

Ei Ei Mon 2011: Effects of Myanmar Volcanic Ash on Portland Cement Concrete Pavement. Master of Engineering (Civil Engineering), Major Field: Civil Engineering, Department of Civil Engineering. Thesis Advisor: Associate Professor Chavalek Vanichavetin, Ph.D. 117 pages.

Use of pozzolan substantially reduces cement requirement in construction leading to better economy and less environmentally adverse impact. But the utilization of Myanmar volcanic ash is still limited due to the lack of understanding of the characteristics of volcanic ash itself and the properties of concrete containing volcanic ash. Effects of pozzolan on properties of concrete vary with pozzolan type and volume. In this study, effects of Myanmar volcanic ash on Portland Cement Concrete Pavement (PCCP) were investigated. Twelve concrete mixes were produced in three levels (0.5, 0.55 and 0.6) of water to binder ratio (w/b) and four levels (0%, 15%, 30% and 45%) of cement replacement with volcanic ash by weight. Specimens were subjected to compressive strength, flexural strength and Los Angeles abrasion tests. Test results showed that optimum percent replacement of cement with volcanic ash was 15% for pavement. The compressive strength, flexural strength and abrasion resistance of volcanic ash concrete were slightly lower than the control concrete. Microstructures were examined using Scanning Electron Microscope (SEM), Mercury Intrusion Porosimetry (MIP) and X-ray diffraction (XRD) analysis. Eight mortar mixes in four levels of cement replacement with volcanic ash and fly ash were mixed to get 100% flow. The water demand of fly ash was lower than volcanic ash and compressive strength of fly ash mortar was higher than that of volcanic ash mortar at early age. The results showed that the strengths of concrete with volcanic ash were correlated well with pore volume.

---

Student's signature

---

Thesis Advisor's signature