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CE -102

A STUDY ON HOME-BUYER'S PREFERENCES AND DEVELOPMENT OF A MODEL FOR RESIDENTIAL CUSTOMER SATISFACTION

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Abstract

Home-buying is a dream of every individual but the preferences may vary from one person to another. The main objective of this study is to determine the home-buyer's preferences and residential satisfaction of customers and create awareness among the builders about what buyers prefer in terms of both service and product during the construction or purchase of their residential premises. A focus interview has been conducted among the home-buyers of Chennai City in India to find out the Voice of the Customer (Feedback) on their preferences on buying a house. Based on the statements received by the present researcher during an interview, and after validating these items with the previous studies, a model linking home-buyer's preferences and customer satisfaction has been developed. This study has identified 23 items from previous studies to measure the home-buyer Satisfaction. Based on statistical analysis, variables such as "Service Quality" and "Top Management Commitment" are significant predictors of customer satisfaction. This model will certainly be helpful to the construction industry in order to understand the needs/ expectations of the home-buying customers and also helps in achieving customer satisfaction.

Keywords: home-buyers, customer satisfaction, statistical analysis, modelling.

CE 103

SPEARMAN'S RHO CORRELATION ANALYSIS OF PERFORMANCE OF CRACKING AND VARIABLE PARAMETERS FOR RURAL ROADS IN INDIA

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Abstract

In this paper, Spearman's rho correlation analysis for low volume village roads in India, to development of any performance prediction model before conduct the correlation analysis is very essential. In this regard, correlation of flexible pavement distress with pavement parameter as cracking which are the most common performance indicators of flexible pavements and independent variables of modified structural number, traffic and age are considered for analysis. In this regard, it is essential that scientific analysis is to be evolved on the basis of correlation of low volume flexible pavements. Considering the above, an attempt has been made in this research endeavor to analysis of Spearman's rho correlation to understand the pavement distress with pavement parameters. Distress data and pavement parameters were collected from the low volume rural roads covering about 173 stretches spread across Tamil Nadu state in India. Based on the above collected road data, correlation analysis using Spearman's rho analysis. It can be concluded that relationship between pavement distress and important parameters of develop performance models in this study can serve as a helpful tool for the model development for flexible pavement category of low volume roads.

Keywords: Cracking, Low volume roads, Modified Structural Number, Spearman's rho correlation.

CE-104

ANALYSIS OF HYDRAULIC PERFORMANCE OF DRIP IRRIGATION SYSTEM BY TWO PHASES FLOW SIMULATION USING COMPUTATIONAL FLUID DYNAMICS

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Abstract

India had the limited resource of irrigation water and unlimited demand of agricultural products. With the growing population in order to meet the food demand with the limited availability of water, optimal usage of water for maximum production of food grains has to be done. These problems should be solving by the means of micro irrigation techniques. Drip irrigation and sprinkler irrigation methods are commonly using micro irrigation methods. Though drip irrigation systems are based on long working experience and offer numerous advantages, these systems are often not able to deliver all of their nominal advantages. They face numerous operating constraints including emitter plugging, non-uniform irrigation. So there is a need to analyse the hydraulic performance of drip irrigation system. Hence this study was focused on to analyse the hydraulic performance of drip system using computational fluid dynamics. The previous studies analysed the friction loss, local loss and emitter clogging separately. With these references in this study emitter clogging, friction loss and local losses due to lateral connections are clipped together for the purpose to analyse the existing system performance. In this study the lateral and emitter flow domains were simulated based on the modern simulation technic called computational fluid dynamics (CFD). The two phase flow simulation method was used to simulate the water and soil particle movement in the drip irrigation system. The best CFD module FLUENT 14 was used to solve the flow domain conditions and provided hydraulic parameters of the system. Finally, that CFD results compared with the short cycle test results and validated. The CFD results were good agreement with experiment results. The outcome of this study was, the existing system performance was affected by the friction loss, local losses and emitter clogging. To improve the performance of the system by decrease the unwanted protrusion length of 5 mm in lateral connector it won't affect the stability of connection and replace the existing emitter which has the clogging possibilities on the sharp corners by smooth flow path emitter.

Key words: Hydraulic performance, Drip irrigation, CFD, FLUENT

CE-105

SUSTAINABLE ENVIRONMENT FOR FUTURE DEVELOPMENT

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Abstract

Mankind is at a critical juncture in implementation of sustainable development of the United Nation development agenda for future world. The various problems are market economies, persistent global imbalances, soaring oil and non-oil commodity prices which are slowing the growth of global economy. These problems hinder the efforts towards the development goals. Second, rising food and energy prices greatly affect the livelihoods of poor and vulnerable people. Third, we are facing threat of climate change and deterioration of nature. These impacts are deep and pervasive. This paper talks about the factors which are affecting the future development and thrives for sustainable environment achievement.

Key words: Sustainable environment, sustainable development

CE-106

Experimental Study on Buckling Modes of Cold Formed Steel Column

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Abstract

Cold-formed steel sections are widely used in roof, wall systems, rack columns, space trusses. Behaviour of the cold -formed steel structures is more complex than that of traditional hot rolled steel structures. Limited studies have been reported in the literatures that cold formed steel members are subjected to a various buckling modes including local, distortional and global modes and their ultimate strength behaviour is governed by these buckling modes. Open cold-formed steel sections such as C, Z, Hat and rack sections are relatively small because of their simple forming procedure and easy connections but they suffer from buckling modes due to their mono-symmetric, point symmetric nature, high plate slenderness, eccentricity of shear center to centroids and low torsional rigidity. An innovative tiny bracing system is proposed to reduce or avoid distortional buckling and also the effect of lipping compared to the tiny bracing will be investigated. Finite strip analysis is carried out to determine the load and the location of the bucking modes. Both analytical and experimental study on the C section will be compared. Simple C sections with and without Lips are tested to understand the different buckling modes and the failure loads are compared with the analytical solutions.

Key Words: C -Section, CUFSM , Buckling modes, Finite strip method, Cold formed steel.

CE-107

DURABILITY PARAMETERS OF HIGH PERFORMANCE CONCRETE WITH ADDITION OF GGBS AND ROBOSAND

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Abstract

Concrete plays a very important role in infrastructure development like building ,bridges and industrial structures .Long term performance of building without deterioration helps economy of nation. High performance concrete (HPC) is one which shows special performance than normal concrete .In this study an attempt has been made to study the strength and durability characteristics of M_{30} grade concrete by partial replacing natural sand with ROBO sand ,cement with GGBS.This necessities use of high range water reducing admixtures to improve the concrete performance. In this analysis the ordinary Portland cement (OPC) is use as a binding material. The experiments were conducted with different percentages from 0 to 30 in the interval of 5% has replaced with sand and ROBO sand respectively and cement and GGBS in the interval of 0%,40%,50% and 60%. There were different combinations of mixes were casted for cube, beam and cylinder were studied at different period of time interval for 7,14,28 days for its Compressive Strength (26.54 ,27.54 ,28.94) N/mm^2 ,Flexural Strength (9.5,10.27,10.88) N/mm^2, Split tensile strength (2.89,2.95 ,3.90) N/mm^2.The result are increased to its strength at 25% and there is decrease in strength of the cube , beam , cylinder at 30% .Finally ,it is observed that the specimens of different combination of sand with Robo sand for 25% had optimum strength of the concrete , as a result replacement of sand with Robo sand at 25% will improve the strength and resistance of the concrete when compared to the control of concrete. And the HPC are in the cycle of wetting and drying in sulphate ionic atmosphere, the solution containing 50g/l of Na2So4 to evaluate the durability. High Range water reducing admixtures are used. The durability was measured in terms of resistance offered to incursion of sulphate ions in to the concrete.

Keywords: High performance concrete, Coarse aggregate, Fine aggregate, Robo sand and GGBS

CE 108

FLEXURAL BEHAVIOUR OF R.C. BEAM BY PARTIAL REPLACEMENT OF FINE AGGREGATE WITH POND ASH

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Abstract

In this paper deals with an experimental investigation on flexural behaviour of R.C.beam by partial replacement of fine aggregate with pond ash in varying percentage. Concrete industry uses many billion tons of raw material each year which is the largest user of natural resources in the world. The production of raw materials of concrete such as cement, fine aggregate and coarse aggregate is considered for environmental impact. There is a need to find the other sources of cost effective raw material in order to reduce the consumption of energy and available natural resources. Pond ash is the waste material obtained during the combustion of pulverized coal at thermal power plants and its disposal is a major problem from environmental point of view. Hence an effort has been made in this experiment to use the pond ash in R.C. Beam. In this paper en experimental investigation was undertaken which contains two phases like In project phase-I the properties of various ingredients of concrete and the compressive strength on standard specimen is tested .Totally 72 cubes will cast and tested with pond ash content as 0%, 5%, 10%, 15%,20% and 25% of fine aggregate by its weight. In this project phase-II the properties of various ingredients of concrete and the flexural strength on standard beam specimen is tested .Totally six beams will cast and tested with pond ash content as 0%, 10%, 20%, 30%,40% and 50% by weight of its fine aggregate.

Key words: Fine aggregate, Coarse aggregate, Pond Ash, UTM

CE 109

EXPERIMENTAL INVESTIGATION ON CONCRETE BY REPLACING COARSE AGGREGATE WITH BASALT AND LIMESTONE

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Abstract

The purpose of this research is to investigate the feasibility of using basalt aggregates in concrete mixes. The researcher has designed an elaborate experimental program that included a variation of basalt percentages in concrete mixes. The laboratory investigation included measurements of compressive strength, indirect tensile strength, flexural strength, thermal conductivity, permeability, shear strength and modulus of rupture. A conventional limestone mix was used as a control mix. The results of this investigation indicate a general improvement in mix properties with the introduction of basalt aggregates in the mix.

Keyword: Basalt aggregates, conventional limestone mix, compressive strength and flexural strength.

CE 110

MANAGING CONSTRUCTION USING BUILDING INFORMATION MODELING

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Abstract

Project information delivery system by two-dimensional (2D) technique hinders the way information is communicated between project teams working together in a construction firm. The key success of a construction industry depends on its sound project management technique adopted. With the growth of Information Technology in the field of construction, various Building Information Modeling (BIM) and process simulation tools have emerged and widely used for construction project management. BIM is both technology and process beneficial for operational visualization and construction application such as design coordination, construction scheduling and estimation. This paper illustrates the importance of a Building Information Modeling Tool – Autodesk Navisworks. Navisworks is well known for its Time liner and Clash detection features. The paper also presents a case study on four-dimensional (4D) and Earned value analysis for a residential building model as a result of Navisworks simulation.

Keywords: Building Information Modeling (BIM), Autodesk Navisworks, Four Dimensional (4D) analysis, Earned Value Analysis and Construction Project Management.

CE 111

APPLICATION OF GENETIC ALGORITHM IN CONSTRUCTION PROJECTS

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Abstract

Resource allocation and leveling are among the top challenges in project management, due to the complexity of projects. The main objective of this project is to optimize the schedule of construction project activities in order to minimize the total with resources constraints using Genetic Algorithm (GA optimization technique. This work describes a genetic algorithm approach to Resource Constraint Project Scheduling Problems (RCPSP) in construction industry. The GA procedure searches for an optimum set of tasks and priorities that produces shorter project duration and better-levelled resource profiles using GeneHunter software. Major advantage of the procedure is its simple applicability within commercial project management software systems to improve their performance.

Keywords: Genetic Algorithm, Resource Scheduling, Resource constraint Scheduling, Construction management.

CE 112

DESIGN OF CABLE - STAYED BRIDGE

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Abstract

A cable-stayed bridge, one of the most modern bridges, consists of a continuous strong beam (girder) with one or more pillars or towers in the middle. A typical cable-stayed bridge is a continuous girder with one or two towers erected above piers in the middle of the span. From these piers, cables are attached diagonally to the girder to provide additional support. Cable-stayed bridges have a low centre of gravity which makes them strong against earthquakes, but at the same time makes them vulnerable to uneven sinking of the ground. Cables are stretched diagonally between these pillars or towers and the beam. These cables support the beam and are anchored in the tower. Cables are extremely well suited for axial tension, however are weak against compression and bending forces. As a result, long span cable stayed bridges, though strong under normal traffic loads, are vulnerable to the forces of winds. Special measures are taken to assure that the bridge does not vibrate or sway under heavy winds. Because the only part of the structure that extends above the road is the towers and cables, cable stayed bridges have a simple and elegant look.

CE-113

EXPERIMENTAL INVESTIGATION ON PARTIAL REPLACEMENT OF CEMENT BY FLYASH AND SLICA FUME IN CONCRETE

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Abstract

Concrete is the most widely used construction material in India with annual consumption exceeding 100 million cubic metres. It is well known that conventional concrete designed on the basis of compressive strength does not meet many functional requirements such as impermeability, resistance to frost, thermal cracking adequately. The production of the Portland cement as a main constituent of concrete has basically led to the dangerous impacts on our environment by releasing substantive amount of CO_2. Production of one ton of Portland cement emits one ton of CO_2 and other greenhouse gases. Hence the cement must be effectively replaced by some other cementitious materials without compromising the desired properties of concrete.The coal based power plant generates a huge amount of fly ash which is collected from electrostatic precipitator and Silica fume is a by-product of producing silicon metal or ferrosilicon alloys in smelters using electric arc furnaces. Disposal of these wastes may require huge land surface or any water bodies which in turn affects the environment, so recycling of these waste is indeed required. The purpose of this study is to find the suitability of Fly Ash and Silica Fume as hybrid admixture replacement materials for cement without compromising the strength & durability of conventional cement based hybrid concrete. Replacement of cement partially by Fly Ash and Silica Fume also reduces the supply demand on cement and may also reduce the emission of CO_2 in to atmosphere. The physical and chemical properties of Fly Ash and Silica Fume has been studied and both the industrial wastes are used to replace the cement at 25%F.A-5%S.F, 20%F.A- 10%S.F,15%F.A-15%S.F and 10%F.A-20%S.F.

CE-114

ANALYSIS OF SHEAR STRENGTH PARAMETERS OF EXPANSIVE SOIL

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ABSTRACT

Expansive soil has swelling and shrinkage characteristics because of presence of montmorillonite clay minerals in it. Now a day's high level research investigations are focused on expansive soil. Among the engineering properties of soil, shear strength plays a vital role in evaluating the suitability of soil for selection of foundation. In this paper shear strength parameters such as cohesive strength © and angle of internal friction (ϕ) are determined for such clayey soil. As far as Geotechnical engineering concerned, evaluation of shear strength parameters for clayey soil is really a challenging task . Direct shear test apparatus has been employed for investigation of shear strength values.

Key words: Expansive soil, Shear strength parameters, Direct shear test.

CE-115

UNCONSOLIDATED UNDRAINED BEHAVIOUR OF SAND SILT MIXTURE

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Abstract

Soil testing leads an innovative development in the field of construction. Engineers must understand the nature of shearing resistances of soil to envisage the stability of slopes, earth fills and lateral pressure on earth-retaining structures. The presence of fines may changes the stress-strain strength behaviour of soil formation thereby calculating the effect of dilatancy and pore water pressure. In this paper the influence of non-plastic silt content on sand and confining pressure in the stress-strain characteristics behaviour, degree of saturation, C_u and intergranular void ratio are determined. Increasing in the silt content from 0 to 100%, decreases the failure deviatoric stress for all the confining pressures. The degree of saturation varies from 40% to 70% up to 70% increase of non plastic silt content hence it was observed that it got partially saturated. From 80% to 100% of addition of fine content, degree of saturation gets fully saturated. The saturated sand with non plastic silt shows lesser strength than that of other remaining soil samples. The clayey sand has higher strength, clay particles fills the pores in sand sample and getting more contact in between them. Hence it has higher strength with different confining pressure.

Key Words: Dilatancy, Pore water pressure, Confining pressure, Deviatoric stress, Shear Strength.

CE-116

STRENGTHENING OF SUB-GRADE USING COCONUT FIBRE FOR RURAL ROADS IN INDIA

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Abstract

In development of low volume village roads, its construction and maintenance is highly tedious in India due to poor sub grade soil. In order to strengthen the sub grade soil Coconut Coir Fibre (CCF) is used. This CCF improves engineering properties of soil. In this study, the Strengthening effect of CCF on soil properties has been investigated in laboratories by conducting various tests using clayey soil. Tests such as optimum moisture content (OMC), maximum dry density (MDD) and California bearing ratio (CBR) in the CBR mould without and with Coconut coir fibre using the various percentage of 0.30%, 0.60%, 0.80% and 1.5% added. Finally the results of the study indicated that CBR values of the Soil sub grade with CCF had improved.

Keywords: Coconut Coir Fibre, California Bearing Ratio, Optimum Moisture Content, Maximum Dry Density, Clayey soil

CE-117

A STUDY ON THE SUITABILITY OF ARTIFICIAL SOIL FOR RAIN WATER HARVESTING

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ABSTACT

Rapid rate of increase in urbanization and development had increase the plastic waste generation. As plastic is nondegradable it remains in the environmental for several years and causes several problems. Hence, plastic waste is a huge environmental burden and disposal of plastic waste is the one of the major problem in the city. In this study, the plastic particles with predefined size are made from the plastic waste. The plastic particles will be mixed with the natural soil with various proportions to make the artificial soil. From this the test sample will be prepared under the various field conditions. Double ring infiltration test will be carried out to find the infiltration rate of various samples. The suitability of artificial soil for rain water harvesting will be computed by the interpretation of the test results.

KEY WORDS: Plastic Waste, Disposal of Plastic, Artificial Soil, Rain Water Harvesting, Infiltration Rate.

CE-119

REVIEW OF TALLEST BUILDING FOR METROPOLITAN CITY IN INDIA

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Abstract

Urbanization has resulted in rapid growth of population india being a developing country needs economical development by way of promoting tourism and encouraging sustainability. This can be achieved by introducing the construction of Sky Scrapers which can save large land space. This study aims of highlighting the importance and usefulness of Sky Scrapers. In developing nations like india. This papers also presents review about various successful Sky Scrapers in different part of the world

Keywords: Metropolitan City, Sky Scrapers, Overcoming Population, Economic Development

CE 120

COMPARISON ON FLOATING AND ONSHORE STRUCTURES

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Abstract

Decades ago city planners build canal to foster trade and improve transportation. Later for the aspect of population crisis the structures are compared. The onshore structure has the features of buildings and innovative residential structures, flyovers, highways and malls etc. Whereas the floating structures includes rivers , individual living resort etc. The onshore structures support seismic features such as Earthquake, Tsunami. On the contrary the floating structures support lively features such as climate, biodiversity, water and health. All the features in the onshore structures are indirectly present in the floating structure. Hence the floating structure stands as a marvelous wonder of the modern world

Keywords: Onshore Structures, marvellous, floating structures, seismic features

CE 121

EXPERIMENTAL INVESTIGATION ON TRANSLUCENT CONRETE

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Abstract:

Generally concrete comprises of cement, fine aggregate, coarse aggregate and water. Which posses maximum strength depends upon their grades, But fails in light transmission property. To attain this property translucent concrete were introduced. Translucent concrete consists of cement, fine aggregate, coarse aggregate, water and optic fibre. This optic fibre place a major role in light transmission. The composition of translucent concrete consist of 96% concrete and 4% optic fibre. This concrete can be consider as green energy saving. As the result of this study the translucent concrete asthetic view of the concrete.

Keywords: Compressive strength, Translucent concrete, optic fibre, asthetic view

CE 122

COMPARISON STUDY OF CONVENTIONAL CONCRETE AND NANO CONCRETE TECHNOLOGY

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Abstract

Concrete is the mixture of cement, aggregates, water and admixtures. It is the most important materials for the construction of building. The manufacture of cement emits large amount of co_2 and it will cause ozone depletion. The ordinary concrete will come across many disadvantages like time required to attain strength and also required admixture for some cases like plasticizers, accelerators, etc., Nano-technology is one of the most active research areas which has wide applications in almost all the fields. Improving concrete properties by addition of nano particles have shown significant improvements than conventional concrete. This Nanoconcrete will attain high strength at earlier stage, CO_2 emission will reduce by replacing cement and also act as a admixtures. This paper presents the comparison study of conventional concrete and Nanoconcrete Technology in terms of admixtures, cement, fine aggregate replacing.

Keywords: Cement, Aggregates, Admixtures, Nano-Concrete and Plasticizers.

CE 125

EXPERIMENTAL INVESTIGATION OF EFFECTIVE USE OF NATURAL ADMIXTURES

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Abstract

Chemicals which are used to enhance the natural properties of cement concrete are called Admixture. Those chemical admixtures which are being used in the construction field instantly pollute the environment because of their chemical composition and also expensive to buy. To avoid such constraints, we may use natural materials as admixtures which are eco-friendly and cost effective. The admixtures such as milk, fibre, have been used as natural admixtures in construction field to reduce the cost of cement and also to increase the strength of cement concrete. The objective of the study is to evaluate the modified performance of concrete with adding natural admixtures and the possibilities of using natural materials like Kadukkai paste and Chicken egg shell powder as admixtures in cement concrete. Kadukkai extract and Egg shell powder are added in different concentration of (5% & 0% , 5% & 5% , 5% & 10% , 5% & 15%) to the cement concrete. Chicken egg shell which as $CaCO_3$ (calcium carbonate) it is added in concrete cement it increases the compression strength, corrosion resistance, hydration and porosity of the concrete cement. The compressive strength reaches the highest value when the content is 15% of Kadukkai. When added to cement mortar it increases the workability and also increases the compressive strength by 1.45 times of reference mortar. Therefore the compressive strength of concrete with combination of Kadukkai and egg shell powder is increased by 1.63 times with that of reference concrete.

Keywords:

Chicken Egg Shell, “Terminaliachebula”(Kadukkai)

CE 126

ENVIRONMENTAL IMPACT ASSESSMENT FOR INDUSTRIES IN AMBATTUR

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Abstract:

Chennai is a growing metropolitan city in a developing country. It is the 4th largest city in India. Chennai confronts substantial pollution and other socio - economic problems. Some areas of the city have problems of contaminated groundwater. This has persuaded to conduct a study on Environmental Impact Assessment. The area chosen for this study is Ambattur Industrial Estate. It stretches about 1300 acres. Samples from about 12 locations were collected to determine the quality standards of water. Further tests will be conducted to determine the various parameters like BOD,COD,pH, turbidity, etc... and interpret the results to resolve the major polluted areas and to implement suitable remedies for a sustainable environment.

Keywords: Impact Assessment, BOD, COD, pH, turbidity.

CE-127

STUDY ON REPLACEMENT OF FINE AGGREGATE WITH CRUSHED STONES AND CEMENT WITH FLYASH

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ABSTRACT

The increased need for sustainable materials in the construction industry has persuaded to experiment on partial and full replacement of the conventional constituents of concrete by crushed stones. Fine aggregate is a one of the predominant contents of the concrete usually natural river and which is scarce. The purpose of the study was to investigate the possibility of using crushed stones as fine aggregates and cement with flyash. In this study concrete mix deign of M_{25} grade was adopted according to Indian standard code (IS: 10262). Concrete cube, beam and cylindrical specimens were tested for assessment of compression, flexural and split tensile strength respectively. The test results indicate the crushed stone dust can be used effectively to replace natural sand in concrete. The experimental study has shown increase in compression strength, flexural strength and tensile strength of concrete.

Keywords*:* Crushed stones, Flyash, flexural strength and tensile strength of concrete.

CE 129

EXPERIMENTAL INVESTIGATION ON BEHAVIOUR OF CONCRETE USING RED MUD

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Abstract

In recent days, the technology advancement resulted in the utilisation of cement and concrete in various construction projects. If this rate of utilisation of cement is continued, it will affect the environment by depleting the natural available resources and also requires a huge amount of energy to produce cement. In order to overcome this constraint, it is vital to make use of industrial by product to manufacture cement in construction projects. One of the industrial by product is Redmud, which is produced during the extraction of aluminium from bauxite ore by bayer process. Redmud which contains cementitious property has been used to replace ordinary Portland cement and experiments were carried out for variable percentage which results in the strength of concrete. The various tests like compressive strength split tensile strength and flexural properties of concrete have been investigated. The environment impacts like Groundwater pollution, Alkali seepage into underground, Impact on plant life, Impacts on soil has been reduced.

Keywords: redmud , bayer process , bauxite ore , cementitious property.

CE130

EFFECT OF TANNERY SLUDGE IN CONCRETE

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Abstract

Tannery waste is considered to be one of the major industrial wastes. The present study covers the use of the tannery shredded waste as a partial replacement for fine aggregate and to determine the mechanical properties of the concrete after replacing. Fine aggregate is an integral part in concrete. Due to increase in the construction activities the requirement of fine aggregate is more. In other hand tannery waste is abundant in nature; a proper replacement of tannery waste over the fine aggregate will not only reduce the tannery waste but also reduce demand for fine aggregate. The concrete produced due to this replacement will have reduced weight and also possess higher strength than the conventional concrete.

Keywords: Tannery waste, concrete, mechanical properties

CE 131

RETROFITTING OF STRUCTURES

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Abstract

Many RCC structures in the present world are not braced for earthquakes and other seismic activities. The recently occurred quakes in the last decade shows that the damage was "not entirely dependent on the quakes" but due to the poor performance of the structures during the quakes, this concludes that the solutions can be retrofitting of structures. In the recent years some techniques of retrofitting were introduced, assessing and retrofitting of structures were against seismic event were analyzed. Some of these methods were implemented and showcased using four story RC building retrofitted for a moderate type of quake. Some other methods such as steel and concrete jacketing and application of fiber reinforced polymer can also be used to improve the load bearing capacity. Also shear wallsand shear corescan also be used to improve the overall stability of structures can be discussed. Retrofitting reduces the vulnerability of damage of an existing structure during a future earthquake. It aims to strengthen a structure to satisfy the requirements of the current codes for seismic design. In this respect, seismic retrofit is beyond convictional repair or even rehabilitation. The principles of seismic retrofit refer to the goals, objectives and steps. The applications include different types of buildings, industrial structures, bridges, urban transport structures, marine structures and earth retaining structures. The benefits of retrofitting include the reduction in the loss of lives and damage of the essential facilities and functional continuity of the life line structure, for an existing of good condition, the cost of retrofitting tends to be smaller than the replacement cost. Thus, the retrofitting of structure is an essential component of long term disaster mitigation.

Keywords: Retrofitting, fiber reinforced polymer, industrial structures, bridges

CE 133

PAVEMENT DISTRESS AND CAUSES OF VILLAGE ROADS IN TAMIL NADU

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Abstract

Any civil engineering structures its performance based on well planning, standardized design, stepwise specification of construction, used to good materials and periodical maintenance. Many civil engineering projects are not properly follow the construction procedures as well as good quality of construction materials till today. In this regards, In Indian highways is largest road network in second position among the world but very fast distresses in especially low volume village roads. Generally road construction containing three important layer are constructed such as sub base, base course and wearing /surface course respectively in the layer of construction used to important materials such as Soil, Aggregate and bituminous. In this paper, reviewed the Indian Road Congress (IRC) Codes with Special publications, Indian Standard Codes (IS), Ministry of road transport highways and shipping (MORTHS) and Ministry of Rural development (MORD). The important materials were discussed and recommended permissible limits. And also review the flexible pavement failures, causes and remedial measures are concluded for low volume village roads.

Key Words: Low volume village roads. Quality of materials, cracking, potholes, roughness, rutting.

CE 134

REVIEW AND CAUSES OF FAILURES IN RIGID PAVEMENT IN INDIA

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Abstract:

In this paper Pavement failure is defined in terms of decreasing serviceability caused by the development of cracks and ruts. Before going into the maintenance strategies, we must look into the causes of failure of rigid pavements. Failures of rigid pavements are caused due to many reasons or combination of reasons. Application of correction in the existing surface will enhance the life of maintenance works as well as that of strengthening sub base, base course layers. It has been seen that only four parameters i.e. skid resistance, pavement cracking, mud pumping and rutting are considered. The purpose of this study was to evaluate the possible causes of pavement failures, and to recommend remedies to minimize failures of the pavement.

Keywords: Pavement, Skid resistance, rutting, failures, cracking

CE 135

A-STATE-OF-THE ART REVIEW ON THE VARIOUS FACTORS AFFECTING THE STABILIZATION OF COHESIVE SOILS

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Abstract

Many challenging soil shows us the necessity to stabilize them either by mechanical operation or by chemical alterations using lime, cement and chemical additives. These methods improve properties such as plasticity, swell potential, density and strength of the soil mass. Cohesive soils such as clays ,silts etc., are often weak and have no enough stability to sustain heavy loads. Many billions of dollars are accredited for cohesive, expansive soils and lose soils in many countries. In general expansive soils give problems to civil engineers and to geotechnical engineers in particular. So it is an urge to stabilize this type of soils which is to be used in many ways. Soil stabilization means a technique where the engineering properties of the soil are altered by adding additive mixtures to increase its shear strength, reduce shrink-swell properties, and to reduce the construction cost by using the locally available stabilizers. So this paper deals with each factor which affects the soil when it is stabilized.

Key words: Cohesive soils, Expansive soils, Lose soils, Soil stabilization, Shear strength, Shrink-swell.

CE 136

REVIEW ON CONCRETE CLOTH FOR CIVIL ENGINEERING STRUCTURES

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Abstract

Concrete is a mixture of cement, fine aggregate, coarse aggregate, & water. Concrete is a freshly mixed material which can be moulded into required shape. There are many advantages of concrete, but there is one drawback that it is not flexible, when it is hardened. To overcome through this draw back of concrete, A new construction material has been developed known as concrete cloth. Concrete cloth is a unique material. It has a wide range of applications throughout civil engineering industry. Concrete cloth is a flexible cement ingredient fabric that hardens when hydrated to form a thin, durable, water & fire proof concrete layer. Concrete cloth geosynthetic cementitious composite mats (GCCM) is a material technology that makes it possible to use concrete on slopes, in water& other hard to reach locations without forms or mixing of mineral equipment requirements. GCCM is fabricated with a three dimensional structure that reinforces the concrete providing strength & durability. Concrete cloth can be quickly cut & secured in place making it ideal for reinforcing and rehabilitating a drainage ditch, abutment, beam or other structures. Concrete cloth was developed by British engineering company and named it as concrete canvas. The British army just placed a sizeable order for an innovative new material that combines the flexibility of fabric with the structural performance of concrete. Unlike anything else on the market this revolutionary technology enables the use of concrete in a completely new way. It will soon be used to enhance front line defenses. The research and use of concrete cloth has now included trips to disaster zones around the world.

Keywords: Geosynthetic cementitious, Concrete cloth, thin, durable, water & fire.

CE137

SYNTHESIS, CHARACTERIZATION AND ANTI MICROBIAL STUDIES OF MANNICH BASE DERIVED FROM 2-METHYL BENZIMIDAZOLE AND ITS METAL COMPLEXES.

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Abstract:

A ligand derived from 2-Methyl Benzimidazole, Nicotinic acid hydrazide and Benzaldehyde where characterised through analytical and spectral studies. Cu(II), Co(II), Ni(II), Zn(II), Fe(III) complexes have been synthesised and characterised by IR, UV-Vis, ^{1}H NMR, ^{13}C NMR. Anti microbial activity of the ligand and its metal complexes where determined against the bacteria Escherichia coli and salmonella paratyphi A.

Key words: 2-Methyl Benzimidazole, Nicotinic acid hydrazide, anti microbial activity.

CE 138

REVIEW OF PRACTICES AND GUIDELINES FOR THE DEVELOPMENT OF PEDESTRIAN FACILITIES

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***Abstract*—** Sustainable transportation is a long-term goal to achieve, and the progress towards it is incremental. This system aims at designing of congestion- free urban planning, with pedestrian friendly design of the areas. Every person is a pedestrian at one point of time or other. Walking acts as an auxiliary mode to public transport, therefore increase in usage of public transport will result in increase in share of walk trips in total trips. The freedom with which a person can walk is the degree of the civilized quality of that area. The making progress and use of the walkability assessment methodology can raise awareness and generate interest among policy makers and city officials and help them to improve walking in developing cities. To improve the pedestrian's facilities, perception survey is to be taken so that by analyzing the results from the survey appropriate steps can be implemented to increases the development of pedestrian's facilities in our country. Managing transport demand and supply in a manner is a far better approach in realizing sustainable urban transport systems that provide efficient and equitable access for people and goods. It is important to recognize the forces influencing the demand for provision of more and better pedestrian facilities. The Pedestrian facilities have often designed by subtractions; they are what are left over after provisions are made for motorized traffic. The pedestrian is marginalized in the provision of transport infrastructure.

Keywords —Pedestrians, Auxiliary Mode, Congestion-free, Walk trips, Pedestrian Facilities.

CE 139

STUDY ON THE PROPERTIES OF CONCRETE WITH PARTIALREPLACEMENT OF VARIOUS MATERIALS BY WEIGHT AND FIBRES BY VOLUME WITH PLAIN CEMENT CONCRETE

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ABSTRACT

The presence of fibers in the body of the concrete or the provision of a tensile skin of fiber concrete can be expected to improve the resistance of conventionally reinforced structural members to cracking, deflection and other serviceability conditions. This project mainly focuses on the experimental investigation on the properties of concrete with partial replacement of aggregates with various materials like Silica fume, GGBS, Plastics, Rice husk. The Bundled hook steel fiber and crimped steel fiber are added in terms volume fraction to its concrete volume. For this study, Bundled Hooked-End Steel Fibres with aspect ratio of 60mm were used. The fibres were added in concrete at different fibre volume fractions of 0.5% and 1.0% on different strength of concrete of M25 as high strength. The replacing materials are added partially by 5% and 10% to its weight of aggregates . Based on thesereplacements various test are conducted on the properties of concrete like mechanical properties, sorptivity, Impact test, shear test. The test results shows that a significant improvement especially compressive strength of concrete for a volume fraction of 0.5% for low strength of concrete was found to be 31.6%.The test results also indicates that the splitting tensile strength of concrete was found to be 15.29%, 29.75, 19.90 for Split Tensile , Cylinder Compression, flexural Strength respectively for a volume fraction of 0.5% on M25 strength of concrete. The maximum increase in strength was found to be with SS10/1 Specimen while comparing the properties of the specimen with conventional concrete of M25 grade concrete.The decrease in strength was found with RP10/10 Specimen while comparing the properties with control concrete of M25 Grade

CE140

VARIATIONS OF AIR POLLUTANT LEVELS USING TRAFFIC VOLUME STUDY

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Abstract— Increase in pollution and urbanization have become a major threat to this developing society. In consideration with the air pollutants present in the atmosphere and identifying the sources where it originates, collecting, analyzing and calculating of other information's helps in further investigation of this project. An attempt was made to calculate the total traffic flow at some intersections by setting up vantage points and calculating the daily traffic data through which variation in air pollutant level data is collected from the source device.

CE-141

ANALYTICAL BEHAVIOUR OF RETROFITTED REINFORCED CONCRETE COLUMNS WITH FRP WRAPS

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ABSTRACT

In the last two decades, incidence of failures of reinforced concrete widely because of increasing service loads and/or durability problems. Many factors contribute to the deterioration of reinforced concrete strictest and called safely. Some of these are cracking due to impact and dynamic loading. Many investigations have been undertaking in and repair of slabs and beams but only little research work is available for repairing of columns. This study is aimed to observe the behavior of retrofitted reinforced concrete columns with and without carbon fibre reinforced polymer laminates under static loading conditions. . The study parameters included first crack load, deflection at first crack load, yield load, deflection at yield load, service load, deflection at service load, ultimate load, and deflection at ultimate load, deflection ductility, energy ductility, curvature ductility and crack width. The associated failure modes for test columns were also examined. The performance of virgin Conventional columns and CFRP strengthened reinforced concrete columns were compared. An ANSYS based model will be proposed to predict the performance characteristics of CFRP laminated with reinforced concrete columns.

Keywords: Fiber Reinforced Polymer, Compression member, reinforced Concrete column, axial load, etc

CE142

WATER QUALITY ANALYSIS OF CHENGALPATTU LAKE NEAR PARANUR

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Abstract

Water Quality is the major issue concerned with urbanization and Industrial development. The study is carried out in the area of Chengalpattu near Paranur (Latitude) from January 2016 to December 2016). Huge of the population in this area depends on this lake water for their basic uses. This study is done to determine the water quality and its suitability for drinking and agricultural purposes. Totally 8 number of samples were collected in the area near to Industries which is the main source of pollutant. Basic physio-chemical parameters test like pH, Turbidity, Alkalinity, Chloride, Nitrate, pH, temperature, Turbidity, Alkalinity, Chloride, Nitrate, DO, BOD, COD, TSS, TDS, EC, Cd, Co, Cr, Cu, Fe, Mn, Ni, Pb and Zn metals. The result obtained from the tests were compared with BIS standard and WHO Standard of Drinking and Agricultural Standards. The water quality status in NW area is found to be good in manner such that the Industrial area is near to SE side. The water quality is found to be highly polluted and exceeds the limit of BIS standard in SE side and it is found that the Oil and grease content in this area is 19.6 mg/l which when compared to BIS the limit is 10 mg/l which exceeds in manner.

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A REVIEW STUDY ON NON-TRADITIONAL ADMIXTURES FOR STABILIZATION OF PROBLEMATIC SOIL DEPOSITS

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ABSTRACT

Clayey soils generally exhibit low shear strength and compressibility, hence requires its complete removal or replacement before any construction work can be commenced. The option of replacement or removal is practically very difficult and becomes expensive. Chemical stabilization of organic soil/expansive soil is the viable option to increase the strength and improve its compressibility. Many chemical additives such lime, fly ash, cement and other industrial wastes are used in various proportions with various degree of success for stabilization. However calcium based stabilizers are not very effective in stabilization of organic soils. The organic content, the humus present retards the formation of cementitious compounds and there by reduces the effectiveness of the stabiliser. The objective of the present study is to explore the application of additives other than the traditional additives used for the stabilization of the organic soils/expansive soils. Ligonosulphonates, a polymeric compound from the wood/paper processing industry, and egg shell powder, waste generated in the food industry is recently used for stabilising soil. However its usage is limited and has not been researched adequately. The aim of the present study is to explore the various research works carried out using various organic stabilizers, and non traditional additives. Some of the potentially important factors affecting the stabilization such as the percentage of the additives, time of reaction, stabilising mechanism involved in improvement of shear strength and compressibility are studied and compared from previous research works. The review study mainly focuses to bring out a complete picture of the overall mechanism involved with the non traditional stabilisers which can greatly help in further experimental investigations of the stabilisers.

Keywords- Ligonosulphonate,organic soil,stabilization,shear strength,compressibility

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INCORPORATING BENTONITE PARTIALLY IN PLACE OF CEMENT-AN ASSESSMENT OF STRENGTH AND DURABILITY PROPERTIES

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Abstract

The Production of cement exposes 7% of CO2 in the atmosphere, which is one of the reasons of Global Warming. Bentonite, a product of volcanic ash is a rich source of silica which substitutes cement which has homogeneous properties. Two types of concrete is prepared with different water-binder ratio of 0.45 and 0.50 designed for M25 with 5%, 10%, 15% replacement. The compressive strength and tensile strength are determined at 7, 28 days and carbonation test are carried out with exposure condition of 6 days. The results obtained from Bentonite replacement are i) Compressive Strength and Tensile strength is achieved on long term basis. ii) Carbonation penetration depth is about 20% less when compared to ordinary PCC.

Keywords— Bentonite, Strength, Durability, Carbonation

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EVALUATION ON PAVEMENT ROUGHNESS USING MERLIN, ROMDAS

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Abstract

Road surface roughness is an important measure of road condition. It is the irregularity of the road surface familiar to all road users, and perception of the riding quality have long been considered as an important criteria for the acceptability of the service provided by the road. Roughness affects the dynamics of moving vehicles. Road roughness emerges as a key property of road condition to be considered in any economic evaluation of design and maintenance standards for pavements. It increases the Vehicle Operating Cost (VOC) and decreases the safety and speed. Smooth surface brings along with it higher speed, less fuel consumption, less wear and tear of tyres, vehicle parts, comfort and safety. Hence a study has been done for a small stretch of road in low volume village roads in Thiruvallur District in state of Tamil Nadu in India. This stretch of road was selected in such a way that the road surface was good for certain length and poor for certain length. For this selected stretch, road roughness was measured by three type of instrument. They are; Machine for Evaluating Roughness using Low cost Instrument (**MERLIN**), Axle Mounted Roughness Measuring Device and Road Measurement Data Acquisition System (**ROMDAS**).

Key Words: Roughness, Vehicle Operating Cost, MERLIN, ROMDAS

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AN EXPERIMENTAL STUDY ON SUGARCANE BAGASSE ASH IN CLAY BRICKS

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ABSTRACT

The utilization of industrial waste produced by industrial process has been the focus of waste reduction research for economical, environmental and technical reasons. Sugarcane bagasse ash (SCBA) is a fibrous waste - product of the sugar mill industry. Sugarcane bagasse ash (SCBA) mainly contains silica, ion, and calcium and alu- minium. In this paper, bagasse ash has been chemically and physically characterized, and partially replaced in the ratio of 0 %, 5 %, 10 %, 15 % and 20 % ash by weight of weight in Clay brick. The samples were fired at temperatures 1100 ºC

Test for texture (particle size analysis), compressive strength, porosity, water absorption and shrinkage were carried out to characterize the samples. The results showed that the amount of ash to be incorporated will depend on mainly the composition of clay but also ash, and indicated that the clay used in this work can incorporate up to 15% weight of ash to produce solid bricks. More than 15% of waste used in the brick making process in SCBA. In order to counteract the effect of usage of clay and to overcome the failure after the 15% consumption of waste the substitute particle are participated in the method of trial and error techniques by using the material lime powder and overheated clay in order to make porcelain clay material and also contain aluminum, as the major composition called as met kaolin material.

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Review of innovative PMGSY road construction techniques

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ABSTRACT:

Roads have been existing in India for the last 5000 years. In early stages of Indian history, Ashoka and Chandragupta made efforts to construct roads. But the real progress was made during the Mughal period. Rural roads have been extensively championed as poverty alleviation instruments by the World Bank and donor institutions. It is argued that rural roads are key to raising living standards in poor rural areas (for example see Gannon and Liu, 1997). By reducing transport costs, roads are expected to generate market activity, affect input and output prices, and foster economic linkages that enhance agricultural production, alter land use, crop intensity and other production decisions, stimulate off-farm diversification and other income-earning opportunities, and encourage migration. Pradhan Mantri Gram Sadak Yojana **(PMGSY**) Roads Construction are one of the key components for rural developments. While building rural roads, it must satisfy all the parameter but at minimum cost. Its our duty as engineers to spend every rupee of the taxpayers money as ours. We can apply some of the proven technologies in stabilization by Ground Improvement Techniques such as lime, cement, grouting and using latest environmental friendly enzymes such as Fujibeton, Terrazyme, Renolith and alternative technologies such as Jute Geo-textile (JGT), Bio asphalt, Waste Plastic Blender Bitumen. Most of the countries adopt these techniques worldwide, but in India it is not popular due to the lack of awareness and exposure. The use of these materials reduce the cost drastically, but the most vital thing is the natural resource conserved and environment is preserved.

Key Words:

Ground Improvement Technique, Eco friendly-Enzymes, Locally Available Alternative Technologies