

Seismic response of geosynthetic-reinforced soil walls under near-fault ground excitations

Ching Hung

Assistant Professor, Dept. of Civil Engineering, National Cheng Kung University
Email: chinghung@mail.ncku.edu.tw

Geosynthetic-reinforced soil (GRS) walls have good seismic performance, which has been demonstrated in recent strong earthquakes, yet conventional analysis of GRS walls rarely take into consideration the near-fault ground effect in design specifications. Noting the characteristics of near-fault ground motions are unique compared to far-field ones, it is expected that the seismic response of GRS walls, in terms of reinforcement loads, residual displacements, and numerical complications, under near-fault ground excitations would shed some light on the seismic designs of GRS walls and applications. To that extent, it is valuable to conduct the followings but not limited to:

1. Design and carry out extensive experimental studies on GRS walls under near-fault ground excitations, and generate quality data for future validations of numerical procedures based on the experimental findings.
2. Investigate the performance of various types of GRS walls under near-fault ground excitations and shed light on the seismic applications of GRS walls. The various types of GRS walls include wall height, soil strength, soil stiffness, reinforcement length and spacing, and 3D printing technologies in creating patterns.
3. Analyze the failure and initiation mechanisms of GRS walls under near-fault ground excitations as well as the potential enhancement, improvement, and renovation on similar geostructures.