CERTIFICATE

Certified that this project report on

"FIBRE REINFORCED ASPHALT CONCRETE ROADS-A SOLUTION FOR SMART ROADS."

is the bonafide work of

SWAPNIL HOLE	**111301023**
HARISH DESHMUKH	**111301015**
RAVI HIRURKAR	**111301022**
MANISH BAGUL	**111301008**

who carried out the project work under my supervision.

DR. S. S.BHOSALE
HEAD OF DEPARTMENT
Civil Engineering Department,
College of Engineering Pune.

DR. I. P. SONAR
PROJECT GUIDE
Associate Professor
College of Engineering Pune

Date: 17th May, 2017

Place: **PUNE**

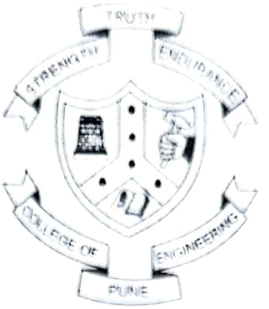
ABSTRACT

Generally in India most of the highways and roads are made of flexible pavements which may be of dense Hot Mix Asphalt(HMA) or Porous Asphalt concrete. After the construction the wearing surface, it is continuously subjected to variable traffic loads and different weathering condition which may lead to cause failure of the surface. If we study both type of pavement we found some critical problems such as Ravelling and rutting of surface. Ravelling which starts from small microcracks which extends to macrocracks and raveling takes place. Ravelling leads to formation of potholes which reduces life of roads

Now a days some of scientist explained the use of some additive fibres to improve the strength properties of asphalt concrete. Already scientist used polypropylene fibres, glass fibres, aeradic fibres to improve the strength so cracks formation will be prevented. With the reference of above research here we want to imply a new concept of induction heating over asphalt concrete so that formed cracks get healed itself. As very few literature is available on induction heating so we decide to take this project. Already we have participated with this idea in "SPARKLE'15" All India project booth competition and our work was well appreciated there, so we took this work as a solution for smart roads where roads will get healed itself.

Main requirement of induction heating was to introduce some conducting fibres in asphalt concrete layer. Initially we take some trials with adding steel fibre (Lathe Machine Waste) to porous asphalt concrete sample. This has increased the compressive strength and shear strength of pavement but it showed some adverse effects also. So we decided to use steel wire mesh as reinforcement in case of dense asphalt concrete roads. This reinforcement will increases the strength of sample and will act as conducting fibre while induction heating so cracks get healed itself. As induction heating can be done many times and crack formation is prevented so fibre reinforced asphalt roads will be a solution for smart roads.

CERTIFICATE



This is to certify that the report entitled

"Analysis and Constructional Aspects of Trenchless Technology"

Submitted by

Akshay A Deshmukh	**111301014**
Panjab J Kawade	**111301035**
Nilesh S Lunawat	**111301041**
Rohit R Nadre	**111301046**

in the partial fulfilment of the requirement for the award of degree of Bachelor of Technology (Civil Engineering) of College of Engineering Pune, affiliated to the Savitribai Phule Pune University, is a record of their own work.

Dr. M. S. Ranadive
Associate Professor & Project Guide,
Civil Engg. Department,
College of Engineering, Pune

Dr. S.S. Bhosale
Head of Department,
Civil Engg. Department
College of Engineering, Pune

Date: / /

Place: Pune

1. INTRODUCTION

a. Trenchless methods offer several potential advantages. They can reduce noise, dust, construction vibration, and other environmental impacts. Trenchless methods have minimal impact on economic activity in congested areas. Traffic is not interrupted, and other utilities are minimally affected. Trenchless technologies are also generally safer both for the construction workers and the general public. b. In general, trenchless technologies offer the following advantages (Koerner 1996) Excavation is not necessary between access points. Sometimes existing manholes can provide sufficient access.

1. Usually the limited amount of "construction activity" is concentrated at the access sites, rather than along the entire length of the pipeline.

2. Work can proceed around the clock because trenchless methods are generally quiet and no disruptive.

3. Rehabilitated systems can outperform original pipes in terms of strength and flow capacity.

DEPARTMENT OF CIVIL ENGINEERING, COLLEGE OF ENGINEERING, PUNE

CERTIFICATE

Certified that this project, titled "Analysis and Design for Projectile Launching System" has been successfully completed by

Amruta Jadhav 141401006 Manisha Patil 141401008

Twinkal Medhe 141401007 Poonam Rathod 141401009

Archana Wagh 141401013

And is approved for the partial fulfilment of the requirements for the degree of "B.tech of Civil Engineering"

Prof. M. S. Ranadive
Project Guide
Department Of Civil Engineering, COEP

Prof. S. S. Bhosale
Head of Department of Civil Engineering
Department Of Civil Engineering, COEP

ABSTRACT:

The Launching of missiles has a key role in the Military section during war times. We all know that the rockets and missiles follow the projectile path. Thus our project **Analysis and Design of Projectile Launching System (PLF)** deals with supporting track and platform which is used for launching. We have also studied the method of **Analysis and Design of RCC pedestal with dual rail track** for impact loads, the feasibility and stability of supporting track. We analysed the section by varying grades of concrete, considering effect of gravity, varying percentage of steel and velocity. Further we have given the conclusion that how the variation in the above parameters affects the properties of the RCC pedestal such as normal elastic strain, normal stress, shear stress, total deformation, strength and stability.

CERTIFICATE

This is to certify that the report entitled 'Removal of binary mixtures of dye from waste water' submitted by Sarah Jacob (111301061) and Tejaswini Purecha (111301068), in the partial fulfillment of the requirement for the award of degree of Bachelor of Technology (Civil Engineering) of College of Engineering Pune, affiliated to the Savitribai Phule Pune University, is a record of their own work.

Dr. M. U. Khobragade
Guide
Department of Civil Engineering,
College of Engineering Pune

Dr. Sukhanand S. Bhosale
Professor & Head
Department of Civil Engineering
College of Engineering, Pune
(An Autonomous Institute of Govt. of Maharashtra)
Shivajinagar, Pune - 411 005

Dr. S. S. Bhosale
Head of the Department
Department of Civil Engineering,
College of Engineering Pune

Date: 23/5/2017
Place: PUNE

ABSTRACT

There are a number of industries that release effluents that contain considerable amount of dyes in them. Due to their color and chemical properties these dyes are not safe to be released into any natural source of water bodies.

This is why the treatment of such dyes from the waste water becomes important.

In this project we focus on the treatment of mixture two different dyes by using the method of adsorption so that it is safe to be released into any water body.

CERTIFICATE

This to certify that the report entitled

"Hydrological Modeling of Khadakwasla Catchment"

Submitted by

1. Snehal Gaikwad (MIS-111301018)
2. Snehal More (MIS-111301045)
3. Shwetha Sahadevan (MIS-111301065)
4. Asrar Ahmed (MIS-111301076)

In the partial fulfillment of the requirement for the award of degree of Bachelor of Technology (Civil Engineering) of College of Engineering Pune, affiliated to Savitribai Phule Pune University, is a record of their own work

Prof. Piyusha S.Hirpurkar
Project Guide
Assistant Professor
Civil Engineering Department
College of Engineering, Pune

Dr. S.S. Bhosale
Head of Department
Civil Engineering Department
College of Engineering, Pune

ABSTRACT

India is a monsoon based country and hence has a large number of reservoirs and systems. The rainfall occurring and its corresponding runoff obtained needs to be formulated accurately in order to maintain a good management of water and sediment for different purposes in a country like India, where agriculture is the main source of income.

In this study, Khadakwasla catchment, situated in Pune, Maharashtra has been taken for our study. Different software tools have been used in order to support the study. The monsoon period of 1st June to 15th October is taken into consideration. Khadakwasla reservoir system basically consists of 4 dams, namely Panshet, Warasgaon and Temghar arranged in parallel which inturn is in series with Khadakwasla, i.e. the water from the above parallel dams contribute to the reservoir of Khadakwasla dam.

In this study, for calibration and validation, SCS Curve Number Method is used, along with the help of SWAT Model and ArcGIS. Calibration is done for a period of 25 years and the validation is done for a period of 5 years and the efficiency is checked accordingly.

CERTIFICATE

This is to certify that the project report entitled

Fibro-structure: Eco-friendly Roofing, Cladding and Panels

Is a bonafide record of the work done by

1. Shejule Priya Ashok	(MIS. 111301062)
2. Kulkarni Sneha Santosh	(MIS. 111301074)
3. Pardeshi Diksha Nandlal	(MIS. 141401003)
4.Ghushe Vaibhav Rajeshwar	(MIS. 141401005)

under our supervision, in partial fulfillment of the requirements for the award of Degree of Bachelor of Technology in Civil Engineering from College Of Engineering Pune for the year 2016-2017

Prof. Dr. P. M. Raval
Guide
Department of Civil Engineering
College of Engineering, Pune

23/05/17

Dr. S. S. Bhosale
Head of Department
Department of Civil Engineering
College of Engineering, Pune

Date: 23/05/2017
Place: College of Engineering, Pune

ABSTRACT

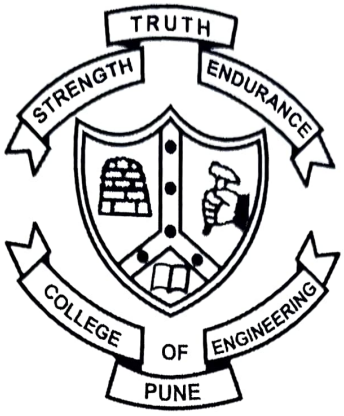
Abstract

The work primly focuses on transforming waste materials into usable materials and replaces the asbestos fibres by natural fibres with the modified matrix system. The study has been carried out in view of highlighting advantages of natural fibers over synthetic fibers and asbestos fibres. In this, cement mortar is used as a matrix and Banana fibres are used as a reinforcing material. Testing on specimen is done as per IS 5913:2003. The properties of the composite material have been studied with the help of various ratios of weight percentage of matrix to fibers. The strength of composite is observed with the variation of fiber length. It is observed that corrugated cement roofing sheet reinforced with banana fibres gives the best properties, cost efficiency and use of banana fibres as a replacement to asbestos fibres which help to achieve the objectives of the paper and to gain advantages over AC sheets.

It also focuses on design of wall panels as per IS 14862: 2000 and it satisfies the requirements given in the codes.

The research focuses on the design of Taylor roof tile which is the category of Manglore tiles and can be used for a decorative component in pitched as well as sloping roofs and satisfies the IS 653 code.

CERTIFICATE



This is to certify that the report entitled, 'Improvements in Design of Passively Aerated Rapid Composting Unit' submitted by Dhage Rishabh (111301016), Gavankar Yash (111301020), Agarwal Charu (111301013) and Khare Vaishnavi (111301038) in the partial fulfilment of the requirement for the award of the degree of Bachelor of Technology (Civil Engineering) of College of Engineering Pune, affiliated to the Savitribai Phule Pune University, is a record of our own work.

Thanedar

Prof. R P Thanedar
Guide
Engineering
Department of Civil Engineering
Pune
College of Engineering Pune

Head of the Department
Department of Civil

College of Engineering

Date: May 17, 2016
Place: COEP, Pune

ABSTRACT

Composting is a process in which aerobic and anaerobic microorganisms bring about decomposition of organic matter under controlled conditions. Rapid composting differs with ordinary composting owing to the reduced composting time; from 2-4 months to an appreciable 3-4 weeks. Rapid composting would be achieved through the use of these means (or a combination of these) – shredding, use of Effective Micro-organisms (EMs), forced aeration, passive aeration, and frequent turning of waste.

In extension to the project done by the group 1, we aim to overcome the shortcomings of the existing design and procedure. The previous objective was designing a low-cost, passively aerated composting unit which can be said to have only partly met. The limitations of the project were related to design aspects, testing and validity of the results, versatility, unloading of the unit, monitoring, operational use and marketability. These shortcomings would be overcome in the current project by group 2. The project aims at imparting changes in the previously designed compost unit for garden biomass (GB) to achieve a compost having C/N ratio of 15-20 in minimum 21 days. Based on the tests conducted on the garden biomass, this project aims to bring changes in the microbial culture. It also targets to scrupulously execute the monitoring of various factors - temperature, moisture content and oxygen. It intends to follow the procedure of sample collection, preparation, preservation and testing diligently for validation of results.

A Steel box unit is fabricated using standard steel angle sections and steel wire mesh. This composting unit was installed on the COEP south campus to perform full-scale field study of the composting process. The dry leaves (carbon-rich content) from the COEP campus collected near the fountain on the South campus were mixed with green leaves and grass (nitrogen-rich) in a volume ratio of 3:1. This mix was applied with Jaggery solution and kept overnight. The next day a microbial culture recipe solution prepared specifically for GB was applied to the waste mix and the unit was loaded in layers while simultaneously sprinkling water to each layer. The waste was allowed to compost and major process variables like temperature and moisture and compost stability parameters were monitored and determined. The test results of 21-day compost on parameters like C/N (14.71), Nitrogen content (1.02) among other others, show conformity to the requirements of MSWC (Municipal Solid Waste Compost) outlined by BIS. The material selection, design iteration cycles and resulting benefits of the current design gauged on specific parameters like embodied energy, increased oxygen supply per unit volume, energy reduction, etc. have been detailed in the report.

CERTIFICATE

This is to certify that the project report entitled

Increasing Shear strength parameters of soil using geotextile as a soil reinforcement

Is a bonafide record of the work done by

1. Patil Tejas Ravindra (111301052)
2. Pisal Suraj Shivaji (111301054)
3. Dhamankar Abhishek Mahendra (141401002)

under our supervision, in partial fulfilment of the requirements for the award of Degree of Bachelor of Technology in Civil Engineering from College Of Engineering Pune for the year 2016-2017.

Prof. Dr. Mrs. R. S. Dalvi
Guide
Department of Civil Engineering
College of Engineering, Pune

Dr. S. S. Bhosale
Professor & Head of Department
Department of Civil Engineering
College of Engineering, Pune

Date: 22/05/17

Place: College of Engineering, Pune

ABSTRACT

The main objective of this study is to investigate the use of geotextile materials in geotechnical applications and to evaluate the effects of various types of geotextile as a soil reinforcement on shear strength of soil by carrying out direct shear tests on two different soil samples. The results obtained are compared for the two samples and inferences are drawn towards the usability and effectiveness of geotextile as a replacement for deep foundation or raft foundation, road construction as a cost effective approach.

CERTIFICATE

Certified that this project report on

"Comparison of the Engineering Geological factors causing Landslides in Basaltic and Lateritic Terrains."

is the bonafide work of

PURVA ANANTRAO JOSHI	**111301030**
POONAM DILIP KAWADE	**111301036**
PALLAVI JEEVAN RUPNAVAR	**111301058**

who carried out the project work under my supervision.

SSBhosale 20/01/17

DR.S.S.BHOSALE

HEAD OF DEPARTMENT

Civil Engineering Department,

College of Engineering Pune.

DR.S.A.MESHRAM

PROJECT GUIDE

Associate Professor of Geology

College of Engineering Pune

Date: 15th May, 2017

Place: **PUNE**

ABSTRACT

Landslide is a sudden downward movement of rock or soil mass movements on slopes with or without true sliding. When a landslide occurs in an active communication network like Highway, Railways, etc., the results will be catastrophic. This sudden movement of slope forming material causes extensive damage to life and property. The common types of failures are boulder falls, slides and slump etc., which damages the structure.

During the monsoon period, landslides are a common in the in study area and its intensity depends upon the thickness of the loose unconsolidated soil formed by the process of weathering. Debris landslides with a combination of varied mineral composition in basalts and laterites, in association with local soil, indicate the role of weathering, triggering the landslide activity. Rainfall is the dominant parameter influencing the chemical weathering process. In addition, deforestation, land use practices and soil erosion are some of the other important factors accelerating the weathering process and landslide occurrences in the region.

Rockfall is a major problem in high hill slopes and rocky mountainous regions and construction of highways at these rockfall prone areas often require stable slopes. The vertical to sub-vertical cut slopes are prone to instability due to unfavorable orientation of discontinuities in slope face of weathered and altered basaltic rockmass. The predominant type of instability has been found as wedge type failure involving medium to large size blocks.

Mumbai-Pune expressway which experiences frequent slope failure due to high intensity rain and complex geological conditions. The area is very susceptible to weathering, different degrees of alteration, formation of soils and occurrences of bole beds in between two consecutive basaltic flows. Soil formation process in this area is one of the most influencing factors for slope failure. These transformed soils create instability on the slopes and ultimately converge to slope failures in addition to this, the presence of discontinuities, heavy rainfall, and unplanned slope geometry, joint etc. also play a pivotal role in instability.

Mumbai-Pune, India's first expressway, which crosses the mountainous and rugged Deccan Trap Province, suffered from a large amount of rockfall and major landslides in 2003 and

2004. A significant number of accidents and fatalities have occurred on the expressway as a result of such events. On the basis of frequency and magnitude of the recorded incidences of rockfall, seventeen critical areas of the road have been deemed in need of investigations and mitigation.

Inland laterisation in Deccan trap regions of some parts of Maharashtra state is not been attended and studied in details. Laterisation of the present study area belongs to the same. The Laterites of Bhilar and surrounding area occur as primary Laterites i.e. directly resting on the parent rocks - Deccan traps with in situ alterations, under favorable conditions occurred in the past.

Geologically in this region rocks are weathered near the surface due to highly oxidizing and humid climatic conditions, developing lithomarge clays and lateritic soil regolith. Loose cohesive soil matrix becomes soft and loses strength due to surface and subsurface flows during heavy precipitation. Regolithic mass of overburden became heavy, lost support / interlocking and slumped along the hill slope. This region lies in zone III as per map of seismic zones for our country. Therefore minute seismic event may act as triggering factor leading to slope instability.

The exposed soils of hills in this area got laterised through surface erosion, fine clay materials seeping down into the lower horizons leaving honey-combed iron rich, indurated surface laterite, a poor terrain for plant growth. The indurated surface laterite is an effective shield against landslides, except when deep vertical cuts are made exposing the soft clayey soil horizon beneath. The vulnerability of deposited lateritic hills to landslides increases if such deposits have taken place along the river courses causing capillary rise of water from beneath and descend of rain water through fissures and holes formed by rotten tree stumps.

Many times accidents due to landslides were averted by the active warning systems like Inclinometers, Boulder nets but the vulnerability to slope failures still exists. So, it is necessary to implement suitable permanent site-specific control measures for the vulnerable cuttings to avoid any failures in the future.

CERTIFICATE

This Is To Certify That This Project Report On -

"*Integrated Watershed Investigations and Planning of Water Conservation Structures in Kolwan Watershed of Mulshi Taluka, Pune District, Maharashtra – A Case Study Of Bhalgudi and Lavhalwadi Micro Watersheds*" is the bonafide work of:

1. Snehal Bhagwat (111301010)
2. Navneet Soni (111301048)
3. Snehal Deo (111301066)
4. Santosh Tummewar (111301077)

who carried out the project work under my supervision.

Dr.S.S.BHOSALE

HEAD OF DEPARTMENT

Civil Engineering Department,

College of Engineering, Pune.

Dr.S.A.MESHRAM

PROJECT GUIDE

Associate Professor of Geology

College of Engineering, Pune.

Date: 15 TH May, 2017

Place: Pune

1. INTRODUCTION

Water is a natural resource having the vital importance for sustaining all forms of life. food, health, production, economic development and integrity. This resource is increasingly threatened by over abstraction as well as contamination, which have insidious long term effects. Further the misuse of such resource poses serious consequences to livelyhood and it is impossible to find any substitute for most if its uses. From the total water content on the globe, the largest reservoir is the collection of oceans, accounting for 97% of Earth's water. The next largest quantity (2%) is stored in solid form in the ice caps and glaciers. The ground water constitutes 0.68% lakes- 0.01%, soil mixture-0.005%, atmosphere-0.001%, streams and rivers-0.0001% and biosphere- 0.00004%. Thus, the fresh water resources are extremely limited. Water is a very scarce commodity and unless it is properly managed, it leads to adverse and paradoxical situations such as temporal scarcity in high rainfall areas. Many parts of India experience the acute shortage of water for different purposes and such problems are likely to become more severe and serious and will continue to escalate into 21st century.

National Water Policy has set the water allocation priorities in the planning and operations of systems the priority should be :

- Drinking water
- Irrigation
- Hydropower
- Ecology
- Navigation

India occupies 3.29 million km^2 geographical areas which forms 2.4 % of the world's land area and it has only 1/25th of world's water resources. As per the international norms , if per-capita water availibility is less than 1700m^3 per year then country is catagorized as water stressed and if it is less than 1000 km^3 per capita per year then the country is classified as water scare. In india per capita surface water availibility in the years 1991 and 2001 were 2309 and 1902 m^3 and these are projected to reduce to 1401 and 1191 m^3 by the years 2025 and 2050 respectively. Hence there is urgent need of proper planning , management and development of water resource for raising the living standards of country-men.These water resources are replenished by the rainfall and the long term average annual rainfall for the country is 1160 mm. However , as much as 21% of the area of country receives less than 750mm of rainfall annually while 15% receives rainfall in excess of 1500 mm. The total utilizable water resource of country are assessed as 1086 km^3. This water resource has two phases i.e. surface water and groundwater.

Certificate

This is to certify that the report entitled "**Comparative Study of RCC Bridge using IRC 112: 2011 and IRC 21: 2000**" submitted by Pooja Bulbule, Prasad Patil, Varun Panickar and Aakash Kamthane in the partial fulfillment of the requirement for the award of the degree of Bachelor in Technology (Civil Engineering) of College of Engineering Pune, affiliated to the Savitribai Phule Pune University, is a record of his own work.

(Dr. S. S. Bhosale)

Head of Department

Department of Civil Engineering

College of Engineering Pune

Pune - 411005

(Dr. S. D. Kulkarni)

Guide, Associate Professor

Department of Civil Engineering

College of Engineering Pune

Pune - 411005

Date: 18th May 2017

Place: College of Engineering Pune

Abstract

The project aims for the comparative study of the codal provisions and the design philosophy involved in the design of RCC Bridges as per IRC 112: 2011 and IRC 21 :2000. The comparative study is carried out between the design procedure for various actions on the bridge members specifically Shear and Flexure so as to determine the modifications with reference to IRC 112: 2011 and its advantages over the IRC 21: 2000. The project involves the Analysis and Design of RCC T-beam Bridge. The analysis is done manually using different rational methods like Pigeaud's method for two way slabs and Courbon's methods for reactions on the girders as well as on software using CSI bridge17. The design is carried out using Limit State Method and Working Stress Method. Then the comparison between various parameters involved in both the codes used for the design is represented graphically. Emphasis is put on the variation in amount of steel by both methods. From this it is concluded that, the actions obtained from software analysis are on the higher side than the manual ones and the design based on IRC 112 is more economical and effective since amount of steel required reduces by 25%-30%. The shear design of elements as per IRC 112: 2011 is more rigorous and economical as compared to that of the design as per the IRC 21: 2000.

CERTIFICATE

This is to certify that the report entitled **"Electronic Waste Management & Recycling"**, submitted by Akshay Badgujar (111201004), Nikhil Gode (111201039), Ketan Mahale (111201031), Abhijeet Alte (111201002), under the guidance of Prof. S. Mukhopadhyay, in the partial fulfillment of the requirement for the award of the degree of Bachelor of Technology (Civil Engineering) of College of Engineering Pune, is a record of their own work. The results contained in this report have not been submitted in part or full to any other University or Institute for the award of any degree or diploma.

-

(Prof. S. Mukhopadhyay)
Guide, Professor
Dept. of Civil Engineering
College of Engineering Pune

Dr. Sukhanand S. Bhosale
Professor & Head
Department of Civil Engineering
College of Engineering, Pune
(An Autonomous Institute of Govt. of Maharashtra)
Shivajinagar, Pune - 411 005

Dr. S.S.Bhosale
Head of the Department
Dept. of Civil Engineering
College of Engineering Pune

Date: 06/07/2017

Place: College of Engineering, Pune

Chapter 1

Introduction

The information technology (IT) industry is an important engine of growth of any country. With the rapid development of technology, manufacturers now produce superior televisions, new and smarter mobile phones, and new computing devices at an increasing rate. People are enjoying what technology brings, surfing the Internet on their smart phones or tablets and watching high-definition movies on their televisions at home. As more and more electronic products are produced to fulfill the needs of people worldwide, more resources are used to produce these items. The rapid growth of computing and other information and communication equipment is driving the ever-increasing production of electronic waste (e-waste). Hence, the electronic industry is the world's largest and fastest growing manufacturing industry in the world. The increasing "market penetration" in developing countries, "replacement market" in developed countries and "high obsolescence rate" of electrical and electronic goods make electrical and electronic waste (e-waste) one of the fastest growing waste streams.

COLLEGE OF ENGINEERING, PUNE – 411005

CERTIFICATE

This is to certify that this project report

"Plan and Design a solar powered self-sustainable house"

Submitted by "SHREY MISTRY (111301044), VERONIKA PHADTARE (111301070), MAYANK SHAHARE (111201056), PRITAM NARALE (111201038) " in partial fulfillment of requirement for award of degree of **Bachelor of Technology** (CIVIL ENGINEERING) , of College of Engineering, Pune, affiliated to Savitribai Phule Pune University, is a record of our own work.

Dr. Sukhanand S. Bhosale
Professor & Head
Department of Civil Engineering
College of Engineering, Pune
(An Autonomous Institute of Govt. of Maharashtra)
Shivajinagar, Pune - 411 005

Assistant Professor

Project Guide
Department of Civil Engineering
College of Engineering, Pune

Head of Department

Department of Civil Engineering
College of Engineering, Pune

Abstract:

Observing the today's need of housing and analysing the data we understood that in 2008, their stands 32 million Middle class houses in the country and up to 2030 this figure will touch a mark of 140 million. Our team is bothered about, How our country will meet this demand? We need to find solution to satisfy this 300% + surge in demand. Not only need of housing will increase but in proportion there will be surge in Electricity consumption and other resources also. Hence, India needs to find a sustainable, cost-effective and Energy efficient solution to meet the demand.

Due thorough study, our team has thought of an idea of planning and designing a 62 sq. meters Solar Powered prefab-mobile home, affordable to Indian Middle-class. House is designed using Passive Solar strategies and Vastu-shastra, so as to maximise utilization of Natural Energy and minimize the consumption of man-made Light Energy and electricity used in HVAC appliances. Our house compromises of environment friendly materials that harm comparatively less to environment compared to cement, during their processing, usage or post-usage period. The prime objective behind usage of such materials was to explore green building materials and introduce idea of making houses without conventional materials. We call our house as Self-reliant as it does not depend on Local Electricity boards for its electricity requirement, but it has its own Solar Photovoltaics system to satisfy its Electricity demand. Hence, considering various different regular usage appliances in active mode as a electricity load, a 5KWh Solar unit was designed for our house.

Finally, combining all above details and concept we present you all our concept house.

CERTIFICATE

This is to certify that the report entitled '**Study of seismic behavior of G+10 steel building with Viscous Damping Walls**' submitted by Srinivas C. Kakade, Vishal D. Shelar, Mayur Y. Nalavade and Shubham S. Patil in the partial fulfillment of the requirement for the award of degree of Bachelor of Technology (Civil Engineering) of College of Engineering Pune, affiliated to the Savitribai Phule Pune University, is a record of their own work.

Dr. Suhasini N. Madhekar
Guide
Civil Engineering Department
College of Engineering Pune

Dr. Sukhanand S. Bhosale
Professor & Head
Civil Engineering Department
College of Engineering Pune
(An Autonomous Institute of Govt. of Maharashtra)

Dr. Sukhanand S. Bhosale
Head of the Department
Civil Engineering Department
College of Engineering Pune

Date: 18th May 2017

Place: College of Engineering Pune.

ABSTRACT

In order to mitigate the post-earthquake effects and the structural damages to the buildings which are not recoverable, study of earthquake resistant system and their design is very important. Important buildings like Hospital, Tall buildings and other critical structures which must remain operational even after a designed seismic excitation. Passive control systems like base-isolation, tuned mass dampers and viscous damping walls provide a supplemental damping to the structures which is very important in dissipating the seismic energy. Out of the several techniques available for vibration control, concept of using the viscous damping walls is relatively new.

This project discusses the use of viscous damping walls in order to control the seismic vibrations of the building. Nowadays, due to lack of space, need of taller of taller structures is increasing. These taller building are generally vulnerable to the severe earthquake excitations which causes damage to the life and affects the society. Hence, reduction of seismic response is necessary. In the present study, a symmetrical steel building (G+10) is considered. In this case two sub- cases are considered. First sub-case consists of building without viscous damping walls and other sub-case is a building with viscous damping walls. Both the sub-cases are modelled and analyzed in SAP2000 using nonlinear response history analysis. Fundamental parameters considered for comparison are maximum storey deflection, storey drift and base shear. It is observed that there is considerable response reduction in case of a building with viscous damping walls.

CERTIFICATE

This is to certify that the report entitled '**Base Isolation Using Scrap Tyre Rubber Pads**' submitted by Nitin Amesur, Gauri Natu, Jyoti Jadhav and Shubham Nikam in the partial fulfillment of the requirement for the award of degree of Bachelor of Technology (Civil Engineering) of College of Engineering Pune, affiliated to the Savitribai Phule Pune University, is a record of their own work.

Dr. Suhasini N. Madhekar
Guide, Associate Professor
Civil Engineering Department
College of Engineering Pune

Dr. Sukhanand S. Bhosale
Professor & Head
Department of Civil Engineering
College of Engineering, Pune
(An Autonomous Institute of Govt. of Maharashtra)
Shivajinagar, Pune - 411 005

Dr. Sukhanand S. Bhosale
Head of the Department
Civil Engineering Department
College of Engineering Pune

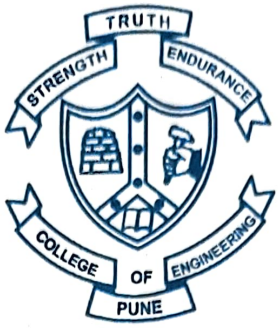
Date of oral: 18/05/2017

Place: College of Engineering Pune.

ABSTRACT

A properly engineered structure does not necessarily have to be extremely strong or expensive. It has to be properly designed to withstand the seismic effect while sustaining acceptable level of damage. This paper focuses on the experimental studies conducted on the development of low-cost seismic base isolation pads using Scrap Tyre Rubber Pads (STRP). The properties of STRP specimens such as horizontal and vertical stiffness are evaluated experimentally. The tests conducted are (a) axial compression test and (b) horizontal shear test. STRPs are prepared by placing 20cm x 20cm cut tread sections layers of truck tyres on top of each other. Larger size STRPs can also be formed by placing longer strips of tread sections side by side in alternating direction layers or using a woven structure. The layers of the tyre pads are kept together by using an adhesive (epoxy). STRPs provide several advantages such as low-cost pads, weight reduction, ease of handling, simple shear stiffness adjustments by changing the number of layers, and environmental benefits by recycling scrap tyres. The project has been executed in the following steps: Study of commonly used isolators; Literature review of various journal papers on base isolation; Survey of materials to be used for Scrap Tyre isolators; Testing the properties of Scrap Tyre isolators; Studying the effect of isolators on a model using E-tabs. From the experimental study, it is found that the STRP can be used as an alternative for elastomeric bearings.

CERTIFICATE



This is to certify that the report entitled, **"Comprehensive Solution for Construction Debris"** submitted by **Ruchika Ambatkar (111301003), Uday Avhad (111301007), Deepak Bangar (111301009),** and **Sharayu Kale (111301033)** in the partial fulfilment of the requirement for the award of the degree of **Bachelor of Technology (Civil Engineering)** of College of Engineering Pune, affiliated to the Savitribai Phule Pune University, is a record of our own work.

27/5/17

Yashwant A. Kolekar

Guide
Department of Civil Engineering
of Engineering Pune

Dr. Sukhanand S. Bhosale
Professor & Head
Department of Civil Engineering
College of Engineering, Pune
(An Autonomous Institute of Govt. of Maharashtra)
Shivajinagar, Pune - 411 005

Head of the Department
Department of Civil Engineering
College of Engineering Pune College

Date: 27/5/17

Place: COEP, Pune

Abstract

Construction and demolition (C&D) waste generation and handling issues have been in focus to achieve sustainable goals. Owing to growth in construction in India, it is appropriate to link generation of C&D waste with the growth. If measures to minimize and handle the C&D waste are not developed and efficiently adopted it may threat the environment as well as sustainable movement of Indian construction industry. C&D waste in India in 2010 may be estimated as 24 million tonnes.

Waste in construction is important not only from the perspective of productivity but also from the environmental considerations. Use of construction and demolition (C&D) waste can be useful for environmental protection. Disposing of waste is not the right solution. Many countries are facing the problem of scarcity of dumping yards

Roads are major consumers of aggregate and the influence of aggregate cost is more in total construction cost of the roads. In order to reduce the cost of construction of roads, the possibility of using building waste as aggregate. Index properties and strength of such type murrum soil is low and does not fulfill the requirements for its use as a road pavement material. These properties may be improved by adding a suitable admixture of construction and demolition waste so that local murrum soil that will suit parameter for granular Sub-base material for low traffic volume roads in rural area. Studies were carried out to determine the engineering properties of the recycled aggregate and compared with conventional aggregate. It has been observed that the construction and demolition (C&D) waste debris can be effectively used as road materials it is satisfying the MoRTH (Ministry of Road Transport and Highways) requirements.

Regarding the scope of this investigation in most of the developing Countries like India, there is major scope for development of rural infrastructure. It will be very useful for construction of rural roads and governments major initiatives such as "Prandhan Mantri Gram Sadak Yojana and Mukhaya Mantri Gram Sadak Yojana".

CERTIFICATE

This is to certify that the project report entitled

Study and improvement of Self-compacting concrete '

Is a bonafide record of the work done by

1. Maitri Shubham Gajanan (111301043)
2. Naikwade Ravi Rajkumar (111301047)
3. Lupin Tiku (111301079)

under our supervision, in partial fulfilment of the requirements for the award of Degree of Bachelor of Technology in Civil Engineering from College Of Engineering Pune for the year 2016-2017.

Yashwant A. Kolekar
Guide
Department of Civil Engineering
College of Engineering, Pune

Dr. Sukhanand S. Bhosale
Professor & Head
Department of Civil Engineering
College of Engineering Pune
(An Autonomous Institute of Govt. of Maharashtra)

Dr. S. S. Bhosale
Professor & Head of Department
Department of Civil Engineering
College of Engineering, Pune

Date: 25/05/2017

Place: College of Engineering, Pune

ABSTRACT

Concrete occupies unique position among the modern construction materials, Concrete is a material used in building construction, consisting of a hard, chemically inert particulate substance, known as a aggregate (usually made for different types of sand and gravel), that is bond by cement and water.

Self – compacting concrete (SCC) is a high – performance concrete that can flow under its own weight to completely fill the form work and self-consolidates without any mechanical vibration. Such concrete can accelerate the placement, reduce the labour requirements needed for consolidation, finishing and eliminate environmental pollution. The so called first generation SCC is used mainly for repair application and for casting concrete in restricted areas, including sections that present limited access to vibrate. Such value added construction material has been used in applications justifying the higher material and quality control cost when considering the simplified placement and handling requirements of the concrete.

The successful production of self – compacting concrete (SCC) for use, is depended on arriving at an appropriate balance between the yield stress and the viscosity of the paste. Specially formulated high range water reducers are used to reduce the yield stress to point to allow the designed free flowing characteristics of the concrete. However, this alone may result in segregation if the viscosity of the paste is not sufficient to support the aggregate particles in suspension.

The process of selecting suitable ingredients of concrete and determining their relative amounts with an objective of producing a concrete of required strength, durability, and workability as economically as possible is termed as concrete mix design.

The Mix Design for concrete M30 grade is being done as per the Indian Standard Code IS: 10262-1982.