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Behavior of A Vertical Pile Under the Effect of an Inclined Load in Loose Sand

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Abstract : This paper presents an attempt made to investigate the behavior of a single vertical steel hollow pile embedded in sand subjected to compressive inclined load at various inclination angles α through FEM package MIDAS GTS/NX 2019. The effect of the inclination angle and slenderness ratio on the performance of the pile was investigated. Inclined load caring capacity and pile stiffness, as well as lateral deformation profiles along with the pile, were presented. The global, vertical, and horizontal load displacements of pile head, as well as the deformation profiles along the pile and the pile stiffness, are significantly affected by α. It was observed that the P-Y curves of the pile-soil system are independent of α. Also, the slenderness ratios are markedly affecting the behavior of the pile. In addition, there was a noticeable effect of the horizontal load component of the applied load on the vertical behavior of the pile, whereas there was no influence of the presence of vertical load on the horizontal behavior of the pile.

Keywords : deep foundation, piles, inclined load, pile deformations
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