

**Special Guest Lecture by:**

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Date: Friday May 26, 2006

Time: 1:00 pm

Location: Sustainable Education Building, Room 122

**TOPIC**

“Field Testing of Passive Site Stabilization”

**ABSTRACT**

Passive site stabilization is a new technology proposed for non-disruptive mitigation of liquefaction risk at developed sites susceptible to liquefaction. It is based on the concept of slow injection of stabilizing materials at the edge of a site and delivery of the stabilizer to target locations using natural or augmented groundwater flow. A full-scale field test was done adjacent to the George Massey Tunnel in Vancouver, B.C. to assess the performance of colloidal silica stabilizer in reducing the settlement of liquefiable soil. This test was a rare and unique opportunity to study the performance of colloidal silica grout at the field scale because the site has a well-characterized, 30-foot-thick liquefiable layer of loose, saturated sand. Slow injection methods were used to treat a 7-foot-thick layer of liquefiable sand. Eight injection wells were installed around the perimeter of the 30-foot-diameter test area and dilute colloidal silica grout was slowly injected into the upper 7 feet of the liquefiable zone. A central extraction well was used to direct the flow of the colloidal silica towards the center of the test area. Subsequently, the injection wells were used to install explosive charges and liquefaction was induced by blasting.

The goals of the test were: 1) to determine if slow injection methods can be used to deliver the stabilizer to the liquefiable layer; 2) to determine how much the settlement in the liquefiable layer would be reduced; and, 3) to compare the reduction in settlement between the grouted area and an adjacent area previously treated with earthquake drains. The field challenges and preliminary results will be discussed.