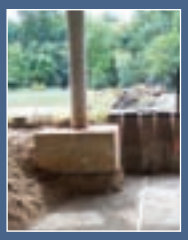
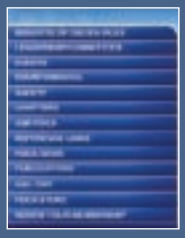


Project Spotlight - Huntingdon Place

▼page 51

Steel Sheet Piling Installation – Best Practices

▼page 59



A Guided Tour of the PDCA Web Site

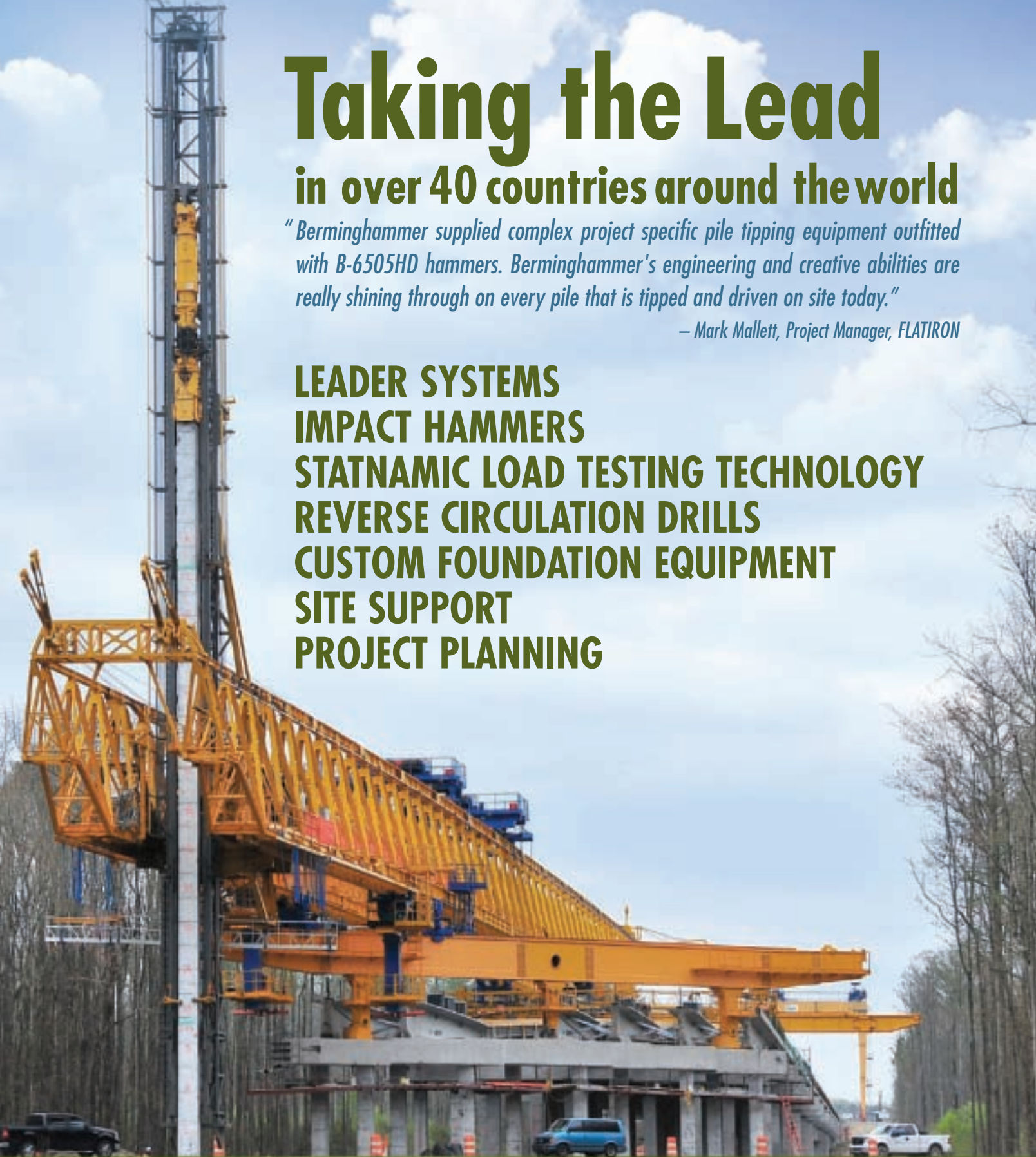
▼page 79

PILEDRIVER

The Official Publication of The Pile Driving Contractors Association | Q4 2008 Vol. 5, No. 4

The Cianbro Corporation Makes Its Mark on the National Harbor Project

PRSTD STD
US POSTAGE PAID
FARGO ND
PERMIT #1080



Taking the Lead

in over 40 countries around the world

"Berminghammer supplied complex project specific pile tipping equipment outfitted with B-6505HD hammers. Berminghammer's engineering and creative abilities are really shining through on every pile that is tipped and driven on site today."

– Mark Mallett, Project Manager, FLATIRON

LEADER SYSTEMS
IMPACT HAMMERS
STATNAMIC LOAD TESTING TECHNOLOGY
REVERSE CIRCULATION DRILLS
CUSTOM FOUNDATION EQUIPMENT
SITE SUPPORT
PROJECT PLANNING

Wellington Street Marine Terminal
Hamilton, Ontario, Canada L8L 4Z9
Tel: 1.905.528.7924 | Fax: 1.905.528.6187
Toll Free: 1.800.668.9432 (in Canada and USA)

BERMINGHAM
FOUNDATION SOLUTIONS
SINCE 1897

Berminghammer
FOUNDATION EQUIPMENT

www.berminghammer.com | www.berminghamfoundationsolutions.com

PILE DRIVING CONTRACTORS ASSOCIATION
1857 Wells Road, Suite 214
Orange Park, FL 32073

P.O. Box 66208
Orange Park, Florida 32065
Phone: 904-215-4771
Toll-free phone: 888-311-PDCA (7322)
Fax: 904-215-2977
www.piledrivers.org
e-mail: steve@piledrivers.org

Published by:
Lester Publications, LLC
140 Broadway, 46th Floor
New York, NY 10005
Toll-free phone: 866-953-2189
Toll-free fax: 877-565-8557
www.lesterpublications.com

President
Jeff Lester

Publishing Director
Sean Davis

Editor
Bonnie Fedak

Design and Layout
Myles O'Reilly

Advertising Executives
Quinn Bogusky, Kari Morgan, Louise Peterson

Visit the PDCA Web site at www.piledrivers.org

For reprint information, contact
Lester Publications, LLC at 877-387-2700
For a media kit, visit www.piledrivers.org

Individual articles can be provided upon request to the PDCA office. Requests should be submitted to the PDCA via e-mail at steve@piledrivers.org or by calling 888-311-PDCA (7322).

Piledriver is published quarterly.
Please contact us by mail at
P.O. Box 66208, Orange Park, FL 32065
Phone: 904-215-4771 | Fax: 904-215-2977
or by e-mail at membership@piledrivers.org

Printed in Canada.
Please recycle where facilities exist.

PILEDRIVER

The Official Publication of The Pile Driving Contractors Association | Q4 2008 vol. 5, no. 4

Contents

On the Cover:
The National Harbor Project.

Building A Deep Foundation

By Van Hogan

Pile driving contractors are deep foundation specialists. They are well-known for their expertise in constructing driven pile foundations. Pile driving contractors, however, often specialize in another type of deep foundation – the community foundation.

Community foundations, like building foundations, provide a platform on which to build. When we build a structure we want to make sure that it has a strong, dependable foundation. We want our foundation to be stable and unyielding even under difficult conditions.

If we want to build something of permanence and we don't have the luxury of ideal site conditions, then we need to install a deep foundation.

Deep foundations are needed for a number of reasons, but the primary reason is dependability. They are something that you can build upon. Deep foundations provide stability. When you build upon a deep foundation, you can rely on it. It will remain steady. It will be able to withstand the forces of change and destruction.

Driven pile foundations are a type of deep foundation. They are installed by pile driving contractors. That is what they do.

Pile driving contractors, however, build other types of deep foundations. They build deep economic and social foundations in their communities. They get deeply involved in their communities and, by their involvement, make them stronger, more stable and better able to prosper. Communities are constantly buffeted by the winds of social and economic change. When it comes to communities and the lives of its citizens, a shallow foundation just won't do.

Following is a brief overview of the commitment and service of a few individuals that have been instrumental in the success of not only the PDCA and our industry, but of their communities as well.

A former PDCA president and one of the founders of the PDCA, Mr. D.R. Jordan (D.R.), of Jordan Pile Driving Inc. in Mobile, Ala., exemplifies this involvement. Jordan Pile Driving has been a fixture in Mobile since 1946. D.R. is a second generation pile driver. In addition to the PDCA, he has served as president of the Alabama Road Builders Association and as president of the Deep Foundations Institute. He is an alumnus of the University of Alabama and serves on its president's cabinet and its business school board of visitors. He also serves on the board of directors for a local bank and is a member of the Warrior-Tombigbee Waterway Association, Mobile Area Chamber of Commerce and the Seaman's Club Foundation. He is also an active supporter of the Boy Scouts of America.

Mr. Wayne Waters of Ed Waters & Sons Contracting Co. in St. Augustine, Fla., is another second generation pile driver and a past president of the PDCA. He served the local construction industry as a member of the board of directors and also as president of the Greater Florida Chapter of the Associated General Contractors. He also served as chairman of the Senior Tournament Players Championship and continues to serve on that tournament's charities board. He also served on the board of directors for a local hospital.

Harry Robbins of Palmetto Pile Driving in Charleston, S.C., and past president of PDCA, is also involved in his community. He led the effort to found the South Carolina Chapter of the PDCA and served as its president and in other capacities, as well. He also served as president of his local American Subcontractors Association, served as a member and chairman of the board of trustees for the Pinewood Preparatory School. He is a member of The Exchange Club of Charleston and a member of the board of directors for the Coastal Carolina Fair, which raises money for charitable causes.

These men are special, but not unique. They are typical of pile driving contractors throughout the world. Pile driving contractors are part of their communities and they are invested in their communities. They are role models, mentors and community leaders.

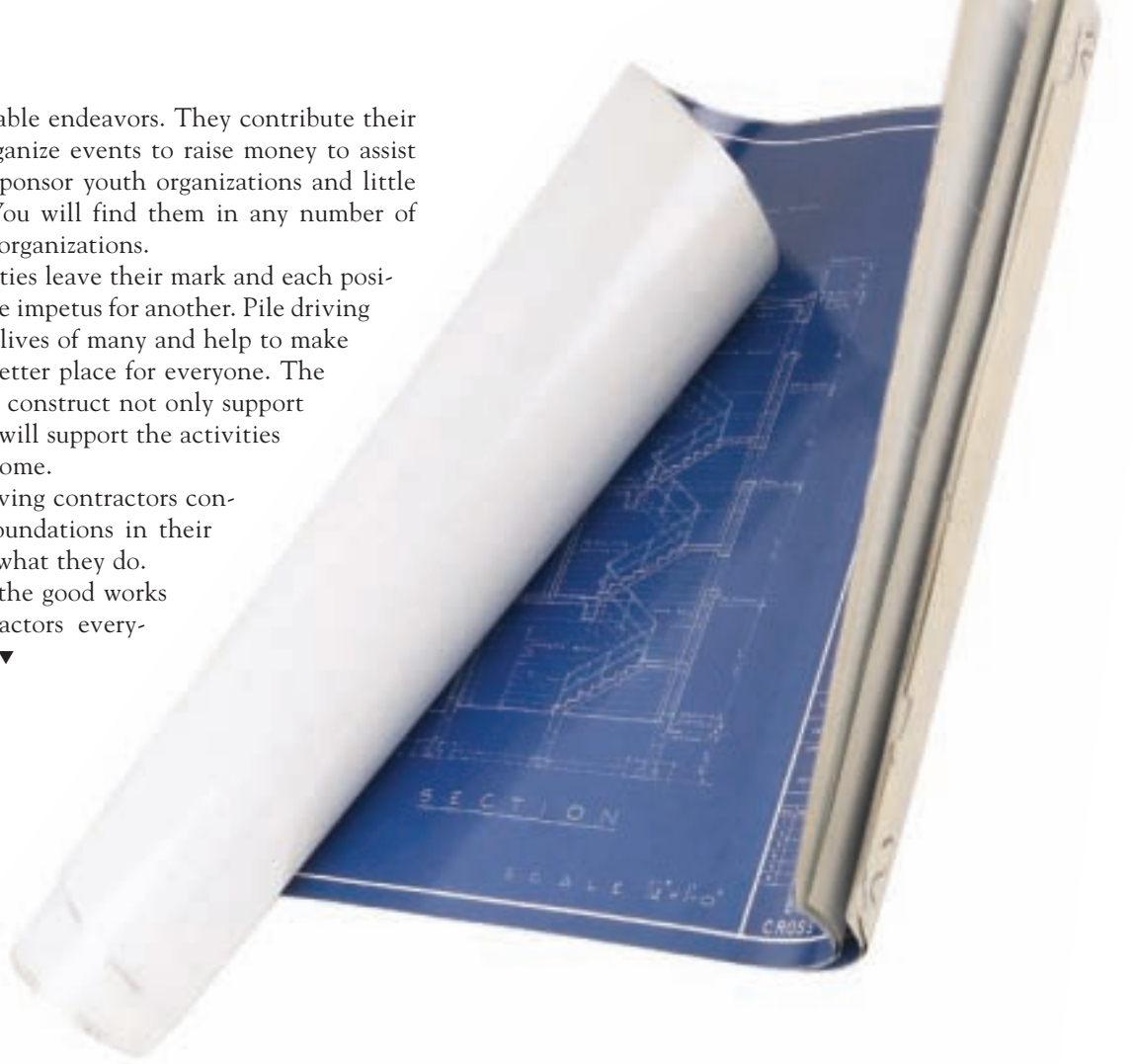
Through their businesses, jobs are provided. Jobs provide stability. Communities thrive on stability. It is not uncommon for pile driving contractors to have many loyal employees with many years of service. Pile driving contractors participate in trade associations to improve business practices, foster relationships, enhance communication, improve education and promote equitable legislation. They

are involved in charitable endeavors. They contribute their time and talent to organize events to raise money to assist those in need. They sponsor youth organizations and little league sports teams. You will find them in any number of civic and educational organizations.

All of these activities leave their mark and each positive action provides the impetus for another. Pile driving contractors touch the lives of many and help to make their communities a better place for everyone. The solid foundations they construct not only support present activities, but will support the activities of generations yet to come.

All in all, pile driving contractors continue to build deep foundations in their communities. That is what they do.

In recognition of the good works by pile driving contractors everywhere, Keep Driving! ▼



By Stevan A. Hall

When you receive this edition of *PileDriver* magazine, it will be middle to late November; we will be entering the holiday seasons and preparing to bring 2008 to a close. It is this time of year when we all start asking ourselves that old familiar question, Where has the year gone? I don't know about you, but for me each year seems to go by just a little faster than the one before.

This issue of *PileDriver* magazine represents Quarter 4 and is the last edition in 2008. The PDCA hopes you have enjoyed your 2008 subscription and have found the articles to be not only interesting, but also informative and educational. The PDCA looks forward to 2009 and another successful year of *PileDriver*. On behalf of PDCA, I want to thank all our advertisers. *PileDriver* magazine is the premiere magazine for the driven pile industry with a readership in excess of 2400. When you advertise in *PileDriver*, you are reaching the decision-makers of our industry, while financially supporting the PDCA. I also want to thank our contributing authors who keep *PileDriver* relevant and interesting for our readership.

As the year ends, I have much to be thankful for and many to thank. First, I want to thank the board of directors under the leadership of PDCA President, Van Hogan. They have dealt with many issues this year and always with the skill and integrity PDCA members would expect from their elected representatives.

The PDCA committees continue to represent their industry segments with uncompromising energy and enthusiasm. This year the Education Committee broke new ground with the first PDCA educational program outside of the continental United States when we teamed up with the Geotechnical Society of Edmonton in Alberta for the Pile Driving Inspectors Certification course. The Market Development Committee planned and implemented a tremendous program for industry professionals, exhibitors and spouses in Phoenix, Ariz., at the 12th Annual International Conference and Expo. Once again, the Technical Committee members made great strides in their work with AASHTO T-15 on the culmination and final approval of the Installation Specifications and progressing work on the Design Specifications.

PDCA owes a debt of gratitude to Van Hogan and John Linscott. Van and John are stepping down as Chairs of the communications and environmental committees, respectively. Van has brought the *PileDriver* magazine from what could almost be referred to as a brochure in its infancy, to an 80-page, industry-recognized professional publication. Van will be replaced as Chair by Pollyanna Cunningham, ICE USA, Inc. John has worked with his committee members over the past four years putting together the PDCA Noise and Vibration database. This was an expansive task requiring hours of work and coordination. John will be replaced as Chair by Joe Savarese, F & S Supply. Van and John can be proud of the hard work and accomplishments they contributed to the PDCA.

I am thankful for the new PDCA office. Our new office provides a professional environment for PDCA to work from and to welcome members and guests too. I am also glad to have Marian Phillips on board as our administrative assistant. The new office and staff have given the PDCA flexibility and opportunities to accomplish more and to better serve the members of the PDCA than ever before.

I want to personally thank each and every one of you for your membership, support and participation in the PDCA throughout 2008. Once again you have proven your dedication and loyalty to the PDCA – *your association*, and the only association representing the driven pile industry. There is no doubt that 2009 will bring some economic uncertainty. Like you, I do not have a crystal ball that will tell us what 2009 holds for us as individuals, as businesses, as an industry or as an association. What I can tell you is that despite current conditions and the downturn in some construction markets, the driven pile industry has fared very

well and remains strong. I can also tell you that whatever 2009 brings, the PDCA will expend every resource available to ensure our market is protected and continues to remain strong and productive. By now, you should have received your 2009 PDCA Membership Dues invoice. The board of directors voted to keep the dues the same as in 2008 in an effort to help you keep costs down, while allowing you to continue to invest in the PDCA. I hope you will give your renewal serious consideration and continue your support of the PDCA, so we can continue to grow and represent you, your business and your industry as no other association can.

PDCA has a lot of good things happening in 2009, such as our participation in the International Foundation Congress and Equipment Expo '09 in March, the Professors' Driven Pile Institute in June, DICEP in California next September, implementation of our new strategic plan and a whole lot more. So hang in there with us, come along for the ride and take advantage of the PDCA and the services and benefits only offered through membership. If you are not a member of the PDCA, but receive *PileDriver* magazine, I have a suggestion for your first New Year's resolution – JOIN THE PDCA TODAY! You will find a membership application in this edition. Fill it out, send it in and become a part of an association that "Keeps on driving!" ▼

Outstanding Piling Products and Service Delivered Year After Year by L.B. Foster.

The **LBFoster** Piling Team

P | N | D

Northwest Pipe Company

GERDAU AMERISTEEL

800.848.6249 lbfosterpiling.com

LBFoster
Piling

2008 PDCA Board of Directors & Committee Chairmen

Officers

Van Hogan
President
Ed Waters and Sons Contracting Company, Inc.
P: 904-823-8817
F: 904-823-9687
3375 Agricultural Center Drive
St. Augustine, FL 32092
vhogan@edwatersandsons.com

John King
Vice President
Pile Drivers, Inc.
P: 843-763-7736
F: 843-763-7974
4530 Hwy. 1162
Charleston, SC 29449
kingpiledrive@aol.com

Don Dolly
Secretary
Foundation Constructors, Inc.
P: 800-841-8740
F: 925-625-5783
P.O. Box 97
Oakley, CA 94561
ddolly@foundationapile.com

John Linscott
Treasurer
H.B. Fleming
P: 207-799-8514
F: 207-799-8538
89 Pleasant Ave.
South Portland, ME 04106
john.linscott@hbfleming.com

Mark Weisz
Immediate Past President
CS Marine Constructors Inc.
P: 707-562-4100
F: 707-562-4106
P.O. Box 2195
Vallejo, CA 94592
mark@csmarine.com

Stevan A. Hall
Executive Director
P: 866-311-PDCA (7322)
F: 904-264-9531
P.O. Box 66208
Orange Park, FL 32065
execdir@piledrivers.org

Directors

Rusty Signor
Signor Enterprises
P: 512-264-8300
F: 512-264-8301
8800 Madrone Ranch Trail
Austin, TX 78734
rustysignor@hotmail.com

Irv Ragsdale
Clark Foundations, LLC
P: 301-272-8241
F: 301-272-1915
7500 Old Georgetown Road
Bethesda, MD 20814-6196
irv.ragsdale@clarkconstruction.com

Mike Elliott
Pile Equipment, Inc.
P: 904-284-1779
F: 904-284-2588
1058 Roland Ave.
Green Cove Springs, FL 32043
melliott@pile-eqp.net

Richard Gilbert
Skyline Steel
P: 800-433-6460
F: 678-584-9778
3250 Peachtree Industrial Blvd.
Suite 203
Duluth, GA 30096
rgilbert@skylinesteel.com

Pat Hannigan
GRL Engineers, Inc.
P: 847-670-7720
F: 847-670-7008
4256 N Arlington Heights Road, #100
Arlington Heights, IL 60004
pat@pile.com

John Parker
Parker Marine Contracting Corp.
P: 843-853-7615
F: 843-853-6263
68 Braswell St.
Charleston, SC 29405
johnp@parkermarine.net

Herbert "Buck" Darling
Herbert F. Darling, Inc.
P: 716-632-1125
F: 716-632-0705
131 California Drive
Williamsville, NY 14221
bdarling@hfdarling.com

Dave Chapman
Blakeslee Arpaia Chapman, Inc.
P: 203-483-2947
F: 203-488-3997
200 North Branford Road
Branford, CT 06405
dchapman@bac-inc.com

Mike Justason
Bermingham Foundation Solutions
P: 800-668-9432
F: 905-528-6187
600 Ferguson Ave.
Wellington St. Marine Terminal
Hamilton, ON, Canada L8L 4Z9
mjustason@berminghammer.com

Michael Kelly
Gulf South Piling Construction, Inc.
Gulf Coast Chapter Representative
P: 504-834-7791
F: 504-834-7792
P.O. Box 10073
Jefferson, LA 70181
gspmichael@bellsouth.net

Sonny DuPre
Cape Romain Contractors
South Carolina Chapter Representative
P: 843-884-5167
F: 843-884-0516
660 Cape Romain Road
Wando, SC 29492
sonny@caperomaincontractors.com

Michael Jahnigen
Sun Marine Maintenance
Mid-Atlantic Chapter Representative
P: 302-539-6756
F: 302-539-6076
Road 4 Box 217B
Frankford, DE 19945
mike@sunmarine.com

Charlie Gibson
Manson Construction Company
California Chapter Representative
P: 510-232-6319
F: 510-232-4528
200 Cutting Blvd.
Richmond, CA
94804-2128
cgibson@mansonconstruction.com

Finance Committee Chair:
John Linscott
P: 207-799-8514
F: 207-799-8538
89 Pleasant Ave.
S. Portland, ME 04106
John.linscott@hbfleming.com

Finance Committee Members:
Van Hogan, Wayne Waters, Randy Dietel, Harry Robbins, Stevan A. Hall
Tom Davis – Financial Advisory
Tom Hallquest – PDCA Accountant

Membership Development and Member Retention Committee Chair:
John King
P: 843-763-7736
F: 843-763-7974
4530 Hwy 162
Hollywood, SC 29449
membership@piledrivers.org

Membership Development and Member Retention Committee Members:
Van Hogan, Don Dolly, John King, Mark Weisz, Richard Gilbert, Dave Chapman, Irv Ragsdale, Mike Justason, Michael Jahnigen, Sonny Dupre, Charlie Gibson, Michael Kelly, John Parker, Rusty Signor, Pat Hannigan, Mike Elliott, Buck Darling Stevan A. Hall

Education Committee Chair:
Mike Justason
P: 800-668-9432
F: 905-528-6187
600 Ferguson Ave. North
Wellington St. Marine Terminal
Hamilton, ON, Canada L8L 4Z9
education@piledrivers.org

Education Committee Members:
Garland Likins, George Goble, Gerald Verbeek, Jim Frazier, John Linscott, Mark Weisz, Mohammad Hussein, Pat Hannigan, Rusty Signor, Steven Kiser, Van Hogan

Market Development Committee Chair:
Mike Elliott
P: 904-284-1779
F: 904-284-2588
1058 Roland Ave.
Green Cove Springs, FL 32043
marketdevelopment@piledrivers.org

Market Development Committee Members:
Stan Baucum, Dave Harper, Dean Abbondanza, Dean Matthews, Max Williams, Phil Wright, Scot Whitaker, Steve Macon, Rob Jolly, Pollyanna Cunningham

Technical Committee Chair:
Dale Biggers
P: 504-821-2400
F: 504-821-0714
P.O. Drawer 53266
New Orleans, LA 70153
technical@piledrivers.org

Technical Committee Members:
Billy Camp, Charles Whiteaker, Charlie Ellis, Dan Brown, Dave Harper, Dean Matthews, Garland Likins, George Goble, Gerald Verbeek, Harry Robbins, Jim Frazier, Joe Phillips
Joe Rose, John Dick, John Linscott, Randy Dietel, Scot Whitaker, Van Komurka, Wayne Waters

Communications Committee Chair:
Pollyanna Cunningham
P: 800-438-9281
F: 704-821-8201
301 Warehouse Drive
Matthews, NC 28104
communications@piledrivers.org

Communications Committee Members:
Garland Likins, Steve Whitty, Doug Scaggs, Van Hogan

Environmental Committee Chair:
Joe Savarese
P: 732-739-5570
F: 732-232-8085
P.O. Box 452
Keyport, NJ 07735
environmental@piledrivers.org

Environmental Committee Members:
Barry Roth, Camilo Alverz, Bud Abbott, Chuck Blakeman, Ed Hajduk, Jim Bay, Joe Savarese, Mark Miller, Warren Waite

Safety Committee Chair:
Greg Lewis
P: 718-786-6557
F: 718-786-6981
46-36 54th Road
Maspeth, NY 11378
Greg.Lewis@skanska.com

www.conklinsteel.com

Toll Free 888-CONKLIN

Sales Fax (513) 769-0610

Celebrating 25 years of Customer Service!

Contact us for availability and pricing

Trusted Stocking Distributor Since 1983

Barge, Rail and Truck Served

Inventory and Sales Offices Throughout the United States and Canada

Transloading Capabilities for Marine Based Projects

QUALITY ✦ SERVICE ✦ PRICE

R.W. CONKLIN STEEL

Steel

100% Melted & Manufactured in the USA

H-Piling • Sheet Piling • Pipe Piling • Piling Accessories • Wide Flange • Structural Shapes • Bar Products • Steel Plate • Bridge Decking • ERW Tubing • Reinforcing Bar • Tie Backs Fabrication Services • Industrial Coatings & Galvanizing

Meet Your New Environmental Committee Chairman Joe Savarese, F & S Supply

By Joe Savarese

Taking on the leadership of the PDCA Environmental Committee is a great honor for me.

For 25 years I have been involved with construction equipment. The last 10 years have been in the deep foundation end of the industry – first with International Construction Equipment, then American Piledriving Equipment, then my own company F.S. Supply working with Junttan pile rigs. I personally have a background in environmental science and forestry. Environmental issues have always had sway on everything we do in construction, and how and when and what we do.

It is imperative that we don't lose the valuable progress that the Committee has made to this point under the leadership of John Linscott. We must complete the Noise and Vibration Database project. This information could affect the very future of the driven pile and would prove to be a great tool in deep foundation engineering. It would be a great contribution by, and credit to, the members of this organization. There is also an informational brochure that this committee has developed and that brochure needs to be promoted and distributed.

We must also address the other important issues that relate to what we do here.

Noise abatement, environmentally safe fuels and lubricants, and impacts on marine life are just a few of the many outstanding issues that impact our business every day and need to be addressed.

I thank John and the members of this committee for the groundwork they have provided and I look forward to building on that groundwork through the direction of the activities of such a key committee. ◆

The Pile Driving Contractors Association
"A Driven Pile is a Tested Pile"

General Membership Information

We are the premier association for pile-driving contractors

The PDCA was founded in 1996 to promote the use of driven-pile solutions in all cases where they are effective. We strive to build and maintain working relationships among end users, manufacturers, government agencies, educational institutions, engineers and others involved in the design, installation and quality control of the driven pile.

We are dedicated to advancing the driven pile

As the only organization solely dedicated to pile-driving contractors, we know that you understand the superiority of the driven pile in most applications. We are the only association addressing the intrusion of non-driven solutions that take away business from the driven-pile contractor. The PDCA understands that to survive in today's competitive marketplace, a pile-driving contractor must strive to stay abreast of the latest trends and technologies in the industry. That is why we maintain close ties with the world's leading suppliers to the industry. It's why we provide a broad range of educational programs for university professors, practicing engineers and contractors. And, it's why more and more contractors, engineers and suppliers are realizing that the PDCA significantly increases their value in the marketplace.

We are a direct link to decision makers

Major manufacturers take an active role supporting the PDCA. At our conferences, we bring together the world's leading design manufacturers and technical application experts to assist you in advancing the driven pile as a superior product.

The PDCA works closely with the technical community to format design codes and installation practices. We offer seminars throughout the country for engineers and educators on the capabilities and advantages of the driven pile. We also work with agencies, such as the Federal Highway Administration and state DOTs, which develop specifications for highway building and other infrastructure projects that use driven piles.

We offer timely, valuable services

The PDCA improves your company's bottom line, as well as your stature in the construction industry, through a variety of programs and services:

Job Referrals

We are the only organization that provides contractor referrals to end users of driven piles. You tell us where you will drive piles and we will refer you to end users. We also provide referrals to our supplier and technical members.

Peer-to-Peer Opportunities

With more than 120 contractor members, the PDCA offers many networking opportunities. Whether at our Annual Conference, DICEP conference, our regional seminars, or by just picking up the phone, you'll develop long-lasting professional relationships and friendships in the industry.

Annual Membership Directory

As a member, you'll receive PDCA's annual membership directory of our contractor, supplier and technical members. Your company is listed along with the piling solutions you employ and states in which you work. This directory is provided throughout the year to construction users on a complimentary basis.

Educational Conferences and Meetings

The PDCA offers cutting-edge education for contractors, engineers, geotechs and anyone else interested in the driven pile and its applications at two major conferences annually. Members receive discounts on exhibit and registration fees.

- The Annual Conference, held in early Spring since 1997, is a nationally recognized conference that brings together leading contractors, technical experts and suppliers to the piling industry.
- The Design and Installation of Cost-Efficient Driven Piles Conference (DICEP), held each September since 2000, is a nationally recognized daylong conference that brings together geotechnical and design engineers, college professors and contractors to discuss the latest trends in understanding, analyzing and controlling piling costs.

Industry Development

The PDCA continually strives to expand market share for the driven pile. The PDCA sponsors the Professors' Driven Pile Institute, held at Utah State University in Logan, Utah. Up to 25 professors from major engineering schools are invited to participate in an intensive, weeklong program that presents them with the latest concepts in driven-pile design, installation and quality control. Some of the leading faculty in the deep foundation field has attended the institute to date. The program supplies the educators with the tools and knowledge to be able to teach their students about the advantages of the driven pile. It promises to have a long-term impact on market share for the driven pile.

Publications and Reference Materials

As a PDCA member, you will receive our quarterly publication, *Piledriver*, which presents articles on issues and trends of interest to our industry. As a member, you'll receive discounts on advertising in the magazine.

All PDCA members receive a complimentary copy of the PDCA's codebook, *Recommended Design Specifications for Driven Bearing Piles*, now in its third edition. This book covers all required guidelines for driven piles and includes a suggested bid and payment schedule.

PDCA also offers the *Installation Specifications for Driven Pile-PDCA Specification 103-07* as a CD to all new members at no charge.

The PDCA also sells *Driven Pile Foundations, Volume I&II*, an FHWA manual on the design and construction of driven piles.

"Through its programs and services, PDCA has presented our company with numerous opportunities to continue our business success. It is certainly a cornerstone for growth in a very competitive business."

D.R. Jordan, President and CEO, Jordan Pile Driving, Inc.

Connect Worldwide at www.piledrivers.org

The PDCA's newly redesigned Web site at www.piledrivers.org lets you research the latest trends in the industry and find direct links to manufacturers, suppliers, engineers and others. PDCA members receive a free listing in our member search area, which is being used by an increasing number of end users to find pile driving contractors and services. Our forums area makes it easy for you to connect with others to discuss issues and problems.

Leadership Opportunities

Membership in the PDCA provides opportunities for recognition and leadership. Positions are available on the PDCA board of directors and various committees that impact the industry. The PDCA recognizes noteworthy contributions to the industry with our Driven Pile Project of the Year Award, giving opportunities for high profile recognition.

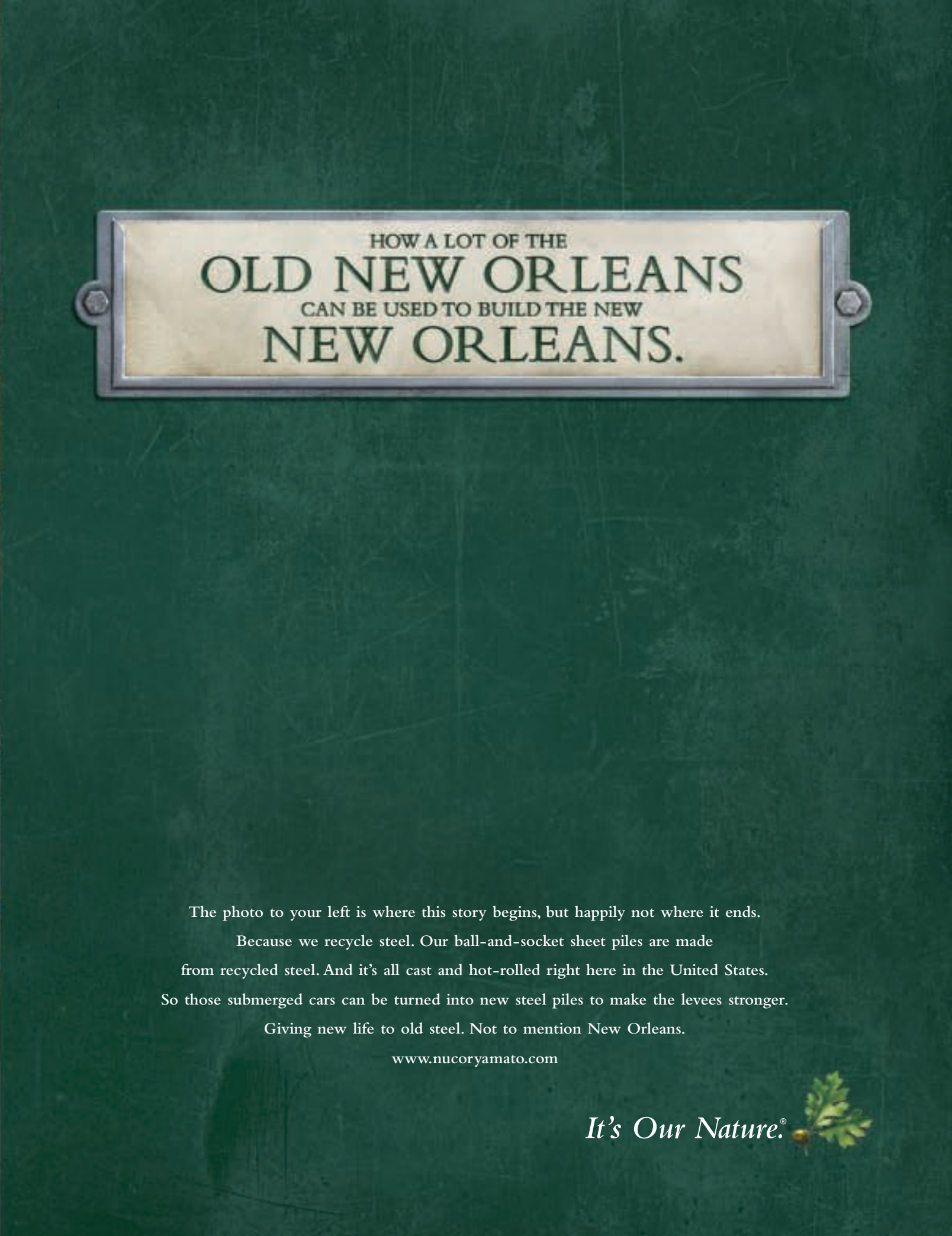
Membership is available to you

There is strength in numbers and we at the PDCA need to count your company when telling government agencies, engineers and suppliers that we are interested in keeping your business viable and in growing market share for the driven pile. We need your ideas and efforts in working together toward a common goal: the use of driven-pile solutions. You can contribute your expertise and assist the Association in developing:

- A greater focus on safety.
- The quality of driven pile products.
- The formatting of codes and specifications for the driven pile.
- Support for a program to help educate students in the use of driven piles.

Join today. Be part of a growing and vibrant organization that will play a key role in the future of deep foundations. Support your industry by completing the membership application in this issue. You will immediately begin to enjoy benefits of membership. ▼


Welcome to
NEW ORLEANS
DOWNTOWN
NUCOR-YAMATO
STEEL


HOW A LOT OF THE
OLD NEW ORLEANS
CAN BE USED TO BUILD THE NEW
NEW ORLEANS.
The photo to your left is where this story begins, but happily not where it ends.
Because we recycle steel. Our ball-and-socket sheet piles are made
from recycled steel. And it's all cast and hot-rolled right here in the United States.
So those submerged cars can be turned into new steel piles to make the levees stronger.
Giving new life to old steel. Not to mention New Orleans.
www.nucoryamato.com
It's Our Nature.®

JUNTTAN

Piling Equipment Specialist

We design and manufacture the most advanced piling equipment for the world's leading piling contractors.

Junttan Oy

P.O. Box 1702
70701 Kuopio, Finland
Tel: +358 17 287 44 00
Fax: +358 17 287 4411
Email: junttan@junttan.com
www.junttan.com

Junttan Oy / USA Sales
Miika Eskelinen / Sales manager
Tel: +358 50 554 0211
Email: miika.eskelinen@junttan.com

Ahti Knopp / Area sales manager
Tel: 1-404-514-8056
Email: ahti.knopp@junttan.com

Sun Piledriving Equipment, LLC / Southeast USA
Michael R. Jahnigen
RD 4, Box 217B
Frankford, DE 19945
Tel: 1-302-539-7187
Fax: 1-302-539-4443
Email: info@spe-usa.net
www.spe-usa.net

F.S. Supply / Northeast USA
Joe Savarese
P.O. Box 452, Keyport
New Jersey 07735
Tel: 1-732-530-3782
Fax: 1-732-530-5355
Email: j.f.savarese@att.net
www.fssupplyco.com

PDCA MEMBERSHIP APPLICATION

Step 1: Select Membership Type

I wish to apply for the following membership status (check one):

❑ **Contractor** ❑ **(Annual Gross Sales >$2 Mill./year: $850.00/year)**
❑ **(Annual Gross Sales <$2 Mill./year: $425.00/year)**

A Contractor Member is defined as a specialty subcontractor or general contractor who commonly installs driven piles for foundations and earth retention systems. Includes one primary membership. Secondary memberships are $75 each.

❑ **Associate** ❑ **(Annual Gross Sales >$2 Mill./year: $850.00/year)**
❑ **(Annual Gross Sales <$2 Mill./year: $425.00/year)**

Associate Members of the Association shall consist of firms or corporations engaged in the manufacture and/or supply of equipment, materials, testing or other services to the pile driving industry. Secondary memberships are $75 each.

❑ **Technical Affiliate ($100.00/year)**

Technical Affiliate Members of the Association shall consist of individuals who are involved with the design and installation of driven piles or in teaching the art and science of pile design and installation. They may be employed engineers, architects, government agencies, or universities. Employees of contractors are not eligible to become Technical Affiliate Members. Note: Technical Affiliate Membership category is for individuals only. For a company listing in the directory and on the Web site, you must join as an Associate Member.

❑ **Retired Industry Member ($50/year)**

A Retired Member shall be defined as any individual who has reached retirement age as defined by U.S. law, who has left active employment and who wishes to remain a member.

I am retiring as a ❑ Contractor ❑ Associate ❑ Technical Affiliate

Step 2: Demographic Information

Company Name _____ Phone _____

Your Name _____ Fax _____

Address _____ e-mail _____

City/State/Zip _____ home page _____

Step 3. Method of Payment

Attached is my payment of $_____ for annual dues.

❑ I understand that dues are due annually on December 31 and that if I joined PDCA after March 31, I may be entitled to a pro-rated dues amount for the subsequent year only.

I am making payment in full by

❑ Check # _____

❑ Credit Card: ❑ MasterCard ❑ Visa ❑ American Express

Card Number: _____ Expiration Date:_____

Name as it appears on card: _____ Signature: _____

Please send this completed application to PDCA | P.O. Box 66208, Orange Park, FL 32065 | 1857 Wells Road, Suite 214, Orange Park, FL 32073
Phone: 888-311-PDCA (7322) | Fax: 904-215-2977 | www.piledrivers.org
(If faxing application to PDCA, please be sure to send both sides.)

Applications Systems

❑ Aluminum Sheet Piles
❑ Coatings & Chemicals
❑ Structural Steel
❑ Synthetic Material Piles
❑ Other_____
❑ Steel Pipe Piles
❑ Steel Sheet Piles
❑ Vinyl Sheet Piles
❑ Other Structural Materials
❑ Timber Piles/Treated Lumber & Timbers
❑ Concrete Piles
❑ Composite Piles
❑ H-Piles

Equipment

❑ Air Compressors
❑ Cranes
❑ Drill Equipment
❑ Drive Caps & Inserts
❑ Hammers
❑ Hydraulic Power Packs
❑ Leads & Spotters
❑ Pumps
❑ Specialized Rigs & Equipment
❑ Other

Services

❑ Consulting
❑ Design
❑ Freight Brokerage
❑ Geotechnical
❑ Marine Drayage
❑ Surveying
❑ Testing
❑ Trucking
❑ Vibration Monitoring_____
❑ Other _____

General

❑ Rental ❑ Sales ❑ Other _____ ❑ Other _____

C. Technical Affiliate Only (check all that apply)

❑ Analysis
❑ Geotechnical
❑ Surveying
❑ Civil & Design
❑ Materials Testing
❑ Vibration Monitoring
❑ Consulting
❑ Pile Driving Monitoring
❑ Other
❑ Educational/Association

Step 4. Geographic Areas Where Contracting, Products and Services Available

(All applicants check all that apply)

❑ All States	❑ CT	❑ ID	❑ MD	❑ NE	❑ NY	❑ SD	❑ WI
❑ AK	❑ DC	❑ IL	❑ ME	❑ NC	❑ OH	❑ TN	❑ WV
❑ AL	❑ DE	❑ IN	❑ MI	❑ ND	❑ OK	❑ TX	❑ WY
❑ AR	❑ FL	❑ KS	❑ MN	❑ NH	❑ OR	❑ UT	❑ Canada
❑ AZ	❑ GA	❑ KY	❑ MO	❑ NJ	❑ PA	❑ VA	❑ Mexico
❑ CA	❑ H	❑ LA	❑ MS	❑ NM	❑ RI	❑ VT	❑ Europe
❑ CO	❑ IA	❑ MA	❑ MT	❑ NV	❑ SC	❑ WA	❑ Global

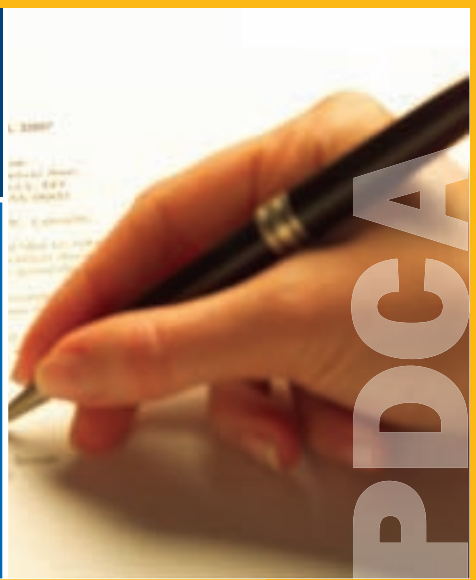
Step 5. Sponsorship: Who told you about PDCA?

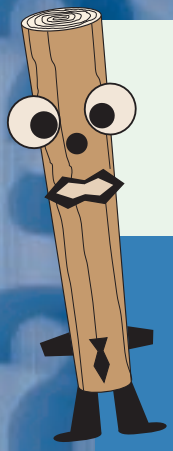
Member Name_____

PDCA
PILE DRIVING CONTRACTORS ASSOCIATION

JOIN TODAY!

Please send this completed application to:
PDCA *P.O. Box 66208, Orange Park, FL 32065*
888-311-PDCA (7322)
Fax: 904-215-2977
www.piledrivers.org





Did You Know?

In this department the PDCA asks "Did you know...?" and provides quick facts and tips of use to members.

The PDCA, through its Professors' Driven Pile Institute (PDPI), has provided educational material on the driven pile to professors from leading educational institutions across the country for use in their classrooms. The next PDPI will be held in June 2009

Driven For Your Success

From cofferdams in the mighty Mississippi River to open cells in the bays of Alaska, and from bridge abutments along Texas highways to the canal levees of New Orleans, Gerdau Sheet Piling is the structural steel product engineers and contractors depend on for a diverse range of construction applications.

Gerdau Sheet Piling PZC™ Z-Profile sheet piling and PS Flat Sheets are engineered to provide cost-effective solutions of the highest quality.

Learn More At www.sheet-piling.com

GERDAU AMERISTEEL™

PDCA Chapters Update

PDCA of the Gulf Coast Chapter:

The PDCA of the Gulf Coast Chapter is busy helping to organize and promote the upcoming DICEP conference. PDCA is grateful for their assistance in what is expected to be a tremendous program.

The PDCA of the Gulf Coast Chapter's next dinner meeting will be back a Messina's Restaurant, 2722 Williams Blvd., Kenner, La., on Nov. 13, 2008. The social begins at 5:45 p.m. with dinner at 6:30 p.m. For more information or to make reservations for the meeting, contact chapter President, Michael Kelly, Gulf South Piling and Construction, 504-834-7791. For information on additional chapter activities or membership, contact Robert Baker (Baker Piledriving & Site Work, LLC) at 985-792-5001 or via email at bakerlandmarine@bellsouth.net or Michael Kelly (Gulf South Piling) at 504-834-7791 or via email at gspmichael@bellsouth.net.

PDCA of the Mid-Atlantic Chapter:

The chapter's next dinner meeting will be on Dec. 4, 2008 at Paul's on the River, in Riva, Md. Guest speakers will be announced at a later date.

PDCA of California:

California PDCA will hold its annual luncheon on Friday, Dec. 5, 2008 at Hotel Mac, Point Richmond, Calif. For more information on the luncheon, contact President Charles Gibson (Manson Construction) at 510-232-6319.

PDCA is expecting to begin conversations with the PDCA of California Chapter regarding the collaborative efforts of holding the 2009 DICEP in the San Francisco area. PDCA is moving DICEP around to all chapters on a rotating basis and is looking forward to working with the California chapter to host this program in 2009.

PDCA of South Carolina Chapter:

The PDCA of South Carolina Chapter will hold its next dinner meeting on Tuesday, Dec. 2, 2008 at the Town and Country Inn. The meeting will begin at 6 p.m.

The PDCA of South Carolina Chapter board of directors will meet on Tuesday, Dec. 2, 2008 at 4:30 p.m., prior to the dinner meeting. ▼

POSEIDON
Barge Corp.

POSEIDON SECTIONAL BARGES for RENT or for PURCHASE!

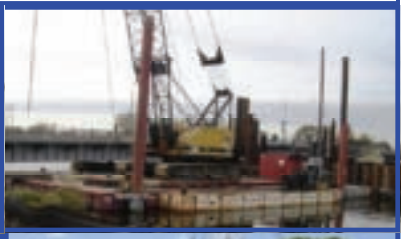
- Stock locations in Indiana, Arkansas, California & Florida
- Dealer: Blue Water Marine, Inc Seattle WA
- Truckable for quick easy setup at your job site
- Pin together as many as you need!
- Use in water as shallow as three feet!
- Coated with two-part epoxy paint on the exterior and bio float rust inhibitor on the interior
- Zinc anodes applied to reduce corrosion in salt and brackish waters
- Rendrag® compatible connection

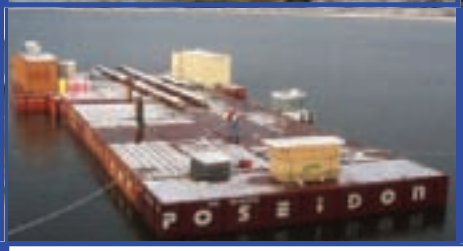
STANDARD STOCK ITEMS

40' x 10' x 5' Sections	Spud Wells
20' x 10' x 5' Sections	Connector Pins
10' x 10' x 5' Rakes	Winch Units
40', 30' or 20' spuds	Barge Pushers

VISIT OUR WEB SITE FOR MORE INFORMATION AT
www.poseidonbarge.com
CALL US AT 260-422-8767
Or 866-992-2743

Blue Water Marine Inc, Seattle, WA
PH: 206-762-3700





POSEIDON
Barge Corp.

POSEIDON BARGE CORPORATION

3101 New Haven Ave, Fort Wayne, IN 46803
PH: 260-422-8767 or 866-992-2743
WEB: www.poseidonbarge.com
Floating Construction Equipment since 1995

Jerry DiMaggio – Moving On

Jerry DiMaggio has been an icon at the Federal Highway Administration (FHWA) for more than 33 years, but now he is moving on to perform another important role in the engineering/infrastructure community.

Jerry DiMaggio, FHWA Principal Bridge Engineer – Geotechnical, decided to retire from public service Oct. 3, 2008, after a 33-year career with FHWA. Jerry will continue to be active after FHWA retirement in his new position. On Tuesday, July 8, 2008, Jerry was confirmed as the implementation manager for the Strategic Highway Research Program (SHRP2) at the National Academies – a part of the Transportation Research Board Special Project Division.

Jerry has been an outstanding representative of FHWA throughout his career. He is the pioneer of the FHWA Geotechnical Engineering Circulars and many of the NHI courses in the field of geotechnical engineering. He represented FHWA in AASHTO committees, NCHRP panels, and in many other activities and professional conferences, giving prestige to FHWA for his high level of professionalism. His unconditional dedication to advance the FHWA Geotechnical program to a statutory level has been recognized across the United States by his colleagues, and his professionalism brought the FHWA visibility throughout the nation as a leading agency in the field of geotechnical engineering.

The Pile Driving Contractors Association has worked with Jerry on many occasions, including seminars, conferences and presentations. His commitment to helping the PDCA progress not only as an association, but also as the leading organization representing the pile driving industry, has been unconditional and steadfast. His counsel has always been positive and insightful.

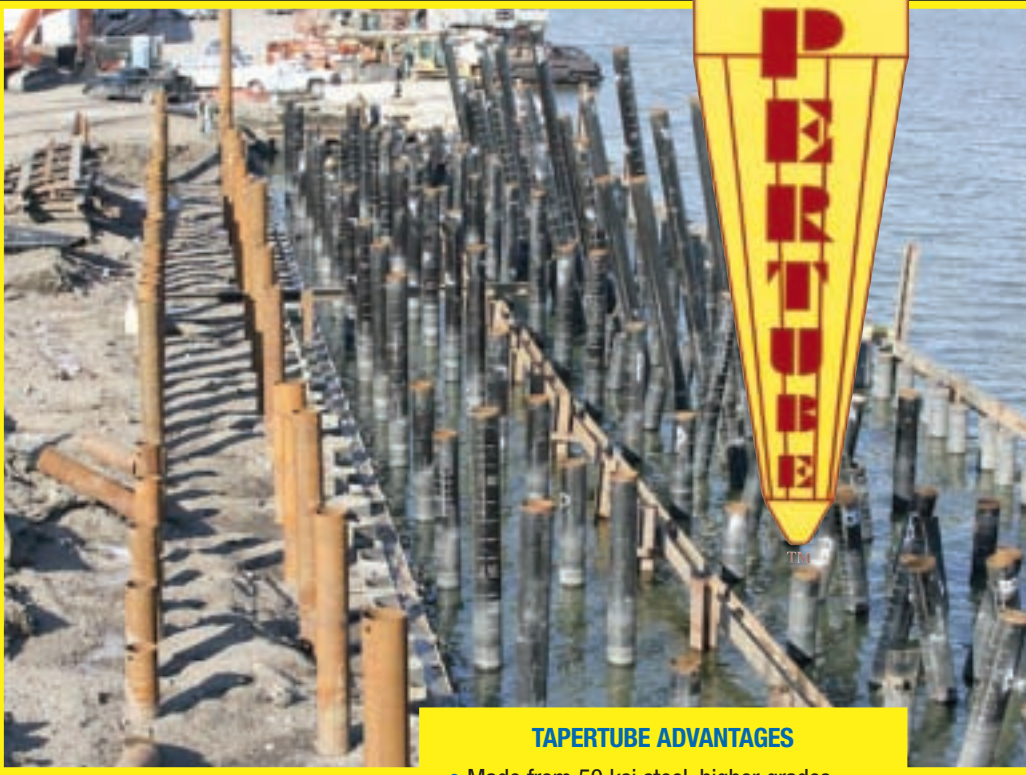
PDCA wishes Jerry the very best in his future endeavor. We know he will be missed at the FHWA level, but we also know that when one door closes, another one opens. Congratulations, Jerry and Good Luck.

SHRP2

America's highway system includes more than 3.9 million miles of highways, arterials, and local roads and streets. These roads, which carry more than 90 percent of passenger trips and account for some 84 percent of freight value, are critical to meeting the mobility and economic needs of local communities, regions, and the nation. In addition to commercial and private vehicles, the roadways accommodate buses, bicycles, and pedestrians and provide vital links to all other modes of transportation. Congress established the second strategic highway research program (SHRP2) in 2006 to investigate the underlying causes of highway crashes and congestion in a short-term program of focused research. To carry out that investigation, SHRP2 targets goals in four interrelated focus areas, which include:

1. Safety – Significantly improve highway safety by understanding driving behavior in a study of unprecedented scale.
2. Renewal – Develop design and construction methods that cause minimal disruption and produce long-lived facilities to renew the aging highway infrastructure.
3. Reliability – Reduce congestion and improve travel time reliability through incident management, response and mitigation.
4. Capacity – Integrate mobility, economics, environment and community needs into the planning and design of new transportation capacity. ▼

THE SHAPE
OF THE FUTURE...



Port of Wilmington Job – Reconstruction of Berth #4 – Kuhn Construction

Tapertube™... Strength = Success!

Project-proven Tapertubes are a dramatic leap forward in on-the-job pile performance. Superior design and robust construction means this remarkable product delivers big advantages over conventional piles or other tapered piles.

For starters Tapertubes are tougher, actually made from 50 ksi steel where another producer claims to cold work to 50 ksi from a lower grade steel. And Tapertubes can be produced with walls that are significantly thicker: .500" for example, compared with the 3 gauge maximum (.239") of a competitive product.

This extra thickness eliminates additional steel reinforcements and coatings, and allows piles to be driven harder and faster. The result: more piles driven, higher production, lower costs.

Tapertube piles are available in an array of shapes and sizes to meet your soil and capacity requirements.

TAPERTUBE ADVANTAGES

- Made from 50 ksi steel, higher grades available upon request
- High capacities for shorter driven lengths
- Conventional equipment and installation methods
- Reduces concrete volume requirements
- Factory attached cast steel points
- Tapertube diameters are made to match standard pipe sizes or even non-standard pipe sizes
- Directly driven... no mandrel or butt reinforcement required
- Full-butt welded splices for direct bearing of pipe extension on Tapertube
- Drive-fit DFP S-1800 sleeves may be used instead of welding to extend piles
- Heavier thickness provides greater drivability, eliminates need for coating and reinforcement

DFP Foundation Products, LLC

PO Box 688 • Franklin Lakes, NJ 07417-0688
201-337-5748 • fax: 201-337-9022 • www.pileline.com

Parker Marine Contracting

By John Parker, Parker Marine Contracting

Parker Marine Contracting is a venerable, well-respected construction firm that specializes in driving piling of every size and of every type in both landed and marine environments.

Parker Marine Contracting Corporation was started by Tommy Parker in August 1950 in Charleston, S.C. The first job consisted of two wood docks on James Island in the Charleston, S.C., area. Parker Marine continued to construct residential wood docks for five years and then started landed timber pile driving work in conjunction with the marine. All pile driving with Parker Marine, at that time, was undertaken with 25-ton Lima cranes and drop hammers or small steam driven Vulcan hammers.

Around 1955, a composite foundation pile became common, which consisted of a wood pile (treated or untreated) driven to the top of the ground. At that point, a corrugated metal pipe shell was nailed to the butt of the pile and a punch was placed through the shell, subsequently filled with concrete. Parker Marine drove hundreds of composite pile around Charleston over seven or eight years. There are still many structures in the Charleston area supported on these piles.

During this time and into the 1960s, the loads were increasing, as well as new products being introduced in the driven pile world. One such product was Raymond Concrete Pile, Incorporated's step taper pile. To compete against Raymond's step taper, Parker Marine embraced 10-inch closed end pipe pile that were driven and then filled with concrete.

In the early 1960s, Parker Marine was invited to bid a large prestressed concrete pile job for a pier for the Georgia Port Authority. They got the job, built a prestressed concrete pile plant in Savannah, and went into the prestressed business. Parker Marine ultimately supplied hundreds of large and small jobs from that prestressed plant, both for themselves and others. In 1963, Parker Marine were true believers in the pre-

PMC installing 100-foot, 12-inch prestressed concrete pile and steel sheet piling for new MUSC Hospital.

stressed concrete pile to economically handle the still increasing loads required, but there was a perceived dearth of information to convince many design professionals. This was greatly allayed when Tommy Parker and Parker Marine successfully performed a 100-ton static load test at a huge expansion project at the Georgetown Paper Mill. This greatly opened up market acceptance of prestressed concrete pile in the area.

Over the ensuing years, Parker Marine grew and helped to further the driven pile industry in both land and marine applications. Tommy Parker and Parker Marine introduced the first diesel hammer to the area with a Link-Belt Speeder 520. The scope of their work expanded to include bridges, large concrete piers for the Navy, marine ender systems for the DOT, and utilities for regional power companies. This included the installation of prestressed concrete pile up to 24 inches in diameter, and 110 feet in length, 8-inch, 10-inch, 12-inch, and 14-inch steel beams, as well as steel and prestressed caissons up to 8 feet in diameter.

Probably the most intriguing job that Parker Marine accomplished was 1,500 feet of 60-inch diameter concrete pipe on concrete pile and concrete caps, 10 feet to 30 feet under water from the Plum Island Sewer Plant. This was a gravity fed outfall from the plant into the Charleston Harbor, so the grade on each successive portion had to be extremely precise.

In 1988, John T. Parker Jr. returned to Parker Marine to join his father and an accomplished group that had years and a wide-breadth of experience. The entire team (office, shop and field) is "home-grown," learning everything on construction in general and driven piles, most specifically, at Parker Marine. Remarkably, if an employee stays more than six months, their average tenure with the company is 20-plus years.

In 1991, Parker Marine returned to the prestressed pile business with the advent of a new casting yard to make 24" x 80' concrete pile for the pier expansion in the Charleston Navy Yard. It continues today to cast 12-inch and 14-inch concrete pile.

The company's largest job was a 39-month utility project that consisted of a series of driven caissons for power structures across Daniel Island in Charleston. The project culminated in six structures that crossed a mile of dredge spoil area that were installed from a driven pile steel and wood trestle. The trestle facilitated a rail system to allow cranes to access the site and bring the necessary caissons, poles, trestle material, and driving equipment along with the process. The job was reversed and the entire trestle was removed and hauled out by rail as Parker Marine moved out. The last leap of the job consisted of two marine structures on prestressed pile, concrete caps, and steel poles done from barges.

With Tommy Parker at its helm, and a capable team of professionals, Parker Marine Contracting Corporation has a half-century history of tenaciously pursuing innovation in the construction world. With the continued and always-expanding advocacy of PDCA, and all their colleagues in the driven pile industry, Parker Marine looks forward to a bright and even more successful future. ▼

1963 - Georgetown, SC 100-ton static test load on 10-inch prestressed pile. Helped legitimize prestressed with regional design professionals.

1965 - Beaufort, MC Power Structures. PMCC installed 66-inch prestressed caissons, inserted 54-inch in them, then 100-foot long poles above them.

PDCA ANNOUNCES "PROJECT OF THE YEAR" AWARD

The PDCA is proud to announce the 2009 "Project of the Year" award competition.

The PDCA is dedicated to acknowledging the hard work, ingenuity and commitment that goes into each project where driven piles are used in a deep foundation or earth retention system or utilized to solve foundation problems. This esteemed PDCA tradition recognizes excellence in driven pile projects completed by PDCA members in good standing.

Through the "Project of the Year" award, the PDCA has the distinguished opportunity to continue its long-standing and consistent commitment to recognize those PDCA members who demonstrate excellence in the process of providing solutions, services and products to the needs of the deep foundation and earth retention environment.

Project entries must feature projects completed in 2008. The PDCA Market Development Committee has expanded the dollar volume and project categories for 2009. Project entries will be awarded in three dollar-volume categories this year, which are "Less than $500,000"; "$500,000 to $2 million"; and "Greater than $2 million." Price ranges are based solely on the dollar volume of the piling contract associated with the project. The two entry categories are distinguished between "Land-based" and "Marine-based" projects.

The PDCA is asking each of its members to consider submitting a project worthy of this symbolic PDCA award. Entry Forms can be found on the PDCA Web site: www.piledrivers.org The 2009 Project of the Year Award entry deadline is December 12, 2008.

Winning entries will be announced during the IFCEE 2009 Conference in Orlando, Fla., during the PDCA Business Luncheon on March 18, 2009. PDCA will NOT reveal the winning entries prior to the luncheon. ▼

Sabine Pipe, Inc.

Structural Pipe Division

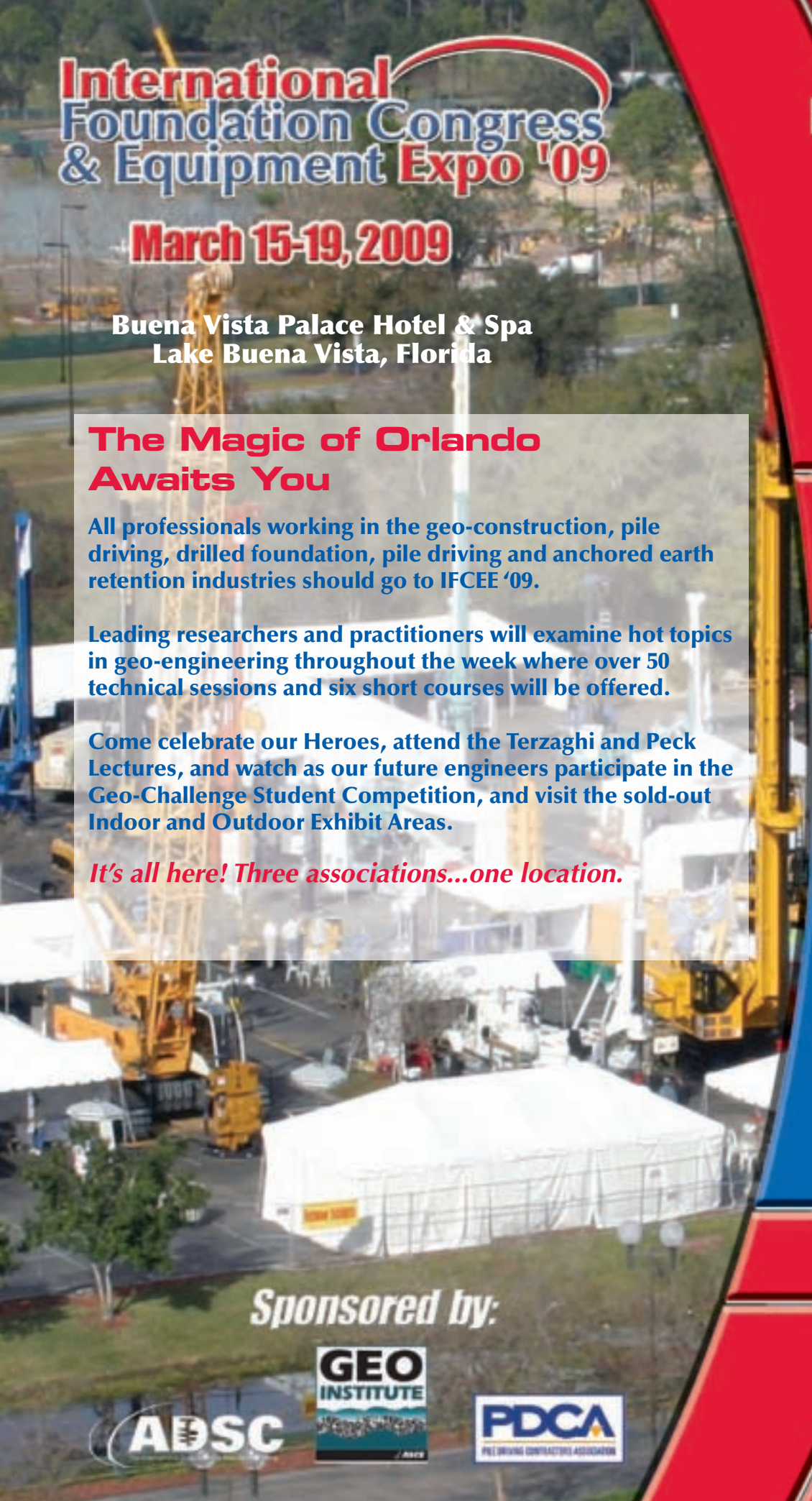
Industrious. Integrated. Diversified.

Products and Services

- Attach Plates & Points
- Splicing – Weld to Length
- 2⅜ through 24" OD
- Standard Pipe & Tubing
- Lacquer Coating
- Torch Beveling
- ASTM A500B, A53B & A252 Grades
- Water Well
- Pipe Piling
- Building Columns
- Road Bore
- Fencing
- Culverts
- Structural Mill Rejects & Secondary Pipe

Ron Welling
Structural Division Manager
903.986.7600
www.SabinePipe.com
PO Box 100
Kilgore, TX 75663

Proud Members of PDCA NASPD



International Foundation Congress & Equipment Expo '09

March 15-19, 2009

Buena Vista Palace Hotel & Spa
Lake Buena Vista, Florida

The Magic of Orlando Awaits You

All professionals working in the geo-construction, pile driving, drilled foundation, pile driving and anchored earth retention industries should go to IFCEE '09.

Leading researchers and practitioners will examine hot topics in geo-engineering throughout the week where over 50 technical sessions and six short courses will be offered.

Come celebrate our Heroes, attend the Terzaghi and Peck Lectures, and watch as our future engineers participate in the Geo-Challenge Student Competition, and visit the sold-out Indoor and Outdoor Exhibit Areas.

It's all here! Three associations...one location.

Building the Foundation for a Solid Future

Sponsored by:

ADSC

GEO INSTITUTE

PDCA

Cooperating Organizations:
AEG, ASFE, ARMA, CGS, DFI, FDOT, FHWA, GSS, ISM, JGS, NAGS, OSHA, RGA, SEI, USUCGER

Congress Highlights

Short Courses

Sunday, March 15

Six one-day concurrent courses focusing on a wide range of topics will be offered Sunday, March 15th. Short Courses provide an excellent opportunity to brush up on familiar subjects or to gain knowledge on new concepts from instructors who are recognized as leading experts in their fields. On-site registration is from **7:00am – 8:30am** with classes running from 8:30am-5:00pm**.** Professional Development Hours (PDHs) for participation and completion of the Short Courses will be available.

SC1 Estimation of Soil Properties for Foundation Design
SC2 Managing Your Safety Program (MYSP)
SC3 High Strain Dynamic Testing for Driven and Drilled Deep Foundations
SC4 Introduction to Instrumentation and Monitoring in Geotechnical Engineering
SC5 Installation and Design of ACIP Piles
SC6 Micropile 201: Advanced Design and Construction Topics

Opening Ceremony
Monday, March 16, 8:30am-9:00am

Keynote Address: ,
Monday, March 16, 9:00am-10:00am
Major General Don Riley, *U.S. Army Corps of Engineers*

Terzaghi Lecture: Judgment, Innovation and Risk in Cost Effective High Rise Foundation Design: A Practitioner's Perspective
Tuesday, March 17, 6:00pm-7:30pm
Clyde N. Baker, Jr., P.E., Senior Principal Engineer, *STS Consultants*

"Honoring Our Hero" Award Reception & Dinner/Dance
Wednesday, March 18, 6:00pm-10:00pm
Join us in honoring our industry hero, Clyde Baker at the "Honoring our Hero" Gala event. This event honors those who have demonstrated exceptional innovation and leadership in the Geo-Technology industry.

IFCEE '09 Student Achievement Awards Luncheon
Keynote Presenter, William F. Marcuson III, Ph.D., P.E., Past President ASCE
Thursday, March 19, 12:00N-2:30pm

Peck Lecture: Pre-Design Geotechnical Evaluation of the OII Superfund Site
Thursday, March 19, 2:30pm-4:00pm
Edward Kavazanjian, Jr., Ph.D., P.E., Associate Professor, *Arizona State University*

Registration & Hotel Information

Registration Hours:

You may pick up your meeting credentials at the IFCEE '09 Registration Desk located at the Buena Vista Palace Hotel & Spa during the following hours:

Saturday, March 14	12:00N - 5:00pm
Tuesday, March 17	7:00am - 6:00pm
Sunday, March 15	7:00am - 6:30pm
Wednesday, March 18	7:30am - 5:30pm
Monday, March 16	7:00am - 6:30pm
Thursday, March 19	7:00am - 12:00N

Hotel

Buena Vista Palace Hotel & Spa, 1900 Buena Vista Dr., Lake Buena Vista, FL 32830

The Hotel: Enjoy the offerings of an extraordinary environment of magic and memories at the Buena Vista Palace Hotel & Spa – a showcase of uncompromising quality. The hotel and surrounding area offer an enticing variety of opportunity and attractions. The resort features three swimming pools, a tennis court, fitness center, European-style spa, complimentary shuttle to Disney theme parks and much more! Golfers will appreciate the preferred tee times at the five Walt Disney World™ championship golf courses.

Rates: $195.00 + tax and $14.95 Resort fee for Single/Double and $215.00 for Triple occupancy from March 10-21, 2009. Due to a limited number of rooms available at this special IFCEE '09 Congress rate, please make your reservations early. Rooms are on a **first-come, first-serve basis.**

To make reservations: Call 866/397-6516 or fax: 407/ 827-3472 **by February 23, 2009.** Advise the hotel that you are attending the IFCEE '09 Congress. Reservations received after February 23, 2009 will be accepted on a space and rate availability basis only. The Buena Vista Palace Hotel & Spa requires a first night deposit to guarantee your guestroom which will be charged to your credit card.

Very Important

A guarantee of one night's room and tax deposit is required at the time a reservation is made and your card will be charged at the time of reservation. The hotel will accept check or credit cards for deposits. Check-in time is 4:00pm and check-out time is 11:00am.

Meeting Cancellations and Refunds

Cancellations: You may cancel up to five (5) days prior arrival. If you cancel within five days, your deposit is non-refundable. Early departures or cancellation of reservations within five (5) days of arrival, are subject to billing on all nights. If you cancel your guest room, be sure to obtain a cancellation number.

Register Online

Register Online at: www.ifcee09.org

IFCEE '09 Congress Week-at-a-Glance

Saturday, March 14 (Pre-Conference)

8:00am-5:00pm	Exhibitor Registration
8:00am-5:00pm	G-I Board of Governors
8:00am-5:00pm	U.S.- China on Ground Improvement Technologies Workshop *(Separate Registration)*
8:00am-5:00pm	ISSMGE Board Meeting
12:00N-5:00pm	Early Registration
12:00N-5:00pm	G-I Committee Meetings
1:00pm-3:00pm	PDCA Education Committee
2:00pm-3:15pm	ADSC Safety Committee
3:00pm-5:00pm	PDCA Market Development Committee
3:30pm-5:00pm	ADSC Micropile Committee
5:00pm-6:30pm	G-I/ISSMGE Reception *(By Invitation Only)*

Sunday, March 15

7:00am-8:30am	Short Courses Registration
8:00am-12:00N	G-I Technical Coordination Council Meeting
8:30am-10:00am	ADSC Anchored Earth Retention Committee
8:30am-5:00pm	Six Concurrent Short Courses
10:00am-10:15am	Short Course AM Break
10:15am-1:00pm	ADSC Executive Committee
11:00am-6:30pm	IFCEE '09 Registration
12:00N-1:00pm	Short Course Lunch Break
12:00N-5:00pm	G-I Committee Chairs Workshop
1:00pm-2:30pm	ADSC Drilled Shaft Committee
2:30pm-3:30pm	Exhibitors Meeting
3:00pm-3:15pm	Short Course PM Break
3:30pm-5:00pm	ADSC Education Committee
5:00pm-9:00pm	G-I Committee Meeting
6:00pm-11:00pm	G-I Committee Meetings
6:30pm-8:00pm	IFCEE Welcome Reception – *Indoor Exhibits Area*

Monday, March 16

7:00am-6:30pm	IFCEE '09 Registration
7:15am-9:00am	IFCEE '09 Welcome Buffet Breakfast *(For Fully Registered Attendees)*
8:30am-9:00am	Opening Ceremonies
9:00am-10:00am	IFCEE '09 Keynote Presentation
10:00am-10:30am	Networking Break
10:00am-12:00N	PDCA Communications Committee
10:00am-6:30pm	Indoor & Outdoor Exhibits
10:00am-6:30pm	Bookstores Open
10:30am-12:00N	Technical Sessions
12:00N-1:30pm	Lunch Break
12:00N-1:30pm	PDCA Members Business & Awards Luncheon *(Fully Registered PDCA Members Only)*
2:30pm-3:00pm	Networking Break
3:00pm-5:00pm	PDCA Technical Committee
3:30pm-4:00pm	G-I / CSSMGE Agreement of Cooperation Signing Ceremony
4:00pm-6:00pm	G-I Annual Meeting & Awards Presentation
5:00pm-7:00pm	PDCA Environmental Committee
6:00pm-7:00pm	ADSC/G-I/PDCA Board of Directors Reception *(By Invitation Only)*
6:00pm-10:00pm	G-I Committee Meetings
6:30pm-8:00pm	Reception – *Outdoor Reception Area*

Tuesday, March 17

7:00am-6:00pm	Registration
7:30am-8:30am	G-I Student Meet/Greet Breakfast in Indoor Exhibit Hall
8:30am-10:00am	Plenary Session
9:00am-11:00am	ADSC Chapter Presidents Council

10:00am-10:30am	Networking Break
10:00am-6:30pm	Indoor & Outdoor Exhibits
10:00am-6:30pm	Bookstores Open
10:30am-12:00N	Technical Sessions
12:00N-1:30pm	Lunch Break
12:00N-2:00pm	ADSC Awards Luncheon *(Fully Registered ADSC Members only)*
2:00pm-3:30pm	ADSC Industry Advancement Trustees Meeting
3:00pm-3:30pm	Networking Break
3:00pm-6:00pm	G-I Student Geo-Competition
3:30pm-4:30pm	ADSC Women's Association Board Meeting
6:00pm-7:30pm	G-I Terzaghi Lecture

Wednesday, March 18

7:30am-8:30am	ADSC Associate Members Committee
7:30am-5:30pm	Registration
8:30am-10:00am	Technical Sessions
9:00am-11:00am	ADSC Women's Association Meeting
10:00am-10:30am	Networking Break
10:00am-6:30pm	Indoor & Outdoor Exhibits
10:00am-6:30pm	Bookstores Open
10:30am-12:00N	Technical Sessions
12:00N-1:30pm	Lunch Break
1:30pm-3:00pm	Technical Sessions
2:30pm-3:00pm	Networking Break
3:30pm-5:00pm	G-I Women Geo-Professional Program & Reception
5:00pm-6:00pm	G-I International Student Donor Reception *(By Invitation Only)*
6:00pm-6:45pm	Honoring Our Hero Award Reception
7:00pm-10:00pm	Honoring Our Hero Award Dinner/Dance

Thursday, March 19

7:00am-12:00N	Registration
7:30am-9:30am	PDCA Executive Committee Breakfast
8:00am-12:00N	ADSC Board of Directors & General Meeting
8:30am-10:00am	Technical Sessions
9:00am-4:00pm	Indoor & Outdoor Exhibits
9:00am-4:00pm	Bookstores Open
10:00am-10:30am	Networking Break
10:00am-11:00am	PDCA Safety Committee
10:30am-12:00N	Technical Sessions
12:00N-2:30pm	IFCEE '09 Student Achievement Awards Luncheon
2:00pm-5:00pm	PDCA Board of Directors Meeting
2:30pm-4:00pm	Peck Lecture

Volumes of Knowledge: ADSC, Geo-Institute and PDCA Bookstores An opportunity for all!

Three associations. Three bookstores on-site. Professionals from regions worldwide share their knowledge and experience through various topical papers, books and technical journals. You will have the opportunity to browse and purchase various gifts and accessories.

Sponsorships for IFCEE '09 are still available!

Contact Jan Hall for additional information at 214/343-2091 or via email: jhall@adsc-iafd.com www.ifcee09.org

HOW TO REGISTER:

There are three easy ways to register for the IFCEE '09! All fees are in U.S. Dollars:

1. Register on-line at: www.ifcee09.org.
2. Fax completed Registration Form with credit card information and signature to: 214/343-2384.
3. Mail completed Registration Form with check, credit card information or money order to: IFCEE '09 Registration, c/o ADSC, Pacific Center I, 14180 Dallas Parkway, Suite 510, Dallas, TX 75254

A. PRIMARY ASSOCIATION AFFILIATION: (Check only one)

☐ ADSC ☐ AEG ☐ ARMA ☐ ASFE
☐ CGS ☐ DFI ☐ FDOT ☐ FHWA
☐ G-I ☐ GSS ☐ ISM ☐ JGS
☐ NAGS ☐ OSHA ☐ PDCA ☐ RGA
☐ SEI ☐ USUCGER

B. ARE YOU: (Check only one type that applies to you)

☐ Contractor (CT) ☐ Consultant (CS)
☐ Supplier (SR) ☐ Educator (ED)
☐ Government (GOV) ☐ Student (S)
☐ Other _____

C. REGISTRATION INFORMATION:

First Name Last Name Nick Name for Badge

Company Name

Mailing Address

City State/Province Zip or Postal Code Country

Phone including Foreign Country Code Fax including Foreign Country Code

Email Address

D. SPOUSE/COMPANION & CHILDREN REGISTRATION

Accompanying spouse/companion and children must register to participate in any function. Do not register spouse/companions and children who will not attend any meal functions or scheduled events.

Spouse/Companions:

First Name Last Name Nick Name for Badge

Home Address

City State/Province Zip or Postal Code Country

Phone including Foreign Country Code

Email Address

Children:

First Name Last Name Age

First Name Last Name Age

E. IN CASE OF AN EMERGENCY, PLEASE CONTACT:

First Name Last Name Relationship

Daytime Phone Evening Phone

F. PLEASE INDICATE ANY SPECIAL NEEDS

☐ Please check if you require special accommodations to participate in IFCEE '09. Please fax a written description of your needs with your name/phone number to: 214/343-2384.

☐ No Shell Fish ☐ Diabetic ☐ Vegetarian
☐ Other _____

G. FULL REGISTRATION FEES

Includes: Entrance to Exhibit Areas, Monday Congress Buffet Breakfast, Monday, Tuesday, & Wednesday Box Lunch on Exhibit Floors, ADSC Members Only – ADSC President's Awards Luncheon, PDCA Members Only – PDCA Awards Luncheon & Meeting, Thursday Student Awards Luncheon, Sunday and Monday Receptions, Technical Sessions & Coffee Breaks, "Honoring Our Hero" Award Gala Reception and Dinner/Dance, and One Copy of the Printed Conference Proceedings & CD ROM.

	Early Bird Rates by 1/12/2009	**Standard Rates January 13 to 3/19/2009**	**Total**
Member	$795	$895 =	$ _____
Add'l Members, *(Please send registration forms together to ensure discount.)*	$755	$855 =	$ _____
Non- Members	$895	$975 =	$ _____
Government	$525	$575 =	$ _____
Spouse/Guest	$500	$555 =	$ _____
College Student *(special 4 day rate)*	$195	$195 =	$ _____
* Child 13-17	$250	$275 =	$ _____
* Child 5-12 *(Children under five years, no charge)*	$225	$250 =	$ _____

Section G Sub-Total **$ _____**

*** Children Ages 5-17** (Children over the age of 17 are to register as a companion – Children under five are free) Includes: Sunday & Monday Receptions; Monday Congress Breakfast; ADSC President's Awards Luncheon (ADSC Members Only). ***Please note that Children's Registration does not include " Honoring our Hero" Reception & Dinner/Dance which is an additional cost- please see fee section.***

H. TECHNICAL SESSION ONE DAY PASSES (All prices are per day.) *Includes: Entrance to Day's Technical Sessions, Entrance to Exhibits for that day, Lunch in Exhibit Area for that day, Coffee Breaks for that day, Terzaghi Lecture –Tuesday Pass Only, Peck Lecture - Thursday Pass Only*

	Early Bird Rates by 1/12/2009	Standard Rates January 13 to 3/19/2009	Total
Member	$345	$445 =	$ _____
Non-Member	$395	$495 =	$ _____
Government	$200	$250 =	$ _____
College Student	$ 75	$100 =	$ _____

Check day(s) you will attend

☐ Mon. ☐ Tues. ☐ Wed. ☐ Thurs.

Section H Sub-Total $_____

I. EXHIBITS ONLY DAY PASSES

Includes: Entrance to Exhibit Areas and Coffee Breaks for that Day.

☐ Monday	$50	$70	$ _____
☐ Tuesday	$50	$70	$ _____
☐ Wednesday	$50	$70	$ _____
☐ Thursday	$50	$70	$ _____
		Section I Sub-Total	**$ _____**

J. SHORT COURSES

Includes: Entrance to Selected Short Course Session Only, Coffee Breaks, Box Lunch, Course Materials, and Sunday Evening Reception

		Member	Non Member	
SC 1	Estimation of Soil Properties for Foundation Design	$375	$400	$ _____
SC 2	Managing Your Safety Program (MYSP)	$375	$400	$ _____
SC 3	High Strain Dynamic Testing for Driven & Drilled Deep Foundations	$375	$400	$ _____
SC 4	Introduction to Instrumentation & and Monitoring in Geotechnical Engineering	$375	$400	$ _____
SC 5	Installation & Design of ACIP Piles	$375	$400	$ _____
SC 6	Micropile 201: Advanced Design and Construction Topics	$375	$400	$ _____

Section J Sub-Total $ _____

K. Individual Event Ticket

	# of Tickets			
Sunday Welcome Reception	___	X	$95	$ _____
Monday Reception	___	X	$95	$ _____
ADSC President's Awards Luncheon	___	X	$50	$ _____
PDCA President's Award Luncheon	___	X	$50	$ _____
"Honoring Our Hero" Reception & Dinner (Adult)	___	X	$125	$ _____
"Honoring Our Hero" Reception & Dinner (Child)	___	X	$75	$ _____
Student Achievement Awards Luncheon	___	X	$50	$ _____

Section K Sub-Total $ _____

Name:_____

L. Your RSVP For Social Events (Please indicate)

Sunday "Welcome Reception"

Self _____ Spouse/Guest _____ Child _____

Monday Congress Buffet Breakfast

Self _____ Spouse/Guest _____ Child _____

Monday Reception

Self _____ Spouse/Guest _____ Child _____

ADSC President's Awards Luncheon *(ADSC Members Only)*

Self _____ Spouse/Guest _____ Child _____

PDCA Business Meeting & Awards Luncheon
(PDCA members only)

Self _____ Spouse/Guest _____ Child _____

"Honoring Our Hero" Reception/Dinner/Dance

Self _____ Spouse/Guest _____ Child _____
(Additional Charge)

Student Achievement Awards Luncheon

Self _____ Spouse/Guest _____ Child _____
(Additional Charge)

M. PAYMENT

Total Amount Due (add G, H, I, J & K sections) US $ _____

Payment **must** accompany your registration & in **US Dollars.**

☐ Enclosed Check # _____ in the amount of US $ _____
(Please make check payable to IFCEE '09) For prompt processing, please write registrants name on the check.

☐ Charge $_____ to the following Credit Card:

☐ American Express ☐ MasterCard ☐ VISA

_____
Card Number Exp. Date Identification Code

_____
Name On Card

_____
Card Holder Signature

International Foundation Congress & Equipment Expo '09

March 15-19, 2009

Lake Buena Vista Palace Hotel & Resort
Lake Buena Vista, Florida

Important Reminders

Registration processed with payment only –
check or credit card must accompany all registrations.

Early Bird Registration Ends January 12, 2009

Hotel Guest Room Cut-off Date Ends February 23, 2009

Contact Jan Hall
for additional information at 214/343-2091
or via email: jhall@adsc-iafd.com.

Visit IFCEE '09 Website at:
www.ifcee09.org

Jinnings Pile Driving Equipment

- Equipment Sales
- Equipment Rentals
- Parts and Services

- Hydraulic Piling Hammers
- BSP SL Models
- BSP CX Models

- Side Grip Vibrating Hammers
- BSP SCV Models
- Power Sources

› For more information on products, availability, or pricing, contact us at:
Toll Free: 877-546-6464 | Fax: 260-447-4363 | E-mail: info@jinnings.com

› **Jinnings Equipment, LLC** | 4434 Allen Martin Drive | Fort Wayne, IN 46806

www.jinnings.com

JD FIELDS

& Company, Inc.

A North American Leader in

TUBULAR PRODUCTS

STEEL LINE PIPE - CASING - OFFSHORE DRIVE PIPE

LINE PIPE API / ASTM / CSA SPECS
1/4" through 48", Grade B through X-80
Various external corrosion coatings
Casing 4 1/2" through 48" – API and Premium threads

Well versed in Canadian specifications and rules of export.

Canadian Contact 24/7: Todd Fagan • 972-869-3794 • tfagan@jdfields.com

Experience real service – real fast.

P.O. Box 134401 • Houston, TX 77219-4401

55 Waugh Drive, Suite 1250
Houston, Texas 77007 • Phone: 281-558-7199

JD FIELDS
& Company, Inc.

the supply of Steel Products

CONSTRUCTION PRODUCTS

H-PILE - SHEET PILE - PIPE PILE - WIDE FLANGE - RAIL

NEW and USED
SALES and RENTALS
PURCHASERS OF USED PILING

JD Fields & Company, Inc.
Headquarters - Houston, Texas Since 1985
www.jdfields.com

• Houston • Dallas • New Orleans • Tulsa • Chicago
• Los Angeles • Denver • Midland

Houston, Texas
Phone: 281-558-7199
Fax: 281-870-9918

Chicago, Illinois
Phone: 708-333-5511
Fax: 708-333-5112

Brea, California
Phone: 714-257-2005
Fax: 714-257-2015

Denver, Colorado
Phone: 303-331-6190
Fax: 303-331-6191

New Orleans, Louisiana
Phone: 985-234-4567
Fax: 985-234-4572

Tulsa, Oklahoma
Phone: 918-459-4638
Fax: 918-459-4636

Dallas, Texas
Phone: 972-869-3794
Fax: 972-869-3861

PilePro®

The world leader in sheet piling connections

PilePro.com
(866) 666-7453

	For PZ and PZC (Ball + Socket)	
	PZ 90	Corner (~50° to ~130°)
	PZ Tee	Tee Corner (~50° to ~130°)
	Joker	Tee Corner (~50° to ~130°)
	Bullhead	Tee Corner (~50° to ~130°)
	CBF	Tee Corner (~50° to ~130°)
	Colt	Corner (~25° to ~65°)
	Cobra	Corner (~115° to ~155°)
	PBS-M **PBS-F**	PZ / PZC + Peiner Beam
	BBS-M **BBS-F**	PZ / PZC + Domestic Beam
	WOM **WOF**	PZ / PZC + Pile Pipe Weld-on
	LBM **LBF**	Transition Profiles 
	For all AZ (U-Pile/Larssen) **Hoesch 1706, 1806, 1856, 1906, 2506, 2606, 2706**	
	V 20	Corner (~30° to ~150°)
	VTS	Tee Corner (~45° to ~135°) Circular driving
	VT	Tee Corner (~45° to ~135°) Omega corner
	Omega 12	Omega corner Jagged U-Walls
	V 22	Larssen Interlock + Pipe Pile Weld-on
	PL	U-Pile + Peiner Beam
	PLZ I **PLZ II**	Peiner Beam + Larssen-Z Piles
	LBM **LBF**	Transition Profiles 

	For Hoesch-Z **with a width of 22.64 inches or 575 mm**	
	HZ 90	Corner (~45° to ~135°)
	HZT	Tee Corner (~45° to ~135°)
	HZ	Variable weld-on
	PZL **PZR**	Hoesch-Z + Peiner Beam
	For Hoesch-Z **with a width of 30.15 inches or 675 mm**	
	HZn 90	Corner (~45° to ~135°)
	HZTn	Tee Corner (~45° to ~135°)
	HZn Knob	Weld-on
	HZn	Variable weld-on
	For PS-Flat Sheet	
	SWC 120	120° Wye Pile
	SWC 90 A	90° Tee Pile
	SWC 90 B	90° Tee Pile
	SWC 60 A	60° Wye Pile
	SWC 60 B	60° Wye Pile
	SWC 30 A	30° Wye Pile
	SWC 30 B	30° Wye Pile
	SWC	Weld-on
	Sealing of sheet pile walls	
	WADIT®	Non-toxic hot cast interlock sealant impervious to weather

To place your order direct from PilePro or for more information dial toll free nationwide: (866) 666 7453 from 8 am to 4 pm CST Monday thru Friday

Joker

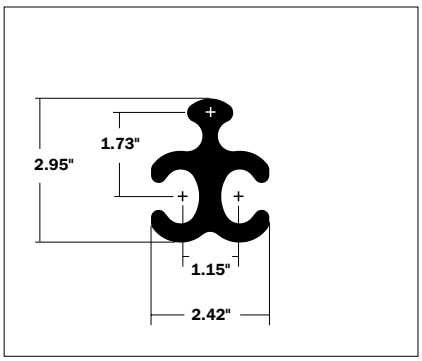
Tee, Corner (~50° to ~130°)

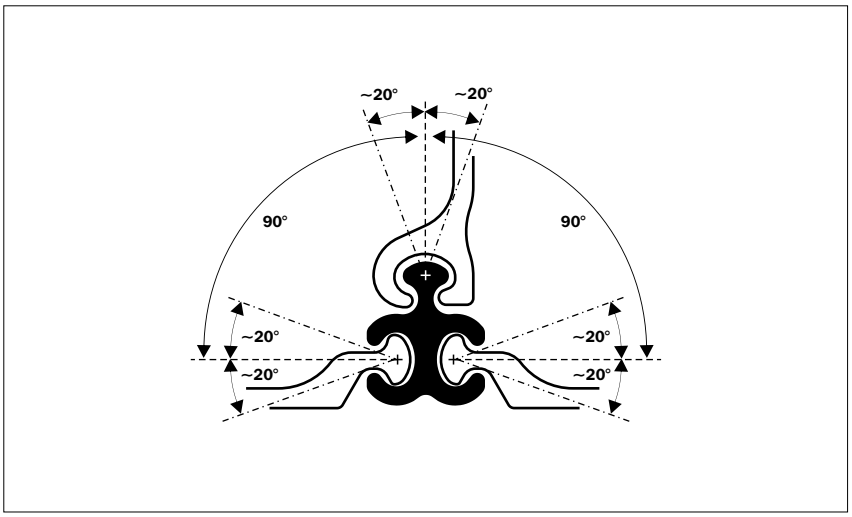
Applications:
Connecting three sheet piling walls.

Typical Properties:
Steel grade: ASTM A572 Grade 50 (S 355 GP)
Weight per linear foot: 10.9 pounds

CAD-Service
Downloads of data sheets and CAD files are available at PilePro.com

Certificate:

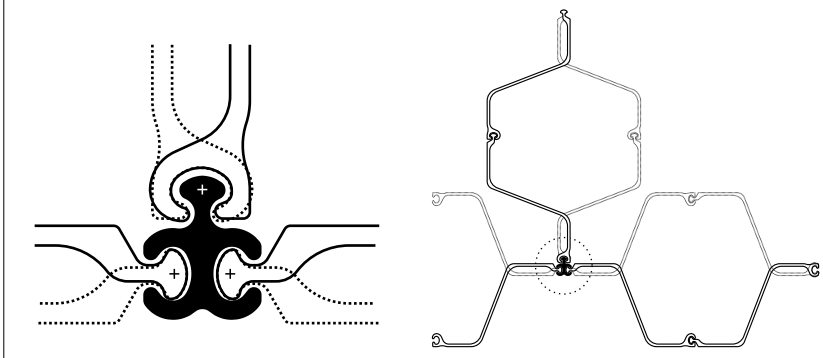




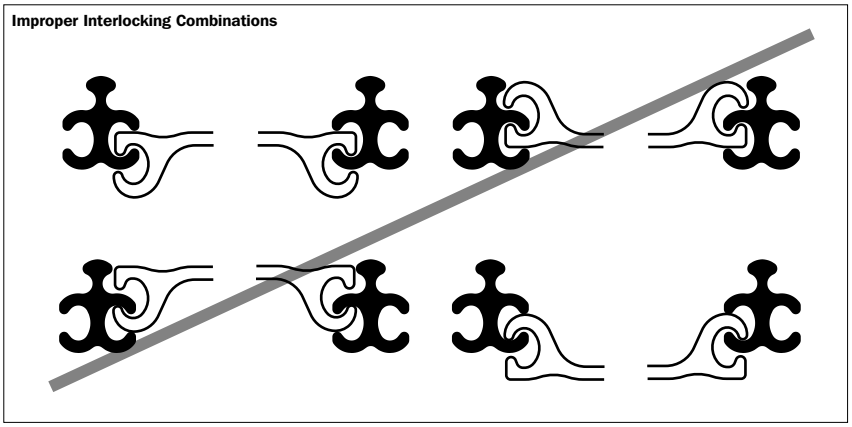
Installation Guidelines

1. General interlocking guidelines call for a ball-to-socket or a socket-to-ball connection. Please review the proper interlocking examples listed.
2. Thread the connector into the interlock while the sheet pile is out of the ground.
3. Adjust the connector to the appropriate position.
4. Tack or spot-weld the connector in place (typically a 10" weld attaching the connector to the sheet pile at the top is sufficient).
5. Drive/extract the sheet (with the connector attached) as you would normally.

Proper Interlocking Examples



Improper Interlocking Combinations



Please note:

1. Swing or rotation stated are typical but can vary by 10° or more due to rolling tolerances found in sheet pile interlocks.
2. PilePro® connectors are protected by patents.

National Harbor Pile Driving Project

By Tony Cygan and Rebecca Moore, Cianbro Corporation

Cianbro Corporation recently completed a number of pile-driving contracts for the National Harbor Project, located in Prince Georges County, Md., just south of the Woodrow Wilson Bridge, which spans the Potomac River. This mammoth, 300-acre, $2 billion mixed-use development project anchored by the Gaylord Hotel and Convention Center, includes a marina, restaurants, shops and a residential compound. During peak construction the project was ranked as the world's fourth largest active construction site.

The piling work was performed under multiple contracts for several owners including contract(s) directly for The Peterson Companies, the project developer. These separate contracts included complete construction of the three marine piers (piling included) and landside piling for building foundations. Overall, the project included driving 185,220 linear feet of eight different pile types with over 4.5 million total cumulative blow counts – all completed within a 16-month duration from August 2006 through December 2007 at a cost of less than $10 million. The contracts overlapped with concurrent activities and all were schedule-driven with challenging elements that included geotechnical conditions, pile lengths, site access and sensitive environmental conditions. The pile driving activities were a critical path item of the overall project development with the marine work being one of the most environmentally sensitive work scopes conducted on the project.

The marine piling was a component of Cianbro's contract to completely construct three piers extending into the river, the Marina, Commercial and Gaylord Piers, respectively. Cianbro self-performed almost all of the contract scopes including pile driving, precast concrete installation, cast-in-place concrete pours, decking for utility trenches, installation of a large floating dock, installation of pier utilities, rebar, marine transport of the precast from Virginia, installation of the tensile structure on the Marina Pier, and handrails along pier perimeters.

The Marina Pier is 30 feet to 100 feet wide and 668 feet long, consisting of 660 linear feet, with two large 60-foot by 100-foot bump-outs and floating docks to accommodate 75 feet of boat slips. The Commercial Pier is 25 feet to 60 feet wide and 715 feet long, consisting of 700 linear feet, with one 60-foot by 60-foot bump-out and various floating docks to accommodate large commercial vessels. The Gaylord Pier is 24 feet to 150 feet wide and 401 feet long, consisting of 425 linear feet, with a large "T" section of 50 feet by 150 feet and various floating docks to accommodate water taxis and other watercraft.

Marine piling included driving 280 concrete piles for the piers and 70 pipe piles for the floating dock. Cast-in-place

concrete involved placing 2,500 cubic yards of concrete and finishing 40,000 square feet of deck. Cianbro set 145 precast concrete bent caps, weighing up to 50 tons each. Once the caps were set and grouted in place, Cianbro set the precast deck and fascia panels. Utility work included sewer, water, telephone, cable television, and a security system to support the piers and marina.

Landside pile driving utilized three Manitowoc 230-ton 4100 Series 2 cranes with 190-foot boom. Two cranes drove pile while the third assisted. Driving was done with two sets of 120-foot box swinging leads and two, each, J&M Foundations Model 115 hydraulic impact hammers with a 175C Power Pack.

Floating equipment for the marine work included a Manitowoc 300-ton 4100 Series 3 ringer crane with 180-foot boom mounted on our 700-foot by 200-foot barge with four hydraulic spuds, a Manitowoc 230-ton Series 2 with 190-foot boom mounted on a 55-foot by 120-foot barge and a Manitowoc 150-ton 4000 crane, also mounted on a 55-foot by 120-foot barge. Three material barges, each 55 feet by 120 feet, were used in the delivery of piles and assisting in the pile driving. Hammers included a Berminghammer B-4505 Diesel Impact hammer, 110-foot box swinging leads and a 1800 Vibro Hammer APE 200. A customized, fixed pile frame and template was fabricated and used on this project.

Pile types included 14-, 18-, and 20-inch precast, prestressed concrete pile, 12-inch and 16-inch pipe pile, AZ sheet pile (for wheelchair ramp down to beach), 12-inch timber pile, as well as 12 by 53 H-pile. The 18-inch and 20-inch precast, prestressed concrete pile consisted of 18,800 linear feet of pier foundations. The 12-inch pipe pile consisted of 540 linear feet of United States Army Corps of Engineers Channel Markers. The 16-inch pipe pile consisted of 6,060 linear feet of floating docks. The AZ sheet pile consisted of 420 linear feet of shoreline protection and grade adjustment. The 12-inch timber pile consisted of 3,660 linear feet of boat docking and pier protection. The 12 by 53 H-pile consisted of 600 linear feet of various small structure foundations.

Landside piling was comprised of approximately 2,000 quantity, 14-inch precast, prestressed concrete pile approximately 105'+/- long for the three parking garages, office and retail building foundations, respectively, known as J, M, and P buildings. The concrete piles were utilized in lieu of traditional auger cast piles in dense soil conditions with various techniques employed to achieve the ultimate, required bearing capacities while limiting pile damage to less than one percent of the piles driven. Cianbro averaged 3,000 blows per pile for a cumulative of 4,669,800 blows. A three-crane system was used to accelerate driving production resulting in a reduction of the project duration and consequent reduction of project cost(s).

The project was completed safely, without environmental incident, on schedule, and within budget, in spite of some of the challenging elements, which included difficult driving conditions in an environmentally sensitive tributary to the Chesapeake requiring special consideration given to Chesapeake Bay Critical Area Laws. Systems, materials, and techniques were continuously modified, at first to minimize, and eventually to eliminate damages to the pile driving

equipment stemming from these conditions.

The project's success is directly attributed to the expertise of 11 active team members of the Pile Driving Contractor's Association (PDCA). Aside from Cianbro, the other active participants on this project who are also member's of the PDCA included: American Pile Driving Equipment Inc., Bermingham Foundation Solutions, Drive-Con, Inc., Pile Dynamics, Inc., Atlantic Wood Industries (Metrocast), Bayshore Concrete Products, Skyline Steel Corporation, Technical Members, ECS Mid-Atlantic, as well as Moffatt & Nichol. This collective team of association members addressed the nature of the project and the inherent difficulties, responding with sound planning and technical creativity.

Due to some of the aggressive scheduling and this critical path work, Cianbro's project team spent a great deal of time planning, scheduling and addressing the project challenges in advance. Changing and unexpected conditions continually brought the project team back together to collectively address the technical challenges and refine the approach and techniques being applied to complete the work and improve production.

The National Harbor Team was headed by Project Manager Howard Sprinkle. Key team participants included: Marine Piling & Piers - Project Superintendent Wade Simons; Electrical Project Manager – Mitch Rubin; Carpentry – General Foreman Mike Crider; Building J, M and P Landside Pile – Superintendent Don Keresztenyi; Safety Support – Paul Day; Engineering – Sr. Project Engineer Mike Manoski, Senior Project Engineer Mike Gales and Project Engineer Saulio Saleta; Field Administration – Mona Evy.

Founded in 1949 by the Cianchette brothers, Cianbro Corporation is now one of the East Coast's largest and most diverse construction companies. Ranked #153 on ENR's list of Top 400 Contractors, Cianbro is 100 percent owned by the 2,500 employee team members operating from three regions with projects covering 15 states. Throughout a 59-year history to date, Cianbro has safely and efficiently planned, managed, and constructed many technically complex, historic, and environmentally sensitive projects for a wide variety of public and private clients. Primary construction markets for Cianbro include: Heavy Civil and Infrastructure, Transportation focusing on movable and specialty fixed-span marine crossings, Marine Fixed Structures, Marine Vessels, Power & Energy, Dam & Hydro, Heavy Industrial, Water & Waste Water Treatment, Pulp & Paper and large Commercial/Institutional.

To learn more about National Harbor, visit www.nationalharbor.com

To learn more about Cianbro, visit www.cianbro.com

▼

KOPPERS

Our Mission:

To be the most valued supplier of quality products and services in the industries we serve, by providing unsurpassed personal attention to our customers and attaining total quality in everything we do.

Koppers is an industry leader in the production and treatment of timber piling for use in foundation and marine piling applications.

Available Products:

Foundation / Land and Freshwater – per AWPA U1-05 Commodity Spec. E

- Creosote - 12 pounds / cubic foot
- Pentachlorophenol - .60 pounds /cubic foot
- Chromated Copper Arsenate (CCA) - .80 pounds / cubic foot

Marine (Salt Water) – per AWPA U1-05 Commodity Spec. G

- Creosote - 20 pounds / cubic foot
- Chromated Copper Arsenate (CCA) - 2.5 pounds / cubic foot

Contact:

Tim Balthazar
Southeast Sales
Tel 800 342 6860
Cell 352 213 6996
BalthazarTJ@koppers.com

Locations:

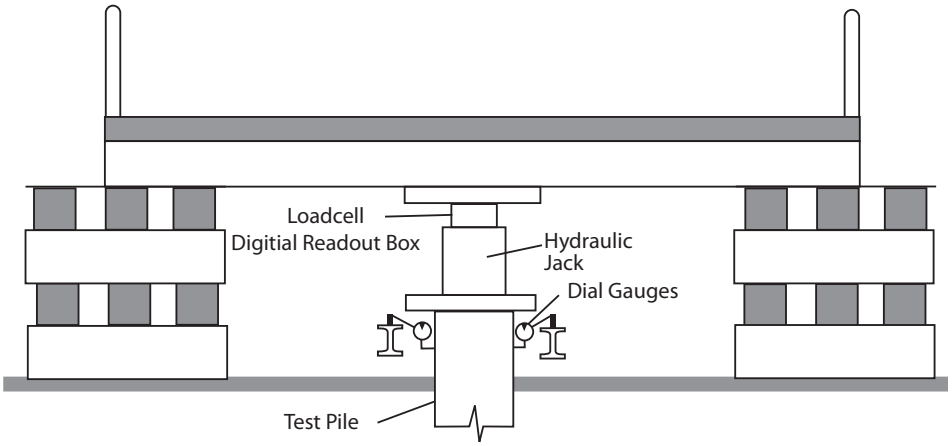
200 NW 23rd Ave.
Gainesville, FL 32609
Tel 800 342 6860
Fax 352 371 4657

280 N. Koppers Rd.
Florence, SC 29506
Tel 843 669 8231
Fax 843 667 6823

PILE TESTING EQUIPMENT

RENTALS • SALES • SERVICE

- Hydraulic Jacks 0-2000 Tons
- Loadcells with Digital Readout Boxes - 0-2000 Tons
- Centerhole Jacks 0-1500 Tons
- Dial Indicators 0-14 inches
- Power Units - Electric, Gas or Manual
- Calibration Services up to 2000 Tons



W.B. Equipment Service Company, Inc.

Supplier of Hydraulic and Pneumatic Jacking Systems for Jacking and Pile Testing.

Toll free: 866-522-5467 • Fax: 201-438-7830 • Email: stephen.cireco@verizon.net • Web: www.wbequipment.com

Huntingdon Place

When Toll Brothers, Inc. purchased a parcel of land in Huntingdon Valley, Pa., it envisioned a luxury condominium complex with picturesque views of the adjoining creek and wooded areas. The severe sloping of the property, however, and the fact that 75 percent of the parcel was below the 100-year floodplain elevation, presented design and construction challenges that would require creativity to realize the vision that the Toll team had created.

The first task in accomplishing the goal was to arrange the site so that residential living could occupy the site and not have any concerns about potential flooding. The solution was to create a detention basin and lake area that would have the capacity to contain storm events and still allow enough area to provide adequate residential living space. Doing so would require the construction of a retaining wall around 80 percent of the site and the cut and fill of 100,000 cubic yards of material. The second task was to determine how best to support the proposed structure, which consisted of five total levels with the first level dedicated as an at-grade parking level under an elevated podium slab and the remainder of residential living space.

The owner's design team determined that given the poor soil conditions and the need for a grade separation wall between the building footprint and the retention basin, a precast segmental concrete wall would be used to support the embankment and auger cast piles would be used to support the structure. When original budget pricing was received from several contractors, the estimated construction costs far exceeded the client's budget and nearly scrapped the project.

One of the contractors that submitted budget pricing was PDCA member Loftus Construction, Inc. of Cinnaminson, N.J. When notified by Toll that the project was grossly over budget, that construction time far exceeded the anticipated opening date and the project was in peril of being shelved, Loftus requested the opportunity to present value engineering solutions.

Having been granted the time by Toll to evaluate value engineering solutions, Loftus engaged the services of Pierce Engineering, Inc., the pre-eminent foundation design firm in the Delaware Valley and a PDCA member firm. The team then sought to pinpoint critical components of the project that were driving the costs and schedule, and how to best minimize the impact of those components. The single largest factor driving the cost and schedule was the poor soil conditions. The design team's selection of the precast concrete wall was well suited for the soil conditions, but would require the export of nearly 40,000 CY of material excavated for the wall and the import of clean stone.

Loftus, after careful consideration of several options, proposed a contractor designed steel sheet pile wall that was tied back with a reinforced concrete deadman system. This system was chosen for many reasons. It was cost effective compared to other solutions due to the curving geometry of the structure, and multiple changes in direction of the proposed wall layout which is 1,100 feet long and 30 feet high. Specifically, the wall was constructed of PZ27 sheets with a coal tar epoxy coating. Double C12x30 members were used as walers and a 1¼" grade 50, epoxy coated threadbar was used as tiebacks to the reinforced concrete deadmen. The deadman was situated such that bearing pile installation could follow the sheeting without affecting the tiebacks.

The proposed system drastically reduced the overall cost of the perimeter wall by eliminating the structural excavation for the segmental wall and eliminating the need for a costly wellpoint dewatering system as all of the structural excavation was below the groundwater level. The proposed system also reduced the cost of the earthwork package by eliminating the export of 40,000 CY and the import of the clean stone. An additional benefit of the value engineering design is the elimination of staged earthwork further reduc-

skylinesteel

The Skyline Webinar:
A Free Online Educational Resource

Your most trusted source for piling technology.

Announcing the 2008 Skyline Steel Webinar Program

- Prosheet Design Software
- Steel Sheet Piles Used in Highway and Bridge Applications
- Steel Sheet Piles in Environmental Remediation Applications
- Steel Sheet Piles in Marine Applications
- Vinyl Sheet Piles: Synthetic Design Considerations
- FRP Sheet Piles: Synthetic Design Considerations
- HDPE Sheet Piles for Environmental Containment
- Durability of Steel Structures: Designing for Corrosion
- Spiralweld Pipe: Manufacturing and Design
- Cellular Cofferdam Design
- The Material Truth: Steel vs. Synthetics for Retaining Wall Applications
- Cost Effective Environmental Containment and Remediation Systems
- Changing the Economics of Below Grade Parking and Basement Structures

These programs are offered several times throughout the 2008 calendar.
Subscribe at www.skylinesteel.com to receive monthly updates on these valuable course topics.

Our unmatched product range, design tools and in-house engineering support have established Skyline as the industry leader in steel foundation systems and solutions.

ing the cost and the time required to complete the work. Loftus was also able to provide used sheeting from its inventory in near new condition and offer it to the client at a greatly discounted cost. Overall, the value engineering proposal saved the client in excess of $3 million in construction costs for the wall and shaved four months off of the original construction schedule.

Loftus also prepared a Value Engineering Proposal to change the auger cast piles to driven steel piles. There was some uncertainty as to the elevation and consistency of the underlying rock layer and the original design eliminated that concern. However, by completing additional geotechnical investigation and assuming some of the risk from the client on the length of the driven piles, Loftus was able to convince the client to accept the proposal and the associated cost and time savings. Loftus was able to install all of the driven piles with its own crews thereby reducing cost and gaining control of the schedule that otherwise would have been controlled by a subcontractor. Loftus was able to stage the installation of the bearing piles with the earthwork placement and the pile cap construction seamlessly so that there were no additional mobilization costs incurred. Eliminating the need for several static load tests by utilizing dynamic testing also reduced cost and construction time.

Once the Value Engineering Designs were approved, Loftus embarked on an aggressive schedule to allow the client to begin marketing the property and establishing closing dates for the condominiums. Multiple operations were occurring on this site to maintain the aggressive schedule, with dozers, excavators and pans weaving in and around cranes installing piles. Concrete crews were constructing pile caps the day after piles were installed. After completion of the sheeting and bearing pile installation, Loftus still had to construct 300 support columns on the pile caps and 150,000 sf of a 13-inch thick, post-tensioned podium slab over the parking level to support the building structure. An alternate post-tensioning scheme was developed by Loftus to further reduce construction time and to assure concurrent work throughout the site.

Upon completion of the contract work, Loftus was called back to the site to solve two additional problems. The first issue was that of an area subject to scour during flood events located between the retention basin and the adjacent creek. The resolution was to construct a permanent spillway at this location utilizing 138 LF of steel sheet piles. This solution also served to increase flow capacity into and out of the retention basin for future flood events. An excavator with a vibratory hammer was used to install these sheets. Access to the site was minimal at this point in the land development process and the only access to this location was via berm along the edge of the retention basin. The 70- and 80-ton sized crawler cranes used to install sheets and piles earlier in the project were too large to traverse this berm. By utilizing the excavator, access was no longer an issue and additional restoration was minimized.

The client then wished to add a swimming pool within the limits of the parking area and under the recently constructed podium slab in an area with only 10 feet of vertical clearance. To make matters worse, the location of the proposed pool interfered with the recently installed tie rods. This presented a challenge because the sheet pile retaining wall system relied on the dead weight of the soil above the deadmen and tiebacks. The installation had to be sequenced such that the integrity of this system was continuously maintained. A new deadman was constructed roughly 15 feet behind the original deadman and was anchored to the original deadman with thru-anchors. A concrete protection slab with a backup drainage system was also constructed beneath the pool itself to channel water away from the tie rods in the event of a future leak. This solution was also designed by Loftus. Had the original deep foundation system of concrete T-walls and auger cast piles been instituted, it would never have been possible to install this pool. Because of the revised systems chosen, the client was able to achieve an 18-foot by 40-foot lap pool up to 6 feet deep.

Tropical Hardwood

Piling, Decking, Timbers, Fenders and Drag Line Mats

Servicing the Marine Construction & Boardwalk Industry Since 1971

We are the Industry Leader with a proven track record of delivering on time, to specifications, and on budget.

CECCO TRADING INC.
IRON WOODS

Greenheart
Purpleheart
Ipe / Bethabara
EKKI / Azobe
Cumaru
and more

GREENHEART PILES

Many sizes available from stock
Call for details

Naturally Durable Hardwoods and Fabrication

TIMBER HOLDINGS INTL

600 E. Vienna Ave.
Milwaukee, WI 53212
414-445-8989

For More Information:
414-445-8989 • Fax: 414-445-9155
www.ironwoods.com • info@ironwoods.com

By combining engineering ingenuity, relying upon a prominent PDCA member firm for design guidance, and by understanding the client's problems, Loftus was able to save the client in excess of $4 million and shorten the overall construction schedule by six months. And, over the course of the project, approximately 50,000 man hours were spent with no lost-time injuries. The project represents the true benefit of using driven piles to solve difficult site and time constraints and exemplifies the value of PDCA firms. ▼

Project Specifics:

Ready Mix Concrete:	10,000 CY
Floor Gross:	145,000 SF
Reinforcement Steel:	800,000 LBS
Post Tension Strands:	159,000 LBS
Steel H-Piles:	300,000 LBS (28,000 lf)
Steel Sheeting (Retaining wall):	900,000 LBS (1,100 lf)
Steel Sheeting (Spillway):	16,000 LBS (138 lf)
Bulk Excavation/Fill:	100,000 CY

Experience the progress.

Experience the Progress with Liebherr: Liebherr Piling and Drilling Rigs are multi purpose machines for any deep foundation application. Advance Technologies are our Business.

Liebherr Nenzing Crane Co.
7075 Bennington Street
Houston, TX 77028-5812
Phone.: (713) 636-4050, Fax: (713) 636-4051
crawler.crane@liebherr.com
www.liebherr.com

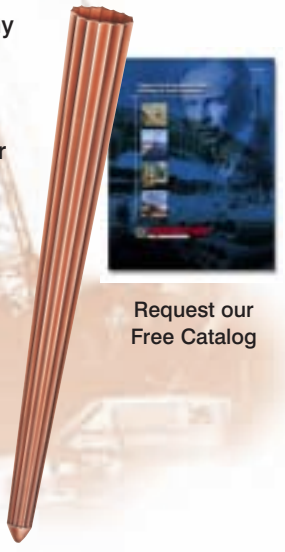
LIEBHERR
The Group

Build your bridges on a foundation of solid economics.

Monotube® piles can help control the exponential costs that can accompany bridge construction in many road building projects.

Proven in deep foundation applications across North America, a tapered steel Monotube pile supports higher design loads at shorter driven lengths than other pile types. Additionally, Monotube piles install quicker with fewer hammer blows while using only conventional equipment.

Add it up…less length, more load capacity, fewer man-hours…that sure sounds like a comparative "cost underrun!" It could mean the bridge components in your bid calculations just got more comfortable. Call or click today for supporting documentation or engineering assistance.



Request our
Free Catalog

MONOTUBE®
PILE CORPORATION

P.O. Box 7339 • Canton, OH 44705-0339 / Ph. 330.454.6111 • Fax 330.454.1572
Executive Office: 5002 Second Avenue • Brooklyn, NY 11232
Email: monotube@neo.rr.com / www.monotube.com

MONOTUBE PILE CORPORATION IS A SOLELY OWNED SUBSIDIARY OF THE DAVIDSON CORP.

Steel Sheet Piling Installation – Best Practices

The impact of steel sheet piling shape and site and soil conditions on driving operations

By Jeffrey H. Greenwald

Introduction

Traditionally, hot-rolled steel sheet piling systems (SSP) are used as major components in the construction of port facilities, bridges, locks and dams, for remediation of contaminated soils, and for support of excavation. Optimal performance depends on proper placement procedures for the particular application and soil type involved. Placement procedures can vary with the site conditions, soil strata, and even the size and shape of the steel sheet piling itself. This article describes the impact of site and soil conditions, as well as steel sheet piling shape, on driving operations.

Figure 1: Installing steel sheet piling depends on proper placement procedures for the particular application and soil type involved.

Site Conditions

Successful steel sheet pile driving is dependent on a good knowledge of the site conditions in order to ensure an accurate assessment of the topographical and geological conditions.

Topography describes the particular environment of the site in terms of working restrictions such as noise and vibration. Each site is subject to its own unique set of restrictions, which vary according to factors such as the proximity and nature of neighboring buildings, road category, underground services, power supplies and material storage areas.

Geological conditions refer to the vertical depth characteristics of the soil strata. To achieve the required steel sheet pile penetration, a site investigation of the soils, coupled with various field and laboratory tests, can greatly aid the installation by providing relevant information on subsoil stratification, particle size, shape distribution and uniformity coefficient, inclusions, porosity and void ratio, density, level of the groundwater table, water permeability of the soil, moisture content, shear parameters and cohesion, dynamic and static penetrometer test results, and results of standard penetration test (SPT) or pressure meter tests.

Although it would be ideal to know all of these conditions, generally only the stratification, density, shear parameters and cohesion, and dynamic and static penetrometer, standard penetration test (SPT) or pressure meter test results are available.

Different soil types result in a variety of driving characteristics. As a result, soil type greatly influences whether impact or vibratory driving will be more economical. Impact driving is best suited for soft soils such as silts and peats, loosely deposited medium and coarse sands, and gravels free of rock inclusions. For these soil types, comparatively problem-free driving may be anticipated. More difficult driving, however, can be expected in densely deposited fine, medium and coarse sands and gravels, hard clays, and soft to medium rock strata.

Vibratory driving is especially well suited to round-grain sand or gravel and soft soils, whereas angular-grain material and soils with firm consistency are much less suited. If the granular subsoil is further compacted by the vibrations, penetration resistance will increase sharply, thereby causing refusal. Driving aids, such as jetting, blasting and drilling, can be used with difficult soil layers. With both impact and vibratory driving, dry soils generally present higher penetration resistance than do moist, submerged or fully saturated soils.

Effect of Steel Sheet Pile Section on Driving

For optimum economy, the steel sheet pile section chosen by the designer also needs to be capable of being driven through the various strata to the required penetration depth. The driveability of a pile section is a function of its cross-sectional properties that vary with the steel thickness, section depth and width, and the piling's designed shape, length, the steel grade and – in the case of press-in-hammer systems – the load applied, the duration of the application and the method employed for installation.

The greater the surface area of the steel sheet pile profile, the greater the driving force required to drive it to a given depth. To avoid unnecessary deformation of the pile head, the pile section chosen should be compatible with the prevailing soil conditions. In addition, the geometry of the pile section may cause plugging of the pilings in cohesive soil strata and in certain dense, granular strata.

The driving force required is also a function of the soil properties; therefore, it follows that there is a limit to the driveability of a given piling profile in a given steel grade. Higher steel grades can withstand higher stresses; thus, a higher yield strength steel piling is more resistant to head or toe deformation than is the same section in a lower steel grade. Consideration of the soil layers and appropriate parameters enables the expected driving resistance to be assessed, and it allows for the selection of a suitable section.

The selection of a suitable pile section for driving into cohesive strata is a complex process, and the section choice is usually based on previous experience, however, it is possible to assess the driving resistance using the surface area of the piling combined with the characteristics of the cohesive strata. This calculation will, of course, be altered considerably if a plug or partial plug forms across the profile of the toe. In that case, the end that bears the resistance of the plugged profile will have to be included together with a reduction in the surface area of the pile profile.

Driving Methods

While it is recognized that a measure of flexibility is desirable to meet site conditions, every precaution must be taken to maintain the necessary standards of safety while at the same time setting the required alignment and verticality of the installed pilings. The first steel sheet pile should be installed with great care to ensure that it is vertical in both planes of the wall. Before being released and driven, it is essential that subsequent piles be sufficiently interlocked with the preceding pile. This can be achieved by a preliminary dug-out trench in the wall line, which automatically reduces the driving length. There are several common driving methods.

The set-and-drive method, where each sheet pile is driven to full depth before setting the next one, is the simplest way of driving; however, it can be utilized only in loose soils and with short pilings. The free-leading interlock is constantly in danger of deviation. For dense sands and stiff cohesive soils – or in the case of possible obstructions – panel driving is recommended instead.

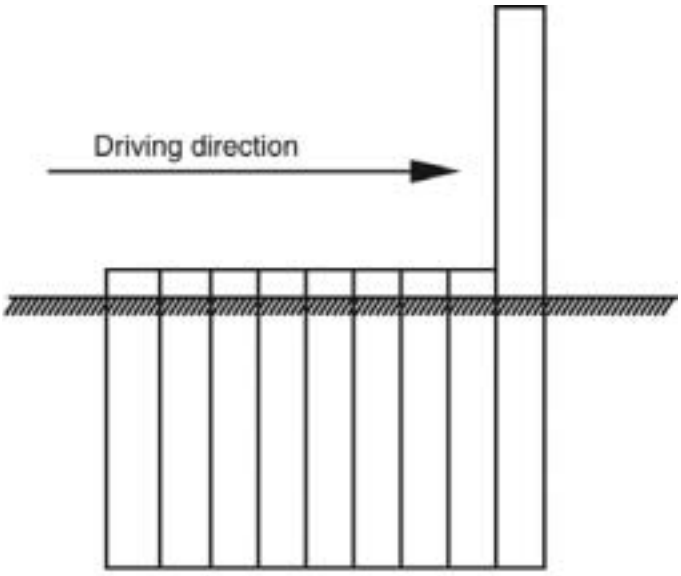


Figure 2: Set-and-drive Method – Each steel sheet pile is driven to full depth before setting the next sheet pile.

The panel-driving technique helps ensure that good verticality and alignment is achieved and also minimizes the risk of installation difficulties or driving out of interlock. This technique also enables complete control to be maintained over the nominal wall length. Because a whole panel of pilings is set at once, there is no need to drive all pilings fully to maintain piling operations. If obstructions are encountered, individual pilings can be left high without fear of disrupting the progress of setting the wall.

Staggered driving combined with panel installation is recommended in difficult soil conditions. The piles are installed between guide frames and then driven in short steps, as follows: pilings 1, 3 and 5 first; then pilings 2 and 4. If the soil is very dense sand, gravel or rock, pilings 1, 3 and 5 can be reinforced at the toe. In this case, these pilings are always driven first, followed by pilings 2 and 4 driven in the second stage.

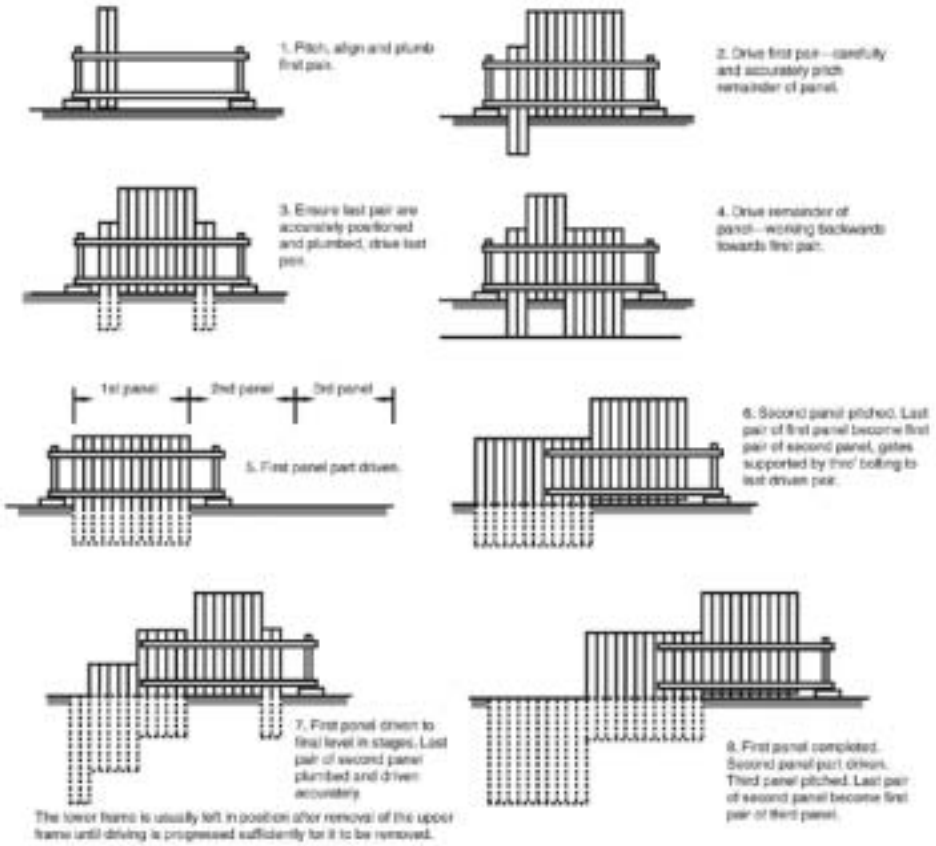


Figure 3: Panel Driving Method – Complete panels of steel sheet piling are set at the same time, enabling complete control to be maintained over the entire wall length.

Driving Templates

It is important that steel sheet piles be maintained in the correct horizontal and vertical alignment during installation. This is achieved by the use of adequate steel templates, which will also prevent lateral drift. Very long sheet piles may need intermediate guides to prevent flexing and other associated driving problems.

SUPPORT IS ON THE WAY

What ever the requirement the right hammer is on the way. You need the proper support to complete your project.
Pileco supports the industry with 15 specially designed hammers, complete with accessories, parts, 24/7 service and engineering.
When it counts... Call the Pileco support team.

PILECO

Pileco, Inc
P.O. Box 16099, Houston, Texas 77222
111 Berry Road, Houston, Texas 77022

Toll Free:1-800-474-5326
PH: 713-691-3000
FX: 713-691-0089
E-mail: pileco@pileco.com

1-800-474-5326
www.pileco.com

PILECO THE PERFORMANCE MINDED COMPANY

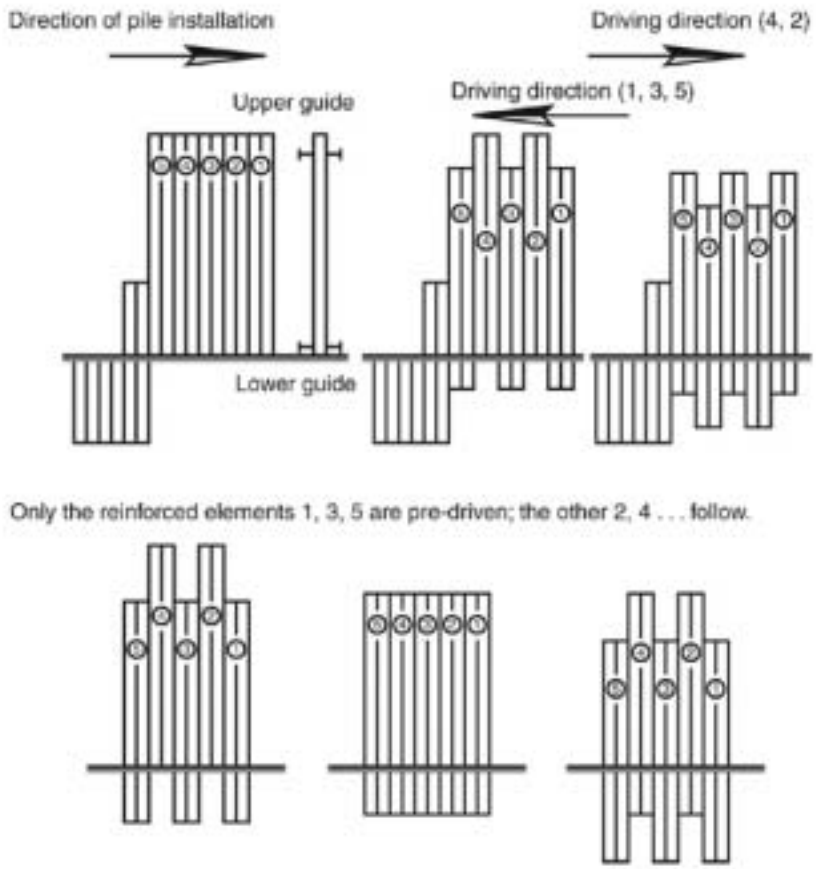


Figure 4: Staggered Driving – The driving of steel sheet piling can be staggered to advance the pile toe with decreased risk of damage or refusal.

Irrespective of the driving method, a template is always required at a low level to ensure correct alignment of the steel sheet piling wall. It should consist of two sturdy beams and be mounted as low as possible, preferably on the ground. Lateral movement of this template must be prevented. The template length should cover at least six pile pairs and cover the existing wall (previously driven piles) by approximately 5 feet. Spacers must maintain the proper spacing of the beams.

Extracting Steel Sheet Piles

When piling is intended to serve only as a temporary protection for permanent construction work, it can be extracted for re-use by means of suitable extractors, either of the impact, vibratory or jacking type. Accurate driving of the sheet piles in the soil makes extraction easier.

For an evaluation of the required pulling force, the previous establishment of a driving record for each pile is very useful. This identifies the piles with the lowest resistance, thus defining the starting point for the extraction work. If driving records of the piles are not available, then the first pile to be extracted should be selected with care. Piles located near the center of a wall should be tried until one pile begins to move. If difficulty is experienced, then a few driving blows with an impact hammer may be used to loosen a pile. It may also be necessary to reinforce the head of the piles to aid the successful extraction of the initial pile.

Vibratory and extracting hammers of various sizes are available. They loosen the sheet pile from its initial position so that it moves via the pulling force of the crane. The limit values of the extracting hammers and crane loads given by the manufacturer should be used. The connection between pile and vibratory hammer is made by hydraulic clamps, shackles and bolts. Sometimes drilling or jetting is necessary to facilitate the extraction operation.

Summary

Successfully driving steel sheet piles requires knowledge of the project site and soil conditions, as well as the compatibility of the steel sheet piling being used. The size, shape and steel grade of the steel piling can influence the driving efficiency and maximum driving force. Various driving systems and methods are available to suit all conditions.

Jeffrey H. Greenwald, P.E., CAE, is the executive director of North American Steel Sheet Piling Association.

About NASSPA

Founded in 2003, the North American Steel Sheet Piling Association (NASSPA) is dedicated to providing information and guidance for the efficient design, construction and maintenance of hot-rolled steel sheet piling systems. NASSPA's members represent the producers of hot-rolled steel sheet piling that supply the North American market. For more information, visit www.nasspa.com

▼

The sky's the limit for marine and deep foundation structures.

With spiralweld pipe facilities throughout North America,
Skyline Steel continues to prove that we are so much more than sheet piling.

To learn more, visit www.skylinesteel.com.

Pile Drag Load and Downdrag Considering Liquefaction

By Bengt H. Fellenius1, M.ASCE and Timothy C. Siegel2, M.ASCE

Abstract

Most piles, be they driven or bored, are constructed through soft and compressible soils to competent soils. Under long-term conditions, even if the settlement in the surrounding soil is are small, negative skin friction will develop and the piles will be subjected to drag load down to a so-called neutral plane — the location of the equilibrium of forces between the pile and the soil. Whatever the settlement magnitude is at the neutral plane, it is also the settlement of the pile. Therefore, the design problem to address is not the drag load, but the location of the neutral plane and the settlement of the soil at the neutral plane, as expressed in the unified pile design method. This note addresses the special problem of sandy soils undergoing compression during liquefaction in light of the general principle of development of a neutral plane. A review of published design manuals including the AASHTO LRFD Bridge Design Specifications indicates that some recommendations for pile design in the AASHTO Specs do not represent the pile response in a manner consistent with the actual axial response of the pile during liquefaction. Liquefaction needs to be separated between that occurring above and below the static neutral plane location before the liquefaction event. For the former case, the effect on the pile due to liquefaction is minor regardless of the magnitude of liquefaction-induced settlement of the surrounding soil. For the latter case, the axial compressive load in the pile increases and additional pile settlement (downdrag) will occur when the force equilibrium is re-established through the necessary mobilization of additional toe resistance. This means that the magnitude of the downdrag is governed by the pile toe load-movement response to the downward shift of the neutral plane. While there is a reduction in shaft resistance due to the reduction in strength within the liquefied layers, this reduction will only influence the required pile length where the liquefying layer is very thick.

Introduction

Several well-documented case histories, a few summarized by Fellenius (1984, 2004, 2006), have shown that essentially all piles will be subjected to drag load due to accumulated negative skin friction even if the settlement of the soil surrounding the piles is very small. In fact, the more able a pile is to withstand the soil settlement, the larger the drag load and the safer the foundation. Conversely, a pile with only a small drag load in a settling soil will experience downdrag, i.e., it will settle. Indeed, "negative skin friction" is not a geotechnical capacity issue. It is necessary, however, to consider negative skin friction when computing the settlement of piles and pile groups. This is recognized in enlightened codes and standards such as the FHWA Manual (2006), which is "FHWA's primary reference of recommended practice for driven pile foundations", the Canadian Foundation Engineering Manual (1992, 2006), the Australian Piling Standard (1995), and the Hong Kong Foundation Design and Construction Manual (2006). These four documents recognize that the appropriate design conditions for drag load and downdrag are: (1) use of the shaft resistance along the entire pile length plus toe resistance in determining the geotechnical axial capacity of the pile, (2) calculation of the maximum axial compressive load at the neutral plane (which is affected by sustained load and drag load) to determine the pile's required axial structural strength, and (3) computation of the pile downdrag as the settlement of the soil at the pile's neutral plane due to changes of effective stress in the soil surrounding the pile. This approach is termed "the unified pile design" (Fellenius 1984; 2004). In contrast, the AASHTO Specifications (2004, 2006) only recognize the development of drag loads where significant settlement occurs, defined as 10 mm, and computes the required geotechnical resistance as the sum of the drag load plus the sustained and the transient loads from the structure. Design according to the AASHTO Specifications does not represent actual pile behavior. As a result, the resulting pile design may be unnecessarily costly and, as it does not address the main aspect, the settling soil, it may result in an unsafe foundation.

Review of Terms

Because of the complexity of the concepts involved, it may be helpful to define the terms used herein in describing the phe-

(1) Consultant, Bengt Fellenius Consultants Inc., 1905 Alexander Street SE, Calgary, Alberta, Canada, T2G4J3, E-mail: <Bengt@Fellenius.net.>

(2) Senior Geotechnical Engineer, Berkel and Company Contractors Inc., 1808 Northshore Hills Boulevard, Knoxville, Tennessee, 37922. E-mail: <tcsiegel@knology.net.>

nomena of drag load and downdrag in respect to the structural and geotechnical axial performance of piles.

Negative skin friction – Shaft resistance mobilized as the soil moves downward relative to the pile. Observations from long-term field monitoring support that negative skin friction develops in essentially all piles.

Drag load – The axial compressive load induced on the pile element due to accumulated negative skin friction when the soil tends to move downward relative to the pile.

Neutral plane – The location along the pile at which the sustained forces (i.e., drag load plus sustained structure load) are in equilibrium with the combination of (positive direction) shaft resistance (below the neutral plane) and toe resistance. This depth is also where there is zero relative movement between the pile and soil.

Downdrag – The downward movement of the pile due to settlement of the surrounding ground. The downdrag magnitude is equal to the settlement of the soil at the location of the neutral plane.

Geotechnical axial capacity – The combined shaft and toe resistances where the pile will no longer reach static equilibrium and will experience continued downward movement. Positive shaft resistance occurs along the full length of the pile and drag load is eliminated.

Factor of safety on geotechnical capacity – The ratio between the geotechnical axial capacity divided by the sum of dead load plus live load, drag load is not included.

Structural axial strength – The compressive axial strength of the pile section affected by dead load plus drag load.

Factor of safety on structural strength at the neutral plane – The ratio between the structural axial strength at the neutral plane divided by the sum of dead load plus drag load, live load is not included.

Although the issue of design of pile foundations is rather broad, this note will address the special condition of consequence for a piled foundation in liquefying soil during a seismic event.

Axial Pile Design for Liquefied Conditions and AASHTO

Sandy soil layers may undergo compression during liquefaction (Tokimatsu and Seed 1987; Ishihara and Yoshimine 1992). This compression results in a downward movement of the overlying soil layers. For piled foundations, the movement may influence the distribution of the axial load distribution in the pile, notably the magnitude of the drag load and the location of the force equilibrium in the pile — i.e., the neutral plane. Depending on the site conditions, the computed change in axial load resulting from liquefaction-induced settlement can have a significant impact on the pile design and foundation costs for projects in seismically active regions. Liquefaction is addressed in a few recently published design manuals, such as the AASHTO LRFD Bridge Design Specifications (2004, 2006) and AASHTO based state highway documents (e.g., MoDOT 2005; WSDOT 2006). The AASHTO Specifications recommend adding the factored drag load from the soil layers above the liquefying layer to the factored dead and live loads from the structure and requires the factored shaft resistance in the soil layers below the liquefying layer plus the factored toe resistance to be equal or larger than the combination of the mentioned factored loads. However, the AASHTO Specifications do not recognize that a drag load is typically present in the pile prior to the earthquake (Fellenius 2006) and that, if the load applied to the pile would cause it to move downward relative to the soil, the drag load is eliminated. Nor do the Specs recognize that live load (transient load) and drag load cannot occur simultaneously. In the authors' opinion, the AASHTO Specifications (2004) concept of designing for drag load is fundamentally flawed. Indeed, the treatment of liquefaction-induced drag load on piles, as presented in the AASHTO Specifications, can have a substantial ramification on foundation costs.

SUB-SUBHEAD: Example

In an effort to demonstrate the phenomena of drag load and downdrag in liquefiable soil, the effect of liquefaction-induced compression is considered for a site in northern California described by Knutson and Siegel (2006). The site is located approximately 70 km southeast of downtown San Francisco in Milpitas, California, and is underlain by Quaternary alluvial deposits (Division of Mines 1951). The upper soil conditions consist of interbedded clays and sands and are represented by the CPT data presented in Fig. 1. Potentially liquefiable layers are indicated in the figure. The liquefaction potential was evaluated for a M 7.8 earthquake and a horizontal ground acceleration of 0.6g using CPT data and the method presented by Robertson and Wride (1998) combined with the recommendations presented by Youd *et al.* (2000).

The effects of drag load are assessed for 460 mm diameter piles installed to a depth of 30 m with a geotechnical capacity of 3,000 kN (obtained from static loading test) and an unfactored sustained axial load of 1,100 kN. According to the AASHTO Specifications (2004, 2006), in the absence of an earthquake, the design is not required to consider negative skin friction and drag load. In reality, negative skin friction will develop also under static conditions and accumulate to a drag load of about 900 kN at a neutral plane located at depth of about 13 m. The load and resistance distribution curves for static conditions are shown in Fig. 2. These curves are calculated applying recommendations of O'Neill and Reese (1999) and values of N60 and undrained shear strength from correlations with CPT cone resistance. For this case, the curves are also approximately equal to values calculated using the Eslami-Fellenius CPT method (Eslami and Fellenius 1997).

The curves shown in Fig. 2 can only be determined using unfactored values, as factored values will distort the magnitude of the maximum axial compressive load in the pile and the location of the neutral plane. The 3,000 kN capacity and the 1,100 kN unfactored sustained load represent a factor of safety of 2.7. The addition of the transient load of 400 kN would reduce the factor of safety to 2.0, and reverse the direction of the shaft resistance (from negative to positive) in the upper portion of the pile, but it would have no influence on pile settlement or the maximum compressive load in the pile at the neutral plane.

Design of a pile foundation for downdrag cannot appropriately be considered in the context of geotechnical axial capacity, as it is a settlement issue. At the neutral plane, the soil and the pile move equally. Therefore, the magnitude of the settlement of the soil at the neutral plane is also the settlement of the pile — also known as downdrag. The proper design approach is to

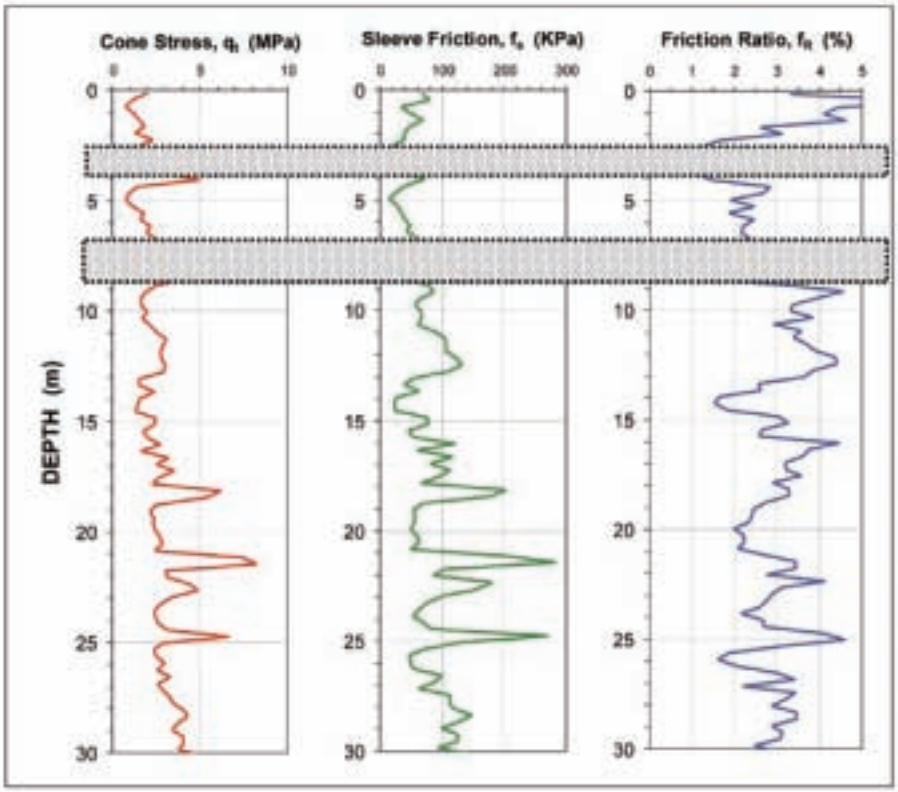


Fig. 1. CPT profile from the example site. The two zones surrounded by the dashed lines are identified as consisting of sand and silty sand and are considered susceptible to liquefaction under the design earthquake.

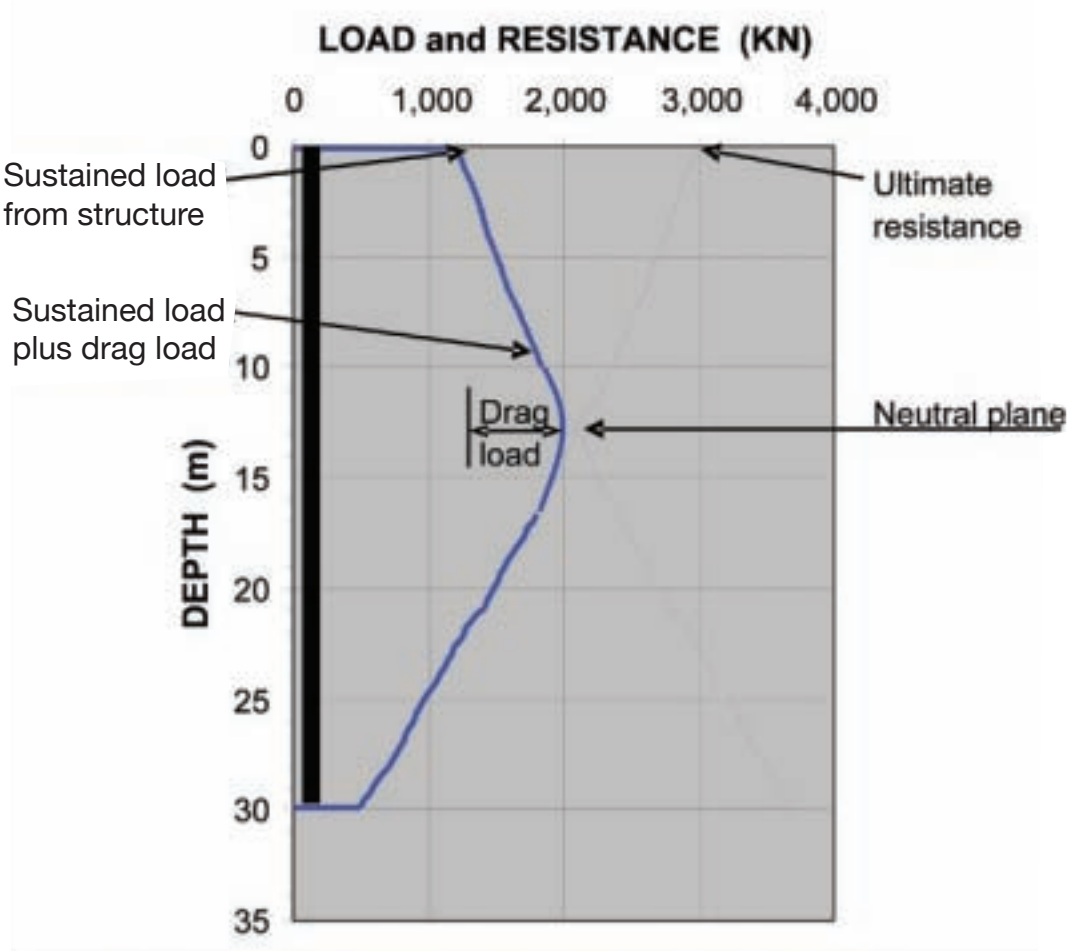


Fig. 2. Distribution of load and resistance along the pile before liquefaction

ensure that the magnitude of the soil settlement at the neutral plane is within acceptable limits or to ensure that the neutral plane lies in non-settling soil. It is noteworthy that the location of the neutral plane depends on the magnitude of the mobilized toe resistance and corresponding toe movement.

It was determined that earthquake-induced liquefaction could occur in the sand layers at 3 m depth and between depths of about 7 m to 9 m. During a liquefaction event, the sand would experience compression and the overlying soil layers would move downward relative to the pile. The unfactored drag load due to accumulated negative skin friction above 9 m depth is about 700 kN. According to the AASHTO Specifications, the drag load, factored up by 1.25, is to be added to the factored sustained and transient structure loads, resulting in a total factored load of 3,060 kN after applying specified load factors on sustained and transient loads of 1.35 and 1.75, respectively (one could argue the actual factors and which AASHTO Specs edition to apply, and including the transient load along with the drag load is incorrect, the two cannot occur simultaneously, but that is beside the point here,). The sum of the factored shaft and toe resistances below 9 m depth is smaller than this load. Indeed, already the unfactored resistances are smaller. Therefore, the approach specified in the AASHTO Specifications implies that the pile is severely under-designed in the event of liquefaction. As a consequence, longer piles would be required (to increase capacity), or the number of piles would have to be increased (to reduce the sustained load per pile). However, the liquefying layer lies above the neutral plane, and the shaft shear down to 13 m depth is in negative direction before the liquefaction occurs. Therefore, as discussed below, the liquefaction will not change the forces in the pile and soil, nor cause the pile to settle. The factor of safety is only marginally affected by the small reduction of shear strength in the liquefying layer. Indeed, there is no need for increasing pile length or number of piles.

It is interesting to note that some AASHTO-based designs allow the use of reduced (residual) strengths when computing the drag load in a liquefaction event. As a result, the design depends on the decrease in strength in layers above the liquefying layer in order to maintain an acceptable load-to-resistance ratio. Because of the inherent uncertainty involved in the liquefaction prediction and soil behavior during earthquakes, this seems imprudent.

Drag Load Evaluation According to the Unified Pile Design Method

The authors propose to apply the unified design method to analyze the effect of liquefaction on the behavior of piles under axial load (Fellenius and Siegel, 2008). The load and resistance distributions in the pile when liquefaction occurs in soil above the static (or pre-liquefaction) neutral plane are shown in Fig. 3 for comparison to the static conditions. The effect of the liquefaction is limited to a loss of negative skin friction in the lique-

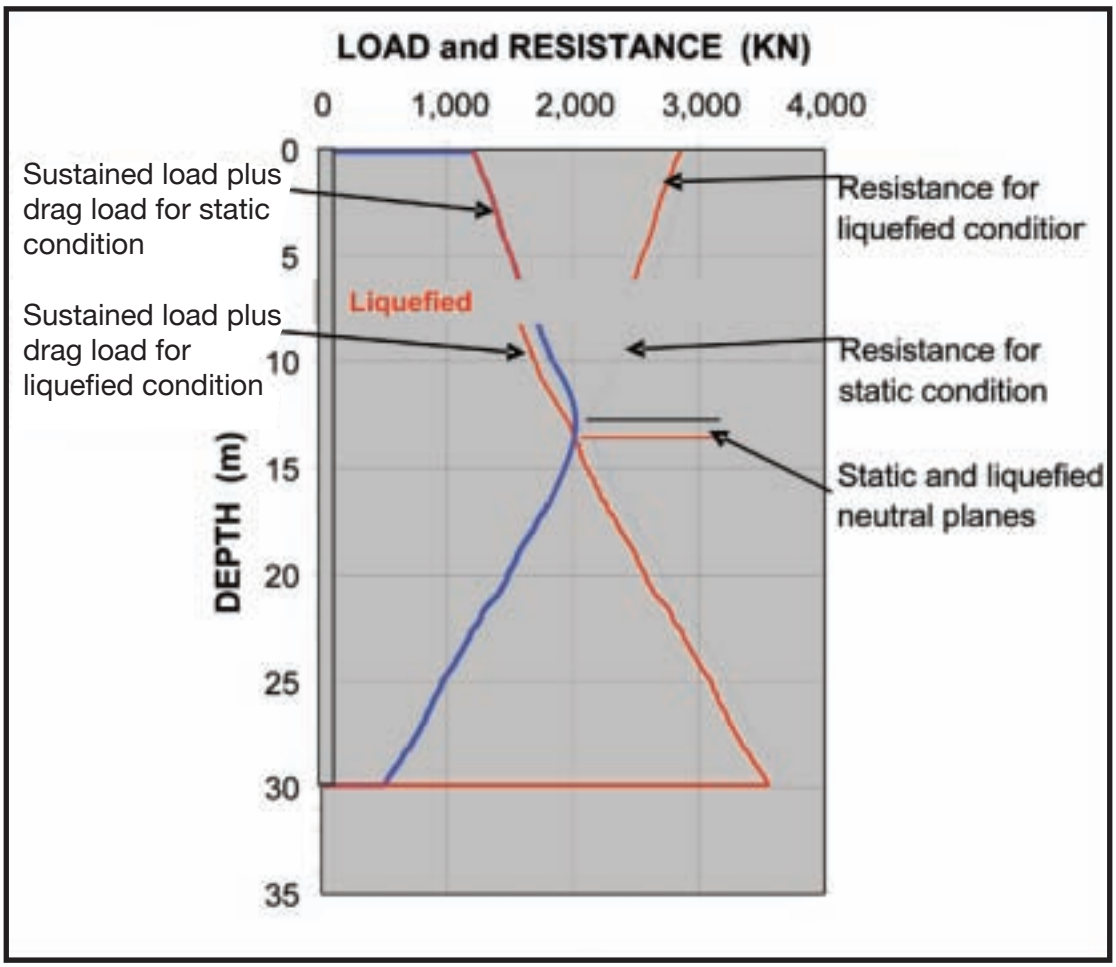


Fig. 3. Distribution of load and resistance during liquefaction above the neutral plane

MANDAL PIPE

The West Bay Bridge

"Steel Pipe Replaces Concrete Piles"

The West Bay Bridge widening project near Panama City, Florida is critical to the Hurricane evacuation plans for the Panama City/Fort Walton Beach areas and will provide the gateway to the new regional airport scheduled for construction in the near future.

Pile driving for the foundation piers came to a halt due to severe and unforeseen jobsite conditions. With the failure of the 30" square concrete piles to pass pre-determined requirements, the completion date for the project prior to the next Hurricane season was placed in jeopardy. The contractor, working with consulting engineers and the Florida Department of Transportation, determined that 30" diameter steel pipe with a heavy 5/8" wall thickness would safely and adequately overcome the existing problems.

A quick delivery of the 40,000' of material was imperative. **MANDAL PIPE COMPANY** responded by supplying the project with over 175 truckloads of steel pipe allowing for the work schedule to recover the original lost time. *On time delivery, with quality material, complete submittals and impeccable traceability* are routine work for the professionals at MANDAL PIPE COMPANY. Why don't you give us a call?

MANDAL PIPE COMPANY
P.O. Box 927
Snellville, GA 30078
Ph: 1-770-573-3022 • **Fax:** 1-770-573-3380

Mandal Pipe Company... RELIABLE, EXPERIENCED, EFFECTIVE

www.mandalpipe.com



THINK PIPE...THINK *MANDAL!*

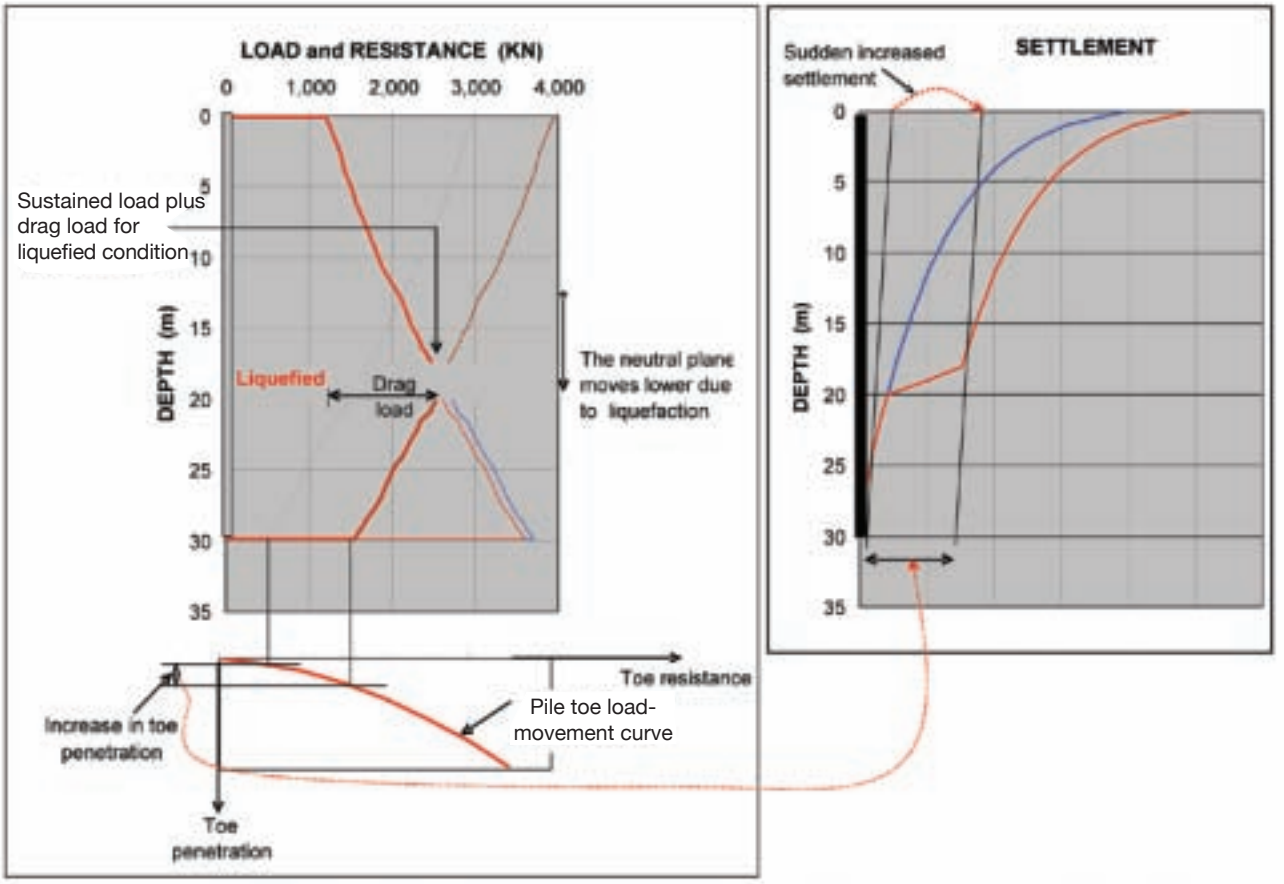


Fig. 3. Distribution of load and resistance during liquefaction above the neutral plane

fied zone, and a slight reduction of the drag load and geotechnical axial capacity. No change occurs below the neutral plane and no pile movement or settlement occurs. This application of the unified design method illustrates that liquefaction occurring above the static neutral plane has minor effect on the axial conditions of the pile.

In the event that the earthquake triggering liquefaction would occur in the soil layer located above the eventual neutral plane before the neutral plane has developed, then, the effect would be limited to speeding up the development of the neutral plane.

If the liquefying layer is located below the static neutral plane, the resulting pile conditions are quite different, as is indicated in Fig. 4. The effect of the liquefaction is the lowering of the neutral plane to the lower boundary of the liquefying layer, an increase of the drag load and, most important, subsequent toe penetration as necessary to mobilize additional toe resistance required to re-establish a force equilibrium neutral plane at the lower boundary of the liquefying layer.

If the pile toe response is stiff in providing the necessary resistance, then, the liquefaction-induced settlement of the pile may be small. Conversely, if the soil conditions are such that increased toe penetration does not provide much increase in toe resistance, then, the neutral plane will move to a location above the liquefying layer and the pile settlement will be equal to the full compression of the liquefied layer. Unless the liquefaction is so extensive that geotechnical axial capacity (toe and positive shaft resistance along the full length of the pile with an appropriate reduction to account for the reduction in soil strength) is exceeded by the structure loads, the governing aspect of the axial design for liquefaction is the ensuing pile settlement. In the extreme, if the geotechnical axial capacity during liquefied conditions is so reduced that it is exceeded by the sustained loads from the supported structure, then, the shaft resistance along the entire pile is positive and the problem ceases to be drag load issue. However, the pile will fail and the "supported" structure will suffer.

Discussion and Conclusions

The methods for the prediction of liquefaction and the design of foundations in liquefiable soil continue to evolve. Recent literature on the limitations of the use of CPT for liquefaction analysis (Li et al. 2007) and on the inadequacy of the Chinese criteria for assessing fine-grained soils (Bray and Sanction 2006; Boulanger and Idriss 2006) serve to illustrate that the available knowledge is incomplete. As a result, the tendency in the engineering community is to design with greater conservatism. It is within this atmosphere that AASHTO and other agencies have published design specifications for considering the effects of liquefaction induced settlement on the axial performance of piles. It may be hypothesized that the design approach presented by AASHTO and others is an attempt to be simple and conservative. In reality, the AASHTO design approach misrepresents the actual pile response and may lead to inappropriate design decisions.

In summary, the authors have proposed to apply the unified pile design for evaluating the influence of liquefaction-induced settlement on the axial behavior of piles that is consistent with the fundamental response of the pile in terms of movements and loads. The following conclusions have been established.

1. Liquefaction of soil layers above the static neutral plane (i;.e., the neutral plane that exists prior to liquefaction) will have a minor effect on the pile regardless of the magnitude of the liquefaction-induced settlement of the soils above the liquefying layer.

2. Liquefaction of soil layers below the static neutral plane increases the axial compressive load in the pile and results in additional settlement. Considering this, the structural design of the pile section and pile settlement should be evaluated for liquefied conditions as part of a comprehensive pile design.

3. In the extreme, if the geotechnical axial capacity during liquefied conditions is so reduced that it is exceeded by the sustained loads from the supported structure, then, the shaft resistance along the entire pile is positive and the problem ceases to be drag load issue.

4. The construction of the neutral plane should use unfactored loads and resistances as the use of factored values will distort the magnitude of the maximum axial compressive load in the pile and the location of the neutral plane. (Note, transient loads neither affect the location of the neutral plane, the maximum axial compressive load at the neutral plane, nor the pile settlement).

References

AASHTO (2004, 2006). *LRFD Bridge Design Specifications, American Association of State Highway and Transportation Officials,* Third Edition, Washington, D.C., USA.

Australian Piling Standard (1995). *Piling design and installation. Standard AS2159-1995,* Australian Council of Standards, Committee CE/18, 53 p.

Boulanger, R.W. and Idriss, I.M. (2006). "Liquefaction susceptibility criteria for silts and clays". *J. Geotech. Geoenv. Engng.,* 132(11), 1413-1426.

Bray, J.D. and Sancio, R.B. (2006). "Assessment of the liquefaction susceptibility of fine-grained soils". *J. Geotech. Geoenv. Engng.,* 132(9), 1165-1177.

California Division of Mines. (1951). *Geologic Guidebook of San Francisco Bay Counties, Bulletin 154,* 392p.

Canadian Geotechnical Society (1992). *Canadian Foundation Engineering Manual, CFEM,* Third Edition, BiTech Publishers, Vancouver, 512 p.

Eslami, A. and Fellenius, B.H. (1997). "Pile capacity by direct CPT and CPTu methods applied to 102 case histories". *Canadian Geotechnical J.,* 34(6) 886-904.

Fellenius, B.H., (1984). "Negative skin friction and settlement of piles". *Proceedings of the Second International Seminar, Pile Foundations,* Nanyang Technological Institute, Singapore, 18p.

Fellenius, B.H. (2004). "Unified design of piled foundations with emphasis on settlement analysis". *Honoring George G. Goble — Current Practice and Future Trends in Deep Foundations, Geo-Institute Geo TRANS Conference,* Los Angeles, July 27-30, 2004, Edited by J.A. DiMaggio and M.H. Hussein. ASCE GSP 125, 253-275.

Fellenius, B.H. (2006). "Results from long-term measurement in piles of drag load and downdrag". *Canadian Geotechnical J.* 43(4) 409-430.

Fellenius, B.H. and Siegel, T.C. (2008) "Pile drag load and downdrag in a liquefaction event". J. Geotech. and Geoenv. Engng, 134(9), 1412-1416.

Hannigan, P.J., Goble, G.G., Likins, G.E., and Rausche, F. (2006). "Design and Construction of Driven Pile Foundations". *FHWA-HI-97-013,* National Highway Institute Federal Highway Administration, U.S. Department of Transportation, Washington, D.C. 1,200 p.

Hong Kong Geotechnical Engineering Office (2006). *Foundation Design and Construction,* Geo Publication No. 1/2006, The Government of Hong Kong, 376 p.

Ishihara, K., and Yoshimine, M. (1992). "Evaluation of settlements in sand deposits following liquefaction during earthquakes". *J. Soil Mech.,* Found. Engng, 118(32), 173-188.

Knutson, L. and Siegel, T.C. (2006). "Consideration of drilled displacement piles for liquefaction mitigation". *Proc., DFI Augered Cast-In-Place Pile Committee Specialty Seminar,* 129-132.

Li, D.K., Juang, C.H., Andrus, R.D., and Camp, W.M. III (2007). "Index properties-based criteria for liquefaction susceptibility of clayey soils: a critical assessment." *J. Geotech. Geoenv. Engng.,* 133(1), 110-115.

MoDOT (Missouri Department of Transportation) (2005). *LRFD Bridge Design Specifications.* 18 p.

O'Neill, M.W. and Reese, L.C. (1999). "Drilled shafts: construction procedures and design methods." *FHWA-IF-99-025,* 758 p.

Robertson, P.K. and Wride, C.E. (1998). "Evaluating cyclic liquefaction potential using the cone penetration test". *Canadian Geotech. J.,* 35(3), 442-459.

Tokimatsu, K. and Seed, H.B. (1987). "Evaluation of settlements in sands due to earthquake shaking". *J. Geotech. Engng.,* 113(8), 861-879.

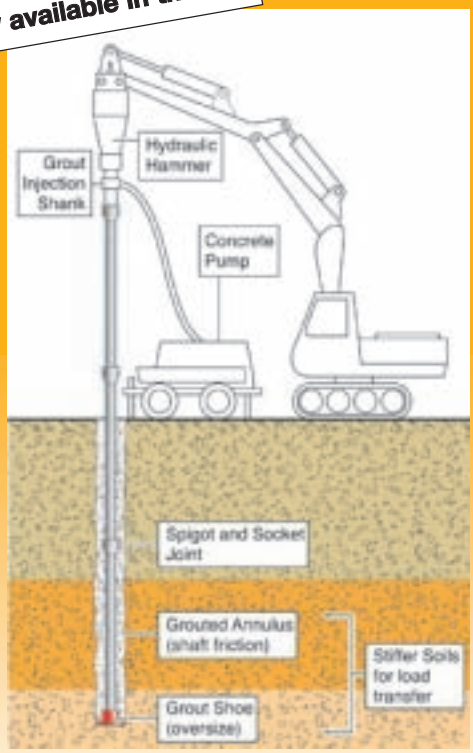
WSDOT (Washington State Department of Transportation) (2006). *Geotechnical Design Manual* M 46-03. Available online at: http://www.wsdot.wa.gov/fasc/EngineeringPublications/Manuals/GDM/GDM.htm

Youd, T.L., Idriss, I.M., Andrus, R.D., Arango, I., Castro, G., Christian, J.T., Dobry, R., Finn, W.D.L., Harder, L.F. Jr., Hynes, M.E., Ishihara, K., Koester, J.P., Liao, S.S.C., Marcuson, W.F.III, Martin, G.R., Mitchell, J.K., Moriwaki, Y., Power, M.S., Robertson, P.K., Seed, R.B., Stokoe, K.H. II. (2001). "Liquefaction resistance of soils: Summary report from the 1996 NCEER and 1998 NCEER/NSF workshop on evaluation of liquefaction resistance of soils". J. Geotech. Geoenv. Engng., 127(10), 817-833. ▼

RELY ON DSI

Ductile Iron Piles

Now available in the US



- **DYWIDAG THREADBAR® Anchors**
- **DYWIDAG Multistrand Anchors**
- ***GEWI*® Piles (Micropiles)**
- **DSI Hollow Bar Anchors**
- **Ductile Iron Piles**
- **DYWIDAG Rock Bolts**
- **Fiberglass Bolts**
- **DYWIDAG Soil Nails**
- **DYWIDAG Tierods**

DYWIDAG-SYSTEMS INTERNATIONAL

NORTH WEST
Kent, WA
Phone 253-859-9995

NORTH CENTRAL
Bolingbrook, IL
Phone 630-972-4036

NORTH EAST
Long Valley, NJ
Phone 610-268-2221

MID EAST
Toughkenamon, PA
Phone 610-268-2221

WEST
Long Beach, CA
Phone 562-531-6161

SOUTH CENTRAL
Arlington, TX
Phone 817-465-3333

SOUTH EAST
Tucker, GA
Phone 770-491-3790

CENT. AM. Phone 954-318-1105
ALASKA Call North West
HAWAII Call West

Local Presence – Global Competence

GEOTECHNICAL SYSTEMS

2008 New PDCA Members

The following is a list of all members who have joined the PDCA in 2008. The association would like to welcome everyone on the list!

CONTRACTORS

AGM Marine Contractors, Inc.
Jonah Mikutowicz
30 Echo Road
Mashpee, MA 02649
Ph: 508-477-8801
Fax: 508-477-8804
Jonah.mikutowicz@agmmarine.com
www.agmmarine.com
Bridge Building, Bulkheads, Docks & Wharfs, Earth Retention, Marine, Pile Driving
CT, MA, ME, NH, NY, RI

Amco, LLC
Anthony Clark
12 Delta Drive
Londonberry, NH 03053
Ph: 603-434-8900
Fax: 603-434-8996
Email: acinternet1@aol.com
www.amcollc-nh.com
Structural Steel, Steel Sheet Pile, H-Pile
CT, MA, ME, NJ, NY, RI, VT

Alaska Interstate Construction, LLC
Rick Macomber
730 I St., Suite 201
Anchorage, AK 99501
Ph: 907-278-7346
Fax: 907-278-7324
www.aicllc.com
rick.macomber@aicllc.com
Bridge Building, Docks & Wharfs, Earth Retention, General Contracting, Highway & Heavy Civil, Marine, Pile Driving
AK, WA, Canada, Europe

A. S. Horner
David Krueger
5801 Bobby Foster Road, S.W.
Albuquerque, NM 87105
Ph: 505-873-1577
Fax: 505-8734867
www.ashorner.com
dkrueger@ashorner.com
Bridge Building, General Contracting, Highway & Heavy Civil, Earth Retention, Pile Driving
AZ, CO, KS, NM, OK, TX, UT

American Deep Foundation & Shoring, Inc.
Jon Beck
1784 Dooley Town Road
Statham, GA 30666
Ph: 770-725-9615
Fax: 770-725-7915
jonathanbeck@cs.com
Earth Retention, Pile Driving
AL, CO, DC, DE, FL, GA, IA, ID, IL, IN, KS, KY, LA, MD, MO, MS, MT, NC, ND, NE, NM, NV, OH, OK, PA, SC, SD, TN, TX, UT, VA, WV, WY

Arthur R. Henry, Inc.
Ralph Henry
3031 Ocean Heights Ave.
Egg Harbor Twp, NJ 08234
Ph: 609-927-6660
Fax: 609-927-4780
www.arhenry.com
rjr@arhenry.com
Deep Excavation, Docks & Wharfs, Marine, Pile Driving, Utilities
NJ

DFI Corporation
Barry Strauss
Sean Freeland
3403 74th Ave.
Edmonton, AB T6B 3B8
Canada
Ph: 780-466-5237
Fax: 780-463-3613
Bstrauss@dfi.ca
sfreeland@dfi.ca
www.dfi.ca
Bridge Building, General Contracting, Pile Driving, Oil Fields, Pipelines
Canada

Denton-James, LLC
Gerald Denley
7855 Jefferson Highway
Baton Rouge, LA 70809
Ph: 225-927-3131
Fax: 225-927-3132
denleygj@aol.com

Eastern Bridge, A Division of Sloan Construction, Inc.
Ted Geddis
P.O. Box 609
Blacksburg, SC 29702
Ph: 864-936-3081
Fax: 864-936-3084
www.sloan-construction.com
geddist@bridge-construction.com
Bridge Building, Bulkheads, Earth Retention, General Contracting, Highway & Heavy Civil, Pile Driving
GA, NC, SC, TN, VA

Jet-Drive General Marine Contracting Co., Inc.
Richard Rivera
480 Brown Court
Oceanside, NY 11572
Ph: 516-763-2829
Fax: 516-678-6073
jetsters@aol.com
Bulkheads, Docks & Wharves, Earth Retention, Marine, Pile Driving
CT, NJ, NY

Kostmayer Construction, LLC
Jimmie Kostmayer
1080 Old Spanish Trail
Suite 14
Slidell, LA 70458
Ph: 504-837-3320
Fax: 504-837-8878
jk@kostmayer.com
Bridge Building, Bulkheads, Deep Excavation, Docks & Wharfs, Highway & Heavy Civil, Marine, Pile Driving, Design
LA, MS

The Laquila Group, Inc.
Dino Tomasseth Jr.
1590 Troy Ave.
Brooklyn, NY 11234
Ph: 718-252-0126
Fax: 718-421-4061
dino@laquilagoup.com
www.laquilagroup.com
Bulkheads, Deep Excavation, Earth Retention, General Contracting, Highway & Heavy Civil, Pile Driving
NJ, NY

Leware Construction Company
Keith Waugh
925 Thomas Ave.
Leesburg, FL 34748
Ph: 352-787-1616
Fax: 352-787-3161
kwaugh@lewarecc.com
Pile Driving
FL

Oklahoma Bridge Company, Inc.
Raymond Flatt
6250 Industrial Blvd.
Edmond, OK 73034
Ph: 405-263-7787
Fax: 405-263-7756
rflatt@obcinc.biz
Bridge Building, Pile Driving
OK, TX

R. Kremer & Son Marine Contractor, LLC
Richard Kremer
321 Mantoloking Road, Suite 2-D
Brick, N J 08723
Ph: 732-477-8012
Fax: 732-477-9224
Email: kremermarine@comcast.net
www.kremermarine.com
Aluminum Sheet Pile, Steel Sheet Pile, Steel
Pipe Pile, Vinyl Sheet Pile, Timber Piles, Treated Lumber and Timbers, Composite Piles, and H-Piles
NJ

Ralph L. Wadsworth Construction Co, Inc.
Todd Wadsworth
166 E. 14000 South, Suite 200
Draper, UT 84020
Ph: 801-553-1661
Fax: 801-553-1696
www.wadsco.com
tod@wadsco.com
Bridge Building, Earth Retention, General Contracting, Highway & Heavy Civil, Pile Driving
CO, ID, UT, WY

Sewell Brothers Construction Co., Inc.
Gary Sewell
4301 S. Eastern Ave.
Oklahoma City, OK 73129
Ph: 405-6706900
Fax: 405-670-6996
sewellbros@yahoo.com
Bridge Building

Sletten Construction Company
Wade Robertson
P.O. Box 2467
Great Falls, MT 59403
Ph: 406-761-7920
Fax: 406-761-0923
wrobertson@slettenинc.com
Bridge Building, Deep Excavation, Earth Retention, General Contracting, Highway & Heavy Civil, Pile Driving
AR, ID, MT, NV, WA, WY

Siletz Boat Works
Stephen Webster
5262 Yaquina Bay Road
Newport, OR 97365
Ph: 541-265-9243
Fax: 541-265-8682
riverbendmarine@charter.net
Marine, Pile Driving
OR

Soil Solutions, Inc.
Vincent Dejana
110 Cherry Valley Ave.
W. Hempstead, NY 11552
Ph: 516-292-6000
Fax: 516-292-6090
www.soilsolutions.net
Bulkheads, Deep Excavation, Earth Retention, Marine, Pile Driving, Pile

ASSOCIATES

Challenger Pipe and Steel, LLC
Randy Hurst
104 S. Freya, Suite 221
Spokane, WA 99202
Ph: 509-534-7473
Fax: 509-534-4254
randy@challengerpipe.com
Steel Sheet Pile, Structural Steel,
All States

Consolidated Pipe and Supply
Brian Rogers
P.O. Box 2472
Birmingham, AL 35201
Ph: 800-467-7261
Fax: 205-251-7838
www.consolidatedpipe.com
brogers@consolidatedpipe.com
Line Pipe, Tubular Stock, Coatings
All States

DFP Foundation Products, LLC
Jack Dougherty
P.O. Box 688
Franklin Lakes, NJ 07417
Ph: 201-337-5748
Fax: 201-337-9022
www.pileline.com
Tapertube Piles, Pipe Piles,
H-Piles, Points & Splices
All States, Canada

Emeca/SPE USA
Beth Webb
200 10th St.
Laurel, DE 19956
Ph: 302-875-0760
Fax: 302-875-0761
beth@spe-usa.net
Hammer Cushions, Pile Cushions,
Pile Points & Spliers
All States, Canada, Mexico,
Central & South America

Interpipe
Gene Repa
3320 Miles Road RR#3
Mount Hope, ON L0R 1W0
Canada
Ph: 905-679-6999
Fax: 905-679-6544
www.interpipe.com
gene@interpipe.com
Steel Pipe Piles, Structural Steel
All States

Kisatchie Treating
Kenneth Busby
P.O. Box 57
Noble, LA 71462
Ph: 318-645-7525
Fax: 318-645-7530
busby@lufkincreosoting.com
Timber Piles/Treated Lumber
All States

New England Construction Products, LLC
David J. Sciortino
22 50th St. – Rear
Taunton, MA 02780
Ph: 508-821-4450
Fax: 508-828-5081
Necpllc1@verizon.net
Hammers, Leads & Accessories,
Drill Rigs, Drills, Pile Driving
Equipment
CT, DE, MA, ME, NH, NJ, NY,
PA, RI, VT

Romar Pipe & Rail Co.
Michael P. Morton
2955 Ridgelake Drive #112
Metairie, CA 70002
Ph: 504-828-0547
Fax: 504-828-0548
www.romarpipeandrail.com
romarnola@aol.com
Coatings & Chemicals, Steel Pipe
Piles
AL, AR, FL, GA, LA, MS

Sany America, Inc.
Weizhong Fu / Bruce Wh
1180 Peachtree St. N.E.
Suite 2618
Atlanta, GA 30304
Ph: 404-685-8318
Fax: 404-872-5318
www.sanyusa.net
Cranes, Drill Equipment,
Specialized Rigs
and Equipment
All States, Canada

Sauls Seismic, Inc.
Keith Best
P.O. Box 356
Hilliard, OH 43026
Ph: 614-7714855
Fax: 614-771-5159
www.saulsseismic.com
Vibration Monitoring
AL, AR, CA, DC, FL, GA, IL, IN,
KS, KY, LA, MD, MI, MO, MS,
NC, NJ, NY, OH, PA, SC, TN,
TX, VA, WV, Canada, Europe,
Mexico

Sabine Pipe
Ron Welling
P.O. Box 100
Kilgore, TX 75663
Ph: 903-986-7600
Fax: 903-986-7606
www.sabinepipe.com
ronwelling@sabinepipe.com
Steel Pipe Piles, Structural Steel,
Sales
All States

Service Rigging
Mel Faciane
3170 Terrace Ave. E.
Slidell, LA 70458
Ph: 985-643-7673
Fax: 985-649-1866
servrigg@hotmail.com
krwinc@msn.com
Cutter Heads & Drill Bits, Dock
& Marine Supplies, Fasteners,
Lubricants & Grease, Rigging
Supplies, Safety Equipemnt
LA

T.R. Miller Mill Company, Inc.
Dan Cox
215 Deer St.
Brewton, AL 36427
Ph:256-312-0948
Fax: 251-867-2579
dcox@trmillermill.com
Timber Piles/Treated Lumber
AL, FL, LA, MS

United Wood Treating Company
Wayne R. Comtois
1121 Delta Road
Whitmire, SC 29178
Ph: 803-694-3668
Fax: 803-694-3976
www.unitedwood.com
wconitois@unitedwood.com
Crane Mats, Timber Pile, Treated
Timber
FL, GA, MD, NC, SC, VA

WB Equipment Service Company
Steve Cireco
127 Oak St.
Woodridge, NJ 07075
Ph: 201-438-7800
Fax: 201-438-7830
www.wbequipment.com
Stephen.cireco@verizon.net
Hydraulic Power Packs, Specialized
Rigs & Equipment, Consulting,
Geotechnical, Testing, Design,
Vibration Monitoring, Rental,
Sales, Analysis, Surveying, Civil
& Design, Materials Testing, Pile
Driving Monitoring
All States, Canada, Europe,
Mexico

TECHNICAL AFFILIATES

Alfred Hartley Jr.
110 12th St. N.
Birmingham, AL 35124
Ph: 205-215-6911

Chris Souder
1470 Vallombrosa Ave.
Chico, CA 95926
Ph: 530-518-2656

Danny DeAvies
502 Wando Park Blvd.
Suite 109
Mt. Pleasant, SC 29464
Ph: 843-654-4448

David Harrison
4375 Gibsonia Road
Gibsonia, PA 15044
Ph: 724-449-2110

John W. Pickering
1506 West 36th Ave.
Anchorage, AK 99503
Ph: 907-561-1011

Surinder Singh
10076 Darnestown Road
Rockville, MD 20850
Ph: 301-424-8696

A Guided Tour of the PDCA Web Site

Piledriver magazine is read by many people in our industry but the PDCA has more to offer. How many of you have visited the PDCA Web site? The PDCA Web site, www.piledrivers.org, is another resource provided by the Pile Driving Contractors Association. It complements this publication and provides a great deal of information about driven piles and our organization. For those of you not familiar with our Web site we offer this "Guided Tour" to acquaint you with the information available there.

Home Page

Like most Web sites, the Home Page is the starting point and gateway to all of the features posted on the site. Information on upcoming events, membership information, popular PDCA documents and links to other areas on the Web site can be found here.

Along the top margin and along the upper left margin are links to other pages within the Web site. These pages are standard on the PDCA Web site and contain information regarding the association and driven piles. Those pages will be described in more detail later.

Just below the top margin you will find rotating banner ads that announce upcoming events and provide links to additional information about those events. These banner ads change as events warrant. Below the banner ads you will find a list of Hot Topics noting upcoming industry events. These features allow you to keep up with PDCA news and events at a glance.

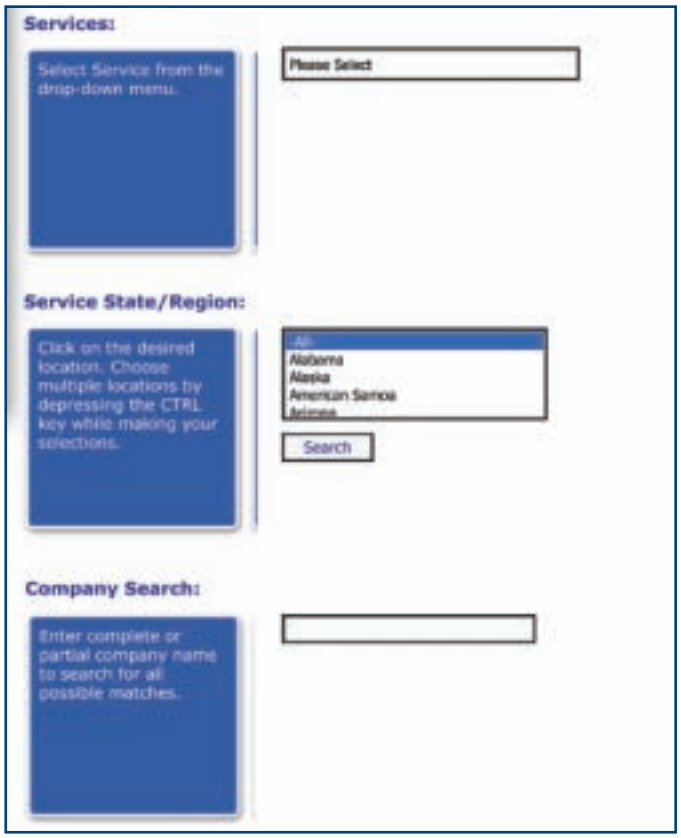
In the lower left margin quick links are provided for items of particular interest. These items can be found at other locations within the Web site but the quick links on the Home page make this important information easy to locate.

About PDCA

This page gets right to the heart of what the PDCA is all about. It outlines our purpose and the methods we employ to achieve our objectives.

Join PDCA

Interested in joining your fellow contractors, suppliers and engineers in promoting the driven pile? This is the place to start. This page describes the services and benefits provided by the PDCA and displays links to additional information on membership categories. You can link to a membership application that you complete and submit online, or you can download a form to send in by mail at your convenience.



Member Search Page.

Find Members

Looking for a PDCA member that provides a particular service or works in a particular geographic area? This page will provide you with information on all active PDCA members.

There are multiple ways to find the members you need. The first option is to search by service. For example, select "pile driving" from the drop-down menu that lists all services provided by PDCA members, click "Search" and you will be provided with a list of all members that drive piles.

You can narrow your search criteria by selecting a specific geographical location. For example, by adding the selection of "Maryland" to your search criterion of "pile driving" you can get a list of all PDCA members that drive piles in Maryland.

The search results provide you with company names and basic contact information for each member shown. By selecting the "Detail" button you can get additional information on your selection including a link to that company's Web site, which provides much more specific information. There are a number of services, material and equipment options listed under "Services" so you can find just what you need.

A third way to search for a member is by name. In the Company Search box simply type in the full or partial name of the company you are looking for, click "Search" and you will be provided with a list of names that match your search criteria. This is a great way to find a member when you might not remember their full company name or are unsure of the spelling.

Contact Us

Have a comment or a question regarding PDCA or driven piles? The Contact Us page provides you with the means to submit your question or comment to PDCA so that it can be routed to those members best able to respond.

Benefits of Driven Piles

Ever wonder why we promote driven piles? This page sums it up. It describes the various benefits of driven piles. It also provides information on the quality, cost effectiveness, adaptability and reliability of driven piles as well as the residual benefits of using this deep foundation option.

Leadership/Committees

Board of Directors

The PDCA is made up of many contractors, suppliers and engineers. This page lists the individuals that have been elected to serve as officers and directors of the organization.

Committees

This page lists the various committees that work within PDCA to accomplish the objectives of the organization – Communications, Education, Environmental, Market Development, Membership and Technical.

Past Presidents

Since the inception of the PDCA, contractor members have been elected by bylaws to serve in the highest leadership position within the organization. Contractors from companies large and small all over the country have served. A list of those that have had the honor to serve their fellow contractors and this industry through PDCA are listed on this page.

Staff

No organization can run smoothly without hard-working, qualified staff to keep the wheels turning. The Staff page lists the names of our Executive Director, Stevan Hall, and our Administrative Assistant, Marian Phillips. Steve's presence has been seen and felt throughout the organization and Marian's recent addition has only enhanced our ability to serve our members.

Committee Meetings

Information on upcoming committee meetings can be found on this page.

Events

PDCA functions and other industry events of interest to our members are listed here. This page contains very useful information regarding upcoming events including dates, location and a description of the activities at the event. For contractors, these events provide ideas regarding alternate construction methods, problem-solving techniques, industry news and equipment innovations. These events are also useful for engineers trying to enhance their ability and knowledge, and fill their continuing education needs CEU/PDH credits in the process. For all, these events are a great way to develop strategic alliances with associate suppliers and generally to keep up to date with industry happenings and trends. This page is also a great help when making your travel plans.

Environmental

The PDCA's ongoing Vibration Database project is detailed here. Vibrations are often associated with driven pile projects in a negative way – usually unjustly. This Vibration Database aims to separate fact from fiction. This ambitious project has collected actual vibration measurements and case histories from a number of pile driving projects with the intent of establishing guidelines for designers and contractors as to the amount of vibration you can reasonably expect for various soil and driving conditions. The goal of the project is to provide factual information to end the reliance on anecdotal hear-say and third-hand information.

Safety

On this page, you will find information related to construction safety and information about Safety Solutions, Inc. Safety Solutions is a consultant to the PDCA and our safety committee.

Chapters

This page provides contact information for each of our four local chapters, South Carolina, Mid-Atlantic, Gulf Coast and California.

Ask PDCA

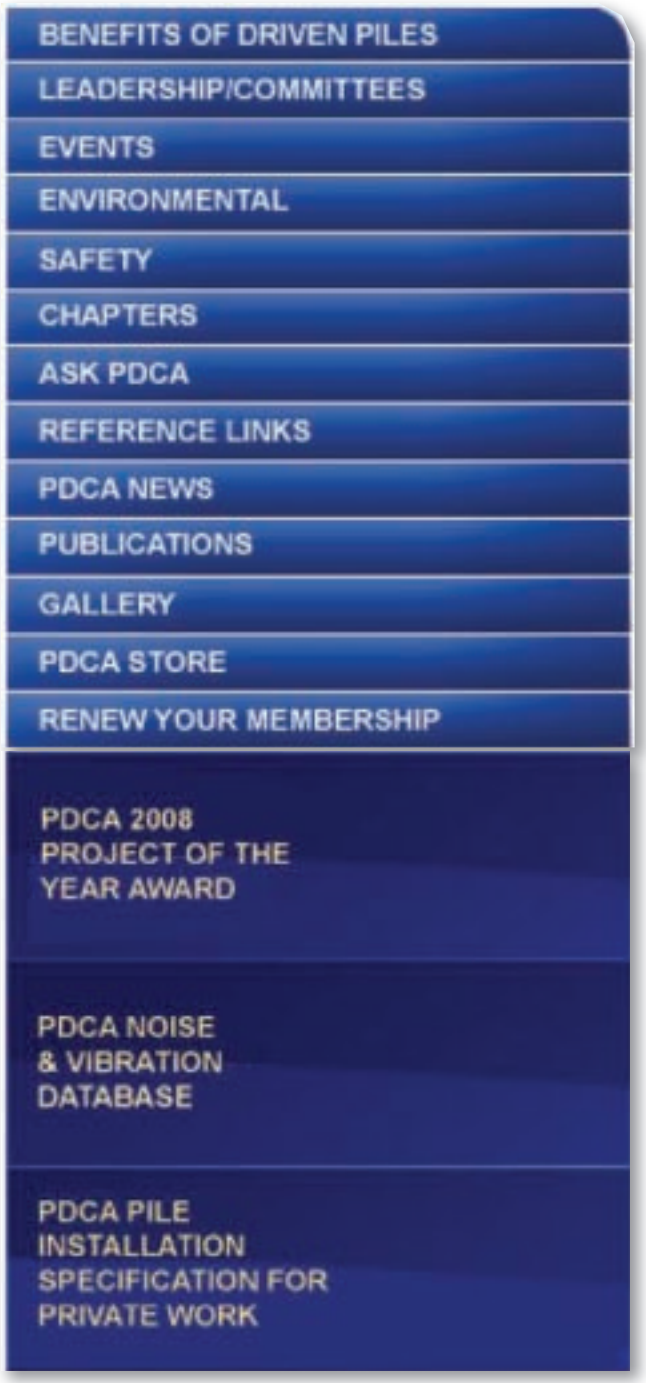
If you have a technical question for PDCA regarding driven piles this is the place to come. Questions submitted to PDCA will be distributed by the PDCA office to those members best suited to provide you with an appropriate answer.

Reference Links

This page provides a great way to get information on pile driving equipment or material. Select from the list of categories to get a list of all of the PDCA's Associate Members that provide that type of equipment or material. Each company name listed provides a link to that company's Web site. You can compare and contrast each company's offerings, get detailed information on material and equipment, learn about services provided, find service locations, get contact information and any number of other useful bits of information.

PDCA News

Driven piles and pile drivers make news. This page keeps you up to date with the latest news in the world of the driven



Leave the driving to us.

No one in the crane business has more crane pile driving expertise than Link Belt.

From the compact 50-ton 108 HYLAB 5 to the highly mobile and simple to assemble 200 ton 248 HYLAB 5 we have you covered.

- Power up, power down with automatic brake and freefall standard on all main drums
- Impressive capacities & drum performance
- Optional front mounted auxiliary drums with free spooling
- Rear mounted high performance auxiliary drums with free fall or auto brake mode
- Spotter circuits standard on many units
- Pile driving top section adaptors and connector points
- Optional attachment idler sheave assemblies to better separate multiple running lines over the top
- Optional angle boom attachment on all smaller models

Link-Belt
CRANES

LINK-BELT CONSTRUCTION EQUIPMENT COMPANY
Lexington, Kentucky | www.linkbelt.com

pile. Keep tabs on unique applications of driven piles and the achievements of our members. If you have an item you would like to share please submit it to the PDCA office so it can be posted here.

Publications

PILEDRIVER Magazine

PILEDRIVER magazine is the primary publication of the PDCA. This page contains PDF copies of all past issues of our magazine. If you have missed an issue or are looking for a particular article this is the page to visit. A Table of Contents page is listed with each issue to assist you in locating specific articles without first having to download an entire issue; download the issue when you have located what you need.

Selected Articles

This page contains copies of selected articles that highlight unique applications, the versatility and the true benefits of driven piles. The PDCA promotes driven piles and these articles describe the quality of driven piles and provide examples of how driven piles solved difficult deep foundation issues.

E-Letters

Copies of our monthly E-Letters can be found here. The E-Letters provide you will a monthly summary of current PDCA news and upcoming events. If you've missed an issue or just need a quick reference you can view or download past E-Letters here.

General Publications

Three important publications reside on this page. First is the PDCA's Installation Specification for Driven Piles for Private Work. This specification was adapted for private work from the recent update to AASHTO's Pile Installation Specification. Let's face it, we've all seen a variety of pile driving specifications – some better than others. This specification, available to all designers and contractors, provides a consistent, fair, knowledgeable and up-to-date guideline for the installation driven piles that is easy to interpret and reasonable to use. It is posted in MS Word format so that it can be downloaded and adapted to any specific pile driving project.

The second publication is entitled, "Information for the General Public." Any construction operation can be intrusive and pile driving, with its customary place at the beginning of a project and its larger than average equipment, often draws attention. The best way to minimize concerns and complaints pertaining to your operation is through education and information. This document is a brochure that can be downloaded, printed and distributed to those surrounding your jobsite to let them know what they can expect and what they can do if they experience a problem. The more that people understand a situation the more likely they are to work with you toward a successful project.

Lastly, we provide a link to download the presentations from our most recent Professors' Driven Pile Institute. This valuable information is shared with a select group of college professors from around the country on a biennial basis at Utah State University. The course exposes the attendees to the technical aspects of driven piles and concludes with a field demonstration of pile installation and testing. The next course will be conducted in June 2009.

Presentations

This page contains several presentations that describe various aspects of driven piles and how they are used. Our primary publication, "Driven Piles Are Tested Piles", provides the reader with an overview of driven piles, how they are used, how they are installed and how they are tested. It is a great introduction to driven piles and is a useful tool to help explain the many benefits of driven piles. Other presentations highlight research that proves and explains the benefits of utilizing driven piles in brownfield areas and how driven piles utilized pile setup to realize great cost savings in material and labor on a project in Orlando, Fla.

Gallery

Visit this page for a brief description of the adaptability and versatility of driven piles then click the "Photo Gallery" link in the right margin to see numerous photographs that display those qualities in actual applications. The several pages of photos show driven piles being used in a variety of locations and a variety of applications. Click on an individual photo to see an expanded view.

PDCA Store

As the name implies, PDCA merchandise can be found on this page. Our merchandise includes the FHWA's Design and Construction of Driven Pile Foundations, Vols. 1 & 2 both in soft cover and on CD. We have also recently added a line of attractive shirts and caps so that you can proudly show your support for driven piles and the PDCA. Items can be ordered online or through the PDCA office.

Renew Your Membership

When it comes time to renew your membership, this page makes it easy. A renewal form can be completed and your dues payment submitted and processed online to make renewal quick and easy.

Well, that about wraps up our tour of the PDCA Web site. As you can see, it contains a great deal of information both for our members and those who simply want to learn more about driven piles. Stop by for a visit. You'll find the PDCA Web site is a useful tool for you and our industry. ▼

Index to **Advertisers**

HAMMER&STEEL

Whatever Your Deep Foundation Need ...

We Have The Solution

Founded in 1989, Hammer & Steel has grown to become the premier supplier of piling and pile driving equipment in North America. A versatile and diverse product line provides unparalleled productivity and reliability for any large-scale drilling, vibrating, impacting or pile driving application. The combination of these products and our highly experienced service and support staff provide the solutions you need to ensure your success.

1-800-325-PILE (7453)
www.hammersteel.com

ABI Banut Chaparral Dawson Delmag PVE

American Piledriving Equipment Inc.
&
J&M Foundation Equipment LLC.

With APE's proprietary dual walled cylinder, the Model 15 60 Hydraulic Impact Hammer driving 36" pipe pile on the south of Lake Pend Oreille. delivering 94% energy.

The Model 200 Vibro features APE's patented multi-stage suppressor with *3 times the line pull* capacity of any other vibro on the market and still be able to sit on it and drink a cup of coffee.

The world's largest single gearbox vibro, the APE Model 600 with the patented Quad Clamp System is designed for the hard jobs and matched by no other in the industry.

APE's high quality, competative priced, single acting deisel hammers are re-defining the foundation industry proving that PEAK FORCE matters on steel piles.

The Largest Manufacturer of Foundation Equipment in the World.
Engineering Designed to Solve problems at the Pace of the industry.
Largest Rental Fleet in the Foundation Construction Equipment Business.
Greatest Number of Patents in the Industry to Protect Your Investments.
Leading the Way in Innovation and Special Applications Increase Your Profits.
We Make You Our Number One Priority.

APE's line of low headroom hydraulic hammers, created to solve seismic retrofit issues, reduce the number of splices needed for extreme overhead restrictions.

J&M Robovib excavator mounted pile driver allows one operator to do the work of three while *minimizing downtime and increasing productivity*

APE's Model 250 Variable Moment Vibro is the answer to the contractor's search for a *reliable, rugged* tool to use when radial vibration is an issue.

The Model 750 hydraulic impact hammer, with its 120,000 lb ram, is the *largest* American-made hydraulic impact hammer ever built.

REGIONAL LOCATIONS:	**Corporate** Kent, WA	**Northeast** Sayreville, NJ	**Western** Rio Vista, CA	**Southeast** Winter Haven, FL	**Mid Atlantic** Virginia Beach, VA	**Gulf** Conroe, TX
PHONE	**(253) 872-0141**	**(732) 432-6604**	**(707) 374-3266**	**(863) 324-0378**	**(757) 518-9740**	**(936) 271-1044**
FAX	**(253) 872-8710**	**(732) 432-6608**	**(707) 374-3270**	**(863) 318-9409**	**(757) 518-9741**	**(936) 271-1046**
TOLL FREE	**(800) 248-8498**	**(888) 217-7524**	**(888) 245-4401**	**(800) 570-3844**	**(866) 399-7500**	**(800) 596-2877**