

Speaker: Dr Siti Nor Linda Taib

Title: Peat Research in UNIMAS: (1) Comparison of Triaxial Compression Results on Cement Stabilized Peat in Sarawak, (2) Peat as Fuel

During the seminar, two different researches on peat performed in Universiti Malaysia Sarawak shall be presented by the speaker. The first section will be on the current geotechnical investigation performed specifically to enhance the strength of this known problematic soil. In the second section, a whole different perspective on peat shall be discussed which is basically performed to further understand the potential of the soil.

Peat is well known as problematic soil due to its high water content, high compressibility and low shear strength characteristics. Studies have been carried out in Universiti Malaysia Sarawak on strength evaluation of stabilized tropical fibrous peat samples from Matang, Sarawak. The stabilizing agent used was Ordinary Portland Cement (OPC). Cemented peat samples were prepared with cement content of 10%, 25% and 50% by weight of dry soil and cured for 7, 14, 28 and 90 days. These stabilized samples were tested for their strength through UCS, UU and CIU triaxial compression tests. From these tests, it was found that as the addition of cement to soil and curing period increased, soil's stiffness and strength increased in the UCS and UU tests but to a certain limit in the CIU test. It was also found that the UU test results are linearly proportional to UCS tests with R-square of above 0.974. It is expected that the detail information of behavior and properties of peat in Matang can be provided from this research since development in the area is growing.

Fossil fuel depletion is one of the major concerns in the world right now as more and more fossil fuels are consumed each day. From small businesses to large economies, the long-term availability of energy worldwide is paramount to growth and development. Coal was the fastest growing fossil fuel in the year 2003 to 2008. However, coal which is categorized as fossil fuel will deplete soon if the rate of consumption keeps on rising. Therefore, research is done in many parts of the world to replace the usage of fossil fuel with alternative fuel. This paper discusses the potential of Sarawak organic soil - peat as an alternative solid fuel. The effect of various admixtures in pellets and sizes of pellets on calorific value of soil are studied. From the experimental result, pure soil pellet has a gross calorific value of 13.3 MJ/kg at operating moisture content of 20%. In addition, pellet of soil combined with saw dust as admixture has 3% higher gross calorific value compared to pellet of soil with sugar cane husk at the same amount of ash content.