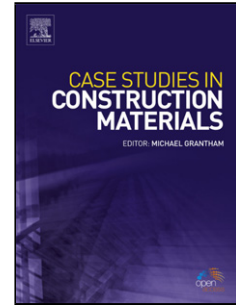


Accepted Manuscript

Title: Mix design and Properties of fly ash waste light weight aggregates in structural light weight concrete

Authors: Manu S. Nadesan, P. Dinakar

PII: S2214-5095(17)30104-3
DOI: <https://doi.org/10.1016/j.cscm.2017.09.005>
Reference: CSCM 119



To appear in:

Received date: 22-5-2017
Revised date: 14-8-2017
Accepted date: 27-9-2017

Please cite this article as: Nadesan Manu S, Dinakar P. Mix design and Properties of fly ash waste light weight aggregates in structural light weight concrete. *Case Studies in Construction Materials* <https://doi.org/10.1016/j.cscm.2017.09.005>

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Mix design and Properties of fly ash waste light weight aggregates in structural light weight concrete

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Research Highlights

- Structural light weight concrete containing sintered fly ash light weight aggregates were produced.
- All the concretes have densities less than 2000 kg/m³
- A new mix design methodology was proposed and has the capability to produce compressive strength up to 70 MPa.
- The obtained properties are quite satisfactory and are suitable for structural applications

Abstract

Concrete is one of the most widely used construction materials and has the ability to consume industrial wastes in high volume. As the demand for concrete is increasing, one of the effective ways to reduce the undesirable environmental impact of the concrete is by the use of waste and by-product materials as cement and aggregate substitutes in concrete. One such waste material is fly ash, which is produced in large quantities from thermal power plants as a by-product. A Substantial amount of fly ash is left unused posing environmental and storage problems. The production of sintered lightweight aggregate with fly ash is an effective method to dispose of fly ash in large quantities. Due to lack of a proper mix design procedure, the production and application of lightweight aggregate in structural concrete are not much entertained. The absorption characteristic of lightweight aggregate is a major concern, while developing the mix proportioning of lightweight concretes. The present study is an attempt to establish a new mix design procedure for the development of sintered fly ash lightweight aggregate concretes, which is simple and more reliable than the existing procedures. Also, the proposed methodology has been validated by developing a spectrum of concretes having water cement ratios varying from 0.25 to 0.75. From the study, it is obvious that the development of

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