

عنوان مقاله:

Numerical modelling of vertical soil improvement systems using embedded beam elements

محل انتشار:

سیزدهمین کنگره بین المللی مهندسی عمران (سال: 1402)

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خلاصه مقاله:

Soils with adequate bearing capacity has become rare to find as the construction of industrial and high-rise structures has increased. Engineers utilize vertical resistant (VR) elements to enhance the foundation to prevent soil rupture and minimize structural settlement. Three most common forms of VR elements utilized in these types of projects are piles, micropiles, and deep soil mixing (DSM) columns. On the other hand, the role of finite element softwares in controlling and optimizing design processes has expanded. Because these types of projects usually require reinforcement with a large number of VR elements, volumetric modeling of these elements in numerical software often causes an increase in computational cost. In order to overcome this problem, embedded beam (EB) is defined as a replacement for volumetric modelling in some cases. In this article, pile and DSM, which differ significantly in terms of constituent materials, were modeled in terms of volume and as EB elements in PLAXIS 3D and ABAQUS software. Then the stress distribution and settlements between VR elements and soil was investigated. Based on the results, it is concluded that the VR elements can be modeled as EB, and the simulation results are reliable

کلمات کلیدی:

.Pile, DSM column, Embedded beam, Numerical analysis, Stress distribution, Settlement

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