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Parametric study on analysis and design of permanently anchored secant pile wall for earth quake loading

Emuriat Julius Emmanuel

Addis Ababa University School of Technology, Ethiopia

Due to space limitations in urban areas, deep excavation in to the ground has become a common practice worldwide. Deep excavations are supported by conventional retaining walls, sheet pile walls, braced walls, diaphragm walls and secant pile walls. An advantage of secant pile wall compared with other excavation supporting systems is that they are the most economical methods of creating an effective water control barriers for building structural walls. The load distribution behind a retaining structure depends on the method of excavation and the resulting deflection of the wall. Secondary factors such as construction activities, static and dynamic loads, variation of ground water level can affect the performance of the anchors. In regions that experience strong ground motions due to earthquakes, secant walls often suffer severe damage and sometimes total failure. This damage demonstrates the need for seismic design of the permanently anchored secant pile wall. A complete plaxis 3D finite element simulation was carried out to show the effects of modeling. This model show the series of parametric analysis of the secant pile walls. The design procedure was subjected to stimulated earthquakes using PLAXIS finite element analyses. The response of the secant wall to real earthquake records was analyzed including deformations; wall bending moments, shear forces, the stability analysis of the wall to evaluate the depth of penetration etc. Detailed design methodology of the secant pile excavation supporting system is furnished in the research study and gives analytic parameters of secant pile excavation supporting system subject to seismic action.

Biography

Emuriat has completed his Bachelor of Building & Civil Engineering from Kyambogo University in Uganda and currently graduate student doing research for Masters studies from Addis Ababa University School Technology, Ethiopia. He is the director of Jet limitd, a Civil Engineering Company. He has published no paper but he is looking forward to and he has excellent professional knowledge in Civil Engineering. He has attended course programmes 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

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