

入滲對非飽和邊坡淺層崩塌發生機制之研究

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摘 要 本研究以靜力平衡觀點探討降雨入滲對非飽和邊坡崩塌發生機制之影響，考慮非飽和土層內之負孔隙水壓，並探討濕鋒線以上之孔隙水壓影響土層穩定性(F_s)，將土層破壞分為於濕鋒線以上之破壞及濕鋒線以下之破壞等二種型態，藉以了解入滲對邊坡穩定之影響，進而了解淺層崩塌機制。

考慮無地下水位之非飽和邊坡分析結果顯示：比較前人之研究，在降雨前之土層穩定性較未考慮負孔隙水壓之前人模式高。入滲後，在無逕流水深之情況，濕鋒雖影響接近土層表面處之負孔隙水壓，但對於原有土層穩定性影響不大，坡度為影響土層穩定之主因，隨著坡度增加，使原有土層越趨於不穩定；在有逕流水深之情況，土層破壞於濕鋒線以上破壞，且破壞深度隨濕鋒下降深度成正比，屬於淺層破壞。故入滲行為在有逕流水深情況下為影響非飽和邊坡崩塌之重要因子，在此情況下土層易發生淺層崩塌。

關鍵詞：孔隙水壓、入滲、逕流水深、土層穩定性、淺層崩塌。

An Unsaturated Slope Shallow Failure Triggered by Infiltration

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ABSTRACT The purpose of this study is to examine the unsaturated shallow slope failures triggered by infiltration from the perspective of static equilibrium. This study takes account of negative pore water pressure and analyzes how pore water pressure of the wetting front affects the stability of the strata. The failure in strata would be divided into two types: one is above the wetting front another is below the wetting front so as to understand the effect of infiltration on strata stability, and correspondingly to understand the effect on the initiation of possible slope shallow failure events.

To consider an unsaturated slope without groundwater, compared with the previous studies, the result reveals that the strata stability prior to rainfall is higher than those model without considering negative pore water pressure. In those cases where there is infiltrating without runoff depth, although the wetting front affects the negative pore water pressure near the surface of strata, it has little effect on the original strata stability. The main cause affecting the strata stability is the degree

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