3rd International Conference

on

Futuristic and Sustainable Aspects in Engineering and Technology (FSAET-2022)

FSAET 2022

November 11-13, 2022

SOUVENIR

Editors:

Dr. Deepak Kumar Tiwari
Dr. Praveen Kumar Gupta
Mr. Prashant Sharma

GLA UNIVERSITY MATHURA

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Organised By
Department of Civil Engineering
GLA University
Mathura (U. P.), India

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Message from Guest of Honour

Dr. Kapilesh Bhargava
Scientist
Nuclear Recycle Board, BARC
, Mumbai (India)

It is matter of immense pleasure to know that the Department of Civil Engineering, GLA University, Mathura is going to publish the proceeding of abstract of 3rd International Conference on "Futuristic and Sustainable Aspects in Engineering and Technology" (ICFSAET 2022) scheduled during November 11-13, 2022. Sustainable development of the society is the need of hour. I am happy to note that conference aims at areas of sustainable development and engineering excellence. Water Resources Engineering, Geotechnical Engineering, Environmental Engineering, Transportation Engineering, Structural Engineering, Remote sensing and GIS technologies along with Construction Technology have been covered in this conference proceedings.

This conference is aimed at bringing together the designers, researchers, and practicing engineers working in the field of various specialization of Civil Engineering to foster and promote the exchange of ideas on the recent advances in the field of Civil Engineering for sustainable development. I believe that this is an opportunity to policy makers, academicians, researchers, students and field practitioners to share their experiences and knowledge by presentation of fundamental/applied scientific advances made in their eminent fields for sustainable development.

I welcome the keynote speakers, eminent academicians and all participants of ICFSAET 2023and wish ICFSAET 2022 a grand success. I also convey my deep appreciation to organizing committee for their hard work and dedication for organizing the International Conference.

Message from the Head

Dr. Sudhir Kumar Goyal
Professor & Head
Department of Civil Engineering
GLA University,
Mathura (India)

Its a matter of pleasure and satisfaction to learn that the Department of Civil Engineering, GLA University, Mathura is organizing a 3-day International Conference on "Futuristic and Sustainable Aspects in Engineering and Technology" (ICFSAET 2022) during November 11-13, 2022.

This Conference aims to cover the wide ambit of Civil Engineering topics in respect of Futuristic Development which, in itself, has now globally become a major issue of concern and challenges.

I am sure that the deliberations and exchange of thoughts and experiences amongst the participating Delegates, Research Scholars, Scientists and the curious students will be of immense use for all the participants, Engineers, researchers and Policy Makers.

I convey my sincere appreciation and thanks to the organizing team of ICFSAET 2022 for organizing such a useful event. I wish the event a great success

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Message from the Chief Chairperson

Prof. Subhas Tripathi
Associate Director Research,
GLA University,
Mathura (India)

I extend my warmest wishes for the successful compilation of the conference proceedings for the upcoming "Futuristic and Sustainable Aspects in Engineering and Technology" (ICFSAET 2022). As a dedicated researcher and an enthusiastic participant in the field of practical sciences and research work.

I am well aware of the significant effort and dedication that goes into organizing such an event. It is a testament to your commitment to fostering knowledge exchange and advancing the frontiers of research in themes like environmental engineering, construction technology, structures and other innovative fields and applications.

I commend your unwavering dedication and applaud your commitment to providing a platform for researchers and scholars to showcase their work.

The conference proceedings play a vital role in disseminating the latest research findings, insights, and innovations presented during the conference. Thank you once again for your valuable contribution to the research community. Your dedication and efforts are greatly appreciated.

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Message from the Dean, Research & Development

Dr. Kamal Sharma
Dean R&D,
GLA University,
Mathura (India)

It is with great admiration and appreciation that I acknowledge the significant effort and dedication you and your team have put into organizing this esteemed conference. Your commitment to advancing knowledge, promoting research collaboration, and fostering intellectual dialogue in the field of Civil Engineering is truly commendable.

The conference proceedings hold immense value as they serve as a vital repository of the latest research findings, breakthroughs, and innovative ideas presented during the conference. They play a crucial role in disseminating knowledge, enriching the academic community, and stimulating further research and development in the respective field.

I offer my best wishes for the success of the conference proceedings. May they serve as a catalyst for further exploration, collaboration, and innovation. Your commitment to nurturing intellectual growth and promoting the advancement of knowledge is truly commendable, and I applaud your tireless efforts in making this conference a resounding success.

Preface (Editorial Team)

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Assistant Professor,
Department of Civil Engineering

Tremendous progress has been made in the field of civil engineering since early civilizations throughout the world. Giant dams and reservoirs for the water resources management and flood control, highways, bridges, airports, industrial structures, marine structures, public water supply systems and wastewater treatment facilities are only a few to mention. A better understanding of natural disasters and environmental consequences of the developmental projects also have accompanied growth in infrastructure development. However, a lot more is yet to be achieved.

Advancements in civil engineering and thorough awareness of sustainable development have given necessary self-confidence and determination for the human race to face the world today. For this it is essential to share the acquired knowledge and experience globally and to incorporate these for sustainable design and development. With this objective, the Civil Engineering Department of the GLA University, Mathura has organized an International Conference on "Futuristic and Sustainable Aspects in Engineering and Technology" (ICFSAET 2022) during November 11-13, 2022.

Realizing the importance of recent developments in the area of Advances in Civil Engineering for sustainable development, the conference focusses on the following themes:

1. Water Resources Engineering

2. Transportation Engineering Planning and Traffic Management, Pavements, ITS

3. Geotechnical Engineering and Geo-environmental Engineering

4. Use of Geospatial (RS, GIS, GPS) and Al Technologies

5. Impact of the Climate Change

6. Environmental Engineering

7. Construction Engineering and Management

8. Structural and Earthquake Engineering

We are glad to mention that this conference has attracted quite a lot of interest and attention of academic institutions, industries of various professional fields and R&D organizations throughout the world as evident from the overwhelming response of the authors from several countries of the world. We expect that the deliberations and discussions of the several technical sessions will be well focused providing innovative ideas from a collection of foremost experts with a view to achieve a larger goal. We are sure that the souvenir of the conference will be a significant addition to the literature on the Futuristic and Sustainable Aspects in Engineering and Technology and will be helpful to the future researchers in their fields of investigations.

We take this opportunity to extend a hearty welcome to all the eminent keynote speakers across the globe, delegates and speakers of the contributory papers. The conference comes to reality due to the untiring efforts of large number of individuals as well as organizations. We are highly indebted to our University Chancellor, **Shri Narayan Das Agarwal Ji**, who is the main driving force for organizing this conference. We place our sincere gratitude to eminent keynote speakers across the world, delegates, paper presenters and our sponsors.

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Transportation Engineering

Use of Waste Plastic in Bituminous Mix and its Impact on Performance and Economy of Road

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ABSTRACT

Many articles have evaluated the effect of the addition of a wide range of plastic types on 8 bitumen properties. The addition of plastic waste reduces the penetration and increases the softening point and viscosity of bitumen. The objective of this study is to check for optimum use of waste plastic to improve the performance of bituminous mix and also to check for its cost effectiveness. Different percentage of waste plastic by weight of bitumen has been selected in bituminous mix varying from 3 % to 15% and Marshall Stability and flow value has been checked with reference to conventional mix. This was done by using dry process (coating of plastic to aggregates). Apart from assessing Marshall Stability and flow value different other test i.e. water sensitivity test, has been carried out and comparative study has been done for mentioned properties for normal aggregate mix and plastic coated (dry process) aggregate mix. Moisture damage test has been performed for normal aggregate mix and plastic coated aggregate mix and result has been analyzed towards water resistivity of plastic coated aggregate mix. The test results have shown that the addition of plastic has improved the properties of the aggregate (crushing value was improved by 23.42%, impact value by 17.93% and abrasion value by 24.31%) and conventional bituminous mix along with ensuring appropriate economical benefits. The basic cost analysis was done to estimate the economy incorporated by the use of waste plastic. 5% (per cubic meter) cost reduction has been calculated by using waste plastic.

Key Words: *plastic modified mix, municipal waste, waste plastic*

Improvement of Auto Emission Testing Centers for Mitigating Vehicular Exhaust Emissions – A Case Study in Kolkata city

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ABSTRACT

Due to rapid urbanization, number of vehicles is drastically increasing in metropolitan cities of India consequently, air pollution has become great concern for environment and human health. Transportation sector contributes almost 14% of the global greenhouse gas emissions. Many countries including India have taken various steps to mitigate vehicular exhaust emission under the Inspection and Maintenance (I/M) program. Pollution under control certification (PUC) of in use vehicle is one of the important components of I/M program in India which is provided by authorized Auto Emission Testing Centers (AETCs). In Kolkata city there is serious concern over quality and credibility of AETCs. In present work, six rational criteria which can affect the performance of AETCs has been identified as Calibration of Equipment, Maintenance of Equipment, adherence to prescribed testing procedure, knowledge of operator, infrastructural facilities and database management and performance of each AETC has been assessed. Each AETCs has been assessed on linguistic scale from very poor to very good and by use of fuzzy theory a fuzzy score for each criterion has been calculated. Analytic Hierarchy process (AHP) is used for calculating the weightage of each criteria by pairwise comparison. Using the Fuzzy score and AHP weightage of criteria, a performance function for AETCs has been developed and performance index of each AETCs has been calculated. Some inventory data has also been calculated during the technical audit. Furthermore, all the audited AETC has been divided into groups based on its performance index by using clustering technique. Finally, recommendations have been given to improve the performance of AETC and making the PUC norms more stringent.

Keywords: Vehicular emissions, Performance of AETC, Pollution under control certification. PUC norms

Assessment of Road Traffic Noise and Associated Health Complaints Analysis through Structural Equation Model

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ABSTRACT

Noise pollution is one of the foremost concerns in the modern era, which hampers the physical and mental well-being of developed and developing countries due to the increasing number of vehicles. Various studies have reported associations between noise exposure and heart diseases, insomnia, stress, annoyance, and high blood pressure. These findings motivate us to assess the situation within our area. This paper aims to analyze the effects of traffic noise on dwellers and on the people living near the area which is adjacent to the national highway (NH-19). This study is based on the subjective analysis of the questionnaire on traffic-related noise pollution. The survey was conducted both online and offline mode for the online survey google forms and offline personally filled hard copies in the local language were used. The data was gathered from 740 valid questionnaire respondents from Mathura (India). Respondents exposed the road traffic noise and analyzed it through structural equation modeling (SEM). AMOS software has the relative link between discrete latent factors calculated by the structural equation model. The constructed Prototype authentication was performed by testing the proposition along with the Coefficient of determination. The calculated state of art methodology for model-based collaborative filtering on the humanoid fitness in the loud zone was categorized by coefficients estimated in the SEM prototype. Protruding effects of noise contamination affect the humans employed in the loud zones. The established prototype identified some associations midst typical structures in the examination of noise exposure in the Indian context and may assist other scholars and scientists to perform further examination.

Keywords: *Noise Pollution; Self-assessment; Road traffic noise; Human health; Structural equation model; AMOS Software*

Analysis of Traffic Safety Awareness Among Road Users in North Central Region

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ABSTRACT

Understanding essential role of the knowledge and awareness of traffic regulations and bad driving practices in reducing traffic accident, this study was carried out to investigate traffic regulations knowledge and awareness among drivers in North Central Region in India. To achieve the objectives, a questionnaire was developed and distributed among road users. The main findings showed that a very low percentage of participants fully complied with speed limits; the majority used mobile phone during driving and drove when feeling fatigued. Interestingly, some of participants lacked the knowledge of traffic signs and a high percentage of participants were knowledgeable of wrong driving practices, which could be the main reasons for the high rate of accidents in the region. Based on the findings of this study, serous efforts should be exerted on promoting traffic safety awareness and compliance with traffic regulations. This study also suggests increasing the female participation on the roads, as they have shown high level of knowledge for traffic regulations. Furthermore, authorities should escalate the efforts to enforce regulations.

Keywords: *Traffic signs, Road Users Safety, Road users' profile*

Review of different techniques used in intelligent transportation system

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ABSTRACT

An advanced application called as an intelligent transportation system (ITS) aims to give cutting benefits related to various modes of transportation and traffic management and to encourage users to use transportation networks in a safer, more structured, and "smarter" way. Using emergency services when an accident occurs, utilizing cameras to police traffic regulations or using signs to indicate speed limit changes depending on the circumstance are some of these technologies. Despite the fact that ITS can refer to all forms of transportation, the European Union's 2010/40/EU directive, passed on July 7, 2010, defined ITS as systems that apply information and communication technologies to the field of road transportation, including infrastructure, vehicles, and users, as well as to traffic management and mobility management.

Keywords: *Intelligent Transportation system (ITS); Smart system, surveillance; CCTV*

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A Review on Accessibility Based Planning for Public Transportation

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ABSTRACT

Movement in cities mainly regulated by the various purposes likes work, shopping, recreational activities. Accessibility is related to ease of access while mobility is related to ease of movement. In literature review concept and components of accessibility is studied first. Though there are many accessibility measures techniques but out of this gravity accessibility measures and cumulative accessibility measures are very important as they consider land use factors for evaluation purpose of accessibility. It also discusses different case studies related to accessibility based planning which will provide overview of application of different accessibility measure in city to improve performance of transportation system. So based on literature available we can conclude that Accessibility gives us authority for analyzing actual accessibility against the indicators due to which accessibility problems can be identified, addressed and monitored in better possible way so that sustainable transportation can be achieved in efficient manner.

Keywords- *Accessibility, Evaluation, Planning, Transportation, Sustainable*

Traffic Stimulation and Modelling in Specific Areas

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ABSTRACT

This article focuses on microsimulation as it pertains to the spectrum of traffic. Even though there are big groups, there are so many hybrids that it is hard to put them all in one. Traditionally, in order to allocate congestion to a system, a static equilibrium must be reached in which no vehicle can find a faster route. Forecasts of the connection flows resulting from operator choices are thus reasonably accurate. The problem is solved iteratively until all routes between each origin and destination pair take the same amount of time. Transport is distributed among the shortest paths, times are revised using proper development, leading to the assignment of more routes, and so on. Microsimulation has been used for minor network components in the past, but it is now possible to mimic entire metropolitan networks to the level of a single car by employing a substantial amount of computing power. Every unit in a geographical matrix is modified using template matching based on its own state and the states of its Neighbours at an earlier time step. Simple rule-based behavior is used at the lowest level of detail. Simulations are created to display the growing order in addition to the effects of events that cause increasing disorder. Microsimulation is also used to show how control and routing techniques work and to predict how route information will affect things. Traffic Stimulation and Modeling aims to enhance transport operations and the profitability of transport services, minimize traffic congestion and fatalities, offer adequate driver training, maintain road infrastructure, and uphold traffic law enforcement.

Keywords- *Microsimulation, Traffic, Modeling.*

Bearing Performance Review of RCC Road Bridges Incorporating Indian Perspective

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ABSTRACT

Bearings are an integral part of a bridge. They play a pivotal role in ensuring optimum performance of the bridge. This study attempts to present an Indian perspective on the significance and functionalities of bridge bearings. It provides an overview of bearing design provisions as adopted by Indian Standard Codes, with a brief background of improvements incorporated. It covers the different facets of bridge bearings and provides an account of prominent issues pertaining to the domain. The recommendations of different researchers, bottlenecks they faced and prominent deduction they proposed, have all been compiled in this review. The different types of bearings, along with their relative characteristic comparisons have been discussed and the importance of bearing on the structural action and efficiency of the bridge has been established.

Keywords: Bearing, Behavior, Bridge Engineering, Reinforced Cement Concrete.

An Essential Concepts for Creating A Road Asset Maintenance Management System

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ABSTRACT

The need for road asset maintenance in India is greater than the resources that are available, which emphasises the necessity for developing asset maintenance management. If the pace of asset deterioration cannot be adequately controlled, the cost of maintaining the road assets would increase and be higher than ever. In order to maintain high-quality road assets and stay within budgetary constraints, India has to adopt a road asset maintenance management system. For the successful implementation of road asset maintenance management in India, a number of difficulties must be resolved. The creation of a system for managing road asset maintenance is a difficult procedure. As a result, an effort has been made in this study to highlight a few fundamental ideas that require special emphasis if India is to establish road asset maintenance management. These comprise the assessment of asset state and creation of databases, administration of road asset maintenance, funding for road asset, etc. This study is anticipated to open the door to India's establishment of a road asset maintenance management system.

Keywords: *Road maintenance pavement management maintenance management system*

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Methods for pavement surface monitoring: a review

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ABSTRACT

Development in transportation sector led to increase the traffic volume in past year. Increase in the number of vehicles have tendency to deteriorate the pavement (paved or unpaved) surface due to heavy load and their repetitions. Heavy vehicle (>4 axle) has more tendency to damage the pavement, so pavement surface monitoring emerges to maintain the pavement surface. Pavement surface monitoring also helps in road safety also, as many accidents occur because of pavement distress like potholes, shoving, rutting etc. There are many methods for pavement surface monitoring, methods may be manual, and semi-manual. In this study semi-manual method is focused. In this method pavement distress images can be captured using high resolution camera of smart mobiles or tablets, in built with GPS. More than 5000 images will be captured of different types of distresses, all distresses are varied in sizes also, and of different location. These images are enhanced using MATLAB or any other software and then coded for deep learning. In deep learning method all the data set of pavement distresses are trained so that we can easily identify a new distress without any time delay. These images are also mapped on GeoSetter software, so that data set can be imported to Google earth file and that can be submitted to maintenance department for healing the pavement distress.

Keywords: *Pavement Distress images, Maintenance, GeoSetter, Deep Learning Method*

A VANET-based proposed model for the several layers of the intelligent transportation system (ITS) and its application

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ABSTRACT

Rapid expansion in the number of vehicles on the road throughout the world is exacerbating the problem of intelligent transportation systems. Without such a tremendous structure, the existing issues like collision, road condition monitoring, lack of intelligent traffic light system, starvation in emergency vehicle pre-emption will continue to grow and deteriorate the situation in the country. Intelligent Transport System (ITS) has the ability to provide a high level of convenience in Traffic congestion, traffic light system, green route, and emergency vehicles pre-emption, parking system, road monitoring system, and many more features. The supported work of this paper presented work built on different layers of ITS and how they are connected to each other and its applications. This paper provides relevant information about ITS, its applications and better understanding of different layers to avoid prevailing issues by understanding the system deeply. It has been predicted that existing systems have some limitations because of using in-adequate structure or working layers. As a result, this research incorporates a collaborative effort for better solution and knowledge like reducing average waiting time, avoid accidents, avoid more fuel consumption, avoid parking issues, prevent collision and other optimised result with more different features. This will help in building a model that is cost efficient and easy to understand

Keywords: *VANET, intelligent trtansportation system, traffic light*

Traffic road safety audit at lumding railway station

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ABSTRACT

Indian railway is responsible for rail transport in India .it is the fourth largest railway network in the world comprising 113,115 km railway track out which 2434 km is in Assam. On average 20038 trains are on the run in India at any given moment. The study area is The existing level crossing (ST-50) and proposed ROB at LumdingYardrailway level Crossing Gate on Road from Lumding Divisional Railway Manager office toLumding Railway Station South Entrance and to Railway Stadium near Horlangfur Bridge in Assam State.The present study has been formulated to assess the volume of traffic flow and theircharacteristics, and to find out the Peak Hour Traffic to assess the future growth rates of traffic based on traffic influence areas and social economic characteristics. This study has been formulated to find the volume of commercial traffic for Pavement Design.To find the commercial vehicles axle load configuration

Keywords: Peak Hour Traffic, volume of traffic flow, vehicles axle load

Assessment of traffic noise on national highway near silent zone of Mathura (india)

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ABSTRACT

In the past one decade, there is vast development in urbanisation as technology developed. This rapid urbanisation has exceeded the density of the population and industrialization, thus increase the transportation. Due to the increase in transportation, noise pollution is also increasing rapidly, as a result of which people are suffering from chronic diseases. Present study deals with the assessment of traffic noise on the national highway (NH-44) near the hospitals and educational institutes which comes under the silence zone. Traffic and noise have been monitored at four different locations on NH-44 near Mathura during weekdays (Monday to Friday). Maximum and minimum noise level was 84.02 and 76.51dB respectively during peak hours which exceeded the limits of silent zone prescribed by central pollution control board (CPCB) India. Further traffic and noise data were characterized by using cluster analysis (CA). Hence, it showed major concern about human health issues. Thus, Road traffic noise in silence zone is recognized as a serious health hazard and need to be controlled. This study will assist the policymakers to overcome such challenges, research should further find ways or solutions to avoid traffic noise. It includes deploying noise barriers, diligent traffic rules, and understandable educational boards to make the people aware of the impact of traffic noise.

Keywords: *Traffic noise, Noise level, Noise pollution, Cluster analysis, Health problems, Chronic disorders.*

Effect of Peak Ground Velocity on the Seismic Response of Bridge

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ABSTRACT

This research looked at dynamic response of high damping rubber bearing(HDRB) isolated bridge is presented for ground motions of different peak ground velocities. Bridge model of three span of length 90 m with 30 m of each span and pier height of 10 m has been modelled in finite element based software SAP2000. The impact of seismic isolation is studied for two near fault ground motions with different peak ground velocities, and bridges are analyzed using time history method in both horizontal directions. Because of bearing's hysteric energy, the bridge with HDRB isolation has lower seismic reaction.

Keywords: *High Damping Rubber Bearing (HDRB), Isolated Bridge, Time History Analysis, Hilber-Hughes-Taylor (HHT) alpha*

An Inventive Road Network Maintenance Plan for Rural Areas

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ABSTRACT

The social and economic growth of rural roads is severely hampered by the fact that many rural towns lack year-round access. Through inconsistent travel and high unit transit costs for crops, goods, services, and people, poor access reduces the effectiveness of agricultural, commercial, educational, and health operations. Experience has proven that these roads are rarely kept in an usable shape despite the fact that they were relatively inexpensive to build, making them an unsustainable maintenance burden for many rural communities and road agencies like PMGSY. Due to improper maintenance, rural roads are rapidly deteriorating, which increases the cost of operating vehicles and causes an increase in accidents, among other problems. Since roads start to deteriorate once, they do so quickly and beyond the point at which repair is useful. Therefore, it is crucial to create a plan for maintaining the road network. An original plan for maintaining rural roads is put out in this study. It is suggested to use a two-stage maintenance approach. A hypothetical network of 10 sections of rural roads is used as an example to demonstrate the methods provided in this study. Analysis findings showed that the suggested technique is thought to be more logical, creative, and rational. This report also includes a few strategies for maintaining rural roads. Therefore, it is anticipated that this study will be helpful for maintaining India's extensive road network and thereby helpful for maintaining a significant asset of road infrastructure

Keywords— Rural Road, Road Maintenance; Maintenance Strategy, Maintenance Priority, Maintenance activity

Method to Produce a GIS database of Pavement Distress of National Highway -44

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ABSTRACT

Pavement surface monitoring is an important part to increase the life of pavement and to minimize the cost incur in maintenance of pavement at an early stage. Traditionally pavement monitoring done using manually method. The aim of this study is to detect the distresses at an early stage so that maintenance can be cost effective. In this study National Highway -44 is selected which is stretch from New Delhi to Agra about 200 Km. Traffic volume HCV of NH-44 is almost equal to LMV, because of that pavement distresses are more frequent and need to be maintained effectively. Pavement distresses are captured using camera and at the same time location is also recorded, these images are then plotted on the map using the software, Geo Setter. Geo Setter helps to export the images to Google earth file which can be used to identify the pavement condition. This helps to save the manual labour and provide the efficient and accurate data and safety is also major concern which can be minimized using this method. This file can be shared with maintenance department to plan for future maintenance according to requirement and severity.

Keywords: *Mathura, Geo Setter, Pavement Distress Images*

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Dynamic Response of an Isolated Bridge with High-Damping Rubber Bearings

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ABSTRACT

The comparative study of the dynamic response of isolated high-damping rubber bearing(HDRB) and the non-isolated bridge is presented. A bridge model of three spans of 90 m with 30 m of each span and a pier height of 10 m has been modeled in finite element-based software SAP2000 for the present study. Two models are used in this study: a non-isolating bridge and a base-isolated bridge with an HDRB isolation device, and isolation are provided between the superstructure and substructure. The influence of seismic isolation is studied for two localized ground movements near faults, and bridges, both isolated and non-isolated are analyzed using the time history method in both the X and the Y directions. The bridge that has HDRB isolation has a smaller seismic reaction than a bridge that does not have isolation because of the bearing hysteric energy.

Keywords: *High Damping Rubber Bearing, Isolated Bridge, Time History Analysis*

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Method for Identifying and Analysis of Defects on Highways

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ABSTRACT

After the improvement of road service requirements, the standards of highway protection and maintenance are gradually improved. Before obvious damage such as obvious cracking (block, transverse, longitudinal) and rutting Emerging, unexplained distress (micro-cracks, polishing, pockmarks) occurs first, this inconspicuous Crisis pavement can provide the basis and criteria for preventive maintenance. At present most of the preventive protection measures are prescribed by experts experienced in road maintenance and repair after site visits. method is like this is difficult to operate, and has a certain amount of volatility because it is based on experience and personal knowledge. Automated detection is a difficult task because of the complicated structure and textural similarity of surface cracks, as well as noise and picture illumination change. To perform pixel-wise categorization of surface cracks on road and pavement photos, we present a deep fully convolutional network in this research. The identification of errors in each image, matching the photos, and combining the many extractions. We illustrate the improvement in performances, specifically how the number of inaccurate detections is decreased.

Keywords:

Review of the Methods Used for Predicting and Modelling of Traffic Flow Using Artificial Intelligence

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ABSTRACT

Traffic flow modelling is one of the most complex problems in transportation engineering. Many different approaches have been used to model and predict the traffic. In recent times Artificial intelligence (AI) techniques have been used to model traffic flow. A few examples of such models are statistical based methods, traditional machine learning methods, deep learning-based methods, reinforcement learning methods and transfer learning methods. A predictive algorithm is a technique used to model traffic flow. AI techniques have been used to model Traffic Flow. A few examples of such Models are statistical analysis and Mathematical Models. A predictive algorithm is a technique used to model traffic flow. A mathematical model is mathematical description of traffic flow that incorporates variables such as road capacity, volume and speed. Statistical model analysis is a method used to detect problems analyze data and make decisions. The objective of this research review paper is to compare the various major artificial intelligence methods and models which have been developed.

Keywords: traffic modeling, traffic prediction, artificial intelligence, machine learning

Waste plastic mixed with bitumen for optimum utilization analysis of waste plastic for construction of flexible pavement

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ABSTRACT

Even while waste plastic has the potential to be a beast for the present and the future, the way of life that exists today prevents the adoption of a total ban on its usage. Because it is unpleasant and non-biodegradable, the transfer of waste plastic presents a difficult problem for everyone. To increase the intended mechanical qualities for a particular road blend, this waste plastic partially replaced the standard material due to the logical arrangement of the materials and the possibility for ground and water toxicity. The reason for developing adaptable asphalts as well as the processes developed to use plastic waste for that purpose will be analyzed in the current research research. Bitumen is used as the binder during the normal street construction process. This bitumen can be mixed with leftover plastic things to make a bitumen blend that can be employed as the optimal layer of flexible asphalt. Blends made using polymers will be used for research. Bitumen was replaced with plastic in amounts of 5%,10%, and 15%. 10% of the composition is modern plastics, while 5.25% is bitumen. The Marshall Test and the aggressive application of hot blend black-top were the main topics of this research. In this study, It is discovered that the expense of plastic blend bitumen was about 5% overall. less expensive than standard bitumen. Moreover, it is effective and environmentally beneficial for the construction of polycarbonate bituminous roads.

Keyword: Bitumen, waste plastic, flexible pavement, coated aggregate, mix design, bitumen test

Geotechnical Engineering

A Review on Soil Nailing Technique for Soil Slope Stability Analysis

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ABSTRACT

The failure of a slope is a natural disaster and a major catastrophe with which our environment generally deals. This disaster is primarily caused by unstable slopes or soil. Soil stabilisation method modify the existing soil for engineering purposes using chemical, physical and biological, or a combination of these three techniques. Soil nailing is a method of in-situ reinforcement utilising steel bars capable of withstanding tensile, shear, and bending forces. This method is employed for both stabilisation of retaining walls and slopes. This research primarily focuses on using soil nails to enhance the geotechnical properties of a sloped soil using the results of numerous previous studies. This research will assist in understanding the benefits and uses of the soil nailing method in comparison to other traditional methods for stabilising soil slopes

Keywords:

A Review on Methods and Materials used for Slope Stability Analysis

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ABSTRACT

The world's infrastructure is currently developing considerably more quickly. The availability of land will become critical to how the world develops in the future. Sometimes buildings need to be constructed on sloped ground in areas with insufficient land. It's difficult to build footings on slopes. In the development of roads, embankments, canals, earthen dams and other infrastructures, we choose various slopes with various geometric conditions. Biggest challenge in the construction industry is how to create a slope that is both safe and as well as economical. Shearing strength and settlement of soil, seismic activity, ground water table, and soil ultimate bearing capacity are the main factors that determine the stability of slopes. This study offers a review of the researches that are currently accessible on the methods and materials used for the analysis of slope's stability.

Keywords: *Bearing capacity, Settlement, SPT, Particle Swarm Optimization (PSO)*

Estimation of Liquefaction Potential of an Alluvial Soil Site – A Reliability Based Approach

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ABSTRACT

Alluvial soil sites with shallow ground water table are susceptible to earthquake induced liquefaction. Field tests like Standard penetration test (SPT), Cone penetration test (CPT) and Cross-hole sonic logging test (CHST) are useful in determining the potential for soil liquefaction under different peak ground acceleration and earthquake magnitudes. However, conduction of these field tests requires too much manual intervention, and their results are affected by the way they are conducted at site. This results in inherent uncertainties in the outcome of these tests. Moreover, as a general methodology, liquefaction potential based on these test results is estimated for individual locations below the structure and the most conservative estimate is used to describe the liquefaction potential of the entire area. If for some reasons, more soil investigations are carried out at later stages at the locations of same structure, the outcome of earlier estimation of liquefaction potential may change drastically. Also, the methodology adopted to determine liquefaction potential of structures with different safety classes is same, thereby not giving weightage to the importance of the structure in the assessment of liquefaction potential. In the present paper, liquefaction potential estimation of an alluvial soil site has been carried out using SPT & CPT based approaches as per the recommendations of NCEER (NCEER 1997) & USNRC guide (NUREG/CR-5741). SPT was conducted at 25 different locations covering the entire building footprint, while CPT was conducted at 6 different locations uniformly distributed below the building footprint. Reliability based methodology has been attempted to convert the data from different borehole locations below the structure to an equivalent borehole to estimate the liquefaction potential using SPT & CPT approaches. Fitting of different probability distributions, such as, normal, lognormal and gamma have been attempted to describe the test data obtained from different test locations at a particular depth below existing ground level. All measured values like SPT blow counts, soil density, and percentage fines for SPT based approach, and cone resistance, sleeve friction and soil density for CPT based approach have been converted into an equivalent borehole by using the best fit probability distribution. This approach inherently takes into account the variability in data and provides results that are not much affected by the future investigations that may be carried out in the concerned area. Liquefaction potential assessment has then been carried out using different percentile values of these parameters. Based on different safety class of structures, different percentile values have been proposed in order to give weightage to importance of the structure.

Keywords: Liquefaction; Standard penetration test; Cone penetration test; percentile values.

Evaluating Factors Affecting Terrafirma as a Sustainable Binder of Clayey Soils

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ABSTRACT

Expansive soils possess very little shear strength value under wet conditions. Besides this, such soils may exhibit a high swelling phenomenon in the wet state and high shrinkage phenomenon in the dry state. Due to such, these soils may be considered as most problematic types of soils. Alternate swelling and shrinkage may cause differential settlement in the substructure part of the structure built over the soils. This differential settlement may cause crack development in various parts of the superstructure leading to a collapse of the structure. This whole phenomenon may reduce the effective life span of the structures such as roads, buildings, bridges, and so on, built over these soils. As a consequence, this may lead to frequent repair and maintenance of the structures, thus, in huge economic loss. In this article, attempts are made to describe the impact of Terrafirma (TFA) on influence the strength of soil, when mixed with such soils. Stabilizer like Terrafirma has a vast range of response spectrum. Vast spectrum laboratory tests like Atterberg's limit test, FSI (Free Swell Index) test, compaction test, UCS (unconfined compressive strength) test, CBR (California bearing ratio) test, and ER (expansion ratio) measures on soil samples with an increasing percentage of Terrafirma between 2 to 8%. Results of these tests showed that MDD, as well as OMC, has increased due to mixing Terrafirma in soil sample. One may notice that CBR test value of clay has been enhancement significantly due to mixing Terrafirma stabilizer. Strength of soil at 8% of Terrafirma stabilizer has increased around 4 to 5 times as that of natural clay subgrade. The nature of swelling in expansive soil was determined by ER and FSI of soil modify with Terrafirma up to 8%. Expansion ratio and FSI has found to be decreased with increasing percentage of Terrafirma. Findings of the laboratory tests show that Terrafirma stabilizer is effective in the enhancement of the index and engineering properties of expansive soils. Pozzolanic reactions from cementitious materials increased the UCS and CBR values. CBR value increases 5 to 5.5 times of natural soil at optimum mix. Shear strength of treated sample rise not only when the proportion of stabilizer is increased but also when the curing period is extended. Micro-level analyses, such as XRD was carried out in addition from tests for determination of soil properties. At the micro-level, Enhancement in soil strength has found using this method. Due to an increase in stabilizer content as well as curing time, a significant fall in peak value was observed in the outstanding results by the XRD examination.

Keywords: Expansive Soil; Terrafirma; UCS; CBR; XRD.

Numerical study on stability analysis of Embabkment using geogrid

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ABSTRACT

Slope failures lead to loss of life and damage to property. Slope instability of natural slope depends on natural and manmade factors such as excessive rainfall, earthquakes, deforestation, unplanned construction activity, etc. Manmade slopes are formed for embankments and cuttings. Steepening of slopes for construction of rail/road embankments or for widening of existing roads is a necessity for development. Use of geosynthetics for steep slope construction considering design and environmental aspects could be a viable alternative to these issues. Methods developed for unreinforced slopes have been extended to analyze geosynthetic reinforced slopes accounting for thepresence of reinforcement. An effective numerical method to explore thebest, efficient and economical embankment designing parameters. In this research, the research area focused on about the parameter by varying height (2m to 8m), side slope(1V:1H to 1V:4H) and varying tensile strength (180 kN/m,300kN/m,600kN/m,800kN/m,1000 kN/m).To improvise the slope stability applying geogridss in single and double layers and check the slope stability to the embankment. The factor of safety of the numerical models has been analyzed by Bentley software named PLAXIS 2D. PLAXIS 2D is a user-friendly, finite-element package that provides you with the ability to model diverse geotechnical problems from a single, integrated application. You can analyze the deformation and stability of projects ranging from excavations, embankments, and foundations to tunneling, mining, and geo mechanics. This study based on different types of zonal conditions like static condition. The main purpose of this research work finds out the percentage of improvement of the slope stability
using Bi-axial Geogrids as soil reinforcement in subgrade layer.

Keywords: Geogrid, PLAXIS 2D, Tensile strength

Study the Effect of Specimen Diameter on Shear Strength of Soil in Tri-axial Test

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ABSTRACT

In geotechnical engineering, the shear strength parameters are crucial and useful for design work to produce safe and economic geotechnical structure. The shear strength of soil is its maximum resistance to shear stresses just before the failure. Soil derives its shearing strength from two main components: internal friction angle and cohesion. Tri-axial tests are essential to estimate the shear strength properties of the soil. As per IS codes this test is limited to cylindrical specimens of nominal diameter of 38, 50, 70 and 100 mm and height equal to twice the nominal diameter. Normally tri-axial tests are carried out on samples of 38 mm diameter and 76 mm height. This paper presents a comparison between shear strength parameters measured with tri-axial tests on soils specimens with 38 mm, 50 mm and 60 mm diameters only. The ratio of diameter of the specimen to the maximum size of the particle taken for the study was kept greater than five as specified in IS 2720 (Part-12). Consolidated undrained (CU) tests were performed with four incremental confining pressures of 1, 2, 3 and 4 kg/cm2 which help to derive both total and effective shear parameters. Analysing the results that were obtained from this study, it is possible to indicate that the variation of specimen diameter has a marginal effect on shear strength parameters. Increasing the diameter of specimen was found to decrease the undrained friction angle ($\square$).

Keywords: *Triaxial test, diameter, shear strength, cohesion, internal friction*

Probabilistic Analysis of Shallow Foundation Based on Settlement Criteria Using ANFIS and PSO-ANN

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ABSTRACT

Soil is a varied medium i.e. its nature and properties change while going along surface and depth. Due to the effect of many attributes of soil the geotechnical behaviour for soil and foundation system makes the prediction of settlement of shallow foundation a complex problem. The present study describes the application of two probabilistic based soft computing techniques i.e. Adaptive Network based Fuzzy Inference System (ANFIS) and Particle Swarm Optimization based Artificial Neural Network (ANN-PSO) to study the reliability analysis of a shallow foundation based on settlement criteria. These models are reliable and can be used by civil engineers for routine design practice. The models were also tested using various fitness parameters. Based on the results obtained PSO-ANN models outperformed while comparing the two models for the reliability analysis of a shallow foundation based on settlement criteria.

Keywords: reliability, ANFIS, shallow foundation, PSO-ANN.

Expansive soil stabilization using Leather Solid Waste and Bagasse Ash

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ABSTRACT

Expansive soils are problematic for their shrinking and swelling tendencies of clayminerals. To strengthen the strength of weak soil, stabilisation involves rearrangement ofsoil particles by adding additional particles. By utilising locally accessible wastematerials, construction costs can be reduced by a certain amount. Lime, cement, fly ash,and other soil stabilisers have been employed for centuries to adjust soil qualities. Nontraditional stabilisers, on the other hand, are available in huge quantities and may take less time than traditional stabilisers. This study employs sugarcane waste fibre ash and leather solid waste to investigate the effect of varying amounts of sugarcane waste fibre ash and leather solid waste on black carbon. Small-scale businesses and manufacturers in India generate a significant amount of leather solid waste and sugarcane waste, both of which will be used to stabilise black cotton soil. Bagasse ash and leather waste will be evaluated for their efficacy as pavement foundations as part of the CBR test. To achieve maximum dry unit, various proportions of bagasse ash and leather solid waste are added to the black cotton soil with its OMC.Ithasbeen studied that after seven days of soaking, the CBR value of black cotton soil has been improved by 67.39 percent by increasing the proportion of acrylic co-polymer

Keywords: Compaction, California bearing ratio (CBR), OMC

Environmental Engineering

Groundwater Quality Index Mapping using Geoinformatics Approach

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ABSTRACT

Groundwater Quality Index Mapping using Geoinformatics Approach Anuj Goyal1 1Assistant Professor, Civil Engineering Department, GLA University, Mathura, U.P, IndiaEmail: anuj.goyal@gla.ac.in Abstract Within the scope of the present investigation, a water quality index was applied to the task of determining the state of the groundwater that is found in the Gurugram district. At the beginning and end of the monsoon season in 2013–2014, water samples were taken from a total of 31 distinct locations across the country. Calculating the water quality index required the use of eight distinct water quality measurements, including pH, alkalinity, hardness, chloride, total dissolved solids, electrical conductivity, and nitrate and fluoride. These were all included in the calculation. The eight factors that were discussed before are the ones that have the most significant influence on the overall quality of the drinking water. When compared to the tests that were performed before a rainfall, 29% of the water tests that were performed during one fall into the categories of "good" to "medium." Pre-rainstorm tests labelled 81% of samples as "Bad" or "Very Bad," indicating that the water is unsafe for direct consumption and needs to be treated. However, postrainstorm tests only identified 71% of samples as "Bad" or "Very Bad." This suggests that the water is unsafe for direct consumption and needs to be treated. After undergoing treatment, the water is fit for human consumption. In order to assist with this investigation, a map of the Groundwater Quality Index was created using geoinformatics. This map is quite helpful for gaining a rapid and simple understanding of the water's quality.

Keywords: *Water Quality, Groundwater, Water quality, Geoinformatics,*

A Technical Analysis of Wastewater Production, Treatment and ReuseStrategies in Uttar Pradesh

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ABSTRACT

The earth's water resources are limited. Less than 1% of this water is suitable for human consumption. Because of the rapid increase in population, there is an urgent need to conserve and reuse water. This study examines all water utilization methods, water demand, and the current state of waste water treatment in India's most populous state, Uttar Pradesh. The current water supply system is incapable of meeting the demand. For a demand of 105.96 BCM, there is a supply of 77.99 BCM. The total amount of seepage waste generated is estimated to be 8263 MLD. In Uttar Pradesh, there are 107 STPs (operational and non-operational) that can treat 3370.87 MLD of water. The remainder of the waste is dumped into rivers or on open land, which harms the environment and exacerbates the problem of water pollution. In this paper, methods for treating waste water (STP) in Uttar Pradesh are described, and a comparative analysis of sewage generated, sewage treated, and the number of STP installed with their total capacity since 1989 is presented. The percentage increase in STP installed per decade is decreasing, as is the percentage increase in actual utilization capacity. These decreasing trends did not correspond to a rapidly growing population, and industrialization resulted in increased waste water generation. There is a need for more efficient water treatment methods, and a greater number of STPs with high actual utilization capacity should be installed to address the issue of untreated sewage disposal. The reuse of treated waste water for various purposes is also addressed. "Water is the reason we live on Earth; conserve and use water efficiently to ensure a prosperous future."

Keywords—Water Treatment, Wastewater Management, Water Reuse, Water Demand

Evaluation of water conservation in green buildings

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ABSTRACT

The population of India is increasing day by day due to which the demand of water resources is also increasing. The problem of water scarcity has direct effect on the water availability and food security of the country. Water bodies are ecological, culturally and economically important ecosystems which provide many valuable services to mankind. However, as climate change and human activities intensify (e.g., global warming, land use and cover changes, population explosion, nutrient and organic matter loading, water conservation projects and other anthropogenic factors), water quantity, water quality, ecosystem health and services are differently challenged. The government is trying to reduce the problem of water scarcity. The use of water is increasing in various sectors in India. Therefore, the demand of water should satisfy without affecting the availability of water resources. Sustainable management of the water resources are required to meet the demand of water and to protect the water. This paper aim is to find out the role of green buildings in the water conservation and discussed the measures under the green concept to save water.

Keywords: green buildings, water conservation, rating systems

Integrating Water Quality Index and GIS Approach Towards a Better Understanding of Drinking Water Quality in Mahanadi basin, Odisha

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ABSTRACT

Surface water quality is one of the critical environmental concerns of the globe and water quality management is top priority worldwide. As one of the longest rivers in Odisha, the Mahanadi River plays an important role in local economy and ecosystem. However, the rapid development of industry has caused significant pollution in this river in recent years. Despite of a number of studies reported on this river regarding water pollution, few have conducted a comprehensive investigation of a wide range of water quality parameters to map the current pollution status. An attempt has been made in this work to understand the suitability of water for human consumption as well as irrigation. The parameters of pH, Electrical Conductivity (EC), Copper (Cu), Chromium (Cr), Sulphate (SO4), Iron (Fe), Nitrate (NO3), Chloride (Cl), Total Hardness (TH), Total Alkalinity (TA) and Sodium (Na) were analysed using standard procedures. The values obtained were compared with the guidelines for drinking purpose period of 2 years (2020-2022) and the quantitative results were justified with the globally accepted water quality guidelines. It compared the results between the Canadian WQI with the Weighted Average WQI and the Canadian WQI and Meireles WQI for drinking and irrigation purposes, respectively. The results revealed that the Canadian method categorized water as Fair quality while the Weighted WQI model results showed good to poor for drinking usage. Besides, the Meireles method showed that the water quality is classified as good to excellent, while the categorization of the surface water was fair to good for the suitability of irrigation. This method is quite useful to infer the quality of water for the people and policy makers in the concerned area. When comparing the results of the Canadian method with the Weighted Average technique for drinking, the latter one gave the abnormal results and pair difference statistics showed the significant negative correlation (r = -0.88) between them. Similarly, the analysis of the two methods (Canadian and Mierels) for irrigation use exhibited that there was no statistical variance between the two techniques at a significant correlation matrix (r = + 0.95). The study concluded that the Canadian WQI for drinking and Mierels WQI for irrigation would deliver better results. The implementation of WQI is necessary for proper management of Mahanadi Basin and it will be a very helpful tool for the public and decision makers to evaluate the water quality for sustainable management.

Keywords: *Mahanadi River, Canadian WQI, Weighted Average WQI, Meireles WQI, correlation*

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Environmental, social and economic sustainability of bamboo and bamboo-based construction materials in buildings

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ABSTRACT

Bamboo is a natural building material that grows in tropical and mild temperate areas. It has been used for a long time because of how strong and flexible it is by nature. In the 1980s, there was a new interest in using bamboo as a building material. This brought bamboo back into use as a cheap and strong building material. There have also been many new building materials made from bamboo that are better suited to the needs of modern building. Bamboo is a favourite green building material because it is good for the environment in many ways. This review takes a critical look at how using bamboo as a building material affects the environment, as well as how it affects society and the economy. The goal is to understand how it affects sustainability.

Keywords:

Assessment of Ground Water Quality of Nandgoan, Barsana, Radhakund, Goverdhan (Uttar Pradesh, India) Using Multivariate Statistical Techniques

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ABSTRACT:

In this Study the quality of the ground water in the surrounding areas of Mathura city in India was investigated. The city of Mathura is located in the Indian state of Uttar Pradesh, which has the highest population density state in India. The area under investigation has experienced rapid urbanization, which can be characterized by irregular development as well as a quick increase in population growth. Monitoring and assessing the groundwater quality have become an important topic because of the impact that it has on people and their ability to live a healthy life. Cluster analysis (CA) and principal component analysis (PCA) were used in this investigation to find the possible sources of Goverdhan, Radhakund, Barsana, Nandgoan, Kosikalan and Chaumuhan. The acceptability of the ground water quality for drinking and agricultural purposes was evaluated in the Mathura area. To better understand how geochemical processes affect ground water quality, ground water samples from 19 different ground water sampling sites—including hand pumps, tube wells, and borings—were collected and studied. Analysis of 18 distinct ground water quality indicators, including Temperature (T), pH, total alkalinity (TA), turbidity (tur), Electrical conductivity(EC), total hardness (TH), magnesium (Mg2+), calcium (Ca2+), total suspended solid (TSS), total solid (TS), total dissolve solid (TDS), Fluoride (F-), Iron (Fe-), Nitrate (NO3 -), Nitrite (NO2 -), phosphate (PO4 3-), ammonia (NH3), Chloride (Cl-). CA was used to determine how comparable the groundwater sampling sites were to one another. All sampling sites were categorized by CA into three clusters. The first cluster represented the sampling sites that were moderately polluted, the second group represented the sites that were less polluted, and the third cluster represented the sites that were more polluted. In order to pinpoint the causes of groundwater pollution, PCA was applied to the data set. Five significant factors were identified by PCA, and they accounted for 85.07 percent of the overall variance in the groundwater quality data sets. According to this research, PCA and CA are useful in helping people understand vast and complex data sets related to the quality of ground water.

Keywords: *Groundwater quality, Barsana, Nandgoan, Radhakund, Goverdhan*

Physicochemical Property Analysis of Groundwater from Bhartia Village in the Mathura District of Uttar Pradesh, India

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ABSTRACT:

Groundwater is a substantial source of freshwater and is considered to be one of the most important sources. The quality of groundwater is deteriorating as a consequence of a wide variety of activities, some of which are natural and others of which are driven by humans. As a result, it is absolutely necessary to maintain a close watch on the condition of the available water supplies. The purpose of this study was to look at the state of the groundwater in the village of Bharthia, which is situated in close proximity to the GLA university campus in Mathura, in the Indian state of Uttar Pradesh. Water samples were taken from two bore wells for the purpose of determining the quality of the groundwater. These samples were then analysed for eleven distinct and significant parameters, which included colour, odour, taste, turbidity, pH, total dissolved solids, total hardness, residual free chlorine, chlorides, total iron, and fluorides. The samples were also analysed to determine whether or not they contained any fluorides. Coliform tests were performed as an additional way for identifying whether or not there was contamination in the product. The results showed that the concentration of turbidity, total dissolved solids, total hardness, and chlorides in the water was higher than the acceptable level but lower than the authorised limit specified by the Bureau of Indian Standards. This was due to the lack of an alternate source (BIS). Water can be drawn up from the earth and distributed to both the university campus and the people who live in the surrounding town. This study will be of tremendous use to the government, those who are responsible for formulating policy, and the general public.

Keywords: *Groundwater, Physicochemical, Water Quality*

Ground Water Quality Assessment with Reference of TDS and EC

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ABSTRACT

When compared to metropolitan areas, a rural area's assessment of groundwater pollution frequently receives less attention. However, rural activities like bathing, washing, etc. close to water sources might cause water contamination. Regular assessments of groundwater quality are required to lessen the effects of water contamination in such situations. Based on the numerous water quality indices, the suitability of groundwater for agricultural and drinking uses was monitored in Mathura's rural areas. The groundwater in the rural areas of Uttar Pradesh's Mathura district was the subject of this study. There is a significant change in the ecosystem occurring as a result of rapid development and excessive groundwater resource extraction. Water contamination is a serious issue today. Based on the numerous water quality indices, the adequacy of groundwater quality for drinking and farming purposes was evaluated in Delhi's rural districts. 20 samples of groundwater were randomly gathered from various sources, including hand pumps, tube wells, and drilling, and the samples were then examined to see how geochemical processes affect the quality of the groundwater. The parameters of EC TDS water quality were examined in the samples. According to the study, 40% of the total samples taken were within the acceptable range for drinking water quality, which is 500–1000 mg/l as defined by WHO and the Bureau of Indian Standards (BIS, 2012). 60 percent of the total number of groundwater samples obtained exceeded the allowable limit. Therefore, most samples of the groundwater in Mathura, Uttar Pradesh, do not meet the drinking water standards. This study provides insight into the pristine state of groundwater quality in the rural setting and is hence relevant for water quality assessments in various rural regions.

Keywords: Ground water, Mathura, TDS, EC

Accelerated tourist flow and its environmental impact on small touristic sites of India: A case of Vrindavan, India

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ABSTRACT

Pilgrimage tourism is one of the most famous forms of tourism especially in India where thousands of tourists visit different pilgrimage sites at least once in their life time. But there is an another side of the story which shows an adverse impact of this ever increasing number of tourists on the natural setting of these touristic sites as most of the pilgrimage destinations in India are smaller in terms of area and having very limited resources which are utilized excessively throughout the year by a number of pilgrims visiting these sites. This paper addresses the issues associated with increasing tourism and its adverse impact on environmental set up of the pilgrimage sites of India; a special reference of Vrindavan which is one of the most famous Hindu pilgrimage destinations of India is taken. This paper is divided into two heads one addresses the basic impact of increasing tourism on general environment of touristic place and in the second half of the paper addresses the environmental issues faced by one of the major pilgrimage destination of India i.e Vrindavan on account of increasing pilgrimage tourism.

Keyword: *Environment, Pilgrimage tourism, Water Pollution, accelerated touristic flow, environmental pollution.*

Ground Water Quality Assessment with Respect to Fluoride Contamination of Rural Areas of Mathura District Uttar Pradesh (India)

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ABSTRACT

In dry and semi-dry regions of the world, one of the most important sources of water is groundwater. Data on the quality of groundwater and its distribution across the landscape are essential for the purposes of planning and management. This study looks into the quality of the groundwater in the Mathura area of Uttar Pradesh, India, and how much F is in it. For the purpose of calculating the fluoride content, seventeen groundwater samples from various sites, including tube wells and handpumps in rural regions of the Mathura district, were collected. June 2022 saw the sampling's completion. The results were compared to standards for drinking water to find out if they could be used. According to the findings of this research, the fluctuation of fluoride contamination in groundwater was varied to be 3.1 and 3.3 mg/l in rural regions of Mathura city, which is greater than the standard limits (1.5 mg/l) of drinking water. This study was conducted in India. The fluoride contamination, along with other physico-chemical parameters, in ground water samples was determined in various rural areas of the Mathura district in the Indian state of Uttar Pradesh. This was done because groundwater is the only source of drinking water in the majority of rural areas. Fluoride concentrations ranged from 0.7 to 3.3 mg/L across these rural areas, with the greatest level being found in Maghera (3.3 mg/l) and lowest level being found in Ram Nagar (0.7 mg/L). When fluoride levels were measured, 11.76 percent fell within the 0-1.0 mg/L range, 17.64 percent fell within the 1.0-1.5 mg/L range, 58.82 percent fell within the 1.50- 3.0 mg/l range, and 11.76 percent fell above 3.0 mg/L.

Keywords: *Groundwater, Fluoride, Mathura*

MCDA Comparative Analysis on the TOPSIS, VIKOR, COPRAS, and PROMETHEE II Methods

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ABSTRACT

Methods for multi-criteria decision-analysis (MCDA) are successfully used across a variety of disciplines and fields. The issue of choosing the appropriate approaches and criteria for decision-making is, however, brought up in a number of research. The research attempts to benchmark a few Multi-Criteria Decision Analysis (MCDA) techniques. A collection of workable MCDA approaches was discovered to help with that. A simulation experiment was prepared using instructions from the reference literature. The formal foundations of the authors' methodology offer a reference set of MCDA techniques, including the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS), VlseKriterijumska Optimizes I Compromission Rezende (VIKOR), Complex Proportional Assessment (COPRAS), and PROMETHEE II: Preference Ranking Organization Method for Enrichment of Evaluations, along with similarity coefficients (Spearman correlation coefficients and WS coefficient). As a result, it was possible to create a collection of models that varied in the quantity of attributes and decision alternatives, as well as conduct similarity research on the sets of rankings that were produced. Additional dimensions were taken into consideration throughout the simulation trials because the authors aimed to create a sophisticated benchmarking model. Various weighing strategies (results acquired using entropy and standard deviation methods) and various normalizing approaches of MCDA model input data are components of the executed analysis and benchmarking procedures. Comparative investigations revealed a thorough relationship between the values of specific factors and the final form as well as a similarity between the final rankings produced by various MCDA techniques.

KeyWords: Decision-making processes, normalize, entropy, and multi-criteria decision-analysis.

Statistical Techniques and the Water Quality Index in a Case Study of Groundwater Quality

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ABSTRACT:

One of nature's most important resources is groundwater. It provides water for irrigation as well as domestic use. For effective resource management, it is crucial to regularly check the quality of groundwater. This study evaluated the quality of the groundwater in Chaumuhan, Mathura, India. In 2019, post-monsoon season water samples were collected and nine physicochemical parameters, including EC, Cl-, pH, alkalinity, Turbidity, NH3, F-, NO3- and NO2-, were analysed. According to the experimental findings, water samples' pH values were either slightly acidic or slightly alkaline. EC, Cl-, F-, TA, NO2-, NH3, and NO3 concentrations are within acceptable drinking water quality standards. However, during the sampling period, some sampling points had turbidity levels that were higher than allowed. The study's goal is to determine whether the groundwater is suitable for drinking by using the water quality index (WQI). After some basic treatment, the WQI values show that the water is fit for drinking.

Keywords: *Water quality, Water quality index, Groundwater*

Multivariate statistical appraisal and Water Quality Index Application for Quality Characterization of Mahanadi River, Odisha, India

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ABSTRACT

Surface water is considered as an imperative component of the accessible water assets across the world. Due to urbanization, industrialization and intensive farming practices, the surface water resources have been exposed to large scale depletion and quality degradation. The water quality and quantity are under constant pressure by the presence of different human activities like removal of vegetation, industrial activities and encroachments, domestic and religious activities. These all activities resulted in water quality degradation. In the present study, evaluation of spatial variations and interpretation of water quality data were made by using multivariate analytical techniques including factor analysis and cluster analysis. Also, ArcGIS software has been used. The research method was formulated to achieve objectives herein, including field observation, numerical modelling and laboratory analyses. A total of 20 samples from 19 different points along the river course were collected for a period of 4 years (2018-2022). Samples were analysed in accordance with standard methods. Most of the parameters evaluated were found to fall in the allowable limits of the World Health Organization (WHO). The Karl Pearson correlation matrix has been established for examining relationship between the water quality parameters. Two different water quality indices like weighted arithmetic water quality index and entropy weighted water quality index were computed to characterize the surface water quality of Mahanadi Basin. Ordinary kriging technique was applied to generate spatial distribution map of the WQIs. Hierarchical cluster analysis (HCA) and Principal component analysis (PCA) were applied to provide additional scientific insights into the information content of the data available in this study. Interpretation of WQI reveals good to poor water quality due to many human activities like industrial, domestic and religious waste. HCA classified 19 sampling locations into three main clusters of similar characteristics. PCA extraction of the dataset yielded five varifactors contributing 79.86% of total variance and evaluate the incidence of each variable on the total variance. These factors reveal anthropogenic activities along the river course, urban waste water discharge and mineral dissolution, responsible for the deteriorating quality of the water. The study recommended continuous pollution monitoring and local regulations to reduce the entrance of both diffuse and point source pollution into the river.

Keywords: urbanization, multivariate, Karl Pearson correlation, HCA, PCA, anthropogenia

Environmental Assessment on the Existing Sanitary Landfill and Its Effects on Water Quality of the River in Sitio Mamala, Limay, Bataan, Philippines

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ABSTRACT

A sanitary landfill facility is a site for waste disposal that should be well-constructed, well-designed, operational, and well-maintained. Sanitary landfills are characterized by utilizing engineering controls that are associated with the importance of the environmental hazards and impacts that would arise in the operation and development of the facility. The municipality of Limay had to stop the operations of their sanitary landfill in Sitio Mamala due to compliance issues that brought harm to a nearby water body. The sanitary landfill went under rehabilitation and was reopened in December 2021. This study aims to assess the rehabilitated landfill by conducting water testing on the river and whether the rehabilitation of the landfill had positive effects and did not cause contamination due to leaching. Water samples were collected from the upstream, midstream, and downstream of the river. Parameters such as fecal coliform, ammonia, BOD, pH, color, phosphate, and total suspended solids were considered in the assessment. The results were able to show the impact of the sanitary landfill on the water body and expressed other factors that may cause pollution or contamination of the river, which is vital in raising awareness of the environmental and public health situation of the municipality.

Keywords:

Comparison Analysis of Vermicompost Prepared using Perionyx ceylanesis and Eisenia fetida Earthworms for Selected Macronutrient Quality

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ABSTRACT:

Two types of earth worms are the subject of a study to determine the quality of their compost. It was discovered that the Earthworm PerionyxCeylanesis, also known as "Jai Gopal," is comparatively superior to the Exotic Eiseneafoetida, also known as Red Worm. It is because of a variety of traits including high fecundity, heat resistance (up to 430C ambient temperature), high protein content (of 67%), and the presence of nearly all protein-related amino acids. With the exception of the cold winter months, it breeds all throughout the year. Jai Gopal also serves as a bioreactor for the growth of soil-friendly bacteria. This species is also comparatively superior in terms of other factors, including the frequency of coccons created each week, the total number of population per three months, the length of life, the time between hatching and maturity, and the capacity to adapt to temperatures between 23 to 430C. As a result, these benefits make it a more effective, practical, and long-lasting species.

Keywords: *Vermicompost, Earthworm, Perionyx ceylanesis, Eisenia fetida*

Utilization of the Water Quality Index (WQI) to Evaluate Groundwater Quality

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ABSTRACT

The quality of groundwater, especially shallow groundwater, is being negatively impacted by a number of anthropogenic activities. To keep the quality of the water within a particular safe range, groundwater monitoring has therefore become essential. In the current study, the groundwater quality in the area of Varun Beverages, Mathura, has been evaluated using the Water Quality Index (WQI). Eight major criteria, including pH, total hardness, alkalinity, chloride, total dissolved solids, electrical conductivity, nitrate, and fluoride, were chosen to calculate WQI since they have the most impact on assessing the quality of drinking water. The 20 samples' WQI has been calculated and determined. 90% of the water samples, according to WQI analysis, fell into the "Very Bad to Bad" water category, and only 10% fall into the "Medium" category. No sample was found to fall into the "excellent to good" category, indicating that the water needs to undergo sufficient treatment before it can be used directly. The water can be used for drinking after being treated

Keywords: Drinking Water, Groundwater, Water Quality Index (WQI), Very Bad

Analysis of physiochemical parameters of Groundwater quality of Palwal region, Haryana

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ABSTRACT

It has become an important component of both responsible resource management and land cover organisation to conduct penetration tests, which identify regions that are more susceptible to contamination from man-made sources. According to the findings of the groundwater Chemical analysis. To ensure that groundwater was safe for human consumption and agricultural use, it was analysed for a wide range of quality indicators. The ionic concentrations of chloride and fluoride in a total of seven groundwater samples collected from running tube wells inside the block were investigated. The values of several parameters, including electrical conductivity (EC), pH, total soluble salt, and total hardness, were measured and analysed.

Keywords: *Chemical Analysis, Groundwater sample, parameters*

Assessment and Monitoring of Physico-chemical Parameters of Water Quality

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ABSTRACT

Since the beginning of time, people have held the belief that rivers are holy places. Getting the water quality back to normal in any river, but especially the Yamuna near Mathura, is a very hard and difficult task at religious sites. Information on the water quality in an aquatic ecosystem is essential for the establishment of guidelines for the management of resources. This study looks into how clean the water in the Yamuna river in the Mathura area is and what causes it to be dirty. The Yamuna River plays a fundamental yet essential role in modern society by acting as a source of irrigation, drinking water, and as a sink for urban wastewater. The present study deals with the analysis of the physicochemical parameters of the surface water of the River Yamuna at ten different locations in the Mathura region of Uttar Pradesh, India. The Yamuna River is an important part of modern society since it serves as a source of irrigation and drinking water, as well as a sink for urban waste water. This triple function makes the Yamuna a fundamental and vital part of modern society. The goal of this study is to look into the physical and chemical properties of the Yamuna River's surface water in the Mathura district of Uttar Pradesh, India, using data from 10 different places. Urbanization, industrialization, the sewage systems of municipalities, waste products from agriculture, and fertilizers are the primary contributors. The current study not only tries to determine the level of pollution, but it also aims at defining its gradient along the various sampling sites along the course of the river, and it consequently assesses the contribution of each location towards. The majority of the water quality metrics have surpassed the desirable prescribed level that has been established by the Bureau of Indian Standards. The water from the Yamuna River is not suitable for drinking or other uses in the home, and the river
water itself cannot be used directly in any way. Because of this, there is an urgent need to teach the general public about how dirty the Yamuna River is right now.

Keywords: *Surface water, Yamuna River, Water Pollution, Hydro chemical Analysis*

Groundwater Quality Analysis of Ajhai Village in Mathura District of Uttar Pradesh, India

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ABSTRACT

One of the most significant sources of freshwater is groundwater. The quality of groundwater is being degraded as a result of a wide variety of natural and human-caused processes. Therefore, keeping an eye on the state of the water supplies is essential. The quality of the groundwater in the village of Ajhai, which is located close to the GLA university campus in Mathura, India, has been investigated in this study. For the purpose of determining the quality of the groundwater, water samples were taken from two bore wells and analysed for eleven distinct and significant parameters, including colour, pH, alkalinity total dissolved solids, total hardness, chlorides and fluorides. Coliform tests were carried out for determining whether or not there was contamination of bacteria. In the absence of an alternative source, the results showed that the concentration of total dissolved solids, total hardness, and chlorides in the water was higher than the acceptable level but lower than the allowed limit established by the Bureau of Indian Standards (BIS). Concentration of Fluoride is higher than permissible limit at one location. Both the university campus and the residents of the community can be supplied with water from the ground. This study will be of great benefit to the government, those who create policy, and the general public..

Keywords: *Ground water, fluoride, permissible limit*

Monitoring Channel Dynamics of River Yamuna in Mathura Region using
Remote Sensing and GIS

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ABSTRACT

Fluvial river channel dynamics are natural phenomena that are influenced by human interventions and climate. Along the Yamuna River, remote sensing geographic information systemtechniques and tools and satellite imagery have been used to identify changes in the path of the river Yamuna in the Mathura region, India. The study utilized satellite images collected between 1994 and 2020. To visualize and quantify the reach-wise spatial and temporal morphological changes, manual and automated digital procedures and GIS tools were utilized. The results made it easy to identify instances of digression, channel meandering, and abandonment of the primary channel. Variable hydrological regime, upstream land use practices, the nature of the channel gradient, and riparian vegetation occurrence changes were among the potential driving forces of morphological changes. The results give the most up-to-date information about how the path of Yamuna River has changed in the Mathura area.

Keywords: *remote sensing; GIS techniques; Yamuna River; river channel dynamics; morphology*

Microplastic Pollution in Oceans: Pattern, Sources, Effects and Sustainable Mitigation of the problem

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ABSTRACT

Humans are treating oceans to dispose of their waste, and microplastic is one of the components of uncontrolled human activities, polluting not only seashores but also freshwater bodies globally. Conceptually microplastic is plastic pieces lower than 5 mm in size. It is polluting land, water, air and groundwater environments for plants, animals and humans. These pollutants are ubiquitous in the marine environment. Due to their smaller size, it is easily approachable to the marine organism and in the end, transferred along the food web. This evitable exposure to microplastic emphasized the need to know about microplastic contamination and measure to control it. Therefore, this review aimed to define and analyze the different sources of microplastic, its potential impact on living organisms etc. At last possible measures i.e., less use of plastic in production, education and awareness about the use of eco-friendly usages and activities, life cycle assessment and less consumption of plastic and strategic waste management method, recycling and waste to energy recovery were suggested to solve the global problem of microplastic pollution.

Keywords: *Microplastic, Microbeads, Oceans, marine biota, Marine health, Marine organism, Eco-system*

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Case study of Municipal Solid Waste Management in Agra, India

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ABSTRACT

In India, one of the most urgent needs is the management of municipal solid waste (MSW). The handling of MSW in Indian cities is very insufficient and unscientific. The current study provides an overview of the MSW management situation in the city of Agra (India). This analysis shows that Agra's MSW management is not sustainable. More over 15 lakh people currently live in the city, and each one produces about 500 g of waste daily. Agra Municipal Corporation(AMC) manages MSW from residential garbage collection to final disposal. Without any sorting, all of the gathered rubbish is dumped in the open. The methods now used for the management of solid waste have numerous flaws. For effective management of MSW, the current study suggests using cutting-edge technology, skilled labour, and a sanitary landfill that is properly designed. Environmental management for sustainable growth depends on proper waste management.

Keyword: *Solid waste, Municipal solid waste (MSW), Landfill, Waste collection*

Assessment and Monitoring of Surface Water Quality of Yamuna River at Agra Region

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ABSTRACT

This study has made an effort to determine the surface water quality status of Agra from eleven different sampling sites in Agra city. River water samples were collected from eleven locations (viz Bhadaya, Jugsana, Kitham, Singma, Arsena, Nagla AkosBangar, Mangarol Gujar, Artauni, SikandarpurEhtmali, Madanpur, Anand vihar) of Agra city, during the month of March, 2022. Samples of river water were brought to the lab for analysis. The analysis was performed for the following variables: pH, electrical conductivity, turbidity, Total Dissolved Solids (TDS), Total hardness, Chloride, temperature and total alkalinity. Yamuna River water is alkaline by nature, as shown by its pH. Yamuna River water is alkaline by nature, as shown by pH. This study shows that the water quality parameters are outside of what the APHA (2012) says is acceptable.

Key words: *Yamuna River, physicochemical, water quality.*

Assessment of Groundwater Quality of Gurugram District (Haryana) Using Geoinformatics, Cluster Analysis and TOPSIS

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ABSTRACT

In this study, groundwater quality of Gurugram district has been analyzed. Water samples were collected from 31 different locations of Gurugram in the year 2013 and 2017 and analyzed for 13 different parameters. Cluster analysis was used to grouped the sampling sites into different cluster based on their water quality similarity. Further, Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) - a multi-criteria decision-making method was performed on the observed data sets to rank the sampling sites according to pollution level. Results have been demonstrated using geo spatial map. This study shows the applicability and effectiveness of combined use Cluster analysis, TOPSIS and Geoinformatics techniques in groundwater quality monitoring and assessment. These techniques will be very useful for policy makers and local public for easy understanding and better interpretation of water quality monitoring data sets.

Keywords: *Water quality, Cluster analysis, TOPSIS, Geoinformatics*

The relevance of the green university concept on students' enrollment decision for higher education

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ABSTRACT

Students contemplate the commitment of an institution for sustainability and the environment before taking an enrolment decision. Students reconnoitre prospects colleges and universities for environmental policies, initiatives, and programs. This study is a distinctive attempt to explore the impact of the green university concept on students' decisions to enroll in higher education. The study aims to understand students' sustainability awareness and concerns and also on the other hand draws the attention of the institutional management to this important aspect to consider in luring the student's attention for enrolment. The research work pinpoints few institutional attributes which are in line with the green university concept which are namely eco-friendly campus, sustainable practices, inclusion of green content in curricula, and student's involvement in green university initiatives.

Keywords: Sustainable development, green campus, SDG

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Experimental Investigation on Tertiary Treatment of Secondary Treated Wastewater Using Zetag-4120 Coagulant

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ABSTRACT

The primary and secondary treatments of waste-water from different sewage treatment plants are of great importance not only for the removal of pollutants but also for the use of treated water for different purposes. The later involves the use of suitable coagulants and their optimal dosages for the treatment. In the view of this, the present studywas carried out to identify the most suitable coagulant and its optimal dosage to achieve the maximum total suspended solids (TSS) and biological oxygen demand (BOD) removal. We used six coagulants (alum, ferric chloride, polyaluminiumchloride (PAC), zetag-4120, mecafloc-25, rothfloc-27) and found that Zetag 4120 is the cost efficientcoagulants at varying coagulant dosage. We arrived at this conclusion based on several experiments performed using varying coagulant dosages. We found that BOD and TSS removal efficiencies at highest when (i) initial wastewater pH is close to 6 and (ii) Zetag dosage is of value 2.7 gm/L.

Keywords:

Assessment and Monitoring of Water Quality in Mathura A Review

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ABSTRACT

India's most sacred city, Mathura, is home to around 2,874,016 inhabitants. In Mathura, around 70% of the population lacks access to clean drinking water. This report presents a thorough overview of research findings on water quality monitoring and assessment in Mathura during the previous few years. The quality of surface water, groundwater, rainwater, and commercially available water was talked about based on where the pollution came from. In general, both surface and ground water are of poor quality. Salt, heavy metals, sewage water, solid waste leachate, and hydrogeological groundwater interactions are all causes of groundwater pollution. Fluoride and chloride have been found in groundwater at numerous spots throughout the Mathura as a result of the hydrogeological influence. Although it was found to be rather clean, Mathura's rainwater has a low PH, which is its main problem. The municipal water supply is the best source of drinking water for the people of Mathura. The quality of bottled water is better than that of municipal water supplies, which are heavily contaminated by microbes. The analysis of developing contaminants and micro pollutants as well as the application of internet-enabled technologies are indicated as future perspectives in water quality monitoring and assessment. The current study will help to illustrate the water quality in the study area for bathing, drinking, and other commercial purposes.

Keywords: *Ground water, Mathura city, Surface water, Water quality parameter, Water Pollution*

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Land Use and Land Cover Analysis of Rispana Rao Watershed

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ABSTRACT

It's a very difficult endeavour, yet planning and development are fundamentally supportive. The majority of urban concerns are tied to land-related activities because land is a valuable resource. Modern urban management scenarios cannot be successfully managed using traditional methods of surveying and land records. It's because people and technology are evolving faster and taking more time. In the current situation, a tool that analyses, analyses, and leads to a workable solution is required. GIS is one such sophisticated tool for handling spatial data and sequentially analysing the physical environment with that of its attribute data, such as canopy, land use, cover, environmental sources, water line, sewer line, etc., and related to its topography [1]. GIS is a useful and effective analytical tool for city planning and resource management. The quick changes in today's IT industry, specifically in the areas of in-memory mobile computing, WiFi, WiMax, internet banking, remote sensing, and virtual reality, have altered our social lives in many ways. Even the realm of government planning reflects this. This paper's primary goal is to discuss the applications of GIS in community planning with regard to community development [2]. Semantics and syntactic analysis of the town from the perspective of urban safety are also covered. Aside from the standard GIS attributes like change intensity, the size of the impennable area, growth patterns, and applications related to water, the requirement of the hour is for safety to be studied for hypothetical situations. A difficult task to perform is controlling cities' safety-related aspects, which is a mind-boggling challenge. They must combine wireless network planning with several technology developments. Remote sensing and its tools will definitely make a city safer if they are used in the right way in urban planning.

Keywords:

A Comprehensive Review Study on Water Quality parameters and its Pollution on Baitarani Basin, Odisha, India

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ABSTRACT

Agriculture, industry, human and animal needs, and river infrastructure all depend on them. Untreated sewage and other types of pollution have been released into major rivers around the world, including those in the Baitarani Basin, as a result of increased industrial activity and rapid human population in semi-urban and metropolitan cities. Since the dawn of human civilization, anthropogenic and natural processes have continued to contaminate the water supply. Environmental degradation and declining water quality are major world concerns. 13 locations were observed seasonally in this study to determine how monsoonal precipitation affected environmental factors and the Water Quality Index (WQI). Over the course of a year, sampling technique was employed in the pre-, monsoon, and post-monsoon phases (2020-2021). Various physicochemical parameters, like TDS, TSS, EC, DO, PH, Turbidity, Alkalinity, SO_4^{2-}, NO_3^-, BOD, TH, HCO_3^-, Ca^{2+}, Mg^{2+}, PO_4^{3-}, Cl^-, Na^+, K^+ and Fe were examined to determine whether water was suitable for a range of applications. The readings for pH, EC, TDS, TH, main cations, and DO were all noticeably under BIS and WHO recommendations. Turbidity, TSS, and, in certain cases, BOD values were all above the permissible threshold, implying contaminated waterways. Utilizing the measured values, the Kriging methodology was used to create interpolated maps for each component, and the WQI algorithm was used to estimate the water purity. The findings indicated that the WQI values ranged from 18 to 60 in pre-monsoon phase, from 17.92 to 59 in the monsoon, and from 20 to 78 in the post-monsoon timeframe. The results revealed that the water quality fluctuated between average and good mostly in chosen sites and that pollutants rises from upstream to downstream. Principal component analysis (PCA) and the clustering technique (CA) were also used. These techniques were performed to analyse the state of the water for effective management. The sampling locations are grouped by CA into homogeneous clusters with comparable behaviours. The river's water quality can be described using PCA by identifying key factors that are relevant to each season. PCA was successful in explaining 76%, 74%, and 72% of the overall cumulative variation in water quality over the course of the year. The PCA results showed that the most significant factors affecting water quality were BOD, Fe, turbidity, and TSS. Significant contributors to river water pollution have been highlighted as fertilizers, home and industrial wastewaters, land degradation, soil leaching, organic contaminants, and environmental contamination. The quantifiable benefits, however, varied different seasons. The calculated rates of the criteria and the WQI clearly demonstrate that the Baitarani River water demands a suitable treatment procedure as well as actions to prevent to stop the deteriorating water quality. Appropriateness of methodologies for planning and designing related to sampling sites for regulating water quality management initiatives in river basins. To improve health and protect water resources and the environment, strict rules and regulations must be implemented in order to protect this water resource from pollution.

Keywords: Baitarani Basin, anthropogenic, Water Quality Index, Principal analysis, clustering.

Impact of E-waste on Environment due to the increasing popularity of E-vehicles

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ABSTRACT

In the present world, electronic waste or e-waste management is not just a problem due to the continuous upgrade of technology but also a need of the hour. The environmental impact is of great concern without proper management and disposal of e-waste. Thus, different approaches are being carried out by different countries worldwide to deal with the issue. This paper concentrates on the different approaches developed to tackle this need of the hour. Electronic waste is becoming a major environmental issue for most developed countries. Most affluent countries have found that exporting their waste to developing countries is a more cost-effective alternative to treating it. The given report highlights the impact of this e-waste on the environment. There are several findings based on the report. Based on the findings, several recommendations have been suggested.

Keywords-*e-waste, electric vehicle, environment.*

Energy Efficiency and Energy Generation: A Step towards Sustainable Infrastructure by Reducing the Carbon Footprints

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ABSTRACT

The focus of this research is on improving an existing commercial building's energy efficiency and addressing the issues of energy generation and use as whole, specifically as it relates to the non-renewable aspect of fossil fuels and the increasing changes in the atmosphere and oceans from greenhouse gas emissions. The case study in this paper analyzes the building carbon footprint, determines possible envelope improvements to reduce operational energy usages, and explores possible renewable energy resources that can be implemented on site to meet the various building energy needs. Significant review of literature into energy generation, alternative energy sources, and the specific building envelope properties and mechanical systems was required. The theoretical analysis includes details on heating and cooling loads, solar angles and irradiation, and wind turbine potential. This main purpose of this research was to provide a framework for future building renovations at this site or be a model for other existing building looking to transition to a more sustainable infrastructure.

Keywords: *Energy Efficiency, Energy Generation, Carbon Footprint, Sustainable Infrastructure, Non-Renewable*

Qualitative evaluation of Hindon River at Mohan Nagar Station, Ghaziabad from 2021 to 2022

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ABSTRACT

The present study was focused to determine the physiochemical parameters of Hindon River water during March 2021 to February 2022 and to evaluate the seasonal variation of water quality in the concerned period. Water samples of Hindon River were collected from the site Mohannagar (Ghaziabad) due to big industrial cluster with large number of residential societies along the river course. We considered various physiochemical parameters like Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Total Dissolved Solids (TDS), Total Alkalinity (TA), Electrical Conductivity (EC), Total Phosphorus (T.Phos.), Total Hardness (TH), Chloride (Cl-), Sulphate (SO4-2). All test procedures were followed as per Indian Standard Methods and APHA (American Public Health Association). The Study found that the water quality fall under the class D or E (IS 2296) and values exceeded than the permissible limit (IS2490). The lower value of DO and higher value of other parameters indicate high pollution level in the river. The main reasons of water quality deterioration are the discharge of untreated sewage and high load of partially treated or untreated industrial effluent discharged into the river. Peoples have demanded to install Sewage Treatment plants or Common Effluent Treatment Plants on the river course and regular monitoring of water quality to improve the ecosystem of Hindon River.

Keywords—Industrial Effluent, Seasonal variation, Water Quality, River course

Assessment of Environmental Flow by Using Hydrological Methods in the Gandak River, Bihar- A Case Study

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ABSTRACT

The concept of minimum flow, which was once thought to be inadequate for aquatic systems to exist, sparked the creation of environment flow research. Rivers are subjected to a variety of factors that enhance their flows, including hydropower plants, flood dams, and irrigation canals. Several types of research have been conducted in order to mitigate the harmful impacts of these constructions on waterways. Environmental flow research has grown as water has become the most important component that must be protected along the riverbed. For the assessment of environmental flow, different hydrological methods are used, namely, the annual distribution method (AMD) and the Tennant method in the Gandak River in Bihar, India. The annual distribution method revealed low alteration compare to the Tennant method of Hydrological Alterations and environmental flow components, allowing us to conclude that the AMD method is better than the Tennant method. As a result of the study's findings, it was found that the annual distribution method is more appropriate for e-flows implementation to satisfy the annual dynamic demand of the riverine ecosystem and thereby preserve the river's health. This case study may be utilized as a reference point for allocating environmental flows in the Gandak River, especially for small hydropower facilities.

Keywords: *Environmental flow, Annual Distribution Method, Tennant Method*

Structural Engineering

Study's on Vibration Analysis of a Multi-storyBuilding for Twisted Plates

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ABSTRACT

The use of composite materials is growing. Antennas, buildings, and ships all make use of composite materials. Functionally, hierarchal materials perform better at high temperatures than layered composites. Generators and the blades of rotary engines use twisted plates. Functionally, hierarchical materials are robust, lightweight, and need less energy. Functionally hierarchal material might make sense as a replacement for metal on certain of these hot surfaces. This study investigates the free vibration of twisted, thin FGM plates. Vibration analysis is done using FCM. A shell component with eight nodes is used in finite component calculations[1]. To simulate continuous material property variation on thickness, the FGM section can be modelled as a laminated composite with uniform layer thicknesses. There are victimization laws at every level. Thickness is influenced by density, elasticity, and Poisson's law. Pre-twisted FGM plate studies of first-order shear deformation A bigger mesh and more layers of increasing thickness converge on frequencies. The finite component model is supported by free vibration results for a variety of boundary conditions. Following the determination of the mesh size and required number of layers to depict fabric depth variation, frequency changes with twist angle and the material property index are investigated. Geometrical factors including gradient index, ratio, aspect to thickness magnitude relation, and angle of twist are explored for their effects on the free vibration of cantilever twisted plates [2]. Material characteristics that are affected by temperature are also regarded as exhibiting nonlinear material property fluctuation with respect to thickness. The effect of a heat gradient in the thickness direction on the free vibration of cantilever twisted plates is investigated.

Keywords: *vibration, mat lab, buckling, twisted plates*

Comparison of Floor Response Spectra (FRS) of Multi - Storey Industrial Building Generated Using Different Methods

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ABSTRACT

Industrial systems and machineries are placed at various positions, both vertical and horizontal in a building or structure. For dynamic analysis of these systems, one needs to have Floor time histories (FTH) or Floor Response Spectrum (FRS). FRS corresponding to system damping is generated using Time History Analysis (THA), Stochastic Analysis or Simplified Analysis of which THA is more robust and accurate one. In this paper, time history compatible with IS 1893 design basis response spectrum (Hard/rocky soil) is generated. Using the compatible time history and/or response spectrum as input, FRS is generated at various floors in a typical multi storey industrial building (G+2) using the three methods and performance of the other two methods is evaluated with respect to THA. It was observed that though both stochastic and simplified analysis were giving higher values, it is the simplified analysis which is closer to THA and can be safely used as alternative to save tremendous computational effort.

Keywords:

Seismic behaviour of rcc elevated water tank with ssi for varioussoil conditions with seismic zones

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ABSTRACT

The Water tanks have been the most vital lifeline structures as they serve as an essential component for most water supply schemes in urban and rural areas. Water storage is generally based on overhead water tanks since the required pressure in the water delivery process is achieved by gravity in RCC elevated tanks rather than the need for large pumping systems. These RCC elevated rectangular water tanks consist of a large water mass at the top which is supported by a tall staging which is extremely weak against horizontal forces caused due to earthquakes. The selection of a suitable staging system plays a important major role in the behavior of RCC elevated rectangular water tanks during earthquakes, since these tanks are often utilized in seismically prone active regions. Compared to conventional building the energy absorption and ductility of RCC and steel elevated water tank is less, hence seismic safety of such water tank structures are very much important reason to be considered. Soil-structure interaction (SSI) is one of the most essential components of structural analysis and this interaction can change the dynamic characteristics of any structures which can be advantageous/ detrimental to its performance. Fixed base analysis disregards the effects of soil flexibility which resulting an unsafe design. The present work is mainly focused on the seismic analysis of RCC elevated water tank for various soil conditions with seismic zones are adopted as per code IS1893 (Part 2):2014. Modeling and analysis has been carried out using FEM based SAP2000 software.

Keywords: *RCC Elevated Water Tank, Soil Structure Interaction, Soil conditions, Seismic zones, Response spectrum, Bracings, Full tank condition, Empty tank condition and SAP 2000 software.*

Anthropogenic Effects on Surface Water Quality Assessment in Baitarani Basin, Odisha Using Multivariate Approach

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ABSTRACT

Rivers are critical to agriculture, industry and the needs of humans and wildlife. Rapid human pressure in semi-urban and urban areas along with increasing industrial activities has resulted in release of untreated sewage and other forms of pollutants into major rivers globally including in the Baitarani Basin. Contamination of water by natural and anthropogenic activities was continued, since the beginning of human development. The deteriorating water quality and pollution of ecosystem is a global concern. In this study, 13 stations were monitored seasonally to understand the effect of monsoonal precipitation on environmental variables and Water Quality Index (WQI). Sampling was undertaken in pre-monsoon, monsoon and post-monsoon seasons for a period of one year (2020-2021). Various physicochemical parameters, like PH, Turbidity, TDS, TSS, EC, DO, Alkalinity, BOD, TH, HCO_3^-, SO_4^{2-}, NO_3^-, PO_4^{3-}, Cl^-, Ca^{2+}, Mg^{2+}, Na^+, K^+ and Fe were investigated to assess the fitness of water for a variety of uses. pH, EC, TDS, TH, principal cations, and DO values were all significantly below BIS and WHO standards. Furthermore, the levels of turbidity, TSS, and, in certain cases, BOD were all over the permitted range, indicating polluting water sources. With the measured parameters, the interpolation maps of each parameter were determined using the Kriging method and the water quality was quantified using the WQI method. The results showed that the WQI values were between 17.76 and 59.72 in pre-monsoon, 17.80 and 58.53 in monsoon, 19.25 and 77.69 in post-monsoon period. The results demonstrated that water quality varied in the selected stations between average and good and that pollution increases from upstream to downstream. Clustering approach (CA) and principal component analysis (PCA) were also utilized. These methods were used to analyse water conditions for efficient management. CA group the sampling locations into homogeneous cluster with similar behaviour. PCA is quite effective in identifying critical parameters for describing the water quality of the river in different seasons. PCA was effective in explaining 76%, 74% and 72% of the total cumulative variance in the water quality in different seasons. The results of PCA indicated that BOD, Fe, turbidity a suitable treatment method as well as preventive measures to curb the diminishing water quality which is clearly established through the average values of the parameters and that of WQI. Suitability of multivariate approaches to design and plan sampling and sampling programs for controlling water quality management programs in river basins. To preserve this water resource against pollution, the implementation of stringent rules and guidelines are needed to enhance health and preserve water resources for future generations.

Keywords: *Baitarani Basin, Water Quality Index, Kriging method, Clustering, PCA*

Effect of geometrical aspects of web openings on the load carrying capacity of steel beams

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ABSTRACT

Steel I-shaped beams with web openings of shapes like hexagonal, circular and rectangular at regular intervals have been used since last 60–70 years. Therefore, aim of this paper is to examine the behavior of steel I-beams with rectangular web openings by performing parametric study. A parametric study based on finite element analysis consists of effect of fillet radius, aspect ratio of rectangular openings, stiffeners position around the openings and the effect on load carrying capacities of steel beam with rectangular web openings was carried out by using a commercial finite element software ANSYS 19.2 software. An overall study of such type of beam was carried out and results shows that rectangular openings having aspect ratio of 2 and fillet radius 20mm and reinforcement in the form of vertical stiffeners around the web openings found to be very effective. The fillet radius and stiffeners also affect the stress distribution around the corner regions of openings. Load carrying capacities of perforated beams are almost equal to plain-webbed beams, when openings are placed within middle two-third (neutral zone) of the span.

Keywords: Steel I-beams, rectangular web openings, fillet radius, aspect ratio, stiffeners, perforated beams

Effect of Material Characteristics on Seismic Vulnerability of Building

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ABSTRACT

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Seismic risk assessment is needed to predict the outcome of earthquakes based on the damage to the built environment in India. During an earthquake, human-made engineered and non-engineered buildings collapse, causing deaths and injuries; therefore, it is essential to rehabilitate these vulnerable structures to reduce considerable loss of human life and property. In the current study, a seismic vulnerability assessment has been carried out of a five-story RC frame building at the different intensities of earthquake having return periods of 2475yrs, 4950yrs, DBE and MCE response spectrum. Static pushover analysis of an RC frame building has been performed using SAP 2000 to determine its seismic vulnerability. The equivalent linearization method estimates the building's performance points after receiving its pushover curve. Fragility curves are developed for RC frame building for various material characteristics. It was found that the chances of damage increase with higher concrete grades and decrease with higher steel grades. Finally, results are presented as variations in the probability of damage of slight, moderate, extreme, and collapse-damaged states due to different material grades at various earthquake intensities.

Keywords: Earthquake, Spectral displacement, Seismic Vulnerability, Fragility curve.

Response of Isolated and Non-Isolated Structure Under Different Ground Motions

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ABSTRACT

The present research aims to study the response of isolated and non-isolated structures under different ground motions. Two finite element models were created using SAP2000. One model was non isolated and other was isolated model. To observe to response of different ground motions on the structures, two ground motions were selected in such a way that the magnitude to ground motions was same but one ground motion had high PGA, PGV values and low predominant time period and the other one had low PGA, PGV values and high predominant time period. Nonlinear time history analysis was performed for both the models and the responses in terms of story displacements, and total base shear have been discussed. The response of isolator to the two different ground motions has also been discussed in this study. It was found in this study that the predominant time period is the governing factor in story displacements of non-isolated structure.

Keywords- *Nonlinear time history analysis, Base isolation, Story displacement, Base Shear*

An analysis of cable stayed bridge for Seismic forces with Different Cable Arrangements

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ABSTRACT:

This project will use STAAD Pro to create and analyze various cable arrangements using various pylon shapes. There are many different cable arrangement kinds, among which we choose fan, radial, star, and harp layouts. The pylons are two lateral layers of stays in the "A" shape, "Y" shape, "H" form, and one axial layer of stays in the circular pylon shape. Many of the forms that are being examined for pylons have circular shapes or have a cross-sectional area. After examining the structures, the best structure will be suggested. With all examples of shear stress, bending moment, and displacements, the relationship is produced. Regarding the execution of a few of the agreements, the inference will be made. This may help to improve the shortcomings of others. This initiative will offer recommendations for enhancing the efficacy of such agreements. The best configuration out of all of these is the circular H shape with harp and fan form design.

Keyword: Cable stayed bridges, "A" shape, "Y" shape, "H" form, shear stress, bending moment, STAAD Pro, harp and fan form design

Study on Influence of Geometric Irregularity on Seismic Response of Multi Storey Buildings

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ABSTRACT

Buildings with simple geometric configuration in plan and elevation suffers very less damage during the earthquake than irregular planned buildings. Irregularities are weak points of the building which may cause failure of structural components or total collapse of the building during an earthquake. This study concerned with the effects of variation of plan irregularity index on the seismic response of buildings having similarity in structural component dimension, orientation of columns and built up area. In this study response spectrum analysis was performed on the G+10 storey regular and plan irregular reinforced concrete (RC) buildings of E, U, L, T and + shape for plan irregularity indexes 0.2, 0.3 and 0.4. Analysis was performed using ETABS as per the IS 1893: 2016 guidelines. Seismic responses like maximum lateral displacement, maximum base shear, storey drift and time period were compared for all regular and plan irregular RC buildings. T shaped building performed better in compare to other shaped buildings.

Keywords: Seismic Analysis, Response Spectrum Analysis (RSA), Base Shear, Drift, Displacement, ETABS, Plan Irregularity.

Study on Flexural Behaviour of Intermediate Web Stiffened Innovative Cold Formed Steel Sections

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ABSTRACT

In recent years, the tendency of using Cold Formed Steel (CFS) in construction industry is increased both as structural and non-structural elements. The advantages such as high strength to weight ratio, light weight, ease of fabrication, erection and economy. C and Z are the most widely used cold formed sections. Both of these sections are prone to buckling. It is important to either postpone or fully remove the different modes of buckling in cold formed sections for beams in order to achieve much improved structural efficiency in terms of strength and stiffness. The sections were analysed both numerically and experimentally. The results obtained shows that the innovative sections carried more load and more ductile in nature compared to conventional section.

Keywords: Cold formed steel, light gauge steel, CFS built-up sections, Innovative CFS sections, ABAQUS

Analysis of Self-Supporting Steel Chimney Along with Retrofitting Concepts

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ABSTRACT

Chimneys or stacks are tall, slender, cylindrical and tapering with circular cross-sections. Chimneys are very dominant and crucial industrial structures used to discharge and disperse of flue gases at a higher elevation in the atmosphere. These chimneys can either be constructed of concrete, steel or masonry. Steel chimneys are ideally suited for process work where a low thermal capacity and short heat-up period is required. The construction of steel stacks has been widely increased since last couple of decades, which is primarily due to the increasing demand for pollution control. These chimneys are subjected to various loads such as self -weight of the chimney, imposed load which is supposed to act, wind as well as seismic force and loads due to temperature effect. These loads when act on a structure causes some types of stresses on the structure. If these stresses are not within permissible limits, then it will cause damage to the structure or in severe cases, the structure may fail. The present study focuses on static and dynamic analysis of steel chimney having height 65m, 90m, 100m, and 130m with seismic zone II, III, IV and V and varying wind speed 33m/sec to 55m/sec. The chimney is resting over an RCC foundation. For analysis Staad Pro software is used, along with static analysis a non - linear dynamic analysis: Time history analysis is also performed. Then the effect of wind load and seismic load on different models has been studied. Comparison is made between the results obtained i.e., Shear force, bending moment, maximum base shear and mode shapes to that calculated using empirical formulas. The two main issues that structure should withstand are the strength and stability of the structure. Structure is then designed for deflection and the stresses, if these stresses are not within permissible limits then the structure must be redesigned and work should be done to control deflection at the top. Some failure mechanisms have also been discussed to check the possibility of the failure, if any. Evaluation and comparison of different retrofit measures to make structure more durable and safer.

Key Words: *Steel chimneys, static and dynamic analysis, Staad Pro*

Scope of irregular geometry in tall building: a way forward

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ABSTRACT

Due to structural efficiency and architectural aesthetic potential diagrid structures are prevalently used for today's tall buildings and extension to this, new grids can be studied and checked. One of grid selected here is irregular grid. In this study irregular geometry for tall building has been adopted, it is important to find relevant structural system for its better overall performance. The outer grid selected here for tall building is Irregular grid. Mainly two cases have been considered here, one is square shape building with Irregular grid including peripheral columns and second case is Conventional grid with peripheral columns for same shape. Modelling for Irregular geometry is done on Rhino 3D using Grasshopper as plugin, which was imported on SAP2000. Material for building selected here is Steel. Analysis has been carried out for both Lateral Loads i.e., Earthquake and Wind Load as per codal provisions. To see how much effectively one can use irregular geometry and overcoming all the flaws of conventional methods, this study can be the milestone for future infrastructure development.

Keywords: Rhino 3D, Irregular grid, SAP2000 and tall building

Investigating Geometrical Properties of Knee Braces in the Seismic Behavior of Braced Frames

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ABSTRACT

Steel bracing is an efficient and cost-effective method of resisting lateral forces in a framed structure. A knee braced steel structure offers exceptional ductility and lateral stiffness. This paper aims to assess the performance of the knee brace system in steel structures using the SAP2000 and SeismoStruct software. To achieve this goal, the effective parameters in knee brace systems, such as stiffness, length, area, and moment of inertia of the knee element, were simulated and analyzed using SAP2000 and SeismoStruct in order to investigate the effective parameters in knee brace investigated. The results showed that increasing the knee member's moment of inertia is the most efficient parameter for improving the frame's lateral stiffness. Furthermore, increasing the axial stiffness of the brace has a limited effect on the lateral stiffness of the frame, and once this value is reached, the stiffness of the brace remains constant and does not exceed it. Moreover, the obtained results from models in the SeismoStruct software were found to be more accurate in comparison to the corresponding models conducted in the SAP2000 software.

Keywords:

Review on Comparative optimization on RCC and Steel elevated water tank considering SSI effect

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ABSTRACT

Water tanks have been the most vital lifeline structures as they serve as an essential component for most water supply schemes in urban and rural areas. Water storage is generally based onoverhead water tanks since the required pressure in the water delivery process is achieved by gravity inRCC and Steel elevated tanks rather than the need for large pumping systems. These RCC and Steelelevated water tanks consist of a large water mass at the top which is supported by a tall staging which isextremely weak against horizontal forces caused due to earthquakes. The selection of a suitable stagingsystem plays a important major role in the behavior of RCC and Steel elevated water tanks duringearthquakes, since these tanks are often utilized in seismically prone active regions. The ductility andenergy absorbing capacity of such RCC and Steel elevated water tanks are less compared to conventionalbuilding. Hence seismic safety of such water tank structures are very much important reason to beconsidered. Soil-structure interaction (SSI) is one of the most essential components of structural analysis.This interaction can change the Dynamic characteristics of any structures which can be advantageous ordetrimental to its performance. Conventional fixed base analysis disregards the effect of soil flexibility,resulting in an unsafe design. The present work is focused on the review on comparative optimization onRCC and Steel elevated water tanks considering the sloshing effect and to evaluate the behavior of Soil-Structure Interaction (SSI) effect in seismic Zones. Different soil conditions are also adopted as per codeIS1893 (Part 2):2014. Modeling and analysis has been carried out using FEM based SAP2000 software.

Keywords: *Elevated Water Tank, Soil Structure Interaction, Soil conditions, Seismic zones, Sloshing effect, Bracings and SAP 2000 software.*

Seismic Analysis of Multistorey Building
with Floating Column

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ABSTRACT

Modern multi-storey buildings are constructed with irregularities such as soft storey, vertical or plan irregularity, floating column and heavy loads. These types of structures have become a very common construction practice in urban India. It is observed that most of the RC structures with such irregularities constructed are highly undesirable in seismically active areas from the results of past earthquake studies. These effects occurred due to various reasons, such as non-uniform distribution of mass, stiffness and strength. This study explains the seismic analysis of a multi-storey building with floating column constructed in seismically active areas observing its reactions to the external lateral forces exerted on the building in various seismic zones using the software ETABS. Thus, highlighting the alternative measures involving in improvising the non-uniform distribution in the irregular building such as multi-storied building with floating column, and recommended the safer design of such building in seismically active areas considering the results observed from storey drifts, story displacements, when compared to Response Spectrum method shows best results.

Keywords: Earthquake design; Irregularity; Seismic codes; Irregular structures

Design of earthquake resistant structure using Cabkoma strands: a review

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ABSTRACT

Earthquakes are the indication for transformation of earths internal surface. The Indian subcontinent has suffered some of the greatest earthquakes in the world. Many research studies have been focusing on decreasing the impact of seismic waves on structures. For this initially there were many passive techniques introduced to reduce the damage caused due to earthquakes which are based on decreasing the lateral loads on structures. But since the late twentieth century the focus has shifted to introduce active earthquake techniques which are meant to absorb the seismic waves or do not let the waves propagate through the building. Though it is not possible to prevent an earthquake, the least that can be achieved in reducing the damage is to make the buildings earthquake resistant with the advancements in earthquake resistant techniques. The main objective of this dissertation is to develop a new earthquake resistant technique using CABKOMA strands. This review paper involves in the study of seismic behavior of a high-rise steel structure using CABKOMA strands. This work also presents the comparative study on Seismic behavior of high-rise steel structure designed using CABKOMA strands and seismic behavior of high-rise steel structure designed using isolators which is existing earthquake resistant technique in use. The seismic analysis and design of high-rise steel structure using CABKOMA strands and isolators is done using Structural analysis and design software application (STAAD pro).

Keywords: CABKOMA Strands, High – rise steel structure, STAAD pro, Seismic behavior

Parametric Study of High Damping Rubber Bearing in an Isolated Building

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ABSTRACT

The present research aims to study the effect of damping variation of isolation device in base isolated structure. For this, four 2D building frames have been modelled. One model is non-isolated while rest of three are base isolated building models with high damping rubber bearing as isolation device with damping ratios 0.1, 0.2 and 0.3 respectively. A finite-element based software SAP2000 has been used for modelling and analysis of the four models. For ground motion, a near field strong ground motion is selected and non-linear time history analysis is performed for all the models and the effect of variation of damping ratio on the maximum storey displacement, total base shear and behaviour of isolation device have been discussed. In this study, it was found that the optimum damping ratio falls in between 0.2 and 0.3.

Keywords- *HDRB, Damping ratio, Isolated building, Time history analysis*

Harmonic Analysis of Influence of Shape Memory Alloy on Composite Beam

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ABSTRACT

The research demonstrates the effect of SMA, or Shape Memory Alloy, on a Carbon/Epoxy composite beam. Current research analyses the harmonic response of a composite beam subjected to a point load of 10 kN in the middle of the beam's length at a frequency of 100 Hz. A cantilevered beam with dimensions of 1000 mm in length, 100 mm in width, and 30 mm in height is subdivided into three 10 mm layers. This investigation includes three cases. Case-I is composed of three layers of carbon/epoxy. In case-II, the middle layer is made of Shape Memory Alloy (SMA), while the top and bottom layers are made of a Carbon/Epoxy composite. Case III's middle layer is composed of Carbon/Epoxy, whereas the top and bottom layers are composed of shape memory alloy. The same loading and boundary constraints apply to all three cases. Used for numerical analysis is ANSYS 15.0.

Keywords: *SMA, Carbon/Epoxy, ANSYS workbench 15.0, Composite beam, Harmonic respons*

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Seismic Parametric Analysis of RC Multi-Storied Buildings with and Without Fluid Viscous Dampers

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ABSTRACT

Earthquakes are enormous natural disasters that increase the energy within the structural system, causing catastrophic destruction. Various control systems, such as passive, active, hybrid, and semi active control systems, can be used to dissipate this unwanted energy. The fluid viscous damper is one such dissipation device used in this study. The goal of this project is to use a fluid viscous damper to lessen the seismic response of the Symmetrical and unsymmetrical G+9 structure in ETABS2017. To obtain the seismic response with and without a fluid viscous damper, ETABS2017 was used to analyse symmetrical and unsymmetrical structures with and without a fluid viscous damper. The analysis takes into account nonlinear temporal history, which is derived using fast nonlinear analysis of Electro data. The position and function of dampers are discussed in this study. For seismic evaluation of buildings with and without fluid viscous dampers, the equivalent static approach and response spectrum method are utilised. The structure was examined utilizing ETABs 2017 programming, with seismic zone IV and medium soil (Type II) according to IS 1893-2016. The structure's exhibition is assessed utilizing story removal, story shear, story float, and modular periods and frequencies. The objective of this study is to about the consequences of static and reaction range examination in both longitudinal and cross over bearings for damper development with and without damper structure.

Keywords: Energy dissipation, Fluid viscous damper, Non-linear time history analysis, Passive control system, Seismic response control.

Natural Fibre Reinforced Composite: A Review

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ABSTRACT

For any industrial industry to survive, materials are crucial. Due to their good strength, damping capability verygood, and higher modulus, composite materials have largely replaced conventional materials. Better qualities of natural fibres composites, such as their less weight, water resistance, good impact strength, and environmental friendliness, composite natural fibre reinforced polymer matrix have gained importance in the modern period. Various natural fibre types that can be employed as reinforcement materials in composites are covered in this study. The production processes and steps for natural fibre reinforced composite are offered in several forms. Then, these composites tribological and mechanical properties are reviewed. There is also discussion of the various applications for natural fibre reinforced polymer composites.

Keywords : Retrofitting, Ultra-High Performance Fiber Reinforced Concrete (UHPFRC), Ferrocement, adhesive bonding, flexural strengthening

Fibre Reinforced Aerated Cement Sandwich Wall Panel- a Case Study

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ABSTRACT

In recent years, fibre reinforced panels (FRP) has provided solutions to the many problems related to savings in cost, time, labour, energy consumption and space requirement etc. It is asbestos free and green products manufactured from environment friendly materials. It has potential to be used in different formats having flexibility to be tailored to suit the cost effective and performance needed such as thermal and sound insulations, improved strength, stiffness, resilience and sustainability of structure systems. In the present case study, fibre reinforced aerated cement sandwich panel has been selected where concrete core is sandwiched with fibre cement boards on either side. Reduction of time, cost, labour, power consumption, space requirements and increase in durability, functionality like resistance to fire, moisture and termites, better acoustics, ease of installation etc. have been studied. Comparison with bricks, concrete has also been done.

Keywords: FRP, sustainability, durability, sandwich panel.

Effect of Nano Silica on Fresh Properties of Geopolymer Concrete

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ABSTRACT

Nanotechnology is a new field of study that might eventually affect every other area in STEM. Many scientists have proposed various definitions of nanotechnology. Control over the structure of matter by regulation of its by-products and products at the molecular level, as described by Drexler et al. In order to generate materials with completely novel characteristics and functionalities, some scientists have described nanotechnology as "the understanding, control, and fabrication of matter on the order of nanometres (less than 100 nm). Nanotechnology, the study of manipulating matter on an atomic scale, has the potential to radically alter the characteristics of building materials. Application of ultra-fine additives such nano silica in cementitious systems seeks to enhance plastic and hardened material properties. Filler effect achieved by micro and nano-scaled silica particles, which fill spaces between cement grains. With the correct ingredients, increased packing density reduces the mixture's water requirement and adds to increased strength by closing off capillary gaps. In addition to this physical impact produced by addition, nano silica has a pozzolanic reactivity that is much greater than that of silica fume.

Keywords: Nano-silica; Fresh properties; workability; Slump test

Assessment of dry-wet cycles effect on the durability of modified rubberised concrete

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ABSTRACT

For communities and property in flood-prone locations, the performance of construction materials during flood occurrences is important. Limited investigations are available on the influence of dry-wet water cycles on rubberised concrete after rubber crumbs treatment. Several tests are done to assess rubberised concrete's mechanical and durability characteristicsand compare it to conventional concrete. An optimum amount (15%) of rubber crumbs areutilised for partially replacing fine aggregate in concrete. Physical appearance, surface cracks, compressive strength, mass difference and ultrasonic pulse velocity of RuC have beentested under water dry-wet cycles. After dry-wet cycles, RuC gains its compressive strength, mass and ultrasonic pulse velocity. No harmful effect is found under dry-wet cycles of water. After rubber crumbs treatment and using pozzolana-based cement, the rubberised concrete canstruggle with dry-wet water cycles during flood conditions for a long duration.

Keywords: *Rubberized concrete; Mechanical properties; Durability properties; Dry-Wet cycles;*

Effect of Sodium Hydroxide on Fresh and Mechanical Properties of Geopolymer Concrete

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ABSTRACT

Concrete made with Geopolymer is a modern, long-lasting, cement-free, Eco-friendly material that eliminates cement's carbon footprints entirely. Cement manufacturing results in the release of a massive volume of carbon dioxide. Experimental research analysing the destructive testing of GPC for its mechanical qualities or engineering properties using NaOH of varying molarities (8M-16M). Learn how the curing temperature affects the GPC's engineering qualities. Experiment results showed that, for identical mix designs, oven-cured specimens achieved greater engineering strength than their ambient-cured counterparts. Among the several molar concentrations mix designs, the 14M mix design scored the highest in terms of engineering strength.

Keywords: *Geopolymer concrete; Molarity; compressive strength, mechanical properties*

Deriving the Mechanical properties of Concrete using waste scarps of steel as a reinforcing material

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ABSTRACT

This research focuses on the investigation of manufacturing sand and utilising steel scrap in the very innovative sector. Concrete with fibrous materials that are evenly spread and randomly orientated. is referred to as "steel scrap" concrete. The lathe-derived steel scrap wastematerial can be used in the construction of pavement and as steel fibre in the innovative construction sector. It is produced by each industry that uses lathes. The ecosystem is harmed by the disposal of these pollutants, which contaminate the soil and groundwater. With concrete, lathe scrap is additionally most likely to utilised to obtain benefits for sustainable developmentand the environment. In this project, lathe waste is used to create and study the properties ofsteel scrap concrete. Due to resource depletion and environmental restrictions, "manufacturedsand" is one such replacement for high-grade, pure river sand that concrete makers have beensearching for fine aggregate. Despite being used in the manufacture of concrete in India, itsproportion of contribution is still quite little in many regions of the nation. The tests includedthe compaction factor test, tests for compressive strength, split tensile strength, and the slumptest. and. For this, concrete cylinders and cubes were cast, cured, and tested after three, seven, and twenty-eight days.

Keywords: *Steel Scrap, Compressive strength, Split Tensile strength, Ordinary port land Cement, Mechanical Properties*

A Study to Check the Effect on Mechanical Properties of GGBS Based Geopolymer Concrete by Changing Molarity of Sodium Hydroxide Solution

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ABSTRACT

Geopolymer concrete, which has only very recently been introduced to the market for use in the construction sector, might be thought of as an alternative to cement-based concrete. Many of the studies that have been done on geopolymer concrete have found that it has the potential to replace cement-based concrete in many nations. However, this replacement will be contingent on the resources that are readily available in those nations, so it remains to be seen whether or not this potential is realized. Construction materials that are kind to the environment, make as little use of natural resources as they possibly can, and contribute to the reduction of greenhouse gas emissions into the atmosphere are currently the focus of research and development efforts in many parts of the world. One of the biggest contributions to the rising levels of greenhouse gas emissions in the environment is the production of normal Portland cement, which is one of the most common types of Portland cement. In this particular setting, geopolymer is necessary, and the production of geopolymer concrete makes use of inorganic polymers as the binding agents for the finished product. The purpose of this study is to investigate the impact that varying the molarity of the sodium hydroxide solution has on the mechanical properties of GGBS-based geopolymer concrete.

Keywords: *Ground Granulated Blast Furnace, Compressive Strength, NaOH, Strength in split tensile, Sodium Silicate and Flexure Strength*

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A Study to Check the Effect of Various Curing Condition on the Geopolymer Concrete

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ABSTRACT

Geopolymer concrete is an innovative method for making concrete that replaces Portland cement with pozzolanic material alternatively. Concrete, along with water, is one of the most commonly used commodities, and as a result, a great deal of Portland cement is required. Extreme amounts of carbon dioxide (CO2) are released during the production of Portland cement, contributing to environmental degradation. Additionally, a great deal of energy is used up in the cement manufacturing process. Geopolymer concrete's characteristics and behaviours vary depending on the context in which they're produced. This paper summarises the several approaches to curing geopolymer concrete, and determines the optimal approach. The mechanical properties of geopolymer concrete were found to be significantly impacted by curing conditions in a series of experiments. Curing geopolymer concrete at ambient temperatures often leads in weak strength development in the early ages, while curing at higher temperatures significantly increases the strength. Additionally, the geopolymerization mechanism was improved by prolonged curing time, leading to increased strength. Nonetheless, the sample fails if it is cured at a high temperature for too long.

Keywords: *Geopolymer Concrete, Ambient Curing, Temperature, Heat Curing and Steam Curing*

Utilization of Sugarcane Fiber in the development of Concrete Elements

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ABSTRACT

The use of natural fiber in construction is prevalent in the engineering of building materials. However, employing sugarcane fiber waste as a natural building material is extremely valuable since it may improve the ductility and crack control of brittle concrete. Additionally, using sugarcane in building can help to reduce environmental pollution. In this investigation, sugarcane fiber will be mixed with regular grade concrete and lightweight concrete to see if the concrete's compressive and tensile strengths increase. The purpose of this study was to compare the compressive and tensile strengths of control and sugarcane fiber-infused concrete. In addition, the ideal amount of sugarcane fiber to utilize in concrete mixtures depends on the amount of fiber that is used.

Keywords: Light weight High Tensile Strength Concrete, Ordinary Portland cement, Sugarcane BagasseFiber, Unit weight ,Tensile strength, Compressive strength.

An Experimental Evaluation of mechanical properties of Bamboo Fiber Reinforced Concrete

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ABSTRACT

In most countries, the construction industry is thought to use the most energy and materials. Many research projects in this area focus on the use of renewable and sustainable materials to ensure the sustainability of the next generation. This research aims at how bamboo fiber can beused to make bamboo fiber-reinforced concrete work better. For this purpose, cube, cylinder andprism were casted to determine the compressive, split tensile and flexural strength of concrete. The specimen was tested at 7 and 28 days respectively. The comparisons have been madebetween plain concrete and BFRC (Bamboo Fiber Reinforced Concrete) with the percentagereplacement of bamboo fibers. It has been observed that the slump value decreases with theincrease in bamboo fiber. Compressive, split tensile and flexural strength of concrete is foundto be increased remarkably.

Keywords: Bamboo Fiber, Compressive Strength, Split tensile strength, Flexure Strength, Slump, BFRC

The Utilization of Agricultural Waste in the development of Concrete: A Review

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ABSTRACT

Concrete is the most used building material in the world, and more and more of it is being usedbecause of how quickly industrialization and urbanisation are growing. Because there aren'tenough resources and the environment is getting worse and worse, scientists are trying to findeffective alternatives to cement that can be made from a lot of natural resources. Cement is oneof the main parts of concrete. To solve and lessen environmental problems, researchers arelooking into ways to use agricultural wastes, such as sugar cane bagasse, rice husk, sugar canestraw, and palm oil fuel, to make cement. The goal is to give concrete properties that aresustainable and good for the environment. Agro-waste materials are crushed into fine and coarseaggregates or burned into ash. The fine and coarse aggregates are then mixed with cement tomakeagro-cement. It is also thought of as a sustainable building material to replace aggregates, either in part or in whole. This paper mostly looks at the current research on agro-cement, whichhas been studied and used to make concrete stronger and last longer. It also gives a summary ofthe important knowledge and techniques, as well as the best ways to use agricultural wastes inconcrete.

Keywords: *Concrete. Agricultural Waste, Rice husk ash, Strength, Cost analysis*

The Effect of Waste Material Marble dust and GGBS Combinations as a Fractional Substitution for Cement in Concrete: A Relative Investigation

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ABSTRACT

Reusing waste has been highlighted as a way to partially replace cement in order to sustain a better environment while improving the mechanical properties of concrete. Directly disposing of waste materials from various sources into the earth can result in ecological problems, and the production of cement emits significant amounts of CO_2 that further contribute to the greenhouse effect. Therefore, In order to make samples with different percentages of waste material, such as 5%, 7.5%, 10%, 12.5%, 15% and 20% waste materials separate from and in various combinations with cement, such as marble dust (MD) and ground granulated blast furnace slag (GGBS), are substituted. Mechanical characteristics of cement containing GGBS and marble dust by conducting compressive strength and tensile strength tests on several examples for a predetermined period of 7 days, 28 days, and 56 days, it is possible to evaluate both in particular and in blend. In addition, the Slump test was carried out to determine the effectiveness of separate cement. However, the best fractional substitution was found at 12.5%, 12.5%, 10%, and 7.5% for MD and GGBS separately and in combination with varying percentage for compressive and split tensile strength tests for predefined days of curing. The results of laboratory work for long term strength increment were not well found in combination of MD and GGBS with varying percentage.

Keywords: *GGBS, Compressive strength, Split tensile test and Workability, Marble dust waste.*

Effect of Unprocessed and Processed Recycled Concrete Aggregates on the Compressive Strength of High Strength Concrete

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ABSTRACT

With increasing demand of natural resources for building material has put a alarming negative effect to our environment. This hasforced the government to regulate the use of natural building materials and scarcity has been felt and is also affecting the growth of construction industry. To tackle with above problem, now a day's more and more emphasis has been given to search for thealternative materials for building construction. This paper discusses about "Recycled Concrete Aggregate" and how the compressive strength of a concrete varies withthe usage of unprocessed and processed recycled aggregate. Hence, the research revolves around making a concrete using naturalaggregates (for comparison), unprocessed recycled aggregates and processed recycled aggregates. Thus, making it a three stageresearch in which the effect of aggregates (natural aggregates, unprocessed & processed aggregates) on the compressive strengthof concrete is closely observed. For the production of processed recycled aggregates "Straight forward mechanical grindingtechnique" was used and "two stage mixing approach" to deal with the recycled aggregates, to produce a strong and homogenousmix. Level of processing was varied by giving 200, 500 & 700 revolutions in Los Angeles Abrasion machine. The replacement of natural aggregates with recycled aggregates (unprocessed and processed recycled aggregates) was done by 20%, 40% and 50%. Therefore, not only the effect of unprocessed and processed recycled aggregates was studied but also the effect of the level of processing was studied. Hence, through this research it was concluded that the processed recycled aggregates processed with 500revolutions gave the target compressive strength at 20% replacement level, although the compressive strength obtained was lessthan that obtained from the natural aggregates but was sufficiently higher than that obtained from unprocessed recycled aggregates. The results were graphically plotted and studied for 7, 8 and 28 days of curing.

Keywords: *compressive strength; high strength concrete; natural aggregate; processed recycled aggregate; unprocessed recycled aggregate*

Implications of Different Clear Cover to Reinforcement on Internal and External Faces of Concrete Members

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ABSTRACT

Clear cover to reinforcement in reinforced concrete members is important for strength, serviceability and durability of the members, and the overall performance of the structure as well. The value of clear cover needed according to the prevalent codes, depends on the type of member, exposure conditions, fire rating, etc. Practitioners argue that the internal exposure conditions would be less harsh than the external and therefore, for deciding the clear cover on internal face, 'one-step-down' approach may be adopted. The implications of such practice have been examined in this article for the first time with a case study. Results indicate that for an internal exposure higher than 50% of the external one, internal corrosion cracks would precede the external ones, thereby depriving the occupants of the early warning, and making repair process difficult and cumbersome as well. An additional issue of different clear cover in different faces of member would make the detailing and execution of such job laborious, time-consuming, as well as prone to mistakes. Therefore, it would be advisable to provide same clear cover for a concrete member on all faces. This study needs to be followed up with detailed investigations before consideration of inclusion in the design codes by regulators

Keywords -

Sustainability In Supply Chain Management In Construction Industry

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ABSTRACT

This review is focused on various research studies in Supply Chain Management and achieving sustainability in supply chain management of civil engineering field. As the supply chain management is not concerned to the specific field but every person in the society is responsible and part of this chain/management. To attain sustainability, it is important to examine and restructure the supply process of the particular material or service or organisation hierarchy for that matter. There are many aspects to a supply chain such as logistics, economy, raw material, manufacturer, supplier, customer need, demand and supply of products etc. All these aspects of the chain run smoothly is a responsibility of supply chain manager. In case of construction lane, a lot of uncertainty and a project timeline affects the supply chain. In paper we are aiming to find the possible best way to maintain sustainability and efficient results from a construction industry's supply chain management.

Keywords: *Sustainability, Supply Chain, Organisation, Logistics, Supply Chain manager*

Miscellaneous

Hazardous waste and its management strategies

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ABSTRACT

Managing solid waste is a significant issue for environmental protection in the industrial age. The idea of sustainability encompasses all of the cost-effective, efficient, social, and environmental concerns that are addressed in the management of hazardous waste. Hazardous solid waste management is yet another crucial area to maintain the ecosystem's balance of flora and fauna caused by climate change and global warming. It is not difficult to recognize the enormous rise in hazardous solid waste in India as a result of the country's significant industrial and economic development, significant lifestyle changes, and rising population density. According to the National Environmental Policy Act of 1969, performing measurements for the efficient management of hazardous waste is a necessary component of all industrial and societal operations. Solid trash from the recent industrial era could include dangerous substances. Industrial multihazardous waste, therefore, contains a variety of radioactive, chemical, and biological dangers. Ewaste, or garbage produced from electronic and electrical equipment, is one of the waste categories that is expanding the fastest, with global growth rates of 3-5% annually. In hospitals and other healthcare facilities around the world, a comparatively substantial volume of infectious materials and dangerous waste is produced every day. The community, the medical staff, and the environment are all directly impacted by improper waste management in healthcare facilities. In order to use the best techniques to enhance safety and reduce negative effects on the environment, it is therefore even more important to handle that hazardous waste correctly. This article's goal is to review numerous innovative techniques and methods for managing, handling, recycling, reusing, and treating hazardous waste, including disposal.

Keywords: Hazardous waste, E-Waste, Biomedical waste, Radioactive waste, Thermal processing technologies

Deformation Characteristics of Metallic Preforms

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ABSTRACT

Forming technology of sintered preforms is being absorbed rapidly in industrial culture for product development. This paper presents an investigation into the deformation characteristics of iron powder sintered preforms during cold forging using vibrating dies. Experiments are conducted to study the variation of preform density and barreling profiles with reduction in height along with increasing processing load. The formability of all the preforms were noted when cracks were observed on the equatorial free surface during reduction in height. In order to have uniform deformation interfacial friction was reduced by using the concept of vibrating dies. Accordingly, composite friction law and velocity fields are developed. Using appropriate yield criteria, interfacial friction law, velocity field and the concept of vibrating dies, mathematical model has been developed for processing load and interfacial pressure using energy method approach. The results are presented graphically with processing parameters such as velocity, amplitude of vibration and percentage of deformation. Results so obtained are quite useful for industrialists and research persons who are interested in technology of sintered preforms.

Keywords- *Forming technology, Sintered preform, vibrating dies, Barreling profiles, Formability*

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Green office: a sustainable move towards employee mental wellness

ABSTRACT

Due to the increasing stress level, work routing, imbalance between personal and professional life and long working hours' majority of the employees from Indian corporate are struggling with various anxiety disorders. We cannot avoid the rat race of corporates for development and growth but we can make changes at workplace by making the offices environmentally sustainable. By recognizing the responsibilities towards environment, the employers are benefitted manifolds as it lowers the cost and make the employees productive. A peaceful, stable and calm mind can overcome such corporate challenges. The present paper examines the impact of the various techniques of green office on employee mental wellbeing and thereby improving the productivity of employees. Green office enhances positive emotions, cognitive thinking and reduces the hidden cost of health care.

Keywords: *Green office, Sustainability, Environment, Mental wellbeing, Stress, Employee*

Impact of Route Process on AA5083 of Back Pressure through Equal Channel Angular Pressing

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ABSTRACT

The goal of this research is to reduce the back-pressure needed to press AA5083 evenly throughout all channels. Equal Channel Angular Pressing has acted upon in a single pass at various temperature effects and with varying back pressure. Acquired free samples for a back-pressure crack. AA5083 samples were examined under an optical microscope for microstructural characteristics following equal channel angular pressing. Hardness and tensile test data are used to discuss mechanical behaviour. The microstructural characteristics, such as dislocation density, micro- strain, and crystallite size, are studied from the XRD peak profiles using a modified and distinct technique. The ideal processing parameter combination to press crack-free AA5083 through an equal channel is temperature of 220 0C and back pressure of 170 N/mm2 . The processing of AA5083 using Equal Channel Angular Pressing under an assault of heated conditions and up to four passes of back pressure using various techniques has successful. According to the processing method and the number of passes, the microstructural, mechanical, and wear behaviour has been studied. After being subjected to the Equal Channel Angular Pressing process, the samples showed a significant degree of grain refinement as well as improved mechanical and wear resistance qualities. The mixed fracture mode, which is ductile and brittle, has validated by the fractographs of the tensile samples. The study of the X-ray line profiles shows that the enhanced mechanical properties are a result of changes made to the microstructure during equal channel angular pressing. It's streamlined microstructure and greater microhardness, the sample produced using route BC displays superior mechanical and wear properties.

Keywords: AA5083, ECAP, Back-Pressure, Grain Size, Dislocation density.

Renewable Energy Generation in India: Current Scenario and Vision 2022

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ABSTRACT

As in India use of digital technology increasing day by day along with the consumption and demand of electrical energy is also rapidly increasing. India currently mainly depends on the generation of electrical energy by conventional energy resources and facing problem of huge energy requirement. And due to increasing pollution government and other agencies mainly focusing on generation of electrical energy by renewable sources. Renewable energy Sources are available in huge amount, in clean form and easy to generate power.

Keywords- DG, MNRE, SHP, MG

Investigation of Structural and Electronics Properties of Boron Co-Doped Silicon Carbide Nanoribbons

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ABSTRACT

In this work we have investigated the structural and electronic properties of boron doped armchair silicon carbide nanoribbon (B-doped ASiCNRs) by calculating the binding energy (BE), density of state (DOS), energy band structure, and bond length using density functional theory (DFT). Calculation shows that B-doped ASiCNRs have strong structural stability as compared to ASiCNR. Before doping, the energy band-gap of armchair silicon carbide nanoribbons is relatively higher than the boron doped armchair silicon carbide nanoribbons. It is found that when Boron (B) atoms are doped in the center the Fermi level shifted towards the valance band. This indicates that the doping of B results in the P-type nature of B-doped ASiCNRs. Our findings give a theoretical framework for adjusting the electronic characteristics of B-doped ASiCNRs. It can be used in future nanoelectronic devices etc.

Keywords: *Electronic properties, Structural properties, Armchair silicon carbide nanoribbons (ASiCNRs), Boron doped Armchair silicon carbide nanoribbons (B-doped ASiCNRs)*

Mitigation of power quality through passive filter in grid connected inverter

Hariom

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ABSTRACT

This papers deals with studying the basic theory of a passive filter its Simulink modeling, estimating various designing parameters and various instabilities. The project will be commenced by a basic understanding of the circuitry of the passive filter the components used in its design and the reason for choosing such components in this circuitry. After this, we are considering the three main filter L,LC and LCL filter take a single phase inverter which are connected with R load and trying to enhanced the value of different waveform which are coming .in another case we are trying to control the value of current and voltage THD less than 5% and get the proper waveform at a reliable value of L and C .in other hand we can say that it will be attempted to simulate a model circuit on any simulating software e.g. MATLAB and analyses the output waveforms for various values of the elements used in the circuit and hence study the system response and instabilities.

Keyword: *L, LC, LCL, THD,ASD,VSI,CSI,HWR,FWR, FACTS*

The Green Human Resource Management Practices and Their Impact on The Corporate Image of Organization: A Review 6782

ABSTRACT

The growing industrialization, technology, and other business-related activities have raised some serious questions on the company's responsibility towards the environment. The essential need for sustainability has made multinational corporations to became more environmentally sensitive. Top management now emphasizes developing culture, policies, and practices that could encourage green practices among employees. Today, the organization's success is highly dependent on the organization's count of carbon footprints and their involvement in CSR (corporate social responsibility) activities. Adopting green HRM practices throughout the organization is not easy, but it helps to generate positive results for the company towards the environment. The paper aims to study the various concepts related to green HRM, the relationship between sustainability and HRM, the challenges, opportunities, and steps involved in implementing green HRM. Further, the paper also highlights the examples of few companies involved in green HRM practices and how it is beneficial for them to improve their corporate image and satisfy their employees and customers.

Keywords: Green HRM, HRM (Human resource management), Sustainability, Environmental

Development of E - Rickshaw Torque Enhancer & Energy Regeneration Kit

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ABSTRACT

E-Rickshaw generally have a low pickup torque which results in wear and tear of the Brushless DC Motor and this wear and tear reduces the battery life of the E-Vehicle including the variable charge & deep discharge pattern of the driver of the vehicle. After observing the problem on a daily basis we thought this problem can be solved by assisting the existing real wheel motor. Our motive is to make the vehicle an all-Wheel drive using a hub motor in front wheel. We will utilize this motor in two different ways: First, it will provide high torque during the start or on the necessary Conditions just by turning a switch ON. Secondly it will also regenerate electricity and charge the battery when the front hub motor is not in use and the rickshaw is running under normal load condition.

Keywords: *E-vehicle, Battery life, wear, tear, all wheel drive;*

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Characteristics of target fragments emerged in the interactivity of 84Kr + Em at 1 A GeV

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ABSTRACT

The main focus of this article is on the emission feature of the black particles emerged in the interplay of 84Kr + Em at 1 A GeV. The correlation between black particle and shower particle also studied. This study reveals that the variation of black particle with shower particle is depending on the interplay of projectile with distinct type of target nuclei. The emission feature of grey particle are also investigated in 4π space angle, FHS and BHS for the events emerged from different target of emulsion

Keywords:

Performance of Grid Integrated 15 kW Solar PV system under variation in Load and Irradiation

Aashish Jaiswal, Subhash Chandra

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ABSTRACT

The main objective of this paper is to identify the problems associated with grid connected solar power system. Utilization of renewable energy systems in modern smart grids have increased in many countries, and with that increase the quality of power becomes a major concern for power system operators, especially at the load side. The main power quality problems, the harmonics comes on top, as they affect the voltage and current quality at the point of common coupling (PCC), and negatively affects the loads. One of the most used renewable generators is the solar photovoltaic (PV) systems, where it is connected into the low voltage distribution grid using power electronics inverters, and with the increased penetration level, massive harmonic current is injected into the network. There is a need to analyse the resulting harmonics distortion and highlight its possible constraints under various irradiation patterns.. This paper presents a case study of a distribution network with a connected 15 kW solar PV plant by taking the irradiation of different locations. The system is modelled and simulates using PSIM software to access the power quality problems (harmonics) at point of common coupling (PCC). The simulation is performed with increasing the connected PV modules, changing the locations and the results are analysed showing high level of THD with the increased PV penetration at the PCC considering a higher loading level of the distribution transformer.

Keywords—PCC, harmoni cdistortion, Smart distribution grid, PV systems.

Detection and Classification of Faults in High Voltage Transmission Line using Artificial Neural Networks

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ABSTRACT

In the transmission line, mistakes might be difficult to detect and classify. This problem has always existed. One of the power's biggest challenges was this one. For the most part, the protective relay device, tape, and management and security of software systems used for sensing the issue and separate the system's damaged unit from the others. This article focuses on identifying and categorizing defects.On transmission cables that carry high voltage. Additionally, fault detection Artificial neural networks were used for categorization. A network of computers is used by the back-propagation algorithmto direct distribution for each of the three stages of the fault process discovering and classifying research into neural networks using several buried layers of neurons, each with a distinct sum was subject to the requirement that the choice of neural network at each step. Using this idea as a basis for a traditional transmission the development of a line for producing the voltage and current settingsMATLAB/SIMULINK. network that was chosen to be simplified Simulate every defect and test generation situation that is conceivable. Of Using newly created test data sets, the Ann is trained and put to the test for flaws. categorization and detection errors. The simulation's outcomes were shown to show that an artificial neural network-based models for the efficient organization and detection of flaws on Transmission lines also achieve performancefulfillment.

Keywords:

Study of strength characteristic of rigid pavement by using polypropylene & polyester fiber

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ABSTRACT

Roadways are a crucial means of transport for the nation and its development is one of the important aspects for developing nation. Concrete roads from many years are providing a movement of vehicles over the road. By incorporating concrete in road construction, it has not only increased its durability but also reduced the cost of maintenance. But with all the benefits the concrete roads, it has been seen that it might experience fracture, striking, little ductile and frail in stiffness. To decipher this issue incorporation of fiber can provide increase in efficiency of concrete pavement. So present study aims to improve the pavement's quality and its efficiency. The fiber incorporated in the research are polypropylene fiber and Polyester fiber and concrete mixture cast-off is of M35 grade. In present study four specimen mix are prepared of which the first one is Plain concrete mix, the second mix is made by adding 1.19% of Polypropylene fiber, the third mix is made by adding 0.35% of Polyester fiber and the fourth mix is made by adding the pair of Polypropylene fiber and Polyester fiber per 1.19% and 0.35% respectively. All these specimens are then tested for Compressive strength, Slump test and Rebound hammer test for comparative study, and this study shows the quality of pavement can be improved by adding discrete fiber in the mix.

Keywords: *Concrete pavement, Compressive strength, Rebound Hammer Test, Polyester*

An Empirical Assessment of Environmental Consideration Initiatives of Indian MSMEs sector

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ABSTRACT

Today, addressing the environmental concerns and reducing carbon emissions has become imperative for every kind of originations. Hence, eliminating adverse impact of business operations is no longer limited to the large organization, even a small and medium business organizations are taking proactive approach in this direction. Considering the dearth of research in the field of environmental issues visa-vis to micro, small and medium enterprises (MSMEs), the present study aims to investigate pertinent issues related to environment faced by MSMEs in India. Further, this study also identifies the factors that impact the adoption of environment consideration initiatives among MSMEs in India. Data were collected from the senior official and management of the MSMEs operating in Delhi National capital region, India. The results revealed that three important factors that determine the level of adoption of environmental practices by MSMEs in India namely; regulatory compliance & pressure from stakeholders, environmental readiness & responsibility and sustainable advantage & capacity building. The findings of the study offer significant contribution in the research related to environmental consideration initiatives of Indian MSMEs sector.

Keywords: Environment protection, Eco-friendly technologies, Sustainable development, Micro-small & medium enterprises, India

Logistic Regression on Data Generated by Wearable IoT for Predicting Changes in Mental Health Scores

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ABSTRACT

Smartwatches and fitness bands are examples of IoT gadgets that can be quite useful in establishing a person's mental health. People are increasingly incorporating them into their daily lives, and smartphone applications are being created to track step count and sleep using sensory perceptions and GPS capabilities. By analysing the data they produced, we can have a comprehensive understanding of the indicators of deteriorating mental health. Using the physical symptoms tracked by commercially accessible wearable bands, we analysed data from The DISCover project to create a classification model in Logistic Regression to determine whether the patient's mental health is deteriorating. Previous studies have found a link between patients' phq9 levels and physical activity. We discovered that IoT devices can play a significant role in researching mental health, as done in the study Digital Signals in Chronic Pain done in Evidation Health. Along with step count and activity tracking have a higher rate in predicting mental health compared to sleep data generated in fitness bands, even without taking the emotional attributes into account.

Keywords— Digital Signals, DISCover, Logistic Regression, GPS, Evidation Health, Fitness Bands.

Current status on the recent limits of millichaged particles based on germanium technology

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ABSTRACT

In this article, we review the current status on the recents limits of millicharged particles, given by various collaborations, specifically TEXONO, GEMA, CDMS, worldwide which are using germanium detector technology.

Climatic Impact on planning scenario of heritage-built form8269

ABSTRACT

The urge of energy in the buildings is exponentially increasing with each passing day as the development in the stream of architecture is shooting up at an extremely pace. It is notable that the recent climatic changes are predominantly linked to man's activities and the concerns pertaining to over consumption of natural resources have reached to an extreme level where it has begun to affect the overall global environment. The infusion of passive architectural techniques involves the combination of design principles pertaining to solar & wind energy parameters. The Indigenous properties of materials are applied to ascertain that the building remain warm during winter and cool in summer, Therefore, ensuring a comfortable environment all throughout the year. Domains of existing planning strategies are studied and discussed from the case of Bikaner-old city havelis, which depicts the perfect role model to deal with planning scenario in hot & arid climate zones. In this paper it is elaborated and expressed that how the ancestral residential buildings should have responded to climate through its orientation, design, material used and passive cooling strategic applications to gain outmost energy efficiency & sustainability in built form. Thus, relating its importance to revive the concept of environmental sustainability in present built forms.

Keywords : *Climatic impact , built heritage , passive cooling , sustainability*

Hydrogeochemical Characteristics of Surface Water (SW) of Baitarani Basin, Odisha

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ABSTRACT

Various techniques were used to evaluate temporal and spatial variations in and interpret large and complex water quality data sets collected from the Baitarani River Basin in order to gain a better understanding of the nature of the factors influencing surface water composition as well as to specify them quantitatively. The goal of this research is to assess the river's water quality and determine its suitability for drinking, agricultural, and industrial use. Standard laboratory methods were used to examine the physical and chemical properties of surface water samples. Physical and chemical parameters such as PH, Turbidity, TDS, TSS, EC, DO, Alkalinity, BOD, TH, HCO3 - , SO4 2- , NO3 - , PO4 3- , Cl- , Ca2+, Mg2+, Na+ , K+ and Fe were determined. The initial goal is to assess the state of the river's water. The second goal is to compute the quality parameters of irrigation water, such as SAR, RSC, RSBC, MH, KR, PI, and PS. All of the PH readings for the sampling locations are alkaline. All of the water samples have EC values below 750, indicating that the irrigation water is of acceptable quality. In all seasons, plotting EC and SAR values on the US Salinity map revealed that the majority of the samples fit into the C1S1 (medium salinity/low sodium) and C2S1 (low salinity/low sodium) categories. In both the pre-monsoon and postmonsoon seasons, there is a positive association between SSP and SAR, with a value of 0.7762. The correlation coefficient (R^2) between EC and SAR is 0.2834 in the pre-monsoon season and 0.266 in the post-monsoon season, indicating a positive relationship. Binary diagrams were also drawn to evaluate the origin of salts dissolved in water and it shows that the plot of Na+ versus Cl_ showed a good correlation between sodium and chloride concentration for most of the points. The plots representing Ca2+ versus SO4 2_ concentrations yielding a good correlation between most of the points. According to the Water Quality Index (WQI), about 92.30 percent of the water samples are safe to drink. The TH, Piper's trilinear diagram, and the WQI research were used to determine the drinking acceptability standard of surface water. It has been shown to be excellent in all sample locations, with the exception of one station that may be ignored in both seasons, and so poses no health risk associated with excessive calcium and magnesium ingestion. Hydro-geochemical facies in the form of Piper's trilinear diagram plot which indicates that surface water is majorly of CaMgHCO3 and NaHCO3 type (fresh type) during both pre-monsoon and post-monsoon seasons barring a couple of samples which are of CaMgSO4 / CaMgClSO4 type in pre-monsoon. This study emphasizes the relevance of using water quality indices to help local people improve water quality by indicating the complete effect of ecological elements on surface water quality and providing a straightforward interpretation of data collected.

Keywords: *Baitarani River, US Salinity, Binary Diagrams, Piper's trilinear diagram, Water Quality Index*

A Design Estimation of Standalone Solar PV System for Renewable Energy Lab

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ABSTRACT

Solar PV system-based electricity generation is now a mature technology but the direct dealing of the customers with dealers is yet not so flexible. In order to boost the government of India's mission, individual customers should have to show their interest in such kinds of small projects. Here In this paper, an attempt is made to propose the estimated design of a Solar PV system which is delivering the fan and lightning load of the renewable energy lab of the department. The required PV capacity is 1.65 kWp , costs around Rs. 75500/ with a payback of period 8.9 years, return on investment of (ROI) 13.1 years considering the lifetime 22 years.

Keywords— *Solar Photovoltaic (PV), Design, cost Estimation, payback period, ROI*

Review on the development scenario of renewable energy in different country

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ABSTRACT

Burning of fossil fuels falls very bad impacts on environment. To mitigate the environmental problems the choice of Renewable energy play very important role. The study and development in this field can increase energy efficiency and reduce effect of greenhouse gases. This paper summarizes the renewable energy development condition, of the different country. The development trend of emerging renewable energy have been summarized and analyzed. It is essential to alter the energy market and uphold the rationality of policymaking in order to support the development of renewable energy sources. The energy sector benefits from a good educational system and awareness of renewable energy in the event of development. This study revealed that a significant amount of research is being done on renewable energy. This work has produced a concept regarding many applications of renewable energy, their advancement in various fields of application, and their solutions.

Keywords— *Renewable Energy, Solar energy, Wind energy, Hydro energy, coal energy, nuclear energy, natural gas, Geothermal energy, Biomass energy, international development*

Simulation and analysis of pure pursuit problem using matlab

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ABSTRACT

In this paper, certain specific cases of pure pursuit problem are solved using MATLAB. In pursuit problem one object chases another object for one or the other reason. Pursuit curves are generally used by fighter aircrafts to chase down an enemy. Here, trajectory of evader and pursuer are generated depending upon the parameters fixed by the user which helps in identifying whether the chase will be successful or a failure. Therefore, in real practice depending upon the capabilities of the pursuer like speed, directional freedom, initial location, range of missile etc. it can be decided whether to initiate the chase or not.Flexibility is provided in the code so as to change the parameters and analyse the results.

Keywords: *Simulation; Pursuit; Predator; Pray; Pursuer; Chase; Coordinates; Trajectory*

A Review of Optimization of Parameter, Technique and Outcome for CNC Lathe Turning

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ABSTRACT

An electro-mechanical device known as a computer numeric control (CNC) machine employs a computer programme as an input to carry out the desired machining. Mills, grinders, and lathes are just a few of the machine tools that can be numerically controlled. To impart complicated geometries on blanks using conventional machining, a complex jig is needed to regulate cutting tool motion. However, since the CNC machine's tool path is digitally set, a jig is not necessary. Additionally, compared to traditional machines, CNC has a number of advantages. For example, CNC requires less manpower to run and expands production options while also being more accurate. Cutting mostly influences the MRR and surface finish while turning. The industrial industry is now required to employ high-quality machining tools due to the rising competition for higher production with high surface smoothness. Spindle velocity, cutting depth, feed, and cutting velocity are some of the several turning parameters that affect surface characteristics. The goal of the current work is to evaluate the research that has been done in the domain of CNC lathe turning optimization. The lathe machine was chosen for parameter optimization because of its widespread availability and versatility in performing different jobs without modifying its configuration. Turning operation was specifically chosen because it offers a number of advantages, including the ability to be utilized for machining a wide range of materials and being one of the least expensive machining processes.

Keywords: cnc, turning, cutting parameter, optimization

Scope, advantages and limitations of e-commerce

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ABSTRACT

"Electronic commerce plays an essential role in advancing information technology as well as communication. This is particularly true in the realm of the economy. In the age of globalizing economics, many markets have become progressively international and competitive. Even as the covid-19 pandemic further leads industries in heavily impacted areas to insource towards local production as global trade was blocked, e-commerce can aid the economy on a local scale. Furthermore, improvements on the internet, along with advancements in information technology, and the progress in logistics and deliveries have enabled nearly every business to buy, sell and liaise on a global scale. This has led to the unexpected interest in electronic commerce in societies. However, although e-commerce has dominated the marketplace, online services and trade, bring on various benefits as well as major key drawbacks. This paper sheds light on the key features of e-commerce and the drawbacks it brings on two, the organization as well as customers. Well, understanding the benefits and drawbacks is essential as a benefit for the customer might be translated into a drawback for the business organization. Prosperous business organizations are very aware of the benefits and drawbacks before venturing into any business decision. The paper concludes, Despite the disadvantages of e-commerce, the numerous advantages of this business manage to successfully attract the attention of both companies and customers. Technology is evolving tremendously, so it is possible to witness the prevention of technological defects in particular in the near future."

Keywords: *Electronic Commerce, E-Commerce, Advantages, Disadvantages, Economy, Benefits, Drawbacks*

Impact of Environmental Temperature on Solar PV Modules and Investigate the Effect on an Optical Sensing Chip

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ABSTRACT

The efficiency of solar cells degrades as the temperature rises, leading to higher internal carrier recombination rates, which are driven by higher carrier concentrations. In the photovoltaic conversion process, the operating temperature is critical. The electrical efficiency is proportional to the operating temperature and power output of a photovoltaic (PV) module. The kind of PV material utilized has a significant impact on the electrical performance. The effect of operation temperature on the electrical performance of photovoltaic systems using silicon-based solar cells/modules is discussed in this study. PV modules with lower temperature sensitivity are better for high-temperature locations. The effect of change in surrounding temperature due to change in irradiance of a solar PV system is investigated using an optical sensing chip with a surface plasmon resonance (SPR) sensor.

Keywords—Efficiency, Temperature, PV module, SPR, Optical Sensing Chip

Multi-optimization & parametric Appraisal for die steel while turning

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ABSTRACT

Die steel is extensively used in the automotive, aerospace, and industrial sectors. Surface roughness has a significant role in both sectors. Although there is a tonne of work on input parameter optimization, there is relatively little material that compares different optimization strategies for the same input parameters. In this study, we contrast the parameters optimised using Grey Relational Analysis (GRA) and Teaching Learning-Based Optimization (TLBO) (GRA). The experimental setup included a complete factorial design. The machining of die steelincludedtheuseofcarbideinserts.

Keywords:

Smart Similar Fashion Recommendations using Cache-Based Hybrid-CBIR System

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ABSTRACT

The Visualization is essential in our daily lives. Contrary to TBIR (i.e. Text Based Image Retrieval), which is meta-data dependent, CBIR (i.e. Content Based Image Retrieval) methodology offers superior estimation of similarity between images by utilizing their properties, such as shape, texture and color. In contrast to TBIR, CBIR sometimes produces inadequate results when image properties (meta-data) including price range, size, category, type and special features (if any) are taken into account. This study proposes a caching-based Hybrid-CBIR system that uses Hybrid-CBIR with Advanced Caching for intelligent fashion wear recommendations. As compared to conventional TBIR or conventional CBIR systems, the suggested approach takes into account and combines the CBIR and TBIR. To reduce server side load, the proposed alternative incorporates an advanced caching system. In this innovative system, it has been presumed that the recommendations for fashion wear are solely based on the chosen item, taking into account both the meta-data and image(s) features of that item. As compared to other standard TBIR and CBIR systems, the suggested caching-based Hybrid-CBIR system provides satisfactory results based on comparative experimental results.

Key Words:

Survey of Visual Cryptography-Based Securityand Authentication Systems

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ABSTRACT

A visual variation of conventional cryptography is known asvisual cryptography. Visual cryptography is a data security method designed exclusively for images. It is a method that enables the encryption of visual data—such as text, images, and so on—in a way that allows for computation-free decryption by a human visual framework. Visual cryptography is a vast field of study that is utilized in a variety of applications, including access control, data concealment, data watermarking, image security, and authentication systems. This paper's focus is on exploring the different uses of visual cryptography, particularly in the areas of security and authentication.Future research and discussion can be focused on a wide range of other visual cryptography's application areas.

Keywords:visual cryptography, security, authentication, watermarking, online transaction, anti-phishing, stenography

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A Review paper on Experimental and Parametric studies of Earth Heat Exchanger (EHE)

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ABSTRACT

Our civilization consumes 44% of its primary energy on a daily basis, with heating and cooling accounting for the greatest portion. Passive heating/cooling applications have made tremendous strides during the last three decades as a result of several research programmes on the issue. Due to its significant contribution to the reduction of heating/cooling energy loads, the improvement of indoor thermal comfort conditions, and the improvement of the urban environment, ground cooling (particularly earth heat exchangers) has been identified as one of the most intriguing technological research topics among passive cooling/heating applications. This paper offers a detailed examination of current advancements in earth heat exchanger research, methodologies, and technologies that contribute to thermal comfort and energy efficiency in built settings. The review focuses on the essential subject of experimental and parametric investigations examining the influence of their major properties on thermal efficiency and applications. System examples for experimental validation were emphasised. The system parameters were categorised into three groups: system design, soil types, and soil surface coverage. The thermal efficiency of the system was significantly influenced by the system's length, internal diameter, and depth of burial. The proposals highlighted the need for more experimental work with laboratory simulators.

Keywords:-

To study the Awareness & Perception of Clean India Mission (Swachh Bharat Abhiyan)

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ABSTRACT

The mission or programme known as the Swachh Bharat abhiyan was undertaken by Mr. Narendra Modi, the Indian Prime Minister. India needed to be cleaned and its dust and sand removed. At that time, India had become incredibly filthy, with people scattering trash everywhere. Therefore, this mission was necessary for this nation. Its conclusion was that because of this, people realized how important hygiene was. It's much better now, and I anticipate further improvement in the days ahead. It's a really nice concept, and there are now a lot of flyers and posters promoting it. People are becoming aware of the deployments of awareness programmes. sweeping the streets with a broom, picking up trash, and concentrating.

Keywords: Clean India Mission, sanitation, open defection, toilets, environmental protection.

Bibliometric analysis of Digital Marketing (DM)- related literature based on Scopus database: A 10 Year literature analysis from 2011 to 2020

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ABSTRACT

Bibliometric analysis is an effective method to express the comprehensive literature on Digital Marketing (DM). In a 10-year literature investigation from 2011 to 2020, Digital Marketing (DM) research has developed in a balanced mode and the collaboration between different institutions and teams has become closer. A total of 1311 DM - related articles were retrieved from Scopus database. Purpose of the present study is to explore research trends and focus of Digital Marketing (DM) research from 2011 to 2020. Sample articles have been examined on the basis of various distributions of these publications like year wise, country wise, author wise, journal wise, Institution wise citation wise and document wise distribution of articles. The results of the study provide fundamental insights and recent developments of Digital Marketing research.

Keywords: *Bibliometric, literature review, Digital Marketing (DB), Scopus.*

Designing and Analyzing Next Generation Film Institute in India

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ABSTRACT

One of the most significant art forms of our generation is now film. India is home to one of the world's largest and most vibrant film industries. The country is known around the world for its movies and music. Regardless of the relations between India and their nation, a lot of people are familiar with India because of its films. With 1500 films regularly made each year, India produces the most films worldwide, around three times as many as the United States. Despite how widely watched movies are, the filmmaking education system has suffered, giving students few opportunities to engage in the culture of filmmaking. Building a cutting-edge, future film institute and studio with the ability to sponsor and produce television programmes of the highest calibre is the paper's main goal, along with raising awareness of the value of filmmaking and its rising trend..

Keywords: Film Institute @ Pondiccerry , Design of each Blocks, Site Analysis, Climate Analysis

Future of Dark Matter Search with Time projection chamber and bubble chamber detector experiments

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Abstract: Dark matter is one of the long-standing problems in different sectors of physics. In this present paper, we will report the current scenario of dark matter candidate's searches. Also, we will focus on the different detection techniques used for their detection. Such as detection through time projection chamber, detection using superheated liquid by bubble formation. Also, we will focus on their current status and proposed future plan.

Keyword:

Smart Similar Fashion Recommendations Using Image Segmentation

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ABSTRACT

The majority of research indicates that when consumers enjoy something, they seek out similar items. This phenomena is true for both traditional and online retailers of fashion apparel. The human brain searches for similar dresses first in terms of kind and category, then moves on to visual features like color, texture, and shape, followed by quality and price. However, the fashion recommendation systems on current e-commerce platforms only use text and ignore image features. Using image segmentation, in this research, a Smart Similar Fashion Recommendations System has been proposed which is based on the idea of similarity detection in human brain psychology. This system mimics and considers each step a human brain takes to detect similarities, such as product size, type and category, visible or image features (colors, texture, and shape), and quality, material types, price range, among others. Similar fashion wear product(s) have been retrieved using TBIR and CBIR methodologies. Before extracting the features of an image, image segmentation has been used to improve accuracy by removing background and distracting elements from images and selecting the targeted object (dress). To reduce the load on server side, an innovative caching technique has been used. It has been assumed that the similar dresses will be recommended on the basis of selected dress. Based on comparisons among experimental outcomes the novel system is giving satisfactory results in comparison to the existing systems.

Keywords:

CYBER TERRORISM

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ABSTRACT

Cyber terrorism essentially denotes the use of technology in achieving terror agendas. This is one of the most common paths taken for indulging into cyber terrorist activities. The cyber terrorism is a way which not only results in virtual data loss; rather it also creates a strong physical impact. The framing procedure of Indian laws on cyber terrorism has been quite latent. Through this research the researcher will highlight the physical impact which is created by cyber terrorism and how it can be used as a tool for mass destruction. Besides this, the researcher will also discuss the legal framework pertaining to cyber terrorism in India. One thing which is seen in this research is that despite of several direct indications regarding the ill-effects of cyber terrorism, the cyber security system in India is significantly poor.

Keyword: *Cyber terrorism, Cyber law, Cyber space, Information Technology*

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A Systematic Review of Comparing and Evaluating Different E-Learning Education Models

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ABSTRACT

E-Learning has become a buzzword in recent times. In times of the worldwide covid-19 crisis, e-learning has become a necessity. Recently, all stakeholders in the domain of education dreamt of bringing e-learning as close to a face-to-face offline model as possible. This paper focuses on thorough research on the experience of users in different e-learning environments, the development achieved as of the date, and the future prospective developments on the UI-UX side of e-learning platforms. The platforms taken up for review are based on criteria of popularity, the field of education, and the diversity of the customer base. Once the present landscape is charted out clearly, solutions are suggested to achieve maximum design principles which can further enhance e-learning outcomes.

Keywords:

Technology and Modern Society : A Lore of Suppression for Transgenders

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ABSTRACT

The problems faced by the transgender community are largely overlooked by the society. This community is not considered as a part of the mainstream society, the problems faced by them is not at all discussed in the public platform. Their identity is a question mark for the society. Sexual violence is one of the major issues faced by the transgender community. The aim of this paper is to discuss the issue of sexual violence, faced by the transgenders. The paper will also deal with the issues of mental trauma, depression, suicidal tendency and identity crisis of the transgenders. Also, we will going to discuss sexual exploitation of the transwomen, A. Revathi in the novel The Truth About Me: A Hijra Life Story and Laxmi in the novel Me Hijra Me Laxmi. The paper will illustrate the traumatic childhood of a transwoman Laxminarayan Tripathi, a trans-right activist. It is to be noted that, there are number of cases of sexual violence against males and transgenders are recorded, the surveys and reports of the rapes and sexual violence cases will be discussed in this paper. Lack of gender inequality leads to the discrimination against the transgender people. Gender equality is necessary to establish peaceful, sustainable and prosperous world. Additionally, this paper will throw light on the thoughts of some scholars who talks about trans-inclusive society like Judith Butler, Emi Koyama, and Julia Serano, in which they have talked about the emergence of transfeminism in the society and union between feminism and transfeminism. Also, the measures to be taken to build a trans-inclusive society will be discussed in this paper.

Keywords – Sexual violence, Depression, Suicide, Transgenders, and Transfeminism

Skilled Labour shortage in the construction industry

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ABSTRACT

A skilled labour shortage is a lack of workers in particular trades or a lack of workers with the necessary abilities. The goal of the study is to pinpoint the regions of the Central Region's building construction industry where there is a shortage of trained labour. The study population, which included project managers, site engineers, site foremen, and engineers working with contractors, was gathered using a survey research methodology. The major method for gathering data was through the use of questionnaires, which were created depending on the specific goals of the research. The study's conclusions showed that the skilled labour shortage affected tile workers, electricians, painters and decorators. Further research revealed that the lack of competent workers was a result of socioeconomic variables, outside forces, job features, job satisfaction, industry constraints, and individual considerations. Employers should increase their personnel base through training while encouraging employees to modify their work attitudes and develop their trade competencies.

Keyword: Productivity, Skilled Workers, Project Delivery, Construction Projects, Performance.

Application of Flaps and Aelerons on the Helicpter's Tail Rotor Blades to Increase Lift Force

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ABSTRACT

In this work, we will predominately modify the tail rotor blades of helicopter by using Flaps and Ailerons. Flaps and Ailerons are the cut parts on the wings of airplanes. These parts can be extended and tilt based on the requirement of pilot, for the increment in lift force and also for the rolling moment. With the help of these cutted and extruded sections, we will increase only the force of lift on the rotary wing aircrafts and try to minimize the rolling moment. For the 3d basic model, we will use Solid works software and for the calculation of aerodynamic forces and other parameters we will use the MATLAB software. We verified the accuracy of the method by theoretical calculation and also on the MATLAB. The results indicate that the modified tail rotor blades can produce same lift force as same as the conventional tail rotor blades with the use of less mechanical linkages but the requirement of material has increased significantly, which intern results to less fuel consumption. This work can enhance the tail rotor wings design to improve aerodynamic and aero acoustic performance.

Keywords: *Flaps, Ailerons, Aircraft, MATLAB, Optimization;*

Analysis the Student Performance by Using Machine Learning and its Tool: A Systematic Review

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ABSTRACT

The Machine Learning has been used in educational area necessitated to handle several types of problems such as: to handle the drop out problems/cases, to improve the students' retention cases, knowing in advance at risk students, to predict and analysis the students' performance. Recently, lot of changes have occurred in education sector/system, such as school/university were temporary closed, offline education work moved towards an online education, school/university have reopened, bringing out major changes in the behavior of students which directly or indirectly affects the performance of students. Compatibility of this study to existing study for obtaining best predictive accuracy value model with significant datasets. For predictive analysis the performance of student into three categories such as excellent , average and poor with significant datasets, consequently upon reopening of schools, the aim/objective of this study for considering the selection between 1501 to 9000 range of datasets by determining the range on average bases somewhere on the point neither more nor less number of previous researchers and also identifying the exiting the best machine learning algorithms whose accuracy value may be above 90%.From 2019 to 2021 MLP (Multi-layer Perceptron), RF(Random Forest), QDA, LGBM (Gradient Boosting), Support Vector Machine, RF, BiLSTM (Bidirectional Long Short-Term Memory) algorithms and to provide higher accuracy value that was greater than 90%. After the analysis of previous research work there were seven algorithms whose accuracy value above than the 90% and also the modest range of datasets (that was greater than 1500 and less than equal to 9000(>1500&<= 9000) was considered by neither more nor less previous researchers (4 previous researchers) in their studies.

Keywords: *Machine Learning, Performance of the students, Analysis.*

A Bibliometric review of sustainability engineering of last 30 years

ABSTRACT

The application of sustainability engineering is a ground-breaking strategy for the long-term enhancement of the human condition. A holistic understanding is required for inviting more research on this topic therefore, this study intents to provide a decentralized framework with the aid of a bibliometric evaluation to examine the research trend on sustainable engineering. The study also contributes to the body of literature by providing insights into a robust, reliable thematic representation on this topic. All published research articles (778) over the last 30 years were examined using the multidisciplinary SCOPUS database. The framework was categorized into thematic categories by the integrative analysis, and these categories were distributed according to the year of publication, the sources of the publications, the major contributors and their locations, the keywords, the most frequently cited research papers, and many other aspects. A co-authorship network, an inter-country co-authorship network map, and a network of keyword co-occurrences were also created using the VOSviewer software.

Keywords: *Sustainable development, sustainable development goals, Scopus, Vosviewer, Bibliometric*

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A Ten Year Bibliometric Analysis of Green Manufacturing from 2011 to 2020

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ABSTRACT

This study aims to find out the research tendency of Green Manufacturing (GM). In this study we analyzed 352 published articles collected from Scopus database in ten years duration from the year 2011 to 2020. Study elaborates bibliometric analysis on the topic of green manufacturing which describes the information of publications in the specified research area. All 352 articles have been analyzed on yearly basis, journal wise, country wise, author wise, institution wise, on the basis of document and subject area basis publications on Green Manufacturing(GM). Outcomes of the study shows the rising trend of research in the area of Green Manufacturing. The results of the study also provide basic insights and latest trends in the progress of Green Manufacturing research area.

Keywords— *Green Manufacturing; GM; Bibliometric study*.

Building Materials

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A Novel Application of Metakaolin for Improvement of Mechanical Characteristics of Ground Granulated Blast Furnace Slag (GGBFS) Mixed Concrete

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ABSTRACT

Concrete is a relatively inelastic material when normal stresses and impact loads are applied. If discrete fibres are incorporated into concrete, it improves ductility and energy absorption during post-yielding phases. The incorporation of fibres causes the concrete material to become ductile rather than brittle, which increases the concrete's properties. The application of steel fibres and glass fibres is needed to improve the nature of concrete additionally to recover the concrete's performance. The focus of this research work is to look at the durability and mechanical characteristics of geo-polymer concrete with M-sand. By incorporating appropriate by-products into concrete, it is believed to provide better material properties than ordinary concrete. Steel and glass fibres are recommended to be used in concrete for enhanced outcomes, and cement is substituted with any suitable combination of GGBS, silica fumes, steel, and glass fibres in geo-polymer concrete utilizing M-sand in the proper amount. Workability, compression, split tensile, flexural, water absorption, acid attack, alkaline attack, and sulphate assault are all tests that will be done on this hybrid fiberreinforced geo-polymer concrete. It is believed that by combining these by-products, improved strengths and results will be achieved.

Keywords: Concrete, GGBFS, Metakaolin, Non-destructive tests, Waste management

Review on Influence and Utilization of Sugarcane Bagasse Ash (SBA) as Supplementary Cementitious Material in Concrete: Processing and Concrete Properties

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ABSTRACT

The cement production industries results in substantial emissions of CO_2 , the greenhouse gas chiefly responsible for global warming. The use of supplementary cementitious material (SCM) or additional cementitious material to reduce the clinker content is an important preventative measure for minimising CO_2 emissions from cement production. As a result, research is being carried out to incorporate the use of agricultural wastes as SCMs. The sugarcane bagasse ash (SBA) is agricultural wastes and it is produced by burning sugarcane bagasse in generation of electricity during sugar processing, improves the properties of concrete. Because of its pozzolanic properties, SBA has been examined extensively as a building material. This review discusses the physical and chemical properties SBA along with the influence of treatment process used to process bagasse ash. The fresh property like slump, mechanical properties like flexural strength, compressive strength, and split tensile strength along with some durability properties have also been discussed. Considering the literature review, the processing and treatment including burning and grinding on sugarcane bagasse ash influencing the physical properties and chemical composition such as increment in silica content and decrease of Loss on Ignition (LOI). Due to the influence of the treatment procedure, the slump either increase or decrease with increase in SBA %. The optimum replacement levels of 5%–20% of cement by SBA provide better mechanical properties. The chloride resistance and acid and sulphate resistance was also improved.

Keywords: *Physical Properties, Chemical Properties, Durability, Treatment, Sugarcane Bagasse Ash, Slump, Mechanical Properties*

Sustainable growth of large-scale 3D printing technology, its materials and working properties: A Review

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ABSTRACT

The goal of this investigation is to encourage the responsible use of large-scale 3D printing technology by reviewing existing design processes and methods for evaluating and measuring 3D-printable concrete materials experimentally. The material behaviour for concrete 3D printing and its evolution over the last few decades are thoroughly reviewed in this research.Following that, a study of material chemistry and 3DCP characteristics is done. We also explore the economic and environmental possibilities of 3D concrete printing, as well as the overall sustainability impact of concrete 3D printing construction. At last, we shed light on the transport mechanisms in printed concrete and provide our opinions and observations. Preparation and optimization of concrete materials with desirable printed qualities, as well as measurement and assessment techniques of their workability, are the primary concerns with this cutting-edge methodology.The most important variables to keep in mind while preparing the materials are outlined. To satisfy the essential needs of a freeform building process, the concrete mixture must be Extrudable, Flowing, and Constructible with Little Effort, have the appropriate setting time, and have minimal shrinkage. After that, early-stage measurements are proposed for evaluating fresh and hardened characteristics of concrete.

Keywords –3D concrete printing, printable property, rheology, sustainability.

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Investigation on Properties of Recycled Aggregate Concrete incorporating Lime and Metakaolin

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ABSTRACT

This study is focused towards exploring the use of Recycled Concrete Aggregate (RCA) as a substitute of conventional concrete. RCA has been used as the main source of aggregate, and varying proportions of the binders were used in the design mixes. The control mix has been designed with cement as the only binder, while other concrete mixes were designed with metakaolin (MK) (20% by weight) as the additional supplementary cementitious material (SCM). The design mixes involved replacement of cement with limestone powder (LS) as the SCM. The design mixes have been investigated for the compressive strength, sulphate resistance and the changes in the microstructure. X-ray diffraction test and SEM test have been conducted to identify the changes in microstructure, due to the addition of LS and MK. Incorporating MK enhanced the compressive strength by 15.07%, also replacing cement with LS by 10% enhanced the compressive strength by 13.49%. Further replacement of cement degraded the properties of mixes. The study of the hydration products reflected filler and dilution effects that can be attributed to improvement in the properties of design mixes. Thus, design mix with a 20% MK and 10% LS can be considered as the optimum mix with enhanced strength and better sulphate resistance in comparison to conventional concrete.

Keywords: *Recycled Coarse Aggregate (RCA), Metakaolin (MK), Supplementary Cementitious Material (SCM), Limestone Powder (LS)*

Investigations on the properties of brick using cow dung ash and lime

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ABSTRACT

Burnt clay bricks were used as the important building material in every country and it is most commonly and easily available in markets as cement or sand. Annually brick production in India is 20,000 crores. Due to high demand of bricks which influences the industries to open more and more brick kilns, which is actually the main reason of huge CO_2 emission in the atmosphere. Unfired bricks will be the one of the tool to solve the problem of carbon emission to the atmosphere. To see the environmental performance of the unburnt clay bricks it is difficult to get comparable data for building material because each research gives different analysis. For common burnt clay bricks the input energy is approximately 4186 MJ/1000Kg with the emission of output CO_2 is 202 kg/1000kg. Burnt clay bricks are made in kilns which has temperature near about 900- 1200 oC to make the bricks more durable and strong. From this kiln large amount of gases were released like CO_2, NO_2 etc. The input energy for sun dried bricks is about 525 MJ/1000 kg with the CO_2 emission around 25 kg/1000 kg. Waste materials are one of the main polluting constituent in the atmosphere. In every industry whether it is construction, chemical or steel to treat the generated waste material is challenging task. Some of the waste generated are toxic in nature these material is first treated then disposed into sea or soils. Waste material generated form construction and demolition industries can be reused as recycled aggregates, waste plastic used for making roads and waste material incorporated in making tiles and bricks. Moreover, the usage of these waste materials not only conserve our natural resources but also helps to reduce the CO_2 emission to atmosphere, reduce the usage of fuel or energy input. Traditional materials used in the construction industries was involving the low CO_2 emission to the atmosphere like lime, rock and sand. Limestone is one of the oldest building material and it is widely available in the nature and can be extracted by the use of very less effort if the extraction process is simple and less energy consuming this means it final will be very less therefore if somehow we try to use lime one of the building materials alternative it will reduce the expenses. These are the reason why the researchers are getting attracted towards the lime. In this study investigation is done on the bricks produced by optimized the percentages of lime and cow dung ash found by stabilization techniques and by doing trial mixes. Various test like compressive strength, water absorption, density and efflorescence was done on the bricks prepared by various constant percentages of lime and varying cow dung ash percentage from 5% to 25%.

Keywords:

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The Utilization of Rice Husk and Metakaolin in Concrete

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ABSTRACT

This Paper opinions the use of Rice husk And Metakaolin this is collected from rice mills & thru the calcination of either Kaolin or Kaolin clay respectively. The paper primarily recognition at the possibility of these two materials in concrete. By way of analytically reviewing preceding work, this looks reviews the mechanical and physical properties of concrete using the RH & MK. The take look summarizes the consequences of workability, water absorption, dry density, compressive energy, tensile electricity & flexural energy of Concrete prepared with RH & MK as said in previous works. The paper also addresses the microstructure & durability performance of this concrete. Using RH & MK in concrete manufacturing is an environmentally pleasant way to the non-stop depletion of nature. Rice husk & Metakaolin ought to enhance the cement matrix mechanical houses. Because of the binding assets of RH & MK, we can use this in geopolymer concrete. Its miles reported that the use of those two fabrics increases the Compressive Strength at some limit. Each splitting & flexural power is improved with RH and MK.

Keywords:

Effect of Nano-silica on the mechanical properties of Conventional Concrete

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ABSTRACT

Nanotechnology is a new field of study that might eventually affect every other area in research and development. Many scientists have proposed various definitions of nanotechnology. Nano-materials could be a good product for repair and rehabilitation of structures due to its particle size. It increases the packing density of the concrete and make the concrete impervious easily. In this research, to check the compressive strength, splitting tensile and flexural strength of different mix design after incorporation nano-silica in the conventional concrete at different ratios. The nano-silica incorporation varies from 0.0 % to 3.0 % by the interval of 0.5 %. After the experimental investigation, the mechanical properties strength increases with the increment of nano-silica ingression in the concrete but it also decreases the workability of the concrete.

Keywords: Nano-silica; Mechanical strength; Compressive strength; Conventional Concrete; Flexural strength

Experimental study of bituminous containing plastic waste material

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ABSTRACT

In this paper, research on bitumen has been done when waste plastic is added to it. The waste plastic and its disposal is a major threat to the environment, which results in pollution and global warming. The plastic mixed bituminous has improved properties in terms of strength than that of original bitumen. When a tiny quantity (5-10 percent by weight) of plastic is put into bituminous mixtures (asphalt), laboratory testing demonstrate that it improves pavement stability, strength, and durability. The goal of this study is to see how plastic bottle strips can be used in road building. In the bituminous mix, the plastic bottle strips serve as a modifier. This kind of plastic road could be a incredible work for such a extreme hot and humid weather as india faces each year. In India, the temperature crosses 50°C very frequently and the rains are also very terrible here, leaving most of the roads with big potholes. This paper includes the percentage (%) change of plastic in bitumen for good hardness and ductility.

Keywords: *Stability, Durability, Strength, Pavement, Bitumen, Asphalt*

An Approach to Check the Effect on Various Pozzolans on the Properties of Geopolymer Concrete

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ABSTRACT

As a building material, concrete surpasses all others in its versatility, durability and dependability. Concrete are the second most common substance after water requires massive amounts of Portland cement. The manufacturing of regular Portland cement is the second largest source of the pollutant carbon dioxide, behind only the operation of automobiles. Cement manufacturing also required a substantial quantity of energy. Therefore, it is imperative to discover a replacement for Portland cement, the material currently in use despite its high cost and high resource use. As a novel building material, geopolymer concrete will be synthesized via the chemical reaction of inorganic molecules. Many pozzolans were used in place of cement to produce the geopolymer concrete. Fly ash, GGBS, calcined clay, metakaolin, rice and other pozzolans were utilize to made the unique type of concrete which name is geopolymer concrete. Concrete's binding material was alumina silicate gel, which was created when pozzolans, which is rich in silica and alumina, combined with an alkaline solution. It's a great replacement for the standard cement concrete used in construction today. Typical Portland cement must not be used in making of geopolymer concrete. In this study, check the impact of pozzolans on the mechanical properties and durability properties of geopolymer concrete.

Keywords: *Geopolymer Concrete, Mechanical Properties, Pozzolans, Durability Properties, Workability*

Mechanical properties of Rice Husk Ash Concrete

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ABSTRACT:

This research demonstrates how the ash of rice husk (RHA) used, affects the mechanical qualities of concrete containing (RHA). Twelve different concrete mixes are used in this experimental programme. RHA was used to make all of the concrete mixtures in place of 0, 10%, and 20% of cement. For the investigation, the M30 grade mix design was used. Fresh samples of various concrete mixtures were tested to determine the slump and other qualities. The split tensile, compressive, and flexural strength of hardened samples after 7 days and 28 days of water curing were also tested. The results of the experimental observations show that using RHA-based concrete mixes increases strength. Additionally, the addition of RHA to concrete lowers the total amount of carbon that is embodied in the material, decreases costs, and makes use of agricultural waste.

Keywords:- Rice husk ash (RHA),concrete, compressive strength, flexural strength, split tensile.

Effect of alkaline solution ratios on the engineering properties of the concrete

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ABSTRACT

Because it completely eliminates the need for cement in construction projects, Geopolymer Concrete is a cutting-edge material that is also cement-free, sustainable, environmentally friendly, and inventive. It cuts down on carbon footprints in a direct manner. The manufacturing of cement results in the release of an extremely high volume of carbon dioxide. During the destructive testing of the GPC that was part of the experimental inquiry, various ratios of sodium silicate to sodium hydroxide (ranging from 0.5 to 3.0) were analysed for their effects on the mechanical and engineering qualities of the GPC. Among the various ratios of sodium silicate to sodium hydroxide, the alkaline ratio of 2.5 achieved the highest level of engineering strength. This was the case in the case of the alkaline ratio.

Keywords: *Geopolymer concrete; alkaline ratio; compressive strength, mechanical properties*

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The Utilization of Rice Husk And Metakaolin In Concrete

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ABSTRACT

This Paper opinions the use of Rice husk And Metakolin this is collected from rice mills & thru the calcination of either Kaolin or Kaolin clay respectively. The paper primarily recognition at the possibility of these two materials in concrete. By way of analytically reviewing preceding work, this looks reviews the mechanical and physical properties of concrete using the RH & MK. The take look summarizes the consequences of workability, water absorption, dry density, compressive energy, tensile electricity & flexural energy of Concrete prepared with RH & MK as said in previous works. The paper also addresses the microstructure & durability performance of this concrete. Using RH & MK in concrete manufacturing is an environmentally pleasant way to the non-stop depletion of nature. Rice huck & Metakaolin ought to enhance the cement matrix mechanical houses. Because of the binding assets of RH & MK, we can use this in geopolymer concrete. Its miles reported that the use of those two fabrics increases the Compressive Strength at some limit. Each splitting & flexural power is improved with RH and MK

Keywords:

The influence of jute fiber on mechanical properties of concrete

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ABSTRACT

The goal of this study is to find out how adding jute fibers affect the properties of concrete when it is fresh and when it is hard. Cubes, cylinders and prism were casted with two different lengths of jute fibers i.e. 10 mm and 20 mm and four different volumes additions.(0%, 0.25%, 0.50%, and 1%). The cubes were tested for compressive strength at the age of 7, 28, 56 and 90 days. The split tensile and flexural strength test was done at 90 days of testing. The results were noted down for different fiber length for the early and later age of testing. The results of the experiments showed that adding 0.5% jute fiber gives similar results as compare to control mix. However, a smaller amount (0.25%) of jute fiber made the hardened properties of the concrete better. The results of the factorial analysis showed that the length and volume of the fibers had a positive effect on the properties of the hardened concrete at both early and late curing ages. The slump value decreases with the addition of jute fiber.

Keywords: *Jute fiber, Slump, Compressive strength, Split tensile strength and Flexural strength*

Performance of Self Compacting Concrete using Dual Admixture in Sulphate Environment

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ABSTRACT

Self-compacting concrete (SCC) is a high-flowing concrete which compacts without the use of external energy. Ordinary Portland Cement (OPC) is often largely substituted in SCC with waste materials or by-products to enhance its performance. Various SCC mixes including both Rice Husk Ash (RHA) and Fly Ash (FA) in combination for partial substitution of OPC were prepared in this study with the goal of obtaining a sustainable alternative building material. Different M30 grade SCC mixtures were tested for their hardened and fresh characteristics. The substitution levels of OPC by FA were kept between 0 and 25% and the optimal replacement amount was determined to be 20%. Following that, each quantity of FA substitution of OPC, various quantities of RHA were used to replace the OPC (0-15%). The fresh characteristics of concrete were evaluated using U-box, V-funnel time, L-box, slump flow, and J-ring tests. Flexural, split-tensile and compressive strengths were used to determine the mechanical characteristics. The workability of the SCC mix improves as the FA content increases, whereas the value decreases as the RHA percentage increases. The optimum amount of OPC replacement by dual admixtures was obtained at 25% [FA(20%)+RHA(5%)]. Further, formulae for prediction of different strength parameters are developed for samples exposed to potable water. A micro-structural study was also carried out to investigate the changes in micro-structure of different SCC samples exposed to tap-water. Ammonium sulphate solutions were used to expose the SCC specimens to study the effect of sulphate on compressive strength and weight change of different SCC mixes.

Keywords: Self compacting concrete; Fly ash; Rice husk ash

Green Concrete: A Review on Sustainable Development

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ABSTRACT.

Each year, the globe produces millions of tonnes of waste, the majority of which cannot be recycled. Recycling waste also uses energy and pollutes the environment. Additionally, the ecology is greatly endangered by waste disposal and accumulation in the regions. Using waste material in concrete manufacturing is an efficient way to eliminate waste while also adding beneficial characteristics. There is a growing market for green concrete and the use of waste-contained concrete should be thoroughly assessed. This literature review is divided into two sections that discuss the utilisation of waste as an alternative to cement and aggregates. The properties of the substituted leading waste material are highlighted, and the finished concrete is assessed. Concrete made with rubber is more fire resistant and ductile than concrete made with agricultural or PET waste. Glass has improved thermal stability over concrete made with rubber.

Keyword: *Green concrete; waste management; sustainable development; waste materials.*

Comparative study on Self-Healing Bacterial Concrete Based on Different Bacteria: Strength and Durability

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ABSTRACT

The Demand of the concrete structures is raising day by day from very long period of time. The concrete that civil engineers are using has certain limitations, it forms cracks on hardening. There are certain methods to fill up these cracks but they costly and require time. But with the self-healing bacterial concrete can able to fill these cracks more effectively. This study is mainly shows comparison between two bacteria i.e. bacillus subtilis and bacillus Megaterium, which bacteria gives better outcomes measured in terms of compressive strength and durability which ultimately gives longer life span of concrete. As the research advances, The MICP (Microbiologically induced calcite bacteria) method also advances. The results from continuous research shows that when these calcite producing bacteria are enclosed in a capsules can give better results as compared to direct method. In conclusion mainly shows the basic difference between Bacillus Megaterium and Bacillus Subtilis has been discussed.

Keyword: Bio-mineralization, Bacillus subtilis, Bacillus Megaterium, Self-Healing Bacterial Concrete, MICP

Blast furnace slag and ceramic waste powder strengthen concrete

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ABSTRACT

This study intends to make ordinary strength concrete from ceramic waste as coarse particles. Broken tiles from local shops will be recycled. Tiles will be used to make 0%, 15%, 20%, 25%, and 30% ceramic waste concrete (CWC). All concrete mixes will use M20 grade concrete with a 0.48 water-cement ratio. India ranks third globally and accounts for 6% of global production. Even with increased ceramic manufacturing, there is waste. Thus, 15%-30% of annual production is wasted. Ceramic waste powder (CWP) replacement rates for portland cement are frequently confined to low percentages (less than 10%). To improve synergy cementitious material reactivity and maintain strength growth despite increasing cement replacement rates, The value of mixing CWP with blast furnace slag is assessed in this research (BFS).

keywords: *Durability, Strength, Environmental responsibility, Ceramic wast*

Seismic Parametric Analysis of RC Multi-Storied Buildings with and Without Fluid Viscous Dampers

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ABSTRACT

Earthquakes are enormous natural disasters that increase the energy within the structural system, causing catastrophic destruction. Various control systems, such as passive, active, hybrid, and semi active control systems, can be used to dissipate this unwanted energy. The fluid viscous damper is one such dissipation device used in this study. The goal of this project is to use a fluid viscous damper to lessen the seismic response of the Symmetrical and unsymmetrical G+9 structure in ETABS2017. To obtain the seismic response with and without a fluid viscous damper, ETABS2017 was used to analyse symmetrical and unsymmetrical structures with and without a fluid viscous damper. The analysis takes into account nonlinear temporal history, which is derived using fast nonlinear analysis of Electro data. The position and function of dampers are discussed in this study. For seismic evaluation of buildings with and without fluid viscous dampers, the equivalent static approach and response spectrum method are utilised. The structure was examined utilizing ETABs 2017 programming, with seismic zone IV and medium soil (Type II) according to IS 1893-2016. The structure's exhibition is assessed utilizing story removal, story shear, story float, and modular periods and frequencies. The objective of this study is to about the consequences of static and reaction range examination in both longitudinal and cross over bearings for damper development with and without damper structure.

Keywords: *Energy dissipation, Fluid viscous damper, Non-linear time history analysis, Passive control system, Seismic response control.*

Rise of Drones in the Construction Industry

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ABSTRACT

The construction industry's use of drones in areas such as building inspection, site mapping, and safety monitoring has risen dramatically. As the use of drones in construction grows, people and drones are more likely to work together and talk to each other. This raises new safety concerns atwork, especially for people who already work in dangerous places. Even though there is a lot ofresearch on the benefits of drones for certain construction tasks, there isn't as much research onthe safety risks that come with using this technology on building sites. This research uses 4Dsimulation to simulate and visualize virtual construction sites inhabited by drones in order toidentify the safety issues associated with their presence in various working situations. Thevalidated 4D simulation can be a very helpful tool for figuring out and evaluating the safety risksthat come with adding drones to construction sites.

Keywords- Drone, UAV, 4D simulation

A Review on Rice Husk Ash as SCM for the Production of New Generation Cement Composites in the Developing Countries-India

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ABSTRACT

Rice husk is an agricultural by-product available in huge quantities, particularly in India. This is an appropriate biomass source for the production of energy. Compared to other agricultural by-products like sugar cane bagasse, the burned rice husk yields nearly 20% of ash, with the chief constituent of silica that will be typically amorphous when properly burned. Wide-ranging research in the last two decades has permitted the use of rice husk ash (RHA) as a supplementary cementitious material (SCM) in cement-based products, whereby significant enhancements in strength and durability properties can be accomplished. From published literature, it has been found that this bio-based material is possessing high pozzolanic properties which have made this a novel technology because of the green nature of the exercise. The CO_2 emission with the utilization of RHA is zero. Hence, a partial replacement of OPC in cement composites with this cementing additive is a breakthrough for our environment with improved sustainability. This paper discussed the state-of-the-art pozzolanic behaviour of RHA, its Physio-chemical characteristics, and its influence on the mechanical and durability properties of cementitious composites. The outcome of the review helps in fulfilling the massive burdens on the construction industry economically and sustainably.

Keywords: Rice Husk Ash (RHA); Supplementary Cementitious Materials (SCM); Mechanical Strength; Durability Properties; Pozzolans; Sustainability; Cementitious Composites

Effect on Mechanical Properties of the Binary Replacement of Cement with Rice Husk Ash and Ground Granulated Blast-furnace Slag

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ABSTRACT

Geographical distribution patterns of rice, one of the world's most popular cereals, reveal regional differences. More than 90% of the world's rice is grown in Asia. GGBS is a byproduct obtained from iron industries when cooled and ground to the fineness of cement. GGBS has hydraulic properties. In the present study, effect on mechanical properties of the Binary replacement of cement with Rice Husk Ask (RHA) with Ground Granulated Blast-furnace Slag have been investigated. The RHA has been varied from 0-15% with increment of 3% and for each RHA %, GGBS has been varied from 0-30% with increment of 5%. Compressive strength of the specimens has been determined at 7 days, 28 Days and 56 Days. It has been observed that binary replacement of cement with RHA and GGBS significantly affected the strength of the specimens.

Keywords: *Mechanical Properties, Rice Husk Ash, Ground Granulated Blast-furnace Slag*

Improvement of Thermal Stability and Compressive Strength Using Slag Cement in Concrete

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ABSTRACT

Slag cement is often used in mortar, either on its own or in contrast to other types of cement, It enhances the strength, decreases permeability, increases resilience to chemical assault and prevents rebar corrosion when used with Portland cement. In this work, OPC has been blended with slag cement in a variety of ratios to achieve thermostability, which helps to increase cement's resilience to high temperatures.To achieve thermo-stability, ordinary Portland cements (OPC) was mixed with slag cement in various ratios in this experiment which aids cement resistance at high temperatures up to 1000 °C. The ratios of Slag: Cement used in the present study in the concrete were 1:5, 1:10, and 1:20. From our results, it has been studied that, Slag in cement has an important influence on post-heating characteristics of concrete. It has been studied that compressive strength increases with increasing slag-content of cement. It has been demonstrated that raising the slag cement proportion increases
thermal stability. Thermo-gravimetric studies showed that adding more slag to cement could reduce mass loss between 400 and 600 °C. The thermo-stability for M-20 grade concrete was determined to be 550°C for Slag: Cement ratios of 1:10 and 1:20 whereas it was 480°C for Slag: Cement ratios of 1:5.

Keyword: *Thermostability, Thermogravimetry, Compressive Strength*

Effect of Engineering Rock Property on Blast-Induced Ground Vibration

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ABSTRACT

Blasting is used for rock excavation at construction sites, which causes ground vibrations having potential to damage the surrounding structures. The effect of blast on the surrounding structures depend largely on ground motion characteristics, dynamic characteristics of structure and founding strata. There is a concern for safety of surrounding structures against blast vibrations. Proper planning and design of rock blasting is needed for safety of surrounding structures to attain a safe vibration level. Due to widely varying nature of rocks, geological structure and explosive materials, it is extremely difficult to predict the levels of vibrations. Blast design parameters are optimized by field-testing. Estimation of safe charges for different distances, designing blasting pattern, and monitoring vibrations during actual blasting are challenging area. The detailed study needs to be conducted for possible blasting of hard rock for excavation to ensure safety of surrounding structures. Blast-induced ground vibrations are characterized by peak particle velocity (PPV). The damage potential of ground vibrations is quantified in terms of PPV. Blasting design parameters includes scaled distance, explosive quantity and properties, geometry, initiation point and sequence, delay intervals patterns, firing method etc. Scaled distance takes care of distance of blast and charge weight. In the present paper, the effect of uni-axial compressive strength on blasting vibration is carried out.

Keywords*:*

Expansive soil stabilization using Leather Solid Waste and Bagasse Ash

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ABSTRACT

Expansive soils are problematic for their shrinking and swelling tendencies of clay minerals. To strengthen the strength of weak soil, stabilisation involves rearrangement of soil particles by adding additional particles. By utilising locally accessible waste materials, construction costs can be reduced by a certain amount. Lime, cement, fly ash, and other soil stabilisers have been employed for centuries to adjust soil qualities. Nontraditional stabilisers, on the other hand, are available in huge quantities and may take less time than traditional stabilisers. This study employs sugarcane waste fibre ash and leather solid waste to investigate the effect of varying amounts of sugarcane waste fibre ash and leather solid waste on black carbon. Small-scale businesses and manufacturers in India generate a significant amount of leather solid waste and sugarcane waste, both of which will be used to stabilise black cotton soil. Bagasse ash and leather waste will be evaluated for their efficacy as pavementfoundations as part of the CBR test. To achieve maximum dry unit, various proportions of bagasse ash and leather solid waste are added to the black cotton soil with its OMC.It has been studied that after seven days of soaking, the CBR value of black cotton soil has been improved by 67.39 percent by increasing the proportion of acrylic co-polymer

Keywords: Compaction, California bearing ratio (CBR), OMC

Evaluation of the effect of polycarboxylate ether-based superplasticiser on the different types of cement by marsh cone test

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ABSTRACT

The Marsh cone test is a direct and straightforward technique for examining the fluidity of cement paste using a superplasticiser. Polycarboxylate ether (PCE) based Auramix 400 superplasticiser, portland pozzolana cement, and ordinary portland cement is used for finding the optimum dosage of superplasticiser with specific cement. The optimum dosage and the superplasticiser's efficiency are determined by the marsh cone test for two types of cement. The fresh and mechanical properties and non-destructive testing of the concrete mixes made by two cement types have been compared. The water-cement ratio is kept constant for both types of cement.Results show that the optimum dosage of superplasticiser depends upon the different types of cement. After the saturation point, the fluidity of cement paste doesn't affect increasing the quantity of superplasticiser. Both concrete mixes' fresh and mechanical properties of the same grade are similar, but fine aggregate and coarse aggregate's requirement is more in OPC (Ordinary Portland Cement) mix concrete than in PPC (Portland Pozzolana Cement) mix concrete. The requirement of superplasticiser is more when used with PPC than the OPC concrete mix.

Keywords: Mechanical Properties; Marsh cone funnel; Workability; Superplasticizer; Saturation point.

Production of Various Construction Materials using Red Mud: a Review

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ABSTRACT

Red mud is a deleterious by-product that are harmful to the environment, formed as a residue in the production of aluminium through Bayer Process. Aluminium being an abundant element on the planet is widely used in the manufacture of many household and industrial goods as well as to fulfil the metal requirement in transportation field. About 66 million tonnes of aluminium is produced each year and hence the corresponding huge production of bauxite residue. For every single tonne production of alumina, 0.7 to approx 2 tons of redmud is generated on the site with almost ineffective disposal method existing till now. Over the years many researchers have come up with their version of solution to this caustic alkaline waste piling up on the earth surface by adding some amount of red mud into various construction materials. This review presents the various ways in which red-mud can be utilized in the construction commerce such as in production of ceramic materials, cements, self-compacting cement, for road pavement etc.

Keywords: Red mud, stockpiling, utilization, cement

Comparative Study of Backpressure on the Composition and Characteristics of the AA5083 Alloy During ECAPed

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ABSTRACT

Equal Channel Angular Processing Process at room temperature along varying backpressure level and numbersof passes produced hefty billets of 25 mm×25 mm×100 mm industrial alloy AA5083 with an ultrafine-grainedmicrostructure. Supersaturated solid iron in an aluminium matrix was treated in brittle cast AA5083 duringEqual Channel Angular Processing with Sixteen passes and a 285 MPa backpressure. The Equal Channel
Angular Processing alloy's strength, ductility, and microhardness were all greatly improved. Increasedbackpressure improves ductility of Equal Channel Angular Processing alloys, the workability and delays thecraking of intermetallic particles. Alloys treated by Equal Channel Angular Processing have improvedworkability due to backpressure. The AA5083 alloy's strength and microhardness were greatly improved. Whenan initially coarse-grained alloy undergoes 3 passes of Equal Channel Angular Processing with a 220 MPabackpressure, its microhardness and room strength (185 HV, UTS = 327 MPa) are significantly higher than theirtypical values following conventional processing with cold rolling or hot pressing. In ECAP, a super saturatedsolution was generated with a peak soluble of 0.6 wt.% of iron allow the ageing of the usually non-hardenablemetal. The cast alloy treated using the Multi - pass approach has positively impacted toughness, elasticity, andmicrohardness.

Keywords: AA5053, High pressure, Backpressure, SPD, and UFG, Nanostructures, Nanofabrications,Transmission Electron Microscopy.

A Review on Effects of Waste Tire Rubber on Fresh, Mechanical, and Impact Resistance Properties of Rubberized Concrete

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ABSTRACT

According to the conclusion of many researchers, it is found that waste tire rubber is useful in concrete leads to construction. Many types of research have been done on rubberized concrete'smechanical and impact resistance properties after partial aggregate replacement by rubber crumbs.Rubber crumbs are useful in the construction field because it has good flexibility and lower unitweight than natural rock aggregates. Thus, rubberized concrete will be advantageous where moreflexibility is required. Rubber tire has a good ability to absorb impact energy and good ductilityproperties that can reduce the effect of the earthquake to save the damage to the structure.However, an increment in the quantity of rubber also has an adverse effect on the mechanicalproperties of rubberized concrete. Less work has been done on the cement rubber matrix to enhancethe mechanical properties of rubberized concrete, and further studies should be done.

Keywords. Rubberized concrete; Mechanical Properties; Modulus of Elasticity; Impact resistance

Construction Technology & Management

Identifying and Analysing Risks Factors affecting the Performances of Construction Projects: Indian Scenario

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ABSTRACT

Construction projects are important for the growth of the indian construction industry. Project performance drives business success, but company risks and uncertainties arise because of complex and changing settings. In the current study, many business performance-related issues that cause construction delays and construction failures are discussed. A thorough questionnaire is used to poll the consultants, architects, civil contractors, and academics who are the major players in the indian construction industry. Financial risk, government rules, uncertainty, insufficient planning and coordination, ineffective labour, and labour shortages were shown to be the most important causes of construction delays. Using the ahp technique, the factors are ranked. Therefore, financial risk is a crucial component of a construction project's efficient and effective completion.

Keywords: Risk Management, Financial Risk, Experts Advise, Conclusion

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