

Large Diameter Pile Combined with Micropiles to Improve the Stabilization of Transmission Tower Foundations

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Abstract

Taiwan Power Company built power transmission lines all over the island across the mountains decades ago. Recently, due to global warming and extreme climate change, transmission tower foundation safety maintenance is significantly important. Facing poor conditions, it is difficult to improve the existing tower foundations. The giant drilling machines cannot access the restricted spaces inside the frame. Though deep pile foundations can resist applied loads, the geological instability under the pile foundations must be concerned. In this work a large diameter pile foundation was built and combined with micropiles. The large diameter pile foundation was 3.5 meter in diameter and 10 meter in depth and connected a group of 7 micropiles, 20 meter in depth and 15 centimeter in diameter, which were made of steel pipe and cement. The micropiles penetrated into the firm rock layer to increase the stability of the transmission tower. The stability of the tower had been shown by inclinometer survey in several months through rain season. It could be beneficial to prevent the small scale of potential landslide underneath the transmission tower foundation and increased the safety factor of the slope.