



Department of Civil Engineering ,College of Engineering, Pune – 411005

(An Autonomous Institute of the Government of Maharashtra)

CERTIFICATE

This is to certify that report entitled “**SOLID WASTE MANAGEMENT PROJECT**” submitted by **Ms. Nikita kurle**(MIS No. - 111601026) , **Ms. Shital Paleriya** (MIS No.- 111601039) and **Ms. Aditi Palve**(MIS No.- 111601040) in the partial requirement for the degree of Bachelor of Technology (Civil Engineering) in Department of Civil Engineering of College of Engineering, Pune, affiliated to the Savitribai Phule Pune University is a record of their own work.

Date: -19 September 2020

Place: - Pune

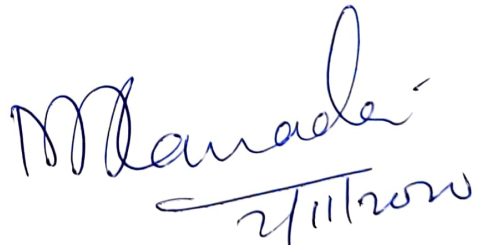


Dr. P.A. SADGIR

Guide

Department of Civil Engineering

College of Engineering, Pune.



Professor and Head of the Department

Department of Civil Engineering

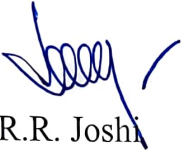
College of Engineering, Pune

ABSTRACT

Solid waste menace is a serious, complex and challenging concern all over the World especially in developing countries where environmental protection has often been neglected in the haste to achieve economic development resulting in pollution, sanitation problems, intensified urban congestion and resource depletion. Conversely, solid waste if managed properly can be a resource to create energy, to local small scale industries which are involved in recycling as well as to poor people of the community like rag pickers etc. Therefore we have to identify a strategic way of addressing this problem and social concerns attached to it. Concepts The present report based on the study carried out on solid waste management practice by COEP students. This study was also designed to study the composition of solid waste in COEP HOSTEL CAMPUS. Also the reasons for poor waste disposal were identified such as lack of adequate refuse bins, insufficient cleaning equipment and materials, delays in collecting of waste for disposal by the authorities etc.

CERTIFICATE

This is to certify that the project work on topic “ANALYSIS AND DESIGN OF HIGH-RISE BUILDING” has been carried out by Ms. Pooja Mahajan, Ms. Sonali Mall and Ms. Pranjali Wani, in partial fulfillment of requirement of B. TECH Project. The entire work has been carried out under my supervision and guidance.

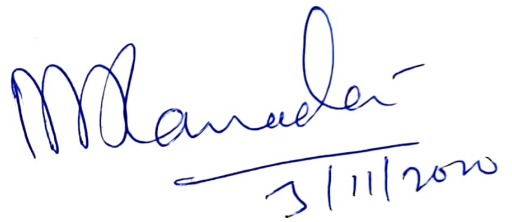


Dr. R.R. Joshi

Project Guide

Department of Civil Engineering

College of Engineering, Pune



Prof. Dr. M.S. Randive

Head of Department

Department of Civil Engineering

College of Engineering, Pune

Date:

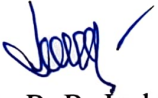
Place: Pune

ABSTRACT

This project is concerned with the analysis and design of high-rise building using IS 1893:2002 and IS 1893:2016. The modelling and structural analysis of high-rise multi-storey reinforced concrete residential building is done with the help of Etabs software. In the present work, using response spectrum method, base shear, lateral forces on each storey, maximum deflection and drift in X and Y directions are found out using different load combinations mentioned in IS 1893:2002 and IS 456:2016.

CERTIFICATE

This is to certify that the project work on topic “DESIGN OF STEEL FOOD GRAIN GODOWN USING TRUSS AND PROFLEX SHEET” has been carried out by Mr. Pravin Birajdar, Mr. Rushikesh Chirake and Mr. Aditya Shinde, in fulfilment of requirement of B. TECH Project. The entire work has been carried out under my supervision and guidance.

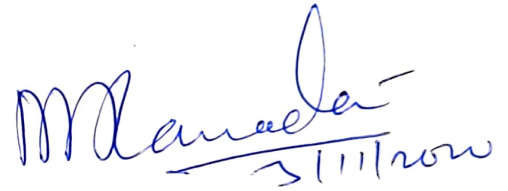


Dr. R. R. Joshi

Project Guide

Department of Civil Engineering

College of Engineering, Pune



Prof. Dr. M. S. Randive

Head of Department

Department of Civil Engineering

College of Engineering, Pune

Date:

Place: Pune

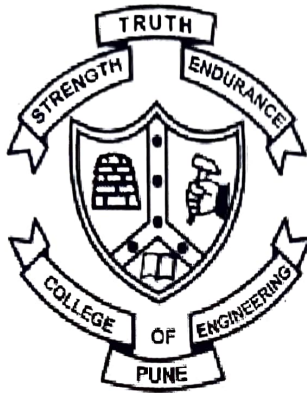
ABSTRACT

We are the students of B.Tech. Civil, College of Engineering, Pune. This project is about designing STEEL FOOD GRAIN GODOWN USING TRUSS AND PROFLEX SHEET. Now-a-days proflex sheet is being used in many structures as an alternative to conventional truss roofing system. In this project, we have studied the advantages of proflex sheet over truss roofing and how proflex sheet is different from truss roofing considering factors like wind load behaviour on curved roof of proflex, arch behaviour of proflex roof, etc. Quantity of steel, cost required in both the cases are compared and also the effects of varying the rise of proflex sheet is studied.

COLLEGE OF ENGINEERING, PUNE

November 2020

CERTIFICATE



This is to certify that the report entitled 'GLOBAL STABILITY ANALYSIS OF REINFORCED EARTH WALL USING BASAL REINFORCEMENT' submitted by Aqueeb Inamdar, Siddharth Kadam and Manjeet Singh 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. Rupa S. Dalvi

Project Guide
Department of Civil Engineering
College of Engineering, Pune

Dr. M. S. Ranadive

Head of Department
Department of Civil Engineering
College of Engineering, Pune

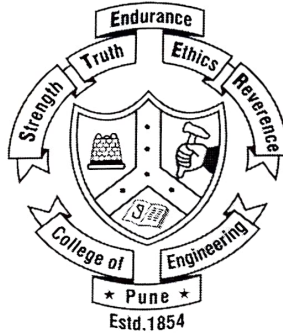
Date: 3rd November 2020

Place: College of Engineering, Pune

ABSTRACT

The analysis of global stability of structures has become very important nowadays. Global Stability is defined as a rotational soil failure that is highly dependent on soil geometry and soil conditions. Global stability analysis is becoming increasingly important in the design of reinforced concrete buildings, especially in the slender ones, due its sensitivity to lateral displacement and in retaining structures. In situations where it is not possible to construct earth structures due to unavailability of hard strata, reinforcement comes into picture. Geotextiles are often used in construction of roads and highways, however, they are used as soil separators, used in filtration and drainage, used as a reinforcement material to increase the stability of earth mass, used for the control of erosion, etc. Geotextiles with good tensile strength can contribute to the load carrying capacity of soil which is poor in tension and good in compression. Geotextiles are porous fabric manufactured from synthetic material such as polypropylene, polyester, polyethylene, nylon, polyvinyl chloride and various mixtures of these. In our project, we have introduced woven geotextile as a basal reinforcement. The basal reinforcement, when laid at the base of an embankment, provides additional resistance to foundation failure and help with the control of settlements. The project is based on analysis of global stability of the Reinforced Soil wall, when the soil conditions are not favorable. Slide 5.0, the most comprehensive slope stability analysis software available currently, is used to determine the global stability of the wall by replacing the foundation soil and changing tensile strengths of basal reinforcement. An example from a real-life project of West Bengal was considered and its soil data was analyzed using the geotechnical software. According to the standard codes, factor of safety required was 1.3. When the basal reinforcement was absent and the RS wall was resting on the replacement soil directly, factor of safety turned out to be below 1.0. After installing a basal reinforcement of high tensile strength, the safety factor improved. Multiple layers of PET woven geotextiles were introduced and hence the desired level was obtained. In some part of the project, soil conditions were assumed to determine the result in critical scenarios.

CERTIFICATE



This is to certify that the report entitled 'Slope stability analysis of artificial embankment of fly ash and plastic recycled polymer using MIDAS GTS-NX' submitted by **Prajakta S. Chavan (141701003)**, **Prajakta S. Neje (141701010)** and **Kalyani G. Patil (141701011)** 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.

Prof. S.M. Nawghare
Guide
Civil Engineering Department
College of Engineering Pune

Dr. M.S. Ranadive
Head of the Department
Civil Engineering Department
College of Engineering Pune

Date: 26 - 09 - 2020

Place: Pune

ABSTRACT

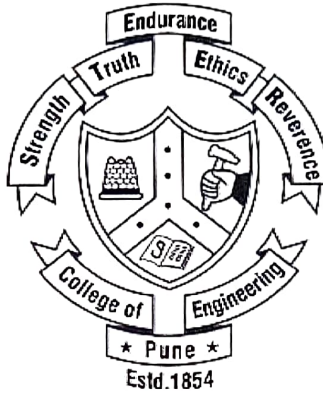
Artificial embankments are constructed to make provisions for infrastructure such as roads, railways, canals and to protect low lying ground from flooding. The design and construction of artificial embankments requires proper understanding of the underlying soils to carry the imposed loads, suitable available materials, careful site investigation, monitoring, sampling, testing, and modelling, evaluation of potential construction materials, and stability analyses before and during construction. As slopes of any embankment are most liable to failure, the slope stability of an embankment should be analyzed.

In this study, an artificial embankment of fly ash and plastic recycled polymer (PRP) is analyzed. The plastic recycled polymers were mixed with fly ash at different proportions to inspect its influence on the slope stability of the artificial embankment. The fly ash was mixed with various proportions of plastic recycled polymers, i.e. with 0%, 25%, 50% and 75%. In this regard, the laboratory study included Atterberg limits, standard proctor test, unconfined compressive strength, and direct shear test. The various parameters (modulus of elasticity, cohesive strength, angle of internal friction, unit weight, saturated unit weight) of the embankment mix were obtained from the laboratory tests. The slope stability of the artificial embankment of fly ash and plastic recycled polymer is analyzed using MIDAS GTS-NX software.

MIDAS GTS- NX is a FEM based modeling software which carries out slope stability analysis by the strength reduction method. Embankment models of only fly ash and fly ash with plastic recycle polymer mix have been accounted and simulated using MIDAS GTS-NX software to understand the failure mechanism and the changes in factor of safety. Besides this, the maximum deformation in the embankment is also studied. The slope stability of the embankment model is validated in this project.

KEYWORDS: Slope Stability, Artificial embankment, Factor of Safety, Finite Element Method, Strength Reduction Method, Fly ash, Plastic recycled polymer, MIDAS GTS-NX, Finite element modelling

CERTIFICATE



This is to certify that the report entitled “ ” submitted by **Bhawna Bisen, Pradnya Gadekar and Vrushali 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.

Prof. S. M. Nawghare
Assistant Professor
Civil Engineering Department
College of Engineering Pune

Dr. M. S. Ranadive
Head of the Department
Civil Engineering Department
College of Engineering Pune

Date: 26th September 2020

Place: College of Engineering Pune

CHAPTER 1: ABSTRACT

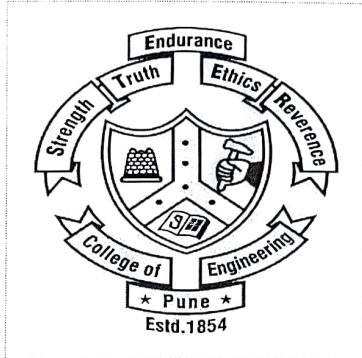
Worldwide the production and consumption of building materials have increased in the last decades. Wastes of different types are used for obtaining construction materials.

Fly ash properties are unusual among engineering materials. Unlike soils typically used for embankment construction, fly ash has a large uniformity coefficient and it consists of clay sized particles. Engineering properties that affect the use of fly ash in embankments include grain size distribution, compaction characteristics, shear strength, compressibility, permeability, and frost susceptibility. Nearly all the types of fly ash used in embankments are Class F.

Fly ash utilization, especially in concrete, has significant environmental benefits including:

- (1) Increasing the life of concrete roads and structures by improving concrete durability.
- (2) Net reduction in energy use and greenhouse gas and other adverse air emissions when fly ash is used to replace or displace manufactured cement.
- (3) Reduction in amount of coal combustion products that must be disposed in landfills.
- (4) Conservation of other natural resources and materials.

CERTIFICATE



This is to certify the report entitled 'Study on behaviour of flyash blocks using fibre and eps beads' submitted by Siddhi Kanthewad (111601023), Amrapali Waghmare (111601056), Omkumar Aru (111601004) 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 .


Prof.S.M.Nawghare

Project Guide ,
Civil Engineering Department ,
College of Engineering Pune .


Dr.M.S.Randive

Head of Department ,
Civil Engineering Department ,
College of Engineering Pune.

Date: 11/12/2020

Place: Pune

ABSTRACT

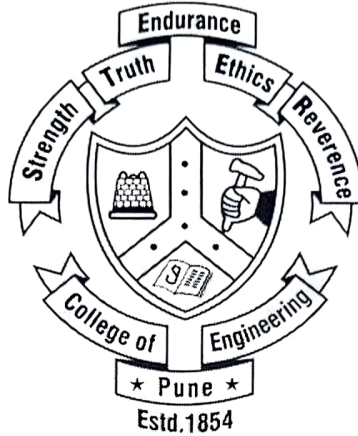
With the increase in demand for construction materials, there is a strong need to utilize alternative materials for sustainable development. Technology has improved a lot in construction techniques of structures. Earlier structures were constructed with heavy material but in present time of construction light weight material like hollow block and light weight wall panels are also used to decrease dead load of building. Several studies are done for replacing coarse aggregates in concrete. Expanded Polystyrene (EPS) beads are used as partial replacement to coarse aggregates. These include lighter loads during construction, reduced self-weight in structures, and increased thermal resistance.

We developed a new structural light weight concrete block by completely replacing coarse aggregates and fine aggregates. EPS is a lightweight material that has been used in engineering application since 1950s. Expanded Polystyrene waste is a granular form is used as light weight concrete to produce light weight non-structural concrete with the unit weight.


A study of concrete made with expanded polystyrene (EPS) beads as aggregates was carried out. Here, fly ash, was partially replaced by cement to find the compressive strength of concrete blocks. Compressive strength of concrete blocks or concrete masonry units are required to know the suitability of this in construction works for various purpose. Concrete Masonry blocks are generally made of cement, aggregate and water, which are usually rectangular and are used in construction of masonry structure. They are available in solid and hollow form.

This experimental work intended to investigate mechanical properties with stiffness and compression strength comparable to medium clay. In this investigation effort is made to develop light weight brick by combining EPS beads with cement fly ash and fibre.

CERTIFICATE



This is to certify that the report entitled 'Formwork for Concrete Structures' submitted by Anusha Suresh (MIS No.111601002), Payal Gunjal (MIS No. 111601015), Sumit Bodkurwar (MIS No. 111601008), in the partial fulfillment of the requirement for the award of degree of Final Year Bachelor of Technology (Civil Engineering) of College of Engineering Pune, affiliated to the Savitribai Phule Pune University, is a record of his own work.



31/11/2020

Dr. (Mrs). V. B. Dawari

Guide

Civil Engineering

College of Engineering Pune


3/11/2020

Dr. M. S. Ranadive

Head of the Department

Civil Engineering

College of Engineering Pune

Date: 28th September, 2020

Place: College of Engineering Pune.

ABSTRACT

Formwork in concrete construction is a kind of temporary structure whose purpose is to support its own weight and that of the freshly placed concrete as well as the construction live loads including materials, equipment and workmen.

The entry of several scaffolding and formwork multinationals into Indian market in the recent past, has revolutionised the way we used to construct few years ago. Few Indian manufacturers have also introduced innovative products and systems which are affordable and one stop solution provider for all construction related problems. But it is vital to select the appropriate and right formwork solutions and their service provider. These days, most of them are offering best of their services and cost-effective scaffolding and formwork solutions.

In today's competitive market, contractors and builders are facing tough competitions which necessitates most economic formwork and scaffolding solutions and also offer speed, safety of workers and most importantly quality to keep them a step ahead in business.

In this project we aim at studying the different types of formwork used in construction as well as the designing of the formwork for various elements using the codal provisions available.

STABILIZATION OF EXPANSIVE SOIL USING FLY ASH

CERTIFICATE

Certified that this project report on

"STABILIZATION OF EXPANSIVE SOIL USING FLYASH"

Is the bonafide work of

VEDANG KOTKAR

111601024

BIRDEV DONE

111601010

UDAY PALWE

111601041

Who carried out the project work under my supervision.

Dr. M. S. RANADIVE

HEAD OF THE DEPARTMENT

Civil Engineering Department,

College of Engineering, Pune.

Pune.


Dr. Y. A. KOLEKAR

PROJECT GUIDE

Associate Professor,

College of Engineering,

DATE: 15th September, 2020

Place: Pune.

1: ABSTRACT

Nearly 51.8 million hectares of land area in India are covered with Expansive soil (mainly Black Cotton soil). The property of these expansive soils, in general, is that they are very hard when in dry state, but they lose all of their strength when in wet state. In light of this property of expansive soils, these soils pose problems worldwide that serve as challenge to overcome for the Geotechnical engineers. One of the most important aspects for construction purposes is soil stabilization, which is used widely in foundation and road pavement constructions; this is because such a stabilization regime improves engineering properties of the soil, such as volume stability, strength and durability. In this process, removal or replacing of the problematic soil is done; replacement is done by a better quality material, or the soil is treated with an additive. In the present study, using fly ash obtained from Sesa Sterlite, Jharsuguda, Odisha, stabilization of black cotton soil obtained from Nagpur is attempted. With various proportions of this additive i.e. 10%, 20%, 30%, 40% & 50%, expansive soils is stabilized. Owing to the fact that fly ash possess no plastic property, plasticity index (P.I.) of clay-fly ash mixes show a decrease in value with increasing fly ash content. In conclusion, addition of fly ash results in decrease in plasticity of the expansive soil, and increase in workability by changing its grain size and colloidal reaction. Tested under both soaked and un-soaked conditions, the CBR values of clay with fly ash mixes were observed. Analysis of the formerly found result exposes the potential of fly ash as an additive that could be used for improving the engineering properties of expansive soils.

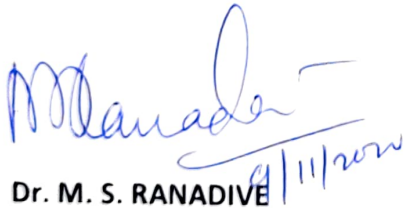
CERTIFICATE

Certified that this project report on

“SOIL STABILIZATION BY USING GROUND GRANULATED BLAST FURNACE SLAG AND LIME”

| | |
|-----------------|-------------|
| SWAPNIL SHINDE | (111601049) |
| SAHARSH SONWANE | (111601053) |
| PRATHAMESH VANE | (111601055) |

Who carried out the project work under my supervision.



Dr. M. S. RANADIVE

HEAD OF THE DEPARTMENT

Civil Engineering Department,
College of Engineering, Pune.



Dr. Y. A. KOLEKAR

PROJECT GUIDE

Associate Professor,
College of Engineering, Pune.

DATE: 20/09/2020

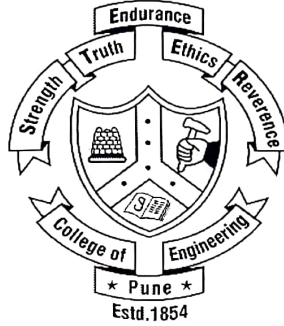
Place: Pune

ABSTRACT

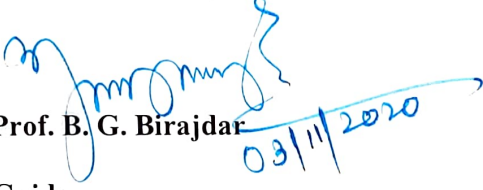
One of the most problematic soils which lay several challenges to civil engineers is expansive soil. Swelling, Shrinking and Strength instability is the salient problems of this soil, which necessitates the treatment. In this study, different percentage of lime and GGBS are used to stabilize the clayey soil. A set of experimental tests (Atterberg limits, Standard Proctor compaction, Unconfined compressive strength, and durability) will be carried out for investigating the effects of binders on the strength and durability of the clayey soil.

In this project GGBS and additives like lime are to be mixed with Clayey soil to investigate the relative strength gain in terms of unconfined compression, bearing capacity and compaction. The effect of GGBS and lime on geotechnical characteristics of Clayey – GGBS and Lime mixture is to be investigated by conducting standard proctor compaction test, unconfined compression test and permeability test. These test are to be performed as per Indian Standard specification. This test are to be performed by partial replacement of Clayey soil with GGBS and Lime.


CERTIFICATE



It is certified that the report entitled 'Study of Base Isolated structures' submitted by Mr Ashwin Prakash Pol (MIS No. 111601045), in the partial fulfilment for 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 his work.


Prof. B. G. Birajdar
Guide
03/11/2020

Department of Civil Engineering
College of Engineering Pune


Dr. M. S. Randive
3/11/2020

Head of the Department

Department of Civil Engineering

College of Engineering Pune

Date: 15th JUNE 2020

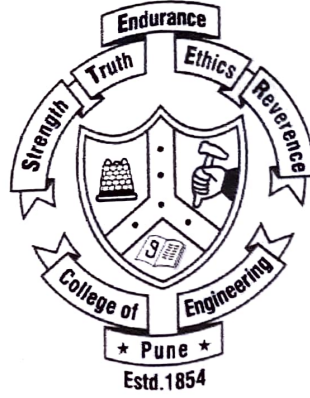
Abstract

A large proportion of the world's population lives in the regions of seismic hazard, at risk from earthquakes of varying severity and varying frequency of occurrence. Earthquakes cause significant loss of life and damage to property every year.

Various seismic construction designs and technologies have been developed over the years in attempts to mitigate the effects of earthquakes on buildings, bridges and potentially vulnerable contents. Seismic isolation is relatively recent and evolving, the technology of this kind.

Seismic isolation consists essentially of the mechanisms which decouple the structure, or its contents, from potentially damaging the earthquake-induced ground, or support, motions. This decoupling is achieved by increasing the flexibility of the system, together with providing appropriate damping. The aim of this B. Tech-project to study, design and working on base isolation systems from the view of the designer and structural engineer. In this study, base isolation is studied thoroughly and its knowledge is applied for design of the base-isolated structure and is checked for gravity load capacity and seismic performance for Design Basis Earthquake (DBE) as per UBC 1997, and its force-displacement curves were plotted to get insight into its energy dissipation.

CERTIFICATE



This is to certify that the report entitled 'DESIGN OF NET ZERO ENERGY BUILDING' submitted by Vaishnavi Jamdhade (111601017), Antara Lole (111601028) and Tanvi Shaikh (111601048) 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.

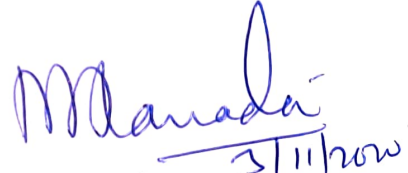


Dr. Mrs. G. S. Vyas

Guide

Department of Civil Engineering

College of Engineering, Pune



Dr. Mr. M.S. Ranadive

Head of the Department

Department of Civil Engineering

College of Engineering, Pune

Date: 26th September 2020

Place: Pune

Abstract

The Global Status report of 2018 by the United Nations states that the construction industry consumes 36% of global energy and releases approximately 40% of energy-related CO₂. Also, according to the National Building Code, buildings in India consume around 25 to 30 % of total energy. Due to rising population and urban development in India, energy consumption of buildings in the construction sector will witness a drastic increase. Studies show that by 2050 the built-up area in India will be quadrupled. Buildings over their operation and maintenance period require energy to satisfy the demands of heating, cooling, ventilation and lighting. To minimize the environmental impact of non-renewable fuels, there is a need to shift towards renewable energy sources. This can be achieved through the concept of Net Zero Energy Building (NZEB) in which the energy consumed by the building is equal to that produced by renewable resources. An NZEB consists of two design principles; passive and active design. Passive solar design utilizes renewable resources such as sunlight, wind and temperature differences to achieve indoor comfort without the use of electricity and fuels. This kind of climate responsive design can be adopted to scale down the dependency on conventional systems. In active design energy efficient lighting systems and appliances are used to reduce the energy consumption. It also comprises of design of a renewable energy system to offset the electricity demand of the building. The intent of this project is to design a two storey 4BHK (Bedroom Hall Kitchen) bungalow in warm and humid climatic conditions by adopting the principles of passive solar design. This is followed by choosing appropriate energy efficient appliances and designing a solar photovoltaic system (SPV).

Keywords: NZEB, Passive solar design, warm and humid climate, energy efficient appliances, solar photovoltaic system.

CERTIFICATE



This is to certify that the **B.Tech. project report** entitled
**'Flexural Performance of Thin Walled Lipped Channel Filled With
Concrete'** submitted by **Sudarshan Godase and Akshay Narhare** is
a record of their own work.

Dr. I. P. Sonar
Guide
Civil Engineering Department
College of Engineering Pune

Dr. M. S. Randive
Head of the Department
Civil Engineering Department
College of Engineering Pune

Date: 14th September 2020

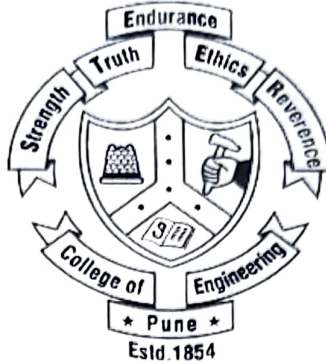
Place: College of Engineering Pune.

ABSTRACT :

Thin walled sections are used for making of partition walls, fall ceilings and for other purposes. These sections consist of channel sections, lipped channel sections, angle sections etc. Since the sections are light weight and have high strength they can be used as beam sections also if utilized in particular way. In this project we are going to check the flexural performance of thin walled lipped channel sections filled with concrete.

When these sections filled with concrete can be used as beams in remote areas. They can replace steel as they are economical than steel. And they are lighter than reinforced cement concrete beam so that they can replace the RCC beams.

CERTIFICATE



This is to certify that the B.Tech project report entitled

‘WATER QUALITY MAPPING OF MUTHA RIVER’

Submitted by

Urmila Mahale (111601030)

Aditya Patil (111601042)

Yogesh Patil (111601044)

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

Dr. K. A. Patil
Guide
Civil Engineering Department
College of Engineering Pune

Dr. M. S. Randive
Head of the Department
Civil Engineering Department
College of Engineering Pune

ABSTRACT

From time immemorial, the rivers are said to be the lifeline for living beings, as all types of developments, directly or indirectly relate to them. That is why all the oldest civilizations developed at the bank of river. Being so close to human activities, rivers are sink of terrestrial and aquatic pollution. Water contamination weakens or destroys natural ecosystems that support human health, food production and biodiversity.

Mutha River is treated like an open drain by citizen who discharges raw sewage, industrial waste and garbage unchecked. Besides all this, illegal activities of washing of oily drums, discharge of unauthorized hazardous waste are also carried out along the course of this river. The water with mixture of sewage and industrial waste is a threat to marine life and the river is showing sign of total loss of such support system. Hence, this study is carried out for the water quality mapping of the Mutha River by available parameters so that pollution load on treatment plant will be reduced.

So we have done the experiments on water samples which are taken from different stations namely KHADAKWASLA , VITTHAL MANDIR ,OMKARESHWAR and near SANGAMWADI BRIDGE along the MUTHA RIVER .

These experiments include pH,Electrical Conductivity, Total solids, Turbidity,Chloride content, Dissolved Oxygen (DO), and Biochemical Oxygen Demand (BOD). The main aim was to investigate the quality of water based on 'Water Quality Index'.

Water Quality Index (WQI) is a means by which water quality data is summarized for reporting to the public in a consistent manner which is used uniformly over a region to avoid confusion. It is similar to the UV index or an air quality index, and it tells us, in simple terms, what the quality of drinking water is from a drinking water supply.

WQI Index is calculated using 'Weighted Arithmetic Index Method' and employed to evaluate spatial and seasonal variations of surface river water quality data.So on the basis of WQI VALUES quality of water is determined.

COLLEGE OF ENGINEERING PUNE

(An Autonomous Institute of Government of Maharashtra)



Certificate of Excellence

This is to certify that

1. Mr. ANUJ RANE (141701001)
2. Mr. RAVINDRA JARWAL (141701005)
3. Mr. LOKESH TAGADE (141701013)

Has Successfully Submitted the report on

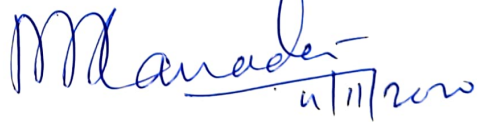
“Bio-remediation and Bio-mining”

In partial fulfillment of the requirement of Fourth Year B. Tech in Department of Civil Engineering at College of Engineering, Pune. For the Academic year 2019-2020.



Prof. Dr. M. U. Khobragade

Civil Engineering Department
College of Engineering, Pune.



Prof. Dr. M.S. Ranadive

Head of Civil Engineering Department
College of Engineering, Pune.

Date: 8th June 2020

Place: College of Engineering Pune

ABSTRACT

Until the 1970s, there were few dumpsites exists in India. Since Vedic times, household discards mostly food waste, which went back to the soil along with stable wastes via compost pits. Urban discards were collected by farmers, they converts it into compost and utilize it in farming and bring their produce to town/city. With the introduction of plastic in the seventies the composition of city waste started changing and people started discarded plastic along with kitchen wastes. These plastics blanketed the fields and made them infertile, as less rain could enter and few seeds could germinated, So farmers stopped collecting urban mixed wastes and cities were left with an unexpected burden. Initially most towns and cities in India started dumping all this unwanted waste outside city limits, along roadsides which are unsupervised and where dumped in no-mans-land. Uncontrolled and continuous dumping of municipal solid waste lead to mountains of legacy waste.

After three decades of neglection, these open dumps have grown larger and higher, becoming point sources of pollution. Waste rotting in these airless heaps produces leachate, a foul dark liquid that kills vegetation around dumps and irreversibly pollutes groundwater due to leachate generation. The heaps of garbage also produce methane, a greenhouse gas that causes 21 times more global warming than carbon dioxide. Besides, contaminating air quality, which further, worsens due to frequent fire incidences. Recently, Hon'ble NGT alarmed that due to incremental growth of Municipal Solid Waste (MSW), these MSW dumps are converting into virtual mountains. Hon'ble NGT further directed that every city/town should adhere to clause 'J' of Schedule-I of SWM Rules, 2016. Finally, Hon'ble NGT directed CPCB to propose Standard Operating Processing (SOP) for implementation of Bio-mining and Bio-remediation of legacy solid waste.

There are many solid waste treatment technologies in use today but Bio-remediation and Bio-mining are environment friendly, cost effective, more efficient technique of solid waste treatment. This project emphasizes on practicing Bio-remediation and Bio-mining. These processes should be adopted as early as possible to ensure holistic solid waste management.



Department of Civil Engineering ,College of Engineering, Pune – 411005

(An Autonomous Institute of the Government of Maharashtra)

CERTIFICATE

This is to certify that report entitled “**BIOGAS PLANT FOR HOSTEL MESS**” submitted by **Sagar Mahure (MIS No. - 111601031)**, **Vishwajeet Mali (MIS No.- 111601032)** and **Pratik Dumhare(MIS No.- 111601011)** in the partial requirement for the degree of Bachelor of Technology (Civil Engineering) in Department of Civil Engineering of College of Engineering, Pune, affiliated to the Savitribai Phule Pune University is a record of their own work.

Date: -13 Sept, 2020

Place: - Pune

Kamlesh Tripathi
21/11/20

Dr. K.K.TRIPATHI

Guide

Department of Civil Engineering

College of Engineering, Pune.

M. S. Randive
21/11/2020

Dr.M.S.Randive

Professor and Head of the Department

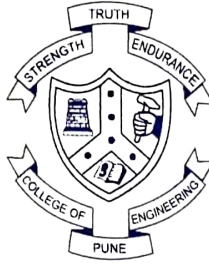
Department of Civil Engineering

College of Engineering, Pune

ABSTRACT

Food wastage is a huge problem arising in today's world. It has become a serious issue in our society in the last years that affects "poor and rich countries" equally and according to the Food and Agriculture Organization (FAO) almost half of all produced food will never be consumed. By wasting food we also waste the "time and energy" that we have used to produce the food and as well our "natural resources" and the "limited available agricultural land" will be used up which could be handled in a much better and sustainable way. Additionally, waste has a strong financial impact and affects the environment including the overall greenhouse gas emission. The present report based on the study carried out on Solid waste management of biodegradable matter of COEP hostel mess.

CERTIFICATE



This is to certify that the B.Tech Project report entitled '**Food Waste Management**' submitted by Pritish Pagare, Rutuja Patil, and Niharika Thorat is a record of their own work.

Kamala Tripathi
3-11-20

Dr.K.K. Tripathi

Guide

Civil Engineering Department

College of Engineering Pune

M. S. Ranadive
3/11/2020

Dr. M. S. Ranadive

Head of the Department

Civil Engineering Department

College of Engineering Pune

Date: 14/9/2020

Place: College of Engineering Pune.

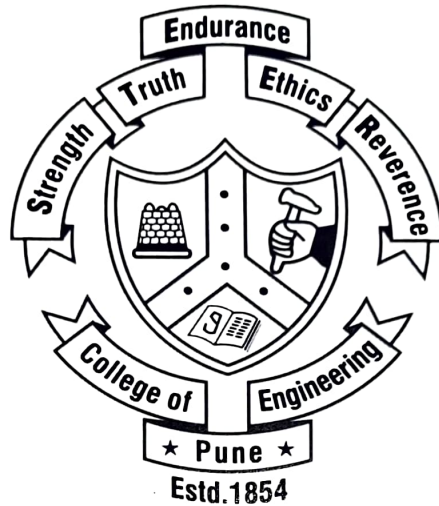
ABSTRACT

The scope of this project was to investigate the technological and environmental parameters related to producing animal feed from wasted food products (FFP). An analysis was conducted to understand both the global and local factors affecting food waste diversion to feed. In the case of India, the Country has great potential resources for FFP, however, it is currently lacking in both visibility and a motivating factor to incentivize industry growth. Published literature was analyzed to understand deployment of FFP operations in other global regions, including Japan, Korea, and Europe. Food waste resources available in India were then characterized and quantified, and a life cycle assessment (LCA) was performed on an existing FFP operation to evaluate the net impact on greenhouse (GHG) gas emissions. With relatively dry feedstock, the range of GHG emissions for FFP operations is favorable compared to other food waste utilization pathways, including direct feeding to animals, composting, and anaerobic digestion.

COLLEGE OF ENGINEERING, PUNE

Wellesley Road, Shivaji Nagar, Pune 411005.

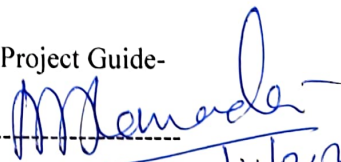
(An Autonomous Institute of Govt. of Maharashtra)



CERTIFICATE

This is to certify that the report entitled “**Analysis of results obtained from Road Bounce Technology, Bump Integrator and Benkelman Beam for road surface**” submitted by Makh Anant Shrikrishna (141701008), Mokashi Vikram Chandrakant (141701009), Shelake Pooja Ananda (141701012) in partial fulfilment of the requirement of the VIIIth semester of Civil Engineering course at the Department of Civil Engineering, College of Engineering Pune during the academic year 2019-2020.

Project Guide-


4/11/2020

Dr. M. S. Ranadive

Professor and Head,

Department of Civil Engineering,

College of Engineering Pune,05.

ABSTRACT

Evaluating existing flexible pavement condition which is pre-requisite to choose improvement technique that has to be adopted to enhance its quality. To evaluate existing pavements, non-destructive testing methods are desirable. Benkelman Beam and 5th wheel Bump Integrator are used to conduct non-destructive test like deflection and roughness survey on existing pavement.

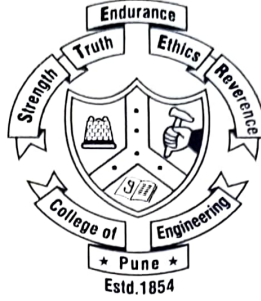
The roughness of roads surface is an important measure to determine the vehicle operating cost. There are different types of roughness measuring methods, but it is necessary to check the accuracy and effectiveness of instruments used. Deflection of existing pavement helps for evaluating stiffness of the pavement surface and determining the overlay require for improving the surface quality.

The main objective of project is to analyse the results of roughness index values obtained by Bump Integrator and Road Bounce Technology and deflection obtained by Benkelman Beam and to correlate unevenness index and deflection.

College of Engineering, Pune

Wellesley Road, Shivaji Nagar, Pune 411005.

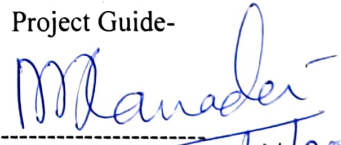
(An Autonomous Institute of Govt. of Maharashtra)



CERTIFICATE

This is to certify that the report entitled '**Temperature Susceptibility of Pyro Oil Modified Bitumen**' submitted by Shriya Hemant Bhavsar (141701002), Kalyani Prabhakar Jikar (141701006) and Vaishnavi Dinkar Mahure (141701007) in partial fulfilment of the requirement of the VIIIth semester of Civil Engineering course at the Department of Civil Engineering, College of Engineering Pune during the academic year 2019-2020.

Project Guide-



Dr. M. S. Ranadive 5/11/2020

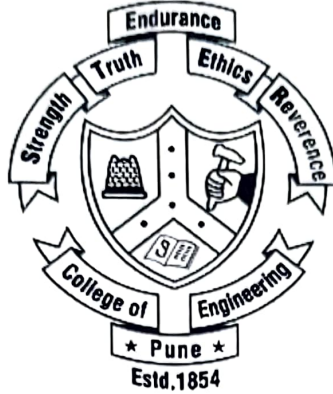
Prof. and Head,

Department of Civil Engineering,
College of Engineering Pune.

ABSTRACT

The development of roads and highways is increasing rapidly which is leading to an increase in demand of bitumen but their sources are limited. On the other hand, the disposal of waste plastic is becoming burning issue due to lack of well-established systems to manage plastic waste which ends up in landfills or in the environment. For this scenario, it is necessary to have sustainable approach in the further development with up to mark performance of the new structures. This study focuses on physical properties of base bitumen VG30 and POMB (Pyro Oil Modified Bitumen) before and after ageing. HDPE plastic was used for preparation of pyro oil using pyrolysis process at about 700°C and mixed with base bitumen at about 3000 rpm for 15 min at 160°C using high shear mixer. Pyro oil was added in various proportions i.e. 1, 2, 3 and 4% by weight of bitumen. The performances of modified binders are checked before and after RTFO and variation in different physical properties with reference to base bitumen are reported. The addition of pyro oil reduces the viscosity of the bitumen to modify this, suitable polymer in this case SBS polymer is being added for better performance of binder in extreme temperature conditions.

CERTIFICATE



This is to certify that the major-project report entitled Methyl Blue Removal From aqueous solution from adsorbent produced from water treatment Sludge

submitted by

PANKAJ RAJMANE (111601046)

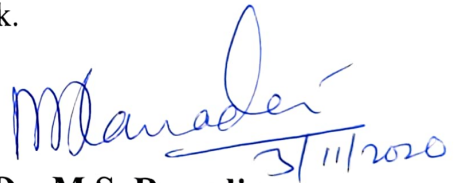
ATHARVA KAKDE (111601020)

SAURAV KAMALKAR (111601022)

is a record of their own work.



Dr. M.U. Khobragade
(Project Guide)
Civil Engineering Department
College of Engineering Pune



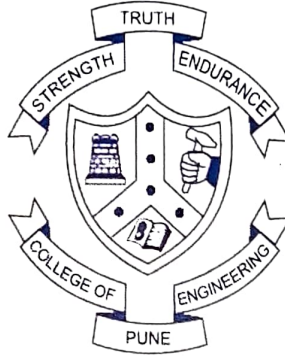
Dr. M.S. Ranadive
Head of the Department
Civil Engineering Department
College of Engineering Pune

Place: College of Engineering Pune.

ABSTRACT

Water pollution because of letting out of industrial waste water has already become a matter of great concern. After all every industry using dyes to colour products and give texture. This introduces dye and dye products in the effluent water which must be removed for water reuse and recycling and also for environmental pollution control. Colour removal from textile effluents on continuous industrial scale has been given much attention, not only due to potential toxicity but also visibility problem. The presence of dyes in the waste water even at low concentration is highly undesirable. There have been various techniques for removal of dyes but they are very costly. In this project we are going to use some waste materials for removal of colour, which result in the feasibility in the treatment and better utilization of the waste material. We will take different samples with different concentration and varying dose, agitation speed, contact time, temperature, and optimize each of this parameter and then analyze with actual industry sample.

CERTIFICATE



This is to certify that the report entitled "Implementation of Total Quality Management (TQM) in Construction Industry" by Harsh Jain (111601016), Manish Kabra (111601018) and Saurabh Chhajed (141701004), in the partial fulfilment of the requirement for the BTech Project of Civil Engineering of College of Engineering Pune, affiliated to the Savitribai Phule Pune University, is a record of their own work.

Dr. N. A. Hedao,
Guide,
Civil Engineering Department,
College of Engineering Pune

Dr. M. S. Ranadive
Head,
Civil Engineering Department,
College of Engineering Pune

Date: 31st May 2020

Place: Pune

*Note: In the **first half** of project work, ended **December 2019** we discussed **five-factor** which affected the site's performance in terms of optimal usage of materials, usage of money and other resources. Considering these factors, we are **focusing on the most severe factor, Inventory Management**, which will help go in the depths of the issues encountered by the firm and the possible solution can be identified and suggested for improvement in the future.*

Inventory Management

1. ABSTRACT


Inventory management system involves procurement, storage, identification, retrieval, transport and construction methods. Each is indelibly linked to safety, productivity and schedule performance. The main objective of Our study is to analyze the inventory management control adopted and the effective utilization of inventory at the construction site. ABC analysis is one of the conventionally used approaches to classify the inventories and the case study of a company is collected. The tracking and locating of materials in construction job sites has increased a great concern among construction entities. The improper handling and storage of materials in construction site has made it difficult to track and locate materials when the time they are needed. These findings may reflect the main factors that will affect the inventory management system which able to achieve the improved efficiency of project management and to reduce the waste of materials in the respective region of construction industries.

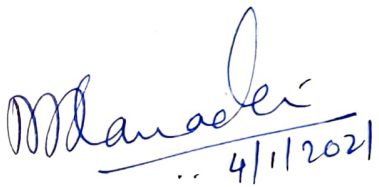
Keywords: Study, Inventory, Management System, Construction, Industry.

CERTIFICATE



This is to certify that the report entitled 'Analysis of Water Footprint'-A Case Study of COEP Campus, submitted by Rushikesh More, Shubham Nogja, Zeeshan Ahmad in the partial fulfillment of the requirement of BTech project (Civil Engineering) of College of Engineering Pune, affiliated to the Savitribai Phule Pune University, is a record of their own work.


Dr. N.M. Mohite
Guide
Civil Engineering Department
College of Engineering Pune


Dr. M. S. Ranadive
Head of the Department
Civil Engineering Department
College of Engineering Pune

Date: 26/09/2020

Place: College of Engineering Pune.

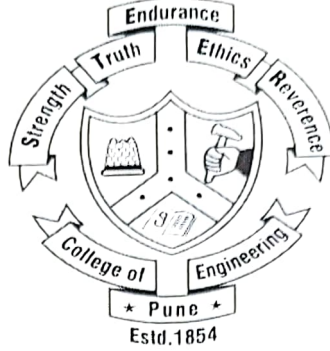
1.Introduction:

The water footprint shows the extent of water use in relation to consumption by people. The water footprint of an individual, community or business is defined as the total volume of fresh water used to produce the goods and services consumed by the individual or community or produced by the business. Water use is measured in water volume consumed (evaporated) and/or polluted per unit of time. A water footprint can be calculated for any well-defined group of consumers (e.g. an individual, family, village, city, province, state or nation) or producers (e.g. public organization, private enterprise or economic sector) , for a single process (such as growing rice) or for any product or service.

Traditionally, water use has been approached from the production side, by quantifying the following three columns of water use: water withdrawals in the agricultural, industrial and domestic sector. While this does provide valuable data, it is a limited way of looking at water use in a globalised world, in which products are not always consumed in their country of origin. International trade of agricultural and industrial products in effect creates a global flow of virtual water or embodies water (akin to the concept of embodies energy)

The Water Footprint Network is an international learning community non-profit foundation under Dutch law) that serves as a platform for sharing knowledge, tools and innovations among governments, businesses and communities that are concerned about growing water scarcity and increasing water pollution levels and their impacts on people and nature. The network consists of around 100 partners from all sectors – producers, investors, suppliers and regulators – as well as non-governmental organizations and academia.

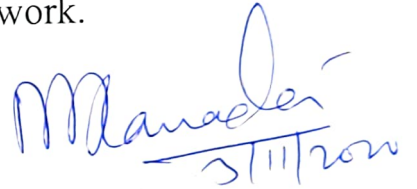
CERTIFICATE



This is to certify that the report entitled 'Water audit of College of Engineering Pune(COEP) campus" submitted by Shubham Khairnar, Kaustubh Gomase and Prajwal Dhamale 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. P. A. Sadgir

Professor ,
Civil Engineering Department,
College of Engineering, Pune


Dr. M. S. Randive

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

Place: College of Engineering Pune.

Date:

ABSTRACT

It's very tough to balance the water demand for development with the need to preserve our natural resources. However, balancing becomes easy to achieve when we move to some new & innovative ideas. Here we are going to deal with the most important natural resource **“WATER”**.

Water, it is the life of human, not only human but plants and livestock also. Ancient people started residing on the bank of river, because every human need water from the birth till death. Human can live without food for several days but not without water. From the morning we wake up, we need water for brushing, cooking, faucets, bath, gardening, drinking etc. the water is not only used in residential building but is also used in various industries such as steel, cotton, paper, sugarcane, pulp etc. in various forms. Water is also used to produce electricity and for farming. Food can't be grown without water. The water covers 71.4% of area on the earth; from that 96% is saline water which is found in ocean and seas. While other is fresh water which is found in underground water, ice and snow, river, lake, pond etc. thus, water is useful to life in various forms and as the population is increasing the demand for water is also increasing. Water taken directly from the river contains various metals and wastes, so it is needed to treat the water and then use. In treating the water some amount of water is lost till it reaches the consumer. Thus, water audit is one of the steps from which the non-use of water, loss of water in leakage or any other form can be known, and steps can be taken to rectify this losses.