

**GEOTECHNICAL FINITE ELEMENT ANALYSIS OF DIAPHRAGM
WALL CONSTRUCTION**

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ABSTRACT

Diaphragm wall are preferred types of wall for construction of Mass Rapid Transit (MRT) viaduct columns, underground train station and tunnels. Conventional construction of diaphragm wall is based on analytical analysis. Analytical analysis leads to unpredictable phenomenon, due to limitation of the analytical analysis. Method by Janbu (1956) and Boussinesq (1885) calculate stress and stiffness separately which the stress in soil body cannot be predicted simultaneously with deformations, and vice versa. It is very important to predict deformation of soil body together with correct applied stresses. In this study, determination of the effect of the ground movement by using finite element analysis can predict the movement of the ground surface during the real construction works. The relevance of using finite element in this research is due to the size and the location of the diaphragm wall which make it impossible to conduct laboratory experiments.

This report shows different soil properties do have influence to the horizontal displacement. Kaolin clay recorded the highest soil movements compared to Hostun sand. Apart from that, diaphragm wall construction stages will cause the maximum deflection occurred after concreting process is completed rather than after trenching process is completed. Simulation with drained and undrained analysis has a big impact on horizontal soil movement. The highest horizontal displacement occurred after concreting process is completed is compared to after trenching process is completed.