



Rainfall induced stability on the basis of unsaturated effective stress principle for Busan landslide

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Heavy rainfall-induced landslide is one of major climatic problems in Korea. This study reports infiltration and stability analyses on both actual failure and non-failure areas. Three out of eight areas in Busan have been recognized to experience actual failure due to prolonged precipitation. Using the stochastic rainfall intensity, the measured hydromechanical properties, and the prescribed initial conditions, the one-dimensional infiltration model assessed the infiltration behavior in unsaturated conditions for 24 hours. To examine the stability of shallow layers, infinite slope model was conducted using generalized effective stress framework based on transient infiltration analysis. The failures could be simulated as time dependent variation of both saturation and pore water pressure, and time dependent reduction of factor of safety into 1.0. It is also shown that the transient infiltration and stability analyses can reconstruct failure events under the generalized effective stress framework.

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