will occur. As a result of this, OPC concrete surface becomes soft and could be removed, thus, exposing the interior concrete layers to deterioration. At the same time as the magnesium sulphate attack, causes decalcification of C-S-H to form magnesium silicate hydrate (M-S-H). It also destroys the binding capacity of C-S-H and leads to a loss of adhesion and strength in concrete. Durability of specimens were assessed by immersing GPC specimens in 10% sulphuric acid and 10% magnesium sulphate solutions separately, periodically monitoring surface deterioration and depth of dealkalization, changes in weight and strength over a period of 15, 30 and 45 days. The test results indicate that the heat-cured fly ash-based geopolymer concrete has an excellent resistance to acid and sulphate attack when compared to conventional concrete. Thus, we can say that the production of geopolymers have a relative higher strength, excellent volume stability and better durability.

Keywords: Geo-polymer, concrete, Fly Ash, GGBS, oven curing