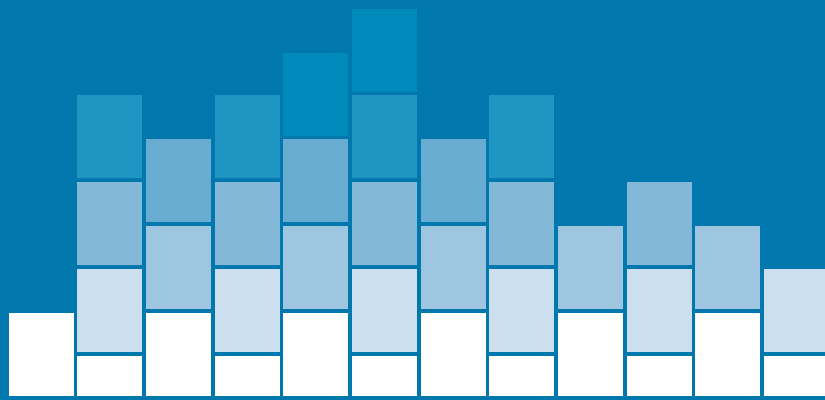




ASCE
GEO-
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ER2010

Earth Retention Conference 3

August 1-4, 2010

Hyatt Regency Bellevue
Bellevue, Washington



Pre-Conference Final Program



Welcome to ER2010 in Bellevue, Washington

On behalf of the Organizing Committee, it gives me great pleasure to welcome you to Earth Retention 2010 in Bellevue, Washington, Aug 1-4, 2010. ER2010 is the third in a series of conferences on earth retaining structures organized by the Earth Retaining Structures Committee of the Geo-Institute of ASCE. Held at 20-year intervals, ER2010 is the next in the highly successful earth retention conferences held in Ithaca, New York (1990) and (1970).



ER2010 brings together a broad community of geo-professionals working on retention structures using a wide range of support systems with comprehensive coverage of developments over the past 20 years. The program is diverse, including case histories and practice-oriented papers, recent research findings, innovative technologies, and the emerging arts across many of our disciplines. We have an impressive lineup of plenary and theme sessions speakers who are leaders in the field in the U.S. and abroad in addition to focused poster session presentations. Professional engineers, researchers, specialty contractors, regulators, educators, and students can interact across a broad range of technical and poster sessions, short courses, discussions, field demonstrations, and student firm visits.

The conference venue, at the Hyatt Bellevue, is a new facility recently completed with state-of-the-art and amenities. We are confident that you will find the venue warm, welcoming, and ideal for interacting with fellow professionals interested in earth retention systems.

The greater Seattle area is a wonderful summer vacation destination. Whether you like the water, the mountains or the cultural scene, there is something for everyone. You and your family can enjoy the many exciting nearby destinations many of which are listed in the companion brochure, before, during or after the conference.

I look forward to personally greet you at ER2010.

With my best regards,

Youssef M.A. Hashash, Ph.D., P.E.
Professor of Civil and Environmental Engineering
University of Illinois at Urbana-Champaign
Chair, Earth Retention 2010

Cooperating Organizations



ADSC (International Association of Foundation Drilling)



GMA (Geosynthetic Materials Association)



AEG (Association of Environmental and Engineering Geologists)



IGS (International Geosynthetics Society)



AMSE (Association for Metallically Stabilized Earth)



NCMA (National Concrete Masonry Association)



ASCE Seattle Geotechnical Group



PDCA (Pile Driving Contractors Association)



DFI (Deep Foundations Institute)



FHWA (Federal Highway Administration)

Program at a Glance

Sunday, August 1

7:00 am - 9:30 am	Registration for Short Courses ONLY
8:30 am - 5:00 pm	Short Courses
4:00 pm - 8:00 pm	Registration
5:00 pm - 6:00 pm	The Academy of Geo-Professionals 4th Induction Ceremony
6:00 - 8:00 pm	Opening Reception (in Exhibit Hall)

Monday, August 2

7:00 am - 6:30 pm	Registration
7:00 am - 4:00 pm	Speaker Ready Room
8:00 - 9:30 am	Opening Plenary Session
9:00 am	Exhibit Hall Opens
9:30 - 10:00 am	Break (in Exhibit Hall)
10:00 - 11:30 am	Plenary Session – International Experiences
11:30 am - 1:00 pm	Lunch (in Exhibit Hall)
1:00 - 2:30 pm	Plenary Session – U.S. Experiences
2:30 - 3:00 pm	Break (in Exhibit Hall)
3:00 - 4:30 pm	Concurrent Theme Sessions
3:30 pm	Exhibit Hall Closes
5:00 - 7:30 pm	Poster Session and Reception

Tuesday, August 3

7:00 am - 3:00 pm	Registration
7:00 am - 2:00 pm	Speaker Ready Room
8:00 - 9:30 am	Plenary Session - Design Issues
9:00 am	Exhibit Hall Opens
9:30 - 10:00 am	Break (in Exhibit Hall)
10:00 - 11:30 am	Plenary Session - Seismic Issues
11:30 am - 1:00 pm	Lunch (in Exhibit Hall)
1:00 - 2:30 pm	Concurrent Theme Sessions
2:30 - 3:00 pm	Break (in Exhibit Hall)
2:30 - 6:00 pm	Student Firm Visits and Field Demonstrations – Off Site
3:30 pm	Exhibit Hall Closes

Wednesday, August 4

7:30 am - 3:00 pm	Registration
7:00 am - 3:00 pm	Speaker Ready Room
8:00 - 9:30 am	Plenary Session - Setting Deformation Limits
9:30 - 10:00 am	Break
10:00 - 11:30 am	Plenary Session - Numerical Analyses
11:30 am - 1:00 pm	Luncheon
1:00 - 2:30 pm	Concurrent Theme Sessions
2:30 - 3:00 pm	Break
3:00 - 4:30 pm	Closing Plenary Session - The Future

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Short Course #1: Geosynthetic Reinforced Soil

Instructors:

Robert D. Holtz, PhD, PE, D.GE, Dist. M.ASCE
University of Washington

R. Jonathan Fannin, Ph.D., P. Eng.
University of British Columbia

This course is an advanced treatment of geosynthetics for soil reinforcement. Because of their increased safety, improved performance, and lower costs in comparison with conventional construction, geosynthetic reinforced soil (GRS) structures are often used instead of conventional earth retaining structures, bridge abutments, and fill slopes. The participants should have some experience with geosynthetics and conventional reinforced soil design and construction. After a brief introduction to geosynthetics, the material properties required for design (tensile strength, including wide-width index tests and isochronous load-strain tests; soil-geosynthetic interface strength and bond coefficients from direct shear and pullout tests; durability issues) are described. Two instrumented reinforced soil case studies are used to show that the sensible application of simple ideas and methods can give safe and acceptable engineering solutions to reinforced soil problems. These basic ideas are sufficiently adaptable for the design and successful construction of more complex problems often found in engineering practice.

Course Outcomes

- » Develop an understanding of the fundamental concepts that govern the behavior of soils reinforced with geosynthetics.
- » Understand the historical development of the analyses for external and internal stability (FHWA, AASHTO, NCMA, BS 8006), and provide design guidance for allowable tensile strength, vertical reinforcement spacing, length of reinforcement, drainage, seismic loading issues, and different facing systems.
- » Provide the basis for confidently making and defending appropriate decisions when designing geosynthetic-reinforced steep slopes and walls.

Short course #2: Earth Retaining Systems and Basement Walls

Instructors:

Nick O'Riordan, Ph.D.
Principal and Global Geotechnics Skills Leader, Arup (San Francisco)

Richard Prust
Associate Principal, Arup (Seattle)

Rob Talby, Ph.D.
Associate, Arup (New York)

Pressure on urban development, downtown regeneration and in particular the growth of underground metro and heavy rail systems has resulted in excavations that are ever larger and more extensive. The classic case histories, mostly based upon 60 to 80 ft. deep, 60 ft. wide multi-propped metro excavations and 150 ft. square building basements are steadily being replaced by mammoth earth-retaining structures of similar depth but which can be over 200 ft. in width and over a mile in length (for example the Boston Central Artery in the U.S., Ashford, Stratford and St. Pancras Thames link stations in the UK and Bologna and Florence stations in Italy). Such structures take years to build. Balancing empirical rules, constitutive soil models and numerical techniques with constructibility to ensure the cost-effective control of ground movements around urban excavations during and after construction presents perpetual challenges.

This course will address these challenges and is a distillation of a series of international master classes developed over many years at Arup. Arup Geotechnics has been responsible for the design and back-analysis of many of the largest, deepest excavations in the world for over 50 years. Dr. David Henkel, Vice Chairman of the first Earth Retention specialty conference held in 1970 at Cornell University, became leader of Arup Geotechnics until his retirement as a consultant to the firm about 10 years ago. This course complements a keynote paper on the impact of codes on the structural and geotechnical design of deep excavations at the 2010 conference to be presented by Prof. Brian Simpson, OBE, a past Rankine lecturer and until recently, the Global Geotechnics skills leader at Arup.

Using the results of published and unpublished case histories, the workshop will provide a robust, practical framework which will be essential for practitioners, researchers, contractors and project managers.

Course Outcomes

Attendees will obtain a good grasp of:

- » the breadth of solutions to the challenge of earth retention, and how to go about choosing suitable solutions
- » the range of contractual contexts, roles and responsibilities surrounding deep excavations in urban areas
- » the importance of understanding the ground conditions and geomorphological history of the site
- » the importance of construction sequence and schedule; the effects of wall and soil permeability and stiffness
- » how to assemble a reasonable ground model and construction sequence for analysis
- » key aspects of soil-structure interaction analysis, including 4D effects

Short Course #3: Design of MSE Walls Using LRFD Methodology

Instructors:

Ryan Berg, P.E., F.ASCE
Ryan R. Berg and Associates

Naresh Samtani, Ph.D., P.E., M.ASCE
NCS

The goal of this course is to provide participants with state-of-the-practice load and resistance factor design (LRFD) tools and the design of mechanically stabilized earth (MSE) walls consistent with Federal Highway Administration (FHWA) and American Association of State Highway and Transportation Officials (AASHTO) guidelines and specifications.

Each participant will be provided with a copy of the U.S. Department of Transportation, Federal Highway Administration reference manual Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes (Berg, Christopher and Samtani, 2009) that is a comprehensive design manual and contains several MSE wall design examples.

Course Outcomes

- » Discuss reinforcement corrosion/degradation mechanisms in regards to the design life of reinforced soil structures; and evaluate steel strength percent decrease over time.
- » Select appropriate material properties and reinforcement/soil-interaction parameters used in design.
- » Apply LRFD concepts to design of MSE walls.
- » Prepare conceptual and basic (i.e., simple geometries) designs, and be able to check designs prepared by others (e.g., wall vendors).
- » Define LRFD load combinations and load factors for MSEW design.

Additionally, with further self-study and use of the course Reference Manual and AASHTO LRFD Bridge Design Specifications, participants will be able to:

- » Complete MSE wall external stability detailed design, and review designs by others for simple and complex geometries and/or loadings.
- » Complete MSE wall internal stability detailed design, and review designs by others for simple and complex geometries and/or loadings.

Short Course #4: Slope Stabilization Using Micropiles

Instructors:

Prof. J. Erik Loehr, P.E.
University of Missouri-Columbia

Dr. Jesus Gomez, P.E., D.GE
Schnabel Engineering

Allen Cadden, P.E., D.GE
Schnabel Engineering

John Bickford, P.E.
DBM Contractors, Inc.

Micropiles have become a widely accepted technology in the United States for a variety of applications. Nowadays, micropiles are being used for underpinning of existing structures as well as for foundations of new construction, for excavation support, and many other applications. One popular application of micropiles is stabilization of existing slopes. Micropiles can be installed on sites with difficult access. They can work in tension, compression, shear, and limited bending, and can be interconnected by simple structural grade beams that can be completely concealed after installation. A number of successful cases have been reported in the literature where micropiles provided a more cost-effective and attractive solution than tiebacks or other stabilization schemes.

The objective of the course is to provide the audience with a practical method to design stabilization of slopes using micropiles, based on previous experiences and experimentation. The course will focus on the use of micropiles for stabilization of slopes and procedures for design of such systems. The course will start with an introductory presentation on current micropile technology. Then, a number of case histories will be presented to illustrate successful examples of stabilization of slopes using micropiles.

During the case histories presentations, the presenters will focus on the mechanics of the stabilization system, illustrating how and why the micropile system worked or did not work. Subsequently, the results of laboratory tests will be presented where model micropiles were used in a soil filled tilting container. A simplified theoretical framework for design of micropile stabilization systems will be presented. The theoretical framework will focus on treatment of the individual pile as a laterally and axially loaded element, and of the system of micropiles as a structural frame. The issue of soil displacement and “squeezing” through the micropiles will also be addressed.

Course Outcomes

- » Upon completing this course, participants will recognize the variety of applications for micropile technology.
- » Participants will learn a practical method to design slope stabilization using micropiles.
- » This course will provide several case histories which illustrate the mechanics of the micropile system and the forces acting on individual piles.

Opening Plenary Session: 8:00 - 9:30 am

Chair: Youssef Hashash

This session will provide an overview of the developments in design, construction and performance of earth retention systems in the last 20 years and will look to how these advances will impact future practice.



Opening Plenary Speakers

Richard J. Finno, P.E., Ph.D., M.ASCE

Professor of Civil Engineering, Northwestern University

“Recent Trends in Supported Excavation Practice”



Ryan Berg, P.E., F.ASCE

Geotechnical Consultant,
Ryan R. Berg & Associates, Inc.

“Fill Walls --Recent Advances and Future Trends”

Plenary Session: 10:00 - 11:30 am

Chair: Hubert Deaton

A boom in construction overseas has sparked innovation in the practice of retention systems. Two internationally-renowned speakers will describe these developments, focusing on practices in Southeast Asia and Europe.



Plenary Speakers

Richard N. Hwang, Ph.D.

Consultant, Moh and Associates, Inc.

“Performance of Deep Excavations in the Taipei Basin”



Anthony O'Brien, Ph.D.

Geotechnics Practice Leader, Europe and Africa Region,
Mott MacDonald & Visiting Professor at
Southampton University, UK

“Embedded Retaining Walls - A European Perspective on Design Developments and Challenges”



Plenary Speakers

Lawrence A. Hansen, Ph.D., P.E.

Principal Geotechnical Engineer,
AMEC Earth & Environmental, Inc.

“Design, Construction and Performance of Unique Two Excavation Shoring Systems in Southwest Desert Soils”



Gordon Denby, Ph.D., P.E.

President, GeoEngineers, Inc.

“Shoring System Innovations in the Puget Sound Area, Washington”



Robert Bachus, Ph.D., P.E.

Principal, Geosyntec Consultants

“A Perspective on Mechanically Stabilized Earth Walls: Pushing the Limits or Pulling Us Down?”

Concurrent Theme Sessions: 3:00 - 4:30 pm

Theme Session 1A

Chair: Paul Sabatini

Learn about analysis design and performance of excavations supported by tied-background anchors, with the theme lecture given by the author of the well-known FHWA report on tiebacks.



Theme Speaker

David Weatherby, P.E., M.ASCE

Vice President Research and Product Development,
Schnabel Foundation Company

“Behavior of Tiedback H-Beam Walls and Recommendations for Their Design”

Presentations

Matthew W. Smith, P.E., M.ASCE

Associate, GeoEngineers, Inc.

“Case History: Investigating the Risks Associated with Allowing Temporary Tiebacks to Remain Stressed”

N. John Bingham, P.E.

Hart Crowser Inc.

“Load Transfer Mechanism of Small-Diameter Grouted Anchors”

Mary C. Nodine, P.E., A.M. ASCE

GEI Consultants, Inc.

“Diaphragm Walls at the Canton Dam Auxiliary Spillway”

Theme Session 1B

Chair: Joe Cavanaugh

Learn about analysis design and performance of mechanically stabilized earth walls, with the theme lecture given by a distinguished practitioner in the field.



Theme Speaker

Florian Bussert

Tensar International Ltd.

“Recent Research and Future Implications of the Actual Behavior of Geogrids in Reinforced Soil”

Presentations

S. D. Rafalko

The Reinforced Earth Company

“Sustainability Measures for MSE Walls and Baseline Environmental Impact Evaluations”

William J. Neely

Retaining Wall Services, Inc.

“Effects of Second-Order Design Factors on the Behavior of MSE Walls”

Armin W. Stuedlein, Ph.D., P.E., M. ASCE

Assistant Professor, Oregon State University

“Factors Affecting the Development of MSE Wall Reinforcement Strain”

Poster Session and Reception: 5:00 - 7:30 pm

Join us for the poster session for one on one discussion with the authors. Take part in the selection of the best three posters. The list of posters can be found on page 16-17 of the program.

Plenary Session: 8:00 - 9:30 am

Chair: Andrew Whittle

Three prominent engineers will provide their perspective on LRFD and how it is used in retention system design. The speakers were instrumental in the development of the AASHTO and Eurocode codes.

Plenary Speakers

Presenting jointly



Paul Sabatini, P.E., Ph.D., M.ASCE
Associate, Geosyntec Consultants

“LRFD for Earth Retaining Structures in U.S. Transportation Practice”



Naresh Samtani, P.E., Ph.D., M.ASCE
President, NCS Consultants, LLC



Brian Simpson, Ph.D.
Director, Ove Arup & Partners Ltd

“Implications of Modern Design Codes for Earth Retaining Structures.”

Plenary Session: 10:00 - 11:30 am

Chair: Pedro Arduino

Seismic issues, particularly pertinent to the Pacific Northwest and many parts of the world, will be discussed by the distinguished speakers in this section.

Plenary Speakers



Youssef M. A. Hashash, P.E., Ph.D., M.ASCE
Professor, University of Illinois at Urbana-Champaign

“Seismic Design Considerations for Underground Box Structures”



Jonathon Bray, Ph.D., P.E., M.ASCE
Professor, University of California at Berkeley

“Seismic Displacement Design of Earth Retaining Structures”



Marshall Lew, Ph.D., P.E., M.ASCE
Senior Principal and Vice President, MACTEC Engineering and Consulting, Inc.

“Seismic Earth Pressures: Fact or Fiction”

Concurrent Theme Sessions: 1:00 - 2:30 pm

Theme Session 2A

Chair: Debra Laefer

Learn about recently developed uses of retention systems as the means to stabilize landslides, with the theme lecture presented by a leader in this field.



Theme Speaker
John R. Wolosick, P.E., D.GE, M.ASCE
Director of Engineering, Hayward Baker Inc.

“The Stabilization of Major Landslides Using Drilled and Grouted Elements”

Presentations

George Siller
BF Langan Consultants, Inc.

“Stabilization of a 70-ft-high Side-hill Fill in West Virginia”

David H. Lee, P.E., G.E., M. ASCE
Principal Geotechnical Engineer, David H. Lee & Associates, Inc.

“Using Tieback Anchors to Stabilize an Active Landslide in San Juan Capistrano, California”

Daniel D. Uranowski, P.E., M. ASCE
Chief Engineer - Foundation Division, Brayman Construction Corporation

“Prehistoric Landslide Stabilization with Ground Anchors and Surface Reaction Pads”

Theme Session 2B

Chair: David Weatherby

Plan to attend this session to learn about recent developments and case studies regarding supported excavations.



Theme Speaker
S.A. (Harry) Tan, P.E., Ph.D.
Associate Professor, National University of Singapore

“One North Station Excavation in 30 m of Jurong Residual Soils in Singapore”

Presentations

John Byrne, Ph.D., P.E.
Principal Engineer, Ground Support PLLC

“Design and Construction of an Innovative Shoring System at a Challenging Urban Site in Seattle, Washington”

Richard D. Luark
Kleinfelder

“Instrumentation of Underpinning Piles in a 94-ft Deep Excavation”

Nick O’Riordan, Ph.D., FICE, CEng
Principal, Arup

“Prototype Test of Soil-Cement Shoring Walls for the Transbay Transit Center, San Francisco”

Student Firm Visits and Field Demonstrations off site: 2:30 - 6:00 pm



Pedro Arduino, Ph.D., P.E.
University of Washington

Student Visit to Geotechnical Firms in the Greater Seattle region

In addition to an exciting technical program, the ER2010 Organizing Committee is arranging a student tour to geotechnical firms in the greater Seattle area.

Surrounded by mountains and water, the greater Seattle area presents diverse and challenging geologic conditions. Given this scenario and being a vibrant cosmopolitan area, many national and international geotechnical consulting firms have offices in this region.

In this context and in coordination with the local ASCE Geotechnical Section, students will visit a selected group of geotechnical companies and be exposed to current projects, day-to-day work, life as a consultant, and job opportunities in the greater Seattle area.

Among current major regional projects are the new WA520 floating bridge, Alaskan Way viaduct replacement with a tunnel, expansion of the recently opened light rail system, etc. Students will have the chance to meet experts in different geotechnical fields and be exposed to the diversity of geotechnical conditions in the area.

The visits will be organized to create an informal environment and students will be encouraged to participate and ask questions. A limited number of spaces will be available on a first-come, first-served basis. Transportation will be provided from and to the conference venue. This event will be organized so that it does not conflict with the field demonstration events.



John R. Wolosick, P.E., D.GE
Director of Engineering, Hayward Baker Inc.



Tom A. Armour, P.E., D.Ge.
DBM Contractors, Inc.

Field/Equipment Demonstrations

Conference attendees are encouraged to participate in the demonstrations to see what really goes on in the field – real world experience! Attendees can expect to view a variety of equipment used in the construction of a range of retaining and shoring systems. Amongst the planned activities, there will be:

1. Demonstration of Soldier Pile/Tieback wall construction including tieback anchor drilling, grouting and stressing/testing.
2. Demonstration of soil nailing including (possibly) drilling, shotcreting and pull-out testing.
3. Modular block wall construction demonstration.

The demonstrations will be conducted offsite and buses will be provided to transport attendees to and from the site. Hard hats and eye protection might be required for some of the demonstrations and will be provided at the site.

Sponsors:



Plenary Session: 8:00 - 9:30 am

Chair: Larry Hansen

More and more, retention systems are being designed on the basis of restricting ground movements adjacent to the wall. Two prominent engineers will provide their perspective on this important issue.



Plenary Speakers

Edward C. Cording, Ph.D., M.ASCE
Professor Emeritus, University of Illinois at Urbana-Champaign

“Assessment of Excavation-Induced Building Damage”



Richard Bathhurst, Ph.D., P. Eng
Professor of Civil Engineering
Royal Military College of Canada

“Facing Displacements in Geosynthetic Reinforced Soil Walls”

Plenary Session: 10:00 - 11:30 am

Chair: Richard Finno

Numerical analyses of retention systems have become more common, and indeed have found their way into the design of some of these systems. Three distinguished speakers will discuss various aspects of this important topic.



Plenary Speakers

Andrew J. Whittle, Sc.D., M.ASCE
Professor, Massachusetts Institute of Technology

“Advances in the prediction of excavation performance”



W. Allen Marr, Ph.D., P.E., M.ASCE
President & CEO Geocomp Corporation

“Displacement-Based Design for Deep Excavations”



Helmut Schweiger, Ph.D.
Professor, Institute for Soil Mechanics and Foundation Engineering, Graz University of Technology

“Design of Deep Excavations with FEM - Influence of Constitutive Model and Comparison of EC7 Design Approaches”

Award Luncheon: 11:30 am – 1:00 pm



Luncheon Speaker

R. D. Holtz, Ph.D., P.E., DGE, M. ASCE
University of Washington

“Some Reflections on Earth Retention, 1962-2010”



Richard J. Finno, Ph.D., P.E., M.ASCE

The Harry Schnabel Jr. Award was established by the Geo-Institute in 2006. This is a memorial award to recognize Harry Schnabel's accomplishments in the field of Earth Retaining Structures over a 50-year career and to encourage continued excellence and innovation by those making a career in the earth retaining structures industry. The award is funded by an endowment from the Schnabel Foundation Company.

Please join us in honoring the 2010 Harry Schnabel Jr. Award winner, Richard J. Finno, Ph.D., P.E., M.ASCE for his innovative research and international work to improve the understanding of Earth Retaining Structures.

Concurrent Theme Sessions: 1:00 - 2:30 pm

Theme Session 3A

Chair: Tom Armour

Learn about advances in seismic evaluation of retention systems and their application to case studies.



Theme Speaker

Susumu Iai, Ph.D.

Professor, Disaster Prevention Research Institute
Kyoto University

“Seismic Design and Performance
of Retaining Structures”

Presentations

Fransiscus S. Hardianto

The Reinforced Earth Company

“Seismic Deformation of Back-to-back Mechanically Stabilized
Earth (MSE) Walls”

Casan King L. Sampaco, Ph.D., P.E, P. Eng.,

Senior Technologist and Geotechnical Engineering Specialist,
CH2M HILL International

“The Golden Ears Bridge Design-Build Project: Stabilizing
Abutment-Wall System for Unnamed Creek Bridge”

Shamsher Prakash, Ph.D

Professor Emeritus, Civil Engineering Missouri S&T

“On Seismic Design of Retaining Walls”

Theme Session 3B

Chair: Kimberly Warren

Learn about case studies that have expanded the state-of-the-practice in the area of fill walls.



Theme Speaker

James E. Parkes, P.E.

PB Americas, Inc.

“Re-Visiting MSE Walls 20 Years After
Construction: A Case History of Evaluation for
Continued Use”

Presentations

Kenneth L. Fishman, Ph.D., P.E., M. ASCE

Principal, McMahon & Mann Consulting Engineers, P.C.

“Metal Loss for Metallic Reinforcements and Implications for LRFD
Design of MSE Walls”

Robert A. Gladstone, P.E., M. ASCE,

Association for Metallically Stabilized Earth

“Coherent Gravity: The Correct Design Method for Steel-Reinforced
MSE Walls”

David M. Cotton

Kleinfelder

“Recent Advances in the Top-Down Construction of a 26.4 m Deep
Soil Nail Retention System-Bellevue Technology Tower”

Closing Plenary Session: 3:00 - 4:30 pm

Chair: Youssef Hashash

Listen to two distinguished speakers provide their thoughts regarding the information presented at the conference with a view towards what lies ahead.



Closing Plenary Speakers

Hubert Deaton, III, P.E., M.ASCE

President, Schnabel Foundation Company

“Lessions Learned, Not Learned and To Be
Learned”



Thomas D. O'Rourke, Ph.D., M.ASCE

Thomas R. Briggs Professor of Engineering School of
Civil and Environmental Engineering, Cornell University

“Key Developments in Earth Retention Systems”

Hotel Information

Hyatt Regency Bellevue
900 Bellevue Way NE
Bellevue, WA 98004-4272



Designer decor and fine furnishings await you at the Hyatt Regency Bellevue. Ideally located in the heart of downtown, this four-diamond Bellevue, Washington hotel is perfectly positioned for work, play or both. Breathtaking views of majestic Mount Rainer, Lake Washington, downtown Bellevue and Seattle provide a relaxing atmosphere and create a spectacular backdrop to luxurious guestrooms.

Wander through The Bellevue Collection's vibrant fusion of shops, restaurants, and entertainment venues, all just steps away from this elegant hotel.

With downtown Seattle and Sea-Tac Airport only 17 miles away and business headquarters and fabulous entertainment just outside the door, you'll agree there is no better choice than the Hyatt Regency Bellevue.

Hotel Parking

Self parking \$16 per day for Sunday night through Thursday night stays. Friday and Saturday night stays are complimentary. Valet Parking \$18 per day.

About Bellevue, WA and Companion Activities

The greater Seattle area is an ideal summer vacation destination. Whether you like the water, the mountains or the cultural scene, there is something for everyone. Plan on bringing your family to enjoy the many exciting nearby destinations before, during or after the conference. Please see Companion Brochure in your bag for more details on sightseeing opportunities around the area.



Bellevue, French for "beautiful view," is enviably situated between sparkling Lake Washington and the majestic Cascades.

Bellevue Downtown Park is an elegant and urban oasis featuring formal gardens, walking trails and a 240 foot-wide waterfall and reflecting pond. Stroll the stunning display gardens and peaceful woodlands at the breathtaking Bellevue Botanical Gardens.

Bellevue Arts Museum, emphasizing the works of local artists, promotes the exploration of art and design with aweinspiring exhibits and fascinating educational programs.

Bellevue Square – or "Bel Square" in local parlance – draws both shopaholics and arts aficionados.

From a distance it looks like a flying saucer on a tripod, but the Space Needle provides superb views of Seattle and its surroundings.

Transportation to and from Sea-Tac Airport

Shuttle Express

One-way fares (24 Hours/7 days a week)

Starting at \$19 per person

Children 12 and under are complimentary with each paying adult
425-981-7000 or 1-800-487-RIDE (7433)

www.shuttleexpress.com

Taxi - Approximately \$30-40 each way

Child Care Services



While ER2010 will not have organized childcare, services can be organized on your own through Best Sitters. With trained, licensed, bonded, and insured childcare providers, Best Sitters has served the Seattle/Bellevue area since 1969 and services the Hyatt Regency Bellevue Hotel. Office hours are Monday through Friday, 8 am - 5 pm and Saturday 9 am -1 pm. For more information, call 425-837-8200 or email bestsitters@comcast.net or www.bestsittersinc.com.

Professional Development Hours (PDHs)

Participants can earn PDHs, nationally recognized units of record, by attending Conference plenary and themed sessions. Please note that there are differences from state to state in continuing education requirements for professional engineering licensure. Each state registration board has the final authority to approve courses, credits, PDHs, and other methods of earning credits in that state. The Geo-Institute strongly recommends that individuals regularly check with their state registration boards for specific continuing education requirements in their jurisdictions that affect professional engineering licensure and the ability to renew licensure. Be sure to check the ER2010 web site (www.er2010.org) for updated information regarding the PDHs that can be earned at this Conference.

Congress Dress Code

Business casual attire is appropriate for most events unless otherwise noted. It is advisable to wear a jacket or a sweater during the sessions, as rooms are typically cool. We also recommend wearing comfortable shoes.

Proceedings

All peer-reviewed technical papers and invited papers will be included in the printed proceedings that will be provided to full Conference (non-student) registrants at the Conference. There will be about 100 papers in this hardcopy and CD-RoM proceedings, which will be a valuable reference to all working in geoenvironmental engineering. Proceedings will be available for purchase through ASCE's publication website post-conference: www.pubs.asce.org.

Program and Session Cancellation

G-I reserves the right to cancel courses and/or sessions because of low registration. In the unlikely event of a cancellation, all registrants will be notified and will receive full refunds, if applicable. Courses and Sessions are subject to change and G-I reserves the right to substitute a course, session and/or speaker of equal caliber to fulfill the educational requirements.

Registration Rates-Full Conference

	Onsite
ASCE / G-I Member or Coop Organization	\$795
Retired	\$495
Speaker	\$645
Non-Member	\$905
Full-Time Student with Proceedings <i>(Proof of valid student ID required)</i>	\$200
Full-Time Student without Proceedings <i>(Proof of valid student ID required)</i>	\$125

Registration Rates-Daily

	Onsite
ASCE / G-I Member or Coop Organization	\$295
Speaker	\$295
Non-Member	\$395

Receive Member Rates

Not a member of G-I? Join today and save on your Conference registration. Visit the G-I Web site at www.geoinstitute.org to complete a membership application or simply select the "Join the Geo-Institute Today" option upon registration and have your membership processed with your registration for the Conference.

Organizational Member

To become a G-I Organizational Member through the end of 2010:

»» The fee is \$1,000 which extends membership through December 31, 2010.

»» There's an Organizational Member application on the G-I website at <http://content.geoinstitute.org/static/orgmembers.html>. Download the application, fax, email, or mail it in with payment.

Cancellations/Refunds

No refunds will be made for cancellations received after July 19, 2010. Send cancellations to REGSupport@YourMeeting.com or fax them to 888-909-3725.

On-Site Registration Hours

Sunday, August 1, 7:00 – 9:30 am For Short Courses ONLY
Sunday, August 1, 4:00 – 8:00 pm
Monday, August 2, 7:00 am – 6:30 pm
Tuesday, August 3, 7:00 am – 3:00 pm
Wednesday, August 4, 7:30 am – 3:00 pm

Release/Waiver/Special Assistance

Photograph Release: By submitting the registration form, I hereby release any photographs that may be incidentally taken of me during these events by Geo-Institute to be used for any purpose.

Liability Waiver: I agree and acknowledge that I am undertaking participation in Geo-Institute events and activities at my own free and intentional act, and I am fully aware that possible physical injury might occur to me as a result of my participation. I give this acknowledgement freely and knowingly that I am, as a result, able to participate in Geo-Institute events, and I do hereby assume responsibility for my own wellbeing.

I also agree not to allow any other individual to participate in my place without prior permission from the Geo-Institute.



Company Name	Website	Description
AGL Manufacturing Ltd	www.aglmfg.com	AGL Manufacturing Ltd is ISO9001 certified provider of soil and rock anchors, soil nails, tieback anchors, micropiles and shotcrete hoses and clamps.
Atlas Copco CMT	www.atlascopco.us	Atlas Copco provides drills, a complete line of drill tooling - up to the largest Cluster Drills, Self Drilling Anchors, Grouting equipment, Symmetrix and Odex for overburden drilling, Swellex rock bolts and Roofex yieldable bolts, diamond drilling tools and equipment as well as air compressors, pneumatic and hydraulic tools.
Basalite Concrete Products LLC	www.basalite.com	Basalite Concrete Products LLC are manufacturers of concrete segmental retaining walls, articulating concrete blocks, permeable pavers, and precast modular blocks.
Chance/Hubbel Power Systems	www.abchance.com	
Civil Solutions Group	www.civilsolutionsgroup.com	Civil Solutions and Structures Hardscapes are a powerful Design + Build firm specializing in Earth Retention, Slope Stabilization, Alternative Storm Water Management, Site and Pavement Design."
Condon - Johnson & Assoc. Inc.	www.condon-johnson.com	
Con-Tech Systems Ltd.	www.contechsystems.com	Con-tech Systems supplies Geo-Support Systems (Strand, Solid, Fiberglass, & Hollow Bars) plus advanced grouting equipment. We also offer deep foundation solutions for renewable energy sources.
DBM Contractors	www.dbmcontractors.com	
Deep Excavation LLC	www.deepexcavation.com	Deep Excavation LLC has developed DeepXcav 2010, an interactive and intuitive computer software program for deep excavations with more than 1000 users worldwide.
DYWIDAG Systems International USA	www.dsiamerica.com	At DSI, we focus on the structural product needs of foundation and geotechnical contractors. We offer a complete line of products for your anchoring and post-tensioning applications. Our mission is to provide the highest degree of technical support, customer service and top quality engineered systems.
Geokon, Inc.	www.geokon.com	Geokon, Inc. manufactures a full range of high-quality geotechnical instrumentation suitable for monitoring the safety and stability of a variety of civil and mining structures.
Golder Associates, Inc.	www.golder.com	Golder Associates is a global company specializing in ground engineering and environmental services. Operating as an employee-owned group since its formation in 1960, Golder has nearly 7,000 dedicated professionals operating in local companies, with offices across Africa, Asia, Australia, Europe, North America, and South America.
Hayward Baker	www.haywardbaker.com	Hayward Baker Inc. is North America's leading geotechnical construction contractor, providing the complete range of geotechnical construction techniques. Ranked #1 Specialty Foundation Contractor (Engineering News-Record).
Hilfiker Retaining Walls	www.hilfiker.com	Hilfiker Retaining Walls, in business since 1902, designing and manufacturing gravity, MSE, and soil nail systems for earth retention solutions.
Insulfoam	www.insulfoam.com	InsulFoam Geofoam, a proven lightweight material used to repair slope failures, reduce loads on underlying soils, embankment fills, or to build highways quickly without staged construction.
Layne GeoConstruction	www.laynegeo.com	Layne GeoConstruction is a geotechnical contractor specializing in jet grouting, micropiles, high and limited mobility grouting, anchors and vibratory ground improvement and stone columns.
Lock + Load Retaining Walls	www.lock-load.com	LOCK+LOAD is a modular cantilever for retaining walls. It is as flexible as wire, costs like small block while having the capacity of panels and big blocks.
Maccaferri	www.maccaferri-usa.com	
Malcolm Drilling Co, Inc.	www.malcolmdrilling.com	Malcolm Drilling Co. is an industry leader in earth retention and excavation support systems, drilled shafts, underpinning, construction dewatering, groundwater control and ground improvement.

Moretrench	www.moretrench.com	Moretrench is a full-service geotechnical contractor providing design/build and turnkey solutions for challenging construction requirements and subsurface conditions through offices in New Jersey, Florida, New York, Massachusetts, Pennsylvania, Delaware, Washington D.C. and Wisconsin.
National Highway Institute	www.nhi.fhwa.dot.gov	FHWA's National Highway Institute is a leader in geotechnical training with a range of earth retention courses.
Nicholson Construction Company	www.nicholsonconstruction.com	Nicholson is a geotechnical contractor specializing in deep foundations, earth retention, ground treatment, and ground improvement. Nicholson has eight offices around the country to address each region's needs.
Plaxis	www.plaxis.nl	PLAXIS FE-software is intended for 2D and 3D analysis of deformation, stability and groundwater flow in geo-engineering applications such as excavations, foundations, embankments and tunnels.
Redi-Rock International	www.redi-rock.com	
Schnabel Foundation Co.	www.schnabel.com	Schnabel Foundation Company is a nationwide contractor specializing in the design and construction of earth retention systems and specialized foundations.
SSL, LLC	www.mseplus.com	SSL is a specialist organization engaged in the design and supply of innovative, cost-effective Mechanically Stabilized Earth systems for any type of project.
Strata Systems, Inc.	www.geogrid.com	Provider of advanced soil reinforcement products: Stratagrid®, StrataBase™, StrataTex™ and Sleeve-It™ System utilized in MSE retaining walls, reinforced steep slopes and embankments over soft soils.
Stressteel PT Systems	www.stressteel.com	
Synteen Technical Fabrics	www.synteen.com	US Manufacturer specializing in High Strength (2,000 lbs/ft to 30,000 / FT) Geogrids and geotextiles (up to 70,000 lbs/ft) for soil reinforcement applications. Custom size and strengths for project specific applications. Geo reinforcement products are our only business making us the most cost effective producer in the USA.
T&B Structural Systems, LLC	www.tbsus.com	
TEI Rock Drills	www.teirockdrills.com	
TenCate Geosynthetics	www.tencate.com	TenCate™ Geosynthetics is the world's leading manufacturer of geosynthetic solutions, with Mirafix® geotextiles and geogrids, we can provide the correct solution for your site specific conditions.
Tensor International Corporation	www.tensorcorp.com	Tensor International Corporation is a provider of specialty products and engineering services. We specialize in site development solutions for common earthwork problems such as grade changes requiring retaining walls and poor foundation conditions affecting the cost of haul roads, parking lots or building structures.
The Neel Company	www.neelco.com	T-WALL® is the premiere prefabricated reinforced concrete retaining wall system in North America. Recognized as a leading designer and supplier for DOT and Railroad projects, The Neel Company provides complete engineering and sales support to owners, consultants and contractors.
The Reinforced Earth Company	www.reinforcedearth.com	The Reinforced Earth Company is recognized as the inventor and market leader of the MSE retaining wall industry and offers retaining wall, sound wall and precast arch solutions.
Williams Form Engineering Group	www.williamsform.com	Williams Form Engineering Corporation has been offering Ground Anchors, Concrete Anchors, Post Tensioning Systems, and Concrete Forming Hardware to the construction industry for over 85 years.

Exhibit Hall Hours

Sunday, August 1

Noon to 5:00 pm Exhibitor Move-In
5:00 pm Show Management Walk-through
6:00 pm - 8:00 pm Reception in the Exhibit Hall

Monday, August 2

9:00 am - 3:30 pm Exhibit Hall Hours
9:30 am - 10:00 am Break in the Exhibit Hall
11:30 am - 1:00 pm Lunch in the Exhibit Hall
2:30 pm - 3:00 pm Break in the Exhibit Hall

Tuesday, August 3

9:00 am - 3:30 pm Exhibit Hall Hours
9:30 am - 10:00 am Break in the Exhibit Hall
11:30 am - 1:00 pm Lunch in the Exhibit Hall
2:30 pm - 3:00 pm Break in the Exhibit Hall
3:30 pm Exhibit Hall Teardown

Supported Excavations

Design Issues

1. **Recommendations for Assessing Bending Moments for Stiff Wall Systems**
A. Liu, C. Pound, and M. Wongkaew
2. **ADAPTATION: Block 75 Redevelopment Shoring and Dewatering**
R. Jameson, L. West, and J. Bishop
3. **Development of Project-Specific p-y Curves for Drilled Shaft Retaining Wall Design**
Jiun-Yih Chen, Emad Farouz, and Paul Landers

Tiedback Excavations

4. **Selection and Construction of a Permanent Anchored Soldier Pile Wall**
Steven R. Lowe, Frederick C. Rhyner, and Edward J. Schluter

Soil Nail Support

5. **Thoughts on Soil Nail Testing and Design**
Thomas D. Richards, Jr.
6. **Soil Nail and Shotcrete Earth Retention for Construction of a Coal Plant Rotary Railcar Dump and Conveyor**
J. R. Hill, M. G. Iffert, and S. J. Farr
7. **Permanent Soil Nail Wall Utilizing Chemical Grout Stabilization**
Keith LaRue
8. **Soil Nailing in Glacial Till: A Design Guide Evaluation Based on Irish and American Field Sites**
James Joy, Tom Flahavan, and Debra F. Laefer
9. **Results of an Instrumented Helical Soil Nail Wall**
Donald Deardorff, Mike Moeller, and Eric Walt
10. **Innovative Waterfront Retaining Wall System Saves a Condominium**
Andrew E. Sparks, Jonathan L. Robison, and Robert D. Holtz II
11. **Quality Assurance of Soil Nail Grout for Provo Canyon Reconstruction Project**
Clifton B. Farnsworth, Blaine Leonard, and Darin Sjoblom
12. **Hollow Core versus Solid Bar Soil Nails for Support Applications in Karst Terrain: What We Learned!**
Jesús Gómez, Andrew Baxter, and Melinda Dirdal

Soil Mixed Walls

13. **Cutter Soil Mixing Excavation and Shoring in Seattle's Pioneer Square District**
Doug Lindquist, Ben Upsall, and Garry Horvitz
14. **Cutter Soil Mixed Wall Shoring and Seepage Cut Off Office Building near Waterfront**
John Kvinsland and Bob Plum
15. **Earth Retention Using the TRD Method**
Ed Garbin, James Hussin, and Chikashi Kami

Case Studies

16. **Influence of Tip Movements on Inclinator Readings and Performance of Diaphragm Walls in Deep Excavations**
Hsiao-Chou Chao, Richard N. Hwang, and Chung-Tien Chin
17. **Design and Construction of an Underpinning and Earth-Retaining System for Lehigh Valley Hospital Building**
Rupert K. Hon and Michael R. Demcsak
18. **Design of an Anchored, Cast-in-Place, Backfilled Retaining Wall**
Steven Van Shaar, Katy Cottingham, Andrew Walker, and Rich Barrows
19. **Design and Construction of Circular Cofferdams for Earth Retention in a Flyash Disposal Basin**
Gordon Elliott, Paul Martin, and Daniel D. Uranowski
20. **Design and Construction of Temporary Excavation Support at a Water Intake Structure**
Gordon Elliott and Gary Pate
21. **The Behavior of a Deep Retained Excavation in Soft San Francisco Bay Mud**
Gregory P. Wilson
22. **Excavation Support for Jacking and Receiving Shafts on the East Boston Sewer Relief Project**
Kevin M. Dawson
23. **Jet Grout Dike for Temporary Excavation Support in Soft Clay**
C. E. Ho
24. **Innovative Use of Jet Grouting for Earth Retention, Underpinning, and Water Control**
Tom Hurley and Richard Crockford

Mechanically Stabilized Earth Retaining Walls

Design Issues

25. Mobilization of Reinforcement Tension within Geosynthetic-Reinforced Soil Structures
Kuo-Hsin Yang, Jorge G. Zornberg, and Richard J. Bathurst
26. Effects of Corrosion Aggressiveness on MSE Wall Stability in Nevada
J.D. Thornley and R. V. Siddharthan
27. Mechanisms That Generate Pullout Resistance of Steel Chain in Non-Cohesive Soils
K. Abongo, T. Boonyatee, M. Kimura, and A. Kitamura
28. Design and Procurement Challenges for MSE Structures: Options Going Forward
Michael R. Simac and Blaise J. Fitzpatrick
29. Phased, Staged and Ground Improvement Measures for MSE Walls: State of Practice for Soft Soils
John Sankey, Keith Brabant and Frederic Masse

Case Studies

30. Heeding Nature's Call: Replacing MSE Wall with a Bridge
Khamis Haramy, Scott A. Anderson, and Daniel E. Alzamora
31. Lessons Learned from Settlement of Three Highway Embankment MSE Walls
Marilyn D. Dodson
32. Case History—Olympic Sculpture Park MSE Structures
George E. Charalambous, Dustin E. Bennetts, and Kenneth P. Akins
33. Geosynthetic Reinforced Soil Walls As Integral Bridge Abutment Walls
Michael R. Simac and David J. Elton
34. Preliminary Results for a GRS Integrated Bridge System Supporting a Large Single Span Bridge
K. A. Warren, W. Schlatter, M. Adams, T. Stabile, and D. LeGrand

Seismic Evaluation of Retention Systems

35. Seismic Response of Retaining Wall with Anisotropic Backfills
Bo Li, Xiangwu Zeng, and Haiyan Ming

Numerical Analyses of Retention Systems

36. Numerical Study on a New Strut-Free Counterfort Embedded Wall in Singapore
S.S. Chuah and Harry S.A. Tan
37. Finite-Element Analysis of Lateral Pressures on Rigid Non-Yielding Retaining Walls with EPS Geofoam Inclusion
Aurelian C. Trandafir, Jesse F. Moyles, and Benjamin A. Erikson
38. An Un-Conventional Earth Retaining Structure
Ashok K. Chugh
39. Study of Mechanically Stabilized Earth Structure Supporting Integral Bridge Abutment
M.J. Grien, K. Truong, and M. R. Tavakolian

Load and Resistance Factor Design

40. Advantages and Limitations of Ultimate Limit State Design Methods for Braced Excavations
D.C. Konstantakos

Other Walls

41. Rockery Design and Construction Guidelines
Justin T. Henwood and Khamis Y. Haramy
42. NPS Retaining Wall Inventory and Assessment Program (WIP): 3,500 Walls Later
Matthew J. DeMarco, Richard J. Barrows, and Stephen Lewis

Landslide Stabilization

43. Permanent Slope Protection in Highly Seismic and Landslide-Prone Area Using Multi-Level Anchored Aligned Pile Wall
Armando Cazzola and Geronimo T. Reyes

Included In Your Registration

	Sunday Welcome Reception	Daily Refreshment Breaks	Monday Guest Orientation Breakfast	Monday Lunch in Exhibit Hall	Monday Poster Sessions & Reception	Tuesday Lunch in Exhibit Hall	Wednesday Award Luncheon	Plenary and Theme Sessions	Exhibits	Congress Proceedings	Student Firm Visits	Field Demonstrations
Full Registration <i>(Member G-I/ASCE/Cooperating Organization/Speaker/Non-Member)</i>	X	X		X	X	X	X	X	X	X		X
Retired	X	X		X	X	X	X	X	X			X
Daily Registration Monday		X		X	X			X	X			
Daily Registration Tuesday		X				X		X	X			X
Daily Registration Wednesday		X					X	X				
Full-Time Student with Proceedings <i>(proof of full-time status required); FULL FEE</i>	X	X		X	X	X	X	X	X	X	X	X
Full-Time Student without Proceedings <i>(proof of full-time status required); REDUCED FEE</i>	X	X		X	X	X	X	X	X		X	X
Guest/Companion	X		X		X		X					

