Centrifuge Modeling of Failure Behavior of Welded-wire MSE Walls with Overlapped Reinforcement

by

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ABSTRACT

Tall mechanically stabilized earth (MSE) walls are generally constructed with inextensible reinforcements, such as bar mats or welded-wire grids, to reduce deformations at the top of the wall. As MSE walls with inextensible reinforcement have grown in popularity and height, numerous special design provisions have arisen. One such provision is the need to overlap reinforcing elements behind especially tall walls. Transport restrictions may limit the maximum deliverable reinforcement length to shorter than the required length for internal stability of the wall. In these cases, two reinforcement grids have to be overlapped in order to provide the required length. Because MSE walls of a height large enough to require overlapping are a relatively recent advancement with few published case or laboratory studies, research into the behavior at the overlap locations is currently somewhat sparse.

The goal of this research is to gain insight into the behavior of welded wire grids at overlapped locations by review of selected laboratory and full-scale case studies as well as current state-of-the-practice design methods, laboratory direct shear testing of soil-grid and grid-grid interfaces, and centrifugal model testing of a prototype welded-wire MSE wall. Drawing on the results of these studies, the failure mechanism of MSE walls with overlapped welded-wire grid reinforcement is discussed in detail and an attempt is made to quantify the effect of the overlap in relation to continuous grid reinforcement.