



Laboratory Study on Mass Stabilization using Lime and Cement Binders on Tropical Peat

Youventharan Duraisamy¹, Khairul Anuar Arsat², Tonny Gindal²

1- Lecturer, Universiti Malaysia Pahang

2- Research Assistant, Universiti Malaysia Pahang

youventharan@ump.edu.my

khairulanuar_kama@hotmail.com

tonnygindal@yahoo.com

Abstract

A research has been carried out on the effects of lime and cement binders in Tropical Peat. It was focused on the improvement of shear strength and compressibility of tropical peat. Laboratory work simulating the mass stabilization method was carried out by mixing the soil with lime and cement in different proportions. Binders were mixed in dosage rate of 150 kg/m³, 200 kg/m³, and 250 kg/m³ and allowed to cure for 7, 14 and 28 days under 18 kPa of pressure. Samples were then tested with unconfined compressive strength test. Results obtained were compared with the parameters from the unstabilized peat.

Keywords: Mass Stabilization, Preloading Method, Shear Strength, Tropical Peat.

1. INTRODUCTION

Peat is one of the most problematic soils when it comes to construction in tropical countries like Malaysia. It has high natural water content, low undrained shear strength and is highly compressible. Earlier construction always focused on hard soil as to avoid any construction problems from occurring. Nowadays research on peat is increasing as construction on peat is unavoidable.

This research was carried out in Pekan, Pahang at the East coast of Peninsular Malaysia as to compare the parameters obtained with the peat from West coast of Peninsular Malaysia. Little information on the peat of east coast of Peninsular Malaysia is available at present making it difficult for developers and engineers to plan and design suitable foundations and often ends up with method that is not economical.

Mass stabilization method is found to be cheap and suggested as one of the cost effective way to construct light weight structure. At present this method is less popular than preloading method among developers because it is yet to be proven effective in peat.

The classification of Pekan peat and its properties will update and improve the present data and information on tropical peat in Malaysia.

2. LITERATURE REVIEW

The literature review comprises on the classification and engineering properties of west coast of Peninsular Malaysia peat. The parameter of Pekan peat was then compared with the literature review after peat was stabilized with lime and cement. Five locations were chosen from previous research done by Al-Raziqi et al. (2003), Yulindasari (2007), Y. Duraisamy et al. (2007), W. L. Sing et al. (2008) and A. Alwi (2008) at various locations in west and south coast of Peninsular Malaysia.

Table 1: Peat classification and identification guide [1]

FVS	FC		OC	MC	SG	Mackintosh Probe
2 – 18 (kPa)	Fibric Peat	> 66%	≥75%	≥100%	1.00 – 1.80	0 to 10 blows every 300 mm
	Hemic Peat	33 – 66%				
	Sapric Peat	< 33%				