

Study on influence of expansive soil slope on bridge foundation under excavation and rainfall conditions

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Abstract

Expansive soil is a kind of special soil with soil particles mainly composed of hydrophilic minerals, and has significant deformation characteristics of water absorption expansion and water loss shrinkage. This characteristic often brings great harm to engineering construction. Relying on the foundation engineering of the bridge on the expansive soil slope of the Jiangxi-Huaihe River, this paper studies the effects of slope excavation and rainfall on the horizontal deformation of the bridge foundation by using temperature simulation and humidity fields and numerical simulation methods. The research results show that during the excavation process, the bridge foundation will produce a horizontal displacement pointing to the top of the slope, and the rainfall after excavation will cause the horizontal displacement of the bridge foundation to decrease and gradually develop in the opposite direction. During the excavation process, the rebound of slope excavation is the main factor affecting the horizontal displacement of the bridge foundation. Under short-term rainfall conditions, the hygroscopic expansion of the slope soil becomes the main influencing factor. Under extreme rainfall conditions, the main cause of the horizontal deformation of the bridge foundation is The influencing factors are transformed into the reduction of the soil weight of the slope and the strength of the soil material.

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