The Cianbro Corporation Makes Its Mark on the National Harbor Project
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 Mallet, Project Manager, FLATIRON

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

President’s Message .......................... 2
Executive Director’s Message .................. 4
2008 PDCA Board of Directors and Committee Chairmen .................. 8
New Chairman of the Environment Committee .......... 11
PDCA Membership Benefits .................. 12
PDCA Membership Application .................. 17
Did You Know? .......................... 19
PDCA Chapters Update .................. 21
Moving On - Jerry DiMaggio’s Retirement .......... 23
PDCA Member Profile: Parker Marine Contracting .... 25
PDCA announces “Project of the Year” award .......... 29
IFCEE ........................................ 31
Project Spotlight - National Harbor Pile Driving Project .......... 45
Project Spotlight - Huntingdon Place .......... 51
Steel Sheet Piling Installation – Best Practices .......... 59
The impact of steel sheet piling shape and site and soil conditions on driving operations
Pile Drag Load and Downdrag Considering Liquefaction .......... 68
2008 New PDCA Members .................. 77
A Guided Tour of the PDCA Web Site ........... 79
Index to Advertisers .................. 84
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 posi-
tive 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 con-
tinue to build deep foundations in their
communities. That is what they do.

In recognition of the good works
by pile driving contractors every-
where, Keep Driving! ▼
Executive Director’s Message

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!”

CHALLENGER PIPE & STEEL, LLC.

“Service is our Specialty”

- New and used steel pipe.
- Pipe piling.
- Line pipe.
- Steel plate.
- Oil county tubular goods.
- Micro pile casing.
- Various end preparations

Call today for a “Same-Day Quotation”

Toll-free: 888-770-7473
Phone: 509-534-7473 • Fax: 509-534-4254

dstout@challengerpipe.com
dlevine@challengerpipe.com
randy@challengerpipe.com

CHALLENGER PIPE & STEEL, LLC.
104 S Freya, Ste 221 White Flag Bldg
Spokane, WA 99202
Toll-free: 888-770-7473

STEEL PIPE.

Valiant Steel has been proudly servicing customers nationwide for over 40 years. With three locations in Southeastern United States, Valiant has what it takes to provide superior service and value.

Valiant Steel and Equipment, Inc.
Steel Caisson & Pipe Piling
(770) 417-1235
Fax (770) 417-1699
Toll Free: (800) 939-9905
sales@valiantsteel.com
Outstanding Piling Products and Service Delivered Year After Year by L.B. Foster.

The **LBFoster** Piling Team

800.848.6249  lbfosterpiling.com
LEADERSHIP

L.B. FOSTER PILING

CUSTOMER SERVICE

2008
## 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

- **Ed Waters**  
  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

- **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

### 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 Jahnnigen**  
  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

### 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
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 Ragdale, Mike Justason, Michael Jahningen, 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 Baicum, 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

H.B. Fleming
Contracting - Engineering
H.B. Fleming specializes in pile driving, excavation support, cofferdam installation and subaqueous pipelines throughout northern New England.
89 Pleasant St. Portland, Maine 04106
(207) 799-8514
(207) 799-8538 (fax)
www.hbfleming.com

Piledriver Q4 2008 9
100% Melted & Manufactured in the USA

QUALITY SERVICE PRICE

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

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

Buy Quality + Buy Experience
Buy American

QUALITY ✫ SERVICE ✫ PRICE

R.W. Conklin Steel

100% Melted & Manufactured in the USA
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.

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

By Joe Savarese

Prime Marine Services has a fleet of prime hydraulic cutting shears with five models capable of shearing 6” to 70” material.

www.primemarineinc.com
312 S. Bernard Road • Broussard, LA 70518
Toll free: 1-877-837-6511 • Phone: 337-837-6500 • Fax: 337-837-6511

Contact Prime Marine Services for your severance solutions, whether it be:
• platform
• pipeline
• structural
• custom applications

• bridge demolition
• cut & exposed precast concrete piles

Powerful | Successful | Safe
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 1&II, an FHWA manual on the design and construction of driven piles.

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.

“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.
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.nucor-yamato.com

It's Our Nature.
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.
We design and manufacture the most advanced piling equipment for the world's leading piling contractors.
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
- H-Piles
- Timber Piles/Treated Lumber & Timbers
- Concrete Piles
- Composite 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
- Civil & Design
- Consulting
- Educational/Association
- Geotechnical
- Materials Testing
- Pile Driving Monitoring
- Surveying
- Vibration Monitoring
- Other

### Step 4. Geographic Areas Where Contracting, Products and Services Available
(All applicants check all that apply)
- All States
- AK
- AL
- AR
- AZ
- CA
- CO
- CT
- DC
- DE
- FL
- GA
- HI
- ID
- IL
- IN
- KS
- KY
- LA
- ME
- MI
- MN
- MS
- MT
- NE
- NV
- NH
- NJ
- NM
- NY
- NC
- ND
- OH
- OK
- OR
- PA
- RI
- SC
- SD
- TN
- TX
- UT
- VA
- WA
- WI
- WV
- WY
- Canada
- Mexico
- Europe
- Global

### Step 5. Sponsorship: Who told you about PDCA?
Member Name

---

**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
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
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 at 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 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.

Now, one number can get you timber piling and crane mats anywhere, on time.

Mcfarland Cascade makes picking up pilings and crane mats easier than ever. Not only are our yards continually stocked with them, our superior railroad and trucking connections allow us to deliver your order anywhere in North America, at a moment’s notice. Never again will you break a sweat, worrying about delivery times. Because the same McFarland Cascade distribution network, famous for providing utility poles around the country after hurricanes, ice storms, and wild-fires is now shipping pilings and crane mats with equal urgency. Simply call the number below and talk to one of our national representatives about how we can be of service. Then relax. You’ll be working with the biggest and most dependable distributor in the US and Canada since 1916. The power is at your fingertips.

(dial 1-877-974-5464)
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 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 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.
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.
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. ▼
Stocking distributors of

**NEW and USED - STEEL PIPE**

- A252 / API / A500 grades of new pipe
- “Reconditioned used” and “surplus” in stock
- End plates / conical points / splicers, etc.
- Coatings OD / ID ... coal tar, fusion bond, etc.
- 4” pipe size to 120” fabricated caisson
- Stocking locations throughout the U.S.
- Small orders and large including mill direct

**Crestwood Tubulars, Inc.**

Toll free: 1-800-238-7473
Fax: 314-842-9064
Email: info@crestwoodtubulars.com

- Please call for quotations -
Deep Experience.

CAJUN DEEP FOUNDATIONS, LLC
A SUBSIDIARY OF CAJUN INDUSTRIES, LLC

VISION BORN OF EXPERIENCE

P.O. Box 104 Baton Rouge, LA 70821-0104
(800) 944-5857 • (225) 753-5857 • www.cajunusa.com

BRITTTEX INTERNATIONAL PIPE SUPPLY

NEW & USED STEEL PIPE

SERVICES
• Weld to length
• Fabrication
• Cutting, beveling
• Coating
• Reconditioning
• Roll and Weld
• Sandblasting
• Custom Orders

PRODUCTS
• New Prime
• New Surplus
• New Mill Reject
• New Limited Service
• Used and Secondary
• Mill Overruns
• Rolled and Welded
• Spiral Welded

We are a major supplier of steel pipe, specializing in custom orders.

We supply pipe from 4” - 108” diameter and also purchase new, used and structural pipe for inventory.

...Any length, any size, call us!

Brittex International Pipe Supply
5505 Almeda Genoa Road • Houston, Texas 77048
Tel: 713-991-6107 • Fax: 713-991-3128 • Web: www.brittexpipe.com
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.
Products and Services

- Attach Plates & Points
- Splicing – Weld to Length
- 2½ 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
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.
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 Oil 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
### 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
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:
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

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.

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

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

<table>
<thead>
<tr>
<th></th>
<th>Early Bird Rates by 1/12/2009</th>
<th>Standard Rates January 13 to 3/19/2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member</td>
<td>$345</td>
<td>$445 = $_______</td>
</tr>
<tr>
<td>Non-Member</td>
<td>$395</td>
<td>$495 = $_______</td>
</tr>
<tr>
<td>Government</td>
<td>$200</td>
<td>$250 = $_______</td>
</tr>
<tr>
<td>College Student</td>
<td>$ 75</td>
<td>$100 = $_______</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Member</th>
<th>Non-Member</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC 1</td>
<td>Estimation of Soil Properties for Foundation Design</td>
<td>$375</td>
<td>$400</td>
</tr>
<tr>
<td>SC 2</td>
<td>Managing Your Safety Program (MYS)</td>
<td>$375</td>
<td>$400</td>
</tr>
<tr>
<td>SC 3</td>
<td>High Strain Dynamic Testing for Driven &amp; Drilled Deep Foundations</td>
<td>$375</td>
<td>$400</td>
</tr>
<tr>
<td>SC 4</td>
<td>Introduction to Instrumentation &amp; Monitoring in Geotechnical Engineering</td>
<td>$375</td>
<td>$400</td>
</tr>
<tr>
<td>SC 5</td>
<td>Installation &amp; Design of ACIP Piles</td>
<td>$375</td>
<td>$400</td>
</tr>
<tr>
<td>SC 6</td>
<td>Micropile 201: Advanced Design and Construction Topics</td>
<td>$375</td>
<td>$400</td>
</tr>
</tbody>
</table>

**Section J Sub-Total $_____**

K. Individual Event Ticket

<table>
<thead>
<tr>
<th>Event/Location</th>
<th># of Tickets</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunday Welcome Reception</td>
<td>___ X</td>
<td>$95</td>
</tr>
<tr>
<td>Monday Reception</td>
<td>___ X</td>
<td>$95</td>
</tr>
<tr>
<td>ADSC President’s Awards Luncheon</td>
<td>___ X</td>
<td>$50</td>
</tr>
<tr>
<td>PDCA President’s Award Luncheon</td>
<td>___ X</td>
<td>$50</td>
</tr>
<tr>
<td>“Honoring Our Hero” Reception &amp; Dinner (Adult)</td>
<td>___ X</td>
<td>$125</td>
</tr>
<tr>
<td>“Honoring Our Hero” Reception &amp; Dinner (Child)</td>
<td>___ X</td>
<td>$75</td>
</tr>
<tr>
<td>Student Achievement Awards Luncheon</td>
<td>___ X</td>
<td>$50</td>
</tr>
</tbody>
</table>

**Section K Sub-Total $_____**

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

<table>
<thead>
<tr>
<th>Card Number</th>
<th>Exp. Date</th>
<th>Identification Code</th>
</tr>
</thead>
</table>

**Name On Card**

**Card Holder Signature**
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
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
<table>
<thead>
<tr>
<th>For PZ and PZC (Ball + Socket)</th>
<th>For Hoesch-Z with a width of 22.64 inches or 575 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PZ 90</strong> Corner (~50° to ~130°)</td>
<td><strong>HZ 90</strong> Corner (~45° to ~135°)</td>
</tr>
<tr>
<td><strong>PZ Tee</strong> Corner (~50° to ~130°)</td>
<td><strong>HZT</strong> Corner (~45° to ~135°)</td>
</tr>
<tr>
<td><strong>Joker</strong> Corner (~50° to ~130°)</td>
<td><strong>HZ</strong> Variable weld-on</td>
</tr>
<tr>
<td><strong>Bullhead</strong> Corner (~50° to ~130°)</td>
<td><strong>PZL</strong> Hoesch-Z + Peiner Beam</td>
</tr>
<tr>
<td><strong>CBF</strong> Corner (~50° to ~130°)</td>
<td><strong>PZR</strong></td>
</tr>
<tr>
<td><strong>Coil</strong> Corner (~25° to ~65°)</td>
<td><strong>For Hoesch-Z with a width of 30.15 inches or 675 mm</strong></td>
</tr>
<tr>
<td><strong>Cobra</strong> Corner (~115° to ~155°)</td>
<td><strong>HZn 90</strong> Corner (~45° to ~135°)</td>
</tr>
<tr>
<td><strong>PBS-M</strong> PZ / PZC + Peiner Beam</td>
<td><strong>HZTn</strong> Corner (~45° to ~135°)</td>
</tr>
<tr>
<td><strong>PBS-F</strong> PZ / PZC + Domestic Beam</td>
<td><strong>HZn Knob</strong> Weld-on</td>
</tr>
<tr>
<td><strong>BBS-M</strong> PZ / PZC + Domestic Beam</td>
<td><strong>HZn</strong> Variable weld-on</td>
</tr>
<tr>
<td><strong>BBS-F</strong></td>
<td><strong>For PS-Flat Sheet</strong></td>
</tr>
<tr>
<td><strong>WOM</strong> PZ / PZC + Pile Pipe Weld-on</td>
<td><strong>SWC 120</strong> 120° Wye Pile</td>
</tr>
<tr>
<td><strong>WOF</strong> Transition Profiles</td>
<td><strong>SWC 90 A</strong> 90° Tee Pile</td>
</tr>
<tr>
<td><strong>LBM</strong></td>
<td><strong>SWC 90 B</strong> 90° Tee Pile</td>
</tr>
<tr>
<td><strong>LBF</strong></td>
<td><strong>SWC 60 A</strong> 60° Wye Pile</td>
</tr>
<tr>
<td><strong>For all AZ (U-Pile/Larssen)</strong></td>
<td><strong>SWC 60 B</strong> 60° Wye Pile</td>
</tr>
<tr>
<td>Hoesch 1706, 1806, 1856, 1906, 2506, 2606, 2706</td>
<td><strong>SWC 30 A</strong> 30° Wye Pile</td>
</tr>
<tr>
<td><strong>V 20</strong> Corner (~30° to ~150°)</td>
<td><strong>SWC 30 B</strong> 30° Wye Pile</td>
</tr>
<tr>
<td><strong>VTS</strong> Corner (~45° to ~135°) Circular driving</td>
<td><strong>SWC</strong> Weld-on</td>
</tr>
<tr>
<td><strong>VT</strong> Corner (~45° to ~135°) Omega corner</td>
<td><strong>Sealing of sheet pile walls</strong></td>
</tr>
<tr>
<td><strong>Omega 12</strong> Omega corner Jagged U-Walls</td>
<td><strong>WADIT</strong> Non-toxic hot cast interlock sealant impervious to weather</td>
</tr>
<tr>
<td><strong>V 22</strong> Larsen Interlock + Pipe Pile Weld-on</td>
<td></td>
</tr>
<tr>
<td><strong>PL</strong> U-Pile + Peiner Beam</td>
<td></td>
</tr>
<tr>
<td><strong>PLZ I</strong> Peiner Beam + Larsen-Z Piles</td>
<td></td>
</tr>
<tr>
<td><strong>PLZ II</strong></td>
<td></td>
</tr>
<tr>
<td><strong>LBM</strong> Transition Profiles</td>
<td></td>
</tr>
<tr>
<td><strong>LBF</strong></td>
<td></td>
</tr>
</tbody>
</table>

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
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.

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.

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
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., Berminingham 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

**NEW PATENTED DESIGN**
**HIGH STROKE AIR HAMMERS**

800 #, 300 # & 150 #
ALLOW THE FASTEST DRIVING OF ALL VINYL, COMPOSITE, ALUMINUM & LT STEEL SHEET PILING + POSTS, PIPE & MEDIUM WOOD PILING.

**COLLINS COMPANY**
Since 1953

888.300.0100
Cell 360.708.5320 | Fax 360.387.2186
collins@whidbey.net | www.collinspilehammers.com

**ED WATERS & SONS CONTRACTING CO., INC.**
GENERAL CONTRACTORS
Specializing in Pile Driving, Steel Sheet Piling and Marine Structures

3375 AGRICULTURAL CENTER DRIVE
ST. AUGUSTINE, FL 32092

Phone (904) 823-8817
Fax (904) 823-9687
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.
Toll free: 866-522-5467 • Fax: 201-438-7830 • Email: stephen.cireco@verizon.net • Web: www.wbequipment.com

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. 280 N. Koppers Rd.
Gainesville, FL 32609 Florence, SC 29506
Tel 800 342 6860 Tel 843 669 8231
Fax 352 371 4657 Fax 843 667 6823
SPECIALTY PILING SYSTEMS, INC.

Toll Free: (888)-231-6478   (Phone & Fax)
Direct Phone (985) 643-0690
E-mail: SWhitty-SPS@charter.net

Hammer Cushions

Pile Cushions
(Cylinder Pile Cushions a Specialty)

VALUE ENGINEERED SOLUTIONS TO DIFFICULT PROBLEMS

PILE DRIVING,
TIE BACKS and ANCHORS
Pile Load Testing-All Types
to ASTM Standards

- COFFERDAMS
- SEWER & WATER LINES
- BRIDGES
- MARINE CONSTRUCTION
- DAMS
- SLURRY & BARRIER WALLS
- HEAVY & INDUSTRIAL FOUNDATIONS

131 California Drive, Williamsville, NY 14221
(716) 632-1125  FAX (716) 632-0705
e-mail piling@HFDarling.com
SERVING NEW YORK, OHIO and PENNSYLVANIA

DFP Foundation Products, LLC
PO Box 688 • Franklin Lakes, NJ 07417-0688
201-337-5748 • fax: 201-337-9022
www.pileline.com
40 YEARS OF EXPERIENCE
SMALL WONDER.
The little remote control drill rig that goes where others can't.

GOES EVERYWHERE.
Only 4.5 ft. wide.

HUSKY & POWERFUL.
65 HP Diesel engine.
Rig weighs 15,438 lbs.

SAFE TO USE.
Remote control offers operators a 360°
range of motion for safe and accurate use.

REMOVABLE POWERPACK.
Removable power pack for exhaust-free
use in enclosed areas.

RUBBER TRACKS.
Won't damage road services.

FITS UNDER LOW CEILINGS.
Telescopic mast shrinks from
15 ft. (max) to 7 ft. (min).

INCREASE PROFIT PER METER.
20,000 ft. lbs. of powerful torque.

DRILL DEEP & FAST.
49 ft. maximum drill depth.

LARGE DRILLING DIAMETER.
Max: 24" / Min: 14"

Very affordable and available only from
Hennessy International

800.656.6766
hennessyinternational.com

Complete Impossible projects on hillsides, unstable terrain and tight
places with the versatile TesCar COMPACT. It's a must-have addition
to your arsenal. In-stock now for sale or rent. Available only from
Hennessy International. Log on or call 800.656.6766 now.
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-
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.
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 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.

GREENHEART PILES
Many sizes available from stock
Call for details

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

Naturally Durable Hardwoods and Fabrication

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

Midgulf Forest Products, Inc.
423 Delaware Avenue
P. O. Box 7222
McComb, MS 39649
Phone: (601) 684-3809
Fax: (601) 684-3850
Email: midgulf@bellsouth.net

Supplying Treated and Untreated Timber Piles and Sawn Timber Products for Industrial Consumers and Contractors throughout the United States.

1250 L&A Road, Metairie, LA 70001
504-834-7791
504-834-7792 Fax
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.
“We carry steel pipe, wide flange, H-pile, sheet pile, and concrete pile. We also carry back up rings, end plates, cutting shoes and H-pile tips.”

Calgary
9100 Venture Ave. SE,
Calgary, AB T3S 0A2
Tel: 403-236-1788
Fax: 403-236-2478
Toll Free: 866-441-7473

Edmonton
6515-34 St. NW,
Edmonton, AB T6B 2V8
Tel: 780-465-1585
Fax: 780-465-1250

Delta
#6-8500 River Road,
Delta, BC
Tel: 604-946-2655
Fax: 604-946-2630
Toll Free: 866-400-7473

Bellingham
38888, Sound Way
Bellingham, WA
98227 - 9754
Toll Free: 866-400-7473

We carry ASTM A252, A139, A53B, AWWA C200, API, and CSA specifications.
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.
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.

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.

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 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

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

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
Serving the foundation and construction industry since 1955

- Diesel
- Vibratory
- Hydraulic
- Air
- Augers
- Pileco
- HPSI
- Vulcan

Seattle, WA    Ventura, CA
206-762-3550    805-746-6965
www.PacoEquip.com

Tele & Fax: (706) 398-1178
www.pilehammerequipment.com

Parts – Vulcan, Conmaco, Raymond
Service – Repairs, Cable Conversions
Leads – Boom Points, Fair Leads
Cushion Material – Micarta, Aluminum, Nylon
Sales – Air Hammers from 7,000-300,000 Ft Lbs
Rentals – Air hammers to 60,000 Ft Lbs
Driving Heads – H-Beam, Pipe, Wood, Concrete

4 Commerce Drive, Cranford, NJ 07016
908-272-4010     www.weeksmarine.com

The Leader in Marine Construction

Legendary Service, Extraordinary Results!
For rates and availability
1-800-626-2185
Visit us: www.taservices.us
• Mansfield, Tx*
• Midlothian, Tx*
• Petersburg, Va

“Transportation for the Steel Industry”

Geotechnical Engineering
Soil and Rock Mechanics
Shoring and Underpinning Design
Pile Load Testing and Inspection
Vibration Monitoring
Construction Materials Testing
Third Party Inspections
Survey Layout

70 Pleasant Hill Road, Mountainville, NY 10953
1-800-626-6531

Timber Piling Solutions For
Marine Construction


TimberPilingCouncil
Foundation & Marine Piling

800-410-2010 pst fax: 206-275-4755
www.timberpilingcouncil.org info@timberpilingcouncil.org
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
- H PILE
- ROUND PILE
- SHEET PILE
- MICRO PILING
- TIE BACKS
- SHORING SYSTEMS
- DESIGN / BUILD SYSTEMS

WORKING IN THE WESTERN UNITED STATES

166 East 14000 South  PH: 801.553.1661
Draper, UT  84020  Fax: 801.553.1696
WWW.WADSCO.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.
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 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-
nominals 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 de-
opps 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 sus-
tained 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 magni-
tude is equal to the settlement of the soil at the location of the 
normal 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 
cluded.

Although the issue of design of pile foundations is rather 
broad, this note will address the special condition of conse-
quence 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 lique-
faction (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 loca-
tion 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 recom-
end 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 simulta-
neously. 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 evalu-
ated 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 pre-
sent 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 rec-
ommendations 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 appropri-
ately 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-
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 existing 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


DYWIDAG-SYSTEMS INTERNATIONAL

RELY ON DSI

DYWIDAG SYSTEMS INTERNATIONAL

NORTH WEST
Kent, WA
Phone 253-859-9995

WEST
Long Beach, CA
Phone 562-531-6161

NORTH CENTRAL
Bolingbrook, IL
Phone 630-972-4036

SOUTH CENTRAL
Arlington, TX
Phone 817-465-3333

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

SOUTH EAST
Tucker, GA
Phone 770-491-3790

MID EAST
Toughkenamon, PA
Phone 610-268-2221

CENT. AM.
Phone 954-318-1105

ALASKA
Call North West

HAWAII
Call West

• 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

Local Presence – Global Competence

GEOTECHNICAL SYSTEMS
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!

**2008 New PDCA Members**

**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 & Wharves, Earth Retention, Marine, Pile Driving
CT, MA, ME, NH, NY, RI

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

Alaska Interstate Construction, LLC
Rick Macomber
730 1 St., Suite 201
Anchorage, AK 99501
Ph: 907-278-7346
Fax: 907-278-7324
www.aicl.com
rick.macomber@auc.com
Bridge Building, Docks & Wharves, 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: 505-873-1577
Email: jetsters@aol.com
www.aishorner.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
Startham, 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
rf@arhenry.com
Deep Excavation, Docks & Wharfs, Marine, Pile Driving, Utilities
NJ

DFI Corporation
Barry Strauss
Sean Freeland
3403 74th Ave.
Erdmore, AB T6B 3B8
Canada
Ph: 780-466-5237
Fax: 780-463-3613
st Strauss@dfi.ca
stfreeland@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
denleygg@aol.com
Bridge Building, General Contracting, Pile Driving, Oil Fields, Pipelines
Canada

Eastern Bridge, A Division of Sloan Construction, Inc.
Ted Geddis
P.O. Box 609
Blacksburg, SC 29702
Ph: 864-936-3084
Fax: 864-936-3084
www.sloan-construction.com
geddis@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: 516-763-2829
www.jetters@aol.com
Bulkheads, Docks & Wharves, Earth Retention, Marine, Pile Driving
CT, NJ, NY

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

Laquilla Group, Inc.
Dino Tomasseth Jr.
1590 Troy Ave.
Brooklyn, NY 11234
Ph: 718-252-0126
Fax: 718-421-4061
dino@laquillagroup.com
www.laquillagroup.com
Bridge Building, 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
kwauge@lewarecc.com
Pile Driving
FL

Okahoma 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.Kremmer & Son Marine Contractor, LLC
Richard Kremmer
321 Mantoloking Road, Suite 2-D
Middletown, NJ 07743
Ph: 732-477-8812
Fax: 732-477-9224
Email: kremmermarine@comcast.net
www.kremmermarine.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

Sewell Brothers Construction Co., Inc.
Gary Sewell
4301 S. Eastern Ave.
Oklahoma City, OK 73129
Ph: 405-670-9600
Fax: 405-670-6996
sewellbros@yahoo.com
Bridge Building

Siletz Boat Works
Stephen Webster
526 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 & Splices All States, Canada

Interpipe
Gene Repa
3320 Miles Road RR#3
Mount Hope, ON LOR 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. Scioritno
22 50th St. – Rear
Taunton, MA 02780
Ph: 508-821-4450
Fax: 508-828-5081
Nepcllc1@verizon.net
Hammers, Leads & Accessories, Drill Rigs, Drills, Pile Driving Equipment CT, DE, MA, ME, NH, NJ, NY, PA, RI, VT

Romer Pipe & Rail Co.
Michael P. Morton
2955 Ridgetlake Drive #112
Mettair, CA 70022
Ph: 504-828-0547
Fax: 504-828-0548
www.romarpiperaandrail.com
romarmola@aol.com
Coatings & Chemicals, Steel Pipe Piles AL, AR, FL, GA, LA, MS

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

Sauls Seismic, Inc.
Keith Best
P.O. Box 356
Hilliard, OH 43026
Ph: 614-7114855
Fax: 614-711-5159
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, WA, 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
krwine@msn.com
Cutter Heads & Drill Bits, Dock & Marine Supplies, Fasteners, Lubricants & Grease, Rigging Supplies, Safety Equipmenmt 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
Whitmore, SC 29178
Ph: 803-694-3668
Fax: 803-694-3976
www.unitedwood.com
wcomtois@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

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
Whitmore, SC 29178
Ph: 803-694-3668
Fax: 803-694-3976
www.unitedwood.com
wcomtois@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

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 Gibson Road
Gibsonia, PA 15044
Ph: 724-449-2110

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

Surinder Singh
10769 Darnestown Road
Rockville, MD 20850
Ph: 301-424-8696
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.
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
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
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.
DISTRIBUTORS OF STEEL PIPE

- CASING
- FIBEROPTICS
- PILING
- GENERAL CONSTRUCTION

SIZES: 1.9" - 48" O.D.
WALLS: .145" - 2.000"

RANDOM LENGTHS OR CUT-TO-LENGTH
DELIVERED TO YOUR JOB SITE
MEMBER OF PUCA/NUCA/PDCA

Lally Pipe & Tube
Division of LB Industries, Inc.
534 Lovelville Road • P.O. Box 69
Struthers, Ohio 44471
Phone: 330-750-1002 • Fax: 330-750-1535
TOLL FREE 1-800-291-7782

www.lallypipe.com
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
With APE’s proprietary dual walled cylinder, the Model 1560 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 three 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, competitive priced, single acting diesel 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.