THESIS TITLE : A STUDY OF BASIC PROPERTIES OF HIGH PERFORMANCE

CONCRETE CONTAINING FLY ASH

AUTHOR   : MR.JIRAT BUNJONGSIRI

THESIS ADVISORY COMMITTEE :

.... Chairman

(Assoc.Prof.Dr.Prinya Chindaprasirt)

.... Member

(Asst.Prof.Piti Angsuwotai)

ABSTRACT

The Objective of this research was to study the basic properties of high performance concrete containing fly ash using 7.5 and 10 % paste overfill. In this study different workabilities of the concrete viz. slump, slump flow, DIN flow table, flow time T-50 and T-stop; and filling ability by using L-apparatus and reverse slump cone, compressive strength and modulus of elasticity. Were tested.

From the test of concrete containing portland cement with fly ash at the proportion of 100:0, 70:30, 60:40, 50:50 and 2% superplasticizer at the water to cement ratio of 0.26 and 0.30, it is formded that the slump test cannot be used for measuring workability since the HPC was too fluid and the slump was over the limit i.e. 20 cm.. The DIN flow table could not be used with HPC because the DIN flow table was too small. In the T- 50 test, normal HPC would flowout slowly to 50 cm. diameter. The approximate optimum range of flow time as from 8.8-11.5 seconds as propose by Somnuk and Bui Khanh Van. The filling ability of HPC should be satisfactory if more than 75% of HPC passed L-apparatus, but with reverse slump cone 100% of HPC mixture should get through. Although the filling ability was within the limit, but it is neccessary that HPC must have slump flow diameter and time needed for T-50 within the optimum range as well in order to control rate of deformation and prevent segregation between paste and aggregate.

From the compressive strength test of concrete, It was found that the incorporation of fly ash decreased the initial compressive strength of concrete, This decrease was more with an increase in fly ash. However the compressive strength at the later stage increased due to pozzolanic activity of fly ash could result is higher than normal concrete. Modulus of elasticity of HPC correlate directly with the compressive strength. Equation $E_C = W^{1.5} 4720 \sqrt{f'_C}$ can be used to accurately predict the modulus of elasticity.