STUDY OF SUSTAINABLE CONCRETE WITH BASALT ROCK FIBRES AND RECYCLED AGGREGATES

A DISSERTATION

Submitted by

ANUSHA B M
(20192BCT0003)

In partial fulfillment for the award of the degree

of

MASTER OF TECHNOLOGY

in

BUILDING CONSTRUCTION TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING
SCHOOL OF ENGINEERING

Under the Guidance of

Dr. NAKUL RAMANNA

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ACKNOWLEDGEMENT

For completing this dissertation work, I have received support and guidance from many people whom I would like to mention with deep sense of gratitude and indebtedness.

I would like to sincerely thank my guide Dr Nakul Ramanna, Head of Department (HOD), Department of Civil Engineering, Presidency University, for his invaluable guidance, motivation and keen interest throughout my dissertation work.

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Last but not the least, I wholeheartedly thank my family and friends for their constant encouragement and support without which the work would not have been complete.

Anusha B M

ABSTRACT

"Study of sustainable concrete with Basalt Rock Fibres and Recycled Aggregates"

Concrete is one of the world's most widely used construction material. However, it has been known that concrete is good in compression and weak in tension. Weak tensile strength combined with brittle behaviour of concrete, results in sudden tensile failure without warning. This type of failure is not desirable for any construction material. Thus, concrete requires some form of tensile reinforcement to compensate its brittle behaviour and improve its tensile strength and strain capacity to be used in structural applications. Steel has been widely used as the material of choice for tensile reinforcement in concrete. Conventionally, reinforcing bars, which are specifically designed, are placed in the tensile zone of the concrete member to carry the tensile forces imposed on the member. Apart from the conventional reinforcing bars fibres can also be used for tensile reinforcement in concrete. In the 1950s, the concept of composite materials came into being and fiber-reinforced concrete was one of the topics of interest. As years passed steel, glass, and synthetic (such as polypropylene) fibres were used in concrete. Basalt rock is a volcanic rock and can be divided into small particles which are used to make continuous or chopped fibres. Basalt rock fibres have higher tensile strength as compared to steel fibres. Utilization of fibres in concrete results in better crack control and improvement in compressive strength and flexural strength.

This research deals with development of sustainable fibre reinforced concrete using basalt rock fibres, PPC and M-Sand. Inclusion of recycled concrete aggregates for partial replacement of coarse aggregates Study of effect of basalt rock fibres on compressive strength, flexural strength and split tensile strength of concrete sample. Ultrasonic pulse velocity test (NDT) has also been used for qualitative assessment of Basalt rock fibre reinforced concrete.

DELAY ANALYSIS IN RESIDENTIAL PROJECTS USING PRIMAVERA

A DISSERTATION

Submitted by

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JINI KRISHNAPRIYA V A

ABSTRACT

DELAY ANALYSIS IN RESIDENTIAL PROJECTS USING PRIMAVERA

Delay can be define as a situation when the actual schedule of a construction project is slower than the planned schedule. In construction, the delay can be defined as the extra time required or incurred either beyond the stipulated completion date or beyond the date that the project stakeholders agreed upon for the completion of the project [1]. Project Scheduling and delay analysis is the important a part of any project for completion of the project within the estimated time and cost. Nowadays there are so many computer software are available in market doing project management. MSP, Primavera p6 etc are the computer software available in market for doing project management [2]. With the help of these software proper planning and scheduling of project can be done. This study involves comparison of planned schedule and actual schedule of residential project using Primavera-P6.In this study online survey conducted among various site engineers, consultants and contractors. This project has intended to identify the causes of delays, the effects of delays and develop a comparative study of planned schedule and actual schedule. This project mainly focus on the residential building constructions in Thrissur district, Kerala.

EFFECT OF MAGNETIC WATER ON PROPERTIES OF CONCRETE

A DISSERTATION

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Mekhala R

ACRONYMS

Acrynoms	Meaning
W	Watt
UPV	Ultra Sonic Pulse Velocity
MWC	Magnetic Water Concrete
NWC	Normal Water Concrete
MFTW	Magnetic field treated water
$MW2_2$	Magnetic water magnetized for 2 days with 2 magnets
$MW2_4$	Magnetic water magnetized for 4 days with 2 magnets
$MW2_6$	Magnetic water magnetized for 6 days with 2 magnets
$MW2_2$	Magnetic water magnetized for 2 days with 4 magnets
$MW4_4$	Magnetic water magnetized for 4 days with 4 magnets
$MW4_6$	Magnetic water magnetized for 6 days with 4 magnets
$MW8_2$	Magnetic water magnetized for 2 days with 8 magnets
$MW8_4$	Magnetic water magnetized for 4 days with 8 magnets
$MW8_6$	Magnetic water magnetized for 6 days with 8 magnets

ABSTRACT

"Effect of magnetic water on properties of concrete"

In this research study, the effect of magnetized water on workability, Compressive strength, tensile strength and flexural strength of concrete was studied. Data's were collected from previous studies. The magnetized water was prepared using 6000 gauss magnets in the plastic container with varying number of magnets in water pump of 15W. Concrete mixes were prepared by using magnetic water and also with normal tap water for comparison of strength and workability.

Workability tests, destructive tests and non-destructive tests were carried out on all the mixes and it was found that concrete produced by the magnetic water is easy to operate without affecting the strength of concrete. It was also found that magnetized water increases the compression strength, flexural strength and split tensile strength when compared to conventional concrete. The best results for compression strength, flexural strength, split tensile strength was best with eight magnets and six days magnetization.

REDUCING INITIAL EMBODIED ENERGY OF A BUILDING

A DISSERTATION

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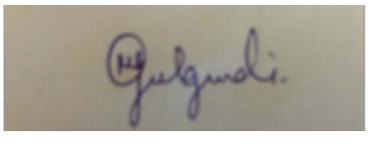

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Safa Rizwanulla Sheriff

ABSTRACT

The development of the construction industry has led to an increase of carbon emissions into the atmosphere. Due to the increasing population the need for development would require more energy from the earth's resources. Therefore it is necessary to plan, design and construct buildings with minimum environmental impact. One way to achieve this is to reduce the embodied energy during the construction phase of a building. In this study the initial embodied energy of four storey residential building is calculated and compared with four different buildings to identify the major contributors of embodied energy in the construction phase. The total initial embodied energy of a four storey residential building of RCC framed structure with pile foundation is found to be 5164.1 GJ. The building materials account for 91% of the initial embodied energy. Methods for reducing embodied energy by altering the building envelope, type of slab/roof and concrete mix is suggested. Steel and cement are found to be the major contributors of embodied energy. Eco-friendly buildings can be designed by analysing various building materials and construction types for low initial embodied energy.