



**2011 – 2012**

*February's Joint MGS and  
MN Section of ASCE Meeting*

**Some Reflections on Early Ground Improvement  
Techniques: PV Drains, Lime Columns, Dynamic  
Compaction, and Pile Supported Embankments**

**Bob Holtz, Ph.D., P.E., D.GE, Dist.M.ASCE**  
**University of Washington**

Forty years ago, the only available methods for improving poor foundation soils were excavation and replacement, displacement by blasting, chemical grouting, vibrofloatation, sand drains, and electro-osmosis, and most of these techniques were only rarely applied. Among the recent developments in soil improvement are PV drains, lime columns, dynamic compaction, and pile supported embankments, and the presentation describes the early history of these relatively newer techniques using the results of some case studies in which the author was directly involved. The pile supported embankment case also involved one of the first uses of geosynthetic reinforcement. Recent developments in these techniques are contrasted with the lessons learned from these early case histories. Pertinent references are also given.

**Date:** Thursday, February 23, 2012

**Location:** Continuing Education and Conference Center  
1890 Buford Avenue  
St. Paul Campus of the University of Minnesota  
(Pay parking is available in lots S104 and S108 or the Gortner Avenue Ramp. Typical evening rate is \$6. Detailed information is available at <http://www1.umn.edu/pts/park/visitorparking.html>.)

**Time: 6:00** Social Hour, Sponsored by Hayward Baker.

**7:00** Dinner – Buffet Style

**8:00** Presentation – Dr. Bob Holtz

(One professional development hour toward continuing education requirements for Professional Engineers is available).

**Cost:** \$30.00 members and non-members, and \$5.00 Full-time students, payable to MGS at the door.

**Reservations:** Requested by 12 Noon, Monday, February 20, 2012  
(STRICTLY ENFORCED)

Please register via the website at <http://www.mngeotechnicalsociety.com/eventsmpls.asp>

---

<b>President</b>	<b>Vice President</b>	<b>Secretary</b>	<b>Treasurer</b>	<b>Program Chair</b>	<b>ASCE Chair</b>	<b>Past President</b>
Travis Rengstorf 651-789-4667	Kurt Heckendorf 651-290-5411	Joel Swenson 952-832-2799	Bill Cody 763-427-4330	Chad Underwood 612-751-8648	Joe Bentler 651-603-6616	Mike Haggerty 952-832-2944

<http://www.mngeotechnicalsociety.com>