



J.K.K. MUNIRAJAH COLLEGE OF TECHNOLOGY

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T.N. Palayam (Po), Gobi (Tk), Erode (Dt) – 638 506

DEPARTMENT OF CIVIL ENGINEERING

2022-2023

S.NO	REGISTER NUMBER	NAME OF THE STUDENT	PROJECT	INTERNSHIP	INDUSTRIAL VISIT
1	731219103002	ANIL KUMAR BALDABOI	✓	✓	✓
2	731219103003	DEBACHAND MUDULI	✓	✓	✓
3	731220103001	DIVAKAR R		✓	✓
4	731221103301	SUSITHRA S		✓	✓

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PROJECT BATCH LIST (2022-23)

S.N	REGISTER NO	NAME LIST	PROJECT TITLE	GUIDE NAME
1	731219103002	ANILKUMAR BALDABOI	AN EXPERIMENTAL INVESTIGATION OF PARTIAL REPLACEMENT OF CEMENT WITH WASTE PAPER ASH	Mrs.V.MOHANAPRIYA
2	731219103003	DEBACHAND MUDULI		


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PROJECT



**AN EXPERIMENTAL INVESTIGATION OF
PARTIAL REPLACEMENT OF CEMENT
WITH WASTE PAPER ASH**



A PROJECT REPORT

Submitted By

ANIL KUMAR BALDABOI 731219103002

DEBACHAND MUDULI 731219103003

in partial fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

in


CIVIL ENGINEERING

JKK MUNIRAJAH COLLEGE OF TECHNOLOGY

TN-PALAYAM – 638 506

ANNA UNIVERSITY: CHENNAI 600 025

MAY - 2023


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ABSTRACT

This research investigates experimentally behavior of red mud with concrete. In this study, the cement replaced with various percentage of red mud in concrete and checked out various mechanical properties. Waste Paper Ash replace with cement and different percentages (25%, 50% and 75%) and also it effects on the strength and other properties of concrete. Thats checked for different grades of concrete M25. The mechanical properties investigated in current study include compressive strength, split tensile strength, flexural strength and study on Waste Paper Ash. Waste Paper Ash, cement, industrial waste, mechanical properties of concrete

The compressive strength, flexural strength and split tensile strength of concrete curing and tested for (7, 14 & 28) days has been found to the replacements of concrete. The results show as effective for practical purpose.



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CHAPTER-1

INTRODUCTION

1.1 GENERAL

Concrete is one of the most versatile and widely used building materials in the world construction industry. It is a composition of aggregates, a Portland or blended cement, water, and contains other cementitious materials and/or chemical admixtures. It contains some amount of entrapped air and purposely entrained air obtained by use of an admixture or air-entraining cement [1]. The annual production of concrete is rapidly increasing. This is because many developing countries are experiencing rapid urbanization and population growth, making the demand for housing and infrastructure development greater than ever before. Cement being the main binder in concrete, its production process is both uneconomical and environmental unfriendly. The production of 1 tonne of Portland cement requires 1.5 tonnes of raw material. According to Malhotra, (1988); and Swamy, (1998) the production process of Portland cement is highly energy intensive, consuming 4–7 MJ of fossil fuel energy per kg, [16, 17] and releases approximately 1 tonne of carbon dioxide for manufacture of each tonne of Portland cement. As a result, a requirement for economical and more environmental-friendly leads the way to search for supplementary cementing materials in concrete that can be used as replacement of the normal Portland cement. This can be done by two methods. The first method is using another binding material instead of cement which is not possible right now for unavailability of such a binding material and the second method is partial replacement of cement by appropriate material. The second method is quite simple because of lots of references are available as well as enough suitable materials are also available. The replacement of cement in concrete by various wastes creates a tremendous saving of energy, costs and also leads to important environmental benefits. As a result, the use of materials has become a common practice in the construction industry. Supplementary cementitious materials (SCMs) are being utilized as partial replacement of cement. In 2016, Savita D., et al., reviewed the cement replacement materials in concrete and concluded various materials as cement replacing materials. These materials are ceramic waste, paper pulp, Ground granulated

blast furnace slag, Silica fume, Hypo sludge, Fly ash, Paper sludge, Waste glass powder, Waste paper sludge ash [2]. According to Ali et al, (2013), more than 450 million tons of paper is produced worldwide per annual and it is expected that the demand for paper will reach 500 million tons per annual by the end of 2020 [10]. And also Asmare, (2015) in his study predicted that the demand of paper to be imported to Ethiopia by the year 2015/16 was 157,956.7 tons of paper and paper board. This demand of paper was increasing from year to year because of education expansion policies and overall economic development of the country [9]. As it was described by Oriyomi M. O., et al, Paper is an example of valuable materials that can be recycled [3]. Disposable paper available in abundance throughout the world is composed mainly of short natural cellulose fibers and is already used in many local raw materials. Waste paper arises from several sources such as newspapers, office and printing papers etc. The chemical composition of paper ash mainly contains SiO_2 (60%), CaO (14%), Al_2O_3 (2.06%), and Fe_2O_3 (0.92%) which are the main essential compounds needed for cement hydration for strength development (Sumit, A. B., et al, 2013). Due to this pozzolanic property, waste paper ash has a possibility to be used as partial replacement of cement in concrete production. So, this study was targeted at investigating the properties of concrete produced by using waste paper ash in order to ascertain their suitability to be used as a cement replacing material in concrete



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CHAPTER 10

CONCLUSION

This work relates to the usage of the waste paper ash from office, a waste clean material used in the concrete mixtures. The following conclusions were drawn based on the experimental investigations carried and the results obtained from those tests, which are as follows:

- a. The study concluded that compressive strength of the concrete improved by 4 to 10 % up to replacement level of waste paper ash with cement by 15 %.
- b. It could be said that replacement of waste paper ash with cement improved the split tensile strength up to 4% for the replacement percentage of 15%.
- c. The compressive strength results of cubes and split tensile strengths of cylinder show that the optimum percentage of replacement of waste paper ash with that of cement was 15%
- d. The workability of concrete increases at all the percentage replacements containing 29% moisture content in waste paper ash.
- e. The first crack load was 45 KN for both sample concrete beams with 0 % replacement of waste paper ash. The first crack load was 50 KN for both sample concrete beams with 5 % replacement of waste paper ash. The first crack load was 50 and 55 KN for sample concrete beams with 10 % replacement of waste paper ash. The first crack load was 60 KN for both sample concrete beams with 15 % replacement of waste paper ash. The first crack load was 40KN for both sample concrete beams with 20 % replacement of waste paper ash.
- f. For higher replacement of waste paper ash in cement (greater than 15%) the compressive and split tensile strength decreases due to an increase of free water content in the mix.

Hence the mix proportion containing 15 % waste paper ash is the optimum mix that can be used for construction purposes.


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INTERNSHIP



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DEPARTMENT OF CIVIL ENGINEERING

INTERNSHIP DETAILS (2022-23)

S. N	REGISTER NO	NAME OF THE STUDENT	NAME OF THE COMPANY	LOCATION	DATE
	731219103002	ANILKUMAR BALDABOI	VJAI BUILDER Planners And Constructions	ER.R.VIJAY HIRETHTHIK 1B/3,B.A.S COMPLEXM,MARKET MAIN ROAD , ANTHIYUR CORNER, BHAVANI- 638301, ERODE DT	06.02.2023 TO 25.02.2023
	731219103003	DEBACHAND MUDULI			
	731220103001	DIVAKAR R			
	731221103301	SUSITHRA S			


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Internship

1 message

Thu Feb 02, 2023 at 2.00 pm

From: V.Mohanapriya<priyaharesh93@gmail.com>
Date :Thu Feb 02,2023 at 2.00 pm
Subject: Internship - reg
To: VJAI BUILDER<vijayinmass@gmail.com>

Dear SIR ,


I am requesting to be joining your **VJAI BUILDER**. The requirements are exactly what I have prepared for and hoped to do. I feel confident that I can make a significant contribution to your organization while at the same time learning from your staff.

Additionally, I shall complete all insurance forms for the new intern orientation. I look forward to working with you and your fine team. I appreciate your confidence in me and providing the chance to work with and observe your outstanding staff.

Ref: following the students: **ANILKUMAR BALDABOI, DEBACHAND MUDULI, DIVAKAR R, SUSITHRA S**

Sincerely,

Head Of the Department –(CIVIL),
JKK Munirajah College of Technology,
T.N.Palayam, Erode-638506, Tamilnadu.


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Internship

1 message

Sat 04 Feb ,2023 at 2.00 pm

From: **VJAI BUILDER** vijayinmass@gmail.com
Date: Sat 04 Feb ,2023 at 2.00 pm
Subject: Internship - reg
To: **V.Mohanapriya** <priyaharesh93@gmail.com>

Dear sir,

I am writing to confirm my acceptance of your internship offer of **06.02.2023 TO 25.02.2023** and to tell you how delighted I am to be joining your **VJAI BUILDER**. The requirements are exactly what I have prepared for and hoped to do. I feel confident that I can make a significant contribution to your organization while at the same time learning from your staff.

As we discussed, I will report at 8:00 a.m. on FEB 06 ,2023 and will be ready to take on my first assignment as an intern for your company. Additionally, I shall complete all insurance forms for the new intern orientation. I look forward to working with you and your fine team. I appreciate your confidence in me and providing the chance to work with and observe your outstanding staff.

Ref: following the students: (**ANILKUMAR BALDABOI, DEBACHAND MUDULI, DIVAKAR R, SUSITHRA S**)

Sincerely,

Er . R. VIJAY HIRETHTHIK
1B/3,B.A.S COMPLEX,MARKET MAIN ROAD ,
ANTHIYUR CORNER,
BHAVANI-638301, ERODE DT.


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VJai Builder

PLANNERS & CONSTRUCTIONS

Er.R.Vijay Hiraththik D.E (Civil)
vijayinmass@gmail.com

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(கட்டுமானம்)
கட்டுமானம்

We are doing multiple types of Commercial & Industrial Construction
Modern House Constructions & Promoting | Interior Designs | Exterior Designs



Date:25.02.2023

INTERNSHIP CERTIFICATE

This is to certify that **ANILKUMAR BALDABOI** Final year in Civil Engineering Register no. 731219103002 student of J.K.K Munirajah College of Technology at T.N Palayam, Gobi(T.K), Erode(Dt) – 638506 has undergone the inplant training in our concern, work site From **06.02.2023 to 25.02.2023**. His conduct and character was good during the training period.

For V-JAI BUILDER

P. Chinn Shoban
Proprietor.

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Er.R.Vijay Hireththik B.E (Civil)
vijayinmass@gmail.com

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(கட்டுமானம்)
மெட்ரோ கவுண்டி

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Date:25.02.2023

INTERNSHIP CERTIFICATE

This is to certify that **DEBACHAND MUDULI** Final year in Civil Engineering Register no. 731219103003 student of J.K.K Munirajah College of Technology at T.N Palayam, Gobi(T.K), Erode(Dt) – 638506 has undergone the inplant training in our concern, work site From 06.02.2023 to 25.02.2023. His conduct and character was good during the training period.

For V-JAI BUILDER

R. Ganesha Srinivasan
Proprietor.

[Signature]
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Vjai Builder

PLANNERS & CONSTRUCTIONS

Er.R.Vijay Hireththik B.E (Civil)
✉ vijayinmass@gmail.com

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Date : 25.02.2023

INTERNSHIP CERTIFICATE

This is to certify that **DIVAKAR R** Third year in Civil Engineering Register no. 731219103001 student of J.K.K Munirajah College of Technology at T.N Palayam, Gobi(T.K), Erode (Dt) – 638506 has undergone the inplant training in our concern, work site From **06.02.2023 to 25.02.2023**. His conduct and character was good during the training period.

For V-JAI BUILDER

R. Vijay Hireththik

Proprietor.

[Signature]

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Er. R. Vijay Hireththik B.E (CIVIL)
vijayinmass@gmail.com

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Date : 25.02.2023

INTERNSHIP CERTIFICATE

This is to certify that **SUSITHRA S** Second year in Civil Engineering Register no. 731219103001 student of J.K.K Munirajah College of Technology at T.N Palayam, Gobi(T.K), Erode (Dt) – 638506 has undergone the inplant training in our concern, work site From 06.02.2023 to 25.02.2023. Her conduct and character was good during the training period.

For V-JAI BUILDER

R. Vijay Hireththik

Proprietor.

[Signature]

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INDUSTRIAL VISIT DETAILS 2022-2023

S.N	REGISTER NUMBER	NAME OF THE STUDENT	DATE	NAME OF THE COMPANY	LOCATION
1	731219103002	ANIL KUMAR BALDABOI	09.12.2022	VJAY BUILDERS PLANNER AND CONSTRUCTION	Er.R.VijayHireththi k 1B/3,B.A.S Complexm,Market Main Road , Anthiyur Corner, Bhavani-638301, Erode Dt.
2	731219103003	DEBACHAND MUDULI			
3	731220103001	DIVAKAR R			
4	731221103301	SUSITHRA S			


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DEPARTMENT OF CIVIL ENGINEERING

Request Letter for Industrial Visit

02.12.2022,

From,

T.N.Palayam

Head of the Department,
Department of civil Engineering
JKK Munirajah College of Technology,
T.N.Palayam,
Erode-638506.

To,

Er.R.Vijay Hireththik
1B/3,B.A.S Complexm,Market Main Road ,
Anthiyur Corner,
Bhavani-638301, Erode Dt.

Sub: Request for permission to conduct an industrial visit at VJAY BUILDERS PLANNER AND CONSTRUCTION

Dear Sir,


On behalf of J.K.K Munirajah College Of Technology, I wish to request for permission to visit at VJAY Builders Planner And Construction . Our college is reputed at providing quality education in the various courses in J.K.K Munirajah College Of Technology, T.N Palayam.

We wish to undertake an industrial visit at VJAY Builders Planner And Construction on 09.12.2022 at 10.00 A.m Our academic curriculum focuses on engaging students in practical experiences to observe the implementation of what they are taught in college .

A group of 4 students in 2nd and 3 rd year and 2 faculty members intend to participate in this industrial visit. Please allow us to conduct an industrial visit to VJAY Builders Planner And Construction and meet your skilled employee. Thank you in advance.

Yours faithfully,

Head of the department
Department of civil Engineering,
J.K.K Munirajah College of Technology,
T.N.Palayam, Erode-638506


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09 May 2022

From

Er.R.Vijay Hireththik
1B/3,B.A.S Complexm,Market Main Road ,
Anthiyur Corner,
Bhavani-638301, Erode Dt.

To
Head of the Department,
Department of civil Engineering
JKK Munirajah College of Technology, T.N.Palayam,
Erode-638506.


Sub : Permission to conduct an industrial visit at VJAY BUILDERS PLANNER AND
CONSTRUCTION– Permission granted

Dear Sir,


With reference to your request letter, We are giving Permission for 4 Students with 2 Staff members of your college to visit our organization on 09.12.2022 between 10.00 AM To 01.00 PM. You are requested to arrange the Students with Valid ID card and Make Discipline for the time of Visit and wearing shoe for safety. Please note Camera / Mobile Phones are not allowed inside our power house.

Thanking you

yours sincerely,


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For V-JAI BUILDER


Proprietor.



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INDUSTRIAL VISIT – 2022-2023



PHOTO OF THE ADDITIONAL KNOWLEDGE GIVEN FROM EXPERIENCED PERSON



PHOTO OF VISIT AT CHENNIMALAI CONSTRUCTION PLOT AREA

[Handwritten Signature]
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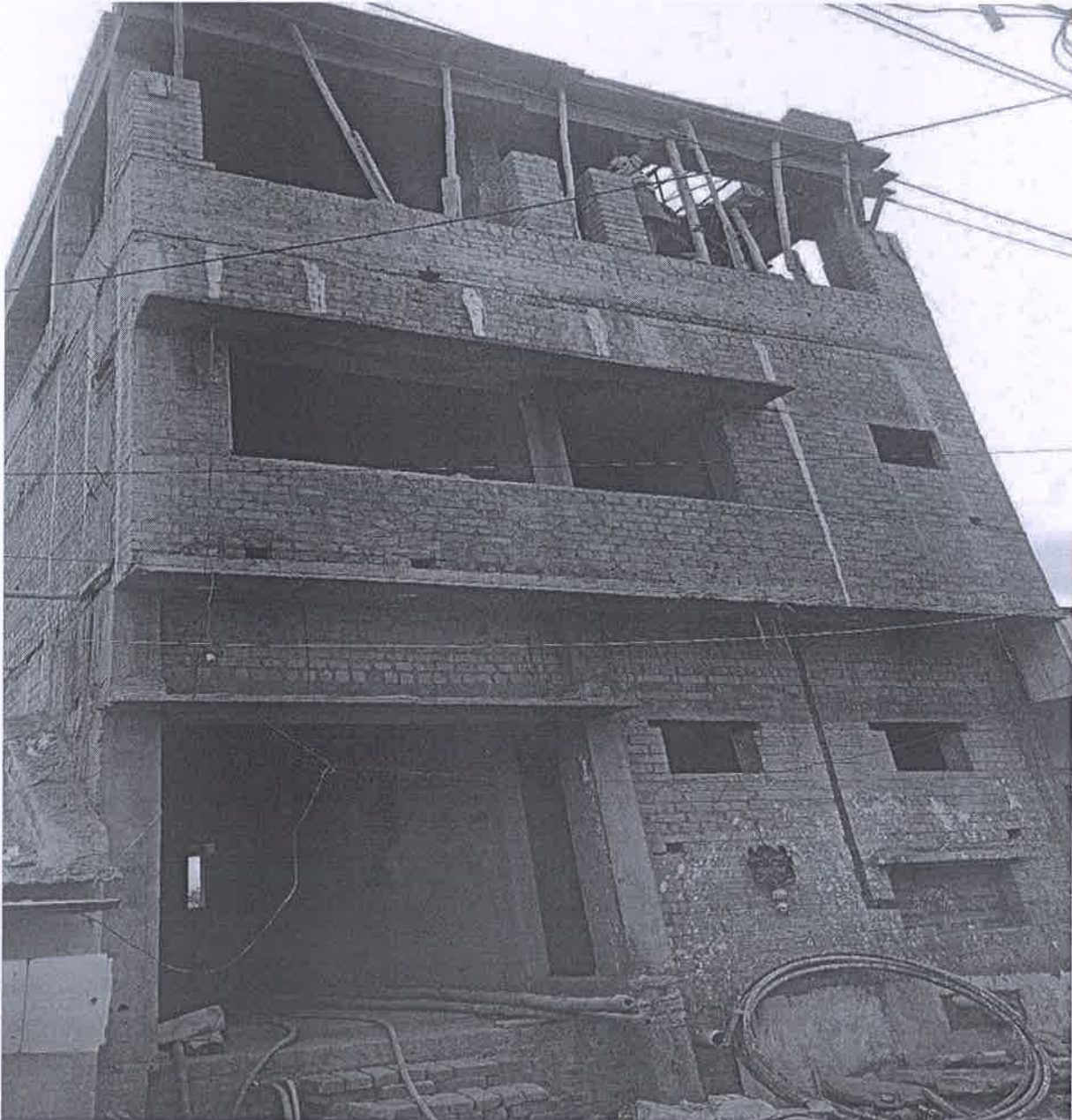


PHOTO OF RESIDENTIAL BUILDING IN ERODE

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PHOTO OF SITE VISIT OF CONSTRUCTION WORKING AREA