METROPOLITAN SECTION AMERICAN SOCIETY OF CIVIL ENGINEERS GEOTECHNICAL GROUP

PRESENTS:
2nd Annual GZA Lecture

TOPIC:
Designing Excavation Support Systems to Protect Adjacent Structures

SPEAKER:
Richard J. Finno, Ph.D

Professor of Civil Engineering

at:
Northwestern University

Tuesday, March 15, 2011
Refreshments: 5:30 p.m.
Lecture: 6:00 p.m.
Attendance is free. No registration is required; attendance is first come, first seat basis.

1 no. Professional Development Hour (PDH) is Applied for -
PDH certificates are free to ASCE members, $10 fee for non-members

CUNY Graduate Center-Recital Hall
365 Fifth Avenue
(Northeast corner of Fifth
Ave. and 34th Street)
New York City

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LECTURE SUMMARY

Damage to buildings adjacent to excavations can be a major design consideration when constructing facilities in congested urban areas. Often excavation support systems must prevent any damage to adjacent structures or balance the cost of a stiffer support system with the cost of repairing damage to the affected structures. Practically speaking, a designer attempts to limit/prevent damage to either the architectural details of a building, which occurs prior to structural damage, or to load bearing walls. Methods that relate building damage to associated ground movements are reviewed, and their limitations discussed.

Because of the uncertainties in making predictions of excavation-induced ground movements, an adaptive management approach can be an attractive approach for predicting, monitoring, and controlling these ground movements. The key to the approach is to use monitoring data to update performance predictions in a timely fashion. Its success depends equally on reasonable numerical simulations of performance, the type of monitoring data used as observations, and the optimization techniques used to minimize the difference between predictions and observed performance. Monitoring data used as observation must be compatible with the capability of the constitutive models employed. Self-updating numerical models are needed to compute anticipated ground movements, update predictions of field observations and learn from field observations.

Several examples of the adaptive management approach applied to supported excavations are presented to illustrate its capabilities. Examples include identifying optimized parameters based on observations made during early stages of excavation so as to allow accurate predictions of performance of latter stages of an excavation, and applying optimized parameters found based on performance data of one excavation to others in the same geological conditions.

The Speaker: Rich Finno is a Professor of Civil Engineering at Northwestern University. He received his Bachelor degree at the University of Illinois and his MS and PhD degrees at Stanford University. He has been at Northwestern University since 1986.
Finno has long been involved in combining theory and practice to reconcile full-scale field performance with analytical and numerical predictions. He is the author or co-author of 135 reviewed technical papers and 20 technical reports. This work has resulted in recognition in the form of the Karl Terzaghi Award, the Walter L. Huber Civil Engineering Research Prize, the Harry Schnabel Jr Award, the Arthur Casagrande Professional Development Award, and the Middlebrooks Award (twice) from the American Society of Civil Engineers. He was named the Civil Engineer of the Year in 2007 by the Illinois Section of ASCE. He has served as a consultant for many firms, including Geosyntec Consultants, Wiss, Janney, Elstner & Associates, Inc, the Ralph M. Parsons Co, STS Consultants and STV Inc, on a wide variety of projects related to retention systems, tunnels, shafts and foundations.

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