

CHEMICAL STABILIZATION OF SARAWAK CLAY SOIL WITH CLASS F FLY ASH

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Abstract

Chemical stabilization of Sarawak clay soil was studied via Fly Ash (FA) due to their potential benefit. FA is a by-product produced from thermal power plant and disposal of FA causing an environmental hazard. Investigation on the feasibility of FA as a potential stabilizer to stabilize the Sarawak clay soils was performed via Unconfined Compression Strength (UCS) and Triaxial Consolidated Isotropic Undrained (CIU). From the compaction results, the Maximum Dry Density (MDD) and the Optimum Moisture Content (OMC) for all mixtures increased and decreased respectively compared to natural soil. Based on the UCS test, the addition of 20% FA and 40% FA achieved a significant improvement in compressive strength and recommended as optimum stabilizer amount. The plasticity index and linear shrinkage for the FA stabilized soil decreased compared to the natural soil. The triaxial test was performed for the optimum amount of stabilizer and obtained significant improvement in effective cohesion and effective internal friction angle compared to natural soil. The deviator stress for FA stabilized soil also increased compared to the natural soil corresponding to the confining pressure. The morphology of stabilized soil shows the existence of cementitious product, which contributed to strength increased as observed via Scanning Electron Microscopy (SEM).

Keywords: Fly Ash, SEM, Soil Stabilization, Triaxial, UCS.