

Wetting-Drying Cycles Effect on Piles Embedded in a Very High Expansive Soil

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Abstract : The behavior of model piles embedded in a very high expansive soil was investigated, a specially manufactured saturation-drying tank was used to apply three cycles of wetting and drying to the expansive soil surrounding the model straight shaft and under reamed piles, the relative movement of the piles with respect to the soil surface was recorded with time, also the exerted uplift pressure of the piles due to soil swelling was recorded. The behavior of unloaded straight shaft and under reamed piles was investigated. Two design charts were presented for straight shaft and under reamed piles one for the required pile depth for zero upward movement due to soil swelling, the other for the required pile depth to exert zero uplift pressure when the soil swells. Under reamed piles showed a decrease in upward movement of 20% to 40%, and an uplift pressure decrease of 10% to 30%.

Keywords : expansive soil, piles, under reamed, structural and geotechnical engineering

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