

A COMPREHENSIVE STUDY OF SOLID WASTE MANAGEMENT IN MANGALORE CITY-CASE STUDY

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Abstract — Mangalore being a fast developing city faces the challenges of dealing with the solid waste generated. The calculation of the quantity of waste generated especially in the households and the manner in which the residents and the local government respond to it becomes crucial in facing this challenge effectively. Present study shows the average solid waste generated by Mangalore is 226 tons per day with the per capita waste generation equalling to 0.4524 Kg per day. The household per capita waste generation equals to 0.2095 Kg per day. Though the total per capita waste generated in the city is not alarming, it is almost equal to the total per capita waste generated by the State of Karnataka and India in general. As we move from the outskirts of the city to the central part of the city there is an increase in the production of the solid waste. It is observed that in the outskirts of Mangalore, the waste is mostly fed to the animals and used as manure, and thus less waste finds its way to the community dumpsites. Since the major part of the household waste generated in the city is biodegradable, by using eco-friendly technologies like vermicomposting in Mangalore 50-60 tons per day of compost could be prepared from household waste alone. The goodwill of the people to cooperate in the proper management and disposal of the household waste needs to be utilized and at the same time strengthened by adequate awareness programs and facilities. Survey shows that the combined action of the municipal authorities and the residents of the wards is necessary in the entire process of management of solid waste.

Key Words: Municipal solid waste; Projections; Paper; Plastic.

I. INTRODUCTION

Concrete is a major material used in the construction. The municipal solid waste management continues to remain as one of the most neglected areas of urban development in India. In most of the cities in India, more than half of the solid waste generation remains unattended. The problem is likely to aggravate further with the rise in population, changing food habits and people life style due to changes in socioeconomic status etc. this gives rise to insanitary conditions

particularly in densely populated areas, which in turn may have serious health and environmental consequences putting high pressure on resources. Solid waste management comprises a whole range of actors involving public, private sector, non-governmental organizations and community based organizations. In India, the responsibility of collection and disposal of waste has vested traditionally with the municipalities which have neither adequate financial resources nor the trained personnel for dealing with increasing complexities of garbage collection and disposal. This is further complicated by weak administration and managerial capacities of urban bodies resulting in mismanagement and inefficiency.

Poor municipal solid waste management (MSWM) is one of the causes for major environmental problems in many cities in Karnataka. The improper management of municipal solid waste (MSW) causes hazards to inhabitants. Various studies revealed that about 90 per cent of MSW is disposed of unscientifically in open area or in the landfills without segregation which is creating public health hazards and damaging the environment around. In the present study, an attempt has been made to provide a comprehensive review of the characteristics, generation, collection, storage, transportation, disposal and treatment technologies of MSW practiced in Karnataka.

Solid waste management is an integral part of urban and environmental management, like most of other infrastructural services has come under great stress, consider low priority areas, solid waste management was never taken up seriously either by public or by concerned agency or authorities and now the piled up waste is threatening our health, environment and well-being (Chouhan and Reddy 1996, Mazumdar 1994 & Yadav et al. 2009). Waste minimization is a methodology used to achieve waste reduction, primarily through reduction at source, but also including recycling and re-use of materials. The benefits of waste minimization are both environmental and financial and wide in their coverage. (Dhande et al. 2005). To implement proper waste management, various aspects have to

A STUDY ON LAND AIR TRANSIT ELEVATED BUS

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Abstract

The Transit Elevated Bus (TEB) (simplified Chinese: traditional Chinese: pinyin is a proposed new bus concept where a guided bus straddles above road traffic, giving it the alternative names such as straddling bus, straddle bus, land airbus, or tunnel bus by international media. A trial was scheduled to begin in Beijing's Mentougou District by late 2010. However the project was not given authorization by the district authorities because the technology was considered to be too immature, and further trials were subject to the development of a concept to prove the system actually works. The city of Manaus, Brazil, has also evaluated the option of installing a straddle bus in its city streets. At the time of the 2016 unveiling of the scale model, it was reported that a prototype would be deployed by mid-2016 in Qinhuangdao. Four other Chinese cities, Nan yang, Shenyang, Tianjin, and Zhoukou, had also signed contracts for pilot projects involving the construction of test tracks beginning in 2016. However a claimed test of a prototype design was heavily criticized in August 2016 and appears to be abandoned as of December 2016.[7]

Index term; prototype, elevated, land, electronic, stability

I. INTRODUCTION

The idea of TEB was proposed in 1969 by two American architects, Craig Hodgetts and Lester Walker, as a public transport concept called the "Bos-Wash Landliner".[8] Later, another version was designed by Shenzhen Hashi Future Parking Equipment Company, and the concept, known as 3D Express Bus at the time, was unveiled at the 13th Beijing International High-tech Expo in May 2010.[9][10] A working scale model was showcased at the 2016 Beijing International High-Tech Expo.[5]

II. STUDY

In China there are four main modes of public transportation: subway, light rail, bus rapid transit (BRT), and normal buses. The express coach would be a substitute for BRT and augment its advantages. To modify the road for the bus, two options are available: rails can be laid on the edges of the lanes that the bus occupies, or two white lines can be painted on the road to facilitate use of autopilot technology.[11] Rails would offer less wheel rolling resistance and better energy efficiency. For either option, it may be necessary to widen the lanes occupied by the bus to accommodate the bus wheels and undercarriage whilst allowing other vehicles to pass under the bus two abreast. Since the bus is no higher than a tractor-trailer, roadway overpasses will usually not be a problem. The bus would run along a fixed route, its passenger compartment spanning the width of two traffic lanes. Its undercarriage rides along the edges of the two lanes it straddles and the overall height is 4 to 4.5 m (13ft 1 in to 14ft 9 in).[11][12] Vehicles lower than 2 m (6 ft 7 in) high will be able to pass underneath the bus, reducing the number of traffic jams caused by ordinary buses loading and unloading at bus stops. Passengers on board the bus are expected to experience a ride comparable to riding in the upper level of a double decker bus. They will board and alight at stations at the side of the road with platforms at the bus floor height similar to stations of an elevated railway, or via stairs descending through the roof of the bus from a station similar to a pedestrian overpass. The bus will be electrically powered using overhead lines or other roof electrical contact systems designed for it, supplemented with photovoltaic panels, batteries, or super capacitors on board. It will travel at up to 60 km/h (37 mph). Different versions will carry up to 1,200 passengers, with the

Comparison study on lead and arsenic removal using groundnut shell and tamarind seed by adsorption and nano-sorption

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Abstract

Toxic heavy metal contamination of industrial wastewater is an important environmental problem. Many industries such as electroplating, pigments, metallurgical processes, and mining and leather industries release various concentrations of heavy metals. Metal ions such as cadmium, nickel, chromium, copper, lead, zinc, manganese and iron are commonly detected in both natural and industrial effluents. An experimental investigation was carried out for the treatment of synthetic solution containing Lead and Arsenic using low cost adsorbents such as ground nut shells and tamarind seed. This work focuses on the utilisation of activated carbon prepared from groundnut shell and tamarind shell for the removal of lead and arsenic from synthetic solution prepared. A laboratory scale setup was used to remove lead and arsenic from synthetic solution using Cu coated nanoparticle on activated carbon. The effects of temperature, contact time of lead and arsenic on the adsorption process have been investigated separately with respect to activated carbon and Cu nanoparticle coated on activated carbon. SEM and EDX analysis confirmed Cu nanoparticle successfully coated/decorated on activated carbon of size ~0.3-0.5 μ m. AAS instrument was used to check the removal efficiencies of activated carbon and nanoparticle from synthetic solution and showed reasonably good potential for reducing heavy metals from synthetic solution.

Keywords: Lead, Arsenic, Groundnut shell, Tamarind seed, activated carbon, nano particle, Adsorption, Nano-sorption.

I. INTRODUCTION

Nowadays various toxins are released into water leading to a great deal of water pollution. Many heavy metals from various industries like battery plants, metal processing industries, pharmaceuticals, hospitals, mining fields etc. are being released into the water bodies leading to unsafe water for normal consumption. The most common heavy metals found are copper(Cu), lead(Pb), arsenic (As), chromium (Cr), oils and grease, pesticides, etc., which when present in very small amounts like ppb (parts per billion range) may be very fatal to the health and the surrounding environment as well.

In order to obtain clean and safe water it is required that these toxic chemicals and metals should be removed. The methods that is employed in this experimental study is purely by keeping in mind environmental sustainability using house hold wastes such as groundnut shell and tamarind seed, which are cheap, easily available and very effective adsorbents as indicated in few literature regarding removal of heavy metals. Groundnut shell and tamarind seeds have adsorbent properties and may be a successful method in purification of water due to the compounds in the groundnut shell and tamarind seed that contain cellulose, hemicellulose, lignin and carbohydrates, protein, crude fibre, calcium, phosphorous, magnesium and potassium respectively. These elements are charged such that their negatively charged electron pairs are exposed, meaning they can bind with metals in the water that usually have a positive charge.

DELINEATION OF GROUND WATER POTENTIAL ZONES AT MOODBIDRI BY ELECTRICAL RESISTIVITY TECHNIQUE

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Abstract - A geophysical survey conducted in the Moodbidri and nearby area of North-East part of Dakshina Kannada district, Karnataka using electrical resistivity method. The Schlumberger electrode configuration is used for the vertical electrical soundings. A total 20 vertical electrical soundings has been taken to delineate groundwater potential zone in the study area and also to understand the thickness of weathered zone/ formation relevant to groundwater behaviors of aquifers in alluvium and in the trap rock. The field data were interpreted by IGIS-VES software to determine the resistivity and thickness of the different layers. Results of geophysical data were used to prepare lineament and geo-morphological maps. The depth for the construction of tube wells and dug wells were suggested. The depth to water table varies from 30 meters to 90 meters at some places.

Key words: Electrical resistivity¹, Groundwater potential zone², vertical electrical soundings³, geophysical data⁴, IGIS-VES software⁵.

1. INTRODUCTION

Groundwater resources play a major role in ensuring livelihood security across the world. The total water resource of our world is estimated as 1.37 Million ha m, of these global water resources, about 97.2% are salt water, mainly in oceans and only 2.8% are available as fresh water at any time on the planet earth. However, the economically extracted groundwater with the present drilling technique is about 0.3%, remaining being unavailable as it is situated below depth of 800 m. Groundwater is Often withdrawn for agricultural, municipal and industrial use by constructing and operating extraction wells. Groundwater is also widely used as a source for drinking supply and irrigation.

Utilization of groundwater reservoir as a viable source for meeting drinking and domestic water needs is safer and economical than surface water, as groundwater is available everywhere and is generally uncontaminated. As a result groundwater investigation has assumed top priority in recent years. Groundwater is usually held within porous soils or rock materials. People all around the world face serious water shortage because of the over exploitation of groundwater for domestic, industrial and agricultural purposes. The conventional Schlumberger resistivity sounding is extensively used for routine groundwater investigations both in laterite and hard rock terrain. Electrical resistivity survey provides much basic information to the hydro geologist, like depth to water table, depth to the basement topography in hard rocks.

The geophysical investigation done for 20 Stations such as Virasath Ground, Puttige, Pryanthy, Laadi, Swaraj stadium, Kadalakere, Hamsanagar, Gandhinagar, Mahaveer collage, Narampaadi, Murarji desai school, Narampadi, Marpaadi, Alangaru, Montry hospital, Palace door, Nagaragadde, Rani abbakka layout, Kadabalu, Handalu at Moodbidri.

2. STUDY AREA

The occurrence of groundwater in any type of terrain is largely dependent on topography, climate and geological setting. Moodbidri, is a town and a taluk in Dakshina Kannada District. It lies 34km North-East of the district head-quarters, Mangalore city, in Karnataka, India. Because of widely grown bamboo in ancient days, this place got named as Moodbidri. The latitude is 13.0688°N and the longitude is 74.9936°E. It has an average elevation of 22m above mean sea level. This area mainly consists of laterite, gneiss, granite and charnockite.



DEVELOPMENT OF WATER CONSERVATION PLAN AT MANIPAL, UDUPI DISTRICT

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Abstract

Water has become oil of 21st century due to increase in demand in proportion to the rapidly increasing population. Now it is high time we must conserve this natural resource. For conservation of water resources, we can adopt number of conservation plans like Rain water harvesting, artificial ground water recharge from roof top catchments to improve the ground water level and fulfill the daily requirements. This should be made mandatory in urban areas to satisfy their demands. Although, the study area Manipal receives annual rainfall of 500 – 560 cm faces water scarcity in dry season due to variation in the population and lack of conservation plans. Since the area consists of multiple large infrastructures, adoption of water conservation plans will be effective. In this project we have discussed regarding structural components and advantages of water conservation plans. These recommendations of water conservation plan have also been made for future benefits of the society.

Keywords:- Water Conservation, Conservation plans : Rain Water Harvesting, artificial ground water recharge, Urbanization

I. INTRODUCTION

Water is an essential and basic human need for urban, industrial and agricultural use. While an abundance of fresh water resources is available, its uneven distribution around the globe creates challenges for sustainable use of this resource. Water conservation refers to the careful use and preservation of water supply. It includes both the quantity and quality of water utilized. Water is an essential asset for the nourishment of all life. The fundamental demand for all activities appropriate from local use to agricultural industry. With the regular expanding weight of the human population, there has been a serious tension on water resources. Negligence of customary water bodies like tanks and lakes, unpredictable and abuse of groundwater, and incorrect preservation of surface water systems has bothered the issue. Still further and is no doubt going to grow in the years to come. There are various approaches to make your water to last nowadays. One simple yet often disregarded strategy to cut your water bill is to use your water twice. Unlike electricity, water can be reused over again and again. That's the idea of water conservation. an efficient and optimal use as well as protection of valuable water resources.

PRINCIPAL

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EFFECT OF INDUSTRIAL EFFLUENTS ON GROUND WATER SOURCES IN AND AROUND BAIKAMPADY

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Abstract

Ground water is the main source for domestic, industrial and agricultural use in Baikampady area. The importance of the hydrogeochemical analysis underlies the fact that chemistry of the ground water can directly be related with the source of water, climate and geology of region. Water sample are collected from various aquifers during fixed interval. The water samples have been tested to check the suitability of water for drinking, irrigation and industrial purpose. All the water samples are falling within the permissible range prescribed by BIS, WHO and ICMR.

I. INTRODUCTION

Ground water is one of the earth's most important resources for human life. Natural ground water is generally free from contamination and is usually the better alternatives to surface water which is mostly contaminated by anthropogenic activities. The quality of groundwater depends on a large number of individual hydrological physical, chemical and biological factors. Generally higher proportions of dissolved constituents are found in groundwater than in surface water because of greater interaction of ground water with various materials in geological strata.

The ground water system is as complex as it is influenced by many factors in a particular site Rainfall, land form, soil, lithology, sea water intrusion and other anthropogenic activities are some of the factors determining the ground water quality. Maintaining ground water quality is the most critical issues in and it necessitates understanding and management of groundwater chemical composition of ground water in coastal differs broadly depending on diver's geohydrology, hydrometeorology, topography, drainage and other artificial condition imposed.

II. STUDY AREA

The study area is being one of the major cities on coast Karnataka gaining economic importance due to urbanization and industrialization. The study area for our project consist of industries etc. Baikampady is located at 12.93176N 74.7944464E. There is significant rainfall in most months of the year. The average annual temperature in Mangalore is 27.0 C. the rainfall average 3783 mm. As per provisional reports of census India, population in 2011 is 488,968; of which male and female are 242,512 and 246,456 respectively. In addition to this open well and bore wells are also the main source of drinking water.

III. OBJECTIVES

- Impact of industrial wastewater on Ground water sources
- Evaluating the effects of effluents on ground water.
- Hydrogeological features of the study area.



ADSORPTION IN WASTE WATER USING ACTVATED CARBON: A Review

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ABSTRACT

Organic pollution is the term used when large quantities of organic compounds originate from domestic sewage, urban run-off, industrial effluents and agriculture wastewater. Sewage treatment plants and industry including food processing, pulp and paper making, agriculture and aquaculture [20]. The removal of nitrogenous compounds can be carried out by electrochemical, biological and adsorption methods [4]. Treated water use for Irrigation, toilet flushing, car washing, gardening, firefighting, etc. Adsorption is the simplest and low cost treatment technology based on the principle of attached growth process. A multimedia filter model was developed by G.I. sheet for treatment of domestic wastewater. Different packing media are used such as Activated carbon, sugarcane bagasse, sand and grass mulch [9]. It has been observed that 75-80 percent removal of COD and organic matter can be obtained by activated carbon [7]. Carbon adsorption is an extremely versatile technology. For many water treatment applications it has proved to be the least expensive treatment option.

Keywords- Introduction, Activated Carbon, Adsorption Isotherm

I. INTRODUCTION

A. General

Carbon has been used as an adsorbent for centuries. Activated carbons ability to remove a large variety of compounds from contaminated waters has led to its increased use in the last thirty years. Recent changes in water discharge standards regarding toxic pollutants have placed additional emphasis on this technology [23]. Adsorption is a natural process by which molecules of a dissolved compound collect on and adhere to the surface of an adsorbent solid. Adsorption occurs when the attractive forces at the carbon surface overcome the attractive forces of the liquid. Adsorption is particularly effective in treating low concentration waste streams and in meeting stringent treatment levels. One of the major attributes of activated carbon treatment is its ability to remove a wide variety of toxic organic compounds to non-detectable levels (99.99%). Its suitability on a specific application will normally depend on costs as they relate to the amount of carbon consumed. [23]

B. ACIVATED CARBON

i) Vapor Phase Activated Carbon

General Carbon carries a complete line of activated carbon made from coal, coconut shell and wood for most vapor phase and air applications. These include impregnated carbons for specialty applications and high capacity non-impregnated carbon for H₂S control [1]. In addition, specialty medias are ideal for the treatment of many contaminants that activated carbon may struggle with. Orders of bulk activated carbon are also acceptable since 1958.

ii) Liquid Phase Activated Carbon

Like the vapor phase carbon, General Carbon's liquid phase activated carbon products are made from coal, coconut shell and wood for most liquid phase and water applications. These include acid washed activated

A Review of Electrocoagulation Process for Wastewater Treatment

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ABSTRACT

Electrocoagulation is a complex process with a multitude of mechanisms operating synergistically to remove pollutants from the water. A wide variety of opinions exist in the literature for key mechanisms and reactor configurations. A lack of a systematic approach has resulted in a myriad of designs for electro coagulation reactors without due consideration of the complexity of the system. A systematic, holistic approach is required to understand electro coagulation and its controlling parameters. This will enable a priori prediction of the treatment of various pollutant types.

Keywords: *Electro coagulation, electro flotation, wastewater, Water treatment.*

INTRODUCTION

The treatment of wastewater involves many challenges that are not limited to the technical objectives of good water quality and solid/liquid separation. In developing a wastewater treatment method, its overall environmental impact, usefulness in various industrial applications, ease of installation and operation, energy efficiency, and cost-effectiveness must be considered [1]. There are numerous wastewater treatment units are employed around the world, each having its advantages and disadvantages. The aim of the study is to investigate the use of electro coagulation, an eco-friendly alternative to chemical coagulation and other treatment processes that require large areas for treatment facilities and staff. Effluents from many industries are now one of the major sources of water pollution which represent important environmental problems. These pollutants in water cause considerable damage to the aquatic environment and significant source of environmental pollution. It contains several harmful chemicals that are toxic to biological life.

ELECTROCOAGULATION

Electro coagulation process involves oxidation and reduction reaction in which destabilization of contaminants (suspended, emulsified, or dissolved) happens because of application of electric current to the electrolytic solution. EC unit consists of an electrolytic cell and metal (Al or Fe) electrodes which are connected to an external power supply. The conductive metal plates are well known as sacrificial electrodes which are made up of same or completely different materials as anode or cathode. In the EC process, anodic dissolution generates *in situ* coagulants along with hydroxyl ions and hydrogen gas at the cathode. These *in situ* coagulants cause the formation of flocs within the sort of metal (Al or Fe) hydroxides and/or poly hydroxides. The hydrogen gas generated at the cathode brings flocs at the water surface by providing further buoyancy.



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MICROBIAL FUEL CELL -REVIEW

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ABSTRACT

Energy is the most fundamental requirement of today's era. Energy is consumed very rapidly. The energy requirements are very increasing. Our population, abundant energy resources and industrial diversity make our self proficient enough in producing and consuming energy. This will definitely leads in contributing to the national economy. It is the fact that initially there is a cost issue with every new technology but gradually developing mind we can cope up with it. The need for optimization in cost and efficiency can create systems which are cost effective, non- hazardous in nature, commercially available, clean fuel, compete with regular ongoing systems, inherently safe in handling, having renewable power and sustainable to nature. We envision a future where industries can fulfil the growing demands in an environmentally sustainable way. Hydrogen fuel cells have the real potential to be the future technology in terms of applicability. This technology has the solution to the problem of increasing requirements in an environmentally viable option. This review article presents the working operation of Hydrogen Fuel Cell, Classification of fuel cell in a comparable way, applications, new developments, future technologies and economic growth. Fuel cell is very much similar to the electrochemical cell or an ordinary dry cell. There are basically three components in each and every fuel cell. They are cathode, anode and electrolyte. They are connected with the electrical circuit. This construction has no rotating parts in its design. Hence, they are pretty simple and efficient in design. The classification is based on the type of electrolyte used.

Keywords: Fuel cell, Efficiency, electrolyte, cathode, anode and applications.

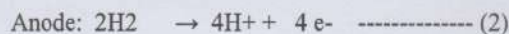
1. INTRODUCTION

Fuel cell is an energy conversion based device. This will harness the power of hydrogen. Hydrogen is a handy fuel, which have the potential to power anything. It s versatility can produce clean and sustainable power in nature. A fuel

Load cell is simple in its operation. It is nothing but electrochemical cell that converts the chemical energy from fuel into electricity. It occurs through the electrochemical reaction of hydrogen and oxygen. There occurs the flow of electrons from one electrode to another through the electrolyte. There are classifications based on types of electrolyte. Its working is very easy to understand. It is clean and environmentally viable option. Here, the energy is liberated by the chemical reaction by the flow of electrons and electrical energy is produced. The very first demonstration of simple basic fuel cell was given by Lawyer and Scientist William Grove in 1839, in his experiment the water was electrolysed into hydrogen and oxygen by passing an electric current by the help of battery, then after it was replaced by multi meter, and a small current is obtained through it. Here, the products are neither pollutants nor harmful in nature. The electrolysis is being reversed by recombining and the products are water. Hence, the electric current is generated. The hydrogen fuel is being burnt or combustion takes place in simple reaction, which is represented as follows:



There are three components in the structure of fuel cell. They are anode, cathode and electrolyte. The reaction takes place at anode and cathode. At the anode of electrolyte in the fuel cell, the hydrogen gas get ionizes which leads to release of electrons and creating H⁺ ions (or protons).



This reaction releases energy. At the cathode, the oxygen gets reacted with the electrons released from electrode and H⁺ ions from the electrolyte. This results in the formation of water.

Seismic analysis of RC regular and irregular building considering soil structure interaction for laterite soil

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Abstract — Dakshina Kannada is one of a districts in the state of Karnataka in India. Surrounded by the Western Ghats on east and Arabian Sea on the west, Dakshina Kannada receives abundant rainfall during the monsoon season. Latitude of Dakshina Kannada is 12.8438° N & 75.2479° E, covers the area of 4559km². Some of the standard journals were referred as guide line for this RC regular and irregular structures. Review standard papers are done on the seismic analysis of RC regular irregular structure considering soil structure interaction of laterite soil. An earthquake is caused by tectonic plates getting stuck and putting a strain on the ground. The strain becomes so great that rocks give way by breaking and sliding along fault planes. Earthquakes may occur naturally or as a result of human activities. Smaller earthquakes can also be caused by volcanic activity, landslides, mine blasts, and nuclear tests. It is therefore essential to consider the lateral force while designing the buildings to mitigate the effects of major earthquakes. In the present study the gravity load analysis and lateral load analysis as per the seismic code IS 1893 (Part 1):2002 are carried out for regular and irregular building.

Keywords: Soil Structure Interaction¹, Spring Stiffness², Base Shear³, Displacement⁴, Natural Time Period⁵.

I INTRODUCTION

Dakshina Kannada is one of the districts in the state of Karnataka in India. Surrounded by the Western Ghats on east and Arabian Sea on the west, Dakshina Kannada receives abundant rainfall during the monsoon season. Latitude of Dakshina Kannada is 12.8438° N & 75.2479° E, covers the area of 4559 km². Dakshina Kannada is situated at a distance of 229km from the capital city Bengaluru Via NH75. Dakshina Kannada comprises of valleys and hills which will be difficult to construct multi-storey structure of same height at all point of the building. If we level the land for construction activity which will makes the project costlier and hence step back building were constructed which will matches with ground profile, a detailed study of a normal regular building and a height wise irregular structure subjected to seismic forces were studied. Due to tectonic plate movement earthquake happens, if the stress bearing

capacity of a member based on design requirement were constructed as per Indian codes, then we may observe the property or life loss will be reduced to some extent, if a large or high magnitude earthquake happens then we may observe disaster. Earthquake effects enhances the loop-hole of the buildings when they act on it, this may arise due to discontinuity in mass, stiffness and geometry of the structures having this discontinuity are termed as Irregularities in structures. Irregular structures contribute a large portion of urban infrastructure because to obey the byelaws and to increase the building area in the upper floors. Irregularities are one of the major reasons of failures of structures during earthquakes so, the effect of Irregularities in the seismic performance of structures becomes really important. Story wise changes in stiffness and mass render the dynamic characteristics of these buildings differ from the regular building. IS 1893 (Part 1):2016 defines irregular distributions in their mass, strength and stiffness along the height of building as irregular structures, when such buildings are constructed in high seismic zones more precision and accuracy is required to calculate forces in the structural members.

II METHODOLOGY

In the present study the analysis has been done for a 8 story building using ETA-BS 2013. Finite element analysis was done using the equivalent static and response spectrum analysis. The properties for the model generated are as mentioned below.

Table No 1: Regular Building Properties & Irregular Building Physical Properties All Dimensions Are In Meter

Beam size	0.3 x 0.6			0.3 x 0.6		
Column size	Group 1			Group 2		
	0.3 x 0.6 (m)			0.6 x 0.6 (m)		
Slab size	0.15 m			0.15 m		
Footing size	L	B	D	L	B	D
	5.0	2.0	1.2	5.0	2.0	1.2
Spring properties	X	Y	Z	X	Y	Z
Translation X 10 ⁷	0.39	0.42	0.44	0.39	0.42	0.44
Rotation	0.15	0.16	0.17	0.15	0.16	0.17

URBAN FLOOD MANAGEMENT AT KOTTARACHOWKI, MANGALORE, KARNATAKA, INDIA. USING GIS AND REMOTE SENSING: A CASE STUDY

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ABSTRACT

Flood impact is one of the most considerable disasters in the world. Floods are caused due to natural factors such as heavy rainfall, high floods and high tides, etc., and human factors such as deforestation, improper land use, blocking of drainage channels etc. Floods result in damage properties and losses of life. Increase population results in more urbanization, more impervious area and less infiltration and greater flood peak and runoff. Flood loss prevention and mitigation includes structural flood control measures such as proper maintenance of the existing drainage system, construction of levees and non-structural measures such as flood hazard and risk management, flood forecasting and warning etc.

The study uses the Remote Sensing and GIS technique to assess the flood inundated places by flood hazard map in the study area, effect of flood on people, infrastructure and vegetation by flood vulnerability map and flood zones which shows hazards and classifying them as low, medium and high hazards by flood zoning map in the study area. The results of the above particulars are used to give early warnings of the flood and suggestion to flood control and mitigation measures for the flood prone study area that is Kottarachowki, Mangalore taluk, Dakshina Kannada district, Karnataka state, India.

Keywords: GIS, Remote Sensing, DEM, Flood Hazard, Flood Vulnerability, Flood Zoning.

1. INTRODUCTION

Flood is defined as the overspill of areas that are normally submerged with water or a stream that has broken its normal confines or has accumulated due to lack of drainage. Floods are the most common and destructive natural hazards causing extensive damage to public and private services, economy, infrastructure and the Environment.

Floods caused by natural and man-made disasters are major environmental problems facing the world. In particular, areas adjacent to the coastal areas and inlands, wetlands, close to watercourses, low laying areas have seen a rise in flooding activities.

Many urban areas and cities are located in flood plains because land is flat and fertile which is suitable for agriculture and urban development. Rivers provide water supply for domestic, industrial and irrigation uses; they also provide convenient means for navigation, transportation and communication.

Design of Parking Area and Traffic Signal for Moodbidri Town based on Traffic Studies

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ABSTRACT-The urban growth and transportation development is the major element of the development of any town/city or nation. For better transportation system, better traffic facilities are considered as a prime objective in traffic system by reduction in conjunction and accident. The Moodbidri town, which is developing city but there is no proper parking facilities and traffic congestions were observed during peak hour. In the present study, the parking survey was done to know about the traffic behavior in the town and design of parking facilities were carried out. Also, the major traffic congestion observed near Hanuman Temple junction were national highway crossing city road. Traffic congestion in Moodbidri city roads leads to delay of our time and works. All these heavy traffic in these days is due to the known fact that, number of vehicles are increasing exponentially in Moodbidri town. In our study, the traffic survey was done and peak and nonpeak hour traffic were calculated. The traffic signal was designed at Hanuman Temple junction.

Key Words: Traffic signal, parking design, Passenger car unit, traffic volume count

1. INTRODUCTION

Rapid industrialization, development of technologies, increasing population and the resulting urbanization has conveyed about an unprecedented revolution in the increase of motorized and non-motorized vehicles all over the world. Nowadays, these factors are not only governed in big cities, it is also a big challenge for mid-sized city or small city.

Traffic analysis is basically the process of intercepting and examining the number of vehicles moving on the road and inferring the pattern of traffic movement. A Traffic survey on the city area of moodbidri has been performed out which comprises calculation of current traffic density and contrast with preceding year data, average velocity of traffic, accident analysis, etc. Traffic volume studies are conducted to determine the number, movements, and classifications of roadway vehicles at a given location. A Traffic survey on the city area of Moodbidri has been performed out which comprises calculation of current traffic density and contrast with preceding year data, average velocity of traffic, accident

analysis, etc. Traffic studies that are usually carried out can be grouped as under:

1. Accident study.
2. Parking study.
3. Speed study.
- Traffic volume study.
- In traffic flow characteristics.
- Traffic capacity study.

1.1 OBJECTIVES

Following are the objectives of our project.

- To study the heavily classified traffic volume.
- To estimate the annual average Dailey traffic, peak hour traffic and to calculate design hourly traffic volume.
- To design the traffic signal based on design passenger car unit.
- To design the parking lot based on the parking studies.
- Identify the black spots and improving the geometric features and other features of road.

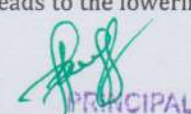
2. METHODOLOGY

The major traffic congestion observed near Hanuman Temple junction were national highway crossing city road. Traffic congestion in Moodbidri city roads leads to delay of our time and works. All these heavy traffic in these days is due to the known fact that, number of vehicles are increasing exponentially in Moodbidri town. So in our study we chose location Near Hanuman Temple Junction.

Present Problems On Parking: Parking is a magnet that attracts traffic. More parking, more traffic jams. Congestion and parking are also interrelated since looking for a parking space (called cruising) creates additional delays and impairs local circulation. In central areas of large cities, cruising may account for more than 10% of the local circulation This leads to the lowering of the road capacity.

2.1 Need for Parking Survey

Parking is one of the serious problems that confront the urban planner and the traffic engineer. Before any

 PRINCIPAL

The Physico – Chemical Analysis of Pond Water at AIET Campus Due to the Overflow of Sewage Water

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Abstract

We have investigated the water quality of the pond located in the AIET campus. The pond which was greenish tan and cloudy appearance, typically contains a large water fowl population and their waste has contributed to decrease the water quality. In an effort increase the water quality we have removed all the floating materials.

We have investigated the status of the pond, we measured pH turbidity, acidity and few more physical properties and we also concentrated on the microbial analysis, during this analysis we have found that the water is not pure and it cannot be used for the domestic purpose. The values obtained for the physical, chemical and microbial analysis are not to standards. We have conducted the experiments during the pre-monsoon and post monsoon seasons and we have come across with an idea of installation of sand filters, Stone pitching and creation of percolation ponds surrounding to the pond.

Keywords: pH turbidity, acidity, microbial analysis

Introduction

In recent years, the growth of industry, technology, population, and water use has increased the stress upon both our land and water resources¹. Locally, the quality of ground water has been degraded. Municipal and industrial wastes and chemical fertilizers, herbicides, and pesticides not properly contained have entered the soil, infiltrated some aquifers, and degraded the ground-water quality². Other pollution problems include sewer leakage, faulty septic-tank operation, and landfill leachates³. Water is one of the most important and abundant compounds of the ecosystem. All living organisms on the earth need water for their survival and growth. As of now only earth is the planet having about 70 % of water. But due to increased human population, industrialization, use of fertilizers in the agriculture and man-made activity it is highly polluted with different harmful contaminants. Therefore it is necessary that the quality of drinking water should be checked at regular time interval, because due to use of contaminated drinking water, human population suffers from varied of water borne diseases. It is difficult to understand the biological phenomenon fully because the chemistry of water reveals much about the metabolism of the ecosystem and explain the general hydro - biological relationship.

The availability of good quality water is an indispensable feature for preventing diseases and improving quality of life. Natural water contains different types of impurities are introduced in to aquatic system by different ways such as weathering of rocks and leaching of soils, dissolution of aerosol particles from the atmosphere and from several human activities, including mining, processing and the use of metal based materials. The increased use of metal-based fertilizer in agricultural revolution of the government could result in continued rise in concentration of metal pollutions in fresh water reservoir due to the water run-off. Also, faecal pollution of drinking water causes water born disease which has led to the death of millions of people.

People on globe are under tremendous threat due to undesired changes in the physical, chemical and biological characteristics of air, water and soil. These are related to animal and plants and finally affecting on it (Misra and Dinesh 1991). Industrial development (Either new or existing industry expansion) results in the generation of industrial effluents, and if untreated results in water, sediment and soil pollution.

Scope and objectives for the study:

The quality of water in the AIET pond in Mijer t is to be studied due to the continuous overflow of sewage in to the pond with out any treatment. Due to the percolation, the pond water seep in to nearby water sources like bore well and well are completely polluted. Hence the study of ground water quality around the pond is polluted.

EXPERIMENTAL STUDY ON COMPRESION AND TENSILE STRENGTH OF LIGHT WEIGHT CONCRETE USING PERLITE

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Abstract: Structural Lightweight Concrete is generally made by using artificial lightweight aggregates such as expanded clay, shale and slate. However, rapidly increasing fuel prices in recent decades and corresponding increase in the production costs of these aggregates have renewed the interest in natural lightweight aggregates such as pumice, scoria, rhyolite and perlite. This study investigates the mechanical properties and durability characteristics of lightweight concretes utilizing natural perlite aggregate in comparison to those of normal weight concrete of similar specific strength (structural efficiency). For this purpose, four concrete mixtures have been designed namely M1 (normal weight concrete with river sand as fine aggregate), M2 (normal weight concrete with M-sand or Robo sand as fine aggregate), M3 (normal weight concrete with partial replacement of cement by GGBS) and M4 (Perlite concrete by partially replacing of Perlite with sand as a percentage of 5%, 10% and 15%). For structural application of lightweight concrete, the density is more important than the strength. A low density for the same strength level reduces the self-weight, foundation size and construction costs. An extensive testing program was conducted on concrete specimens to determine fresh properties such as unit weight and setting time; hardened properties such as compressive strength, split tensile strength. The results have shown that natural perlite aggregate and perlite powder can be satisfactorily utilized in the production of lightweight concrete with 28-day compressive strengths up to 50 MPa.

Key words: Perlite aggregate, Compressive strength, Split tensile strength

1. INTRODUCTION

Perlite powder is used as loose fill insulation in buildings construction, as it enhances fire levels and reduces noise transmission to buildings. There are many advantages interest in the use of lightweight fine materials, because of their association with cement paste and the compatibility among aggregates and cement paste seems not require to be carried into consideration for the design of the mix. As

composite materials, this character of concrete will head to a further homogeneous and cohesive material with a lesser of micro-cracks. In the mix design, the cement can be somewhat displaced by the natural pozzolan substances. All those materials and properties affect the properties of fresh and hardened concrete.

Fine aggregate is essential component of concrete and cement mortar. So, need for clean sand in the construction from the point of view of durability of structures. As the demand for Natural River sand is surpassing the availability, has resulted in fast depletion of natural sand sources. Robo sand is the answer for this problem especially when some states have already banned the use of river sand for construction. As per reports, Robo sand is widely used all around the world and technicians of major projects around the world insist on the compulsory use of Robo sand because of its consistent gradation and zero impurity.

2.. Objectives and Scope

There are several objectives of this thesis.

- Structural lightweight concrete has low density compared to that of normal concrete. For structural application of lightweight concrete density is more important than its strength. A low density for the same strength level reduces the self weight and the construction cost. In the present study we will be comparing the strength of lightweight concrete with that of normal concrete by using Cement, GGBFS, Sand with normal and perlite aggregates. In this case we are partially replacing the aggregate with Perlite aggregate to make the structure more lighter with varying percentage. The investigations are carried out using various tests which include compressive test and split tensile test.



COMPARATIVE STUDY ON QUALITY OF BACTERIAL CONCRETE WITH NORMAL CONCRETE

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Abstract — In recent years, there is increasing interest in the phenomenon of mechanical property recovery in concrete construction using self-healing concrete. The study was motivated by the need to find a solution for the problem of cracking approaching the concept of self-healing concrete. The study was carried out on a bacteria based self-healing concrete using *Bacillus Subtilis* bacteria. An investigation on the strength assessment of the bacteria-based self-healing concrete by finding out the optimum amount of bacterial content to be added to obtain maximum strength. 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 favorable bacteria in concrete improved the overall behavior of concrete. It is expected that further development of this techniques will result in a more durable, sustainable and crack free concrete that can be used effectively for constructions in wet atmospheres where corrosion of reinforcement affects the durability, permeability and strength of concrete. Therefore, it is decided to carry out an investigation of 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 these various samples are tested under various laboratory methods. Slump cone test, compressive strength testing, ultrasonic pulse velocity test, and scanning electron microscopes thereby an optimum dosage required is computed. Bacterial concrete is found to be superior as compare to that of conventional concrete in all the aspects of durability. 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.

Keywords: *Bacillus Subtilis*¹, Mechanical Strength², UPV³, SEM⁴.

I. INTRODUCTION

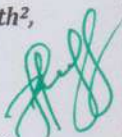
Concrete is a major material used in the construction field, from the foundation of buildings to the structures of bridges and dams. Several construction techniques

without incorporating concrete have been developed but concrete still continues to be the most important building material for infrastructure. The major shortcoming of concrete is that it tends to crack when subjected to tension. Tiny cracks formed on the surface of the concrete make the whole structure vulnerable due to seepage of water into the concrete, promoting corrosion of the steel reinforcement, thus reducing the life span of the structure.

Self-healing concrete is a solution to this problem of durability of concrete structures and has also received increasing attention as a smart material with interesting potential applications in civil infrastructure. Self-healing materials used in such type of concrete have the ability to heal the damage inflicted on the concrete partially or completely, there by restoring the original functionality of the structure. Self-healing system can achieve a tremendous cost reduction in terms of health monitoring, damage detection and maintenance of concrete structures, assuring a safe service life of the structure.

Self-healing concrete is a product which biologically produces limestone by which cracks on the surface of concrete surface heal. Selected types of the bacteria genus *Bacillus*, along with calcium-based nutrient known as calcium lactate. The self-healing agents can lie dormant within the concrete for up to two hundred years. When a concrete structure damages and water starts to penetrate in the cracks present in it the bacteria starts to feed on the calcium lactate consuming oxygen and converts the soluble calcium lactate into insoluble limestone. Hence the durability of steel in construction becomes higher.

Bacterial concrete refers to a new generation concrete in which selective cementation by microbiologically induced CaCO₃ precipitation has been introduced for remediation of micro-cracks. A technique was proposed in remediating cracks and fissures in concrete by microbiologically inducing calcite precipitation. Microbes like *Bacillus*, can induce the precipitates of calcite. It can increase the durability performance of



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COMPARATIVE STUDY ON SCC WITH PARTICLE PACKING DENSITY AND EFNARC DESIGN

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Abstract:- Self-compacting concrete (SCC) is an innovative concrete that does not require vibration for placing and compaction. The hardened concrete is dense, homogeneous and has the same engineering properties and durability as traditional vibrated concrete. The self-compacting concrete flows easily at suitable speed into formwork without blocking through the reinforcement without being heavily vibrated. This project deals with the self-compacting concrete where the cement is partially replaced with fly-ash. Here Ordinary Portland Cement is replaced with 20% of fly-ash. The mix design particle packing density is used to determine the proportion of concrete ingredient and comparing with the EFNARC 2005 guideline. This work summarizes the experiments for evaluating the performance of self-compacting concrete including V-funnel, L-box, J-ring and slump flow tests as well as the recent achievements of the fresh and hardened properties of self-compacting concrete such as slump flow, segregation resistance is studied for the different water cement ratio and compressive strength and tensile strength for corresponding mix determined.

Keywords: Self Compacting Concrete, flow ability, passing ability, resistance to segregation, fly ash, Super plasticizer.

1. INTRODUCTION

Self-compacting concrete (SCC) is an innovative concrete that does not require vibration for placing and compaction. The hardened concrete is dense, homogeneous and has the same engineering properties and durability as traditional vibrated concrete.

Self-compacting concrete (SCC) was first developed in Japan in the late 1980's as a concrete that can flow through congested reinforcing bars with elimination of compaction, and without undergoing any significant segregation and bleeding. In recent times, this concrete has gained wide use in many countries for different applications and structural configurations. Adoption of SCC offers substantial benefits in enhancing construction productivity, reducing overall cost, and improving work environment. Therefore, the first point to be considered when designing SCC is to restrict the volume of the coarse aggregate. This reduction necessitates the use of higher volume of cement which increases the cost, besides resulting in undesirable temperature rise. So, cement should be replaced by other mineral admixtures like Blast Furnace Slag, Fly Ash, Silica Fumes, etc. The usage of mineral admixtures in the production of SCC not only provides economic benefits but also reduces heat of hydration. A very limited work is reported from India, non-mechanization of the construction industry, abundant

availability of construction materials available at very low cost. There for it can be said that SCC is still quite unknown to many researchers, builders, ready mix concrete production, academia etc. There are non-coda references for the mix design of high-grade Concrete. Mix designs for high grade concrete can be done by particle packing density Method. This is a new concept of mix design.

The packing density is the ratio of volume of solids to the total bulk volume. The Particle Packing gives indirect measurement of geometry of the concrete mix and also gives the cement paste to be required to fill the Void content in the concrete. To achieve the optimized particle packing density, particle is selected in such a way that small size particles fill up the Voids between the larger particles and so on. The Voids between the aggregate particles are filled by the cement paste and the excess of the paste will be a solid coating around each aggregate present in the mix. For the optimized packing density of aggregate small amount of paste content is required to fill the Voids.

2. MATERIALS USED

2.1 Cement

The OPC 43 grade which is used in the study conforming to IS12269:1987.

GEOTECHNICAL INVESTIGATION OF LANDSLIDE OCCURRED IN CHARMADI GHAT: A CASE STUDY

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ABSTRACT

For centuries human has tried to control the nature for their advantages and to some extent, they have achieved in harnessing the Mother Nature. During the ancient times, human had a little knowledge about the nature and its functioning, but as the time elapsed more innovative technologies developed, population rate increased and the land become scarce, as a result human become greedy for their own needs, a lot of disasters other than natural calamities began to strike – the manmade disasters [3]. The project mainly aims at studying the geotechnical aspects of a landslide occurred in Charmadi Ghat, Dakshina Kannada district, Karnataka. The study includes the primary investigations of the site, collection of soil samples, testing of samples, and analysis of test results with scientific theories, mapping of the study area and finally proposing the remedial measures to mitigate landslide effects.

Keywords-Landslide, Arc-GIS

I. INTRODUCTION

A. General

Landslide refers to several forms of mass wasting that include a wide range of ground movements, such as rock falls, deep-seated slope failures, mudflows and debris flows. Landslides can occur underwater, in which case they are called submarine landslides, and in coastal and onshore environments. Although the action of gravity is the primary driving force for a landslide to occur, there are other contributing factors affecting slope stability. Typically, pre-conditional factors build up specific surface or sub-surface conditions that make a slope prone to failure, whereas the actual landslide often requires a trigger before being released.

A massive landslide had occurred at Charmadi ghat 81km from Mangalore city in the Western ghat on June 12th 2018. Landslide had occurred due to heavy rain, has severely affected free flow of traffic on the ghat highway that connect Mangalore – Bangalore route (NH-234). As many as 210 vehicles mostly large vehicle, buses and four wheelers and 1500 people were stranded due to landslide and retaining wall constructed near drain in Sakleshpur was collapsed. Since June 12th nine landslides occurred in different places in Charmadi ghat

This thesis work involves the investigation of the geotechnical properties of the soil collected from a landslide prone area in Charmadi ghat. The collected soils were taken to the geotechnical laboratory and the properties are analysed by conducting corresponding experiments as per Indian Standards. Due to the increase of water content the stress increase and the strength decreases leading to landslide causing extensive damages. The susceptibility of slope to failure is dependent on many factors like slope, geotechnical property, cohesion and presence of discontinuity.

B. Mapping Of The Area

Advancements in computer knowledge, modeling, Remote Sensing (RS) and Geographical Information Systems (GIS) have particularly been handy to detect landslide zone. Through modeling coupled with RS and GIS use, landslides can be predicted and the landslide vulnerable as well as landslide zone areas can be mapped out. This information is not only important to the policy makers but also to the public especially in the affected areas, in terms of providing early warnings, evacuation exercises and general preparedness.

Generally, disaster management involves four stages of prediction, preparation, prevention and mitigation and damage assessment. RS and GIS techniques have been reported to be handy in all these stages. With the landslide problem

Black Spot Determination For NH-169 Between Mijar And Mangalore

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Abstract- Accidental studies is a term used in Road safety management to determine rate of traffic, amount of traffic, and also previous accidental data collection and calculation. The present work intended in Accidental studies between Mijar and Mangalore by collecting past four years data from commissioner office mangalore. The past four year data regarding accidents occurred between mijar and mangalore is analysed to find the major cause for accidents by through study of FIR copies and the data are collected depending upon that locations. The keen observation of trend in accident growth rate from past to future using curve fitting technique. The curve fitting technique is used to monitor the growth rate of accidents. The traffic details are collected by conducting traffic detail survey between mijar and mangalore NH road. The traffic volume and traffic density area studied to analyse the reasons for accident severity at prone areas due to heavy traffic movements. The present project work deals with determination of black spot and analysis of various accidental data and prioritizing the causes for the occurrence of accidents between mijar and mangalore. And mitigating measures are proposed to reduce and resolve number of accidents between mijar and mangalore.

Keywords- Accidental Data, Black Spots, Traffic Volume Count, Visual Survey, Remedial Measures.

I. INTRODUCTION

Transport is responsible for the development of civilizations from ancient times by meeting people's travel requirements and goods transportation requirements. National highways form the country's economic backbone and have frequently facilitated development along their routes.

1.1 BLACK SPOT

There is no universal definition of accident locations on roads, commonly termed Black spots, which means that the definition of Black spot is open to much speculation. The traditional definition considered that the Black spot as a place where a high number of accidents are found or the locations where the accidents are occurring more frequently had to be

identified and were marked as the Black spots. It may have occurred for a variety of reasons, such as a sharp drop or corner in a straight road, so oncoming traffic is concealed, a hidden junction on a fast road, poor or concealed warning signs at cross-roads.

According to The Bureau of Transport and Regional Economics of Australia (2001) locations are in general classified as black spots after an assessment of the level of risk and the likelihood of a crash occurring at each location. At certain sites, the level of risk will be higher than the general level of risk in surrounding areas. Crashes will tend to be concentrated at these relatively high-risk locations. Locations that have an abnormally high number of crashes are described as crash concentrated, high hazard, hazardous, black spot sites. Sites with potentially hazardous features are sometimes described as grey spots. In general, the number of crashes is affected by four factors i.e. the road condition, condition of vehicles, skills, concentration and physical state of road users and environmental condition are also causes for the road accidents.

II. IDENTIFICATION OF BLACK SPOTS

Accident data for Mijar to Mangalore is obtained from Mangalore city Commissioner Office and chart prepared for the same is shown in Chart-1. Black spot locations are identified based on the accident data collected from Commissioner Office and general interviewing with local people. From the accident data it was found that the road stretch between Mijar to Mangalore is an accident prone area as it contains a many blackspots.

The data was incorporated into MS excel and the trends of accident growth are obtained from the same which revealed the importance of accident study in the identified black spots. Also forecasting of the collected data was done in order to know the future predictions.

The following tables show the accident scenario of Mangalore city. total no. of accidents in the year 2016 is 51 while in 2018 it has been increased to 66 which is increasing



PRINCIPAL

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UTILIZATION OF COIR FIBRE AS A COMPONENT MATERIAL IN MANGALORE TILES

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ABSTRACT

This study was conducted to utilize coco coir fiber as a component material in Mangalore tiles. As technology innovation, the Breaking load tests of the Mangalore tiles was conducted to determine the fracture or to cause the sample to fail of using a Breaking load Testing machine. Coco coir fibers were air-dried and shredded, segregated and cut into a maximum length of 15 millimeters to prevent these from bending during the mixing process. Statistical results showed that the use of coco coir fiber as a component material significantly affected the tensile strength of Mangalore tiles. Brown coir and white coir should be mixed with clay by selecting a different proportion. Then tiles are made with machine. These tiles were dried and burnt for 20 days. Then breaking load test and water absorption test must be done. As a result, white coir reinforced tile gives more strength and it is more durable when compared with brown coir reinforced tile.

Keywords-: Coconut Fibers, Water Absorption, Breaking Load, Permeability test.

I. INTRODUCTION

General

In almost all developing countries, there is a great shortage of roofing material. Local materials are often used, like soil, stone, grass and palm leaves. These roofs require a lot of maintenance and are not always resistant to heavy rain. Materials like Corrugated Iron Sheets (CIS) and asbestos cement sheets have replaced traditional material. Roofing materials tend to be the biggest expense for individual home builders.

Asbestos cement sheets should not even be considered, because of the health Hazard associated with making them. Ceramic tile roofs are good. However, if the Kiln does not allow adequate temperature control during firing, the quality of the finished tiles can be very much uneven. Concrete tiles have partially replaced ceramic tiles for purely economic reasons but what limits the use of concrete tiles is their weight on the roof, which requires a strong load bearing structure.

Coir fibre is one of the natural fibres abundantly available in tropical regions, and is extracted from the husk of coconut fruit. Coir is stiff coarse fibre and is being found between the husk and the outer shell of a coconut. It is a fibre abundantly Available in India the second highest in the world after Philippines. The individual fibre cells are narrow and hollow, with thick wall made of cellulose. There are two Varieties of coir; (i) Brown coir-extracted from a varieties ripe coconut which contains more lignin and less cellulose and are stronger but less flexible.

(ii) White coir- The immature husks are suspended in a river or water-filled pit for up to ten months. During this time micro-organisms break down the plant tissues surrounding the fibres to loosen them – a process known as retting. Segments of the husk are then beaten by hand to separate out the long fibres, which are subsequently dried and cleaned. This fibres are extracted from coconut before they are ripe, which are white or light brown in Colour and are smoother and finer. There are many general Advantages of coconut fibres e.g. they are moth-proof, resistant to fungi and rot, Provide excellent insulation against temperature and sound, not easily combustible, flame-retardant, unaffected by moisture and dampness, tough and durable, resilient, springs back to shape even after constant use, totally static free and easy to clean.

