

Effect of Elastic Modulus Anisotropy on Helical Piles Behavior in Sandy Soil

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Abstract : Helical piles are being used extensively in engineering applications all over the world. There are insufficient studies on the helical piles' behavior in anisotropic soils. In this paper, numerical modeling was adopted to investigate the effect of elastic modulus anisotropy on helical pile behavior resting on anisotropic sand by using a finite element limit analysis. The load-displacement behavior of helical piles under compression and tension loads is investigated in different relative densities of soils, and the effect of the ratio of horizontal elastic modulus with respect to vertical elastic modulus (EH/EV) is evaluated. The obtained results illustrate that in sandy soils, the anisotropic ratio of elastic modulus (EH/EV) has notable effect on bearing capacity of helical piles in different relative density. Therefore, it may be recommended that the effect of anisotropic condition of soil elastic modulus should be considered in helical piles behavior.

Keywords : helical piles, bearing capacity, numerical modeling, soil anisotropy

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