

GREEN BUILDING

A THESIS

Submitted by

**NARENDER SHARMA
(19PGCE01)**

*in partial fulfillment for the award of the degree
of*

MASTER OF TECHNOLOGY

IN

CIVIL ENGINEERING

With specialization in

Construction Technology and Management

Under the Supervision of

Mr. Deepak Kaushik
Assistant Professor



**DEPARTMENT OF CIVIL ENGINEERING
LINGAYA'S VIDYAPEETH
Faridabad – 121002, Haryana (India)
MAY 2021**



**Department of Civil Engineering
Lingaya's Vidyapeeth
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CERTIFICATE

This is to certify that the Thesis entitled “**GREEN BUILDING**”, submitted by **Mr. Narender Sharma bearing Roll no.: 19PGCE01** in partial fulfillment of the requirements for the award of **Master of Technology in Civil Engineering** with specialization in “**Construction Technology and Management**” during session 2020-2021 at Lingaya's Vidyapeeth, Faridabad, Haryana is an authentic work carried out by him under my supervision and guidance.

To the best of my knowledge, the matter embodied in the report has not been submitted to any other university/institute for the award of any Degree or Diploma.

Approved by

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Department of Civil Engineering**

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DECLARATION

I **Narender Sharma** bearing reg. no. **19PGCE01**, a student of **Master of Technology in Civil Engineering** with specialization in "**Construction Technology and Management**" during session 2020-2021 at Lingaya's Vidyapeeth, Faridabad, Haryana, hereby declare that the work presented in this report entitled "**GREEN BUILDING**" is the outcome of my own bonafide work and is correct to the best of my knowledge and this work has been undertaken taking care of Engineering Ethics. It contains no material previously published without referring or written by another person nor material which has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgment has been made in the text.

Date: NARENDER SHARMA
Roll. No.: 19PGCE01

ACKNOWLEDGEMENT

I would like to thank several individuals who in one way or another contributed and extended their help in preparation and completion of this study. My sincere thanks to **Mr. dAssistant Professor & HOD** whose motivation and guidance has been my inspiration in the completion of this research work. This research work would not have been possible without his help and the valuable time that he has given us amidst his busy schedule.

My utmost gratitude to **Mr. Alok Singh Kushwaha**, Former Dean, Lingaya's Vidyapeeth, Faridabad for providing necessary advice and co-operation throughout my study.

My sincere thanks to all my friends at Lingaya's Vidyapeeth, Faridabad for making my stay in the campus a pleasant one. The co-operation shown by them is worth noting.

Lastly, I would thank my parents and the almighty God for giving me support and courage throughout this study.

Narender Sharma

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M.Tech – Construction Technology and Management

ABSTRACT

GREEN BUILDING

Building a green building is not just a matter of assembling a collection of the latest green technologies or materials. Rather, it is a process in which every element of the design is first optimized and then the impact and interrelationship of various elements and systems within the building and site are evaluated, integrated and optimized as part of a whole building solution.

By blending the right mix of design and green technologies that cost less with green technologies that cost the same or slightly more, it is possible to have a very green building project that costs the same as a conventional one. Often the key to a cost effective green building and site design lies within the interrelationships and associated costs and performance tradeoffs that exist between different building systems. It is also paramount to separate the role of the different participants in ensuring that the building consumes minimal resources during its life cycle and that it poses a minimal threat to the environment by minimizing the ecological footprint.

The main aim of this project is to devise a comprehensive methodology to reduce the development footprint in buildings by introducing of green construction schemes in the construction practices.

Development Footprint is a relatively new avenue for research and its application in the Indian scenario is seen technology for the future considering the impetus on environment friendly practices of building construction and design

The study undertaken deals with :-

- Identification of various aspects pertaining to development footprint.
- Identification of various credit requirement related to development footprint.
- Assessment of the estimated footprint in terms of usable and unusable land.
- Identification of the alternatives in the construction process which help in reducing the development footprint.
- Estimation of development footprint of the given site in plan.

TECHNOLOGY OF PERI FORMWORK

A THESIS

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MASTER OF TECHNOLOGY

IN

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This is to certify that the Thesis entitled “**TECHNOLOGY OF PERI FORM WORK**”, submitted by **Mr. Vikrant Kumar bearing Roll no.: 19PGCE02** in partial fulfillment of the requirements for the award of **Master of Technology in Civil Engineering** with specialization in “**Construction Technology and Management**” during session 2020-2021 at Lingaya's Vidyapeeth, Faridabad, Haryana is an authentic work carried out by him under my supervision and guidance.

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ACKNOWLEDGEMENT

I would like to thank several individuals who in one way or another contributed and extended their help in preparation and completion of this study. My sincere thanks to **Mr. Deepak** Assistant Professor & HOD whose motivation and guidance has been my inspiration in the completion of this research work. This research work would not have been possible without his help and the valuable time that he has given us amidst his busy schedule.

My utmost gratitude to **Mr. Alok Singh Kushwaha**, Former Dean, Lingaya's Vidyapeeth, Faridabad for providing necessary advice and co-operation throughout my study.

My sincere thanks to all my friends at Lingaya's Vidyapeeth, Faridabad for making my stay in the campus a pleasant one. The co-operation shown by them is worth noting.

Lastly, I would thank my parents and the almighty God for giving me support and courage throughout this study.

Vikrant Kumar

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M.Tech – Construction Technology and Management

ABSTRACT

TECHNOLOGY OF PERI FORMWORK

PERI experts support the construction companies with an extensive range of services: from 3D planning and assembly of complex formwork units through to punctual deliveries and transparent billing.

On the basis of a 3D model, PERI engineers succeed in precisely tailoring project-specific formwork units of almost any shape in order to realise the ideas of the architect. Even before completion, planners can envisage the formwork solution for themselves with photo-realistic, moving and three-dimensional images. Moreover, the required on-site formwork assembly steps can also be visualized by animating the construction process. This ensures cost transparency and reliable calculations.

For every planning task, the engineers use as many system components as possible and therefore always find the most cost-effective way. Some projects can be realized by means of system formwork with individual special elements such as customized loose sheets, recess units in the floor, wall and ceiling or box-outs. For the construction of buildings that continually incline or have a curved design, however, unique special formwork is required.

The formwork sets are delivered punctually on the agreed date to the construction site ready-to-use and in the required quantity. PERI assembly and logistics staff coordinate capacity at the company's own formwork assembly facility on an on-going basis. This means that customers can also have large amounts of materials at very short notice.

All in all, the services also contribute to ensuring smooth and efficient construction even with difficult project requirements, and thus actively participate in the realization of today's architectural highlights.

**PERFORMANC OF CONCRETE TUNNEL
SYSTEM SUBJECT TO FAULT
DISPLACEMENT**

A THESIS

Submitted by

**NISHANT BHARDWAJ
(19PGCE03)**

*in partial fulfillment for the award of the degree
of*

MASTER OF TECHNOLOGY

**IN
CIVIL ENGINEERING**

With specialization in

Structural Engineering

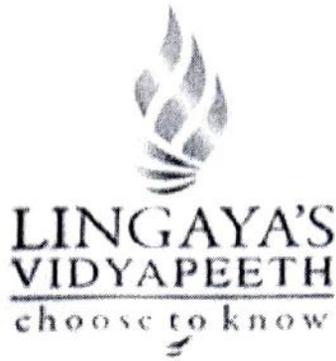
Under the Supervision of

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Department of Civil Engineering
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CERTIFICATE

This is to certify that the Thesis entitled “PERFORMANC OF CONCRETE TUNNEL SYSTEM SUBJECT TO FAULTDISPLACEMENT

”, submitted by Mr.Nishant Bhardwaj bearing Roll no.: 19PGCE03 in partial fulfillment of the requirements for the award of Master of Technology in Civil Engineering with specialization in “Structural Engineering” during session 2019-2021 at Lingaya's Vidyapeeth, Faridabad, Haryana is an authentic work carried out by him under my supervision and guidance.

To the best of my knowledge, the matter embodied in the report has not been submitted to any other university/institute for the award of any Degree or Diploma.

Approved by

Mr. Alok Kumar
Head of Department
Shailja Singh
Assistant Professor
SUPERVISOR
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I Nishant Bhardwaj bearing reg. no. 19PGCE03, a student of Master of Technology in Civil Engineering with specialization in "Structural Engineering" during session 2019- 2021 at Lingaya's Vidyapeeth, Faridabad, Haryana, hereby declare that the work presented in this report entitled "Performance of Concrete Tunnel System subject to fault displacement

" is the outcome of my own bonafide work and is correct to the best of my knowledge and this work has been undertaken taking care of Engineering Ethics.

It contains no material previously published without referring or written by another person nor material which has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgment has been made in the text.

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ACKNOWLEDGEMENT

I would like to thank several individuals who in one way or another contributed and extended their help in preparation and completion of this study. My sincere thanks to **Ms. Shailja Singh** Assistant Professor & HOD(Mr. Alok singh) whose motivation and guidance has been my inspiration in the completion of this research work. This research work would not have been possible without his help and the valuable time that he has given us amidst his busy schedule.

My utmost gratitude to **Dr. Sitesh Kumar Singh**, Former Dean, Lingaya's Vidyapeeth, Faridabad for providing necessary advice and co-operation throughout my study.

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Lastly, I would thank my parents and the almighty God for giving me support and courage throughout this study.

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M.Tech – Strutural Engineering

ABSTRACT

PERFORMANCE OF CONCRETE TUNNEL SYSTEMS SUBJECT TO FAULT DISPLACEMENT

A Finite Element Analysis (FEA) investigation of concrete tunnel systems traversing seismic faults is carried out to determine how to effectively mitigate the stresses induced in the liner when subject to fault displacement. A parametric study of various fault parameters, both in the damage zone and competent rock, is carried out to determine the site conditions which induce the most stress on the tunnel liner system. Results indicate that friction angle, cohesion, and elastic modulus of fault zones have varying effects on the stresses induced on the liner. The width of damage zone and expected displacements are also investigated and it has been shown that even small displacements over narrow damage zones, around 10 m, can still result in significant damage to the concrete liner whereas in wider damage zones the effects of the displacement are more evident. The use of flexible joints in what is known as the articulated design method is investigated to mitigate the stresses induced by fault displacement and discussed. Several orientations, lengths and variations in relative stiffness of these flexible joints are investigated to determine their optimal effectiveness. Results show that this is an effective solution which can be used in design and repair of tunnels to mitigate the stresses and resulting damages to concrete tunnel liners subject to fault displacement.

Steel Fiber Reinforced Concrete

A THESIS

Submitted by

**Deepak Bhati
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MASTER OF TECHNOLOGY

IN

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With specialization in

Structural Engineering

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Shahbaz Akram
Assistant Professor



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This is to certify that the Thesis entitled “Steel Fiber Reinforced concrete”, submitted by Mr. Deepak Bhati bearing Roll no.: 19PGCE04 in partial fulfillment of the requirements for the award of Master of Technology in Civil Engineering with specialization in “Structural Engineering” during session 2020-2021 at Lingaya's Vidyapeeth, Faridabad, Haryana is an authentic work carried out by him under my supervision and guidance.

To the best of my knowledge, the matter embodied in the report has not been submitted to any other university/institute for the award of any Degree.

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I Deepak Bhati bearing Reg No. 19PGCE04 , a student of Master of Technology in Civil Engineering with specialization in “Structural Engineering” during session 2017-2018 at Lingaya’s Vidyapeeth, Faridabad, Haryana, hereby declare that the work presented in this report entitled “Steel fiber reinforced concrete” is the outcome of my own bonafide work and is correct to the best of my knowledge and this work has been undertaken taking care of Engineering Ethics.

It contains no material previously published without referring or written by another person nor material which has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgment has been made in the text.

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ACKNOWLEDGEMENT

I would like to thank several individuals who in one way or another contributed and extended their help in preparation and completion of this study. My sincere thanks to **Shahbaz Akram** Assistant Professor & HOD whose motivation and guidance has been my inspiration in the completion of this research work. This research work would not have been possible without his help and the valuable time that he has given us amidst his busy schedule.

My utmost gratitude to **Shahbaz Akram** Former Dean, Lingaya's Vidyapeeth, Faridabad for providing necessary advice and co-operation throughout my study.

My sincere thanks to all my friends at Lingaya's Vidyapeeth, Faridabad for making my stay in the campus a pleasant one. The co-operation shown by them is worth noting.

Lastly, I would thank my parents and the almighty God for giving me support and courage throughout this study.

Student Name – Deepak Bhati

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M.Tech – Structural Engineering

ABSTRACT

Steel fiber Reinforced Concrete

The various aspects covered are the materials, mix proportioning for M20, M25, M30, M40 grades of concrete. As the concrete is weak in tension, a work has been carried out to investigate the improvement in tensile, shear, flexure, and even compressive strength of concrete and also to investigate the cracking strength and reserve strength of concrete & FRC. M20, M25, M30, M40 grades of concrete have been added to investigate the compressive strength, tensile strength & shear strength of concrete. Steel fibers acts as a bridge to retard their cracks propagation, and improve several characteristics and properties of the concrete. Fibers are known to significantly affect the workability of concrete. The aspect ratio (50) and variable in this study were percentage of volume fraction (0, 0.5, 1.0 and 1.5) of steel fibers. Compressive strength, splitting tensile strength and flexural strength of the concrete were determined for the hardened properties. Their main purpose is to increase the energy absorption capacity and toughness of the material. But also the increase in tensile and flexural strength is often the primary objective. A marginal improvement in the ultimate strength was observed. The addition of fiber enhanced the ductility significantly.

Key Words:

**ANALYSIS OF BUILDING COLLAPSE
UNDER BLAST LOAD**

A THESIS

SUBMITTED BY

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**IN PARTIAL FULFILLMENT FOR THE AWARD THE DEGREE
OF**

**MASTER OF TECHNOLOGY
IN
CIVIL ENGINEERING**

With Specialization In

STRUCTURAL ENGINEERING

UNDER SUPERVISION OF

**MR. SHAHBAZ AKRAM
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This is to certify that the work titled '**ANALYSIS OF BUILDING COLLAPSE UNDER BLAST LOAD**', submitted by '**Mr. Hari Shankar Verma**', in partial fulfilment of the requirements for the award of "**Master Of Technology in Civil Engineering**" with specialization in "**Structural Engineering**" during the session 2019-2021 at **Lingaya,s Vidyapeeth**, Faridabad, Haryana in an authentic work carried out by him under my supervision and guidance.

To the best of my knowledge, the matter embodied in the report has been submitted to any other university/institute for the award of any degree or diploma.

Approved By

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Date: May 22, 2021

HARI SHANKAR VERMA
Reg. No.:

ACKNOWLEDGEMENT

The successful completion of this project is not an individual effort. This section is a vote of thanks and gratitude towards all those who have contributed in their own special way towards the successful completion of this project.

First and foremost, I feel extremely exhilarated to express my sincere gratitude to the esteemed supervisor(s) **Mr. Shabaz Akram, Department of civil engineering**, who right from the inception constantly guided the project with his pastoral care, vision, vigilance, and encouragement without which this project would not have been possible. My profound thanks are due to them.

I am also thankful to **Mr. R.K Singh** Professor, Lingaya's Vidhyapeeth, Faridabad for valuable suggestions and kind cooperation as and when required during the course of this work.

I am thankful to teaching and non-teaching staff of Civil Engineering department, and the people who helped me directly or indirectly for the success of this work.

Above all, I thank to the almighty who gave me all the courage and strength to carry out this project work.

Hari Shankar Verma

Place:
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ABSTRACT

A bomb explosion within or immediately nearby a building can cause **catastrophic damage** on the building's external and internal structural frames, collapsing of walls, blowing out of large expanses of windows, and shutting down of critical life-safety systems. Loss of life and injuries to occupants can result from many causes, including direct blast-effects, structural collapse, fire, and smoke. In addition, major catastrophes resulting from blast loading result in large dynamic loads, greater than the original design loads, of many structures. Due to the threat from such extreme loading conditions, efforts have been made during the past three decades to develop methods of structural analysis and design to resist blast loads. Studies were conducted on the behavior of structural concrete subjected to blast loads. These studies gradually enhanced the understanding of the role that structural details play in affecting the behavior.

Structural behavior during an explosion depends entirely on the materials used in the construction of the building. Upon **hitting the face of a building**, the shock front from an explosion is instantly reflected. This impact with the structure **imparts momentum** to exterior components of the building. The associated kinetic energy of the moving components must be absorbed or dissipated in order for them to survive. Generally, this is achieved by converting the kinetic energy of the moving component to strain energy in resisting elements. Typically the resisting elements, such as windows, building facades and support columns fail, causing partial damage through to **progressive collapse** of the building

**“FOR THE SUSTAINABLE ENVIRONMENT AND INCREASE THE
TRENTH, USE OF FIBRE WAST AS COMPLEMENT IN CONCRETE”**

A THESIS

Submitted by

RAHUL KUMAR TAYAL

*In partial fulfillment for the award of the degree
of*

MASTER OF TECHNOLOGY

IN

CIVIL ENGINEERING

With specialization in

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**LINGAYA'S
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Under The Guidance of
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CERTIFICATE

This is to certify that the Thesis entitled “FOR THE SUSTAINABLE ENVIRONMENT AND INCREASE THE STRENGTH, USE OF FIBRE WAST AS COMPLEMENT IN CONCRETE”, submitted by Mr. Rahul Kumar Tayal bearing Reg. no.:19PGCE06 in partial fulfillment of the requirements for the award of Master of Technology in Civil Engineering with specialization in “Structural Engineering” during session 2019-2021 at Lingaya's Vidyapeeth, Faridabad, Haryana is an authentic work carried out by him under my supervision and guidance. To the best of my knowledge, the matter embodied in the report has not been submitted to any other university/institute for the award of any Degree or Diploma.

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DECLARATION

*I Mahesh Kumar bearing reg. no. 19PGCE06, a student of Master of Technology in Civil Engineering with specialization in “Structural Engineering” during session 2017-2018 at Lingaya’s Vidyapeeth, Faridabad, Haryana, hereby declare that the work presented in this report entitled “**For The Sustainable Environment and Increase The Strength use of Fiber waste as Complement in concrete**” is the outcome of my own bonafide work and is correct to the best of my knowledge and this work has been undertaken taking care of Engineering Ethics.*

It contains no material previously published without referring or written by another person nor material which has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgment has been made in the text.

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Rahul Kumar Tayal
Reg. No.: 19PGCE06

ACKNOWLEDGEMENT

I would like to thank several individuals who in one way or another contributed and extended their help in preparation and completion of this study. My sincere thanks to **Mr. Deepak Kaushik** Assistant Professor whose motivation and guidance has been my inspiration in the completion of this research work. This research work would not have been possible without his help and the valuable time that he has given us amidst his busy schedule.

My Utmost gratitude to **Alok Kushwaha, H.O.D**, Lingay's Vidyapeeth, Faridabad for providing necessary advice and co-operation throughout my study.

My sincere thanks to all my friends at Lingay's Vidyapeeth, Faridabad for making my stay in the campus a pleasant one. The co-operation shown by them is worth noting.

Lastly I would thank my parents and the almighty God for giving me support and courage throughout this study.

RAHUL KUMAR TAYAL

Reg.No.19PGCE06

M.Tech – Structural Engineering

ABSTRACT

“FOR THE SUSTAINABLE ENVIRONMENT AND INCREASE THE STRENGTH, USE OF FIBER WASTE AS COMPLEMENT IN CONCRETE”

One of the many challenges faced in developing world is the issue of waste management. Organic fibers forms major percentage of waste produced from agricultural products and should be of great concern. Fibers have been used to reinforce composites concrete to obtain lighter weight, reduce shrinkage effects which serve to reduce environmental waste. Natural fiber is 100% bio-degradable and recyclable, thereby eliminate pollution, promote biodiversity and conservation of natural resources and thus environmentally friendly. This paper focuses on

Utilization of some fibers as solid wastes for making economically-friendly and affordable green environment. Three fibers: Jute, Oil palm and Polypropylene fibers were used as complement in concrete and its suitability, durability and influence on the properties of concrete were assessed. The percentages of fiber used were 0.25 and 0.5 of cement content by weight. A total of 84 concrete cube specimens were prepared for standard tests which included compression test, slump test and compaction factor test. The compression test was carried out at concrete

Ages of 7, 14, 21 and 28 days. As the percentage of the fiber increases, the tendency for fiber to ball up becomes higher in water. The test results showed that for Jute and Oil palm fibers, the optimum fiber content was 0.25% and for Polypropylene fiber, the optimum fiber content was 0.5%. They all yielded increase in strength when compared to the control specimen and has proven to reduce reasonable environmental waste pollution.

So we using polypropylene micro fiber for increase the Strength of the concrete. It is also help full to Increase the sustainability of the environment waste management.

Keywords: Environmental Pollution, Fiber, Concrete strength, Jute, Polypropylene Waste reduction.

**“STRENGTH CHARACTERISTICS OF FIBER REINFORCED
COMPACTED POND ASH”**

A THESIS

Submitted by

VARUN AGGARWAL

*In partial fulfillment for the award of the degree
of*

MASTER OF TECHNOLOGY

IN

CIVIL ENGINEERING

With specialization in

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Under The Guidance of
Shailja Singh
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Department of Civil Engineering
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This is to certify that the Thesis entitled “STRENGTH CHARACTERISTICS OF FIBER REINFORCED COMPACTED POND ASH” submitted by Varun aggareal bearing Reg. no.:19PGCE07 in partial fulfillment of the requirements for the award of Master of Technology in Civil Engineering with specialization in “Structural Engineering” during session 2019-2021 at Lingaya's Vidyapeeth, Faridabad, Haryana is an authentic work carried out by him under my supervision and guidance.

To the best of my knowledge, the matter embodied in the report has not been submitted to any other university/institute for the award of any Degree or Diploma.

Shailja Singh

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I Varun Aggarwal bearing reg. no. 19PGCE07, a student of Master of Technology in Civil Engineering with specialization in “Structural Engineering” during session 2019-2021 at Lingaya's Vidyapeeth, Faridabad, Haryana, hereby declare that the work presented in this report entitled “Strength Characteristics of Fiber Reinforced Compacted Pond Ash” is the outcome of my own bonafide work and is correct to the best of my knowledge and this work has been undertaken taking care of Engineering Ethics.

It contains no material previously published without referring or written by another person nor material which has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgment has been made in the text.

Date:

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ACKNOWLEDGEMENT

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M.Tech – Structural Engineering

ABSTRACT

“STRENGTH CHARACTERISTICS OF FIBER REINFORCED COMPACTED POND ASH”

At present around 130 million tons of debris is being created every year from the coal based nuclear energy stations in India. The force necessities of the nation are quickly expanding in pace with in modern turns of events. Almost, 73% of India's absolute introduced power age limit is warm of which coal based age are almost 90% (by diesel, wind, gas and steam adding about 10%). Indian coal gives 35 to 45% ash which is responsible for large volumes of pond ash. Construction of huge debris removal regions brings about resettlement issues and loss of farming creation, brushing area and territory just as other hand use impacts from redirection of large areas of land to waste disposal. The current practice in the majority of the force plants is to utilize huge debris lakes, and almost 75,000 sections of land of land is by and by involved by debris lakes at times more than 80,000 sections of land, which as a rule includes resettlement issues. Since, land possessions are regularly little in size; a huge debris lake advancement can cause difficulties through loss of land-based resource and job for in a real sense a huge number of individuals..

Thinking about these components, successful usage of lake debris in geo-specialized developments as a substitution to ordinary earth materials needs uncommon consideration. The innate strength of the compacted lake debris mass lessens impressively because of immersion. In this setting to improve and hold the strength of compacted lake debris, establishing specialists like concrete or lime might be especially helpful. The pressure strain conduct of compacted lake debris mass can be changed by incorporation of fiber fortifications. Fiber fortifications additionally improve the strength qualities of the mass. Although, the use of reinforced earth materials has been widely

Investigation on Effect of Glass Powder And Quarry Stone On Brick.

A THESIS

Submitted by

**Mohit Gautam
(19PGCE10)**

*in partial fulfillment for the award of the degree
of*

MASTER OF TECHNOLOGY

IN

CIVIL ENGINEERING

With specialization in

Construction Technology & Management.

Under the Supervision of

Dr.Sitesh Singh
Assistant Professor



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Faridabad – 121002, Haryana (India)
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This is to certify that the Thesis entitled "Investigation on Effect of Glass Powder And Quarry Stone On Brick.", submitted by Mr.Mohit Gautam bearing Roll no.: 19PGCE10 in partial fulfillment of the requirements for the award of Master of Technology in Civil Engineering with specialization in "Construction Technology & Management.

" during session 2017-2018 at Lingaya's Vidyapeeth, Faridabad, Haryana is an authentic work carried out by him under my supervision and guidance.To the best of my knowledge, the matter embodied in the report has not been submitted to any other university/institute for the award of any Degree or Diploma.

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It contains no material previously published without referring or written by another person nor material which has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgment has been made in the text.

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ACKNOWLEDGEMENT

I would like to thank several individuals who in one way or another contributed and extended their help in preparation and completion of this study. My sincere thanks to **Ms.Shailja singh** Assistant Professor & HOD whose motivation and guidance has been my inspiration in the completion of this research work. This research work would not have been possible without his help and the valuable time that he has given us amidst his busy schedule.

My utmost gratitude to **Dr. Sitesh Kumar Singh** ,Former Dean, Lingaya's Vidyapeeth, Faridabad for providing necessary advice and co-operation throughout my study.

My sincere thanks to all my friends at Lingaya's Vidyapeeth, Faridabad for making my stay in the campus a pleasant one. The co-operation shown by them is worth noting.

Lastly, I would thank my parents and the almighty God for giving me support and courage throughout this study.

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M.Tech – *Construction technology & Management*

ABSTRACT

"Investigation on effect of Glass Powder and quarry stone on Brick

Clay brick manufacturing is a field which necessitate a lot of firing processes requiring higher temperature which can be maintained by large amount of fuel in the form of wood, coal, bio-mass and so on need to be burnt in the kiln causing significant issues of air pollution. Furthermore, as the increase in the number of industries coming up, large amount of un-disposable waste gets assembled. It may pollute the water bodies through runoff, If suitable remedies are not embraced for its safe disposal. This project is basically to put an effort to making the whole process environmental friendly by reducing the brick firing temperature in the kiln to about 600 °C and by reducing the production cost. This project shall put forward a suitable alternative for the safe disposal of industrial debris like quarry dust and glass powder by incorporating them as a partial substitute for river sand which is costly constituent of clay brick and thereby further reducing the cost of production.

The feasibility of using waste material as a brick body was investigated, where several possible waste additives, including slag, biological waste, and waste container glass, were considered. Recent studies was conducted in order to assimilate past work and experimental results. The results of testing programs were compared and in the addition of waste additives to bricks was discussed. Due to its amorphous glassy structure, soda content, availability and waste glass was determined to be a feasible option for addition. The specimens with glass additions exhibited an increase in compressive and flexural strength, a decrease in the initial rate of absorption, and an increase in firing shrinkage. The determination of feasibility of adding slag or biological waste to bricks was hindered by a lack of comparable data; however, the limited comparison available suggested the necessity for additional, directly comparable testing programs. As a result, an experimental program was developed to determine potential benefits in terms of strength, absorption, and durability of bricks associated with the addition of waste glass, as well as economic and environmental gains as a result of the process.

PREFABRICATION STRUCTURE

A THESIS

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ACKNOWLEDGEMENT

I would like to thank several individuals who in one way or another contributed and extended their help in preparation and completion of this study. My sincere thanks to **SHAILJA SINGH** Assistant Professor whose motivation and guidance has been my inspiration in the completion of this research work. This research work would not have been possible without his help and the valuable time that he has given us amidst his busy schedule.

My utmost gratitude to **ALOK SINGH KUSHWAHA** , HOD Lingaya's Vidyapeeth, Faridabad for providing necessary advice and co-operation throughout my study.

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Lastly, I would thank my parents and the almighty God for giving me support and courage throughout this study.

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M.Tech – CONSTRUCTION TECHNOLOGY AND MANAGEMENT

CONCRETE MIX DESIGN

A THESIS

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ACKNOWLEDGEMENT

I would like to thank several individuals who in one way or another contributed and extended their help in preparation and completion of this study. My sincere thanks to **Mr. Alok Singh Kushwaha** HOD whose motivation and guidance has been my inspiration in the completion of this research work. This research work would not have been possible without his help and the valuable time that he has given us amidst his busy schedule.

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Lastly, I would thank my parents and the almighty God for giving me support and courage throughout this study.

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M.Tech – Transportation Engineering

ABSTRACT

The method of concrete mix design consists of selection of optimum proportions of ingredients is Cement , Water, fine and coarse aggregate and admixture if needed to produce concrete of specified properties such as strength , workability , durability etc as economically as possible . The compressive strength of hardened concrete which is generally considered to be an index of its other properties , depends upon many factors that is quality and quantity of cement water and aggregates , batching and mixing , placing compaction and curing . The cost of concrete is made up of the cost of materials plant and labour . The variations in the cost of materials arise from the fact that the cement is several time costly than the aggregate , thus the aim is to produce as lean mix.

The proportions of concrete mix are obtained by experimentally evolved relationship between the factors in the choice of mix design . It provides reasonably accurate guidelines to arrive at an optimum proportions of ingredients . The preliminary trail mixes are made and checked. Further suitable adjustments are made and process is repeated until the satisfactory proportions of ingredients are achieved , which possess specified properties both in fresh and hardened states with maximum overall economy

CERTIFICATE

This is to certify that the Thesis entitled “**A REVIEW OF SOME OF THE FACTORS LEADING TO CONSTRUCTION PROJECT DELAYS**”, submitted by Mr. MANISH SHARMA bearing 19PGCE15 in partial fulfillment of the requirements for the award of Master of Technology in Civil Engineering with specialization in “**CONSTRUCTION MANAGEMENT**” during session 2019-2021 at Lingaya’s Vidyapeeth, Faridabad, Haryana is an authentic work carried out by him under my supervision and guidance.

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ACKNOWLEDGEMENT

I would like to thank several individuals who in one way or another contributed and extended their help in preparation and completion of this study. My sincere thanks to Mrs. Shailja Mam Assistant Professor whose motivation and guidance has been my inspiration in the completion of this research work. This research work would not have been possible without her help and the valuable time that she has given us amidst her busy schedule. My sincere thanks to all my friends at Lingaya's Vidyapeeth, Faridabad for making my stay in the campus a pleasant one. The co-operation shown by them is worth noting.

Lastly, I would thank my parents and the almighty God for giving me support and courage throughout this study.

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M.Tech – CONSTRUCTION MANAGEMENT

ABSTRACT

A construction project is successful only if the target(s) is/are achieved as per schedule and following the baseline to the core. Any variations from these can be called a delay. Thus, delay in construction project is a situation in which the project cannot be completed within a planned time. Any delay is an expense to all the parties involved in the completion of a particular project. As a result, these may often end up in clashes between parties, arbitration or litigation and in certain cases can lead to the total abandonment of project. This is a common issue faced all over the world. There are several factors attributed to delay. The scenario grabs more attention in the case of high-rise buildings. Due to the rapid boom in construction industry, confinement of land and more stringent rules on floor space index and parking provisions, builders/developers are forced to go for basements as an alternative for parking and other services. This paper tries to identify the various factors attributed to delay of high rise building construction and effects of these. The research methodology includes literature review and questionnaire survey. The data was analyzed using relativity index method and multiple regression analysis. Based on the analysis of the data obtained from the survey, it was concluded that the most agreeable practical factors affecting the delay of high rise construction and the corrective measures required for reducing the delay. Same methodology is also adopted for identifying the effects of delay, time and cost over-run being the most common and methods to reduce these. The project progress of a project in nearby locations is also tracked using MS-Project to identify the impact of delay on timeline. An analysis of these delay are then carried out.

Keywords— Construction delay, Cost over-run, Effects of delay, High rises, Time over-run

A DETAILED STUDY ON SELF COMPACTING CONCRETE

A THESIS

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ACKNOWLEDGEMENT

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Lastly, I would thank my parents and the almighty God for giving me support and courage throughout this study.

Student Name : JATIN GAUR

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MTech : Transportation Engineering

ABSTRACT

STUDY OF SELF COMPACTING CONCRETE

Due to the ever-increasing quantities of waste materials and industrial by products, one of the biggest difficulties confronting all nations throughout the world is their disposal. Waste materials and industrial byproducts come in a variety of forms. Some of these may be useful. The use of such ingredients in self-compacting concrete (SCC) reduces the cost of the product while also helping to solve the disposal problem. Fly ash is one of the industrial byproducts produced when coal is burned in thermal power plants. Foundry sand, obtained from the ferrous and nonferrous metal casting industries, is another by product that has been effectively employed as a land infill material. However, due to the rapid rise in disposal costs, land filling with fly ash and foundry sand is becoming an issue. As a result, the current study investigates the use of fly ash and foundry sand as a substitute for cement and fine aggregate. Pozzolanic concretes are widely used around the world, particularly in the oil, gas, nuclear, and power industries. The use of such concretes is growing every day due to their higher structural performance, environmental friendliness, and energy-saving implications. Apart from the ordinary risk of fire, these types of concretes are exposed to high temperatures for long periods of time in the above sectors. Concrete is generally thought to be a fire-resistant material, although high temperatures cause considerable damage. Chemical change of gel decreases matrix bonding at high temperatures, resulting in a loss of strength in fly ash concrete.

Fly ash is a material that can be added to concrete to improve its strength and longevity. Fly ash can also be used as an admixture, a partial substitute for cement or fine aggregates, or a complete replacement for fine aggregates, as well as a supplementary addition to achieve various concrete qualities.

Experimental tests of SCC mixes' strength qualities (compressive strength, splitting tensile strength, and modulus of elasticity, mass loss, and porosity) and permeability (rapid chloride permeability) at higher temperatures up to 300°C were carried out in this study. Fine aggregate was substituted with 10% foundry sand by weight, and cement was substituted with three percentages of fly ash (0 percent, 30 percent, 40 percent, and 50 percent). There were four SCC mixes created (SCC1, SCC2, SCC3, and SCC4). The control mix (SCC1) was created without the addition of fly ash or foundry sand. SCC2 was made using 30% fly ash and 10% foundry sand, SCC3 was made with 40% fly ash and 10% foundry sand, and SCC4 was made with 50% fly ash and 10% foundry sand. Each SCC mixture's specimens were

A STUDY ON SEDIMENTS OF RIVER IN CONCRETE

A THESIS

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MASTER OF TECHNOLOGY

IN

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With specialization in

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Under the Supervision of

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Assistant Professor



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This is to certify that the Thesis entitled "SEDIMENTS OF RIVER IN CONCRETE", submitted by Mr. HITESH KUMAR bearing Roll no19PGCE17 in partial fulfillment of the requirements for the award of Master of Technology in Civil Engineering with specialization in "Structure Engineering" during session 2019-2021 at Lingaya's Vidyapeeth, Faridabad, Haryana is an authentic work carried out by him under my supervision and guidance.

To the best of my knowledge, the matter embodied in the report has not been submitted to any other university/institute for the award of any Degree or Diploma.

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It contains no material previously published without referring or written by another person nor material which has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgment has been made in the text.

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ACKNOWLEDGEMENT

I would like to thank several individuals who in one way or another contributed and extended their help in preparation and completion of this study. My sincere thanks to **Mr. Shahbaz Akram** Assistant Professor & HOD whose motivation and guidance has been my inspiration in the completion of this research work. This research work would not have been possible without his help and the valuable time that he has given us amidst his busy schedule.

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Lastly, I would thank my parents and the almighty God for giving me support and courage throughout this study.

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M.Tech – Structure Engineering

ABSTRACT

The method of concrete mix design consists of selection of optimum proportions of ingredients is Cement, Water, fine and coarse aggregate and admixture if needed to produce concrete of specified properties such as strength, workability, durability etc. as economically as possible. The compressive strength of hardened concrete which is generally considered to be an index of its other properties depends upon many factors that are quality and quantity of cement water and aggregates, batching and mixing, placing compaction and curing. The cost of concrete is made up of the cost of materials plant and labour. The variations in the cost of materials arise from the fact that the cement is several times costly than the aggregate, thus the aim is to produce as lean mix. The proportions of concrete mix are obtained by experimentally evolved relationship between the factors in the choice of mix design. It provides reasonably accurate guidelines to arrive at an optimum proportion of ingredients. The preliminary trial mixes are made and checked. Further suitable adjustments are made and process is repeated until the satisfactory proportions of ingredients are achieved, which possess specified properties both in fresh and hardened states with maximum overall economy.