VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

A PROJECT REPORT ON

"EXPERIMENTAL STUDY ON COMPRESSION AND TENSILE STRENGTH OF LIGHT WEIGHT CONCRETE USING PERLITE"

Submitted in partial fulfillment for the award of Degree of

BACHELOR OF ENGINEERING

IN

CIVIL ENGINEERING

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CERTIFICATE

This is to certify that the project entitled **"EXPERIMENTAL STUDY ON COMPRESSION AND TENSILE STRENGTH OF LIGHT WEIGHT CONCRETE USING PERLITE"** has been successfully completed by

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the bonafide students of **DEPARTMENT OF CIVIL ENGINEERING, ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY** of the **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI** during the year 2018–2019. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of Project work prescribed for the Bachelor of Engineering Degree.

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ABSTRACT

Structural Lightweight Concrete is generally made by using artificial lightweight aggregates such as expanded clay, shale and slate. However, rapidly increasing fuel prices in recent decades and corresponding increase in the production costs of these aggregates have renewed the interest in natural lightweight aggregates such as pumice, scoria, rhyolite and perlite. This study investigates the mechanical properties and durability characteristics of lightweight concretes utilizing natural perlite aggregate in comparison to those of normal weight concrete of similar specific strength (structural efficiency). For this purpose, four concrete mixtures have been designed namely M1 (normal weight concrete with river sand as fine aggregate), M2 (normal weight concrete with M-sand or Robo sand as fine aggregate), M3 (normal weight concrete with partial replacement of cement by GGBS) and M4 (Perlite concrete by partially replacing of Perlite with sand as a percentage of 5%, 10% and 15%). For structural application of lightweight concrete, the density is more important than the strength. A low density for the same strength level reduces the self-weight, foundation size and construction costs. An extensive testing program was conducted on concrete specimens to determine fresh properties such as unit weight and setting time; hardened properties such as compressive strength, split tensile strength. The results have shown that natural perlite aggregate and perlite powder can be satisfactorily utilized in the production of lightweight concrete with 28-day compressive strengths up to 50 MPa.

Key words: Perlite aggregate, Compressive strength, Split tensile strength