

THE ASCE PITTSBURGH SECTION GEO-INSTITUTE CHAPTER PRESENTS

The 2014 Cross USA Geo-Institute Lecture Tour

Effectiveness of Inhibiting Liquefaction Triggering by Shallow Ground Improvement Methods: Field Shaking Trials with T- Rex in Christchurch, New Zealand



Presented By: *Dr. Kenneth H. Stokoe, II, the Jennie C. and Milton T. Graves Chair in Engineering in the Civil, Architectural and Environmental Engineering Department at the University of Texas at Austin.*

Christchurch and the Canterbury region in New Zealand were devastated in 2010-2011 by a series of powerful earthquakes. The Christchurch area experienced widespread liquefaction that caused extensive damage. One critical problem facing the rebuilding effort is that the land remains at risk of liquefaction in future earthquakes. Therefore, effective engineering solutions must be developed to increase the resilience of homes and low-rise structures. To this end, a series of full-scale field trials of shallow ground improvement methods was undertaken. In the first stage, the following four methods were tested: (1) Rapid Impact Compaction (RIC), also known as dynamic compaction, (2) Rammed Aggregate Piers (RAP), which consist of gravel columns, (3) Low-Mobility Grouting (LMG) with a cement paste, also referred to as compaction grouting, and (4) a double row of horizontal beams (DRB) constructed beneath existing residential structures via soil-cement mixing. The improvement methods were targeted to improve soil within 4 m of the ground surface. Field trials involving test panels of the four improvement methods and two unimproved natural soil panels are presented. Each test panel was instrumented and characterized before shaking. A large mobile shaker operated by NEES@UTexas, called T-Rex, was used to excite each test panel with an increasing sequence of 100-cycle, dynamic horizontal loads. The pre-shaking characterization effort and the shaking results are presented. The effectiveness of inhibiting pore water pressure generation by the different ground improvement methods is discussed.

Attendance at this technical presentation qualifies participants for 1.0 PDH

***DINNER RESERVATIONS ARE REQUIRED
PLEASE RSVP ON OR BEFORE Friday, November 14, 2014***

*Reservations made and not honored will be invoiced.
Cancellations must be received by the RSVP deadline in order to qualify for a refund.*

Date: **TUESDAY, November 18, 2014**

Buffet Style Dinner

Time: 6:00 PM Social Hour
7:00 PM Dinner
8:00 PM Presentation

Cost: \$25 ASCE Pittsburgh Section Members
\$35 Non-members
Students are welcome free admittance.

Place: Gaetano's Restaurant
1617 Banksville Road
Pittsburgh, PA 15216
(412) 343-6640

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