# THE MODELLING OF LATERAL MOVEMENT OF SOFT SOIL USING FINITE ELEMENT ANALYSIS AND LABORATORY MODEL

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Penolong Naib Canselor (Penyelidikan)
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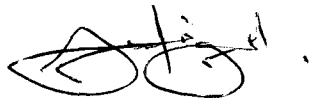
Y Bhg. Prof,

**LAPORAN AKHIR PENYELIDIKAN BERTAJUK 'THE MODELING OF LATERAL MOVEMENT OF SOFT SOIL USING FINITE ELEMENT ANALYSIS AND LABORATORY MODEL'**

Merujuk kepada perkara di atas, bersama-sama ini disertakan 3 (tiga) naskah Laporan Akhir Penyelidikan bertajuk 'The Modelling of Lateral Movement of Soft Soil Using Finite Element Analysis and Laboratory Model' oleh kumpulan penyelidik dari Fakulti Kejuruteraan Awam untuk makluman pihak Y. Bhg. Prof.

Sekian, terima kasih.

Yang benar,



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JUHAIZAD BIN AHMAD
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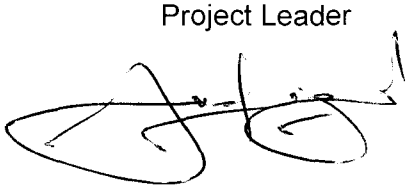

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Tandatangan

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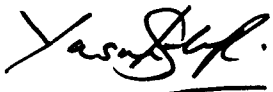

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# ABSTRACT

Lateral movement of sheet pile driven in soft soils has been a major problem in geotechnical engineering. It was reported that the conventional theories such as Rankine and Coulomb theory has overpredicted the lateral movement, hence causing inaccuracy. On top of that, the behavior of lateral movement on soft soil is not well understood since it is complicated and involved many parameters. So, the objectives of this study are to understand the behavior of soft soil in terms of lateral movement and to measure the amount of lateral movement on soft soil using physical laboratory model and Finite Element Method, which is PLAXIS. Excavation work has been conducted on the physical model and at the same time the available models in PLAXIS software such as Mohr-Coulomb (MC), Hardening-Soil (HS), Soft Soil (SS) and Soft Soil Creep (SSC) model were employed to predict the amount of movement during excavation. Based on the results, the amount of lateral movement is proportional to the depth of excavation. The lateral movement increases as the depth of excavation increases. Moreover, through physical modeling, it was found that the angle of wedge failure is the same as Rankine theory which is (45°+ø/2). Besides that, through Finite Element Method, it was observed that the Soft Soil Creep model gives more accurate results since this model is specially design for soft soil problems. As a recommendion, this study can be enhanced by using centrifuge model due to its ability to replicate the real soil unit weight, therefore producing more reliable results. In terms of Finite Element Method, 3-D model should be engaged in order to obtain more accurate results.