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THE OFFICIAL PUBLICATION OF THE PILE DRIVING CONTRACTORS ASSOCIATION | Q3 2007 VOL. 4, NO. 3

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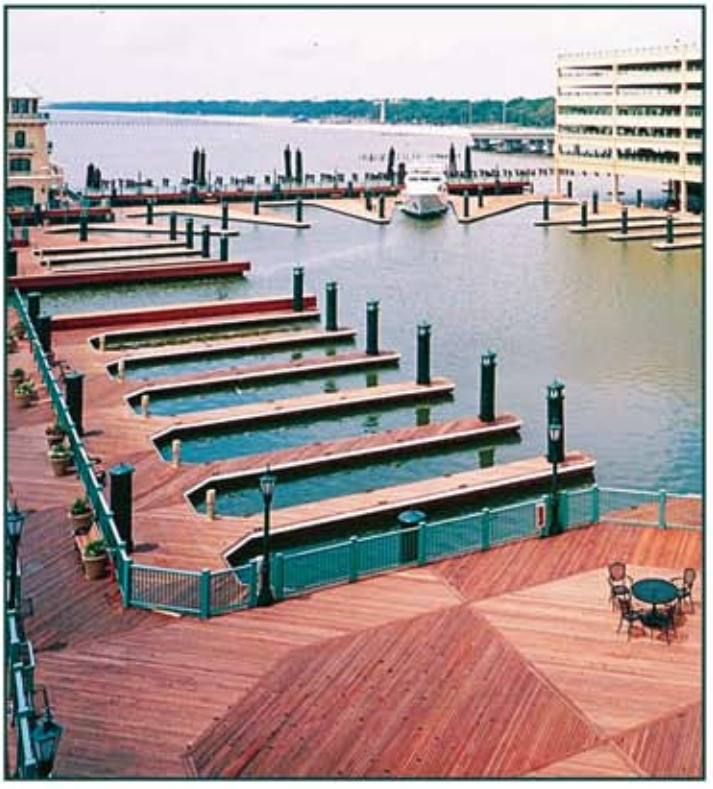

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PDCA meets goals and provides value

By Mark Weisz, P.E.

I'd like to start off by thanking the members of the PDCA for their outstanding financial support of the fourth Professors' Driven Pile Institute, which was held this June at Utah State University in Logan, Utah. This year's cash donations reached an all-time record. To date, the PDCA has received well over $50,000 from its members. As originally intended, this program was to be fully funded by volunteer donations. This is the first year that the donations will have surpassed the cost of the program. Never before have so many PDCA members contributed to the success of this very important educational program. Thanks again to all who were able to help support this noteworthy educational event!

The entire executive committee and I had the pleasure to be in Logan during the last two days of the program. We were able to mingle with the college professors and get their feedback and thoughts on the program. The recurring sentiment from them was of sincere appreciation that the PDCA provided them with the opportunity to learn about driven piles. Many of these professors had never been exposed to a driven pile curriculum nor have had the chance to witness an actual pile being driven in the field. Several professors asked me to make sure that I thank the PDCA membership for providing them with the opportunity to be a part of this event. It made me proud to know that I was representing your association at such a worthwhile program. It was an intense five-day course, but the education and handouts these professors received couldn't have been possible if not for the generous donations made by you. Finally, I need to thank Joe Caliendo of Utah State University and our many volunteer "instructors" who took the time and effort to prepare courses and to teach their specific area of specialty. Great job to all!

During my first board meeting as president, I announced that the main goal during my term would be to increase the contractor membership by 20 percent. Initially, the board was directed to contact past PDCA members that hadn't renewed with us in a few years. I'm happy to announce that some of those former PDCA members have rejoined and we are glad to have them back. Now with the Professors' Driven Pile Institute behind us, it's time for the board and me to roll up our sleeves and work toward the goal of increasing the contractor membership. The board's most recent task was to begin contacting potential members from referrals given to us by many of our active associate members and fellow contractors. Since April 2007, the board has been actively recruiting new contractors by all means possible, and we've been making steady progress.

This leads me to a story I'd like to share. While I was contacting a potential contractor member via e-mail, the gentleman asked me, "What's the benefit for a small contractor joining the PDCA?" Honestly, that's a valid question for anyone considering a new membership in a trade association. I explained that the PDCA was founded by owners of many small to medium-sized pile driving companies with issues and concerns similar to his company. After I composed several bulleted points that I ultimately discarded, I finally wrapped up the e-mail by stating, "The PDCA is the only trade association with the sole purpose of promoting and educating the advantages of the driven pile." And it's true — the PDCA is the only platform for the driven pile industry. This association provides its members with a voice to federal agencies, state DOTs, and local agencies and engineers.

In conclusion, the PDCA has been able to fulfill many of its strategic goals and has provided value to its members for over 11 years. The PDCA has been able to accomplish some very worthwhile programs, such as this year's Professors' Driven Pile Institute, all with the help of dedicated volunteer members and generous donations. More successes will be possible when we continue to work together for the good of all. Please encourage non-members to consider the opportunities the PDCA offers. If you're already a PDCA member, please consider joining a committee, participating at an upcoming educational event, or attending a local chapter meeting. Enjoy the rest of your summer, and I hope to see some of you at DICEP in Maryland this September. ▼

The PDCA's future looks bright

By Stevan A. Hall

From an Executive Director's standpoint, there is no doubt that the PDCA is on the move. This statement is substantiated by the fact that upon conclusion of one program, the PDCA is off and running with the next program that typically seems to be scheduled just around the corner.

The PDCA started off this year in Orlando, Florida, supporting the Foundation QA's High Strain Dynamic Pile Testing (HSDPT) Examination and Certification program. This week-long program was attended by more than 40 students. A month later, the PDCA was in Nashville, Tennessee, for the Annual Conference, which you were updated on in the previous *Piledriver* magazine. Recently, the PDCA completed what is considered one of its most important programs — the Professors' Driven Pile Institute!

From June 17 through June 22, the PDCA was back at Utah State University (USU) teaching professors from universities and colleges across the United States and Puerto Rico about the advantages of driven piles. This was the PDCA's fourth Professors' Driven Pile Institute program, resulting in over 100 of the nation's leading engineering professors teaching driven pile concepts to their undergraduate and graduate students. This also resulted in a new generation of engineers specifying driven piles as the preferred method for deep foundations and earth retention systems.

PDCA is grateful to the College of Engineering at USU for its continued support of the Professors' Driven Pile Institute, the use of its facility, and assistance in coordinating this program with the PDCA.

PDCA is also grateful to all of our sponsors, especially Build, Inc., Skyline Steel Company, and L.B. Foster/Chaparral for their generous contributions, resulting in a tremendously successful program. (Please read more about the Professors' Driven Pile Institute, USU, and the PDCA Member Sponsors in this edition of *Piledriver* magazine).

What's next? Well, in September 2007, the PDCA will present the eighth Annual Design and Installation of Cost-Efficient Piles Conference (DICEP). DICEP is a uniquely focused one-day program for engineers featuring various presentations designed to emphasize advantages of driven piles through discussion regarding quality assurance, quality control, cost savings, reduced project construction time, and various material applications. This year's program will be held in Ellicott City, Maryland, (just outside of Baltimore), at the Turf Valley Resort on Thursday, Sept. 27, 2007. The program will include presentations on local projects by speakers from the surrounding area and national speakers with presentations impacting our industry on a broader level. All presentations will provide an interesting perspective on the advantages of the driven pile.

PDCA is pleased to announce Mike Justason (Bermingham Solutions) as the new Chair of the PDCA Education Committee. Mike has already discussed two additional programs for 2007: a HSDPT Examination and Certification course and a Pile Driving Inspectors Certification course. The HSDPT is tentatively scheduled for November 2007, in Atlanta, Georgia, and the Pile Driving Inspectors Certification course may be in Edmonton, Alberta, Canada — a first for PDCA to host a course outside of the continental U.S.

The PDCA is also pleased to announce Mike Elliott, (president of Pile Equipment, Inc.), as the new Chair of the Market Development Committee, which is (in part) responsible for planning the PDCA tradeshows that include the Annual Conference. It is not in 2007, but everyone needs to begin planning for the PDCA 2008 Annual Conference. The conference will be in Scottsdale, Arizona (or Phoenix) in February 2008. The Market Development Committee is placing a major emphasis on getting a 100 percent turnout by PDCA contractor members to the 2008 Annual Conference. PDCA is also inviting all of the DOT officials and local area contractors and engineers in an effort to make this the best attended conference in PDCA history.

Continuing to get off of the "this year" topic just a bit, the PDCA will act as a joint partner in presenting what could turn out to be the largest

Geotechnical Engineering and Geo-Construction conference ever held. I am speaking of the 2009 International Foundations Congress and Equipment Exposition, which will focus on foundations and include related geo-engineering and geo-construction technologies.

This event will take place in March 2009, in Orlando, Florida. The event will include a full technical program and a very large international foundation equipment exposition. It is anticipated that the massive outdoor equipment expo, which will be augmented by an equally large indoor exhibition, will attract attendees from around the world. PDCA expects a significant international presence to complement a large U.S. contingent.

If you are seeking business development, personnel development, technological developments, improvements or advancements, then the PDCA is the place for you. So come along with us as we continue to move forward, growing ever stronger and bigger to create a greater impact on our industry by showing the advantages of the driven pile in deep foundations and earth retention systems. ▼

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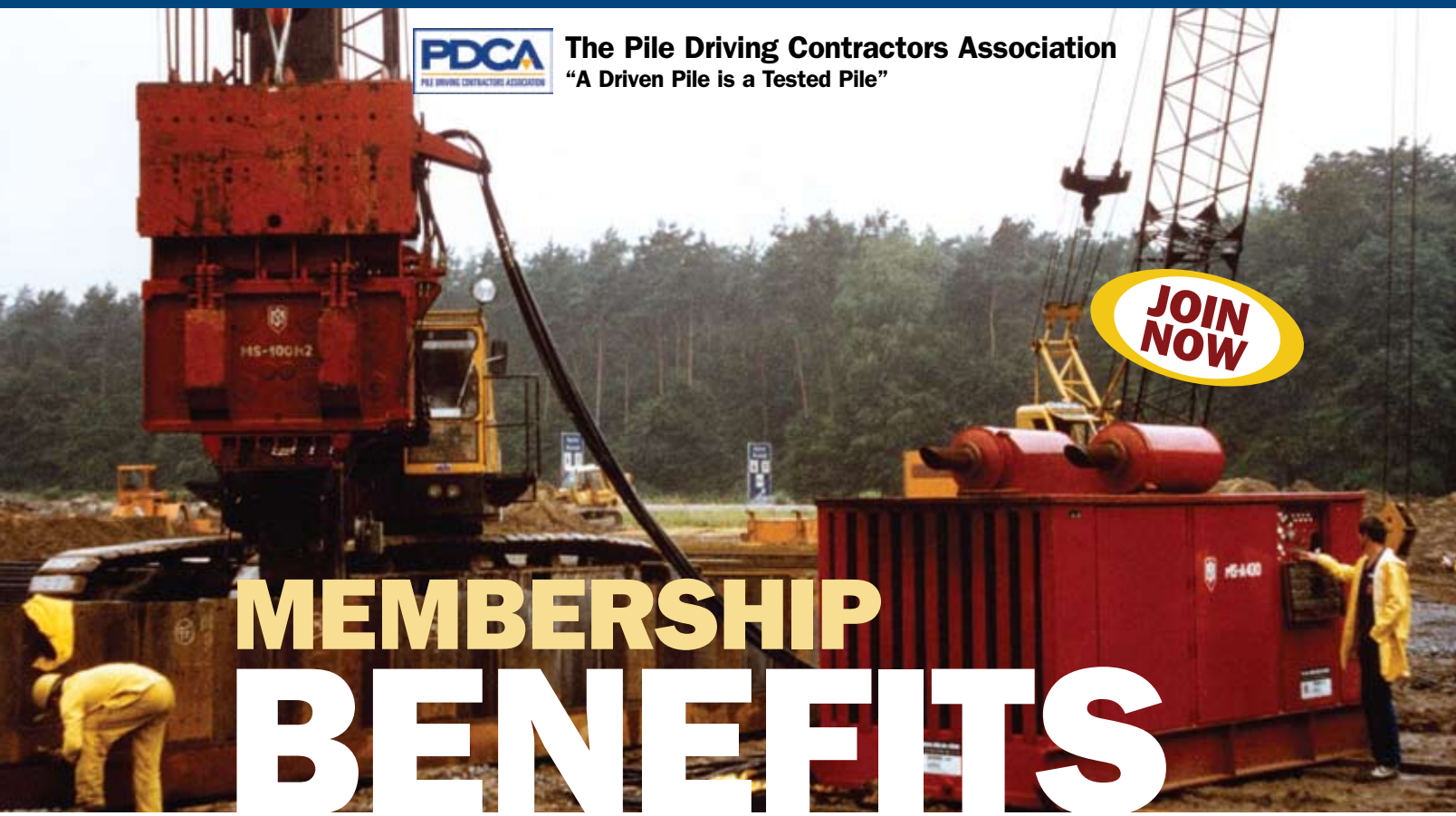

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General Membership Information

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 100 contractor members, the PDCA offers many networking opportunities. Whether at our Winter Roundtable, 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 complementary 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 technical experts, suppliers to the piling industry and contractors. This conference focuses on the key issues faced by pile-driving contractors and features discussions and presentations as well as an extensive exhibit area.

- The Design and Installation of Cost-Efficient Driven Piles Conference (DICEP), held each September since 2000, is a nationally recognized two-day 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.

"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.

All PDCA members receive a complementary 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 102-07* 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.

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. ▼

PDCA

MEMBERSHIP APPLICATION

Step 1: Select Membership Type

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

❑ **Contractor** ❑ **(Annual Gross Sales >$1 Mil./year: $725/year)**
❑ **(Annual Gross Sales <$1 Mil./year: $350/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 ($725/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 ($95/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
Phone: 888-311-PDCA (7322) | Fax: 904-264-9531 | www.piledrivers.org

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
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❑ AR	❑ FL	❑ KS	❑ MN	❑ NH	❑ OR	❑ UT	❑ Canada
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Step 5. Sponsorship: Who told you about PDCA?

Member Name_____

PDCA
PILE DRIVING CONTRACTORS ASSOCIATION

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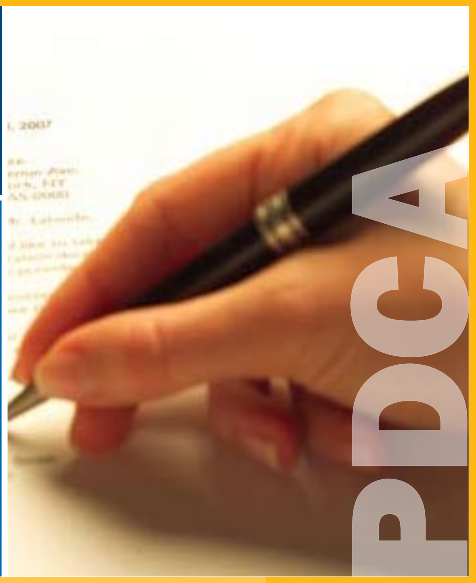

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The John J. Audubon Bridge

"Mandal Pipe Company Supplies Piling for the John James Audubon Bridge in south central Louisiana"

The John James Audubon Bridge project is a new Mississippi River crossing between Pointe Coupee and West Feliciana parishes in south central Louisiana.

The bridge–proposed to be the longest cable-stayed bridge in North America when complete–will replace an existing ferry between the communities of New Roads and St. Francisville.

The bridge will also serve as the only bridge structure on the Mississippi River between Natchez, Mississippi and Baton Rouge, Louisiana (approximately 90 river miles).

Over 6000 Tons of Large Diameter Steel Spiral-weld pipe ranging in size from 48" to 96" O.D. and in wall thicknesses from .500 to 1.000 inches was supplied by Mandal Pipe Company for both the Pier foundations and the temporary work trestle. Specially designed trailers were constructed to facilitate the transportation of the massive 30 Ton pieces of 96" x 1.000" steel caissons manufactured in 60' lengths.

The project is being constructed by Audubon Bridge Constructors and is expected to be completed by the summer of 2010.

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THINK PIPE...THINK *MANDAL!*

Committee Corner

Committee Corner is a new department in *Piledriver* in which we profile the chairs of various PDCA committees. In this issue, we highlight the work of John S. Linscott, who is a member of the PDCA Environmental Committee and is a co-owner of H.B. Fleming in South Portland, Maine.

I am a co-owner of H.B. Fleming, Inc., located in South Portland, Maine. The company was founded in 1955 by Howard Fleming. We specialize in pile driving, cofferdams, and marine-related pipe work. Both my partner, Dean Sciaraffa, and I are registered civil engineers who graduated from the University of Maine. When needed, we do design work for our own projects such as temporary cofferdams, work trestles, sheet pile, and soldier pile retaining walls. We have approximately 30 employees and we can conduct work in Maine, New Hampshire, Massachusetts, and Vermont.

The PDCA Environmental Committee is charged with confronting environmental issues such as vibration, noise, effects of underwater noise on fish, biofuels and lubricants, and advantages of piles in brownfield sites; my experience is quite limited on these issues. Fortunately, we have approximately 10 committee members who are experts on these subjects. In addition, we have developed a pamphlet for contractors to distribute to apprehensive neighbors when starting projects, and it can be downloaded from our Web site, www.piledrivers.org

Our largest ongoing project is the development and implementation of a Vibration Data Base. This work is being done at the Citadel in Charleston, South Carolina by students and assistant professor Ed Hajduk, P.E. Data has been collected from around the country and is available on the PDCA Web site. By the end of this year, an analysis, including tables or graphs, will be available on the Web site. The project's purpose is to help contractors reduce concerns of damage by predicting approximate levels of vibration that they might have on projects. ▼

A driven pile advantage

Professors' Driven Pile Institute celebrates its 4th year

By Stevan A. Hall

The PDCA has completed the fourth Professors' Driven Pile Institute and once again the end result was a successful program for students and PDCA alike.

The PDCA Professors' Driven Pile Institute (PDPI) has been recognized as one of the most important programs the PDCA offers! Why? The answer to that question is not so much in the short-term but the long-term benefits derived by both the driven pile industry and PDCA. The concept behind the PDPI is similar to many train-the-trainer educational programs that strive to maintain superior levels of instruction, thereby providing an optimum learning experience for the students.

By their own admission, many if not all of the faculty that attend the PDPI do not have adequate field experience, which does not allow them to present a more comprehensive understanding of deep foundations to their students — especially in the area of driven piles. The PDPI allows professors who teach foundation engineering courses to gain a thorough understanding of all aspects of driven piles as it relates to deep foundations and earth retention systems; consequently, it educates a new generation of engineers who can specify driven piles as the preferred method for deep foundations and earth retention systems upon their graduation and entrance into their profession. One professor wrote, "Those professors who don't have any field experience, but teach deep foundation engineering courses must attend this course. This will be a great service to students, perhaps an obligation."

The PDCA held the PDPI from June 18 to 22, 2007, at Utah State University in Logan, Utah. Eighteen "students" attended this year's PDPI program. The professors attending the PDPI were treated to five days of intensive lectures and field exercises, which exposed them to pile design and design considerations, pile types, static analysis of pile groups, dynamic measurements, load tests, pile driving equipment, wave equations, computer workshops, soil and pile set-up, cost components, and field events including static and lateral load tests, pile driving, dynamic testing, and re-strikes.

Conservatively, once this graduating class finishes teaching their deep foundation courses in 2007-08, the PDCA will have provided the means to teach approximately 6,750 engineering students about driven piles. This accomplishment is an asset to our industry and the PDCA and continues to solidify the PDCA's commitment to promoting driven piles and the PDCA's reputation as a leader in providing educational programs designed to enhance our industry's product and image.

The PDCA would like to acknowledge the Utah State University's College of Engineering for its continued partnership with the PDCA in this important program. USU not only provides support for the program, but also provides a beautiful campus for classroom and field demonstrations, as well as administrative and logistical support that is vital to the success of the program. A special "Thanks" to Scott Hinton, Dean of USU College of Engineering, and Loren Anderson, Jim Bay, and Ken Jewkes of USU for their support and contributions to the program. PDCA is especially grateful to Joe Caliendo, who worked so closely with the PDCA on the program and was a driving factor in its ultimate success.

PDCA wants to thank all the instructors who provided their valuable time, knowledge, and services to teach the students.

PDCA would also like to thank our 2007 sponsors. It was through their generosity and commitment to the PDCA that this program provided a level of quality unmatched in any other industry program. PDCA especially wants to acknowledge Build, Inc., Skyline Steel Company, and L.B. Foster/Chaparral for their generous contributions and participation.

2007 PDCA Professors' Driven Pile Institute sponsors

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One-of-a-kind conference

8th Annual Design and Installation of Cost-Efficient Piles (DICEP) Conference will be informative, interesting

By Stevan A. Hall

The PDCA has announced the scheduling of the eighth Annual Design and Installation of Cost-Efficient Piles or DICEP Conference.

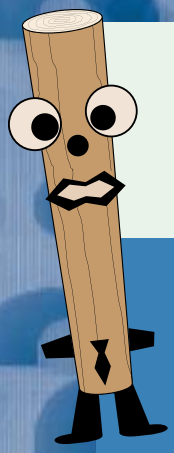
DICEP is a uniquely focused one-day program primarily for engineers and features various presentations designed to emphasize advantages of the driven pile through discussion regarding quality assurance, quality control, cost savings, reduced project construction time, and various material applications. The conference, while specific to civil, geotechnical and structural engineers, will also provide practical information for contractors, developers, owners, and government personnel.

This year's DICEP conference will be held in Ellicott City, Maryland, (just outside of Baltimore), at the Turf Valley Resort on Thursday, Sept. 27, 2007. The program will include presentations on local projects by speakers from the surrounding area and national speakers with presentations impacting our industry on a broader level, but all providing an interesting perspective on the advantages of the driven pile.

Conference topics include presentations on the advantages of the driven pile that result in substantial benefits in time savings and cost reductions compared to alternative solutions; a project that included 18 retaining walls and 13 bridges with some new concepts that saved the state of Tennessee $13 million in costs; a project that incorporated technological advances in precast concrete piles and splices; competitive advantages of using high-capacity prestressed concrete piles; engineering challenges and project considerations of driving 42" steel pipe for a marine harbor; and more.

Vendors will also be invited to exhibit during the conference, but space is limited and exhibitors are restricted to table top displays only. ▼

For more details and registration information on the conference, visit the PDCA Web site at www.piledrivers.org



Did You Know?

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

Accounting for set-up in pile design can result in the use of smaller hammers, smaller pile sections, shorter piles, higher capacities, and more economical installations.

Traffic bridge transformation

Great Lakes Construction Company creates a safer bridge

By Jeremy Levenson

THE GREAT LAKES CONSTRUCTION CO.

Interstate 80 is the main east-west corridor between New York and Chicago. The five-mile stretch just northwest of Youngstown, Ohio boasts the third busiest truck traffic in the United States. Additionally, the average daily traffic exceeds 65,000 vehicles per day, with projections of 80,000 vehicles in the next 20 years. This particular section of I-80 also contains antiquated twin structures that span the primary drinking water source for Trumbull, Mahoning, and Columbiana Counties. According to the Ohio Department of Transportation (ODOT), owner and contract administrator, "This entire project is aimed at making the bridge safer, both for traffic and the environment."

The Great Lakes Construction Company, located just south of Cleveland, Ohio, has consistently pursued and completed challenging civil construction projects. Founded in 1948, Great Lakes Construction began as an excavating company digging house basements. In the late '50s and throughout the '60s, they began to construct sections of the Interstate Highway System. While construction activities flourished in the highway arena, the company also began to expand into the power industry during the '70s. Throughout the '80s and '90s, they developed a reputation as one of the premier heavy/highway contractors in Ohio. Today, Great Lakes Construction is one of the largest employee-owned companies in the state of Ohio and continues to build on its civil construction expertise working for a variety of owners by meeting the demands of complex and fast-track projects. ODOT Project 002-06 is a fine example of Great Lakes Construction's challenges and successes.

Project introduction

A partner in the Anthony Allega Cement Contractor, Inc./The Great Lakes Construction Co. Joint Venture, Great Lakes is currently replacing the Interstate 80 bridges over the Meander Creek Reservoir and adjacent roadways in Mahoning County, Ohio for ODOT. This $43 million portion of the contract — the total contract is $86 million — is scheduled to be finished in 2009 and is currently the second largest project in the state that ODOT is managing. The new structures will be 2,522 feet long and 61 feet wide. The new eastbound bridge is being built to the south of the existing eastbound structure.

Then, after the two existing bridges are removed, the new westbound structure will be built in the location of the old westbound structure. In order to accomplish this without impeding traffic on the existing interstate, construction crews work from multiple barge operations leapfrogging across the reservoir.

Design

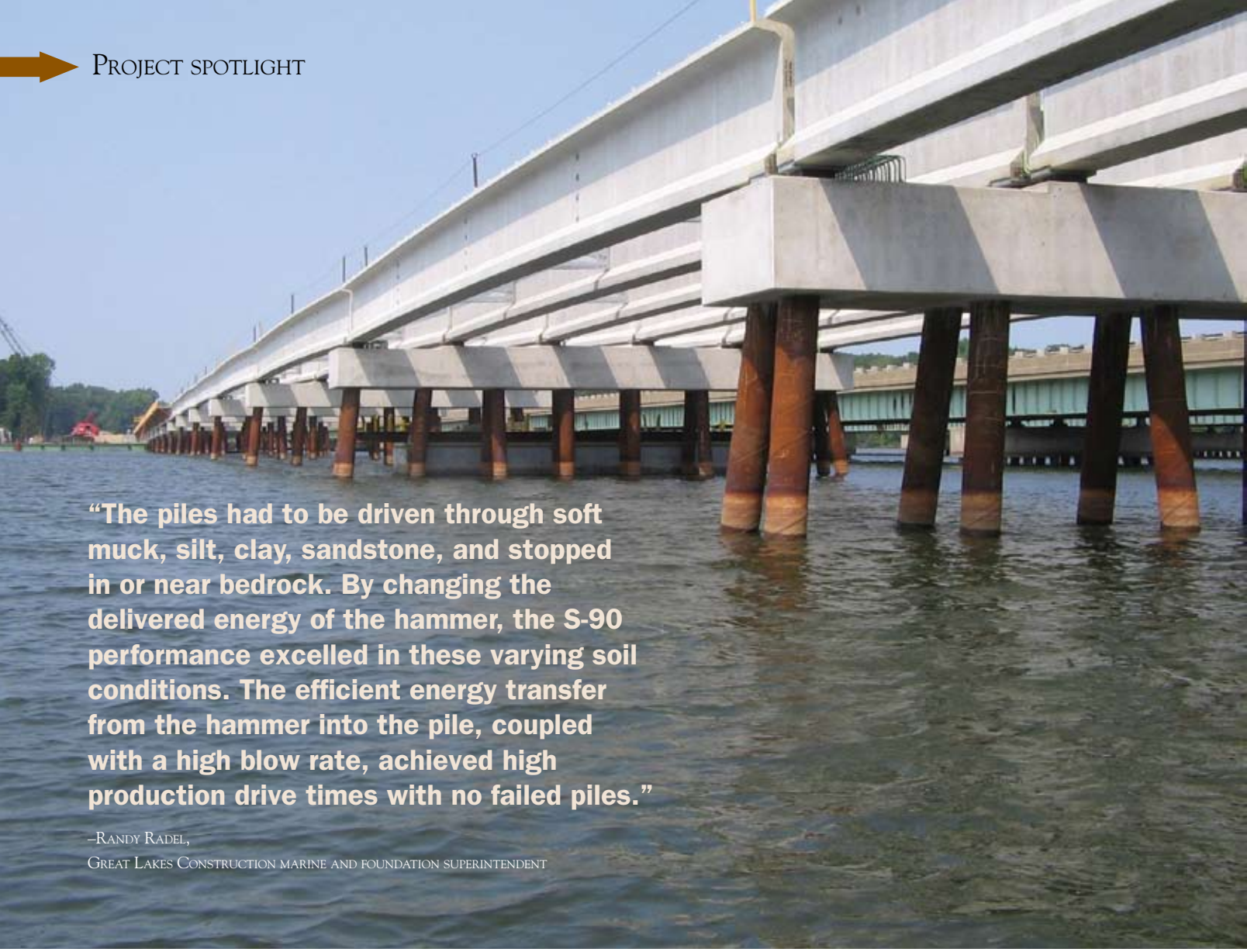
The new structures will be very similar to the existing bridges, which were originally built in 1969, except about twice as wide. When designing the existing structures, ODOT had originally investigated installing causeways for most of the distance, with much shorter bridges in between. However, at that time, the quantity of material in this region to construct a causeway was limited and costly. Consequently, the Department chose to design the bridges for the full length with friction piles for the foundation. The existing bridges have 16 battered piles in each pier and the 20 piers per bridge support steel girder beams.

When designing the replacement bridges for this project, the idea of a causeway was revisited. Once again, the causeway concept was abandoned for two main reasons. First, the estimated cost of the causeway couldn't compete with that of deep pile foundations. The second reason was the uncertainty of stone volume and settlement beneath the reservoir. After exploring several different caisson and pile options, ODOT determined that the new structure foundations should be similar to the existing 40-year-old structures.

Environmental issues

The Meander Creek Reservoir serves as the water supply for 300,000 customers in Youngstown, Niles and the surrounding communities in Northeast Ohio. The reservoir and the surrounding properties are owned, maintained, and patrolled by the Mahoning Valley Sanitary District (MVSD). Needless to say, the District holds the water quality to high standards.

In order to preserve the water quality during construction, Great Lakes Construction is using biodegradable hydraulic fluid and vegetable-based oils in the equipment operating on or near the reservoir. Also, an oil containment boom has been placed in the lake to the north and to the south of the construction area, stretching from the east bank to the west bank. According to Tom Holloway, chief engineer for MVSD, the booms are only the latest step taken by the contractor to preserve and protect the reservoir.



"The piles had to be driven through soft muck, silt, clay, sandstone, and stopped in or near bedrock. By changing the delivered energy of the hammer, the S-90 performance excelled in these varying soil conditions. The efficient energy transfer from the hammer into the pile, coupled with a high blow rate, achieved high production drive times with no failed piles."

–RANDY RADEL,
GREAT LAKES CONSTRUCTION MARINE AND FOUNDATION SUPERINTENDENT

Construction access

Great Lakes Construction was prohibited from disrupting traffic on the existing bridges by the project specifications. This required the work to be executed from barges. Sectional barges were the most logical option because the reservoir is landlocked. Various size sectionals were both purchased and rented for the project. These rental units came from Shugart Manufacturing in Chester, South Carolina.

The different barge configurations were determined based on the crane sizes, construction materials, and other required equipment. Maximum load pick radii and allowable crane lists were also contributing factors. Dejong and Lebet, Inc. of Jacksonville, Florida provided all necessary barge design calculations.

An access dock was constructed with 35' long PZC-18 sheets, driven by an ICE 44-50 vibratory hammer and supported with tie rods at the west shore. Great Lakes Construction designed the sheet wall to support a Manitowoc 2250, 300-ton capacity crane, the largest piece of equipment that would walk across the wall onto a barge. The entire barge loading operation takes place at this sheet wall, including all the piles to be shipped out to the pile driving crane, the concrete and rebar trucks, and the 126 each, 6' tall, 120' long, 60-ton prestressed concrete I-beams on transportation trucks.

Drive frame

A Manitowoc 2900 crane barge installed and removed the pile drive frame and template, and also placed rebar cages and concrete in the piles. Two drive frames were designed and fabricated internally by Great Lakes Construction prior to mobilization. These templates were supported by 18" OD spud piles and HP14 strut beams. Survey crews were then able to locate the template within 0.5" of plan location and elevation.

The piers were designed with plumb and battered (3:12 and 2:12) piles. Trumpet plates with pile sleeves were fabricated so the appropriate batters could easily be obtained. Once the trumpet plate was pinned to the template, the pile could be threaded through the sleeve and driven in the proper location and batter.

Pile driving

Each bridge structure is comprised of 20 piers and two abutments. The piers are supported on 16 each 18" OD x 0.456" wall pipe piles and the abutments are supported on 28 each 14" OD x 0.306" wall pipe piles. The pier and abutment piles each have ultimate bearing capacities of 205 ton and 138 ton, respectively. All of the spiral-welded piles were supplied by Skyline Steel Corporation. All pile testing (a static load test and several dynamic load tests) were performed by GRL Engineers, Inc. to ensure the pile driving criteria applied throughout the project would provide the proper bearing.

A Manitowoc 888, 230-ton capacity crawler crane is the center of the pile driving barge. However, the most critical equipment decision was choosing the right pile hammer for the project's environmental concerns. Air and diesel hammers were quickly eliminated due to the exhaust emissions, leaving a hydraulic hammer as a remaining option. After careful study of a wave analysis performed on several hydraulic hammers by GeoDrive Technology in Holland, Great Lakes Construction decided to utilize an IHC S-90 Hydrohammer with a P-250 Power pack.

"This hammer performed beyond our expectations," said Randy Radel, marine and foundation superintendent for Great Lakes Construction. "Mike Songer and the IHC team provided great technical assistance and field service throughout the first phase of this project."

Radel said the changing soil conditions were also a challenge. "The piles had to be driven through soft muck, silt, clay, sandstone, and stopped in or near bedrock. By changing the delivered energy of the hammer, the S-90 performance excelled in these varying soil conditions. The efficient energy transfer from the hammer into the pile, coupled with a high

"This hammer performed beyond our expectations. Mike Songer and the IHC team provided great technical assistance and field service throughout the first phase of this project."

–RANDY RADEL,
GREAT LAKES CONSTRUCTION MARINE AND FOUNDATION SUPERINTENDENT

blow rate, achieved high production drive times with no failed piles," he said.

The eastbound substructure piling has been completed. The total plan length was approximately 42,000 lineal feet with the longest pier pile achieving 155 feet in length. Although additional splicing was required in most locations, Great Lakes Construction pile driving crews maintained the critical schedule and completed the eastbound substructure work prior to winter shutdown without any lost time accidents. This labor-intensive project was a major contributor for the company's 2006 first place national safety award from the Associated General Contractors of America (AGC).

The future

Currently, The Great Lakes Construction Company is building the superstructure for the eastbound bridge. Once this new bridge is completed, all of the traffic will be routed across it, and the two existing bridges will be removed. The pile driving operation will swing back into full gear for the westbound structure in early spring of 2008. ▼

For the most recent information and project listing regarding The Great Lakes Construction Company, please visit our Web site at www.tglcc.com

Mission accomplished: Sacramento's lifeline rebuilt

All aboard: Union Pacific trestle back on track

By Mark Gershkovich

The Union Pacific's approximate 1,400-foot timber trestle's east approach in Sacramento was cut off to its 2,400-foot long bridge over the American River, the lifeline line that connects everyone east of the capital city. The trestle was entirely on fire at approximately 6 p.m. Pacific Standard Time on Thursday, March 15, 2007. Knowing how catastrophic the situation could have become, the Foundation Constructors, Inc. team took immediate action to ensure the reconstruction took place as quickly as possible to avoid traffic mayhem on one of the busiest rail lines in the country.

The process

After numerous contractors bid to get the job to reconstruct the trestle's east approach, Foundation Constructors, Inc. won it. The process of awarding the contract happened in a span of 24 hours, where normally it would take weeks if not months.

"In most circumstances it is nearly impossible to get permits granted on the weekend, however in this particular situation we were able to get all the permits required in a time frame that was quite unique. The fire on the trestle occurred on Thursday, and by Friday morning we began applying for the permits to bring the machinery and all the resources needed to complete the project," said General Superintendent with Foundation Constructors, Inc. John Honaker.

The fire was fully ablaze on Thursday, March 15, 2007 and completely extinguished by Saturday, March 17, 2007. Debris was removed from the site to an approved facility by the end of Sunday morning on March 18, 2007. Foundation Constructors, Inc. was given the go-ahead to begin reconstruction at 2 a.m. on Monday, March 19, 2007.

"We had our first planning stages immediately after we had heard what occurred and put in place all of our resources to get the contract. We hoped we could be part of such an important repair process for our community," said Don Dolly, president of Foundation Constructors, Inc.

Project manager Dermot Fallon said that Jennifer Jones, the construction coordinator for Foundation Constructors, Inc., worked 24 hours a day to bring many human resources to ensure that reconstruction went as smoothly and as quickly as possible.

"In such a small time frame it was imperative that we would be able to get as much manpower as possible. Through the incredible work of Jennifer Jones, we were able to get the people, materials, and machines to get the job done right, smoothly and quickly," said Honaker.

"In such a small time frame it was imperative that we would be able to get as much manpower as possible. Through the incredible work of Jennifer Jones, we were able to get the people, materials, and machines to get the job done right, smoothly and quickly."

JOHN HONAKER, GENERAL SUPERINTENDENT WITH FOUNDATION CONSTRUCTORS, INC.

The goal

Dolly said the company's main objective was to reconstruct the east approach of the trestle as quickly and accurately as possible, so it would not inconvenience the community members any more than they already were.

"Union Pacific partnered with the local community to make citizens aware of this project and to address any concerns they may have had. With all construction projects inconveniences will occur, however our goal was to make this project as painless as possible for the community," he said. "I don't recall a large outcry from the public, and the media coverage was quite positive. There was constant communication with local politicians to communicate back to their constituents about progress of the project."

Safety and environment

Safety and environmental monitoring was a vital issue throughout the construction process. Union Pacific brought in representatives to monitor progress of the reconstruction to ensure things were being completed according to California building codes. With the American River being so close to the construction project, representatives from the local government environmental division were there to monitor where things were being deposited and that everything was being disposed of in a safe, clean, and environmentally conscious way, explained Fallon.

"Safety was our number one issue throughout the reconstruction process. We had a crew of approximately 120 employees where during normal circumstances on a project this size we would have about 30 to 50 employees. With that in mind we committed our Health and Safety Manager, Bill Hammond, to the project full time. Hammond split his days between the day and night shifts, ensuring that all operations were monitored for compliance to Foundation's safety protocol and procedures. During the entire construction timeline we only had three minor accidents requiring only first aid, and we did not suffer even one lost-time accident. Safety was definitely not compromised on this project, and we made sure that everyone took safety into consideration wherever they were working," said Fallon.

"Not only did using driven piles work much faster, it was much more cost effective for everyone."

JOHN HONAKER,
GENERAL SUPERINTENDENT WITH FOUNDATION CONSTRUCTORS, INC.

Materials and machinery used

The materials and machines needed to reconstruct the east approach of the Union Pacific trestle in nine days were incomprehensible. Construction that should have taken a month was completed in just over a week. With the expertise and experience that the company's employees had, they worked 24-hour split shifts (or two 12-hour shifts) to secure the building materials and machinery needed to complete this project.

Materials used to reconstruct the bridge approach included the piles themselves, which were 280ea 14 x 89 H-piles, having a length ranging from 60' to 80' and approximately 14,887 feet or 2.8 miles of steel piling weighing 1.32 million pounds. As well, there were 94 pre-cast concrete caps; 188 pre-cast concrete girders, of which 180 were 30 feet long and weighed 50,000 pounds each; 2.6 miles of welding wire or rods that weighed 2,500 pounds, which connected the steel piles, braced the steel piling, and connected the caps to the steel piling and girders together and to the caps; and 2,800 feet of tracking including 5,600 linear feet of rails, 1,700 composite ties, and 17,000 track spikes; and 2,800 tons of rock ballast to ensure a stable roadbed. Three pile hammers, Delmag D30-32 diesel impact pile hammers, were used on-site. In addition, three pile driving cranes were used, which included a Manitowoc 4100 with 110' of boom and 90' of swinging leads, a TEREX American HC165 Ton crane with 110' of boom and 90' of swinging leads, and a Manitowoc 2900 with 50' of boom and 53' of fixed box leader. There were also four forklifts on-site: a 988 cat, a pettibone super 20, and two extendable boom forklifts. The project also involved 5 Man lifts and 23 welding machines that were used to unload, move, and place the steel pre-cast concrete bridge components.

"With all of these materials and machinery needed, the main problem was to get all of the materials and machinery to the site. We had to deal with access issues including having to re-route a number of access points because of the removal of the east approach, so it took longer for the materials and machinery to come in. In addition, there was still quite a bit of rubble left over from the fire, so it got fairly slippery. Things were complicated with the fire damage, however there were many more obstacles that we needed to get around. But it was dealt with and the job was done right," said Honaker. "Due to the fact that the job site was in a wetland area, specifically behind a levy, access proved to be extremely limited. We required machinery to lift the cranes over the levy in order to get the machinery on the job site."

Execution and completion

This vast reconstruction project was finally completed nine days after the fire at 6 p.m. on Tuesday, March 27, 2007. This can be attributed to having this project "fast tracked," which did not require any curing time, because unlike driven piles, drilled shafts must have sufficient time to cure.

"Not only did using driven piles work much faster, it was much more cost effective for everyone," said Honaker.

Track one officially opened to train traffic in 10.5 days after the fire, and track two opened in 15.5 days after the fire. Both of these events were preceded by an official grand opening by local and state government officials alongside citizens of the community and the media who took part in the unveiling.

With Foundation Constructors Inc.'s expertise and professionalism, the new Union Pacific trestle is stronger and more fire retardant than it was prior to the devastating fire. A total of 250 employees worked on the project and 233 trucks and 16 rail cars were used to transport construction materials from Omaha, Dallas, Tucson, Albuquerque, and Roseville to Sacramento. The mission was accomplished. ▼

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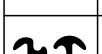	**BBS-M** **BBS-F**	PZ / PZC + Domestic Beam
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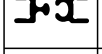	**LBM** **LBF**	Transition Profiles

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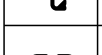	**PLZ I** **PLZ II**	Peiner Beam + Larssen-Z Piles
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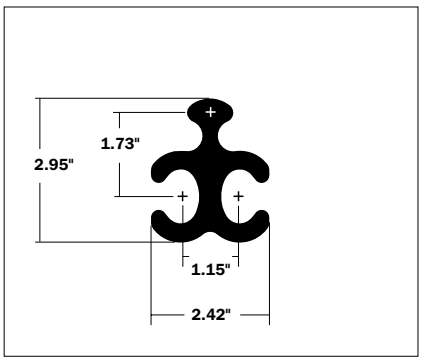
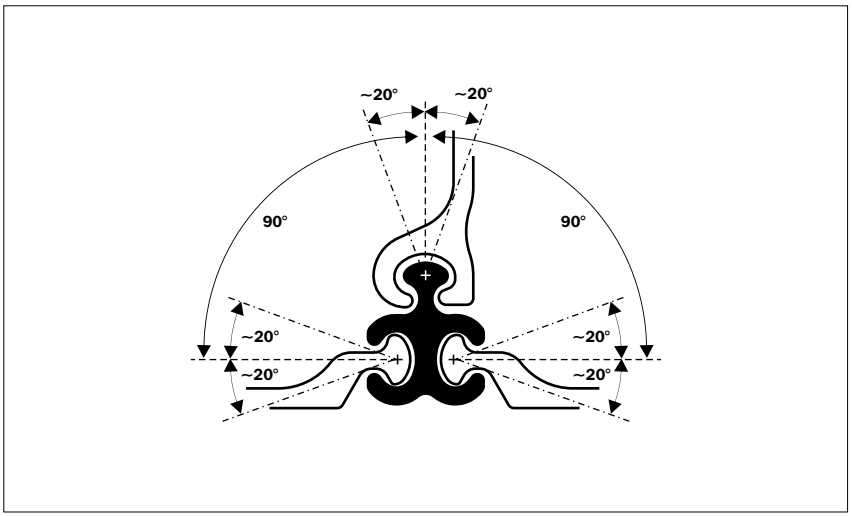
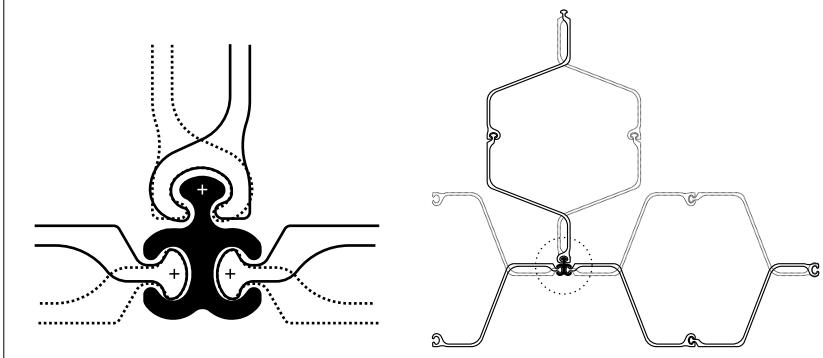




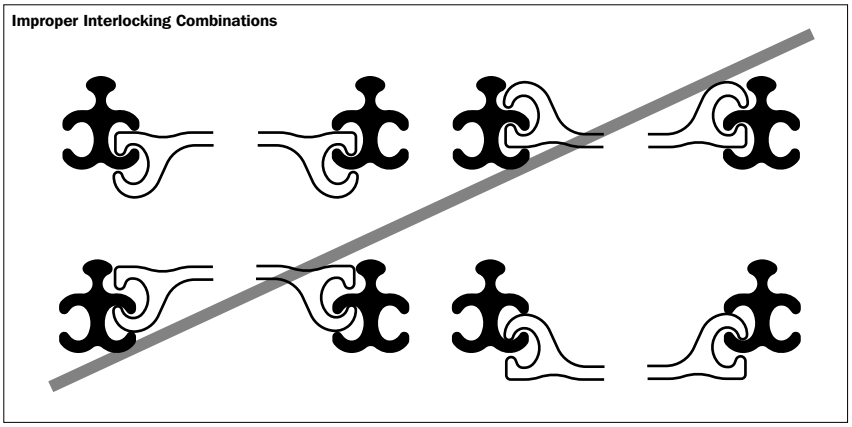
Installation Guidelines

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:

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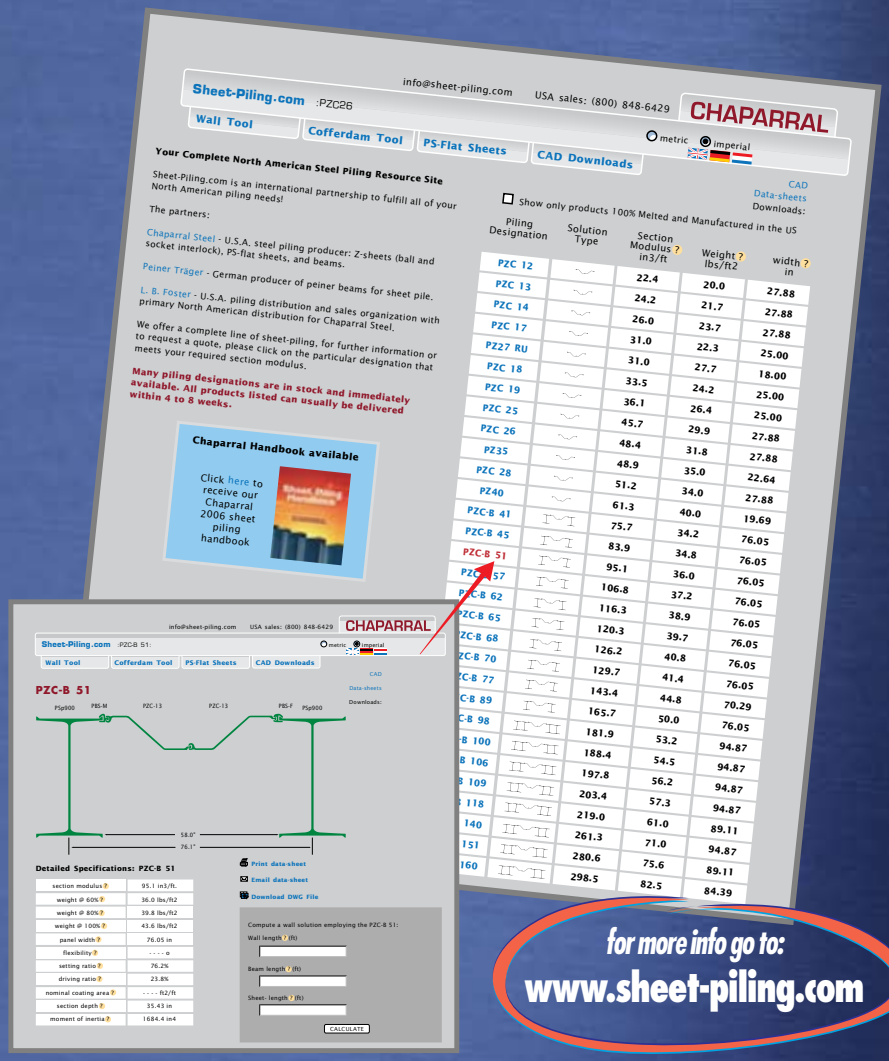

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CHAPARRAL

Transforming Ordinary Materials into Extraordinary Solutions

Innovation along the interstate

Original design gives birth to a safe wall and saves state money

By Jeanne Fronda, Saieb Haddad, and Henry Pate

Interstate 40/75 and right-of-way restraints

Right-of-way restraints can make the construction of retaining walls a challenge. The placement of standard concrete cantilever walls in the face of limited right-of-way demands temporary walls to decrease the construction easement.

The Tennessee Department of Transportation (TDOT) has been working on expanding Interstate 40/75 in Knoxville, and the venture was comprised of 13 bridges and 18 retaining walls. Two buildings — a retail center and an insurance building — had to be supported, so a cantilever wall had to be built in a space with a large cut. Underground easements near the anchors or a right-of-

way are necessary if tie-backs were going to be used to support a tie-back retaining wall. But there was limited area, as there was only 15 feet of space available behind each wall. A caisson pile secant wall was proposed by the consultant designer and if this design was to be used, the walls were estimated to cost $24 million or $12 million per wall.

Project concerns

The geology of the area was of importance, because there was shallow irregular limestone with a lot of karst activity; this meant there were many cavities and weathered joints within the limestone. Soils had to be sampled, so an intensive investigation was conducted. Rock elevation was detected every 50 feet and unconfined compression tests were performed to determine the physical property of the rock.

A new design

Saieb Haddad, a TDOT geotechnical engineer, and Henry Pate, a TDOT structural designer, formulated a new alternate design. The initial alternate proposed design was a steel sheet piling wall externally braced by walers and battered piles with a concrete facing. A small quantity of soil would be extracted, and then the battered piles would be driven. Finally, at the peak of the battered piles, a waler would be affixed. The steel sheet piling would then be driven with the waler acting as a template. The extraction that happens near the front wall would then proceed, and it is near

"It was a pleasure to use the driven piles, because without them we wouldn't be able to come up with the system. So by being familiar with driven piles, we came up with the shape that we designed."

SAIEB HADDAD, GEOTECHNICAL DESIGNER

the uppermost flange of the battered piles that the digging would continue. Studs would be arranged on the battered piles, then the concrete facing would be poured. This was decided not to be the ideal answer due to the vertical irregularity of the rock and the quantity of the permanent sheeting needed.

The final solution was to do away with the sheeting by building a rigid frame wall composed of H-piling. So the chosen system was a frame made of driven battered piles and vertical piles joined by a waler. To impede the piles from moving and to increase the chance of the piles biting into the rock, special pile tips were fortified. To hinder overturning, a structural concrete face was employed to direct the soil loads toward the piling system. This wall system also ensured soil loads were transferred to a sloped face instead of a vertical face. Vertical tie-down anchors would provide extra support.

The proposed wall system was examined, and it was concluded that the driven piles would act as a frame for the wall; the frame and the concrete face would then act as a gravity wall. The retaining wall would be a whole system with the inclusion of a structural concrete facing that had an Ashlar Stone finish. The soil could be entirely excavated in front of the wall due to the stability provided by the anchors. This would allow the concrete face to be poured from the top all the way to the bottom. Using the vertical tie-down anchors solved the construction sequence problem and allowed the wall to gain more stability. This new design would save at least $13 million; therefore, TDOT decided to use this design with a driven H-pile frame and vertical tie-down anchors.

"It was a pleasure to use the driven piles, because without them we wouldn't be able to come up with the system," said Haddad. "So by being familiar with driven piles, we came up with the shape that we designed."

By driving the piles, the shape of the design emerged. Each battered pile, which was approximately 18 degrees from vertical, gave lateral support to the back piles. Since the concrete facing and the coping could not be poured together, the vertical anchors gave adequate stability to the piling system. So the concrete face would be poured first, followed by the coping. Temporary wood lagging was used between the battered piles to support the soil before pouring the concrete face.

Haddad attributes the idea to having a lot of experience working on earth and concrete dams, which he believes gave him the instinct on how to

come up with the battered face. Upon examining the system, Haddad recognizes it has the same shape as that of a concrete dam. Haddad and Pate finally developed a system using battered piles, vertical piles, and walers with a concrete face and coping.

The Tennessee Department of Transportation in Knoxville selected Charles Blalock & Sons Inc. to work as the contractor for the project and the pile driving. The anchors were supplied by DYWIDAG, and a local distributor, Skyline Steel, provided the piles.

Concerns during construction

An important concern of the project was the need to change the slump requirement for the structural facing concrete. Originally, the slump was set at six inches, but this would make it impractical to achieve the specified form-liner finish on the wall's battered slope. Increasing the slump to eight inches allowed for uniformity and flowability. However, this meant more bracing for the forms was needed, because the increased flowability caused the concrete to protrude when it was poured through the battered face.

The contractor's use of auger drilling was another major concern of the project. A clean rock socket could not be achieved because both forms of casing — PVC and thin metal — could not be seated into rock, and this resulted in the sockets becoming packed with mud and water. In addition, the PVC or thin metal casings that were employed to guard the holes from caving were destroyed during placement. An alternate drilling process was required, so this meant drilling had to involve simultaneous drilling and casing of the hole with the casing socketed in rock. This new style of drilling prevented 90 percent of the anchors from faltering, as it stopped mud from collapsing into the rock socket; the remaining 10 percent were re-drilled and corrected.

Although the final design was an innovative one, there were no excessive environmental or noise concerns other than ensuring there were no power lines above the cranes that were used on the project or the expected noise that accompanies driving piles.

The future

The construction of the two walls near Interstate 40/75, which began in July 2003 and was completed in November 2004, cost $1,970,500.

Based on the appraised value of the insurance building at $13 million and the retail center at $5 million and before introducing our new system, the TDOT would have constructed the caisson pile secant wall for $12 million to support the insurance building (since this is cheaper than buying the building) and would have bought the retail shopping center for $5 million (since buying it is cheaper than constructing a caisson pile secant wall for $12 million). Part of the retail center could be salvaged and sold back for an estimated value of $3 million, so the total cost would have been $15 million. Since the system, which is known as a piling framed concrete wall, cost less than $2 million to support both properties, the accomplished savings is $13 million.

This project resulted in Haddad earning a recognition from the Tennessee legislature, the Appreciation Award from the Physical Review Committee of the Tennessee legislature, and the Award of Excellence from the Tennessee Department of Transportation.

The same new system is being used on another new retaining wall project in downtown Knoxville, Tennessee. In addition, a contract between TDOT and the University of Tennessee is in the works to instrument this wall and monitor the stresses in the new wall to confirm this unique design. ▼

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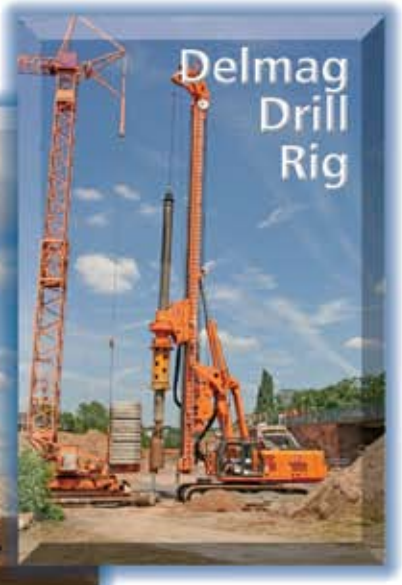

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Keeping your focus in focus

Ways to create a positive work environment

By Rick Marshall CHST

As an industry, we hardy construction types tend to believe in our own myth that, once informed about a subject, we will always remember the information and therefore always behave in a proactive manner to ensure accidents or incidents do not occur. In a perfect world this would be true; however, our world is a little different and far from perfect. Perhaps at times, we lose our focus on the basic fundamental procedures that guide us to a positive work environment.

How many employees do we have that make comments like, "I've been doing it this way for 30 years" or "If you've never screwed something up, you ain't doing nothing"? How scary is it when you have employees aged 30-something making these comments right alongside of the so-called older more mature crowd? Have you ever listened in on a Hey-you-should-see-my-scar or If-I-had-been-just-a-couple-of-inches-closer-I'd-be-a-goner kind of conversations in a change trailer at lunchtime? Some of these conversations are quite awe inspiring, especially when properly embellished, and yet you never hear — Paul Harvey, forgive me — the rest of the story. I am talking about the part where the storyteller describes what he or she did to ensure that the incident never happens again.

Perhaps it's time to look into our organizations' respective mirrors and take a good hard look at what we see. What happens in your company if someone suggests a new procedure, technique, or policy change? Some people look at the new procedure as a challenge, or perhaps a problem we can solve. Unfortunately, others see a new or different procedure or policy as a really dumb idea, usually before it is even implemented on a trial basis. "We have never done that before, so therefore it is a dumb idea" is a typical construction mindset. Those who choose to embrace the challenge do so in an attempt to better the company and themselves. The naysayer among us continues to be the problem and not a part of the solution. The naysayer in our companies reinforces our loss of focus.

Think about this for a minute: Have we ever driven piles from a barge before? Can we really drive 110' 14 x 73 H-Beams with swinging leads? Often times the answer is "Yes, we can," but if someone suggests that we can't, all of a sudden we tend to believe that indeed we can't do it. The same concept applies in the field when we are working our cranes and driving rigs. The challenges are typically less in scale, often times even go unnoticed, but are always there. I am referring to basic, safe crane and driving rig operation.

Do we take the time to level the service crane before we hoist piling? Do we use available earth moving equipment to grade an access way for the crane or self-contained pile driving rig, or do we just use the crane or pile rig itself to "plow"

"We have so many opportunities to fail in our business. We constantly deal with the unknown when we work below the earth's surface. Let's get back to focusing on the simple things, the ones we do know about and the ones we can control."

RICK MARSHALL CHST

its way through? I mean, after all the car body makes a pretty good dozer blade and once the crane sinks down deep enough it's got to be stable, right? Who among us hasn't seen a 3900 or similar crawler crane stand on its tiptoes? Have any of you ever repaired a drive chain on a crawler rig that is buried up to its undercarriage in mud? And then have the other side break when you try to move it because we still didn't clear away the material that has bound up the tracks? "That would take too much time to move the material. We don't have any money in the bid for auxiliary equipment," we say to ourselves. So we allow the same thing that hurt us in the first place to bite us in the butt once again. It is so easy to get in the mindset of "we can't" that we won't even take the time to do basic things like providing access and a stable, level work environment for our equipment. We lose the focus.

Have you ever side loaded a crane boom? Are you sure? Next time you look at your crane and leads, watch the leads when they are hoisted from a completed pile. Did they drift to the left or right of the crane? Do they hang left or right of the crane's center line? They should be about center of the butt section of the boom when looking back to the crane. If not, your crane is not level and you are indeed side loading the boom. "Big deal. We have been doing that forever," you say. Have you ever seen a level jobsite? I know these excuses have built into our daily operations and we just deal with them. Maybe you have never seen a boom twist and fall to the ground. That mindset does not make it right, and if we continue to believe that, then we are not focusing on the very simple things that can domino into a real catastrophe.

Do you take the time to lay out your piling material ahead of yourself, or do you simply just keep driving and pull up the next pile from the stack using the third line? You operators out there, have you ever wondered where the guy or several guys on an older crane pulling the third line off are going? Have they ever disappeared and then returned in a minute or so and tell yourself to "get up" on the third line? You feel the slack tighten up, see the leads drift to one side, and you start to feel the bouncing of the pile you are now dragging from behind you. How about when the pile snags on something? The foreman is whipping that finger in the air literally screaming at you with that shaking finger. You know what is about to happen, but you keep hoisting anyway and bang, clang, here comes the pile. It's a good thing the leads are there because it's the only thing that will stop the pile from becoming a projectile. Oh, by the way, among other no-no's, you are side loading the boom when you do that.

Are you taking the time at the beginning of each shift to inspect the crane? Do you document it? How about the hammer and leads? What about the Power Pac, air compressor, supply lines and connections control valves, on-off switches or valves, emergency stop buttons — do they even work? "That takes time. We don't have time to spend on an inspection. We look at it while we are working," you say. Did it ever occur to you that the hammer — regardless of type — goes into self-destruct mode the moment you use it? Tell me you have not

seen actual pieces of the hammer fall to the ground right in front of you or, worse yet, right on your head?

Do you think you may have prevented such a failure if you had inspected the unit first? If your hammer goes down due to a component failure, what do you do now? Hook up the reserve hammer and let the medics repair the downed hammer? On a huge project with multiple rigs, that may well be the case, but how about your bread-and-butter jobs where you don't? Where does the time come from to wait for the repair? Think for a moment about the potential problems that you will have if someone is injured by the faulty hammer. Where is your focus?

Are our projects becoming so complicated that we cannot manage them correctly? Could it be something as simple as losing sight of the three simple disciplines that keep us in business: safety, production, and quality control?

We all should have only three mandates in our organizations:

- Work safely.
- Be as productive as possible.
- Maintain the highest level of quality control.

Sure, there are numerous bullet points to describe how to achieve each mandate, but the "Big Three" is where the focus must be at all times and at all levels of the organization.

When we have a breakdown in that focus, something negative invariably happens. For instance, are we not all guilty of speeding things up to increase productivity? Case in point, don't most of you managers start off your conversations with the superintendent with "How many did you get today?" Does that question imply we should sacrifice quality assurance and/or quality control (QA/AC) or safety for an increase in productivity? We don't actually intend for that to happen, but does it? So where is the focus? How many quality piles did we drive today without any incidents? That is a more focused question, and one we all need to be asking.

We have so many opportunities to fail in our business. We constantly deal with the unknown when we work below the earth's surface. Let's get back to focusing on the simple things, the ones we do know about and the ones we can control. We all use pile driving rigs of some sort and make use of many different types of cranes during the course of an average day. The operation of this type of equipment is so commonplace that we often lose our focus concerning the hazards associated with their use. Oftentimes it takes an incident or injury to cause us to refocus on how to use this equipment correctly.

The basic or fundamental activities that we perform are what usually get us in trouble, not the new or different procedures. Improper crane or pile rig set up, overloading, side loading, unstable conditions, not using all of the outriggers, improper or, worse yet, no blocking under outrigger pads, not knowing the weight of the object to be lifted, no swing radius barricades, overhead power line contact — to name a few — are fundamental and controllable conditions that are guaranteed to result in damage, injury, or death to something or somebody if we lose focus.

Our industry believes that we can self-regulate, and in fact we are willing to align with and teach OSHA how we safely operate, remain productive, and maintain high levels of quality control. But my friends, the regulatory folks also read the newspaper, and watch television. How long will it be before they begin to question our ability to self-regulate? We all need to focus on the "Big Three" starting today. Our livelihood depends on it.

Have a safe and focused day! ▼

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PDCA Chapters Update

Many exciting things are happening for the Pile Driving Contractors Association (PDCA). The Gulf Coast, South Carolina and Mid-Atlantic PDCA chapters have been engrossed with meetings, conferences, tours, or presentations. In addition, the PDCA has gained a new chapter in California.

The PDCA of the Gulf Coast

Our next chapter meeting of the Gulf Coast Chapter of the Pile Driving Contractors Association is Sept. 20, 2007. The guest speaker is Jim McCracken and he will talk about different types of preservative treatments for piling and utility poles.

The PDCA of South Carolina

The South Carolina Chapter of the Pile Driving Contractors Association is proud to boast about John Parker with Parker Marine. The Beaufort Memorial Hospital Parking Garage was designed on augercast piles. The General Contractor called Parker because years ago they — the General Contractor, Parker Marine, and the engineer — switched the Roper Hospital addition successfully from augercast piles to driven 12" prestressed concrete piles.

When Parker Maine priced it out, it proved it to be economical. They provided this information to the engineers and explained the quality control and quality assurance (QC/QA) of their prestressed concrete pile, (which was made by Parker Marine). When vibration concerns were raised, Parker informed them that they already planned to pre-drill, which would minimize vibrations. When Parker also explained to them that they could easily monitor vibration readings using the geotechnical engineering firm that would be already on-site recording driving records (A Driven Pile Is A Tested Pile), they enthusiastically switched the project to 535–50' 12" driven prestressed concrete piles.

Way to go, Parker Marine! One man can make a difference, because it's never just one project. Parker has saved two from the dark side.

On June 5, at the Town and Country Inn on Savannah Highway in Charleston, SC, we had 61 engineers, suppliers and contractors at our quarterly meeting. Mike Douglas, design engineer with International Construction Equipment (ICE), discussed Tier 3 compliance on noise pollution at construction job sites. ICE was also the proud sponsor of our meeting. Before the open meeting, a full board meeting was held with Stevan A. Hall and guests Van Hogan (Ed Waters & Sons Contracting) and Mike Jahnigen (Sun Marine Maintenance). One of the topics discussed was our upcoming third Driven Pile Seminar slated for March 27, 2008.

The PDCA of the Mid-Atlantic

The Mid-Atlantic Chapter of the Piledriving Contractors Association is continuing with its preparations to host the upcoming Design and Installation of Cost-Efficient Piles at Turf Valley Resort in Ellicott City, Maryland this Sept. 27. ▼

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The following is a list of all members who have joined the PDCA in 2007. The association would like to welcome everyone on the list!

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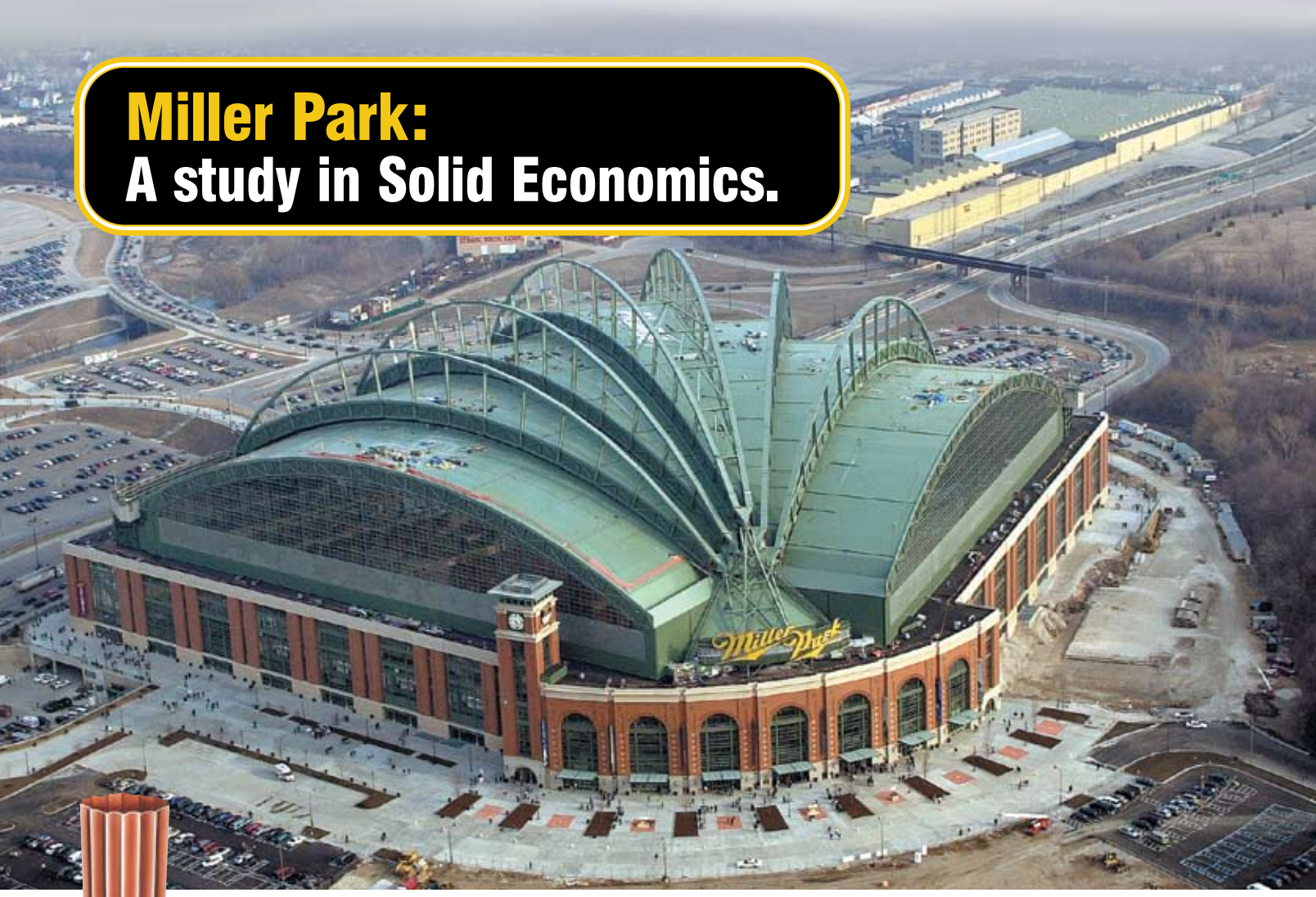

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Their summary showed the Monotube® piles to be the most economical by far. Examining the results on an **installed cost-per-ton supported**, data showed the Monotube® achieved a 400-ton ultimate capacity at the 77-ft. range. The pipe, by comparison, required over 100-ft. embedment to obtain a 300-ton ultimate capacity. Using conventional equipment, Monotube® piles required significantly less time and hammer blows to penetrate to final design depth, thus achieving design capacity with much shorter embedment lengths.

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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2008 Project of the Year Award

The Pile Driving Contractors Association announces the 2008 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. This esteemed PDCA tradition recognizes excellence in driven pile projects completed by PDCA members in good standing.

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

The PDCA is asking each of its members to consider submitting a project worthy of this symbolic PDCA award. A call for entries will be mailed later in 2008 to all PDCA members. Winning entries will be announced and presented their award during the PDCA Annual Conference in March 2008.

So watch for your "Call for Entries" Project of the Year entry form and participate in showcasing your best project of 2007. ▼

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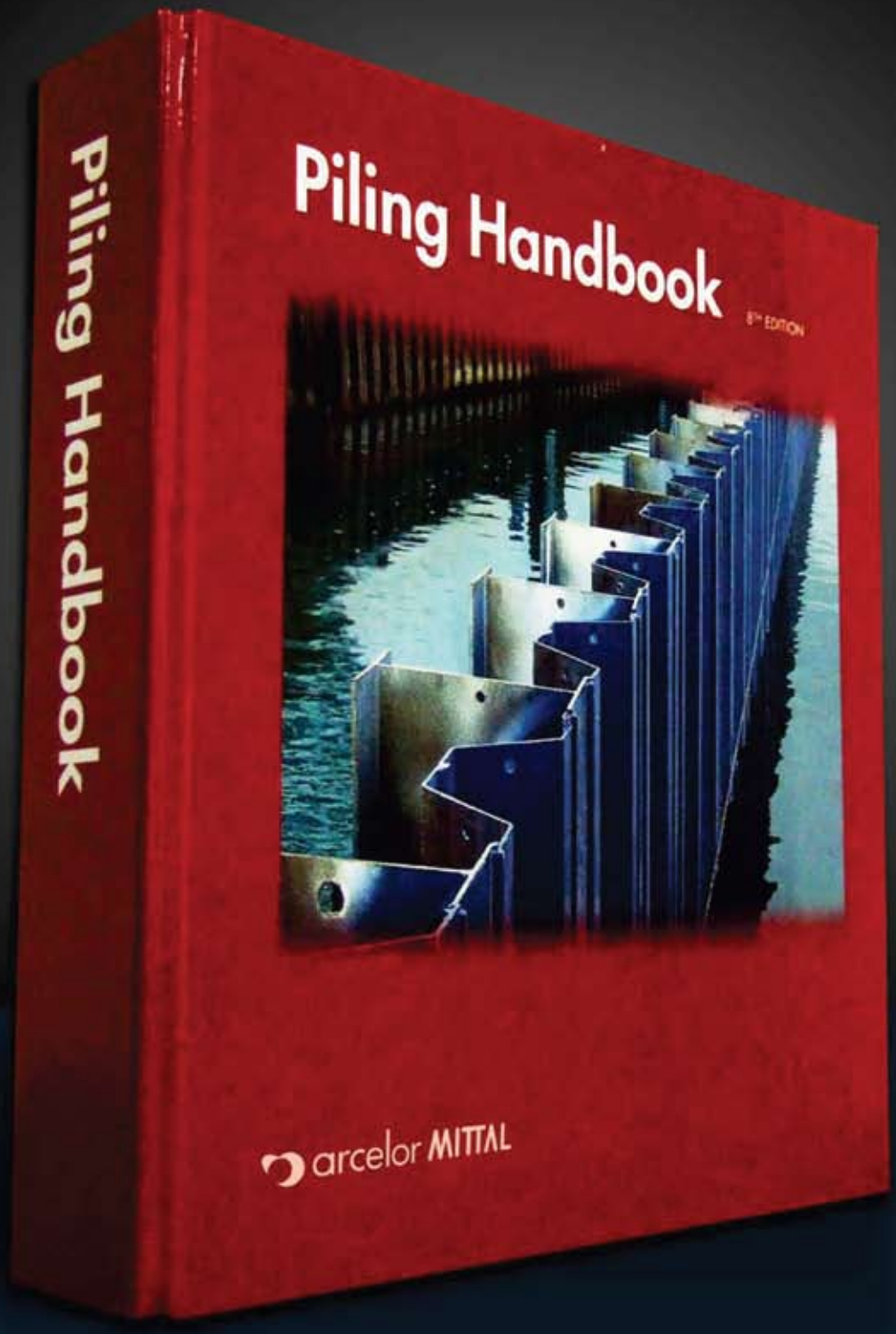

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Benefits of driven piles

A driven pile is a relatively long and slender column, provided to offer support or resist forces, made of preformed material having a predetermined shape and size that can be physically inspected prior to and during installation. It can installed by impact hammering, vibrating or pushing into the earth.

Quality

Driven piles are a total engineering solution. The design, installation and quality assurance, that are a part of each driven pile, combine to eliminate guesswork and produce a known, reliable and cost-effective product that can accommodate a wide variety of subsurface conditions.

Driven piles consist of natural materials or pre-manufactured structural shapes built to precise tolerances utilizing high strength materials and reliable quality control. All driven piles conform to ASTM standards. Their quality is consistent from the first pile to the last and can be seen and verified prior to installation.

Driven piles maintain their shape during installation. They do not bulge in soft-soil conditions and are typically not susceptible to damage from the installation of subsequent piles. Many hollow-section piles can be visually inspected after installation to assure integrity. Most solid-section piles are uniform in section and can be dynamically inspected to verify integrity.

The pile-driving process can be easily modeled prior to installation to determine adequate and economic equipment selection. Static or dynamic testing can confirm load-carrying capacities of installed piles. Dynamic testing can easily confirm proper hammer performance and its effect on the pile. Many modern hammers have impact velocity measurement devices permanently installed, providing a very high level of quality control.

Cost effective

Driven piles are usually the most cost-effective deep-foundation solution. You pay for only what you need. There are no hidden extra costs or added expenses for site clean-up. The wide variety of materials and shapes available for driven piles can be easily fabricated or specified for high structural strength, allowing them to be driven by modern hammers to increased working loads, thus requiring fewer piles per project, resulting in substantial savings in foundation costs.

Pile capacity is easily verified by either static or dynamic pile testing. Capacity per pile or pile length can be easily optimized to provide exactly the required capacity (including safety factors) to minimize foundation costs. Testing also eliminates the uncertainty of bearing capacity estimates based on static analysis. There is no need to be overly conservative and thus wasteful to protect against failure.

As an additional benefit, driven piles often gain capacity after installation. Shaft soil strength usually increases with time after pile installation is complete to provide additional load capacity. This phenomenon, called “setup,” can result in substantial foundation cost savings when considered in the design and confirmed by testing. The incorporation of setup into the foundation design results in fewer piles and/or shorter piles

Driven piles can be

- Steel
- H-Pile
- Pipe (open-end or closed-end)
- Tapered
- Shell (mandrel driven)
- Sheet Pile
- Concrete
- Square
- Octagonal
- Cylinder
- Sheet Pile
- Timber
- Composite piles that combine pile types (i.e., a concrete pile with a steel tip extension).

driven with lighter equipment. The reduction in time, labor and materials provide substantial cost savings to the owner.

Adaptability

Driven piles are installed to accommodate compression, tension or lateral loads. Piles can be selected to meet the specific needs of the structure, site conditions and budget. You can select from a variety of materials and shapes that best meet your needs.

Driven piles easily adapt to variable site conditions to achieve uniform minimum capacity with high reliability, thus eliminating uncertainty due to site variability. Driven piles are usually installed to established criteria (i.e., minimum blow count per unit penetration, sometimes with a minimum penetration). Because they are normally driven to a blow count to assure the desired minimum capacity, pile lengths may vary when subsurface conditions are not uniform. Driven piles may either be cut-off to shorten their length or spliced to extend their length. Splice designs usually meet or exceed the strength of the pile itself. Pile shoes or "points" can be added to assist penetration requirements and provide very reliable contact with rock. The optimum length is used for each pile which accommodates all site conditions.

Driven piles adapt well to unique site conditions and restrictions. They are ideally suited for marine and other nearshore applications. There are no special casings required and there are no delays related to the curing of concrete. Piles driven through water can be used immediately, allowing construction to proceed in a timely manner. For bridges or piers, driven piles can be quickly incorporated into a bent structure allowing the bridge or pier itself to be used as the work platform for succeeding piles in top-down construction.

To minimize disturbance in wetlands or allow work over water, driven piles can be used to construct temporary trestles. Piles installed to meet any temporary construction need can be extracted when the need is ended.

In earthquake prone regions, large diameter driven piles are well suited to resist seismic forces. Non-displacement pile sections (i.e., H-piles) can be utilized to minimize vibration effects on nearby existing structures. In corrosive environments, coatings and/or additives can be used to mitigate the effects of corrosion thereby lengthening the service life of a structure. Coatings can also be used to mitigate the effects of negative skin friction.

Reliable and available

Pile-driving contractors can be found all over the country. The equipment and installation methods are time-tested and well proven. Advances in materials, equipment, methods, and testing continually combine to improve the efficiency of driven piles.

Recording the blow count versus depth during pile driving easily documents successful pile installation. You know what

you have at the completion of driving. Because driven piles are usually driven to a blow count criterion, they will have a measurable capacity providing assurance that they meet the project requirements. Piles can be easily driven through upper soft soil layers regardless of the soil type and groundwater conditions.

Driven piles have vastly superior structural strength. Driven piles almost never fail structurally during static testing or static loading. They have high lateral and bending resistance for their entire length making them ideal to resist wind, berthing and seismic loading conditions. Driven piles can tolerate moderate eccentricity in the application of superstructure loads due to their full-length strength. Piles can be driven either vertically or at various angles of inclination to increase support for lateral loads. In special cases, piles can even be driven horizontally.

Residual benefits

Pile driving is relatively easy in many soils. Since the soil at the toe is in a compacted condition for displacement piles, end bearing can often carry a substantial load. There are no "soft bottom" soil conditions, so large settlements for end bearing piles are eliminated.

Driven piles displace and compact the soil. Other deep-foundation options can require the removal of soil and considerable subsidence, which can undermine the support of adjacent structures and cause excessive deformations, both of which can result in structural problems. Drilling for cast-in-place piles relieves soil pressures and reduces unit shaft resistances. In groups of drilled piles, the removal of soil generally loosens and weakens the soil structure, reducing the capacity of previously installed piles. Groups of driven production piles densify the soil, improving the capacity of previously driven piles. In groups, driven-production piles usually have a higher capacity than the test pile, while drilled production piles often have a lower capacity than the test pile. Thus, driven piles generally have higher capacities than other pile types of the same diameter and length.

Driven piles require no curing time and can be driven in natural sequence rather than skipping alternate piles, thus minimizing the moving of the equipment and speeding installation.

Environmentally friendly

Driven-pile installations usually produce no spoils for removal and therefore no exposure to, or costly disposal of, potentially hazardous or contaminated materials. The site is left clean and ready for the next construction activity.

Alternate uses

The most common use of the driven pile is in deep foundations. Driven piles can also be utilized in other applications such as pile-supported embankments, sound wall barriers, retaining walls, bulkheads, mooring structures, anchorage structures and cofferdams. ▼

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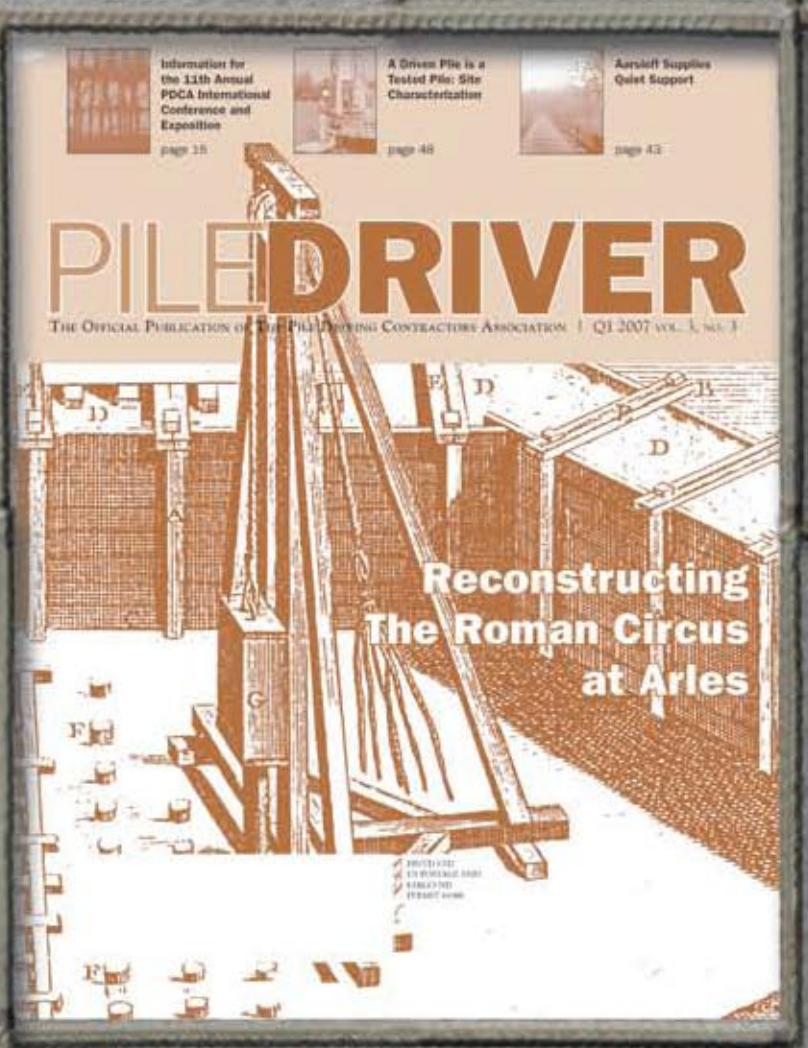
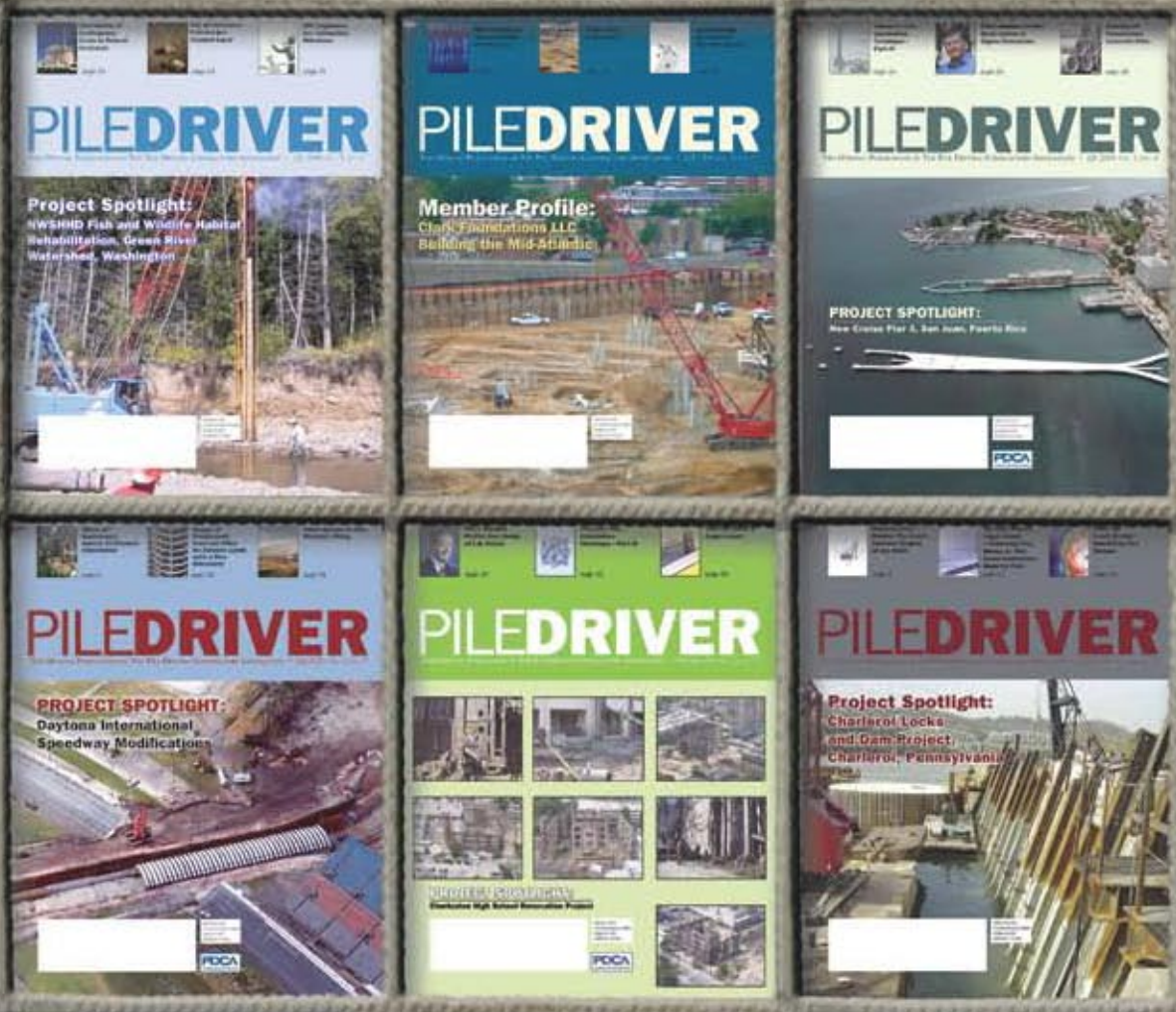




Innovative noise reduction

Design calling for drilled foundations installed over 60 nights changed to driven piles installed in only 9 days

By Greg Forester

The following article was originally published by The Princeton Packet on Friday, June 29, 2007. To view the article online, visit www.princetonpacket.com Reprinted with permission.

The West Windsor Township Council approved a resolution Monday reducing some Alexander Road bridge work from 60 nights to nine days, in a plan that should save nearby West Windsor residents hours of sleep and the New Jersey Department of Transportation millions of dollars.

Representatives from the New Jersey Department of Transportation and a contractor performing the work, IEW, made a presentation to council Monday that showed a departure from the original plan for the new crossing of the Northeast Corridor railroad tracks.

The new process should significantly reduce the potential for sleep disturbances for residents living near the work site, DOT officials said.

The original plan called for the drilling of shafts, which house the members that support the bridge, for a duration of 60 nights, working from midnight to 4 a.m. each night.

The new plan calls for a different method of getting the support structures in place — driving 40-foot piles into the ground using mechanical hammers, as opposed to drilling 36-inch wide shafts

through dirt and 10 feet of solid rock.

"I rejected the first proposal right away, as quality of life is a very important issue to me," said West Windsor Mayor Shing-Fu Hsueh. "The reduction to nine days is much better, and I agree with council that we should allow them to do that."

Hsueh said he had negotiated the bridgework years ago, convincing the DOT to pay for all of the work at the dilapidated old bridge.

According to the new plan, the vast majority of the work would be completed during the daytime, except for a small section of piles that are located directly adjacent to train tracks. The removal of the prohibition of daytime work followed negotiations between the DOT and Amtrak, said Jim Snyder, a representative of IEW.

"Amtrak is on board and the county is on board with this plan," said Snyder.

Time constraints are usually in place due to the use of the nearby train tracks by Amtrak, which has strict rules on when it can de-energize overhead electrical wires as required by the work process, according the DOT officials at Monday's meeting.

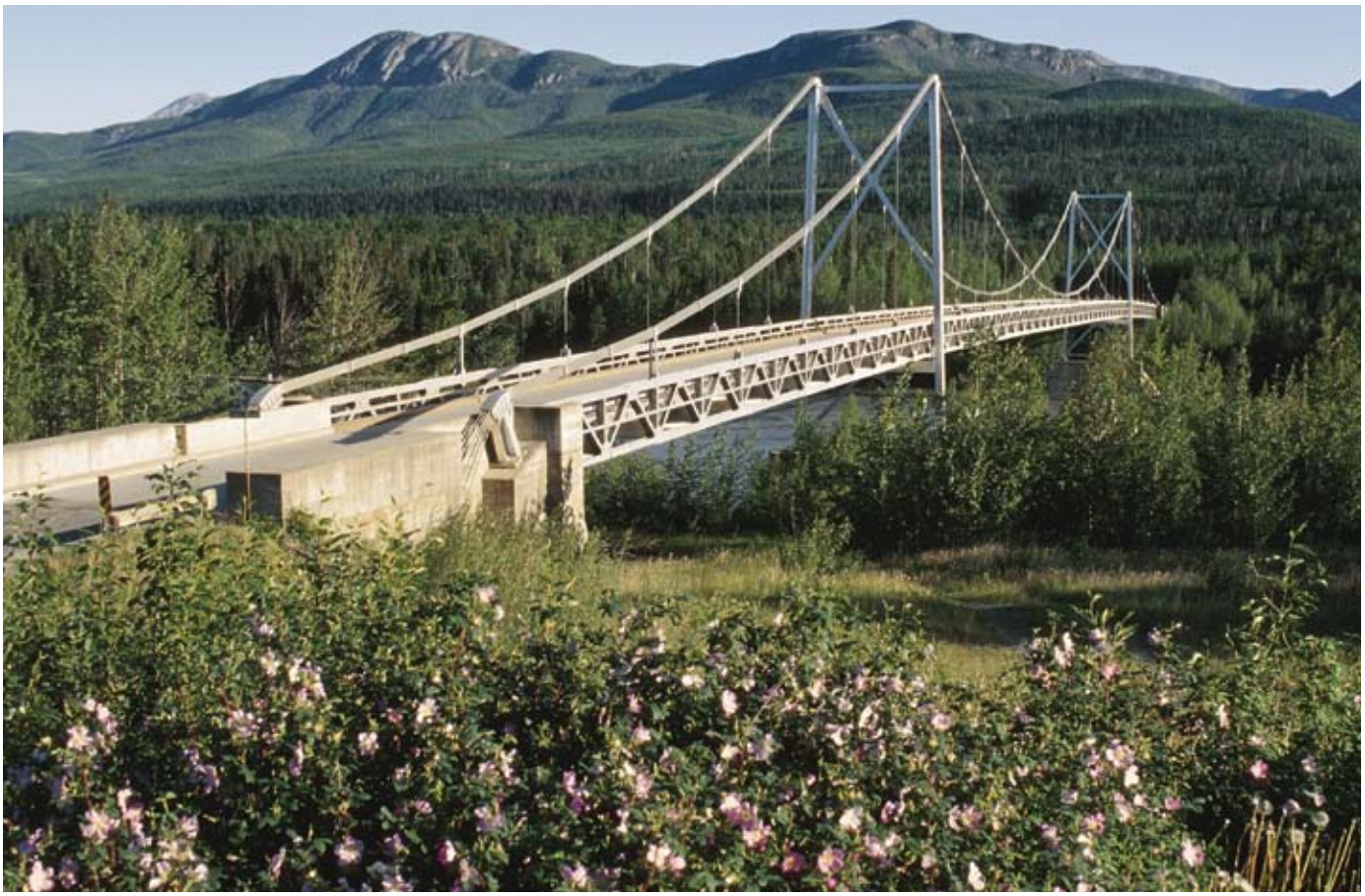
With the finished negotiations, the pile driving would take place at different times between 9 a.m. and 5 p.m. over the course of nine days, with a chance of one night of work driving the rows of piles closest to the tracks, IEW officials said.

"When you hear a story where you're facing 60 nights of constant noise, nine days sounds much better," said West Windsor Councilman Charles Morgan.

"If there are residents living in the area of the bridge in the audience during the presentation, and they don't object, that's kind of a big deal to me," he added, referring to several residents at council during the presentation.

West Windsor resident Valerie Servis, who lives on Harris Road about a half mile from the bridge, questioned the presenters on various aspects of the bridge work following Monday's presentation.

"I'm not sure everyone on council and in the audience knows all the technical terms, so you have to trust these



professionals," said Servis. "Everyone has their own agenda, but this does sound like a win-win situation."

Servis asked the presenters whether or not the new method would affect the life of the bridge, or the quality of the new span over the Northeast Corridor tracks.

DOT Bridge specialist Rick Dunn said the method would not affect anything about the bridge, which should have a life of 75 to 100 years. IEW representatives said they would provide notice to residents of when the hammering of the piles would be taking place.

The contractor also intends to place monitors around the site of the hammering to measure the vibrations caused by the work, although IEW officials said they don't expect to see any sort of dangerous vibration generated by the work.

"We're splitting hairs," said Fisher Place resident Pete Weale, during discussion of the plan. "Short of any concrete reason to stop these people, we should move forward and vote on this."

The resolution received unanimous approval from the Township Council. ▼

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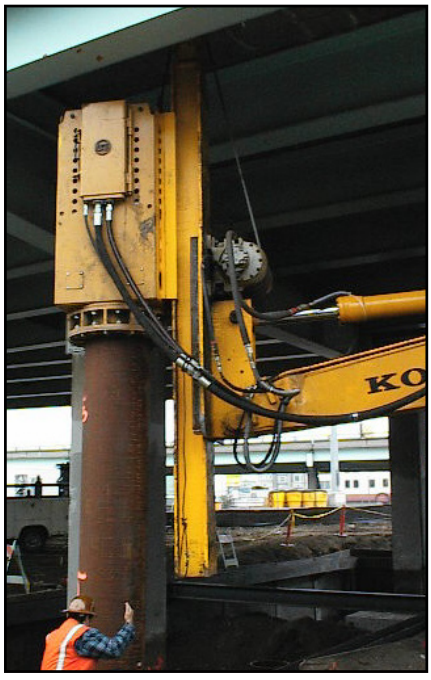

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