



## RESEARCH PROJECT: Laterally Loaded Drilled Shafts Behind an MSE Wall

### Wyndotte County, Kansas

Sponsor: Kansas DOT

Participants:

University of Kansas

DBA

Applied Foundation Testing, Inc.

Tensor International

Years of Project: 2007

KDOT Reference:

Jim Brennan, P.E. (785-296-3008)

Project Highlights:

The goal of the study was to develop rational design procedures for situations where drilled shafts are constructed near or adjacent to MSE walls. Seven test shafts and six reaction shafts were constructed. The reaction shafts were socketed into the underlying limestone and shale bedrock while the test shafts were tipped above the bedrock. All of the test shafts were located within the reinforced backfill zone of the wall, varying the distance between the shafts and the wall face. Single shafts and shaft groups were loaded laterally. The wall face, reinforcing geogrid materials, and backfill were instrumented to measure loads, strains, and movements. The shafts were built with inclinometer casings to measure shaft deflections.

Analysis of the drilled shafts consisted of:

- Developing a reasonable baseline soil model for the unreinforced fill.
- Performing LPILE analyses for each test, reducing the p-multiplier to achieve a reasonable match to the observed deflection response of each shaft.
- Calculating the mobilized shear with depth using the “best fit” p-multiplier values.

Technical Publications:

Pierson, M., Parsons, R.L., Han, J., Brown, D.A. and Thompson, W.R. (2008). “Capacity of Laterally Loaded Shafts Constructed Behind the Face of a Mechanically Stabilized Earth Block Wall”, Report for the Kansas Department of Transportation

Parsons, R.L., Pierson, M., Han, J., Brennan, J.J., and Brown, D.A. (2009). “Lateral Load Capacity of Cast-in-Place Shafts Behind an MSE Wall”, 2009 International Foundation Congress and Equipment Expo, Contemporary Topics in In-Situ Testing, Analysis, and Reliability of Foundations, Geotechnical Special Publication No. 186, ASCE, pp. 560-567.

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