Deep Foundations Institute
Technical Activities

Mary Ellen C. Bruce, P.E., D.GE.
DFI Technical Activities Manager
April 25, 2013
Overview

• Technical Activities
• Committee Project Fund
• International Activities
• Outreach
• Research
• Resources
Technical Committees

- Augered Cast-in-Place Piles (CFA Piles)
- Codes and Standards
- Deep Foundations for Landslides and Slope Stabilization
- Driven Piles
- Drilled Shafts
- Ground Improvement
- Helical Foundations and Tiebacks

- Marine Foundations
- Micropiles
- Seismic and Lateral Loads
- Slurry Walls
- Soil Mixing
- Sustainability
- Testing and Evaluation
- Tiebacks and Soil Nailing
Committee Activities

- Seminars
- New Publications
  - Design Guide for Seismic and Lateral Loads
  - NDT Guidelines for ACIP and Drilled Displacement Piles
- Committee Projects
  - Guidance documents
  - Specifications
- Webpages
- Magazine reports
# 2013 Committee Seminars

<table>
<thead>
<tr>
<th>Committee</th>
<th>Date</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helical Foundations and Tiebacks Seminar</td>
<td>June 6</td>
<td>Vancouver, BC</td>
</tr>
<tr>
<td>The Use of Slurry Wall in Infrastructure Projects</td>
<td>June 27</td>
<td>Washington, DC</td>
</tr>
<tr>
<td>DFI-ADSC Drilled Shaft Seminar: Support with Confidence</td>
<td>July 11-12</td>
<td>Columbus, OH</td>
</tr>
<tr>
<td>Current Topics in Marine Foundations</td>
<td>August 1-2</td>
<td>Seattle, WA</td>
</tr>
<tr>
<td>Current Topics in Soil Mixing Design and Construction</td>
<td>October</td>
<td>San Francisco, CA</td>
</tr>
<tr>
<td>Augered Cast-in-Place Pile Seminar</td>
<td>November</td>
<td>New York, NY</td>
</tr>
<tr>
<td>DFI-PDCA Driven Pile Seminar</td>
<td>November</td>
<td>New Orleans, LA</td>
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</tbody>
</table>
SuperPile 2013

• May 15-16, 2013
• Minneapolis, MN
• Joint Committee Effort
  • Driven Piles, Augered Cast-in-Place/Drilled Displacement Piles, Micropiles, Marine Foundations, Testing and Evaluation, Seismic and Lateral Loads, and Drilled Shafts
• Local presentations
• Sandy storm presentation
DFI Annual Conference

- Phoenix, AZ
- September 25-28, 2013
- Committee meetings
- Technical presentations
- Student Competition
- Awards
Committee Project Fund

• Research fund for DFI Technical Committees
  • Advance state of practice and understanding of deep foundations
  • Produce a usable deliverable
  • Projects must be endorsed by a Committee

• Next RFP to be issued May 1
• Proposal deadline November 15
## 2012 Approved Projects

<table>
<thead>
<tr>
<th>Committee</th>
<th>Topic</th>
<th>Deliverable</th>
<th>Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground Improvement</td>
<td>Liquefaction mitigation practices and ground improvement techniques</td>
<td>State-of-practice overview, transcripts of survey interviews, Journal article</td>
<td>$15,000 In-kind contributions $15,000</td>
</tr>
<tr>
<td>Sustainability (joint project with European Federation of Foundation Contractors EFFC)</td>
<td>Carbon emissions calculator for deep foundations techniques used in Europe</td>
<td>User-friendly, spreadsheet-based calculator tool, database of standardized carbon factors</td>
<td>$25,000 In-kind contributions $25,000</td>
</tr>
</tbody>
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## 2012 Approved Projects

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<tbody>
<tr>
<td>Slurry Walls</td>
<td>Design guidelines for permanent reinforced concrete diaphragm walls in highly seismic areas</td>
<td>Design recommendations and proposals for influencing relevant building code provisions</td>
<td>$20,000 In-kind contributions $83,160.</td>
</tr>
<tr>
<td>Deep Foundations for Landslides and Slope Stabilization</td>
<td>Update to an existing Strain Wedge Model technique used for analyzing slopes stabilized with one row of piles</td>
<td>Software and final report</td>
<td>$14,965 In-kind contributions $12,805</td>
</tr>
</tbody>
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## 2013 Approved Projects

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<tr>
<th>Committee</th>
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<th>Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainability</td>
<td>Second phase of calculator tool</td>
<td>User-friendly, spreadsheet-based calculator tool and associated database of standardized carbon factors</td>
<td>$20,000 In-kind contributions $20,000</td>
</tr>
<tr>
<td>Helical Foundations and Tiebacks</td>
<td>State of practice survey and report on design and construction practices for helical piles and tiebacks</td>
<td>White paper and DFI journal article</td>
<td>$24,000 in-kind contributions $83,160</td>
</tr>
<tr>
<td>Committee</td>
<td>Topic</td>
<td>Deliverable</td>
<td>Funding</td>
</tr>
<tr>
<td>----------------------------</td>
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<tr>
<td>Seismic/Lateral Loads and Drilled Shafts</td>
<td>Literature review and development of online database of large scale pile load tests</td>
<td>DFI Journal article, presentations and database of load test data</td>
<td>$30,000</td>
</tr>
<tr>
<td>Micropiles</td>
<td>Literature review and survey on state-of-practice for design and construction and research needs for reticulated micropile networks</td>
<td>Website database of technical papers, DFI journal article</td>
<td>$15,000</td>
</tr>
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## 2013 Approved Projects

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<th>Deliverable</th>
<th>Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tiebacks and Soil Nails</td>
<td>Analysis of potential limitations of 80% anchor unbonded length criterion</td>
<td>Final report and journal article</td>
<td>$26,400</td>
</tr>
<tr>
<td>Augered Cast-in-Place Piles</td>
<td>Assessment of acceptance criteria commonly included in building codes</td>
<td>Final report and possible change to the International Building Code</td>
<td>$17,000</td>
</tr>
</tbody>
</table>
EFFC-DFI Carbon Calculator

- Joint Project with European Federation of Foundation Contractors
- User-friendly, spreadsheet-based calculator tool
- Database of standardized carbon factors
- Phase 1 technologies
  - Drilled shafts, micropiles, diaphragm walls, slurry walls, sheet pile walls, anchors, grouting and soil mixing
- Phase 2 technologies
  - Displacement piles, drilled shaft walls, soldier pile walls, soil nails, dynamic compaction, vibro compaction, jet grouting, stone columns, and vertical drains

www.geotechnicalcarboncalculator.com
BORED PILES

Contributors to samples

KELLER
Cementation
SKANSKA
SOLETANCHE BACHY

9 projects
- Parker Steel Warehouse
- Kühnsdorf
- Graz
- Wembley
- Radlett Place
- Barrow
- A485 Dualling Section 3
- Wigmore
- IKEA

Emissions sources breakdown


Technical Activities
The main quantitative results and associated ratios are shown below:

<table>
<thead>
<tr>
<th>Primary Emission sources – BORED PILES</th>
<th>98 %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Source</strong></td>
<td><strong>Activity data</strong></td>
</tr>
<tr>
<td>Materials</td>
<td>Quantity of materials</td>
</tr>
<tr>
<td>Energy</td>
<td>Amount of energy</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Secondary Emission sources</th>
<th>2 %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Source</strong></td>
<td><strong>Estimation method</strong></td>
</tr>
<tr>
<td>Freight</td>
<td>Standard activity data (details in the freight section)</td>
</tr>
<tr>
<td>Assets</td>
<td>Additional rate : 0.4%</td>
</tr>
<tr>
<td>Mob/demob</td>
<td>Additional rate : 0.3%</td>
</tr>
<tr>
<td>Waste</td>
<td>Additional rate : 0.3%</td>
</tr>
<tr>
<td>People transportation</td>
<td>Standard activity data</td>
</tr>
</tbody>
</table>
Worldwide Membership

Argentina · Australia · Austria · Bahrain · Barbados · Belgium · Bolivia · Brazil · Canada · China · Columbia · Dominican Republic · Ecuador · Egypt · Estonia · Finland · France · Germany · Guatemala · India · Indonesia · Iran · Ireland · Israel · Italy · Japan · Korea · Lebanon · Malaysia · Mexico · Morocco · New Zealand · Nigeria · Poland · Qatar · Russia · Saudi Arabia · Singapore · Slovenia · South Africa · Spain · Sweden · Switzerland · Taiwan · Thailand · The Netherlands · Trinidad · Turkey · UAE · United Kingdom · United States · Venezuela · Vietnam
Mexico Conference 2013

- November 14-15, 2013 in Mexico City
- Joint with Mexican Society of Geotechnical Engineering (SMIG)
- Four ½ day technical sessions
  - Drilled Shafts/Slurry Walls
  - Ground Improvement
  - Innovations/Emerging Technologies
  - Monitoring and Testing
India Conference 2013

• November 15-16, 2013 Mumbai
• In cooperation with Indian Geotechnical Society and Indian Institute of Technology Bombay
• Abstract Submission Deadline: May 31, 2013
• Topics
  • Drilled Pile Systems
  • Driven Pile Systems
  • Deep Excavation Support
  • Ground Improvement
• Workshop on ground improvement
Sweden Conference 2014

- May 21-23, 2014 in Stockholm
- Abstract Submission Deadline: May 27, 2013
- Execution Codes
  - Bored piles / driven piles
  - Wet and dry deep mixing
  - Slurry walls / sheet piling
- Video program
International Seepage Barrier Conference 2015

- June 2015, New York City
- Supported by U.S. Army Corps of Engineers
- State-of-the-practice/art seepage barrier technology
- Levee and dam construction/rehabilitation coastal restoration
- International dam and levee community
Educational Activities

• Sustainability
  • Lead not follow
  • Committee discussion on sustainable aspects of technologies
  • Presentations at each topical seminar

• LRFD
  • Do practitioners understand?
  • Are educational tools adequate?
International Foundations Congress and Equipment Expo
March 2015

- ADSC, GI, PDCA and DFI joint society effort
- March 17-21, 2015 in San Antonio, TX
- Equipment exhibition and conference
- Joint committee meetings
  - Leverage society strengths and missions
  - Develop product
    - State of practice
    - Research needs
    - Market projection
    - Educational tools
Associated Groups

- ASCE Geoinstitute
- ADSC
- PDCA
- USUCGER
- ASFE
- ACI, ASTM, AASHTO
- FHWA/TRB
IBC Change Proposals - 2015

• International Building Code proposals
• Ongoing multi-society effort
• Detailed review and rewrite of Chapter 18 Foundations
• To be submitted for voting January 2015
• Implementation in 2018
• New sections
  • Ground Improvement
  • Foundation testing
  • Expansive and collapsible soils
U.S. Army Corps of Engineers
Seepage Cutoff Working Group

• Initial Workshop – December 2012
• USACE Engineering Manual Seepage Control Cutoffs
• Next Workshop – February 12-13, 2014 (Miami)
  • Attendance open to the industry
  • Presentation Proposal Deadline: June 3, 2013
  • More agencies (BurRec, TVA, NRCS, FERC)
  • Levee Boards
  • Ground improvement techniques for dam and levee foundations
  • Review lessons from Hurricane Katrina
  • Discuss work for Sandy restoration
NHI Courses

• DFI partnership
• Delivery of geotechnical courses
• FHWA request to target consultants for training
  • Increase exposure
  • DOTs that are served by consultants
  • DOTs with limited training budgets
Energy Piles Working Group

- March 25-27, Switzerland International Workshop
- Breakout sessions and summary reports
  - Best practices
  - Codes
  - Market challenges
  - New technologies
  - Validation of design tools
  - Education
- Dedicated DFI journal 2013/2014
One Mine - Document Repository

- Online search engine and resources library
- Access to over 100,000 technical documents related to foundation, construction, tunneling, geology and mining/materials.
- Includes DFI publications pre-2012
- Free with DFI membership
- www.onemine.org
• Practice-oriented journal
• Manny Fine, Publisher
• Editors
  • Ali Porbaha, Ph.D., P.E., Editor, *California State University*
  • Dan A. Brown, Ph.D., Editor, *Dan Brown & Associates*
  • Zia Zafir, Ph.D., P.E., Editor
  • Lance Roberts, Ph.D., P.E., Associate Editor, *RESPEC Consulting and Services*
  • Thomas Weaver, Ph.D., P.E., Associate Editor, *Nuclear Regulatory Commission*
DFI Magazine

- Six issues per year
- Virginia Fairweather, Executive Editor
- Committee reports
- Member news
- Industry articles
DFI Educational Trust
www.dfitrust.org

- **Endowed Scholarships**
  - University of California at Berkeley
  - University of Illinois
  - Auburn University
  - University of Houston
  - City College of New York
  - University of Cincinnati
  - Carnegie Mellon

- **At-large Scholarships**
- Fundraising golf outings and dinners
DFI Staff

Theresa Rappaport, Executive Director
Emilio S. Fandino, Business/Trust Administrator
Mary Ellen Bruce, P.E., D.GE, Technical Activities Manager
Erin Groenewal, Event Coordinator
Lauren Nance, Event Coordinator
Shirin Madon, Office Manager
Lisa Rayment, Bookkeeper
Laurie Seebach, Administrative Assistant

DFI Headquarters
326 Lafayette Ave
Hawthorne, NJ 07506 USA
Tel: 1+ 973 423 4030, Fax: 1+ 973 423 4031
staff@dfi.org
Mary Ellen Bruce, P.E., D.GE
Technical Activities Manager
Deep Foundations Institute
P.O. Box 178
Venetia, PA 15367
(724) 924-4220 phone (412) 997-4829 cell
(724) 260-0582 fax
mebruce@dfi.org