Chutchavan Visitanupong 2009: Durability of Fly Ash Based Geopolymer Mortar. Master of Engineering (Civil Engineering), Major Field: Civil Engineering, Department of Civil Engineering. Thesis Advisor: Associate Professor Prasert Suwanvitaya, Ph.D. 102 pages.

The purpose of this study is to assess the durability of fly ash based geopolymer mortar in adverse environments. The attacking conditions were sulfuric acid, acetic acid, sodium and magnesium sulfate solutions, chloride solution and carbonation atmosphere. Mechanical properties were weight change and compressive strength. The effects of exposure to attacking agents on the microstructures were studied by using scanning electron microscopy. The variable parameters were 6M, 10M and 14M sodium hydroxide used in producing geopolymer, exposed to 1%, 3% and 5% sulfuric acid, 1%, 3% and 5%acetic acid, saturated sodium sulfate, saturated magnesium sulfate and 5% chloride solution, 7% carbon dioxide atmosphere.

From the experiment results, 14 M sodium hydroxide yielded geopolymer mortar was the most resistant to acids and to sulfate attacks. As for rapid chloride test, carbonation permeation test and chloride penetration test, they showed that OPC mortar was more resistant than geopolymer mortar group.

_____ _____ ___ / ___ / ___

Student's signature Thesis Advisor's signature