



**Dr. D. Y. PATIL PRATISHTHAN'S COLLEGE OF  
ENGINEERING,  
SALOKHENAGAR, KOLHAPUR**

**DEPARTMENT OF CIVIL ENGINEERING**

**CERTIFICATE**

This is to certify that the project report entitled  
**“RESTORATION AND BEAUTIFICATION OF  
KALAMBA LAKE”**

Submitted by

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for  
  
Project Guide

(Prof. Amar D. Patil)

  
Head of Department

(Dr. R. V. Jadhav)

  
Principal

(Dr. S. D. Mane)

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## ABSTRACT

This project focuses on the installation and construction of three key elements like a geotextile mattress for stone pitching restoration, an oxygen park, and an acupressure walkway.

The project begins with a detailed study of the Kalamba Lake Dam in Kolhapur, Maharashtra, highlighting the need for restoration of its stone pitching. Advanced techniques such as the use of a geotextile mattress, laser scanning, drone technology, high-pressure water jetting, and epoxy bonding are explored for effective restoration.

Furthermore, the project proposes the creation of an oxygen park, which serves as a green space promoting the production of oxygen, air purification, and a rejuvenating environment. The park incorporates various amenities such as seating arrangements, drinking water facilities, restrooms, and green landscaping, providing a serene and healthy atmosphere for visitors.

Additionally, an acupressure walkway is designed to offer therapeutic benefits to individuals. The walkway features specially selected stones with acupressure properties arranged in a specific pattern. The construction procedure involves excavation, base preparation, stone placement, and finishing touches.

Through this project, the aim is to contribute to the restoration and enhancement of the Kalamba Lake Dam, promote environmental well-being through the creation of an oxygen park, and provide a holistic wellness experience with the acupressure walkway. The project integrates advanced construction techniques, environmental considerations, and user-centric design principles to achieve the desired outcomes.



**Dr. D. Y. PATIL PRATISHTHAN'S COLLEGE OF  
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**DEPARTMENT OF CIVIL ENGINEERING**

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This is to certify that the project report entitled

**“ANALYSIS AND DESIGN OF THE MODERN SPORTS  
COMPLEX FOR KOLHAPUR CITY”**

Submitted by

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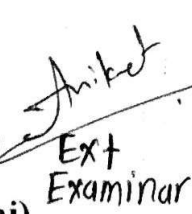
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## ABSTRACT

Sports have the power to bring people together, foster a sense of community, and inspire individuals to achieve their full potential. Kolhapur City has a rich history of sporting excellence, with a community that thrives on sports and athletic activities. However, the lack of world-class sports facilities has hindered the growth and development of athletes in the region. This project aims to transform the sporting landscape of Kolhapur City by designing and developing a world-class sports complex that will provide state-of-the-art facilities for various sports and recreational activities.

The sports complex will be a transformational project that will have a significant impact on the community and the region. It will be a beacon of hope for athletes, coaches, and sports enthusiasts, providing modern facilities and infrastructure that will empower them to achieve their full potential. The project will also stimulate economic growth in the area, creating numerous employment opportunities and contributing to the development of a robust sporting ecosystem.

The design and development of the sports complex will be a collaborative effort involving local stakeholders, including sports clubs, schools, and community organizations. The project will be designed with a focus on sustainability, incorporating renewable energy sources and eco-friendly materials. The sports complex will feature state-of-the-art facilities for athletics, football, cricket, tennis, badminton, swimming, and other popular sports. It will also have training centres, fitness studios, physiotherapy clinics, and accommodation facilities for athletes, coaches, and officials.

The sports complex will not only provide a platform for athletes to showcase their talents but will also foster community development. The project will create a space for social interactions and community engagement, promoting healthy living, and enhancing the quality of life for residents. The sports complex will also attract sports tourism, generating revenue for the region and enhancing its global reputation. In conclusion, the design and development of a world-class sports complex in Kolhapur City will be a transformational project that will have a lasting impact on the community and the region. It will empower athletes, drive economic growth, and foster community development, making it a landmark destination for sports enthusiasts and a source of pride for the city.

**Keywords:** Future sports complex, modern sports facility, High-Tech Innovative, Amenities, development.





**Dr. D. Y. PATIL PRATISHTHAN'S  
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This is to certify that the project report entitled

**" BEHAVIOR OF LATERITE SOIL BY USING SCRAP  
RUBBER TYRE "**

Submitted by

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**Mr. Shrivallabh Satish Katkar**

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**Project Guide**

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**(Dr. R. V. Jadhav)**

**Principal**

**(Dr. S. D. Mane)**

*Avilad*  
**Ex. Examiner**

## ABSTRACT

Soil Stabilization is the biological, chemical or mechanical modification of soil engineering properties. Technique to refine and improve the engineering properties of soils. Soil Stabilization can be utilized on roadways, parking areas, site development projects, airports and many other situations where sub-soils are not suitable for construction.

Laterite soil is reddish to yellow in colour Laterite soil is formed under conditions of heavy rainfall with alternate wet and dry periods, and high temperature which leads to leaching of soil, leaving only oxides of aluminium and iron. The amount of tire wastes, an unwanted urban-industry surplus, has been increasing every year throughout the world. The objective of the study is to use these refuses, as a stabilizer in soils, in order to increase the strength properties and the bearing capacity of the soil-stabilizer mixture.

Series of experiments have been performed on laterite soil samples with different powder rubber ratios. Various laterite soil-powder rubber mixtures having 0 %, 5 %, 10 %, 15%, 20% waste crumb rubber particles by weight were chosen.

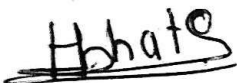
Keywords- Soil stabilization, laterite soil, Rubber.

# CERTIFICATE

Certified that, this Project Report entitled “**PERFORMANCE EVALUATION OF LABORATORY SCALE VEGETATED VERMIFILTER FOR DOMESTIC WASTEWATER**” by following students is approved by me for submission, certified further that, to the best of my knowledge, the report represents work carried out by the students.

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Project Guide

( Prof. Harshada V.Vibhute )

  
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(Dr. Rashmi Jadhav)

  
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# ABSTRACT

Earthworm's body works as a biofilter and have been found to remove BOD, COD, TDS, and TSS by general mechanism of ingestion, biodegradation, and absorption through body walls. Two lab-scale vertical flow vermifilter are to be designed, one aided with only canna indica and filter media and second with canna indica and (earthworms) along with filter media. The experimental phase is to be continued for 72 hours. Various parameters such as BOD, COD, pH, turbidity, Growth of Canna indica and bed clogging.

Organic waste management is a growing issue due to the unsustainable practices of its disposal. Sewage treatment plants are designed to treat wastewater to produce a safe effluent. However, one of the byproducts, the sewage sludge which is disposed off in landfill or used as fertilizer in agricultural operation is high in pathogens. Sustainability can be achieved by Vermicomposting of organic matter which involves accelerated cycling of nutrients through a closed cycle whereby waste products are put to productive end use. Vermicomposting and vermifiltration are natural waste management processes relying on the use of worms to convert organic wastes to stable soil enriching compounds.

The fate of filter materials and microbial communities during the vermifiltration process were studied for 72 Hours while treating the concentrated greywater. Two filter were filled with 10 cm, from bottom first layer is Coarse aggregate (size 20mm and height 6mm), Second layer is Fine aggregate (size 10mm and height 4mm), third layer is Charcoal (size 25mm and height 4mm), fourth layer is Sand (size 4mm and height 4mm), fifth layer is Soil and last is free board.



**Dr. D. Y. PATIL PRATISHTHAN'S COLLEGE OF  
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This is to certify that the project report entitled  
**“STRUCTUEAL HELTH MONITORING OF PEDESTRAIN  
BRIDGE USING SENSORS”**

**Submitted by**

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**Principal**

**(Dr. S. D. Mane)**

  
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### Abstract

In 21st century as we move towards the advance technology using smart equipment's like smart phones, laptop etc.in thus device various types of sensors are used for many activities makes easier. Hence, we try to put some sensors on particular part of a bridge to detect the movement of the bridge as well as current loading activity on bridge. This sensor helps day to day structural health monitoring of the bridge, and it reduces the accidents causes on the bridge

Structural health monitoring (SHM) plays a crucial role in ensuring the safety and integrity of bridges, including pedestrian bridges. With the increasing importance of maintaining infrastructure, the implementation of SHM systems using sensors has become essential. This abstract presents an overview of a comprehensive approach to monitor the health of pedestrian bridges using sensor-based technologies. The proposed SHM system utilizes a network of sensors strategically placed on the bridge structure to continuously monitor and collect real-time data. These sensors are capable of measuring various parameters such as strain, vibration, temperature, and displacement. The collected data is processed and analyzed using advanced algorithms and machine learning techniques to identify potential structural issues, defects, or anomalies. The key objectives of the SHM system are to detect and assess any signs of deterioration, damage, or deformation in the bridge structure. By continuously monitoring the bridge's behavior, the system can provide early warnings and alerts, enabling timely maintenance and repair actions to prevent catastrophic failures.

The abstract also highlights the advantages of using sensor-based SHM systems for pedestrian bridges. These advantages include enhanced safety, improved maintenance planning, reduced inspection costs, and extended service life of the bridge structure. The system can also facilitate a data-driven decision-making process for bridge owners and maintenance personnel, optimizing resource allocation and prioritizing maintenance activities based on the actual condition of the structure. In conclusion, the implementation of a sensor-based SHM system for pedestrian bridges is crucial for ensuring their long-term safety and functionality. By leveraging advanced sensor technologies, data analysis techniques, and proactive maintenance strategies, the proposed system contributes to the efficient management and preservation of pedestrian bridge infrastructure



**Dr. D. Y. Patil Pratishthan's College of  
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**B.Tech Civil (2022-23)**

**DEPARTMENT OF CIVIL ENGINEERING**



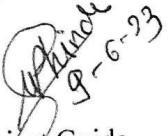
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This is to certify that the project report entitled  
**“Design of a Waste Water Treatment Plant in  
College Campus”**


Submitted by

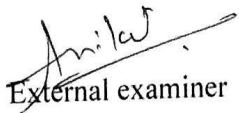
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Miss. Saloni S. Mane.	32
Miss. Shraddha B. Pardeshi.	39
Miss. Rutuja M. Patil.	45

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Project Guide  
(Prof. M.P. Shinde.)

  
Head of Department  
(Dr. R.V. Jadhav.)

  
Principal  
(Dr..suresh mane)

  
External examiner

## ABSTRACT

The area of our project is the planning and designing of waste water treatment plant in Dr. D.Y. Patil Pratishthan's college of Engineering Salokhenagar, Kolhapur.

There is a lot of waste water is wasted in college Campus. During summer season availability of fresh water is less. The main objective of this project is to reduce the demand of portable water and generate the new source from reuse of waste water.

Waste water treatment process is design to achieve improvements in the quality of waste water. Waste water treatment is closely related to the standards and expectations set for the effluent quality.

The campus requires a huge amount of water for different purposes like cleaning, gardening etc. So, to fullfill the demand of water. we work on treatment and reuse of waste water generated in college campus. Thus it reduces the load over fresh water and to reduce the demand of fresh water. Treatment is required for waste water and then it is utilized.

So our team as a part of college currently is working on a project about promoting sustainable campus by transforming our campus into ecofriendly hubs. In this project we are employing solar panel system, rainwater harvesting, water treatment, and vertical gardening.

**Keywords :-** Waste water, Treatment, Reuse, Chemical parameters.



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This is to certify that the project report entitled

**" Experimental Investigation of Low cost concrete using  
Hypo sludge"**

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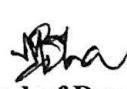
**Mr. Siddesh Nandkumar Salokhe**

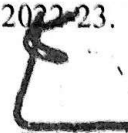
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## ABSTRACT

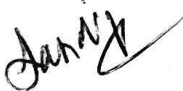
Every year, approximately two billion tonnes of cement are produced, a figure that is likely to rise in the future. The production of cement comes with an important release of CO<sub>2</sub>, the cement industry accounting for 5% of anthropogenic carbon dioxide emissions alone. These emissions come from different stages of the cement production - the calcination process of limestone, combustion of fossil fuels in the kilns, and from power generation. In the hope of reducing the carbon footprint of the industry, cement has been partially replaced by other materials with similar hydration behaviour to OPC. Hyposludge is a byproduct of the paper industry. This sludge contained 46.20% CaO, 3.30% MgO, 9.00% SiO<sub>2</sub>, 3.60% R2O3, 56.8% Moisture content, 27% Loss on ignescent and 11.1% Acid insoluble. The aim of this project was to evaluate the effects of hyposiludge as a partial cement replacement. 10%, 20%, 30%, 40%, 50%, 60% and 0% hyposludge was used in the mix to replace cement. The strength of cement/hyposludge concrete increased with curing period but above 30% replacement, decreased with increasing hyposludge percentage. The highest strength was 31.33 N/mm<sup>2</sup> and 28 N/mm<sup>2</sup> at 28 days for 30% and 0% Hyposludge respectively. The durability studies like Sulphate attack and water absorption were studied and the results shows 30% replacement of cement was optimum. The compressive strength and sulphate attack of cement mortar cube also done for 3, 7 and 14 days curing period. The results indicated that increased with curing period but above 30% replacement, decreased with increasing hyposludge percentage. The results of the conducted experiment proved the possibility of hyposludge as replacement in ratios up to 30% without causing significant effects on the studied properties of cement.

# CERTIFICATE


Certified that, this Project Report entitled " RURAL AREA DEVELOPMENT AND PLANNING " by following students is approved by me for submission, certified further that, to the best of my knowledge, the report represents work carried out by the students.

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## Abstract –

Rural development is a multifaceted concept which implies the improvement in the quality of lives of the rural people. The objectives of rural development are multi-directional which includes the raise in the per capita income of the rural masses, improvement in agriculture and allied activities, development in the provision of basic amenities and progress in all aspects of human resources. It is a process which enhances the social and economic well-being of the rural people. For the success of sustainable development in the rural areas, Government of India has formulated plans and implemented programmes for the overall development of the rural people especially the rural poor. Fundamentally, the rural development plans and policies have been designed to increase the equity in the production and distribution system along with the enhancement in generating job opportunities for the rural masses both in agricultural and in non-agricultural sectors. However, despite the significant efforts the rural poor continues to live in poverty along with inadequate provisions of basic amenities, infrastructure and poor communication system.

Hence, rural development is essential for an economic structure in India and exception where the rural areas are confronted with the multiple problems in different aspects. The site area is selected for the project is Ekondi village, taluka Kagal. The present study aims to evaluate the disparities in the level of rural development amongst the blocks in terms of social, economic and infrastructural parameters. The research work has been done more precisely for the purpose of identifying the problems of the study area and accordingly suggests some remedial measures in order to ensure better socio-economic life of the rural masses. Furthermore, the study aims to evaluate the income generated rural development programmes implemented in the study area and assess the level of rural development.



## CERTIFICATE

Certified that, this Project Report entitled "**Campus Development by Using Sustainable Method**" by following students is approved by me for submission, certified further that, to the best of my knowledge, the report represents work carried out by the students.

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Project Guide

(Prof. Amar D. Patil.)

(Prof. Sandeep Nale.)

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# CHAPTER 1-INTRODUCTION

## **1.1 General**

The Campus Development Plan models future academic activities, explores how these requirements could be implemented on campus and calculates order-of-magnitude space requirements to describe a general direction for further development and improve campus facilities. The changes in operating environment and society such as needs arising from new types of Learning and digitalization, affect operations of higher education institutions and development of campus.

The present project deals with –

1. The planning and designing of Hostel Building, Open Auditorium, Reading Hall .
2. Reconstruction of collapsed Retaining Wall on north side of playground of-

Dr. D.Y. Patil Pratishthan's College Of Engineering, Salokhenagar.

The project organization challenges the planning process through its variety of people, organizations. This plan provide the boarders a peaceful and congenial environment to enable students to excel in their studies and personality development .Overall campus development plan of DYP Salokhenagar including Planning, Design, Estimation of various civil engineering aspects. Civil Engineering Aspects such as

- 1) Designing a hostel building by Implementing Green Building Concepts
- 2) Reading Hall Design
- 3) Open Auditorium Design
- 4) Reconstruction of Collapsed Retaining Wall

## **1.2 Hostel Building by Implementing Green Building Concepts-**

Green hostel building project refers to the ecological friendly approach to design and building within the construction industry. Concept of Green Building is used in planning. Such practices aim to reduce the human impact on the natural environment in all its phases; from the design phases to the construction, and maintenance .

Furthermore, the project will make suggestions on how on-campus hostel accommodations can be re-engineered to achieve educational goals and enhance employability and self-productivity for national Hostel accommodation adds to the quality of an institution. Green building are designed to reduce overall impact of built environment on human health and natural environment by efficiently using water, energy and other resources.

### **1.3 Reading Hall**

The purpose of providing reading hall in college is that, it allows students to work individually in communal atmosphere, while reducing the distractions of daily life. Reading rooms serve a valuable role in the library environment, not only by providing proper space and studious environment for silent study, but also spaces that can inspire.

### **1.4 Open Auditorium**

An open auditorium is a place where theater and concert performances are held in open air. It include a stage and seats open to sky. The nature of outdoor theatre promotes a great relationship between the speaker and their audience, as they can wander through the crowd and encourage a lot of interaction and audience participation.

### **1.5 Retaining Wall**

Retaining wall is a structure that are designed and constructed to withstand lateral pressure of soil or hold back soil materials. The lateral pressure could be also due to earth filling, liquid pressure, sand, and other granular materials behind the retaining wall structure. There are various types of retaining wall structures which are used for numerous goals.

**A  
PROJECT REPORT ON**

**“PRODUCTION OF PAVING BLOCK BY USING WASTE PLASTIC  
AND FOUNDRY SAND”**

**SUBMITTED IN A PARTIAL FULFILLMENT OF THE REQUIREMENTS OF THE  
AWARD OF DEGREE  
BACHELOR OF TECHNOLOGY  
(CIVIL ENGINEERING)**

**Submitted by**

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**Under the guidance of  
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**ASSISTANT PROFESSOR**



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DR. D. Y. PATIL PRATISTHAN'S COLLEGE OF ENGINEERING  
SHIVAJI UNIVERSITY, KOLHAPUR.  
2022-2023**

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**CERTIFICATE**

This is to certify that .....have satisfactorily completed the synoptic work entitled "PRODUCTION OF PAVING BLOCK BY USING WASTE PLASTIC AND FOUNDRY SAND" in partial fulfilment of Bachelor's degree of Technology in CIVIL ENGINEERING under DR. D. Y. Patil Pratisthan's College of Engineering affiliated to Shivaji University, Kolhapur, for the academic year 2022-23.

**PROJECT GUIDE**

Mrs. M. P. Shinde

Assistant Professor

**HEAD OF THE DEPARTMENT**

Dr. Rashmi Jadhav

Head and Associate Professor

**Principal**

  
**External Examiner**

## INTRODUCTION

Nowadays, there is huge problem of waste plastic generated from various sources such as industries, residential, commercial, institutional, agricultural etc. It is very harmful to our environment as well as human health and animal's health. Normally, plastic items take 10- 1000 years to decompose or some time it may do not decompose so we can't use this waste (8)

Except plastic there are various wastes generated from various activities, the foundry sand is one of them, it is use only for dumping purpose so the huge amount of foundry sand generated as waste after the industrial process.

Our priority was to reduce environmental problems by using waste plastic & foundry sand, So that we decided to make some good product from waste plastic and waste foundry sand, our aim is to make paving blocks from them.

The wastes plastic in household is large and increases with time. In each country the waste composition is different, since it is affected by socioeconomic characteristics, consumption patterns and waste management programs, but generally the level of plastics in waste composition is high. The large volume of materials required for construction is potentially a major area for the reuse of waste materials. Recycling in concrete has advantages since it is widely used and has a long service life, which means that the waste is being removed from the waste stream for a long period. Because the amount of mineral aggregates required in concrete is large, the environmental benefits are not only related to the safe disposal of bulk waste, but also to the reduction of environmental impacts arising from the extraction of aggregates. (10)

Building materials like bricks, concrete block, tiles, etc. are popularly used in construction. However, these materials are expensive and hence common people find it difficult to easily afford them. Moreover, these building materials require certain specific compositions to obtain desired properties. Plastic is one of the recent engineering materials which have appeared in the market all over the world. It is a material consisting of a wide range of synthetic or semi- synthetic organic compounds that are malleable and can be molded into solid objects. By definition, plastics can be made to different shapes when they are heated.

It exists in the different forms such as cups, furniture, basins, plastic bags, food and drinking containers and they become waste material. Accumulation of such wastes can result into hazardous effects to both human and plant life. Therefore, need for proper disposal, and if



Possible, use of these wastes in their recycled forms arises. Plastic waste is increasing day by day throughout the world. Where proper garbage collection system is not available, waste plastics are strewn everywhere which becomes eyesore. It also pollutes the environment. (4)

A large amount of waste plastic are discarded or burned which leads to the contamination of environment and air. The large volume of materials required for infrastructure construction is potentially a major area for the reuse of waste materials. Recycling the plastics has advantages since it is widely used worldwide and has a long service life, which means that the waste is being removed from the waste stream for a long period. Reuse of waste plastics has environmental benefits not only related to the safe disposal of bulk waste, but also to the reduction of environmental impacts that arises due to burning of plastics.

Use of waste plastics in infrastructure construction has been tried and reported. The present research is performed to study the properties of bricks manufactured by mixing sand and waste plastics. This study is expected to provide some information regarding the suitability of such sand plastic bricks for use in construction industry. (2)



**Dr. D. Y. PATIL PRATISHTHAN'S COLLEGE OF ENGINEERING,  
SALOKHE NAGAR, KOLHAPUR**

DEPARTMENT OF CIVIL ENGINEERING

**CERTIFICATE**

This is to certify that the project report entitled  
**"CONTAMINATION OF A NITRAE IN GROUND WATER"**

Submitted by,

**Mr. Tejas dattatray Vaidya (2019087310)**

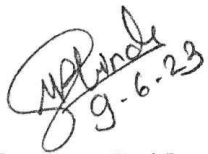
**Mr. Kedar Dilip Jadhav (2019087273)**

**Mr. Gaurav Ravindrarao Tidke (2020078403)**

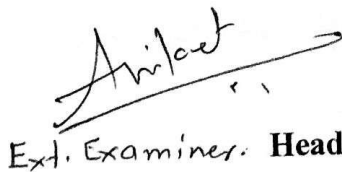
**Mr. Shubham Vijay Jagdale (2020077125)**

**Mr. Susmit Hanumant More (2020078329)**

has completed the Project work carried out by them under the supervision of Prof. M. P. Shinde and it is submitted towards the partial fulfillment of the requirement of Shivaji University, Kolhapur for the award of Bachelors Degree of Engineering in Civil Engineering for A.Y. 2022-23.

  
9-6-23

**Project Guide**  
(Prof. M. P. Shinde)



**Ext. Examiner. Head of Department**  
(Dr. R. V. Jadhav)



**Principal**  
(Dr. S. D. Mane)

## ABSTRACTS

Fast urban growth, without proper arrangements of waste management led to serious problems of contamination of groundwater in many urban centers of India. Present study clearly indicated how uncollected and unmanaged waste contaminates the groundwater.

Taking nitrate as an indicator of groundwater pollution due to urban wastes in Kolhapur, a detailed survey of nitrate level in groundwater was carried out in Kolhapur in order to assess the magnitude of problem in different areas of Kolhapur.

Nitrate, which may cause methemoglobinemia or “blue baby” disease, is found much above the drinking water limits prescribed by WHO and Bureau of Indian Standards. Nearly 57% of the samples showed values higher than prescribed limit of 45 mg/L, with nearly 13% samples showing values exceeding 100 mg/L. Since, groundwater is source of drinking in many parts of the city as the DJB supply is inadequate due to growing demand the dependence of groundwater is inevitable.

Thus, exposure of population to high nitrate cannot be ruled out. A need of detailed study on health impact of consuming high nitrate groundwater in different part of the city.

**DR. D.Y.PATIL PRATHISTHAN'S COLLEGE OF ENGG,  
KOLHAPUR.**



**CERTIFICATE**

This is to certify that **VAIBHAV R.PATIL (76), TANMAY A.GONDKAR (63)** of B.E.Civil Engineering have satisfactorily completed the project work entitled **“SHIPPING CONTAINER HOME”** in partial fulfilment of Bachelor's degree in Civil Engineering under Shivaji University, Kolhapur, for the academic year 2021-22.

PROJECT GUIDE

HEAD OF DEPARTMENT

EXTERNAL EXAMINER

## Chapter 1: Introduction

Shipping containers are also known as cargo containers. They are large metal boxes that are used to transport product or train or boat, usually use when sending large shipments to another country. Most of these containers remain unused. Most people asked by them without even noticing them and don't really bother to think about all the wonderful things the container can be used for. But what they don't realize is that those shipping containers can be used for lots of interesting projects. One of the most important of which is building a shipping container house.

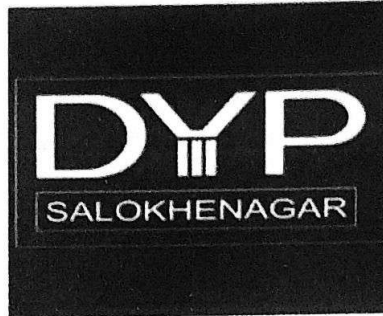
It might seem odd at first but, the most you think about it, the more you realize it's actually a very good idea. Shipping container house present several great advantages. For example, they are very sturdy. Moreover, they are hurricane and fireproof and this makes quit amazing. Another great advantage is the fact that shipping container houses are affordable and they cost about 20% less than a house built out of the usual materials. Also, they are considerably easier to build. And if you are concerned about sustainability and impact on the environment you should know that these houses are eco-friendly.

Of course, just like any house, they also have disadvantages one of them is the fact that shipping container houses are not suited for areas with extreme heat or extreme cold. You could give them insulation but it's not really worth the trouble. Another important downside would be the fact that, since they there aren't many such houses in the world, finding a shipping container house building specialist can be difficult. Also you will have plenty of trouble with building codes.



**Dr. D. Y. Patil Pratishthan's College of Engineering**

*Salokhenagar, Kolhapur*



## **CERTIFICATE**

This is to certify that, Mr (kedar,navjot,swaroop,muenuddin)  
has satisfactorily completed the work entitled  
“STUDY OF SEISMIC BEHAVIOUR OF BUILDING IN DIFFERENT SEISMIC  
ZONE”

in partial fulfillment of award of Bachelors of Engineering Degree in

**CIVIL ENGINEERING**

**By Shivaji university, Kolhapur**

PROFESSOR  
Sandeep S. Nale  
Dept. of civil engineering

Dr. RASHMI JADHAV  
Dept. of Civil engineering

PRINCIPLE

External Examiner



## ABSTRACT

Engineers are mostly adopting complex non-linear methods to research multi-storey residential apartment structure to withstand earthquake forces. This paper uses much simpler Equivalent Static method to analyse G+2+Terrace storey structure to repel earthquake forces using Staad pro software. The seismic analysis is further compared with non-seismic analysis of an equivalent structure using Staad pro software. It had been observed that the seismic results obtained consisted of significantly increased maximum moments and shear forces than the non-seismic analysis. From past earthquakes it is proved that many of structures are completely or partly broken because of earthquake. So, it's a necessity to figure out unstable responses of such structures. The main aim of the present work is to make a comparative study of seismic and non-seismic structure. The analysis was performed as per the specification of IS codes IS 1893:2002, IS 456:2000.

Dr. D. Y. Patil Pratishthans College of Engineering,  
Salokhenagar

DEPARTMENT OF CIVIL ENGINEERING

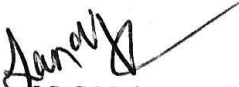
**CERTIFICATE**


This is to certify that the project work entitled is “UTILIZATION OF LATERITE SOIL IN MANUFACTURING OF BRICKS” carried out by students as below, in partial fulfilment for the award of degree of **Bachelor of Technology in Civil Engineering**, laid down by Shivaji University, Kolhapur during the academic year **2022-23** under the guidance of Prof. S. S. Nale.

Name	Roll No.	Exam Seat No
Mr. Shivprasad Ravindra Kasar.	23	8798
Mr. Shashank Dattatray Nikam.	36	8797
Mr. Dhananjay Nandkumar Jadhav.	14	8810


Date –

Place-

  
Prof. S.S. Nale  
(Project Guide)

  
Prof. R.V. Jadhav  
(H. O. D)

  
External Examiner

  
Prof. Dr. S.D. Mane  
(Principal)

## ABSTRACT

House is the third need of human in the world. While considering about India the population is increasing day by day which required Food, Cloths & Shelter for living. Affordable housing is needed in many countries of the world especially the developing ones. Building material makes up for 75% of the total cost of construction. The high demand for housing has increased the use of conventional building material which causes various environmental problems. To address these situations, attention has been focused on low-cost alternative building materials using industrial, agricultural, and natural wastes. Using the waste as substitute raw material in manufacturing of building products is an innovative way of waste utilization.

The laterite soil is a waste product in laterite stone quarries. As we know that government banned on digging of sand and soil. So, this waste material can be effectively used in manufacturing of bricks.

The laterite soil is collected from Ratnagiri (Kokan). Bricks of 10% cement and varying percentage of laterite soil (70%, 50%, 45%, 40%) and waste foundry slag (20%, 40%, 45%, 50%) of bricks were prepared and tested for compressive strength in compressive testing machine and water absorption test for 28 days. We notice that, the best quality of bricks with high quality strength were obtained for mixed proportion of (40% laterite, 50% WFS, 10% cement)

By this study, we concluded that addition of excess waste foundry slag increases the compressive strength of bricks.

**Key Words: Laterite soil, waste foundry slag, compressive strength, water absorption.**