



## **The simulation application of failure process for reinforced soil walls due to rainfall through discrete element method**

Chen Tao-Yu (1) and Lo Chia-Ming (2)

(1) Department of Civil and Disaster Prevention Engineering, National United University, Miaoli, Taiwan (jason793793@gmail.com), (2) Department of Civil and Disaster Prevention Engineering, National United University, Miaoli, Taiwan (cmlo@nuu.edu.tw)

In the field of geotechnical engineering, it has been determined by the slope hazard statistics that the failure of the reinforced retaining wall is characterized by lateral bulging, subsidence, and bearing failure. However, recent studies show that the main causes of failure for retaining wall are the rainfall-induced damage to the retaining structure and the key factors such as engineering planning and human factors influencing the shear strength loss during construction. Landfill structure with reinforced wall is multi-layered that reinforced soil mass with closely spaced geosynthetic reinforcement is referred to as geosynthetic-reinforced soil (GRS). The study according to the GRS design to know the related formula and conditions, the use of discrete element method of landfill structure with reinforced wall construction methods to simulate the failure process of the reinforced retaining wall. And then, the study used UAV, LiDAR, and RTK survey methods to compare/adjustment the simulation results, and monitoring large slope terrain evolution process in study area. During the simulation and terrain survey, considering the different soil properties, rainfall, and construction processes, landfill structure with reinforced wall strength disability and prediction to the wall damage results, and add a new verification method for geotechnical engineering technology.

Keywords: reinforced retaining wall, rainfall, GRS, discrete element method, UAV