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PILEDRIVER

The Official Publication of The Pile Driving Contractors Association | Q3 2008 Vol. 5, No. 3

Blakeslee Arpaia Chapman, Inc. and the Mystic Seaport Lift Dock Replacement

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Fax: 904-215-2977
www.piledrivers.org
e-mail: steve@piledrivers.org

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President
Jeff Lester

Publishing Director
Sean Davis

Editor
Jeanne Fronda

Design and Layout
Myles O'Reilly

Advertising Executives
Quinn Bogusky, Louise Peterson

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PILEDRIVER

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Connecting the Dots

PDCA membership: Getting to know your peers and gaining access to industry information

By Van Hogan

On a recent trip to Finland to observe local pile driving and manufacturing techniques, a few members of our group sat down for breakfast one morning and found ourselves in a conversation about — what else — pile driving. One member of our group, Taunya Ernst, mentioned she was working in the Salt Lake City area, so this led to a discussion of pile setup related to the soils in that area. The discussion prompted me to mention Van Komurka of Wisconsin, (who has investigated pile setup and presented information on that topic at previous PDCA conferences), as a potential resource for Taunya; she had not yet met Van Komurka.

We were soon joined at breakfast by another member of our group — who is also a friend of Taunya's — Richard Christensen, Ph.D. The conversation continued until someone asked how we all came to be on this particular trip. For the answer to that question we turned to the organizer of our trip, Michael Jahnigen, who is with the Delaware-based company Sun Pile Driving Equipment. He related that a little over a year ago, a staff member in the PDCA office contacted him to be featured in *Piledriver* magazine's Member Spotlight. Michael was happy to appear in the magazine and the article was published in the Q2 2007 issue. The article was subsequently read by Mark Ahrens, a pile driving contractor in Wyoming, who was interested in Michael's story and his approach to pile driving. Mark contacted Michael, inviting him to Wyoming to demonstrate his pile driving equipment. After meeting and getting to know one another, Mark introduced Michael to a geotechnical engineer with whom he often worked, Taunya Ernst. Taunya, in turn, introduced Michael to Richard Christensen, a consultant with

whom she often worked. Richard lives in Wisconsin and, as it turned out, knew Van Komurka. Michael subsequently invited Taunya and Richard on the trip to Finland and, as a result of our conversation in Helsinki, Taunya learned that she had a connection to Van Komurka and his research on pile setup.

It occurred to us that in the course of a short conversation, through the PDCA, we had connected a series of dots that traveled the following route: Utah to Wisconsin; Wisconsin down to Florida; Florida up to Delaware; Delaware to Wyoming; and from Wyoming back to Wisconsin. The pile driving community had become smaller. While the connections we made with each other were interesting that was only part of the story. Through the PDCA, we each had the opportunity to meet and get to know people in our profession that we might never have otherwise known. We had now extended our own individual networks to use as a resource, share information and facilitate additional contacts.

If you are content to simply belong to the PDCA, you are truly missing a valuable aspect of membership. The true value of a PDCA membership is found in the people you meet. PDCA members are located around the globe. We work in a specialized industry that involves subtleties that are not easily grasped by those outside our industry.

We all face a variety of challenges but our objective is the same – the efficient installation of driven piles. There is no one better to turn to for information or collaboration than someone who faces the same challenges as you and that someone is a fellow PDCA member.

Use your PDCA membership to get to know others in your profession. Use your membership to expand your reach and create your own resource network. Once the conversation begins you never know where it's going to lead. You might be surprised at the connections you make and what you can learn.

The best way to stay productive is to have good information. Use one of the most valuable resources for good information available to you – other PDCA members.

One sure way to get to know other members is to get involved in a committee. Our committees all include a good mix of contractors, associates and technical affiliates. Each member brings a different perspective to the table to address common issues. At every meeting there is something to be learned.

Our conferences also provide a great way to meet other members. They not only provide opportunities to learn about business, construction and technical issues, they also offer many opportunities for conversation with other members of our profession.

Take the time to get to know your fellow PDCA members. It's an investment that is invaluable and guaranteed to pay dividends. Every connection you make provides you with additional resources with which to do your job.

Keep driving! ▼

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Embracing Diversity

PDCA: An international association promoting change, efficiency and the exchange of information

By Stevan A. Hall

When you think of the geographical make-up of members in the Pile Driving Contractors Association, what comes to mind? Does the question create a vision of companies from Washington to Maine; from California to Florida; and from Texas to North Dakota? Does it also include Alaska and Hawaii? (Actually, the PDCA has member companies in 42 of the 50 United States, including Alaska and Hawaii.)

But hold on. The Pile Driving Contractors Association is an international association, so what about our members from around the world? What role do they play in the PDCA and in the driven pile and deep foundations industry?

Did you know that PDCA membership is also represented by companies from Canada (including those members located in the provinces of Alberta, Ontario, British Columbia, Nova Scotia, Vancouver and New Brunswick); Guayaquil, Ecuador; Trinidad, West Indies; Bocas Del Toro, Republic of Panama; Vina Del Mar, Chile; Netherlands; Kuopio, Finland; Kaltenkirchen, Germany; Pantin Cedex, France; Singapore; and Dondelange, Luxembourg? Based on this geographical diversity, you would have to agree the PDCA is truly an international association.

Recently, the PDCA received an inquiry from Vladimir Kirilov, a project manager with the Novosibirsk, Russia-based company General Hammer, JSC. His inquiry was submitted through our Web site's Ask PDCA section, and he indicated an interest in PDCA membership; networking with PDCA members; and attending the DICEP conference in New Orleans and the IFCEE '09 conference in Orlando. He also thought an exchange of information between Russian hydraulic hammer manufacturers and U.S. (PDCA member) manufacturers and contractors would be beneficial.

Another example of the association's international composition is when a Dubai, United Arab Emirates-based PDCA member contacted our office. He needed technical information on a specific pile so he could increase his chances of securing work overseas.

One more example of the PDCA's diverse make-up involves a PDCA member taking several contractors and engineers to Finland. Why? For several reasons and one of which should be obvious - marketing. So there is no doubt the PDCA is a resource for networking with tremendous potential for developing, renewing and sustaining existing and new relationships. If you have a product — be it a hammer, piles, cushions, cranes, testing products or anything that you sell to the deep foundations industry — then PDCA members are a target audience for your products, and the way you market your products is limited only by your creativity and budget. However, the second reason for the trip was to expose PDCA members to a country that has businesses that not only drive a lot of piles, but have developed an efficient and effective way of providing a service and product that is not

utilized in the United States. Due in part to Finland's smaller population, the country's pile driving manufacturers are very proficient in utilizing its labor force and yet reducing those needs through automation and robotics.

Regardless of geographical distinctions, there is no doubt that pile drivers can share information that makes us more effective and efficient at what we do, making us more productive and profitable in the long run. A microcosm of this point is the PDCA Annual Conferences. How many times have we heard about the PDCA member who has discussed a problem, issue or project with another conference attendee — of course, both attendees are in the pile driving industry and sometimes they are complete strangers to each other — only to have the answer provided simply because the question was asked and it changes the way business is conducted?

We are all aware of the global economy, because it's an environment in which we live, work and are affected by every day. The global nature of the world we live in makes it possible to go beyond the traditional boundaries and expand our way of thinking and bring new practices home to implement, making us more proficient. PDCA members, regardless of where they reside, have the opportunity to learn not only from those traditional resources, but also those that have the ability to provide a different perspective to our business and lives.

PDCA and our members need to embrace the diversity that exists within our industry on a global level; seek change that makes us more efficient; and promote effective change. Our international contingent of members allows us to do that. ▼

2008 PDCA Board of Directors & Committee Chairmen

Officers

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

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

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

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

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

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

Directors

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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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:
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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
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Communications Committee Chair:
Van Hogan
P: 904-823-8817
F: 904-823-9687
3375 Agricultural Center Drive
St. Augustine, FL 32092
Communications@piledrivers.org

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

Environmental Committee Chair:
John Linscott
P: 207-799-8514
F: 207-799-8538
89 Pleasant Ave.
S. Portland, ME 04106
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
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Meet the PDCA Officers and Directors

Biographies about your PDCA executive

By Stevan A. Hall

Officers

Van Hogan, president
Van is vice president of Ed Waters and Sons Contracting Company, Inc. in St. Augustine, Fla. Van graduated from University of Florida School of Building Construction in 1978 and has 28 years of experience in construction and driven foundations piles. Ed Waters and Sons Contracting Company, Inc. drives prestressed concrete, steel H-Pile, timber pile, steel sheet pile structures and performs both land and marine construction. Van has served as vice president and is the current chair of the PDCA Communications Committee.

John King, vice president
John is an estimator for Pile Drivers, Inc. in Hollywood, S.C. John has 18 years with Pile Drivers, Inc. that drives pile and performs deep foundation work in the commercial, industrial and residential markets. John served as PDCA secretary and is the current chair of the PDCA Membership Development and Member Retention Committee. John is also the immediate past president of the PDCA of South Carolina Chapter.

Don Dolly, secretary
Don is president of Foundation Constructors, Inc. in Oakley, Calif. Don has over 27 years of experience in the driven pile and the deep foundations industry in both marine and land projects. Foundation Constructor currently performs work in California, Nevada, Utah and Washington. Don has been involved in over 600 projects while working with Foundation Constructors, Inc., including the Bay Bridge Retro-fit East Shore.

John Linscott, treasurer
John is co-owner of H.B. Fleming, Inc. in South Portland, Maine. John has over 34 years in the construction industry, and he began his career in construction upon graduating from University of Maine in 1974. A registered engineer, he has performed work as a field engineer, project engineer, chief engineer and area manager. H. B. Fleming designs most of the cofferdams, work trestles and earth support systems they build.

Directors

Herbert F. Darling III
Herbert F. "Buck" Darling III is president and co-owner of Herbert F. Darling, Inc. in Williamsville, N.Y. Herbert F. Darling is a closely held family business, started by Herbert Sr., and has operated from 1940 to the present. Buck began working for the company at the age of 17 during summers and vacations and became president of the company in 2003 when his dad retired. Buck graduated from Clarkson College of Technology (now Clarkson University) in Postdam, N.Y., in 1980 with a bachelor's degree in professional studies, business management and civil engineering.

Dave Chapman
Dave oversees engineering and land operations for Blakeslee, Arpaia, Chapman. Dave earned his B.S. in civil engineering from Lehigh University and an M.E. in civil engineering from R.P.I. Dave is a registered professional engineer in Connecticut and New York. He is also a member of ASCE and active with the CT Road Builders. Blakeslee, Arpaia, Chapman was founded in 1843 and is, to its knowledge, the oldest operating heavy equipment company in the country. BAC has four divisions including heavy, marine, utility, and rigging and performs a wide variety of heavy construction services in the Connecticut and surrounding areas. Prior to his current position, Dave has worked as a project engineer and superintendent.

Irv Ragsdale
Irv is a project executive for Clark Foundations, LLC in Bethesda, Md. He has worked for Clark for 29 years and has 35 years of experience in the construction industry. Irv received his B.S. in civil engineering in 1973 from Virginia Polytechnic Institute and State University. Irv is a registered professional engineer in Maryland, D.C. and Virginia. He coordinates functions of Clark Foundations / Civil Division, including design, estimating, purchasing, contracting and staffing. The activities of the civil division consist of the design and engineering of excavation support systems and underpinning adjacent structures, and the supervision of field operations involving temporary and permanent earth retention, deep foundation systems,

dewatering, and specialty excavation. Irv is the current president of the PDCA of Mid-Atlantic Chapter.

John Parker

John works for Parker Marine, a family-owned business in Charleston, S.C, that was founded in 1950 by his father, John Sr. John is a graduate of Emory at Oxford (1984) and Emory University (1986). John worked summers at Parker Marine and returned full time in 1987. Parker Marine specializes in the manufacturing / installation of prestressed concrete pile, marine utilities and sheet piling for deep foundations, as well as bridges and docks. John helped found Tideland Bank, a community bank with six branches around coastal South Carolina. John is the current president of the PDCA of South Carolina Chapter.

Michael R. Jahnigen

Michael is the owner of Sun Piledriving Equipment, LLC in Frankford, Del. Mike is the president and founder of Sun Marine Maintenance, a pile driving company that opened in 1974. He opened Sun Piledriving Equipment in 2005. In 2008, Mike opened EMECA/S.P.E. USA, a manufacturing factory of pile joints. In 2009, he will open a Junttan Piledriving Rig Service Center. Currently, Sun Piledriving Equipment is a stocking Junttan dealership, providing the sale of Junttan Piledriving Rigs, parts, inventory, warranty and service for after-sales customer care. Mike is the immediate past president of the PDCA of the Mid-Atlantic Chapter.

Mike Elliott

Mike is the president and partner in Pile Equipment, Inc. in Green Cove Springs, Fla. Mike graduated from Missouri State in 1972 with a B.S. in education. In 1972, he went to work for Mississippi Valley Equipment in Pile Driving Equipment and Steel Sheet Pile. In January 1987, Mike opened Pile Equipment, Inc. He is current chair of the PDCA Market Development Committee. Mike also served on the Florida DOT 455 Review Committee and gives presentations on equipment for various organizations, customers and state DOTs.

Mike Justason

Mike is a product manager for Bermingham Foundation Solutions, in Hamilton, Ontario, Canada. Mike's background includes a B.S. in civil engineering and management and a master's degree in earthquake engineering; he earned both degrees from McMaster University. Mike is a registered professional engineer in Ontario, Canada, and he has performed over 400 statnamic pile load tests in 13 countries. Since 2002, Mike has been the lead engineer in the R&D of Bermingham's Clean Diesel Pile Driving hammer and other advancements in pile driving hammer technology, such as the automatic Energy Control System (ECS). Mike is also involved in investigation and feasibility of "energy piles," which provide integrated heating and cooling systems in pile foundations.

Richard Gilbert

Richard is the southeast district manager of Skyline Steel and works from its Duluth, Ga. offices. Richard is a 1970 graduate of the University of Georgia with a bachelor's degree in business administration. Richard began his career in the steel piling industry in 1971 and joined Skyline Steel in 1996. He is a charter member of the PDCA of South Carolina and has served on its board since the chapter's inception. Richard has served on the PDCA Board of Directors since 2005.

Michael Kelly

Mike is a project manager / estimator for Gulf South Piling and Construction, Inc., located in Metairie, La. Mike is a graduate of LSU in 1985 and has a B.S. in construction. Gulf South Piling and Construction is a land-based foundation contractor involved in commercial and industrial pile driving and bridge building for over 25 years, serving Louisiana, Texas, Missouri, Alabama, and Florida Gulf Coast areas. Mike has been involved in the pile driving industry for 23 years and has been with Gulf South for 11 years.

Other Board Members Include:

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Charlie Gibson, Manson Construction Company, Richmond, Calif. ▼

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

MEMBERSHIP BENEFITS

General Membership Information

We are the premier association for pile-driving contractors

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

We are dedicated to advancing the driven pile

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

We are a direct link to decision makers

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

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

We offer timely, valuable services

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

Job Referrals

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

Peer-to-Peer Opportunities

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

Annual Membership Directory

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

Educational Conferences and Meetings

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

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

Industry Development

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

Publications and Reference Materials

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

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

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

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

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

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

Connect Worldwide at www.piledrivers.org

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

Leadership Opportunities

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

Membership is available to you

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

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

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

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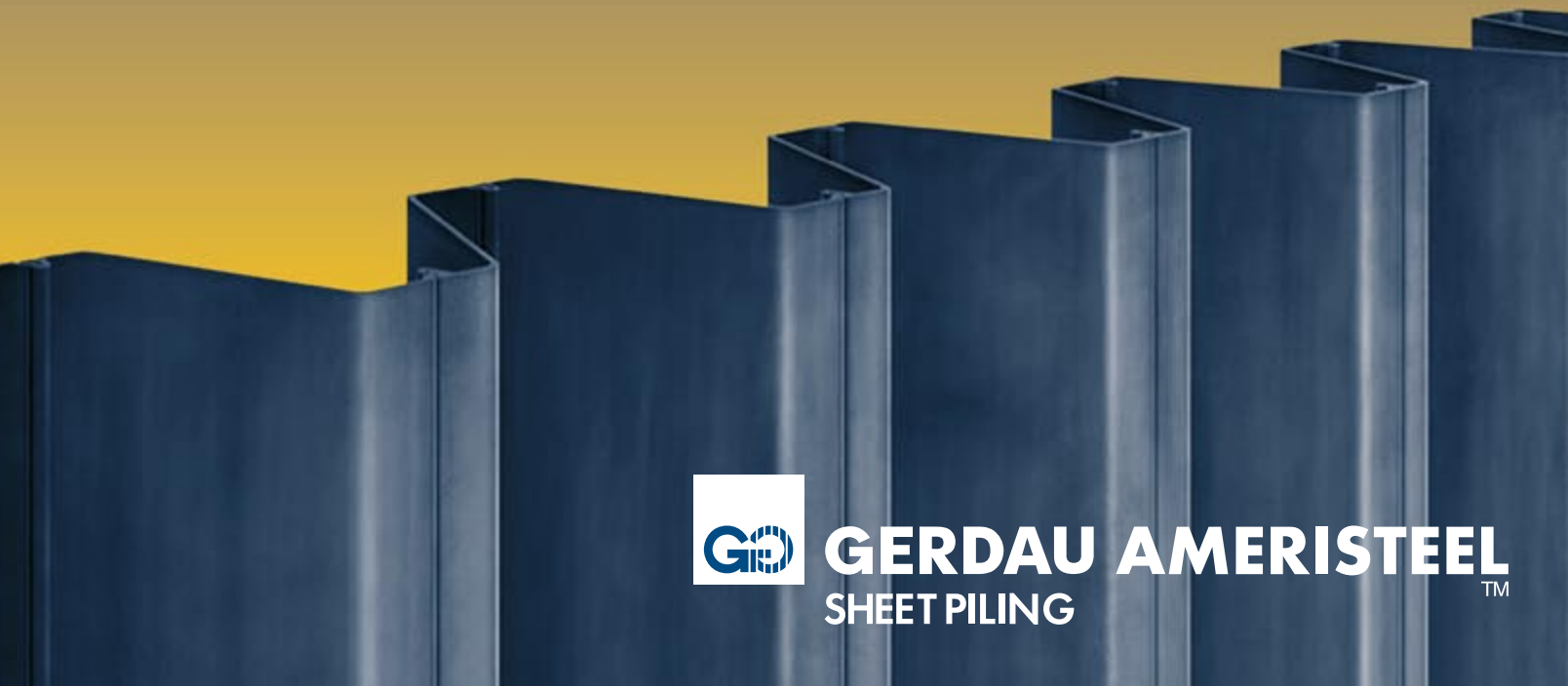

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MEMBERSHIP APPLICATION

Step 1: Select Membership Type

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

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

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

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

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

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

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

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

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

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

Step 2: Demographic Information

Company Name _____ Phone _____

Your Name _____ Fax _____

Address _____ e-mail _____

City/State/Zip _____ home page _____

Step 3. Method of Payment

Attached is my payment of $_____ for annual dues.

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

I am making payment in full by

❑ Check # _____

❑ Credit Card: ❑ MasterCard ❑ Visa ❑ American Express

Card Number: _____ Expiration Date:_____

Name as it appears on card: _____ Signature: _____

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

Applications Systems

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

Equipment

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

Services

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

General

❑ Rental ❑ Sales ❑ Other _____ ❑ Other _____

C. Technical Affiliate Only (check all that apply)

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

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

(All applicants check all that apply)

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

Step 5. Sponsorship: Who told you about PDCA?

Member Name_____

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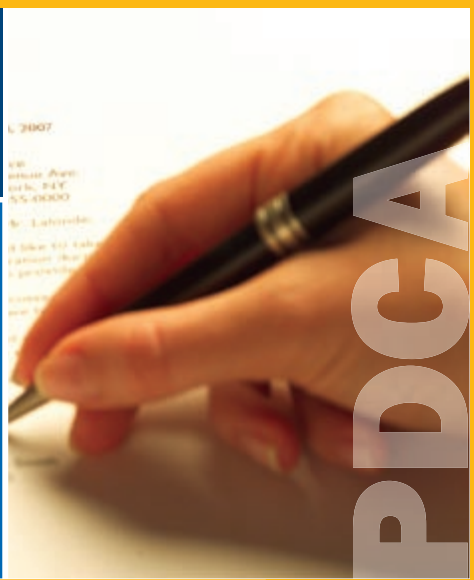

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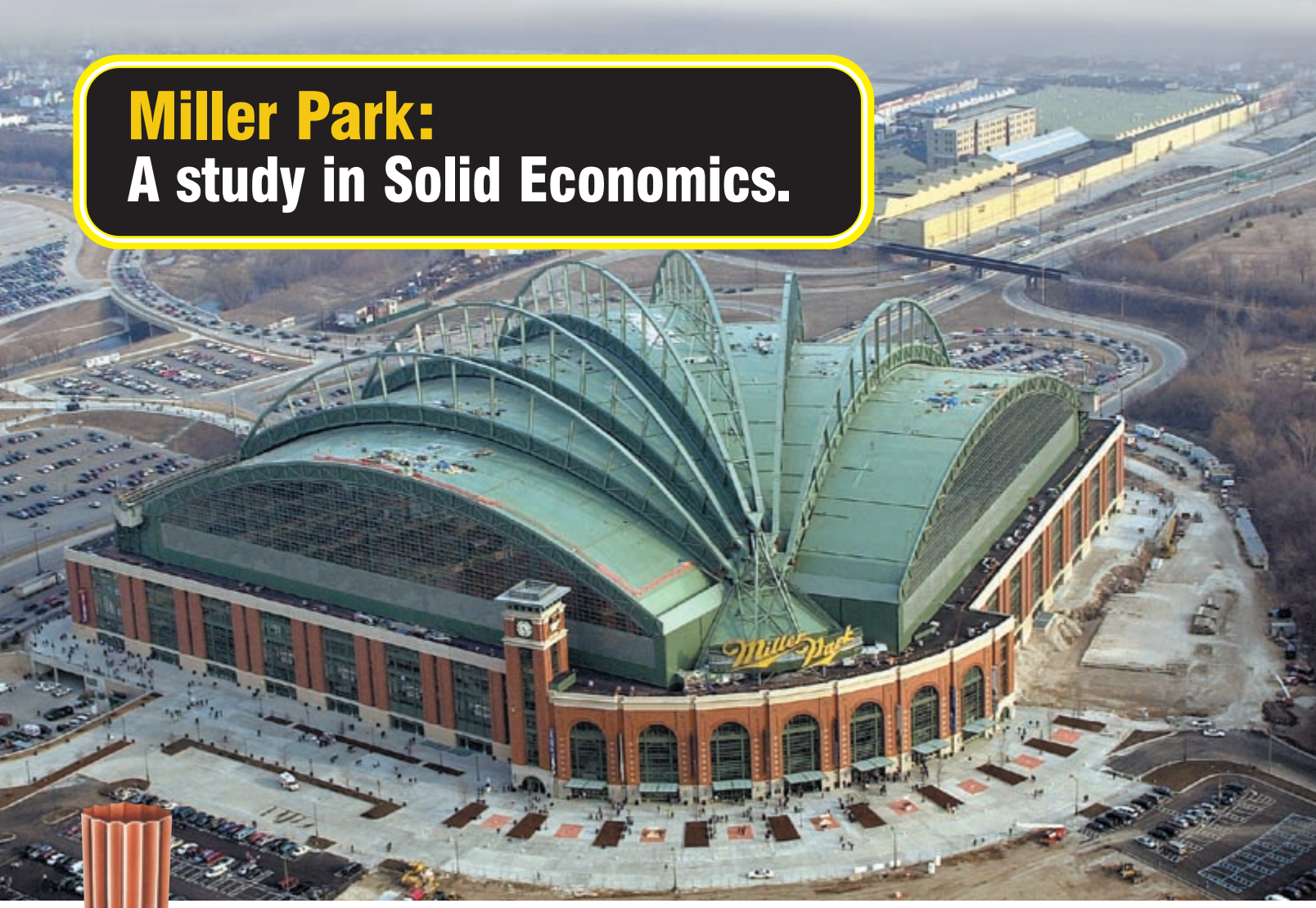

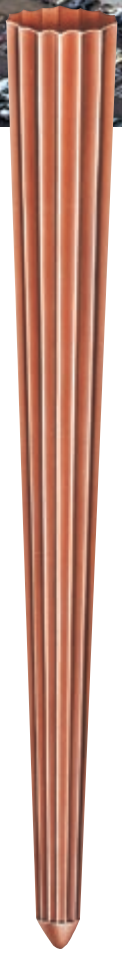

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Importantly, it was recognized that by investing a relatively small amount of money in a test pile program early on, millions could be saved in the deep foundation work designated for driven piling.

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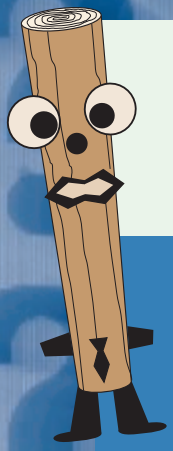
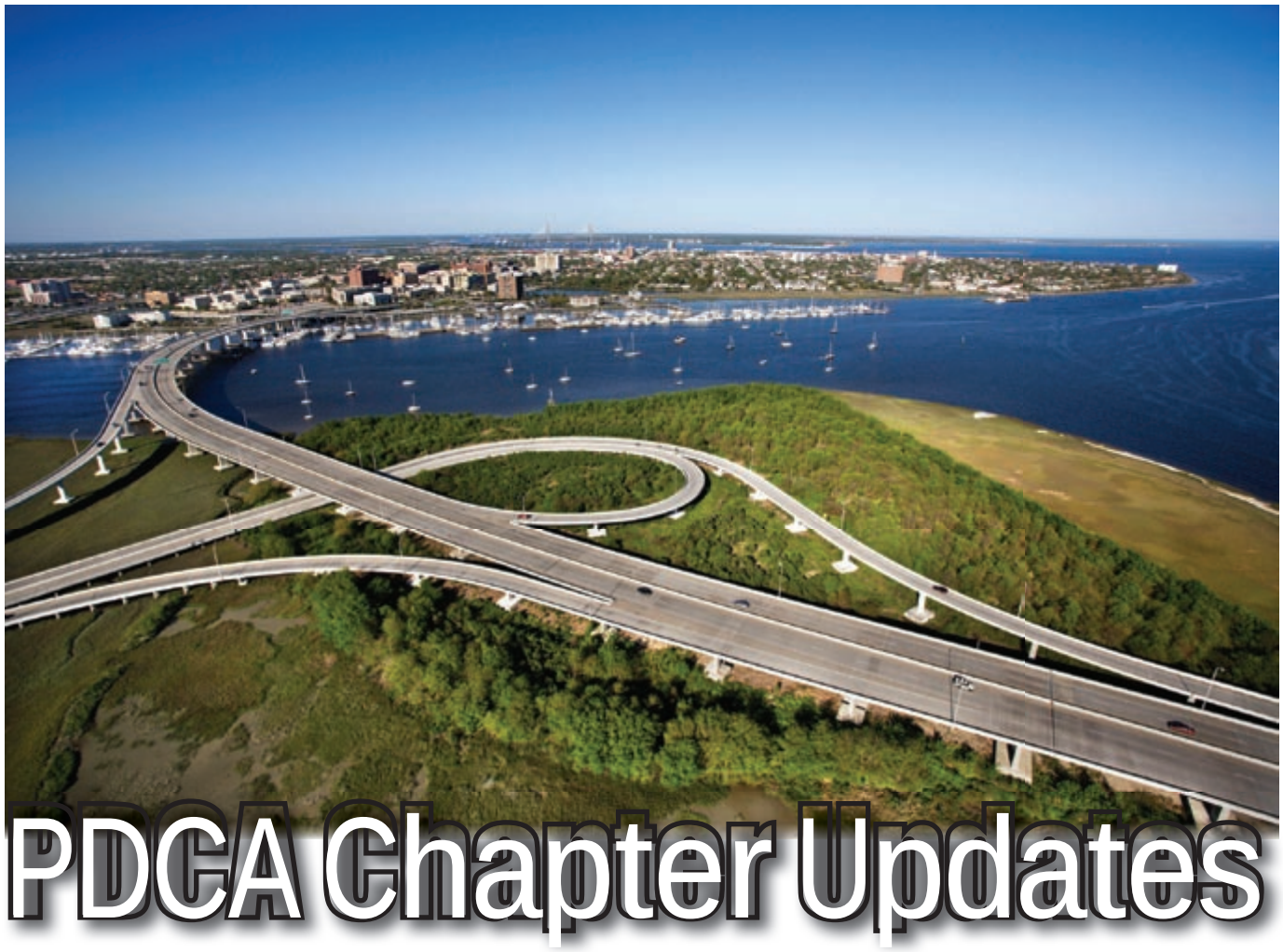


Did You Know?

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

Driven piles generally have higher capacities than other pile types of the same diameter and length.



PDCA Chapter Updates

PDCA of South Carolina Chapter

PDCA of South Carolina Chapter had a dinner meeting on Tuesday, June 3. The speaker was Alwyn McDowell with Skyline Steel Company. Alwyn discussed Hybrid Topdown Excavation with Steel Sheet Piles. Alwyn's presentation was well received by the 60 piledrivers, engineers, and suppliers in attendance. Additional updates on local and national chapter activities were provided by Chapter President John Parker, (who is with Parker Marine), and PDCA Executive Director Steve Hall. The meeting was sponsored by S&ME and Geoquip, Inc.

The next PDCA of South Carolina Chapter dinner meeting will be on Tuesday, Aug. 26, 2008, at the Town and Country Inn, which is located in Charleston, S.C. and is on Hwy. 17. The chapter dinner meeting will be preceded by the board of directors meeting. S&ME and Geoquip Inc. will also be sponsoring the August meeting. For more information on the PDCA of South Carolina chapter meetings, activities or membership, please contact John Parker at 843-853-7615 or by e-mail at johnp@parkermarine.net.

PDCA of the Gulf Coast Chapter

The PDCA of the Gulf Coast Chapter members are busy helping 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 next dinner meeting, which is scheduled for Aug. 21, 2008, will be back at Messina's Restaurant, located at 2722 Williams Blvd., Kenner, La. For more information, or to make reservations for the meeting, contact Chapter President Michael Kelly, (who is with Gulf South Piling and Construction), at 504-834-7791. For information on additional chapter activities or membership, contact Robert Baker, (who is with Baker Piledriving & Site Work, LLC), at 985-792-5001 or via e-mail at bakerlandmarine@bellsouth.net or Michael Kelly, (who is with Gulf South Piling), at 504-834-7791 or via e-mail at gspmichael@bellsouth.net.

PDCA of the Mid-Atlantic Chapter

The PDCA of the Mid-Atlantic Chapter recently held its quarter dinner meeting on Thursday, June 26, 2008, at Paul's on the South River, Riva, Md. The chapter dinner did not feature a presentation by a specific speaker, but was conducted as a chapter business meeting. During the meeting, President Irv Ragsdale, (who is with Clark Foundations, LLC), updated the members and guests on the success of the recent dinner meeting with speaker Jerry DiMaggio, FHWA. Rob Braden, (who is with Skyline Steel), treasurer, provided a financial report indicating the status of the chapter; it was doing well as a result of the last DICEP conference and dinner meetings. Steve Hall updated the members on national activities. Ragsdale then

opened the floor for nominations for the position of chapter vice president. William "Bill" Bonneau, senior project manager with Cianbro that is based in Baltimore, Md., was nominated and voted unanimously as the chapter's vice president. Congratulations, Bill!

Additional discussions were held in a roundtable format and included local business and industry work, the economy, and local communities/Cities/Towns, etc. that were beginning to enact moratoriums on driven pile work due to noise and vibration. Hall indicated that PDCA is concluding its noise and vibration database that will provide credible arguments against the perceived noise and vibration resulting from driving piles. Hall also indicated that PDCA has grown to the point that taking on legislative issues at their point of origin is no longer out of the realm of possibilities of the PDCA's resources and expertise. PDCA members and/or executive members can write a white paper on noise and vibration, dispelling longstanding myths and providing factual evidence that these two issues are not the problems they were once believed to be. PDCA members can also participate in committees that are generating legislation or, at the very minimum, be asked to sit on review committees to rebut the ordinance language and challenge the legitimacy of the proposal.

Finally, the PDCA members discussed a plant tour for engineers at the Atlantic Metro Cast, Inc. concrete production plant in LaPlata, Md. The plant produces pre-stressed, precast concrete piles and has offered to conduct a plant tour for local engineers. The purpose is to expose engineers to the quality control, quality assurances and exacting standards that are incorporated into the manufacturing of driven pile – in this case, concrete. This program has been successfully conducted with positive outcomes by PDCA independent contractor, Signor Enterprises, (which is owned and run by Rusty Signor), in Austin, Texas, and by the PDCA of South Carolina Chapter, which also incorporated timber and steel pile manufacturing into its program.

PDCA of California

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

In Memoriam

David I. Peterson
March 28, 1945 – May 30, 2008

Vice President David Peterson of Atlas Foundation Co., Rogers, Minn., passed away on Friday, May 30. He was a 30-year employee with the company and worked as an estimator and project manager. He was involved with many notable projects throughout Minnesota and the surrounding states. Before starting with Atlas, David worked as a land surveyor with Comstock & Davis in the 1970s.

David was a member of the U.S. Army and served in Germany and Vietnam.

Those close to David knew he was an avid bird hunter and always had his dog, Gunner, by his side. He was also involved in Ducks Unlimited and Pheasants Forever.

David will be sadly missed.

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DICEP in New Orleans

Announcing the 9th Annual Design and Installation of Cost-Efficient Piles conference

In 2007, the Pile Driving Contractors Association began working with local PDCA chapters to jointly conduct the Design and Installation of Cost-Efficient Piles (DICEP) conference. In 2008, national PDCA and the Gulf Coast Chapter of the PDCA will host the 9th Annual Design and Installation of Cost-Efficient Piles conference on Friday, Sept. 12, 2008 at the InterContinental, located at 444 St. Charles Ave., New Orleans, LA, 70130.

DICEP is primarily designed for civil, geotechnical, and structural engineers, presenting the lectures from an engineering perspective. However, the conference is also intended to provide a positive learning experience for contractors and other firms or individuals who support, conduct business or are associated with the pile driving industry.

The 2008 DICEP conference will focus on design, installation, cost efficiency, varying material selection and advantages for using driven pile in deep foundation solutions through a series of lectures presented throughout the day.

Watch for more information on this important PDCA conference in future E-Letters, *Piledriver* magazine, and on the PDCA Web site, www.piledrivers.org. ▼

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Quality Steel Piling

R.W. Conklin Steel Supply, Inc. commemorates its 25th anniversary

By Trina Rehberg

When Rolland William Conklin Jr. started his company, R.W. Conklin Steel Supply, Inc., in 1983, he had no idea it would become as successful as it is today. He had just retired from a 30-year career at U.S. Steel and decided to continue on in the steel piling business, but to do it his own way. That was, by providing customers with quality steel piling and products that had been melted and manufactured in the United States.

"He worked with the idea of commerce and faith," says his son, Philip Conklin, adding that customer service was his father's main priority. He knew it wasn't about creating a shorter supply chain, but a smarter supply chain, one that would connect him directly to those he had served. He says that at the time, people had been buying their steel piling from large manufacturers, but with his father's attention to customer needs and commitment to providing 100 percent U.S.-made materials, he was able to build a strong loyal customer and mill vendor base.

"My dad worked tirelessly," says Phil, stressing his father was also dedicated to his country, since he served as a U.S. medic aboard the U.S.S Quincy during World War II before he worked at U.S. Steel. "He believed that time was the best investment he could make."

R.W. Conklin, known as "Pete" by his friends and customers, maintained his focus on old-fashioned values from the very beginning. Phil remembers his father going to work in his family's spare bedroom, where the company had its humble start, and typing on an old typewriter he had purchased from U.S. Steel.

"That thing must have weighed 80 or 100 pounds," Phil

"When you can get family to work together – you can do anything! Our entire business operates like a family."

— Phil Conklin, CEO of R.W. Conklin Steel Supply, Inc.

says with a laugh. "When he was typing away on it, the whole house would shake when the carriage returned."

Phil promised his father he would work for him on one condition — that he buy a computer. He agreed, and Phil started doing quotations for him when he was in his early teens. As he grew older, he would deliver pile points and splicers to customers, and finally started working for his father on a formal basis on Jan. 1, 1995.

Just a short while later — "one year, three months and seven days," Phil says — his father passed away unexpectedly. It was Phil's birthday, and also the day he took over the family business. He didn't know anything about selling steel, as his background was in accounting, finance and marketing, but he knew he had to learn quickly.

Phil recalled listening to his father when he was in sales mode, and tried incorporating his techniques into his own methods.

"It was a lot of trial and error, and making mistakes along the way," he says. "I asked a lot of questions and people were helpful in providing guidance — even customers. They were very patient with me."

He must have done something right, as the company has continued to expand and achieve success throughout the years. What started as a one-man operation in a spare bedroom is now a large corporation with locations throughout the United States and Western Canada, and more on the way.

Headquartered in Blue Ash, Ohio, R.W. Conklin Steel also has sales offices in Cincinnati, Ohio, Hobart, Ind., and

Vancouver, British Columbia, Canada with some of its largest inventory stocking facilities located in Cincinnati, Hamilton and Shadyside, Ohio; Elizabeth, N.J.; Steele, Mo..; Blytheville, Ark.; Fort Wayne, Ind.; Edmonton and Calgary, Alberta; and Vancouver, British Columbia. More locations are planned for the West Coast and southern U.S., including the state of Florida.

What hasn't changed is the company's devotion to its customers and its ability to provide them with a wide array of U.S-made steel products, such as domestic steel H-piling, pipe and sheet piling, standard and wide flange beams, structural tubing, and steel casing and caissons — to name just a few. All products meet the requirements of the Buy American Clause, which mandates steel is melted and manufactured in the U.S., when a project is either partially or fully funded by public funds.

"Because of the additional penalties recently imposed by states for violators, our business has flourished," says Phil. "Customers know what they're getting when they buy from R.W. Conklin."

The company has provided materials for several U.S. projects, such as the New Yankee Stadium, which is the new ballpark for the New York Yankees, along with the Newark Airport in Newark, N.J., children's hospitals in Minneapolis, Minn. and Columbus, Ohio, and Thomas Jefferson Hall at the United States Military Academy in West Point, N.Y. It has also provided steel for sound barrier walls at the I-465 and I-69 interchange in Indianapolis, Ind., as well as the I-65 and I-94 interchange in Gary, Ind., one of the biggest interchanges in the U.S.

A posthumous portrait painting of R.W. Conklin Jr.

"My dad, [R.W. Conklin Jr.], worked tirelessly. He believed that time was the best investment he could make."

— Phil Conklin, CEO of R.W. Conklin Steel Supply, Inc.

R.W. Conklin Steel has been an integral part of Canadian construction projects, too, including the Hanging Stone River Bridge in Fort McMurray and the Transalta Power Plant in Keephills, Alberta, Canada. The company's steel products can even be found overseas, having supplied NATO's coalition forces at Baghram Airforce Base in Afghanistan.

With all these projects on the company's roster of accomplishments, it seems fitting to celebrate 25 years in business with an anniversary gala this coming October. Phil is excited to host employees, customers, and guests alike.

Phil says that he is also looking forward to the next 25 years and beyond, which he hopes will be just as successful as the legacy he and his father have already built along with its very dedicated and loyal employees. Four additional family members are now involved in the business.

"When you can get family to work together – you can do anything! Our entire business operates like a family," says Phil. "We're going to continue to grow our business model and increase the focus on products we currently have while continuing to market new ones."

Business aside, he strives to stick to the principles his father taught him and run the company in a way that would have made him proud. "He was always looking over my shoulder before," Phil says. "Sometimes, I think he still is." ▼

2009 Project of the Year Award

The Pile Driving Contractors Association announces 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 who are 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.

The PDCA will be expanding the project entry levels in 2009. Some tentative considerations that will be taken under advisement by the PDCA Market Development Committee include expansion of the project contract dollar volume from two to three or more categories (greater than $1 million and less than $1 million are the only two existing categories); inclusion of both a land and marine project; and other considerations that will allow for more equitable judging of projects with similar criteria. Winning entries will be announced and awards presented during the PDCA Business Luncheon in March 2009 at the International Foundation Congress and Equipment Exposition '09 at the Buena Vista Palace Resort and Spa in Lake Buena Vista, Fla.

Additional information will be available on the PDCA Web site, www.piledrivers.org, and by mail in early September 2008. ▼

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Driven Piles Support the World's Largest Maritime Museum

Blakeslee Arpaia Chapman, Inc. builds the foundation for the Mystic Seaport Lift Dock Replacement

By Ryan Clement

In a small seaside town in Connecticut, a new lift dock is making waves.

The Mystic Seaport, which is located in Mystic, Conn., is one of the community and state's leading tourist attractions. As the world's largest maritime museum, the Mystic Seaport occupies 19 acres of public space and attracts 300,000 visitors each year. It has three main sections, including a gallery for exhibitions and a re-created traditional 19th century New England village, but the museum's most unique and famous feature is its harbor and shipyard filled with antique vessels. Most celebrated of these vessels is the impressive Charles W. Morgan, a wooden whale ship that was built in 1841 and is the last of its kind in the world.

In fall 2008, a major restoration of the Charles W. Morgan will happen. It will take three years to complete and will cost an estimated $4 million. The new improvement at the Mystic Seaport is designed to lift antique maritime vessels out of the water in the museum's harbor. This needed restoration work was one of the incentives behind the push for a lift dock replacement, and due to the priceless nature of the loads it is designed to carry, construction of the project had to be done with high quality and precision. Representatives from Lloyd's of London were even on site to ensure quality was maintained during project implementation.

Project Introduction

The project for the lift dock was originally designed by Syncrolift of Rolls-Royce, and the civil design was by M. G. McLearn Engineers. The construction as well as the pile driving was completed by Blakeslee, Arpaia, and Chapman Inc. (BAC), a firm based in Branford, Conn. BAC's work history dates as far back as 1844, and its pile driving work for the design was recognized as one of the PDCA 2008 Projects of the Year for projects under $1 million.

In order to install the new shiplift, the old lift had to be removed. Once this process was complete, the new materials

and components had to be brought in and constructed. The new shiplift was built utilizing concrete, steel, and timber.

"We started with an existing lift platform, bulkhead and site that no longer functioned. We removed the existing structure and platform, which was on the harbor bottom and replaced it with a new Lloyds Classed lift dock. This included control buildings, utilities, structural steel and concrete, dredging, as well as the pile driving.

"The civil design engineer used a driven pipe pile foundation with batters to stabilize the lift dock system from the lateral loads applied by vessels on the lift, from wind load during normal operations, and pier side service of vessels," says Jim Dempsey, BAC superintendent of the project. "We used conventional techniques with precise pile placement. The false work system allowed us the precision. We used a Vulcan 010 with short suspended leads hung at the 1:10 batter for driving the piles. Each pile was spliced once using a splice ring."

Project Obstacles

BAC faced a series of obstacles during the project. Due to a pre-cast concrete cap design, the tolerances for the pile locations were fairly tight. Through a combination of extensive surveying and a false work system, BAC workers enabled pile placement and pre-cast installation to proceed within 1/2" of the intended location.

Complicating matters was the workplace itself. As a popular marine site and tourist destination, land access at the

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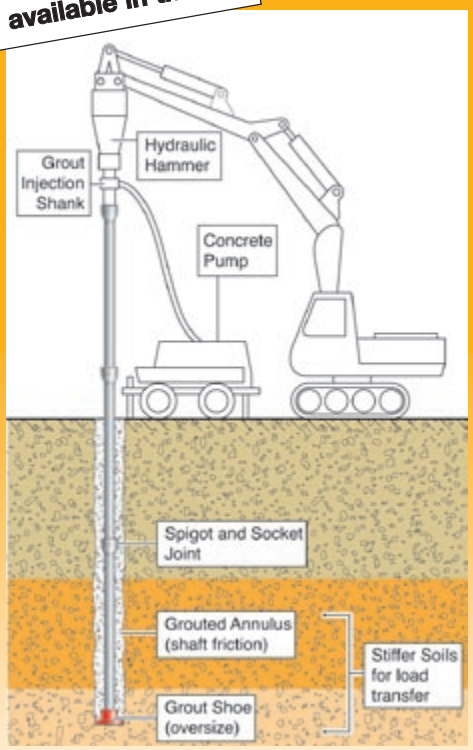

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Mystic Seaport proved to be difficult. The nearby boat launch had to remain open to the public, and both land and water faced heavy traffic loads.

"All work was accomplished while normal shipyard operations continued and the public observation deck was open. We literally were observable throughout the entire job," says Dempsey. "The public and shipyard personnel had access to portions of the work site during most of the project. Working with the Mystic Seaport we were able to set guidelines and access as needed. Cooperation between BAC [staff] and the [museum staff] allowed us to maintain a safe work site."

Pile driving operations were restricted and had to be performed between 8 a.m. and 4 p.m., and due to the small size of the land site and limited access for truck or equipment deliveries, BAC was forced to store most of the on-

Mystic Seaport, the nation's leading maritime museum, sits on 19 riverfront acres in historic Mystic, Conn. The museum is home to the Charles W. Morgan, the last wooden whaler in the world.

Photo courtesy of Mystic Seaport

"BAC is proud to have been the contractor on this project because of the significance the shiplift plays in the historic preservation of ships like the Charles W. Morgan."

— Jim Dempsey, Blakeslee Arpaia Chapman, Inc. superintendent

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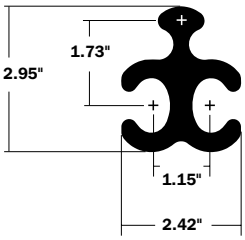
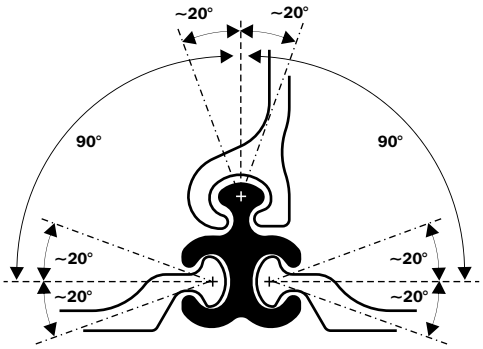
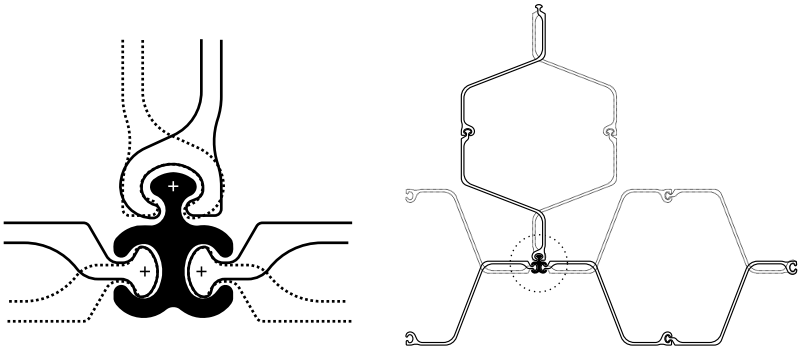




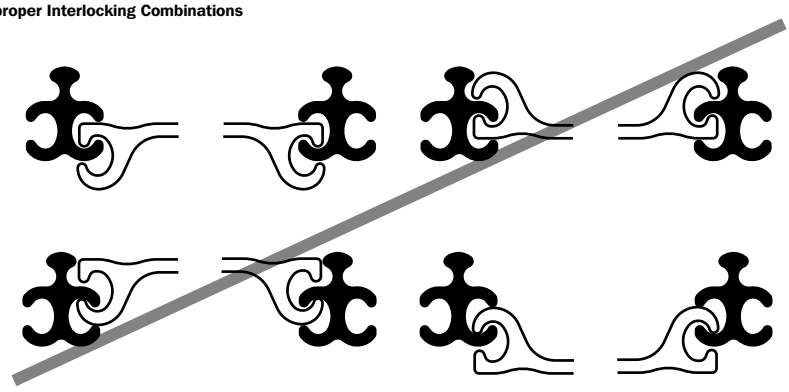
Installation Guidelines

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

Proper Interlocking Examples



Improper Interlocking Combinations



Please note:

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

Early phases of construction on Mystic Seaport's new shiplift facility.

Photos courtesy of Kane Borden.

site materials on barges. Two crane barges and three material barges served this purpose throughout the project, and deliveries were received at the BAC marine facility in New London, Conn.

Another obstacle was the type of soil encountered.

"Soils were generally sand and silt layers with a layer of till just above bed rock," says Dempsey. "A dense sand layer was encountered at approximately elevation -60'. This allowed the installation of pile clusters of two piles going to bedrock approximately 120' long and two friction piles of approximately 90' in length. By reducing the pile lengths during the value engineering process substantial savings were realized by the owner."

Material and Machinery Used

The bearing piles were concrete-filled steel pipe and were 14" in diameter, coated with a 3-coat epoxy system, and conical points were attached. Fender system piles were 12" timber piles. Hoesch 1700 steel sheet piles were used for the bulkhead. A 150' x 50' x10'crane barge, equipped with a Manitowoc 3950 was used for driving the piles and the concrete filling. The 14" diameter 1/2" wall pipe piles were driven with a Vulcan 010 and an H&M 1700 Vibratory Hammer.

The piling and sheeting was supplied by L.B. Foster, and the marine fabrications and hardware were supplied by JC McElroy. The Enterprise Electric Company completed the electrical work for the project, while the fabrication and

coating of the lift platform was provided by the Thames Ship Yard. The pre-cast concrete components were furnished by United Concrete Products. The tropical hardwood timber was furnished by W.G. Moore, and Atlantic Wood Industries furnished the C.C.A.-treated piling and SYP timber. (This is one of the first projects in the U.S. to use FSC Certified Ekki wood, which was a green requirement of the Mystic Seaport. 5" x 12" Ekki was used for the decking of the shiplift because of Ekki's resistance to degradation and material properties.)

Conclusion

After it was completed, the pile driving component of the Mystic Seaport lift dock replacement was estimated to cost $900,000. The 696 Long Ton Ultimate Capacity shiplift had an overall budget of about $5 million, and the driven pile work was completed during summer 2007.

"BAC is proud to have been the contractor on this project because of the significance the shiplift plays in the historic preservation of ships like the Charles W. Morgan," says Dempsey. "We are pleased to be associated with the museum and the maritime education. We are also proud of the fine craftsmanship and engineering that went into this project." ▼

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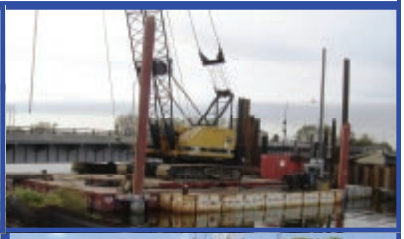

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Foundation Creation in the Sunshine State

Hal Jones Contractor, Inc. builds the Trout River Bridge foundation on Interstate 95, resulting in time- and cost-savings

An aerial shot of the Trout River Bridge project.

Photos provided by AERO Photo.

By Jeanne Fronda, editor

The Trout River Bridge is part of Interstate 95, one of the chief highways along the eastern coast of the U.S. So constructing a new bridge for one of the country's main highways — I-95 consists of two sections and runs 1,925 miles — was not a simple task. Located in Jacksonville, Fla., the foundation of the 2,400-foot Trout River Bridge was designed to be built on either drilled shafts or driven piles, and an innovative foundation design was essential for this challenging job.

The Florida Department of Transportation (FDOT) chose Hal Jones Contractor, Inc., headquartered in Jacksonville, as the prime contractor for the Trout River Bridge project. The company, a PDCA member and a successful contractor that serves the southeastern U.S., was established in 1997. Guided by a knowledgeable management crew, Hal Jones Contractor, Inc. has both private and governmental clients and has completed jobs for the City of Jacksonville, Jacksonville Port Authority, US Navy, US Coast Guard, and numerous private organizations. Possessing a collection of equipment that includes barges up to 150' in length and 55' in width; pile hammers that weigh up to 148,000 pounds; and cranes that lift up to 275 tons, Hal Jones Contractor, Inc. has the essential tools and resources to complete heavy construction work both on land and water.

Project Introduction

The entire project involved the widening of the main bridge, as well as the broadening of three land overpasses from four to six lanes. The plan required several stages for its completion, including the positioning of barges to work on

the bridge; the creation of the southbound bridge to divert traffic while the contractor dismantled the existing bridge; reconstruction of the northbound bridge; and redirecting traffic onto the new passageway.

"All of our managers have well over 20 years of experience, and Hal Jones himself has over 40 years of experience in heavy construction and marine pile driving and marine construction," says Dennis E. Harrison, president of Hal Jones Contractor, Inc. "So our past history and experience certainly contributed to us being able to do the job."

From an overall project cost of $60 million involving approximately three miles of roadway, the Trout River Bridge itself was roughly half a mile in length, while construction of the foundation cost $8 million. Hal Jones Contractor Inc. was responsible for the whole job, including the roadway, the bridge construction, pile driving, and the widening of the overpasses.

54" concrete cylinder pile in place with the concrete cap and prestress beams set.

The project required 160 piles between 100 and 140 feet in length and an average weight of 132,000 lbs.

In Favor of the Driven Pile

As the general contractor, the team at Hal Jones Contractor Inc. opted to bid and use driven piles for foundation construction. The preference to use driven piles rather than drilled shafts to build the foundations of the bridge's 16 piers pointed to considerable time- and cost-savings, resulting in the Jacksonville-based company as the winning bidder; using driven piles would mean several months from the project schedule were eliminated from the schedule and a $5,000,000 savings to the project cost. The decision to use driven piles would also result in minimizing traffic interruption; a less complicated construction sequence; and a reduction in the project's negative environmental impact.

If drilled shafts were used, each of the Trout River Bridge's 16 piers would call for 10 shafts. In total one hundred and sixty 54-inch diameter shafts and 16,600 lineal feet of shafts would be required.

Shafts are also quite expensive due to the casings needed, because each shaft would require a casing that needed dewatering and positioning. A subcontractor would have to be

Aerial shots of the Trout River Bridge project.

Photos provided by AERO Photo.

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54" concrete cylinder pile being lifted for installation.

54" concrete cylinder pile in place with the concrete cap and prestress beams set.

hired by Hal Jones Contractor to build or install each casing, and the shafts would need to be higher than the waterline height, resulting in further modification to each column for it to meet the proper elevation. Using the driven pile would remove these extra steps, as the piles would be positioned in a single continuous method, and only the tops of the piles would need to be cut with air-powered saws in order to make them a suitable height for the bridge caps.

Building a foundation using drilled shafts instead of driven piles could also yield more environmental destruction. There would be potential damage from the polymers employed to support the open shaft during drilling, as well as possible damage to the bridge's surrounding environment due to spoil elimination and handling.

Pile Driving

Pile installation would be difficult given the piles' sheer weight and dimensions, as there was a 30-ton ram requirement. Naturally, one of the main issues was finding the right methods to handle, drive, and direct piles during installation. The answer to this challenge was threefold: the use of a template, a hydraulic hammer that could satisfy the specification requirement, and a remarkably tough fabric for the slings that would handle the piles.

Pile Slings

The pile slings were each 20 feet long and weighed 40 pounds, and every sling was made from Super-Lift, an ultra-solid synthetic material. A sturdy textile was needed that could do three things: handle high loads; be thin or light-

LEFT: APE 400 Hydraulic Impact Hammer being lifted from the rack to drive 54" pile.

ABOVE: APE 400 Hydraulic Impact Hammer.

weight enough to allow for easy movement during pile installation; and offer the greatest durability against wear from the concrete.

Hydraulic Hammer and Two-stage Template

A massive hammer was needed to install the large piles, so the contractor used an APE Model 400 hydraulic hammer that weighed 148,000 pounds. With a ram of 80,000 pounds and the ability to stroke up to 4 feet, the hammer's ram was used at a low stroke in order to reduce stresses during pile driving.

The hammer, powered by a separate hydraulic unit with a 990 horsepower Cat 3412 E engine, also had an offshore bell. Attached to the bottom of the hammer, the bell centered the pile beneath the hammer, so traditional leads were not employed. The hammer would rest on the pile while the template held the pile in position, and during the pile driving the hammer chased the pile as it was driven down. After minimum tip elevation and load capacity were achieved, the hammer was withdrawn from the pile.

To achieve proper pile installation, a temporary two-stage template that could support up to five piles during driving was used. Piles were positioned using the template, which was built with steel H-piles and steel wide-flange beams. The template was supported by 24" diameter steel pipe piles that were driven by an APE D-30 diesel pile hammer.

Environmental Issues

Pile installation was also challenging due to environmental and access issues. A section of the Trout River Bridge

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An aerial shot of the Trout River Bridge project.

Photos provided by AERO Photo.

is located over shallow marsh water, so the contractor had to devise a way for pile installation to occur over the marsh; this was addressed by having piles located mid-river that were installed from barges. In addition, the contractor had to work within the narrow right-of-way provided by FDOT, so many of the piles also had to be brought in by truck. Temporary access roads were created for pile transportation, and a temporary trestle, one that would safeguard the immediate marsh area but also allow accurate pile installation and access over the water, was constructed to reduce negative environmental effects.

Finally, the contractor decided to further reduce damage to the surrounding area by using environmentally friendly hydraulic fluid in the driving hammer. Should a hose rupture or drip, a non-toxic and biodegradable liquid would be released, causing no environmental harm or waste.

Materials and Machinery Used

The bridge project included the installation of 54-inch diameter concrete cylinder piles that had a wall thickness of 7.5 inches. There were a total of 160 piles used and they were between 100 and 140 feet in length, with an average pile length of 110 feet and an average weight of 132,000 pounds. A total of 16,921 lineal feet of piling was involved in the project.

The piles were cast in one piece by Standard Concrete.

Hal Jones used a 275-ton Kobelco crane for pile installa-

Aerial shots of the Trout River Bridge project.

Photos provided by AERO Photo.

tion, and air-powered saws were used to cut pile tops to the proper elevation.

The sling material, Super-Lift, was provided by United Rigging, and the biodegradable hydraulic fluid was provided by Terrasolve Inc.

An APE D-30 diesel pile hammer was used to drive the 24-inch diameter steel pipe piles for the temporary trestle, and a vibratory hammer was used for extraction of the driven pipe piles. An APE model 400 hydraulic hammer, provided by PDCA member American Piledriving Equipment Inc., was used to install the piles. Hammer performance data was monitored by an E-Saximeter system provided by PDCA member Pile Dynamics Inc. The system included proximity switches affixed to the hammer and a radio transmitter that conveyed information to the close by handheld Saximeter for data observation.

Project Completion

The Trout River Bridge project is a noteworthy example of how the use of the driven pile can be a cost-effective and environmentally friendly solution for foundation construction. Work on the $60-million Trout River bridge project began in May 2005 and was completed in March 2008. The choice to use driven piles as opposed to drilled shafts shaved several months from the project schedule and resulted in an overall cost-savings of $5,000,000. Using driven piles also minimized traffic interruption and decreased environmental destruction to the surrounding area. In addition, the inventive way in which piles were maneuvered, as well as the choice in the distinctive hammer used for pile installation demonstrated the versatility Hal Jones Contractor's staff.

Due to the successful performance of Hal Jones Contractor, Inc., the project received an honorable mention for the PDCA's 2008 Project of the Year Awards.

"We didn't win, but I'm proud we at least made the finals for it," says Harrison. "It's just a really nice project. There have never been 54-inch cylinder piles driven in this area, so this was the first time this had been done in northeastern Florida, so we wanted to be a part of that."

As of June 2008, Hal Jones Contractor, Inc. was still wrapping up the project, as it is completing the construction of the roadway leading from the Trout River Bridge. The entire project is slated for completion in summer 2008. ▼

Unless otherwise noted, all photos provided by Hal Jones Contractor, Inc.

The choice to use driven piles as opposed to drilled shafts shaved several months from the project schedule and resulted in an overall cost-savings of $5,000,000.

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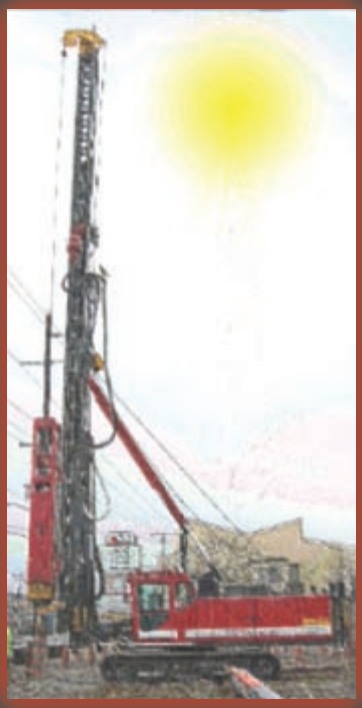

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Stressed-out Concrete Piles

The Effect of Diesel Hammer Combustion Chamber Pressure on Tension Stresses in Concrete Piles

By George Goble and John White

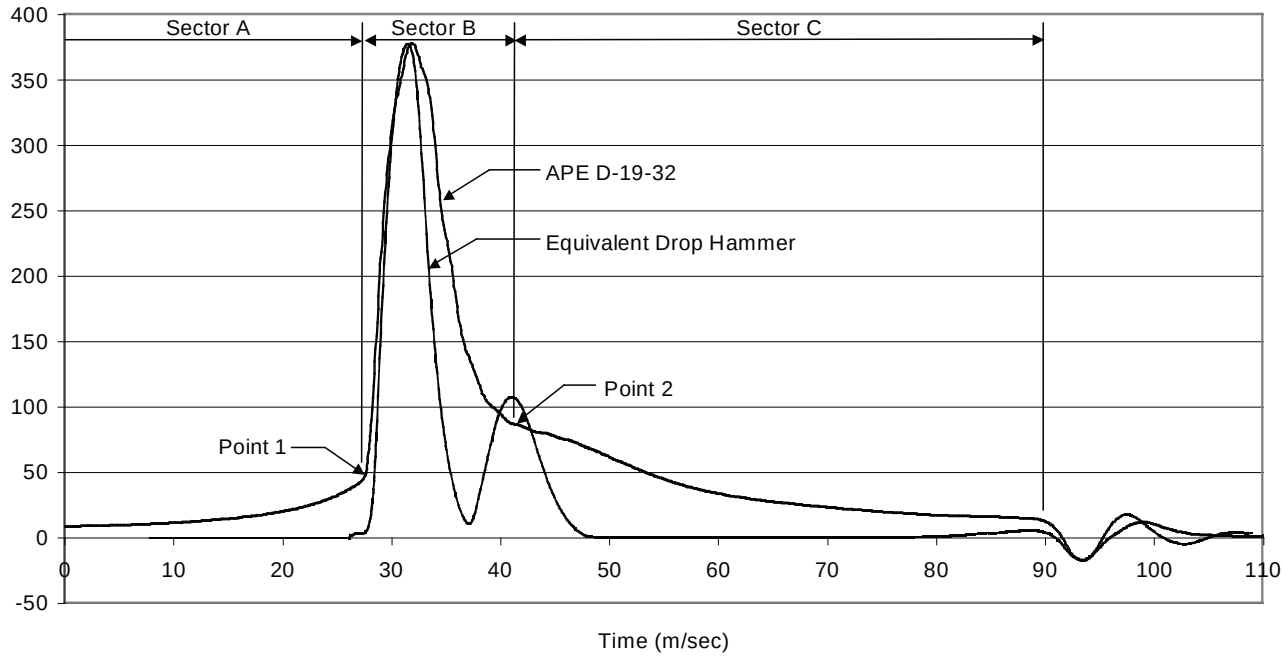

Figure 1: Force Records for APE-D-19-32 and an Equivalent Drop Hammer at the top of a 400 Foot Long

Some piling contractors and engineers have observed that diesel hammers seem to have fewer problems with tension cracking in concrete piles than similar external combustion hammers. Certainly this view is not held universally, but it caused us to consider why such an effect might be true. Routine Pile Driving Analyzer (PDA) measurements have indicated that the stress wave induced by a diesel hammer seems to decay more slowly than would be expected from a theoretical analysis. Since the difference between the two hammer types is primarily combustion chamber pressure, we asked the question, "What is the effect of the combustion chamber pressure on the stress wave immediately following impact?"

A small study was undertaken to investigate the stresses induced by the combustion chamber pressure immediately after impact. In the first phase, we sought to compare the induced stress wave from a diesel hammer and a comparable external combustion hammer. Due to the complexity of the problem the only means of examining the question was to use wave equation analysis. All of the analyses presented here were made using GRLWEAP 2002-1.

In order to easily separate the induced (downward traveling) wave from the reflected wave, a 400-foot long concrete pile was analyzed. Of course, such a long pile is unrealistic from a practical point of view, but it shows the input compression wave at the pile top without the effect of a reflected wave. A 12-inch square concrete pile section was used with an APE D-19-32 diesel hammer and an APE driving system with a three-inch-thick plywood pile cushion. The pile was embedded in the ground 20 feet with a total soil resistance of 100 kips. The rather large soil resistance was necessary to carry the total weight of the pile, hammer and driving system. Since only the downward traveling wave was of interest the characteristics of the reflected soil resistance was of no consequence so long as it was not reflected back to the pile top on top of the induced downward traveling wave.

The force induced at the pile top by the APE D-19-32 is shown by the solid line in Figure 1. The force during the time shown in Sector A is the pile top force due to the diesel hammer pre-compression force. The ram has moved past the exhaust ports and is compressing the air in the combustion chamber and exerting a force on the pile top. Impact occurs at Point 1 on the curve inducing a force that continues to Point 2. Sector B represents the force at the top of the pile from the time of impact to the time of ram separation. During this period pile penetration can be induced by the large force coming from ram impact. After about Point 2 the ram has separated from the impact block. Actually, the point where the ram and the impact block separate is not clearly defined in the force record. Sector C is the period from ram separation from the impact

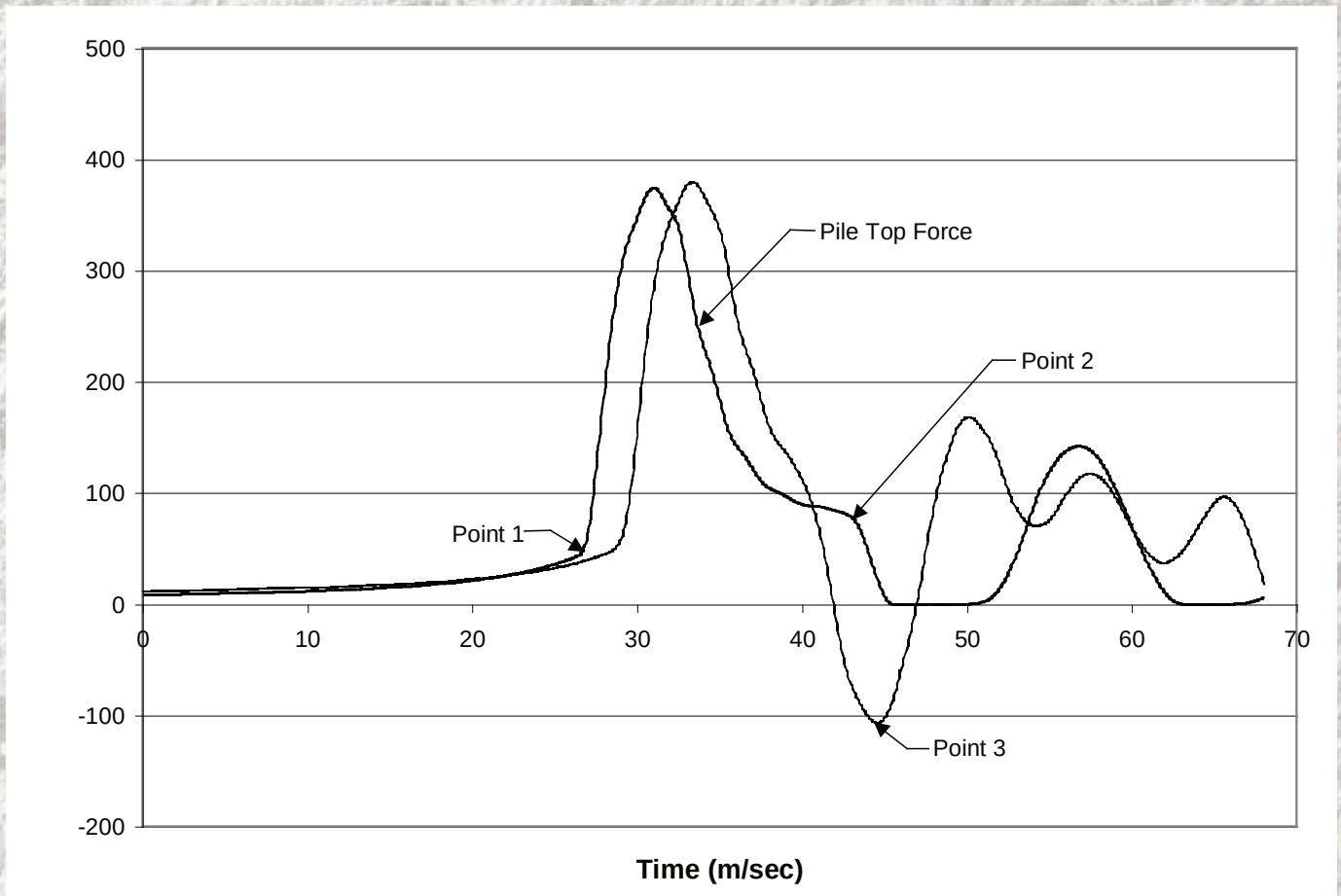

Figure 2: Force Records for the APE-D-19-32 Driving a 100 Foot Long Concrete Pile

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block to the arrival of the reflection of the impact wave back from the toe of the pile. The force during this time comes from the combustion chamber pressure.

An equivalent drop hammer was created in GRLWEAP to compare with the diesel hammer results. The drop hammer ram was given the same geometry and weight as the ram and impact block of the APE D-19-32. This drop hammer was then dropped on the pile top using the same helmet and cushion as was used in the diesel hammer analysis described above. The stroke was adjusted to obtain the same peak impact force as was generated by the APE D-19-32. The force generated at the top of the pile by the drop hammer is shown in Figure 1 by the light line. The double-humped record at impact is probably due to the dynamic interaction of the ram, pile cushion and helmet. There is a slight similar effect at about the same time in the diesel hammer record in Figure 1, but almost all of the effect is probably smoothed by the combustion chamber pressure.

After the impact, the drop hammer force stays constant at zero until the arrival of the toe reflection. The slow decay of the induced force after the impact event for the diesel hammer provides a continuing downward compression force input that when superimposed on the upward reflected tension stresses results in a reduced magnitude of net tension stresses along the pile. This reduced net tension is directly attributed to the long extended downward traveling compression wave coming from the combusted gas in the chamber.

A more realistic example was then analyzed using the same two driving systems with the same 12-inch concrete pile, but with a length of 100 feet. The same soil

resistance was also used. The results of the analysis of the APE D-19-32 are shown in Figure 2. The solid line is the force at the pile top. Point 1 is the beginning of impact and Point 2 is at the time when the tension reflection first arrives back at the top, causing the force to go to zero.

The force records for each analysis element along the length of the pile were examined to locate the element with the largest tension stress. It was located about 30 feet from the top of the pile in element 10, and the record for that element is shown by the light line in Figure 2. The maximum tension force was 106 kips or 736 psi at Point 3. (Note: This tension is not a usual problem as usually the prestress is larger than this, so no true tension exists in the concrete itself.)

The last example analyzed used the equivalent drop hammer on the same 100-foot-long pile. The results of the analysis are shown in Figure 3. In this case, the maximum tension force occurred in Element 21, about 30 feet from the bottom of the pile as shown by Point 1 in Figure 3. The maximum tension

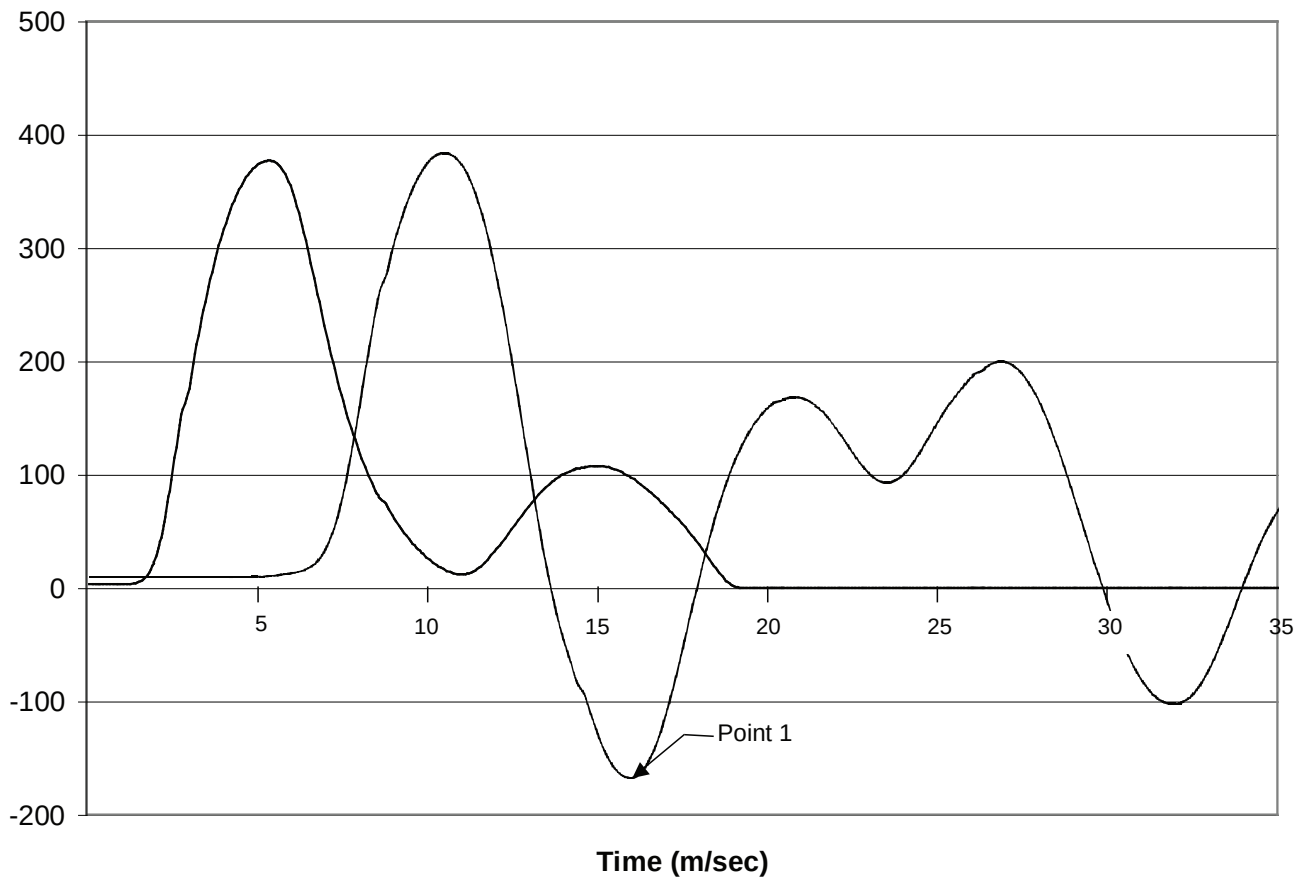

Figure 3: Force Records for the Equivalent Drop Hammer Driving a 100-Foot Long Concrete Pile

force was 166 kips or 1,150 psi, more than 50 percent larger than the same case driven by the diesel hammer.

This brief example showed the effect of the "stretching out" of the compression force in the stress wave by the normal operation of a diesel hammer. It can be expected that this effect can substantially reduce the possibility of tension

cracking and damage in concrete piles driven with diesel hammers when compared with a similar external combustion hammer. This effect is determined by the usual GRLWEAP analysis. This study shows that arbitrary limitations on pile-ram weight ratios often contained in pile driving specifications are not appropriate for diesel hammers. It is essential that a wave equation analysis must be made to evaluate possible tension stresses during the driving concrete piles.

George Goble is principal of George G. Goble Consulting Engineer, LLC, located in Boulder, Colo. He can be reached for questions or comments by phone at 303-494-0702, or by e-mail at goble@bridgetest.com.

John White is president of American Piledriving Equipment, located in Kent, Wash. He can be reached for questions or comments by phone at 253-872-0141, or by e-mail at johnw@apevibro.com. ▼

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As dusk arrives, festive lights illuminate floating restaurants on the Aura River in Turku, Finland.

Photo by Van Hogan

If it's Tuesday, It Must Be Turku

A travel diary: A report about pile manufacturing and installation methods in Finland

By Van Hogan, PDCA president

Last February, it was with great interest and anticipation I accepted an invitation to visit Finland to observe the techniques and procedures used to manufacture and install driven piles in that country. I was one of several other pile drivers and engineers on this trip, including PDCA members Michael Jahnigen with Frankford, Del.-based Sun Piledriving Equipment; Harry Robbins with Charleston, S.C.-based Palmetto Pile Driving; Randy Dietel with Texas City, Texas-based Piling, Inc.; John King with Hollywood, S.C.-based Pile Drivers, Inc.; Trey Ford with Virginia Beach, Va.-based Ford Pile Foundations; John Parker with Charleston, S.C.-based Parker Marine Construction; and Taunya Ernst with Gillette, Wyo.-based Consolidated Engineers & Materials Testing, Inc. We were joined by Richard "Dick" Christensen, who holds a Ph.D., and is with Fort Atkinson, Wis.-based R.W. Christensen, Inc.; Charles Duffy with Charleston, S.C.-based Engineered Foundations; Diana Salazar with Salisbury, Md.-based Hilles-Carnes; and Robert Still with Charleston, S.C.-based ADC Engineering. The trip was jointly sponsored by the Frankford, Del.-based company Sun Piledriving Equipment and Kuopio, Finland-based company Junttan Oy.

Saturday, May 17, 2008 – Sunday, May 25, 2008

We boarded our Finn Air flight in New York for Helsinki. We adjusted our watches seven hours ahead and prepared for a short night. We arrived in Helsinki about 9 a.m. on Sunday, May 18.

We boarded a small bus at the airport for the short trip to downtown Helsinki and to Hotel Kamp, a very nice hotel near the harbor. After a shower and a short nap, we were

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Our group observes the pile manufacturing process at the Rudus Betonituote plant in Nurmijarvi, Finland.
Photo by Van Hogan.

taken on a Helsinki tour, and we were joined by Ahti Knopp, the U.S. sales manager for Junttan; he accompanied us for our entire time in Finland. We toured local sites and found Helsinki to be a beautiful city with rich architecture, an active waterfront and many activities.

Monday, May 19, 2008

We left Helsinki and traveled north to Nurmijärvi. There we visited a pile manufacturing plant operated by Rudus Betonituote Oy. We were welcomed by Olli-Heikki Pietikäinen, the company's plant manager. Rudus Betonituote Oy manufactures a number of precast concrete products including piles, barrier walls, traffic products and railroad ties (sleepers). The plant was highly automated and the entire casting operation was under cover. Piles cast at this plant were all precast and ranged in size from 200 mm (10"), 250 mm (12") to 300 mm (14").

Reinforcing steel cages were tied by machine and stockpiled until needed. The cages were simply lowered into the forms by an overhead crane prior to casting.

The casting operation required little manpower. An overhead, rail-mounted hopper delivered mixed concrete to a machine that placed, consolidated and screeded the concrete as it traveled over the forms. Eight piles were cast simultaneously. The ends of the piles were either plain or contained an end (driving) plate, splice joint or rock point as required by the customer's site conditions.

Piles were cast in relatively short lengths, approximately 12 – 13 m, which were easily transported via truck. Cured piles were stockpiled in the yard prior to delivery.

A precast concrete pile segment is hoisted into place for installation on a job site in Helsinki, Finland.
Photo by Randy Dietel.

We left the Rudus Betonituote Plant and returned to Helsinki to visit a construction site. This job site was typical of several sites we saw in Finland. Piles were being driven at the site with a purpose-built, Junttan PM 20 piling rig. Subsurface conditions featured relatively soft soils overlaying a dense, bearing stratum. Each rig featured a hydraulic hammer with a heavy ram relative to the weight of the piles. A one-foot stroke was used to drive the piles. The pile hammer traveled vertically on a mast mounted directly to the front of the driving rig. This configuration required that the entire site be stable and level so that the driving rig could be positioned adjacent to each pile location.

The driving crew consisted of only two men, an operator and a ground man. As we pulled up on the site, we watched a truckload of piles being unloaded. Due to the piles being a relatively small size and short lengths (+/- 40'), typical practice was for the truck driver to unload his piles using a small crane mounted to his trailer. The crew never stopped driving production piles during pile delivery. The short pile lengths made transportation and handling very easy.

Piles were typically cast with a fabricated splice joint that was very easy to join together in the field. As the top of the first section of pile neared the ground pile driving was stopped. A second length of pile with a splice joint was hoisted, set under the hammer and held in position. The ground man helped the operator align and join the two sections of pile. He then inserted four locking pins in the joint and used his sledgehammer to drive the pins flush with the surface of the pile. From the time driving stopped to the resumption of driving, splices were typically completed in three to four minutes. The

From l to r: Tommi Lindbom, Miika Eskelinen, Michael Jahnigen, Diana Salazar, Trey Ford, Charles Duffy, John King, Rob Still, Randy Dietel, Dick Christensen, Taunya Ernst, Ahti Knopp and Van Hogan.

Photo by Satu Nurminen

type of pile driving rig used allowed for very precise control of pile movements making the positioning of the pile above the splice and the mating of the piles very easy.

With proper subsurface conditions and site preparation, the combination of a purpose-built pile driving machine, two-man crew, small pile cross-section, a heavy ram and short stroke made for a very efficient pile driving operation. There was very little noise, no vibration and no lost motion.

Later in the afternoon we traveled to the beautiful city of Turku. The Aura River flows through the middle of the city. There were a number of boats moored to the retaining walls lining the river that served as restaurants. We ended our day with a very nice supper on one of these floating restaurants.

Tuesday, May 20, 2008

We visited two job sites in the vicinity of Turku, then traveled on to the Emeca Oy factory in Köyliö. We were greeted by Petri Koivunen, one of the factory's owners. The Emeca factory manufactures pile joints, rock points, pile shoes, pile bands, casting guides (headers) and driving plates. The plant has 11 staff members and they make extensive use of robotic technology. The pile joints they manufacture are symmetrical - two male lugs and two female lugs each. The joints are very lightweight and can easily be set in a form by one man. A driving plate is used to protect the male lugs when driving piles. The driving plate, which is the same height as the lugs, provides a flat surface for driving.

We were treated to a tour of its facilities. Robots conducted the entire fabrication operation from cutting the reinforcing steel, fabricating the lugs and pins to welding the entire assembly together; it was a very impressive operation.

After leaving the Emeca factory we traveled on to Jyväskylä for the evening.

Wednesday, May 21, 2008

We left Jyväskylä and traveled about two hours to Haapajärvi and the Lujabetoni pile manufacturing plant. We were met by Sakari Petsalo, the division vice president, and Juha Kinnumen, the plant manager. The company is the third largest manufacturer of concrete products in Finland. They manufacture 200 mm, 250 mm and 300 mm piles along with other precast concrete products while also providing ready-mixed concrete. Working with its customers, Lujabetoni developed the Jopi-Paalu (Jopi Piling) system as a means of reducing the amount pile waste due to uneven rock bearing strata. This system allows the pile driver, at the completion of driving, to cut off the pile at or near cut-off elevation with a saw attachment mounted directly to the pile driving rig. Jopi Piles are cast with splice joints at each end. At the end of driving, the portion of the pile remaining above cut-off elevation that would normally be wasted could now reused. To start a new pile, the cut-off end of the pile would be dropped into a

Short, light pile segments are easily transported and are typically unloaded by the truck driver via a small crane mounted on his trailer. Pile driving continues uninterrupted during material deliveries.

Photo by Van Hogan.

driving shoe that slips over the end of the pile. The shoe is constructed with small wedges on the inside that compress when the pile is inserted allowing the shoe to fit the pile snugly. With the shoe in place, the pile would be moved to a new location, driven and spliced to other piles as needed.

Similar to the first plant we visited, the Lujabetoni plant was also highly automated and the entire operation was under cover.

As before, the reinforcing steel cages were tied by machine and stockpiled until needed. Piles at this plant were fabricated on a conveyor system. Approximately 1,000 meters of piles could be cast in eight hours. A total of five workers manned the production line. Overhead cranes positioned a form that was then moved along the conveyor line to a station where driving plates and/or joints were placed at the ends of the form and a reinforcing cage inserted. The form next traveled through an enclosure where zero slump concrete was placed in the form, which continued on to the end of the conveyor line. In a matter of minutes, an overhead crane lifted the form off of the new pile, which was then recycled to start the casting process again. The newly cast pile was then covered and moved to a new location for curing. Casting and curing the piles in a heated, enclosed structure provided optimum curing conditions.

We left the Lujabetoni plant and traveled on toward Kuopio. Near Kuopio we were treated to a Finnish sauna - very hot, moist air followed by a plunge in a nearby, cold lake; it was a real eye-opener. After our sauna we enjoyed supper before traveling on to Kuopio.

Thursday, May 22, 2008

We traveled to the Junttan factory in Kuopio. We were greeted by Tommi Lindbom, the managing director of Junttan and Pilomac Group. We were invited to the factory floor for a short ceremony where work on the floor was stopped and a symbolic key to the 500th Junttan pile driving rig was presented to Michael Jahnigen, who will be taking possession of the rig in the near future. After the ceremony, we listened to a short presentation by Miika Eskelinen, its sales manager.

At the conclusion of the presentation we walked through Junttan's design offices then went to the factory floor to view the production line. As with the other manufacturing facilities we visited, Junttan's operation was modern and efficient. We were able to view a number of pile driving rigs in various stages of assembly and observe how all of the components fit together.

After our walk-through we went outside to their equipment yard to see a new pile driving rig that had just come off the production line being inspected and tested prior to shipment.

At the end of the day we returned to our hotel then walked down to the Lake Kallavesi waterfront for a dinner cruise. We

Uspensky Cathedral in Helsinki, Finland.

cruised among numerous, tree-covered islands as we enjoyed a delicious supper and great conversation. Everyone had a very good time. It was just a great way to spend an evening.

Friday, May 23, 2008

After taking in some of the sights near Kuopio, we spent a few hours sightseeing in town. We then caught the 1:50 p.m. train for the four-hour ride to Helsinki. The train proved to be a quiet and comfortable way to travel. We got off the train in Helsinki and walked the few blocks to our hotel. We spent the evening walking around town and relaxing.

Saturday, May 24, 2008

Our last full day in Finland presented us with an opportunity to take in the sights of Helsinki and the market along the waterfront. Several of us took a boat tour of Helsinki Harbor. We saw a lot more of the city from the water and a few sites that we had not been able to get to otherwise. The afternoon weather was beautiful and made it a great day to get out for a nice walk around the city.

For our last night in Finland, we were treated to a very nice supper at G.W. Sundmans, one of the finest restaurants in Helsinki. The food, wine and service were outstanding.

Sunday, May 25, 2008

After another short walk around town it was time to go to the airport. We traveled from Helsinki back to New York, arriving late in the afternoon. The trip to Finland was a wonderful opportunity and was made even more enjoyable by those with whom I traveled.

Conclusion

Our trip to Finland proved to be exceptionally informative. The entire driving system we observed was counter to most of what we typically see in the United States. We usually cast prestressed concrete piles to the length required and equip the project accordingly. There is a lot to be said for the Finnish system of driving smaller, shorter piles that are easily spliced. You reap the benefits of smaller, lighter equipment, faster handling and increased production. The short stroke used to install the piles also made a very positive reduction regarding noise and vibration considerations. Site conditions can dictate otherwise, but the use of a short stroke and heavy ram relative to pile weight provided for fast, efficient installation with the added benefit of reducing tension stresses in easy driving.

The Finnish system of pile installation probably developed out of necessity. The cold climate led to the casting of piles inside where the climate could be controlled. This restricted the maximum length that could be cast resulting in piles being cast in shorter lengths and created a need for inexpensive joints so that piles could easily be joined together. These short pile segments proved to be beneficial in facilitating easy transport without the need for special escorts or over-length loads. Piles of a modular length can be kept in stock minimizing the necessity of estimating accurate casting lengths, particularly in areas of uneven bearing strata where we tend to be conservative with our casting lengths. Through the utilization of drive-on pile shoes, many concrete pile cut-offs might be no longer wasted. They would simply become the first section of a new pile.

The equipment that evolved to install these piles resulted in a rig with a fixed-length mast and a low center of gravity. The easy handling provided by this equipment along with the jointed pile system, lend themselves to the use of smaller crews. The combination of smaller crews and increased production make driven piles even more competitive with alternative cast-in-place options. This is enhanced by an unquestioned advantage in quality by virtue of the manufacturing processes and in-place testing options available for driven piles.

Every driving system has its place. The general trend in our industry has been toward heavier piles, higher capacities and larger equipment with an increase in the amount of energy required to drive the piles to bearing. Soils conducive to pile setup allow us to achieve the objective of smaller, shorter piles driven to lower capacities at the end of drive. Time then provides a capacity increase to the required ultimate capacity for best cost savings. The Finnish pile system provides us with most of those same benefits in many locations. Without the added benefit of setup we might have to drive a few additional piles but if they can be driven efficiently, this system can be very competitive. ▼

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Miika Eskelinen / Sales manager
Tel: +358 50 554 0211
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Ahti Knopp / Area sales manager
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TECHNICAL AFFILIATES

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

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

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

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

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Contractor:

Atlantic Pile, Inc.
Jeff Merlette
142 Bamm Hollow Road
Middletown, NJ 07748
USA
Phone: 732-957-0818
Fax: 732-957-0817
Piledriver2005@aol.com
Sheet Pile, Pipe Pile, Timber Pile, Concrete Pile, H-Pile, Pile Driving.
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Contractor:
(Employee Optional Listing)

Ed Waters and Sons Contracting Company, Inc.
Van Hogan
3375 Agriculture Center Drive
St. Augustine, FL 32092
USA
Phone: 904-823-8817
Fax: 904-823-9687
vhogan@edwatersandsons.com

Associate:

IHC Hydrohammer B.V.
Egbert van 't Hooft
Smitweg 6, 2961 AW Kinderdijk
P.O. Box 26, 2960 AW Kinderdijk
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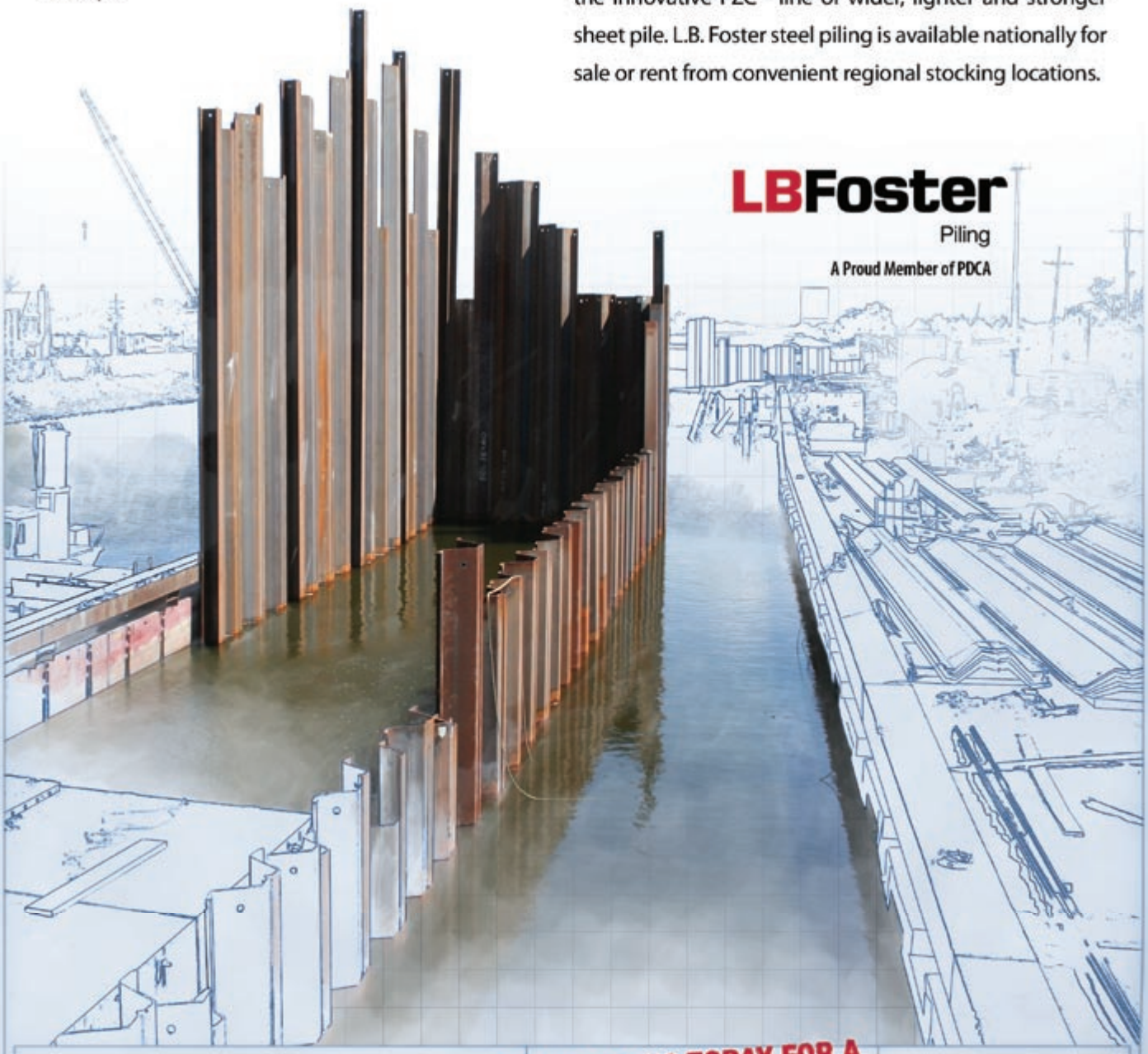

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