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# SEISMIC PERFORMANCE OF DEEP EXCAVATIONS RESTRAINED BY ANCHORAGE SYSTEM USING QUASI STATIC APPROACH

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One of the site effects is the effects of soft ground on the performance of structures on it. If a site is located on the soft ground, The maximum ground acceleration increases and the period of the earth's vibration cycle is longer and the response of the built structure will be raised on the soil.deep excavations stability is one of the most important issues in geotechnical engineering. therefore, an investigation of the factors affecting stability and deformation of the retainning Wall under Anchorage system is important. the resistance parameters of soil and designate appropriate values for length, angle and distance between nails have a direct effect on the stability and deformation of the retainning Wall under Anchorage system.

In this study, quasi-static behavior retainning Wall under horizontal acceleration 0.15g in an excavation built in tehran city and with a height of 20 meters And with two different soil types, the soil with the poor and potent mechanic characteristics has been investigated. In addition, the effect of the anchores geometrical parameters (change at angle and change at length and change at distance between anchores) as well as the effect of change in the Prestressing force in anchores on horizontal displacement and vertical displacement (settle of the adjacent earth and swelling at the bottom of the excavation) and also force induced by the Deformation resulting from displacement retainning Wall (under Anchorage system) and factor of safety, are considered and the results have been discussed.

In the present study, PLAXIS 2D finite element software for the analysis of soil deformation and stability has been used.The general geometry considered in this paper is shown in Fig.1.The plain strain state has been used to analyze the deformations. Soil elements has been considered as triangular and 15 nodes.For soil, the behavioral model of hardening soil has been considered. In the unbond length and as well as anchores bond length, the elasto plastic behavior model has been used.

The finite element mesh in the models made for this study has been shown in Fig. 2. According to the recommendation of Lees, the minimum horizontal distance between the vertical edges of the trench should be 4 times the its height so that the effects of the boundaries of the model on the results was minimized.This recommendation is used for the distance between the vertical and lower bounds of the model.Investigating the displacement contours and as well as stress contours obtained indicates that this distance is sufficient. also, The lower boundary of the model has been fixed against horizontal and vertical movements and lateral boundaries has been fixed against horizontal movements.for real modeling of soil deformation, first the overhead caused by the three - storey building, which is 3 tons per square metre, is considered. In the next step, the initial displacement is considered zero, and then the stages of modeling of the excavation and installation of the anchores in 7 stages, each stage including excavation, execution of the shut creet, installation and pre-stressing of the anchores (5 Strand 0.6") under the force of 272.7 kN, is fully is modeled in the finite element software. In the next step, the quasi-static analysis has been considered in the model with the horizontal acceleration coefficient of 0.15g and in the analysis final step, the stability coefficient (Factor of safety) has been considered.The results of this study show that taking into account the proper values for the anchor parameters (angle, length and distance between the anchors and the amount of pre-stress force in them) has important implications for design safety and deformation control.

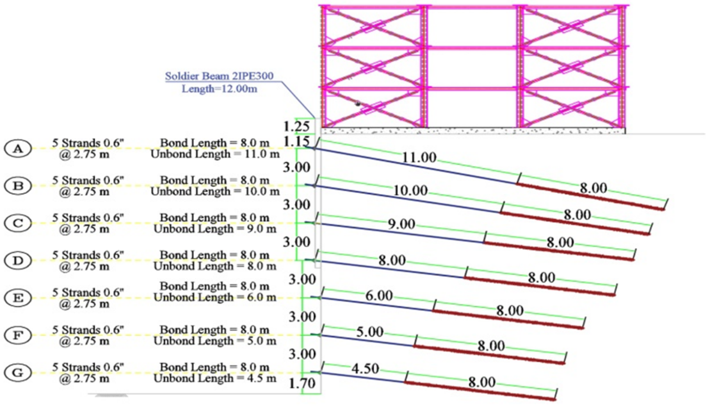


*Figure 1. General geometry of numerical models constructed in the present study.*

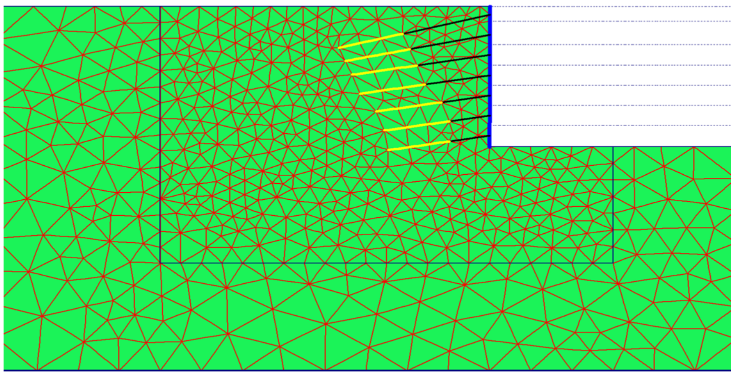

*Figure 2. The finite element mesh in the present study.*

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