EFFECT OF GYPSUM ON THE COMPRESSIVE STRENGTH OF CEMENT

A PROJECT REPORT PRESENTED BY

K B K SANJEEWA

to the Board of Study in Physics of the

POSTGRADUATE INSTITUTE OF SCIENCE

In partial fulfilment of the requirement
for the award of the degree of

MASTER OF SCIENCE IN PHYSICS OF MATERIALS

of the

UNIVERSITY OF PERADENIYA
SRI LANKA
2011

EFFECT OF GYPSUM ON THE COMPRESSIVE STRENGTH OF CEMENT

K B K Sanjeewa
Postgraduate Institute of Science
University of Peradeniya
Peradeniya
Sri Lanka

Abstract

Gypsum ($CaSO_4 \cdot 2H_2O$) has been ground into cement in small percentage (0 - 10%) to regulate its setting time. It prevents flash setting and makes the concrete workable for hours. The gypsum influences not only the setting but also other properties of cement such as grindability, sensitivity to storage, volume stability and strength.

Experimental investigation was conducted on strength variation of Cement for different gypsum amounts. For this purpose, a number of experiments were performed on several cement samples of Ordinary Portland Cement (OPC) and Portland Limestone Cement (PLC) manufactured from same clinker.

Cement mortar for compressive strength was prepared and tested as per SLS ISO 679: 2008. Percentage of gypsum (as SO_3) and other chemical compound present in the cements were determined by using X-ray fluorescence (XRF) analysis. In addition, phase formation of cement and hydrated cement was studied by using X-ray powder diffraction (XRD) analysis.

The average values of test results obtained in this research were recorded and analysed. The experimental results show that the strength varies with the increment of gypsum. It was revealed that the optimum SO_3 content for OPC is about 1.7 % and for PLC is about 1.6 %.