VISVESVARAYA TECHNOLOGICAL UNIVERSITY

Jnana Sangama, Belgaum -590014

KSCST SPONSORED PROJECT

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PROJECT REPORT

ON

"CHARACTERISATION OF POND ASH FROM RTPS AND ASSESMENT OF ITS PROPERTIES FOR SUSTAINABLE CONCRETE WHEN USED AS FINE AGGEREGATE"

Submitted in partial fulfillment of the requirements for the award of degree of

BACHELOR OF ENGINEERING

IN

CIVIL ENGINEERING

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SYNOPSIS

Coal ash is a by-product generated from the process of coal combustion, at a high temperature of over 1600°C at the coal fired power plants. Fly ash is the one of the numerous substances that causes air, water and soil pollution, disrupt, ecological cycles and set off environmental hazards. The combustion of powdered coal in thermal power plants produces fly ash. The high temperature of burning coal turns the clay minerals present in the coal powder into fused fine particles mainly comprising aluminum silicate. Fly ash produced thus possesses both ceramic and pozzolana cement properties.

When pulverized coal is burn to generate heat, the residue contains 80 percentage fly ash and 20 percentage bottom ash. The ash is carried away by fuel gas collected at economizer, a pre heater and ESP hoppers bellow the boiler is called bottom ash.

This can be divided into fly ash and bottom ash. Uncollected finer and coarser particles of fly ash and bottom ash are mixed with water and pumped out in slurry form to large pond and hence known as pond ash.

The World Bank has cautioned India that by 2015, disposal of coal ash would require 1000 square kilometers or one square meter of land per person. Since coal currently accounts for 70 percent of power production in the country, the Bank has highlighted the need for new and innovative methods for reducing impacts on the environment.

The objectives of the project is to study the characteristics and properties of the pond ash in sustainable concrete when used as fine aggregates and other related works by conducting test as per relevant code of practice, so that

- Pond ash supplements shortage of Fine Aggregate (River sand).
- Reduce the demand for disposal of thermal power plant waste.
- Reduces environmental impact of thermal power plant waste.
- Proper utilization of waste in construction industry.

In this experimental study, we have considered 1:1.6:2.5 (cement: fine aggregate: coarse aggregate) with this concrete, we will be able to find out, if the supplementary materials like pond ash, fly ash can classified as fine aggregate. Post this, based on the results obtained here we can continue studies for the other ratios.

During experiment, concrete cubes are cast for M30 grade of concrete for different proportion of pond ash as sand replacement. The size of specimen to be cast is (150*150*150) mm. The testing of compressive strength of specimen of each mix at curing period of 1 day, 3 day, 7 day, 28 day as per IS516-1967 reaff 1999 is conducted and values compared with standard values.

The chapter division of this report reflects the work carried out in this investigation.

Chapter 1 gives brief introduction to pond ash, fly ash and concrete.

Chapter 2 summarizes the literature survey carried out on the earlier studies conducted on various aspects of Pond ash and Fly ash

Chapter 3 presents the aim and scope of the present investigation.

Chapter 4 condenses the details of characteristics of materials used in concrete such as cement, fly ash, pond ash, coarse aggregate, fine aggregate and admixtures) and different mixes of concrete consider for study.

Chapter 5 deals with the details of experimental programmed consisting of material testing, specimen casting, curing, instrumentation, test setup and test procedure as per codal procedures.

Chapter 6 presents the test results of this investigation and discusses about parameters contributing/affecting the compressive strength of concrete. Also condenses the above discussion in to rational conclusion.

Chapter 7 provides the details of scope for future investigation.