

4th World Congress and Exhibition on

Construction & Steel Structure

October 16-18, 2017 Atlanta, USA

Effect of wall penetration depth of sheet pile retaining wall for seismic response

Julius Emmanuel Emuriat

Addis Ababa University School of Technology, Ethiopia

The design of the sheet pile requires the complete knowledge of the earth pressure distribution behind the wall. The complex soil structure effect makes the earth pressure estimation a difficult task for static and dynamic case. The conventional methods used in the structural design of sheet pile walls are based on the limit equilibrium approach that does not consider wall deformations, which are important for serviceability considerations. The wall penetration depth is determined during the design using conventional methods and is the usual practice to use the determined depth for construction of the retaining wall. This study investigates, how varying the penetration depth affects; deformations, anchored forces and wall moments for static and dynamic case. A series of numerical modeling was conducted to evaluate the structural response and the behavior of the sheet pile wall for static and dynamic case during the excavation process using finite difference method (FDM-FLAC 2D) and finite element method (FEM-PLAXIS 2D). The simulated results from the analyses showed that increasing wall penetration depth results to reduced wall deformations. Also increasing wall penetration depth can reduce wall bending moments significantly in anchored walls for static case. The analysis also showed that bending moments and anchored forces during and after the earthquake are significantly greater than for static case.

Biography

Julius Emmanuel Emuriat has completed his Bachelor of Building and Civil Engineering from Kyambogo University in Uganda and currently pursuing Master's from Addis Ababa University School of Technology, Ethiopia. He is a Graduate Researcher and has published a paper entitled "Parametric study on analysis and design of permanently anchored secant pile wall for earthquake loading". He has attended course training programs for UEGCL on Dam training and Hydrology organized by Manitoba Hydro International in Association with Nippon Koei UK International Consulting Engineers.

emuriat25@yahoo.co.uk

Notes: