

**VISVESVARAYA TECHNOLOGY UNIVERSITY**  
"JNANA SANGAMA", BELGAVI-590018



**A  
PROJECT REPORT  
On**

**"An Experimental Study on Partial Replacement of Cement with Fly  
Ash and Fine Aggregate with Pond Ash"**

Submitted in the partial fulfillment of the requirement for the award of Degree of

**BACHELOR OF ENGINEERING**

**In  
CIVIL ENGINEERING**

**By**

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***Under the Guidance of***

**Mr. Teerthananda Sagar C S**

**Asst. Prof, Dept. of Civil., Dr.T.T.I.T, K.G.F**



**2017-2018**

**DR. T. THIMMAIAH INSTITUTE OF TECHNOLOGY**

**Department of Civil Engineering  
Oorgaum, Kolar Gold Fields – 563120**

# DR. T. THIMMAIAH INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

OORGAUM, K.G.F. – 563120

2017-18

(Affiliated to Visvesvaraya Technological University, Belagavi)



## CERTIFICATE

This is to certify that the Project entitled “An Experimental Study on Partial Replacement of Cement with Fly Ash and Fine Aggregate with Pond Ash” is a bonafide work carried out by **HARISH P C (1GV14CV008)** in partial fulfillment of the requirements for the award of BACHELOR OF ENGINEERING IN CIVIL ENGINEERING of the Visvesvaraya Technological University, Belagavi during the year 2017-2018. The report has been approved as it satisfies the academic requirements with respect to Project work prescribed by the V.T.U of the above mentioned degree.

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## ABSTRACT

Due to rapid growth of construction industry the demand for concrete is increasing drastically. Fly ash and pond ash are the by-products formed at the thermal power plants during the combustion of pulverized coal. Which is hazardous to environment and disposal of this products has become a problem which leads to various pollutions. In this present study fly ash and pond ash are partially replaced for cement and fine aggregates respectively. The cement and fine aggregates has been replaced accordingly in the range of 10%, 20%, 30%, 40%, 50% by weight M-30 grade concrete. The main objective of this project is to utilize the waste material to reduce the cost of construction.

**Key words:** Pond ash, Fly ash, concrete, Flexural test, compressive test.

**VISVESVARAYA TECHNOLOGY UNIVERSITY**  
**“JNANA SANGAMA”, BELGAVI-590018**



**A**  
**PROJECT REPORT**  
**On**

**“CONSTRUCTION USING PLASTIC BOTTLES”**

**Submitted in the partial fulfillment of the requirement for the award of Degree of**

**BACHELOR OF ENGINEERING**

**In**  
**CIVIL ENGINEERING**

**By**

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**RAHUL R**  
**DHANANJAYA K**

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**1GV12CV002**  
**1GV14CV401**

**Under the guidance of**  
**Dr. SYED ARIFF**  
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**2017-2018**

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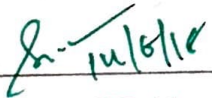
DEPARTMENT OF CIVIL ENGINEERING  
OORGAUM, K.G.F. – 563120  
2017-18

(Affiliated to Visvesvaraya Technological University, Belagavi)



## CERTIFICATE

This is to certify that the Project entitled “**Construction Using Plastic Bottles**” is a bonafide work carried out by **RAKESH M SHETTY (1GV14CV021)**, **RAHUL R (1GV12CV002)** and **DHANANJAYA K (1GV15CV401)** in partial fulfillment of the requirements for the award of **BACHELOR OF ENGINEERING IN CIVIL ENGINEERING** of the Visvesvaraya Technological University, Belagavi during the year 2017-2018. The report has been approved as it satisfies the academic requirements with respect to Project work prescribed by the V.T.U of the above mentioned degree.



Signature of Guide

(Dr. Syed Ariff)

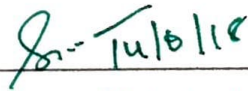


Signature of H.O.D

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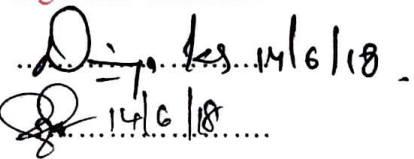
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Name of the Examiners

1. Divya K.S.
2. Vedavathi R.P.

Signature with Date



## **ABSTRACT**

Large amount of plastic bottles are wasted and disposed every day. People thrown away them without considering that what those plastic bottles can have impact on the humans and environment. As plastics are non biodegradable its disposal has always been a problem. Waste plastic bottles are major cause of solid waste disposal. One of the main disadvantages in constructing houses is high cost of the building. High cost is primary requirement for constructing the house in places where people are below poverty line, is becoming one of the most significant problem of people. To investigate the application of plastic bottles as one of the urban wastage in buildings construction and that how it can lead to sustainable development. It also intends to compare the characteristics of some construction materials such as brick and concrete block with bottle wall. Among several waste reduction strategies, one that is gaining momentum is the development of construction materials that reuses a number of solid wastes. The 'bottle brick' is one such invention. Waste Polyethylene Terephthalate (PET) bottles packed with other dry solid wastes or sand and earth has been successfully used in a number of countries around the world. This study looked into the strength properties of waste PET bottles filled with fine sand.

When the bottles are filled with soil or sand they work as bricks and form a framework for walls or pillars in which plaster made of clay or a cement mixture fills the space between all bottles. It also includes different factors such as time of execution, cost, load capacity, flexibility, reducing waste and energy efficiency; plastic bottles may be more effective compared to some conventional building materials such as brick.

**Key words:** PET Bottles, Sand, Cement, Compressive strength and Flexural strength.

**VISVESVARAYA TECHNOLOGY UNIVERSITY**  
"JNANA SANGAMA", BELGAVI-590018



**A**  
**PROJECT REPORT**  
**On**

**"A Study on Concrete by Partial Replacement of Cement with Fly  
Ash and Fine Aggregates with Gold Mine Tailings"**

**Submitted in the partial fulfillment of the requirement for the award of Degree of**

**BACHELOR OF ENGINEERING**  
**In**  
**CIVIL ENGINEERING**  
**By**

**ANUSHA M S**

**MALLIKARJUNA P H**

**SANDHYA S**

**SOUNDARYA M E**

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**2017**

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DEPARTMENT OF CIVIL ENGINEERING

CERTIFICATE

This is to certify that the Project work entitled


“A Study on Concrete by Partial Replacement of Cement with Fly Ash and Fine Aggregates with Gold Mine Tailings”


Is bonafied work carried out by


ANUSHA M S  
MALLIKARJUNA P H  
SANDHYA S  
SOUNDARYA M E

1GV14CV001  
1GV14CV010  
1GV14CV016  
1GV14CV018

In partial fulfillment for the award of degree of **BACHELOR OF ENGINEERING** in Civil Engineering of **VISVESWARAYA TECHNOLOGICAL UNIVERSITY**, Belgavi during the year 2017-2018. It is certified that all corrections suggestions indicated for internal assessment has been incorporated in the report kept in the department library. The project report has been approved as it satisfies the academic requirements in respect of project work prescribed for the said degree.

  
Signature of Guide  
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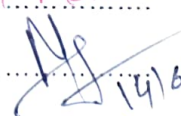
  
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## ABSTARCT

The waste products from Gold mine process and Thermal power plant are creating environmental hazardous and hence, an attempt is made to utilize gold mine tailings and fly ash as partial substitute for river sand and cement in producing concrete. River sand is replaced with 10%,20% and 30% gold mine tailings and cement is replaced with 20%, 40% and 60% fly ash. Mix proportion for M30 concrete are obtained as per guidelines given in IS:10262-2009. Workability, compressive strength, and flexural strength are conducted. The strengths obtained at the ages 7,14 and 28 days of curing are reported. The investigations revealed that there is no increase in the compressive strength and flexural strength for any replacement of the concrete ingredients when compared with the nominal concrete.

Key words: Workability, Gold mine tailings, Fly ash, Compressive strength and Flexural strength.

**VISVESVARAYA TECHNOLOGY UNIVERSITY  
BELAGAVI -590018**



**“EXPERIMENTAL STUDY ON UTILIZATION OF PLASTIC,  
FOUNDRY WASTE SAND, FLY ASH AND CUTBACK BITUMEN IN  
THE MANUFACTURING OF BRICKS”**

A thesis submitted in the partial fulfillment of the requirements for the degree of  
**BACHELOR OF ENGINEERING**

In  
**CIVIL ENGINEERING**

Submitted by

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**2017 - 18**

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**DEPARTMENT OF CIVIL ENGINEERING**

**CERTIFICATE**

Certified that the thesis entitled “**Experimental Study On Utilization Of Plastic, Foundry Waste Sand, Fly Ash And Cutback Bitumen In The Manufacturing Of Bricks**” carried out by **Afra Sardar (1GV14CV022), Bhanushree GV(1GV14CV004) and Pavithra S (1GV14CV014)** in the partial fulfillment for the award of degree of **Bachelor of Engineering in Civil of Visvesvaraya Technology University, Belagavi.** The thesis has been approved as it satisfies the academic requirement in respect of project 10CV85 prescribed for the bachelor of engineering degree. It is certified that all corrections/suggestions indicated for internal assessment have been incorporated in the report deposited in the department library.

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*M. Maneela 14/6/18*  
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(Mrs. M Maneela)

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Signature of Principal  
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1. *M. MANEELA M. Maneela 14/6/18*

2. *AS 14/6/18*

## ABSTRACT

There has been a considerable imbalance between the availability of Conventional building materials and their demand in the recent past. The disposal of waste plastics is a biggest challenge, as repeated recycling of PET bottles pose a potential danger of being transformed to a carcinogenic material and only a small proportion of PET bottles are being recycled. On the other hand the Foundry Waste Sand is abundantly available. Approximately 100 million tons of foundry sand is used in production annually, of those 7-10 million tones is discarded annually and is available to be recycled into other products. However as energy consumption grows, the total generation of fly ash by the thermal power plants in India was about 100 million tonnes last year. The ash generation is expected to 175 million tonnes per year. The scale of air pollution will increase due to production of fly ash and also needs large disposal areas. Fly ash as construction material can be effectively used. In this work an attempt has been made to manufacture the bricks using Plastics in the range of 60 - 80% by weight of Foundry Waste Sand and Bitumen is added in the range of 2 - 5% by weight of sand in molten form and this bitumen- plastic resin is mixed with Foundry waste sand and fly ash in different proportions to manufacture the bricks. For this, various testing is done to prove that this brick is better than the normal conventional bricks. The bricks manufactured possess the properties such as neat and even finishing, with negligible water absorption and satisfactory compressive strength in comparison with the conventional bricks.

**Keywords:** Plastic, Fly ash, Brick, Bitumen.