IMPROVEMENT OF CONCRETE USING WASTE GLASS POWDER, COCONUT SHELL AND FLY ASH

Project Report submitted,

In partial fulfilment of the requirements of the degree of

Bachelor of Technology

In

CIVIL ENGINEERING

School Of Engineering & Technology

By

Aditya Godyal

Under the Supervision of

Mr. Rishabh Arora (Asst. Prof)

SOET

K R MANGALAM UNIVERSITY, GURUGRAM, HARYANA, INDIA

December,2023

Registrar
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Sohna Road. Gurugram (Haryana)

CERTIFICATE

It is certified that the work contained in the project report titled "**IMPREOVEMENT OF CONCRETE USING OF WASTE GLASS POWDER, COCONUT SHELL AND FLY ASH,**" by the following students:

Name of the Student	Roll Number
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has been carried out under my/our supervision and this work has not been submitted elsewhere for a degree.

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DECLARATION

I declare that this written submission represents my ideas in my own words and where others' ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. I understand that any violation of the above will cause disciplinary action by the Institute and can also invoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

Aditya Godyal 1901050002

Date: 09/06/23

ACKNOWLEDGEMENT

It gives me immense pleasure to express my deepest sense of gratitude and sincere thanks to my highly respected and esteemed guide **Mr. Rishabh...Arora,** for his/their valuable guidance, encouragement and help for completing this work. His/Their useful suggestions for this whole work and co-operative behavior are sincerely acknowledged.

I would like to express my sincere thanks to **Mr. Rishabh Arora, Mr. harish Soni** KRMU for giving me this opportunity to undertake this project. I would also like to thank you for your wholehearted support.

I also wish to express my gratitude to ...**My Parents**... for his kindhearted support. I am also grateful to my teachers **Mr. Shivam and Mr. Rupesh** for their constant support and guidance.

I also wish to express my indebtedness to my parents as well as my family member whose blessings and support always helped me to face the challenges ahead.

At the end I would like to express my sincere thanks to all my friends and others who helped me directly or indirectly during this project work.

Place: Gurgaon, Haryana

Student Name: Aditya Godyal

Date: 09/06/23

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CHAPTER 1: INTRODUCTION

GENERAL

Concrete is an artificial composite material, the word concrete comes from the Latin word "concretus" (meaning compact or condensed), the perfect passive participle of "concrescere", from "con-" (together) and "crescere" (to grow), comprising a matrix of cementitious binder (typically Portland cement paste or asphalt) and a dispersed phase or "filler" of aggregate (typically a rocky material, loose stones, and sand). The binder "glues" the filler together to form a synthetic conglomerate. Many types of concrete are available, determined by the formulations of binders and the types of aggregate used to suit the application of the engineered material. These variables determine strength and density, as well as chemical and thermal resistance of the finished product.

When aggregate is mixed with dry Portland cement and water, the mixture forms a fluid slurry that is easily poured and molded into shape. The cement reacts with the water through a process called concrete hydration that hardens over several hours to form a hard matrix that binds the materials together into a durable stone-like material that has many uses. This time allows concrete to not only be cast in forms, but also to have a variety of tooled processes performed. The hydration process is exothermic, which means ambient temperature plays a significant role in how long it takes concrete to set. Often, additives are included in the mixture to improve the physical properties of the wet mix, delay or accelerate the curing time, or otherwise change the finished material.

Admixtures are added to modify the cure rate or properties of the material. Mineral admixtures use recycled materials as concrete ingredients. Conspicuous materials include fly ash, a by-product of coal-fired power plants; ground granulated blast furnace slag, a by-product of steelmaking; and silica fume, a by-product of industrial electric arc furnaces. For settlement and bleeding resistance purpose, small quantity of gas forming admixtures which is generally 0.5 to 2% by weight of cement is used. But for making light weight concrete larger quantity generally 100 grams per bag of cement is recommended.

The compressive strength of concrete can be increased by:

- Including admixtures.
- Adjusting the cement type and quantity.
- Reducing the water/cement ratio.
- Utilizing supplementary cementitious materials (SCMs)
- Altering the aggregates - type and gradations.

ADMIXTURES

Admixtures are ingredients that are added to the concrete batch immediately before or during mixing. They confer certain beneficial effects to concrete, including frost resistance, sulfate resistance, controlled setting and hardening, improved workability, increased strength, etc. Admixtures offer high workability, high compressive strength, durability, watertight, wear resistant,

STEEL LATTICE TOWER

Project report submitted

In partial fulfillment of the requirement for the degree of

Bachelor of Technology

in

Civil Engineering

By

PREJWAL KAUSHIK(1601050006)

Under the guidance of

Mr. Manish Kumar

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Department of Civil Engineering

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November-2019

DECLARATION

I declare that this written submission represents my ideas in my own words and where other's ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all the principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. I understand that any violation of the above will because for disciplinary action by the Institute and canal so evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed. I further declare that if any violation of the intellectual property right or copyright, my supervisor and university should not be held responsible for the same.

PREJWAL

(Prejwal Kaushik) (1601050006) (Signature)

Place:- KR MU

Date:- 30/11/19

CERTIFICATE

It is certified that the work contained in the project report titled "**STEEL LATTICE TOWER**" by the following student:

Prejwal Kaushik **1601050006**

has been carried out under our supervision and that this work has not been submitted elsewhere for a degree.

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Date: - 30/11/19

Place: - KRMU

ACKNOWLEDGEMENT

"Enthusiasm is the feet of all progress, with it there is accomplishment and Without it there are only slits alibis."

Acknowledgment is not a ritual but is certainly an important thing for the successful completion of the project. At the time when we were made to know about the project, it was really tough to proceed further as I were to develop the same on a platform, which was new to us. More so, the Designing part seemed tricky that it seemed to be impossible for me to complete the work within the given duration.

I really feel indebted in acknowledging the organizational support and encouragement received from the university.

The task of designing this tower would not have been possible without the constant help of our faculty members and friends. I take this opportunity to express our profound sense of gratitude and respect to those who helped us throughout the duration of this project.

I express our gratitude to our supervisor Mr. Rishabh Arora for giving their valuable time and guidance to us.

Place: -

Date:- 30/11/19

Prejwal Kaushik

B. Tech(CE)

ABSTRACT

In this project, the design of steel lattice tower prescribed for Microwave antenna by the categorized gravity and lateral loads will be studied and analyzed for the employment of the project. The analysis will be done by taking different combination of loads and then the design will be come into picture using the code module IS 800:1984 and wind load will be calculated using code module IS 875:1987 . The present work describes the analysis and design of transmission line tower of 60 meter height viz. various parameters. In design of tower for weight optimization some parameters are considered such as; base width, height of tower, outline of tower. The tower members will design as angle section. The desired safety factors has to be actuated contemplating the selected location i.e. Agra. The various factors including environmental and materials used for the structure is also be considered.

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Chapter 1: INTRODUCTION

1.1INTRODUCTION

A steel tower is a tall structure, usually a steel lattice tower, used to support an overhead power line, Dish antenna or for observations. A Steel Lattice tower or truss tower is a freestanding framework tower. Typical height ranges from 15 to 55 m though the tallest are the 370 m towers. In addition to steel, other materials may be used, including concrete and wood. They can be used as transmission towers or as an observation tower. In communication network towers play a significant role hence failure of such structure in a disaster is a major concern. Therefore utmost importance should be given in considering all possible extreme conditions for designing these towers. In most of the studies, the researchers have considered the effect of wind only on the four legged self-supporting towers. In this project, a four legged lattice tower is analyzed. A lattice tower is usually assembled at the location where it is to be erected. This makes very tall towers possible; up to 100 m. Assembly of lattice steel towers can be done using a crane. Lattice steel towers are generally made of angle-profiled steel beams (L-or T-beams). For very tall towers, trusses are often used. Towers may be self-supporting and capable of resisting all forces due to conductor loads, unbalanced conductors, wind and ice in any direction. Such towers often have approximately square bases and usually four points of contact with the ground.

A semi-flexible tower is designed so that it can use overhead grounding wires to transfer mechanical load to adjacent structures, if a phase conductor breaks and the structure is subject to unbalanced loads. This type is useful at extra-high voltages, where phase conductors are bundled (two or more wires per phase). It is unlikely for all of them to break at once, barring a catastrophic crash or storm.

A guyed mast has a very small footprint and relies on guy wires in tension to support the structure and any unbalanced tension load from the conductors. A guyed tower can be made in a V shape, which saves weight and cost.

Before transmission towers are even erected, prototype towers are tested at tower testing stations. There are a variety of ways they can then be assembled and erected. They can be assembled horizontally on the ground and erected by push-pull cable. This method is rarely used because of the large assembly area needed. A jinn pole crane can be used to assemble lattice towers. This is also used for utility poles; Helicopters can serve as aerial cranes for their assembly in areas with limited accessibility. Towers can also be assembled elsewhere and flown to their place on the transmission right-of-way. Helicopters may also be used for transporting disassembled towers for scrapping.