Thesis Title	Use of Coarse Fly Ash to Produce Portland Pozzolan Cement
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Candidate	Mr.Wanchai Boorapa
Supervisors	Assoc. Prof. Dr. Virote Boonamunayvitaya
	Assoc. Prof. Dr. Chai Jaturapitakkul
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Abstract

In this study, coarse fly ash from Mae Moh power plant which had low pozzolanic reaction was used to produce Portland pozzolan cement. Fly ash was classified into fine and coarse fractions by air classifier. The coarse fly ash with specific surface area of 962 cm^2/g was mixed with clinker or Portland cement type I and ground together to produce Portland pozzolan cements. The replacements of coarse fly ash to clinker or Portland cement type I of 0, 15, 35 and 50% with the various specific surface area of 3250, 3850, 4450 and 5050 cm^2/g were investigated. Physical and chemical properties of the cements were tested. Compressive strength of 5x5x5 cm^3 mortars made from both Portland pozzolan cements were determined at the curing age of 1, 3, 7, 14, 28, 60 and 90 days. Setting times of cement pastes and flow of mortars were also tested. The compressive strengths of the mortars from Portland cement type I and Portland pozzolan cements were compared.

It was found that Portland pozzolan cement obtained from grinding clinker with coarse fly ash has similar properties to that of Portland pozzolan cement from grinding Portland cement type I with coarse fly ash. Portland pozzolan cement with 35% of coarse fly ash with the specific surface area of 4450 cm^2/g has the properties similar to those of Portland cement type I. It was also found that the grinding power and grinding time were 2.3 and 1.9 times higher than those of Portland cement type I. However, the total energy used to produce cements was lower about 27% as compare to that of Portland cement type I. The compressive

strength of mortar made from Portland pozzolan cement from interground at early ages was higher than that of mortar made from mixing Portland cement type I and fly ash because interground increased the specific surface area of some particle size of cement, thus increased rate of reaction.

Keywords : Coarse Fly Ash / Portland Pozzolan Cement / Compressive Strength / Clinker