

The Effect of Physical and Engineering Properties of Stabilization of Burnt Tropical Lowland Peat in the Banting Area, Selangor

AZLAN SHAH NERWAN SHAH¹, MOHAMAD TARMIZI MOHAMAD ZULKIFLEY¹
& ROSLAN HASHIM²

¹Department of Geology, Faculty of Science, University of Malaya, Kuala Lumpur, Malaysia

²Department of Civil Engineering, Faculty of Engineering, University of Malaya, Kuala Lumpur, Malaysia

Peat soil is a representative material of soil and well known as highly organic, high compressibility and low shear strength. These soil occur in many countries and formed naturally the decomposition of plant and animal matter. When prolonged drought occur peatlands become dry and can become a tinderbox resulting in fires. When peat forest fires happen, it leads to burn soil and also humic acids as a dominant organic matter contained in peat soil as well as the forest. The impact of the peat fire on peat soil from Banting, Selangor Peninsular Malaysia were investigated through the physical and engineering properties through burnt peat site. The physical properties of the peat samples were determined through natural moisture content (NMC), loss of ignition (LOI), ash content and pH value. The engineering properties of the peat was performed by shrinkage limit of untreated and treated peat and unconfined compressive strength test to determine the strength gain after 14 and 28 days of curing period. The unconfined compressive strength result show the peat soil gained in strength that strongly related to the binder and filler dosage, moisture content of peat and curing time. The UCS value of stabilized burnt peat samples range 106.87 – 245.30 kPa (14 days curing) and 121.48 – 412.17 kPa (28 days), respectively.

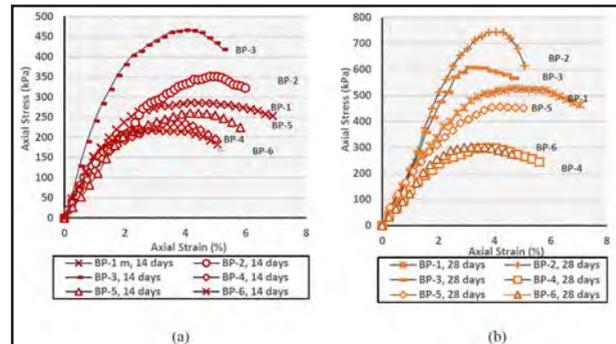


Figure 2: Unconfined Compressive Strength test result of stabilized burnt peat samples (BP-1 – BP-6), a) 14 days; b) 28 days, by using the same composition of mineral soil filler (m.s.f) and Ordinary Portland Cement (OPC).

The value of UCS strength increased with the gain of moisture content of peat samples but the strength tends to be decrease when the moisture content exceed 400%. The UCS strength value tend to be increased but seem to be a slower rate of strength gain after 14 days of curing. The most important geotechnical aspect of peat that have effect on stabilization process are natural water content, humification grade and pH value. The strength of burnt peat can be considerably improved by stabilization.

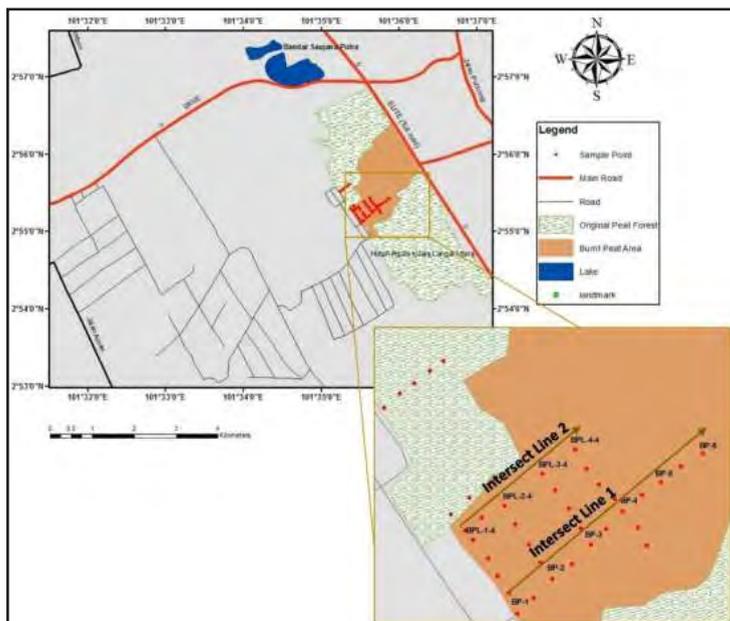


Figure 1: Base map of project area showing the sampling location of burnt peat soil samples.