



OPTIMIZATION OF DURABILITY BY TRI-BLEND CONCRETE MIXES CONTAINING FLYASH, SILICA FUME AND GROUND GRANULATED BLAST FURNACE SLAG POWDER (GGBS)

By

Omar Hussein Abd El- Ghany Hussein

A Thesis Submitted to the
Faculty of Engineering at Cairo University
In Partial Fulfillment of the
Requirements for the Degree of
MASTER OF SCIENCE
In
Structural Engineering

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Under the Supervision of

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Title of Thesis:

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BLAST FURNACE SLAG POWDER (GGBS)

Key Words:

Concrete's Durability; Permeability; Potential Alkali-Silica Reactivity; Petro
graphical Examination; Fly ash.

Summary:

The concrete is the most used material in construction field, concrete has an advantage from another material use in building as it has durability with time and the most thing effect in durability is permeability; No concrete structure is absolutely waterproof. In this research five mixtures with different percentage of supplementary cementing material are developed. Concrete mix containing cement replacement of 40 % GGBS and 10% silica fume lead to increasing compressive strength from 350 kg/cm² to 800 Kg/cm². In addition to permeability reduction (as measured by DIN test) from 18 mm to 5 mm.

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