World Academy of Science, Engineering and Technology
International Journal of Geotechnical and Geological Engineering
Vol:14, No:06, 2020

Behavior of Helical Piles as Foundation of Photovoltaic Panels in Tropical Soils

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Abstract : Brazil has increased the use of renewable energy during the last years. Due to its sunshine and large surface area, photovoltaic panels founded in helical piles have been used to produce solar energy. Since Brazilian territory is mainly cover by highly porous structured tropical soils, when the helical piles are installed this structure is broken and its soil properties are modified. Considering the special characteristics of these soils, helical foundations behavior must be extensively studied. The first objective of this work is to determine the most suitable method to estimate the tensile capacity of helical piles in tropical soils. The second objective is to simulate the behavior of these piles in tropical soil. To obtain the rupture to assess load-displacement curves and the ultimate load, also a numerical modelling using Plaxis software was conducted. Lastly, the ultimate load and the load-displacements curves are compared with experimental values to validate the implemented model.

Keywords : finite element, helical piles, modelling, tropical soil, uplift capacity
Conference Title : ICGEG 2020 : International Conference on Geophysical Engineering and Geotechnics
Conference Location : Copenhagen, Denmark
Conference Dates : June 11-12, 2020