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BOOK OF ABSTRACTS

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Paper 1

DELAY ANALYSIS IN CONSTRUCTION PROJECT BY QUESTIONNARE SURVEY USING RELATIVE IMPORTANCE INDEX METHOD

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ABSTRACT

Construction sector has been facing many hurdles during executing of project in spite of proper planning in initial stages before commencement of the project. Usually in any construction project it is been framed by three parties i.e Proprietor who invests money, Contractor who performs the construction works and Project Management Consultants who act as bridge to fill the gap between Investor and contractors. For any ongoing project the main input is the proper planning of cash inflow and outflows. In spite of proper monitoring and control by contractors during the stages of ongoing works, there may be deviations from scheduled pre-planned dates. This creates disputes between owner and contractor which results in recalling of tendering process for the continuation of stopped work.

This paper has made an attempt to analyze and investigate the cause for the delay during the progress of construction project by means of “QUESTIONNAIRE SURVEY” conducted in 10 companies in and around Mangalore city. The survey data is collected at construction site from owner, contractor and PMC .Data and information are weighed by providing rank on a scale from one to five. Further relative importance index method is used to determine the causes and effect from construction delays.

Paper 2

INTERACTION BEHAVIOUR OF LATERITE QUARRY WASTE WITH FLY ASH AND LIME

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ABSTRACT

Soil is one of the most important construction material which is formed by chemical and weathering of solid rocks. The soil is treated as a complex material, if it does not suit the required condition. Laterite soils are formed by weathering process, which is a geologic cycle taking place in the earth by which iron, aluminum, manganese and titanium oxides are formed. Laterites have served as a major and sub base material for various construction in tropical countries. Soil should meet some basic requirements along with strength criteria for various construction projects. The laterite quarry can be obtained in different compositions by using admixtures to meet the requirements of engineers.

In this project work, laterite quarry waste is mixed with varying percentage of fly ash, and lime in order to study the strength and other properties of soil. Various tests are carried out with these mixed soil sample. The tests carried out include particle size distribution, specific gravity, liquid limit, plastic limit, compaction and C.B.R tests. By analyzing the test result the substantial and desirable changes in the properties of lateritic soil are observed and which can be used as a Engineering material on application of fly ash and lime.

As per this research work laterite soil is mixed with 5%, 10%, 20%, 30% of fly ash and lime. Addition of these admixtures shown increase in the soil properties. Thus fly ash and lime can be used to stabilize the laterite quarry waste.

Paper 3

EXPERIMENTAL STRENGTH CHARACTERISTIC ANALYSIS OF LATERITE SOIL USING CASHEW NUT SHELL LIQUID AND CEMENT

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ABSTRACT

Soil stabilization has become one of major issue in construction engineering. In this project, an attempt was made to use the laterite soil with a small amount of cement and cashew nut shell liquid, to stabilize the soil and also to prepare cost- effective blocks. For the stability of laterite soil, locally accessible admixtures such as cashew nut shell liquid and cement were chosen. Admixtures are blended with laterite soil in the proportion of (cashew fluid) 2%, 3%, 4%, 5% and (cement) 3%, 4.2%, 5.6%, 7% for different laboratory experiments such as Proctor compaction test and California bearing ratio test are performed on stabilized soil to determine the effect of admixture on laterite soil.

By conducting compaction tests, the optimum percentage of different component is determin ed.Results of this research indicate that the use of these locally accessible admixtures, if corr ectly optimized, may be a feasible option to laterite soil stabilization. The impact of cashew nutshell fluid and cement on lateritic soil resistance characteristics was explored in this project

Paper 4

EFFECT OF PARTIAL REPLACEMENT OF M-SAND BY SANDY SOIL IN THE CONCRETE

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ABSTRACT

Increase in the prices of materials of construction is causing a lot of concern around the world. This creates a need for the research into indigenous materials as alternatives in building and rural infrastructure. Research efforts are directed towards enhancing the use of locally and readily available material as an alternative solution.

Use of new materials in the production of the concrete concrete will reduce the high dependency of concrete manufacturer on conventional fine aggregates.

Since the M-sand is adopted to the conventional river sand of late there is a need even to think the economical and sustainable use of the M-sand also. In this project study is done to compare the strength characteristics of the concrete with M-sand as the fine aggregate and the concrete with soil which is rich in the sand content as the fine aggregate. Study is done to assess the feasibility of sandy soil rich in sand content for the low strength concrete. Concrete mixes containing 0%, 25%, 50% soil replacement were casted and is subjected to water curing for 7, 14 and 28 days. Workability test, compressive strength test conducted in accordance to the existing standards. Results have shown that the replacement of 50% has shown some feasibility of usage.

Paper 5

COMPARATIVE STUDY ON STRENGTH AND QUALITY OF SELF HEALING CONCRETE WITH NORMAL CONCRETE

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ABSTRACT

Concrete is the second most consumable material in the world after the water but most of the concrete str uctures are vulnerable to cracking. Tiny cracks allow the water and different chemicals in to the concrete and reduce the mechanical strength and its durability property. Therefore in the present day more importance is given for the recovering the cracks developed in the concrete. The study was motivated by the need to find a solution for the problem of cracking approaching the concept of self-healing concrete. Bacterially induced calcium carbonate precipitation has been proposed as an alternative and environmental friendly crack repair technique. It is found that microbial mineral precipitation as a result from metabolic activities of favourable bacteria in concrete improved the overall behaviour of concrete.

The paper discusses the plugging of artificial crack in cement concrete using Bacillus Subtilis bacteria. Study involves determining optimum dosages of bacterial solution required for concrete by forming various concrete cube and cylinder samples having variations of bacterial solution 20 ml, 30 ml, 40 ml, and 50 ml. Further mechanical strength of these various samples was compared with the normal concrete and quality of the bacterial concrete was checked by using the ultrasonic pulse velocity test and water absorption test. SEM imaging provides detailed images of cracks, which was sealed by calcium carbonate precipitate produced due to the metabolic activities of favourable bacteria. Among the different specimen incorporated it shows that bacterial concrete containing 40ml solution is the optimum dosage required, after which the strength found to be stable or decreased. Bacterial concrete is found to be superior as compare to that of conventional concrete in all the aspects of durability.

KEY WORDS: Bacillus Subtilis, Self-healing concrete, Compressive Strength, UPV, SEM.

Paper 6

COMPARATIVE STUDIES ON THE MARSHALL PROPERTIES OF PLAIN AND CRUMB RUBBER MODIFIED BITUMINOUS MIX ON DBM GRADE- II

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ABSTRACT

The abundance and increase of waste tyre disposal is a serious problem that leads to environmental pollution. Crumb rubber obtained from shredding of those scrap tires has been proven to enhance the properties of plain bitumen. Use of crumb rubber leads to improve pavement life, driving comfort and low maintenance. The rheology of CRMB depends on internal factors such as crumb rubber quantity, type, particle size, source and pure bitumen composition, and external factors such as the mixing time, temperature, and also the mixing process.

In the present study, the physical properties of aggregates and bitumen were determined. Rothfutch's method is carried out to obtain proportion of aggregate mixing and Marshall Stability method is adopted for mix design. Then for the neat bitumen, Marshall tests were conducted to obtain the OBC for DBM Grade II. The OBC of 5.2% is obtained for the mix. The present study aims in investigating the experimental performance of the bitumen modified with 15% and 18% of crumb rubber mixed with 500g of bitumen i.e. (75g and 90g crumb rubber) is used for preparation of CRMB .Two categories of size of crumb rubber is used, having sieve size (3.35 mm–2.36 mm) and (2.36mm – 1.18mm). Also we prepared specimen by varying quantity of crumb rubber by weight of bitumen i.e. 14% , 13% and 12%. Penetration tests and Softening point tests were performed on the modified bitumen using various sizes of crumb rubber modified bitumen. For the moulds prepared with CRMB and with neat bitumen, a comparative study is made among the modified bitumen samples using the various sizes of Crumb Rubber particles and the best size is suggested for the modification to obtain best results.

Paper 7

EXPERIMENTAL STUDY ON M30 GRADE CONCRETE WITH PARTIAL REPLACEMENT OF CEMENT WITH EGG SHELL POWDER AND FLYASH

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ABSTRACT

The carbon dioxide produced by cement industries causes environmental pollution and global warming. In 1000Kg of cement manufacturing processes approximately 900Kg of CO_2 is emitted. In order to reduce the impact of cement production on atmosphere, waste by products is used as admixture in this study, so that environmental pollution and natural resources consumption is reduced. 75million tones of fly ash which are rich in silica are disposed to landfill as a waste annually in India. Egg shell powders which are rich in calcium are thrown away as a waste. In the present study, these two wastes are used as a partial replacement of cement and various properties like workability, compressive strength and split tensile strength were determined. Egg shell powder fixed to 10% and fly ash varied up to 30% (10%, 20% & 30%). From the Experimental investigation it is recommended that the replacement of cement with 10% of egg shell powder and 10% of fly ash is optimum, so that there is increase in compressive strength of concrete with reduction in use of cement. It is clear that for 100 bags of cement, 20 bags of cement can be saved at 10% partial replacement of egg shell powder and 10% of fly ash with cement.

KEY WORDS: Egg shell powder, Fly ash, Compressive Strength, Split tensile strength.

Paper 8

COMPARATIVE STUDY OF BUBBLE DECK SLAB AND SOLID DECK SLAB

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ABSTRACT

Bubble deck slab is an innovative floor system of reinforced concrete which contains spherical hollows as concrete saving elements. It is a revolutionary method which virtually eliminates all concrete from the middle portion of a floor slab. The structural dead weight is reduced due to the non-performance of any structural function by the middle portion of the slab. High density polypropylene spherical balls replace the in-effective concrete in the center of the slab. Voids in the middle of the slab provide thermal insulation and also leads to 30 to 50% lighter slab. Bubble deck slab allows longer spans between columns supports.

In this paper, flexural strength of the slab was determined by two point load test. The aim of this paper is to discuss about various properties of Bubble deck slab based on the various studies done abroad. Moment, deflection and stress distributions are verified using Finite Element Method (FEM) in SAP2000.

KEYWORDS: Bubble deck, Slabs, Conventional, concrete.

Paper 9

STUDY ON PERFORMANCE CHARACTERISTICS OF SUPERPLASTICISED CONCRETE FOR DIFFERENT CLIMATIC CONDITIONS

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ABSTRACT

In the modern day construction world, superplasticiser (SP) is being widely used to produce a more fluid, high strength and durable concrete by modifying the properties of concrete to make them more suitable for the work. The interaction between SP and aggregates is highly affected by the surrounding conditions of built environment by obtaining the desired slump retention and high initial strength. In this study, Sulphonated Naphthalene Formaldehyde (SNF) family SP is blended with two types of cement, Ordinary Portland Cement 53 grade and Portland Pozzolana Cement (OPC - major chemical composition with CaO 62.85% & SiO_2 19.05%, PPC with CaO 63.47% & SiO_2 19.82%) and different types of climatic condition that prevails in Indian cities were investigated. The objective of this study is to analyse the improvement in the performance of workability retention, setting time and compressive strength of concrete for various climatic conditions in the western, southern, northern and central parts of India with the use of SNF SP (in accordance with IS 9103: 1999). Experiment was conducted to obtain slump of 150 to 180 mm. The initial and final setting time variation for different cement-SP combination was determined. Thirty concrete cubes were cast for different cement-SP combination and the compressive strength for 1 and 7 days were determined and results were analysed. Concrete made with different cement-SP combination had better workability retention, extended setting time and high initial strength in various climatic conditions.

Addition of excess water to achieve high workability will only improve the fluidity or the consistency, and will not improve the workability, homogeneity and cohesiveness of the mix. Concrete blended with SP will improve the desirable qualities by controlling the amount of free

water and viscosity of fresh concrete. Higher the C_3A (Tri Calcium Aluminate) content and fineness of cement, lower the fluidising effect (Hanna et al., 1989). The chemical composition and molecular structure of the admixture influence the paste rheology (Flatt et al., 2001). A high ambient temperature causes a higher water demand for the concrete and increases the temperature of fresh concrete which results in an increased rate of loss of slump and leads to accelerated setting to a lower long-term strength of concrete (Neville, 1999). By understanding the influence of C_3A, sulfate content, alkali content under various ambient conditions, it is possible to improve the fluidity and other properties of fresh and hardened concrete (Mailvagananan, 1999). High ambient temperature accelerates hydration resulting in rapid stiffening rates of the cement matrix (Alshami et al., 1997). The fluidity of fresh concrete and cement paste varies with time due to hydration, setting process, adsorption of water by the cement and evaporation (Roncero et al., 1999).

In this research work, effort has been made to analyse the strength characteristics and behaviour of concrete for different site and environmental conditions. The results obtained are analysed and compared with traditional concrete.

KEYWORDS: Concrete, Superplasticiser, Compressive Strength, Special Concrete.

Paper 10

EVALUATING THE COMPRESSIVE STRENGTH OF CELLULAR CONCRETE WITH PARTIAL REPLACEMENT OF CEMENT AND PARTIAL REPLACEMENT OF FINE AGGREGATE

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ABSTRACT

Construction onsite with low load bearing capacity soil is a challenging and expensive task. Reducing the dead load of the concrete will help solve this issue. The use of waste materials to improve the strength of the concrete helps in reducing the cost of construction and also helps in the safe disposal of waste. Hence an attempt has been made in the present investigation to study the influence of addition of Foaming agent at a dosages of 0.3%, 0.55% and 0.8% of cementitious material and a partial replacement of the cement with 30% Fly ash and a partial replacement of Fine aggregate with 10% E-Waste. Experimental investigation was carried out using M25 mix as per recommended procedures by relevant codes. For each trial mix 9 cubes were casted, 3 for each curing periods .The compressive strength of all the cubes were measured. The result thus obtained was compared with normal concrete and percentages at which the maximum strength and weight reduction is determined.

KEY WORDS: Cellular concrete, foaming agent, fly ash

Paper 11

QUANTITATIVE ANALYSIS OF WATER OF BEJAI MANGALORE AREA

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Mr. Sharathraj aggithaya, Ms. Pavithra M, Mr. Prakyath H, Ms. Thokur Akshatha Rajanna

ABSTRACT

The term "water quality"is used to describe the microbiological, physical and chemical properties of water that determine its fitness for a specific use. These properties are determined by substances which are either dissolved or suspended in the water. Water may contain dissolved substance or micro-organisms which may not necessarily affect the appearance or taste of the water but which may have serious may health met or other effects, making the water unfit for domestic use. The fitness for domestic use of particular water can therefore only be assessed if an analysis of the water is which includes the substances of concern for domestic use.

The collected water sample is taken to the laboratory for the various tests ensure the quality of the water. Hence the water is undergone the various tests such has pH, alkalinity turbidity, hardness and chlorine tests. Alkalinity is primary way of measuring the acid neutralizing capacity of water. In other word, its ability to maintain relatively constant pH. Water hardness is an expression for the sum of the calcium and magnesium cations concentration in the water sample. The values of pH 0 to a less than 7 are termed as acidic and the values of pH a little above 7 to 14 are termed as basic. When the concentration of H+ and OH- ions are equal then it is termed as neutral pH. Water that has high mineral content is known as hard water. Hard water contains bicarbonate, chlorides and sulphates of calcium and magnesium. When treated hard water with soap, it gets receipted in the form of insoluble salts of calcium and magnesium. Hardness of water is a measure of the total concentration of calcium and magnesium ions expressed as calcium carbonate.

KEY WORDS: water quality, alkalinity, sulphates, hardness

Paper 12

A STUDY ON AMPHIBIOUS HOUSE: A NEED OF TOMORROW

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ABSTRACT

Flooding is a natural phenomenon of rivers. Sea levels are predicted to rise. To counter these natural calamities continuous research is going on. Floating homes are one of the solutions There are two types of floating homes, permanently floating homes and homes that float only when flood waters swell, but sit on the ground during the dry season. New constructions within flood plains, and at threatened shorelines, this new concept will work. This is constructed on the water, it can be transported and shifted to any location in less time for the usage. This will Avoid house getting flooded in the Flood zone .The main goal of the project is to design a house that will not disturb the ecology of the surrounding area, but at the same time offers flexibility and out of the box living experience. All rooms are designed in a way to provide maximum visual connection with surrounding landscape. Master bathroom, bedrooms and living room have direct access to the terrace around the house perimeter, making house very open and blend with environment. The base of the house is constructed of floating platform that gives great flexibility of location. The house can be easily docked at marina or pier on the lake, river or bay. Roof structure is carried by system of columns separated from curtain wall, this solution allows for micro-movements caused by uneven water surface.

KEY WORDS: flood, floating house ,environment

Paper 13

AN EXPERIMENTAL STUDY ON STRENGTH CHARACTERISTICS OF CONCRETE PRODUCED BY PARTIALLY REPLACING CEMENT WITH MARBLE POWDER AND FULL REPLACEMENT OF SAND BY M-SAND.

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ABSTRACT

Concrete is the most widely used construction material in the world. In recent years, there have been several studies to find substitute constituents for the components of concrete due to various issues such as availability, special requirements, costly raw materials, environmental impacts etc. Among all ingredients of concrete, aggregates form the major portion; further there exists a challenge in attaining the structural light weight concrete utilizing the waste. The strength of concrete has been tried to be increased as the stronger concrete will result in smaller sections, saving cost. This research work will showcase the work carried out where cement was partially replaced by marble powder and river sand was fully replaced by M-Sand. The study shows the experimental data carried out in the laboratory. The replacement has been done with an idea to improve the strength of concrete as well as effective utilisation of waste materials available. M-Sand is generally obtained in the quarries which is creating environmental problems. Hence, in this study, the river sand is fully replaced by M-Sand. The behavior of concrete in compression, flexural and split tensile is analysed. The compression testing on cube and split tensile test on cylinder were performed to authenticate its feasibility. The feasibility for the usage of locally procured marble powder and M-sand is tested to evaluate its Elasticity and ultimate strength.

KEYWORDS: M-Sand, Marble Powder, Compression Strength, Solid Waste Management, River Sand.

Paper 14

ANALYSIS ON PROGRESSIVE COLLAPSE OF BUILDING BY USING ETABS

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ABSTRACT

The building undergoes progressive collapse when there is a continuous failure in the primary structural elements, which propagates to the secondary structural elements of the structure resulting in collapse of a portion or whole structure. In the state in which a column is removed or weak due to natural disasters or man-made situation, the load carried by this column is transmitted to the adjacent columns and when the adjacent column transfers the load in the absence of the removed column This leads to the progressive failure of part or the entire structure. The load always takes on alternate paths. Adequate reinforcement is to be provided to the primary and secondary structural elements so as to avoid the condition of progressive collapse. The structure is designed to study its potential ability to seismic actions.

For this study a reinforced concrete framed structure of twelve storeys is considered to calculate the Demand-Capacity Ratio (DCR) as per the guidelines of U.S. General Services Administration (GSA). DCR is the ratio of member force to its member strength. Linear static analysis of the structure is conducted using ETABS 2016. Indian Standard codes are followed for the design of the building. The building is designed and analysed for the final design output. To study the condition of the progressive collapse, columns are removed at certain locations. For each column removal, analysis and design are done. The DCR of the beams are calculated for each seismic zone as well the additional reinforcement in order to avoid the progressive collapse.

When the column was removed, the beams connected to it almost failed instantly. To avoid this failure of beams, additional reinforcement shall be provided for the beams and redesigned. When the load takes an alternate path, the beams will be sustaining the extra loading on them when additional reinforcement is provided, thus avoiding the condition of progressive collapse.

KEYWORDS: Progressive Collapse, DCR, GSA.

Paper 15

COMPARISON ON CONVENTIONAL INDUSTRIAL TRUSS AND PRE-ENGINEERED FRAME

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ABSTRACT

Long range, section free structures are the most basic in conventional industrial truss and pre-engineered structures (PEB) satisfy this prerequisite alongside diminished time and cost when associated with regular constructions. This thinking is flexible not just because of its quality pre-planning and erection, yet in addition because of its light weight and conservative development. The present work exhibits the similar investigation and plan of regular steel outlines and pre-designed structures (PEB). In this effort, Analysis of Conventional industrial Steel Truss and Pre-engineered frame having 5m bay spacing with changing span 20m and 30m for having same Dead Load, Live Load and Wind Load (zone2, zone3, zone4, zone5) are by using STAAD ProV8i software.

KEYWORDS: Pre-Engineered Structures, Conventional Industrial Steel Truss & STAAD ProV8i

Paper 16

COMPARATIVE STUDY ON CONVENTIONAL SLAB SYSTEM AND FLAT SLAB SYSTEM USING PUSHOVER ANALYSIS

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ABSTRACT

Earthquakes are caused by geotechnical activity in the Earth's crusts, followed by a sudden release of energy that is very unpredictable and causes heavy loss when occurring in populated areas. It is known that earthquakes do not destroy creatures, although this is the case with fragile constructions. This study deals with the seismic requirements and capacity of conventional plate systems and flat plate systems using pushover analysis using the codes FEMA 356 and ATC-40 and ASCE 41-06. In the present study, the seismic performance of the 3 types of structures is compared with a pushover analysis with different heights, i.e., G + 5, G + 6 conventional buildings and G + 5, G + 6 flat plates system. The main idea of this study is to relate the performance of a traditional RCC system and the performance of a flat plate RCC structure by height variation, i.e., with different heights for seismic performance. The gained outcomes are linked in standings of Base shear, Storey displacement, and storey drift. When comparing traditional slab construction and flat plate construction with and without drop, conventional slab construction is considered more efficient, taking into account variations in pushing curves. Base shear of various structures are having a deviation of about 60-70%.and Storey drift and storey displacement of conventional slab RCC building is found to be less than the flat slab and flat plate RCC structure at the maximum level. As a whole conventional slab structure is considered to be more seismic efficient than flat slab and flat plate RCC structure.

KEYWORDS: Pushover Analysis, Flat slab system and Conventional slab system.

Paper 17

COMPARITIVE STUDY ON SOIL STRUCTURE INTERACTION FOR REGULAR BUILDING FOR THE VARYING FLOOR LEVELS AND SOIL LEVELS

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ABSTRACT

In the present work, if the structure is constructed in separate soil layers for regular buildings with multiple soil levels present in the soil, then these interactions of soil structure with the buildings will be attempted. In this project, two different soil layers were selected for analysis and the building was located by taking into account regular construction for Ground floor, (G+2) and (G+4) levels. Equivalent static analysis is performed to examine the displacement, using the von Mises stress in X, Y and Z and directions are developed in the structure.

KEYWORDS: ANSYS Mechanical APDL, Soil Structure Interaction, Regular Building, Equivalent Static Analysis.

Paper 18

A STUDY ON JUTE REINFORCED LITHOMARGIC CLAY

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ABSTRACT

Sometimes the soil in the construction site is susceptible to excessive settlement, lack of shear strength and high compressibility, and hence the modification in the soil is required before the construction of a structure. The most common method to increase strength of soil is using different materials (natural or man-made) to reinforce the soil. Reinforced soil is a technique where tensile elements are placed in the soil to improve stability and to control deformation. The fiber reinforced soil behaves as the composite material when fibers of high tensile strength are reinforced in a soil. Shear stresses in the soil mobilize tensile resistance in the soil due to which the strength of the soil increases. With the increase in environmental concern there is growing demand for eco-friendly substances that can be reinforced in the soil to improve the mechanical properties of the soil and does not harm the environment thus replacing geosynthetics. Natural fibers, such as jute, coconut coir, kenaf, sisal have low density, low cost, suitable toughness and reasonable specific strength. Natural fibers can be easily recycled and are biodegradable.

Our research work was mainly focused on improving the strength of the lithomargic soil by reinforcing the soil with jute fibers to minimize the consolidation that happens over the course of time. Taking in consideration the results obtained from direct Shear, UCS & permeability tests, it can be concluded that the reinforced soil with aspect ratio & percentage wt. of jute 1.0cm: 184um & 0.5% respectively performs the best owing to its higher internal angle of friction and lower permeability value. Hence, while designing an embankment this combination of reinforcement will prove beneficial for improving the geotechnical properties of the problematic soil side by side proving economically viable.

KEYWORDS: Soil Reinforcement; Natural Fibers; Geosynthetics; Jute fiber.

Paper 19

EXPERIMENTAL INVESTIGATION ON MICRO TRUSS REINFORCEMENT IS AN ALTERNATIVE TO CONVENTIONAL RCC ROOFING SYSTEM

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ABSTRACT

Conventional reinforced concrete slab system is common practice in residential and commercial building construction. However few drawbacks in these slab systems observed with respect to material requirement which may lead to uneconomical construction. In slab system, the concrete below neutral axis serves the purpose of providing depth and cover with reinforcement and reasonable thickness below neutral axis satisfies deflection requirements and carries very marginal load. So concrete quantity below neutral axis adds dead weight to structure. In this new system micro truss is acting as main reinforcement and 6mm diameter bars are used as supporting micro truss reinforcement. This micro truss reinforced slab is tested by applying uniformly distributed load on its surface with sand bags. Deflections at different locations in the slab are also found to be within permissible limits. The system is found to be lighter (40% in dead weight) stiffer and cheaper, (20% in cost) when compared with conventional slab system.

Paper 20

A STUDY ON PILE FOUNDATIONS OVER LIQUIFIABLE SOIL LAYER

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ABSTRACT

The title of my project is A Study on Pile foundation over the liquefiable soil layer. Pile Foundation is a type of foundation where the super structural load is transferred to the weak or compressive layers of soil. This type of pile foundations are majorly used for the construction of bridges, buildings as a support system to avoid excess settlement, the super structural load is safely transferred to the mother earth. Due to the heavy major earthquake, Failure of pile foundations has been observed in many cases. In this paper, three Building model are considered for the study (1 regular building and 2 irregular buildings). The Building consists of G+5 storied RCC structure. The analysis was carried out in "ETABS" software. First the building was analyzed for dead load and imposed load combinations and then the structure was analyzed by Equivalent static method. In this paper black cotton soil was considered for the design of Pile foundation. Design of piles was done using Indian Standards IS 2911 (Part-1 /Sec-2), IS 456:2000 and IS 1893:2002 (Part-1). Soil condition is considered as Black cotton soil over the liquefiable sandy soil layer. Graphs were plotted for all three types' structures. It was found that for C-Type of structure more number of piles has to be provided for seismic analysis rather than static analysis, were as for L-Type number of piles for static analysis yielded more compared to seismic analysis.

KEYWORDS: Pile Foundation, ETABS 2015, Equivalent Static method.

Paper 21

TO DEVELOP ECO-FRIENDLY PARTIAL BEAM WITH HIGH FLEXURAL AND SHEAR STRENGTH.

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ABSTRACT

IS456-2000, Clause 38.1 one of the assumptions is, the tensile strength of concrete is ignored. Many literatures concluded near neutral axis, concrete can be replaced by low cost recycled materials or creating void. Also they mentioned below neutral axis, nominal grade of concrete can be used. All these efforts to achieve eco-friendly low cost Partial beam.“Flexural and shear strength of partial RCC beams and slabs” – A review, IJSART - Volume 2 Issue 6 –JUNE 2016 mentioned, Many researchers are concluded ultimate load in both normal and partial beams is nearly same, but early cracks in partial beams. But no thorough study on shear failure, which is dominant in medium and deep beams. This paper highlights how to improve shear strength of partial beams and to eliminate early cracks.

KEYWORDS: partial beam, flexural and shear strength, low cost, eco friendly.

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Paper 22

IMPROVEMENT OF RED SOIL BY STABILIZING WITH POLYPROPYLENE STRIPS

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ABSTRACT

The current demand for construction has pushed the boundaries of engineering to a whole new level. We are creating ways to build huge buildings on low support ground. One of these soils with reduced bearing capacity due to its porous and friable structure is red soil. The red soil covers much of the land in India. These soils are found in areas with low rainfall and are not able to withstand moisture. Due to their high iron content, these soils are red in colour. In order to improve the Engineering and strength properties of these soils, the soil stabilization can be carried out by adding some additives to these soils. These paper emphases on the stabilization of red soil using Polypropylene strips. The Polypropylene strips when introduced into the red soil acts as a strengthening agent and develops the shear strength by improving the friction component of the latter soil. Test result showed the highest value of maximum dry density (MDD) and lowest optimum moisture content (OMC) for the trial mixes, when compacted with 3% Polypropylene strips, which can be taken as the optimum one. The strength is evaluated based on unconfined shear strength, and the penetration resistance in California Bearing Ratio (CBR) test for the samples compacted at maximum proctor density for optimum percent of Polypropylene strips in the red soil.

KEYWORDS: Stabilization, Red soil, polypropylene strips.

Paper 23

STABILIZATION OF LITHOMARGIC SOIL BY USING DIFFERENT ADDITIVES

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ABSTRACT

Soil stabilization is the alteration of one or more soil properties, by mechanical or chemical

means, to obtain an improved soil material possessing the desired engineering properties. In our investigation an attempt is made to study the behavior of lithomargic soil before and after Silica Fume, Glass Powder, Lime Powder stabilization. Various geotechnical properties are studied and improvement in the soil properties with different percentage of silica fume, glass powder, lime powder additions are derived. The important properties such as basic properties which includes sieve analysis, consistency limits and compaction characteristics and major properties like unconfined compression characteristics (UCC) and California bearing ratio (CBR) and also chemical properties of silica fume, glass powder, lime powder were studied. The results obtained indicated that there is tremendous improvement in almost all the properties with the addition of Silica Fume, Glass Powder, and Lime Powder.

KEYWORDS: Soil stabilization, Silica Fume, Glass Powder, Lime Powder stabilization, Lithomargic soil, ground improvement.

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