

## **Determining the peat soil dynamic properties using geophysical methods**

### **ABSTRACT**

The small strain dynamic properties of peat soil are a fundamental parameter related to the mechanical behaviour of a structure constructed on peat ground. These parameters are used in evaluation of the dynamic behaviour and seismic design in geotechnical structures. Determination of dynamic properties of peat soil is often done using laboratory-based tests that risk overestimation and underestimation due to sample disturbance. Since geophysical methods are proven to be able to obtain small strain dynamic properties with similar magnitude as the laboratory tests, it has become popular and is increasingly used in practice. Two geophysical methods known as multichannel analysis of surface waves (MASW) and seismic refraction were performed in this study to estimate the small strain maximum shear modulus ( $G_{max}$ ) and maximum elastic modulus ( $E_{max}$ ). The results showed the value of  $G_{max}$  and  $E_{max}$  were ranging from 1.01 to 6.83 MPa and from 3.88 to 10.9 MPa respectively. Correlations were also established to assist in estimating  $G_{max}$  and  $E_{max}$  on peat soil with bulk density. There appears to be a particularly good link between the  $G_{max}$ ,  $E_{max}$  and bulk density. Overall, the small strain dynamic properties determined shows significant increment with depth which could be governed primarily by the effective stress. Other parameters such as water content, bulk density, organic content and degree of decomposition also could significantly influence the dynamic properties of peat soil.