

Effect of Cantilever Sheet Pile Wall to Adjacent Buildings

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Abstract : Ground movements induced from excavations is a major cause of deformation and damage to the adjacent buildings and utilities. With the increasing rate of construction work in urban area, this problem is growing more significant and has become the cause of numerous legal disputes. This problem is investigated numerically in the present study using finite element method. Five-story reinforced concrete building rests on raft foundation is idealized as two dimensional model. The building is considered to be constructed adjacent to excavation affected by an adjacent excavation in medium sand. Excavation is supported using sheet pile wall. Two dimensional plane strain program PLAXIS is used in this study. 15 nodes triangular element is used to idealize soil with Mohr-Coulomb model. Five nodes isoperimetric beam element is used to idealize sheet pile and building. Interface element is used to represent the contact between beam element and soil. Two parameters were studied, the first is the foundation depth and the second is the building distance from the excavation. Nodal displacements and elements straining actions were obtained and studied from the analyzed finite element model results.

Keywords : excavation, relative distance, effective stresses, lateral deformation, relative depth

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