Validation and application of a finite element approach on field mechanically stabilized earth walls with secondary reinforcement

*BING-RU WU[1], CHIH-HSUAN LIU[1], CHING HUNG[1]

1. National Cheng Kung University

Mechanically stabilized earth (MSE) walls have been used widely to prevent slopes from natural disasters around the world. The typical vertical spacing of geosynthetic reinforcement used in the practical MSE wall may cause high reinforcement connection strength and lead to wall-facing bulging. Previous studies show that installing short (secondary) reinforcement layers in-between primary reinforcement layers could mitigate these problems by reducing wall facing deflection and primary reinforcement strains, increasing the wall internal stability, alleviating down-drag forces behind the wall facing, and so on. Although the performance of the secondary reinforcement has been widely examined, its controlling factors (i.e., length, spacing, distribution) on the behavior of MSE wall are scarcely studied. In this study, a finite element approach was validated via a benchmark field case and was applied to understand the effect of the controlling factors on the behavior of MSE wall as well as giving a guidance on the design of MSE wall with secondary reinforcement.

Keywords: retaining structure, MSE wall, controlling factors, secondary reinforcement, finite element

