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BOOK OF ABSTRACTS

S003

**FLOOD HAZARD MAPPING OF CHENNAI USING REMOTE SENSING GIS
TECHNIQUES.**

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ABSTRACT

Flood is the most vulnerable natural calamity which will occur every monsoon season. Flood will occur due to various reasons like excess rainfall, poor infiltration and urbanization. The effects of the flood lead to very severe like loses of human lives and property. So, it is necessary to plan flood management measures in flood prone areas. It is not possible to avoid effects of the flood completely but the effects of the flood can be reduced by preparedness through flood hazard mapping. In this study the flood hazard mapping of Chennai city has been prepared in order to identify flood vulnerable areas. The flood prone areas in the city have been identified from overlaying of rainfall data, contour map, DEM map and river networks map in ARCGIS environment. The result of the map shows that the low lying areas present in North, North-Eastern and Southern part of the city was comes under flood vulnerable areas.

Keywords: Flood, contour map, DEM map, Rainfall, river and ARCGIS.

S006

**TRAFFIC FLOW IMPROVEMENT ALONG PERUMANALLUR ROAD AT
THIRUPUR IN TAMIL NADU**

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ABSTRACT

The major roads within Thirupur city are carrying the traffic which exceeds the capacity. This study tries to manage the traffic flow by adopting suitable Transport System Management (TSM) which is a short-term measure. The study location is between Shanthi theatre in south and Pooluvapatti intersection in north along Perumanallur road in Thirupur city. This study length of road traverse through four major intersections such as 60 feet road intersection, Kannagi nagar intersection, Boyapalayam intersection and Pooluvapatti intersection and more number of local streets. Road inventory survey, intersection volume count survey, pedestrian count and Origin and Destination survey have been carried out to suggest TSM measures to improve the current flow. The Average Daily Traffic (ADT), peak hour and peak volume, modal split of vehicles at intersections, dominating mode, capacity assessment, forecasting the traffic for the next ten years have been assessed. At 60 feet road intersection the peak hour traffic comes to 9590 PCUs (11.00-12.00 hrs), at Kananagi nagar intersection, it is 8235 PCUs (17.00-18.00 hrs), at Boyampalayam intersection it is 9659 PCUs (9.00-10.00 hrs) and at Pooluvapatti intersection the peak volume is 11110 PCUs (9.00-10.00 hrs). ADT at 60 feet road intersection is found as 118370 in numbers and 104752 in PCU, at Kannagi nagar intersection is 113855 in numbers and 96776 in PCU, at Boyampalayam junction is found as 98544 in PCU and at Pooluvapatti intersection ADT is found as 119846 in PCU. In the peak hour two wheelers are dominating up to 81% followed by the cars with just 7% in the modal split of vehicles at 60 feet road intersection, two wheelers are up to 64% followed by the cars with 27% at Kananagi nagar intersection, two wheelers up to 84% followed by the cars with just 6% at Boyampalayam junction and two wheelers up to 83% followed by the cars with just 9% at Pooluvapatti intersection. The peak hour traffic at four intersections are projected at a rate of 5% annually and it will be around 14878 PCU at 60 feet road intersection, 12776 PCU at Kananagi nagar, 14984 PCU at Boyampalayam junction and 17237 PCU at Pooluvapatti intersection in the year 2030. TSM concepts are recommended especially, G turn to divert the movements of vehicles at study intersections which will bring down the volume to capacity ratio lesser than one.

Keywords: Transport System Management, forecasting the traffic, intersection improvement, volume to capacity ratio, peak volume.

S007

**INTERSECTION IMPROVEMENT AT FORESHORE ESTATE ALONG DGS
DINAKARAN SALAI IN CHENNAI**

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ABSTRACT

Rapid urban development generates enormous number of vehicles on road which leads to high level of congestion. Assessment of traffic volume provides measure for safe and efficient flow of traffic. Foreshore Estate intersection is in Southern part of Chennai city along Santhome high road has been selected for study. The road inventory survey has been carried out to collect the road geometry such as width of the road, median, footpath etc. The vehicle volume has been collected by performing the survey at four arms of Foreshore Estate intersection. The traffic accumulation graph is developed for the traffic volume at the study intersection, the peak hour and corresponding traffic volume has been assessed. Short and long-term measures are suggested to manage the traffic congestion. Asashort-term measure change in directional movement and as a long-term measure reconstruction of broken bridge from Pattinambakkam to Besent Nagar are suggested and this will ease the traffic volume at Foreshore Estate Intersection.

Keywords: Traffic congestion, Intersection study, Traffic survey, Traffic management measures, Transport System Management

S014

**IDENTIFICATION AND ASSESSMENT OF RISKS IN CONSTRUCTION PROJECTS
- A CASE STUDY OF ILLU ABABOR ZONE, ETHIOPIA.**

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ABSTRACT

In construction projects generally risk indicates future uncertainty, whereas the actual outcome of an activity or event is likely to vary from the planned one. Construction projects come across the unlimited uncertainties raised from external environment (Unstable Political, Economic, Financial condition and Natural disasters) and internal environment (Design, Safety, Quality, Resources, Disputes, Internal Conflicts and Corruption) of the project. Consequently nowadays, the risk investigation, supervision and controlling to be a main feature of the project management. The objective of this study is to recognize the various risk factors by using qualitative and quantitative survey. Qualitative study was done for 12 risk categories in construction projects, based on the opinions of experts major 5 risk categories were identified in the study area. Data collection was carried out by structured questionnaire, which was designed based on 5 categories and 61 questions. The questionnaire survey was carried out among clients, consultants and contractors. The top most risk factors that affects the performance and quality of construction industry were ranked based on Relative Important index method, reliability test was conducted to check the constancy and internal consistency of a risk factors by using Cronbach alpha method. Finally, the most affecting risk factors were analyzed systematically and control measures were given to rectify the risk factors and those control measures were implemented in Illu ababor zone construction projects.

Keywords: Risk Identification, Managing Risk, Relative Important index, Cronbach alpha.

E004

UTILIZATION OF PLASTIC WASTE IN BRICKS AS ECO FRIENDLY MATERIAL

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ABSTRACT

Plastics are often utilized in several forms for manufacturing the construction materials like bricks, tiles, road pavements etc. In general, solid waste generation surges with induced urbanization and related developments which cause the swift urge of utilizing plastic as one of the inevitable material (Bhada-Tata & Hoornweg, 2012). Several authors have attempted in their their research to utilize the waste plastics for road construction, for manufacturing cost effective bricks, paver blocks, etc. The main focus of this project is to reduce the impact of plastic pollution by reusing and recycling the waste plastics for producing the adaptive and suitable material. Hence the present study explored the operational sequence for utilizing the waste plastics for manufacturing eco bricks. The test specimens such as Plastic and Sand (1:3), Plastic and Sand (1:4), Plastic, Cement, and Sand (1:1:3) were tested for assessing the strength characteristics of different proportions of eco brick which ensure the applicability of developing eco-friendly construction material.

Keywords: Eco brick; Plastic waste; Construction material; Solid waste; Strength characteristics

E007

ENHANCING THE STRENGTH OF BRICKS BY USING WASTE MATERIALS

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ABSTRACT

Concrete blocks have been a significant material in the construction industry because of their high compressive strength. However, The growth in urbanization has led to severe problems such as a shortage of construction material, and an increase in waste. Blocks made from waste have a wide transition compared to conventional blocks. In recent times, eco-friendly bricks are accepted among the citizens, because of their environmental impact. To reduce the cost of concrete blocks, and to protect the environment, many countries have implemented eco-friendly bricks. Nowadays, bricks can be made from different waste materials such as organic sludge, paper sludge, agriculture waste, and much more.

Considering the current scenario, discarded PPE kits, and masks are increasing therefore, this study will emphasize the reduction in biomedical wastes by using them to make the concrete blocks and examine the tests on the block, also comparing the results with the conventional block.

E018

**BEHAVIOUR OF NEW COLD-FORMED STEEL BUILT-UP COLUMN SECTION
UNDER AXIAL**

COMPRESSION -*V. A. Veera Vignaesh*

ABSTRACT

Cold-formed steel columns are widely used in the construction industry for low-rise buildings due to their lightweight, easy installation, and erection. Back-to-back built-up coldformed steel lipped channel sections and box sections are used in cold-formed steel structures. In this study, a new built-up column consists of a total of four individual CFS channels, in which two individual CFS lipped channels are placed back-to-back at the web using two selfdrilling screw fasteners at specified spacing along the column length, while another individual unlipped are placed around the boundary of the back-to-back channel at the flange using two self-drilling screw fasteners at specified spacing along the column length. Buckling analysis and non-linear analysis are performed through Abaqus 6.14 software by varying the length of the column while the thickness of the section is constant.

E021

**AN EXPERIMENTAL INVESTIGATION EFFECTS OF VARIOUS CHEMICAL
ADMIXTURES AND STRENGTH CHARACTERISTICS ON HSC USING M-SAND**

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ABSTRACT

Today's world is need of some special concrete, which is able to solve all the functions of different concrete such as high strength, high permeability and high corrosion resistance. Also we decided to improve these properties by adding different components such as manufacture sand, silica fume and chemical admixture. Super plasticizer is a type of water reducers; however, the difference between super plasticizer and water reducer is that super plasticizer will significantly reduce the water required for concrete mixing. In this experimental investigation, a brief review is presented on high strength concrete by using mineral and chemical admixtures.

We have collected all the details of these mineral admixtures from those reputed industries, and a brief introduction of all mineral admixtures is presented in this project work. We have designed high strength concrete. We have used this super plasticizer in order to achieve good workability under lower water-cement ratio for high strength concrete such as M60. We have also found out the percentage replacements of these mineral and chemical admixtures in order to achieve maximum strength. In High Performance Concrete, silica fume (SF) with extreme fineness and high amorphous silica content plays a very important role with physical (filler, lubrication) and pozzolanic effects. However, the limited available resource and the high cost constrain its application in modern construction industry, especially in developing countries. For these reasons, it gives a motivation for searching for other materials to substitute SF with similar functions.

E023

**EXPERIMENTAL AND NUMERICAL STUDIES ON UN-PLASTICIZED POLY
VINYL CHLORIDE PIPE BURIED IN M-SAND**

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ABSTRACT

Buried Pipes are mostly used for water delivery and drainage, but they also have a variety of other uses, including oil, liquefied natural gas, coal slurries, and mine tailings. Although the distinction between stiff (reinforced concrete, vitrified clay, and ductile iron) and flexible (steel, UPVC, Aluminium, Fiber Glass, and High-density polyethylene) pipes is subtle.

The deflection or buckling of a flexible pipe determines its design. Because of its light weight and long lifespan, UPVC pipes are favoured for chemical stability over time and cost effectiveness.

The aim of the study is to investigate the load deformation behaviour of buried pipe and stress variation across the pipe's cross section under static loading, as well as the influence of embedment depth and backfill density on pipe deformation and stresses, as well as the deformation behaviour of buried pipe when soil is reinforced with geogrid reinforcement, and to assess the pipe's structural performance.

Keywords: Deformation, Embedment, Reinforcement, Backfill Density, Buckling

E024

**PERFORMANCE EVALUATION OF SELF PURIFYING CEMENT MORTAR
INCORPORATED WITH CONSTRUCTION DEBRIS**

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ABSTRACT

In recent years demolished construction waste handling and management is the new primary challenging issue faced by the countries all over the world. In order to minimize the construction waste, research on reuse options especially for the construction purposes considered as the most viable option with certain modifications. The present study is aimed to investigate the suitability of construction debris to replace the fine aggregate for making self-purifying cement mortar by incorporating TiO₂. is self-purifying material and acts as a photocatalyst which helps to fill the pores and removes dust in surface. The present study investigated the performance of conventional mortar incorporated with construction debris and titanium dioxide. The cement mortar of (1:4) is prepared with different percentage of replacement of fine aggregate such as 0%, 25%, 50%, 75%, 100%. To study the effectiveness of modified mortar, the tests such as compressive strength, apparent density and open porosity were performed and the results were analysed. To investigate the material composition and morphological characteristics, the analysis such as Scanning Electron Microscopy (SEM) and X-ray Diffraction (XRD) were made for the conventional mortar and Debris based self-purifying mortar. The performance analysis will provide the optimum replacement percentage of fine aggregates and will advancing the way for effective utilization of construction debris with specific modifications for the production of special purpose cement mortar.

Keywords: Self purifying cement mortar; TiO₂; Construction debris; SEM; XRD

E027

**INTEGRATED SEAWATER INTRUSION AND WATER QUALITY STUDY OF
COASTAL REGIONS OF KANCHEEPURAM**

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ABSTRACT

Seawater intrusion and submarine groundwater outflow are two opposing processes that are essential in groundwater management in coastal areas. In areas where there are no rivers, groundwater is the primary source of water for drinking, irrigation and other industrial uses. This study aims to identify the seawater intrusion zones along Kancheepuram district coastal regions. During the study, groundwater and ocean samples were collected along the coastal zones. Thirteen water samples have been collected. The collected water samples have been tested for the following physio-chemical parameters includes colour, odour, turbidity, total suspended solids, total dissolved solids, electrical conductivity, salinity, total alkalinity, and total hardness. The possible places of seawater intrusion were identified based on groundwater electrical conductivity. From the journal (V.Manivannan et al. 2020) if the electrical conductivity is more than 3000 $\mu\text{S}/\text{cm}$, it indicates that there is seawater intrusion. The result of the analysis shows that the electrical conductivity range of all the sampling locations are within the limits, which reveal that there is no seawater intrusion in Kancheepuram's coastal regions.

Keywords: Groundwater, Sea water intrusion and Electrical Conductivity

E029

**STRUCTURAL BEHAVIOUR OF DOUBLE SKIN HOLLOW COMPOSITE
COLUMN NITTANY RODRIGO**

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ABSTRACT

At present, the mandate on construction industry is concentrating towards producing the heavy loaded members in a structure with minimal cross-sectional dimensions. This could be attained by the provision of composite members in structures. The reduced self-weight of composite elements has a knock-on effect by reducing the forces in those elements supporting them. In a Composite Column, both the steel and concrete would resist external bonding by interacting together by bond and friction. The efficacy of the composite column is mainly due to its strength and stiffness that can be accomplished with minimal use of materials. The main attention of the study is to investigate Double Skinned Composite Steel Tubular Columns with Shear Connectors. The test specimens consist of steel square tube as outer and inner skin with self-compacting concrete filled in between tubes. This work elaborates the results of an experiment investigating the behaviour of Double Skinned Composite Steel Tubular Columns with shear connectors under various conditions. The Specimens are casted and tested under axial loading condition. The results of load deflection relationship, load strain relationship, and failure loads are discussed. The structural behaviour of double skinned Composite Steel tubular composite column is compared with the conventional column. Also, the results determined from the experimental study are compared that of Numerical Analysis using FEA software ABAQUS.

E030

**DESIGN AND ANALYSIS OF SUSTAINABLE BUILDING WITH HEXAGONAL
CONFIGURATION**

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ABSTRACT

As the cost of building materials and construction keeps increasing, there is a requirement to increase the efficiency of the building designs. The structural efficiency can be achieved through optimizing structural elements, efficient member design and positioning. The shape of the building, or the geometry of the structure also significantly affects the structural integrity and sustainability of the building. The purpose of this study is to design and analyze buildings with hexagonal configurations, to determine the resistance to seismic loads and wind loads acting upon them and to compare the structural efficiency of these buildings against the conventional rectangular building. In the process, one can understand the sustainability and the structural reliability of using the hexagonal geometry to design the building, and cost-performance value of using it. The main objective of the study is to design and analysis buildings with hexagonal topologies with Response-spectrum analysis (RPA) and to compare the structural performance of the designed structures with conventional building under different dynamic responses. Keywords: Response-spectrum analysis, conventional building, seismic loads

E031

STUDY ON UTILISATION OF INDUSTRIAL WASTE IN CONCRETE

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ABSTRACT

Concrete is the most important engineering material, and changes in philosophy of concrete can be feasible by adding or replacing some of the ingredients. The research of concrete with Class F fly ash and GGBS as partial replacements for cement and copper slag as fine aggregate is presented in this work. For the concrete mix design in this project, M30 grade concrete was used. The mechanical properties of concrete such as compressive strength, split tensile strength, flexural strength and Modulus of elasticity were investigated for various substitutions of cement and fine aggregate. Rapid Chloride Penetration Tests and Sulphate Attack Tests were performed to study the durability properties of concrete. Partial replacement of cement by 15% flash and 15% GGBS with 20% of copper slag as fine aggregate in Concrete gives the 28 days maximum Compressive strength. The flexural behavior of beam was studied with load –deflection curves and stress - strain patterns.

Keyword: Fly ash, GGBS, Copper Slag, Mechanical property, Durability.

E050

**A STUDY OF WATER QUALITY STATUS OF MAJOR LAKES IN THIRUVALLUR
DISTRICT USING WATER QUALITY INDEX**

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ABSTRACT

Lakes are an important inland water eco system which provides many ecosystem services like fresh drinking water, water for irrigation, domestic purpose and industrial application. Thiruvallur is a fast developing district of Tamilnadu, giving it a special industrial and commercial important. The development, urbanization and load of the various pollutant sources leads to deterioration of lake water quality. This study was undertaken to assess the quality of water in the ten important lakes of Thiruvallur district and deriving the Water Quality Index (WQI) using weighted arithmetic mean method. Water quality can be assessed by The Physio-Chemical and Biological parameters like pH, Electric conductivity, TDS, Total Hardness, Calcium, Magnesium, Chloride, Sulphate, Total Coliform And E. Coli. The water quality index was classified into five categories such as Excellent, good, Moderate , very poor and poor. This study shows that with the exception of few parameters, most of the water quality assessment parameters showed within the accepted standard values of Bureau of Indian Standards (BIS) and the water quality index was ranged from excellent to good for all the ten Lakes in Trivallur District, which shows the lake water is fit for human consumption.

Keywords: Lake water, Physio-chemical parameters, Water Quality Index and Bureau of Indian Standards.