



**PDCA 10<sup>th</sup>  
Anniversary  
Annual Conference  
Information**

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**Design of  
Prestressed  
Concrete Piles  
for Seismic Loads  
adds a New  
Dimension**

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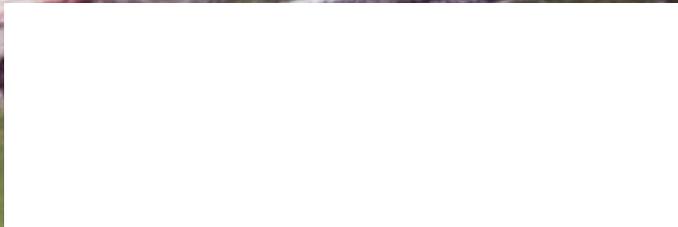
**PDCA Member Profile:  
Midlantic Piling**

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# PILEDRIVER

THE OFFICIAL PUBLICATION OF THE PILE DRIVING CONTRACTORS ASSOCIATION | Q4 2005 VOL. 2, NO. 5

## **PROJECT SPOTLIGHT: Daytona International Speedway Modifications**



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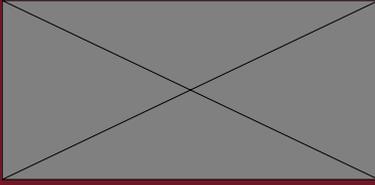
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**COVER:**

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# Pile Driving Overcoming a Negative Image

By Harry Robbins, PDCA President

In real estate it is said that the only thing that matters is location, location, location. Often, that preferred location is a site on which nature did not originally intend for man to build a large, heavy structure. The site may have a small upper crust underlain by soils with the consistency of pea soup down to something solid. But, we still want to build on that location.

Transferring the load from the structure to a suitable bearing strata is what pile driving is all about. Our industry makes it possible for owners to have what they want – a structure where they want it. Pile driving is a simple and reliable solution.

I often hear “we have a problem... the engineer says we need piles.” As a pile driver, I cringe when I hear this. From my perspective, the problem is a poor site. Driven piles are the solution. Be thankful!

We haul our equipment to the site, set up and before we start driving the neighbors are upset. Why? First of all, they do not want the structure built there anyway. It blocks their view or will increase traffic problems on their street or something. All legitimate issues but they have nothing to do with pile driving. We just happen to be one of the first major construction activities on which to vent their displeasure.

Construction is tough. Noise and vibration comes with the territory. Sorry, but it just does. It starts when the dozer clears the site, the beep-beep of the backing dump trucks, the slamming of tail gates to get that last bit of sand from the truck bed, the backhoes, and on and on. Then comes the most feared. But no matter, the pile driver is still viewed as the villain.

I have had more than one geotechnical and structural engineer tell me that they know that driven piles is the best solution. They know from experience that the owner's fears about pile driving are not justified. They know that as the engineer of record, they would sleep better at night if driven piles were used. Yet they cave in rather than take a stand they know in their heart of hearts is right.

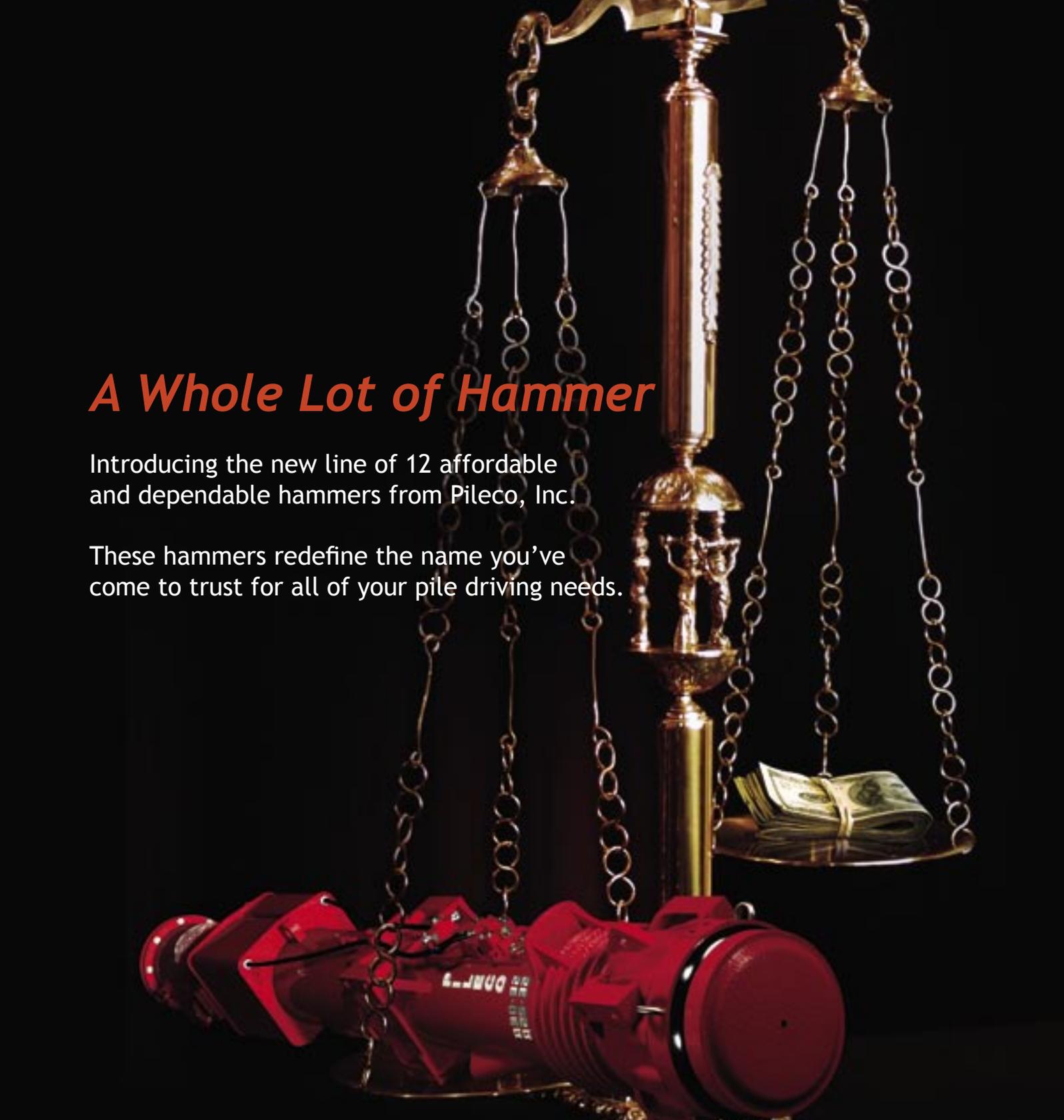
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**It has been proven over and over that pile driving noise is tolerable and vibrations are a perceived problem but not an actual problem.**

---

I am certain this news comes as no shock: there are alternatives to driving piles. Of course, these alternatives have their issues, too. But, the negative image of pile driving is a major selling point for these alternatives. No matter that the alternatives may have questionable quality control, unproven results, and may actually cause more disruption than pile driving. “Give me some of that if I do not have to drive piles! I want the easy way out. My neighbor is afraid of pile driving and I am afraid of my neighbor.”

We pile drivers need to help designers specify what we do. When driven piles are the right solution, piles should be driven. Simple enough, so how do we do this? First of all, we have a responsibility to ourselves and the pile driving industry to do our projects in a quality manner. We must use quality products, install them with appropriate techniques and equipment in good working order, and be sensitive to the environment. Do the job poorly and the whole industry gets a black eye. If a plumber botches a job, the plumber



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**We must use quality products, install them with appropriate techniques and equipment in good working order, and be sensitive to the environment. Do the job poorly and the whole industry gets a black eye. If a plumber botches a job, the plumber gets the blame. If a pile driver botches a job, the process – pile driving – gets the blame.**

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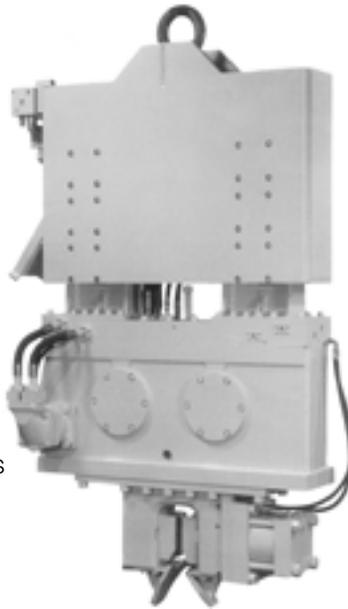
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gets the blame. If a pile driver botches a job, the process – pile driving – gets the blame. That owner and designer will look for another solution the next time. I see this as the first responsibility of PDCA – to help and encourage pile driving contractors to be good stewards of our industry.

Next we must pool our resources to help owners and designers make the right decision. In other words we must do a better job of marketing our product – driven piles. As an industry, we do a poor job of marketing but with good reason. Most of us who only drive piles for a living are too small to effectively market by ourselves. PDCA is doing this on a national level. Why anyone who makes a living in the pile driving industry would not be a member of PDCA is beyond me.

On the local level, we can also pool our resources. I am very proud that the first local chapter of PDCA is the Pile Driving Contractors Association of South Carolina. As a group, we promote driven piles in our area. We monitor jobs in the planning stage. We talk to engineers. We talk to owners. We promote driven piles.

I hope that in my year as President of PDCA, that I can make a positive contribution to the pile driving industry. It is my turn at the plate, so to speak. Randy Dietel, our outgoing President, is an inspiration to me. This position is a volunteer one that is not without its costs of time and resources. He has been generous with both. PDCA is better today because of Randy's wisdom and steady leadership.

Tanya Goble, our outgoing Executive Director, has served PDCA well. She has been an exceptional manager of our financial resources and we are stronger for her service. We owe her our thanks and best wishes in her future endeavors.

Steve Hall is our new Executive Director. He is a seasoned association management professional who has "hit the ground running." PDCA is in capable hands.

Finally, to all of our PDCA friends and associates on the Gulf Coast, know that you continue to be in our thoughts and prayers.

Until next time, remember driven piles are tested piles. ▼



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# Here's to a Great 2006!

By Stevan Hall, PDCA Executive Director

Let me begin by saying it is a pleasure to bring you the first PDCA Piledriver magazine of 2006. By the time you receive this publication, we will have just begun the New Year. All of us at the PDCA want to wish you a prosperous 2006, and hope your business remains strong, the industry vibrant, and through this may you have prosperity and peace.

One of the most exciting and entertaining events the PDCA hosts each year is the Annual Conference – formally referred to as the Winter Roundtable. It appears as though many of you agree because over the years this event has grown in popularity and participation. Each year the Education Committee, who is responsible for planning this event, tries to incorporate something into the program that will excite and attract not only the past participants, but will also entice the participation of new individuals and companies.

The 2006 Annual Conference is no exception, with a new, entirely redesigned format. This year's PDCA Annual Conference, located at the four-star Hilton Palacio Del Rio in San Antonio, Texas on the famous Riverwalk is intended to offer something for everyone, from contractors and engineers to spouses, significant others, and guests. The 2006 PDCA Annual Conference will not only present quality programs (tracks) designed to educate and inform you, but you will also leave the conference with a better understanding of your industry and the positive influence and progress the driven pile is having in construction.

In 2006, the conference will offer two distinctive tracks – one for contractors and one for engineers. However, this format does not prohibit cross-over

attendance by either contractor or engineer, so each individual has the benefit of choosing the track that best suits his or her needs or interests. PDCA has also organized a Roundtable discussion titled, "Comparing Driven Pile Capacities with Drilled Shaft Capacities." Our panel of experts will present compelling arguments for driven pile and drilled shaft, with audience participation. This is one roundtable discussion you won't want to miss. PDCA also has Mr. Terry Bautista, Chief, Engineering and Construction Division, Galveston District, Corps of Engineers as a keynote speaker during the PDCA luncheon. Mr. Bautista will discuss the logistics of dealing with hurricane Rita, working with the Corps and FEMA, and upcoming Corps construction projects that will utilize driven piles.

The conference is also designed to entertain, as well as allowing for socializing and networking. Those not attending the daily courses will have an opportunity to travel to and tour the historic town of Fredericksburg, Texas; visit the Wildseed Farm with over 200-acres of blooming wild flowers in Texas Hill Country; and visit the Becker Vineyards for a tour and the opportunity to do a little wine tasting.

These programs are just a few of the activities planned for this year's Annual Conference. It is a conference you don't want to miss. Contact the PDCA or go online to [www.piledrivers.org](http://www.piledrivers.org) for registration information.

I would also like to take a moment to thank Randy Deitel for his service as your association's 2005 President. Randy was successful on many fronts when it comes to accomplishing his goals and those of the PDCA. I want to thank President Deitel for his commitment to the PDCA, its members, and the entire pile driving

industry that he faithfully represented throughout 2005. I also want to welcome Harry Robbins, the PDCA 2006 President. Harry has served the PDCA in many capacities and brings many qualifications to this leadership role. I know Harry will make a positive impact on the future of the PDCA, however, Harry, like all Presidents before him and all that will follow cannot accomplish his goals and objectives without the support of the PDCA membership. As I mentioned in my last message to you, the whole is greater than the sum of its parts. For PDCA to truly be a significant force in the industry and to be recognized by our peers and end-users, we need members – existing and new and we need your constant participation and continued support. Don't sit back and let someone else carry the PDCA banner for you – get involved. I assure you the experience will be well worth your time, energy, and effort.

I also want to thank the PDCA Technical Committee for their hard and consistent work on the review and recommended changes to the Private Driven Pile Installation Specification, which were presented to the AASHTO T-15 Technical Committee on Dec. 7, 2005. I want to acknowledge both Garland Likins and George Goble for their part in the process and as PDCA representatives on the revisions at the T-15 meeting in Columbus, OH.

I would like to leave you with one last passage regarding your involvement with PDCA: It is a quote by Bo Bennett in "Year to Success." "Avoiding the phrase "I don't have time...", will soon help you to realize that you do have the time needed for just about anything you choose to accomplish in life." You can make a difference in the future of the PDCA – won't you make the time? ▼

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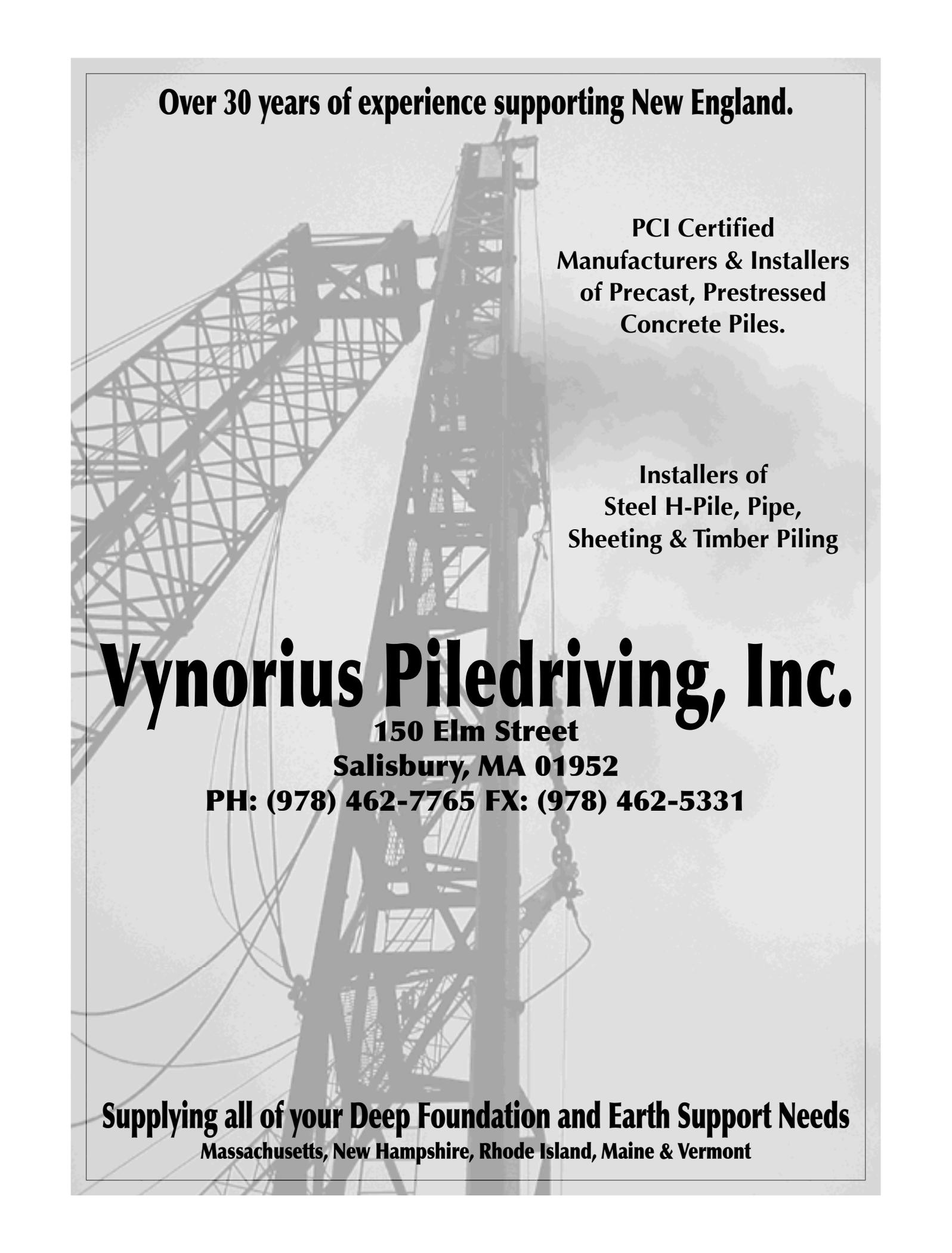
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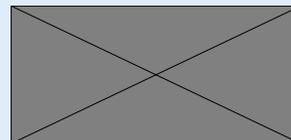


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## PDCA 10th Anniversary Annual Conference

Hilton Palacio Del Rio • San Antonio, Texas • March 2 - 4, 2006

### Who Should Attend?

The PDCA 10th Anniversary Annual Conference is for contractors, geotechnical and structural engineers, suppliers, manufacturers, and other firms or individuals who support, conduct business or are associated with the pile driving industry. This conference has the largest pile driving industry attendance in the United States.

### What You Will Learn and Experience

- Option to choose between Contractor and Engineering programs
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- Recent technological and engineering advances in the Pile Driving Industry
- Design innovations and new project applications for Driven Piles
- An opportunity to meet with your peers and industry leaders

### Exhibitors

Exhibit opportunities are available. The conference offers exhibitors over 15 hours of product and information exposure to attendees. Exhibits and courses will be held in the same area increasing exhibitor traffic. Exhibitor booth space is 8'x10'. Prices start at \$900 for members and \$1100 for non members. Registration includes one main conference registration. Fill out and submit the Registration Form on page 14 to reserve your space.

### Pre-Conference Short Courses - Thursday, March 2, 2006

**8:00 - 5:00 FHWA Driven Pile Inspectors:** The course follows recommended FHWA and AASHTO specifications and practices and covers all areas of the driven pile construction process from fabrication and delivery to installation and testing. Includes a copy of the Pile Inspectors Manual and a certificate verifying .7 CEUs or 7 PDHs.

**1:00 - 4:00 Introduction to Wave Equations:** The course will cover background material including models for hammers, driving systems, piles and soils. Intended for the novice user, a practice-oriented problem solving session will demonstrate the various basic software options for the commonly used program GRL WEAP.

**4:00 - 5:00 Applications of LRFD in Driven Pile Design:** The Load and Resistance Factor Design (LRFD) method has been used for the design of concrete and steel structures by ACI and the AISC codes for several years and is now being implemented in the AASHTO Bridge Code. LRFD methods are simple and direct and will be discussed in this presentation.



### Hotel Information

Hilton Palacio Del Rio  
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- All conference programs and exhibits will be located on-site at the Hilton Palacio Del Rio.
- Attendees are responsible for making their own reservations. To make reservations, call the Hilton at 1.800.445.8667 or go on-line at [www.palaciodelrio.hilton.com](http://www.palaciodelrio.hilton.com). Use the PDCA reservation group code "PDC" when making reservations.
- The room block will be released February 8, 2006. Please make your room reservations prior to this date to ensure your accommodations at the Hilton Palacio Del Rio.
- Room rates: Single/Double - \$189, Confirmed Riverside Single/Double - \$224 based on availability. All fees exclusive of taxes.

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### PDCA Spouse or Guest Programs

Bring your spouse or a guest to this year's Annual Conference. They are sure to enjoy the sites and scenery of San Antonio. PDCA has a variety of entertaining programs scheduled for registered spouses and guests, which include:

- Continental Breakfast and Luncheon
- Opening Reception in the exhibit area
- Field trip to Fredericksburg, TX, with art galleries, antiques stores, shopping and provided lunch
- A visit to the Wildseeds Farm, a 200-acre facility in Texas Hill Country
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- Ladies Tea Breakfast with a guest speaker

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## Course Overview

### CONTRACTOR TRACKS

- Horizontal Pile Driving and Cofferdams
- Geothermal Aspects of the Driven Pile
- Case History - Bulkhead Failures
- Case History - Value Engineering Driven Pile in Texas
- Spread the Word: Driven Pile - No Voodoo Engineering Required
- Challenges of Rebuilding New Orleans in the Wake of Katrina
- Assessing and Mitigating the Effects of Pile Driving Noise on Fish: An Update on Research and Regulatory Guidelines
- Government Contracts and the Environmental Aspects of Rebuilding New Orleans

### ENGINEER TRACKS

- Advantages of High Strength Prestressed Concrete Pile
- Update: AASHTO Pile Foundation Specifications
- Batter Piles for Lateral Loads: A Driven Pile Advantage
- Pile Set Up in a Foundation Design
- Bridging Problem Soils Without Bridges
- Pile Driving Vibration Review: Status of a Vibration Data Base
- Static Axial Capacity Comparison Between Drilled and Driven Pile
- Vibration Monitoring: A Sound Practice on Shaky Ground

### SPEAKER LIST

**Bud Abbott** - Senior Principal Biologist at MACTEC Engineering and Consulting with research on pile driving impact assessments and mitigation related to the seismic retrofit of San Francisco Bay Area bridges.

**Dan Brown** - Seven years in consulting practice and 19 years on the faculty of Auburn University and active in applied research and consulting on deep foundations.

**Steve Dapp** - PE accomplished in geotechnical engineering and design with design and analysis experience with deep foundations and deep vibro and compaction grouting soil improvement methods.

**Derrick Dasenbrock** - PE and Assistant Foundations (GeoTech Lab) Engineer at Minnesota DOT supporting specialty lab testing, CPT operations, and GIS/data management.

**George Goble** - Involved in driven pile research for 40 years and founded Pile Dynamics and GRL. Served as Dept. Chairman of CE at U. Colorado and Case Western Reserve Univ. Consults on driven pile design problems.

**Ed Hajduk** - PE and Senior Geotechnical Engineer at Wright Padgett Christopher, Charleston, SC. with technical expertise in dynamic testing and vibration monitoring. Leading an effort to develop a national vibration data base.

**Richard Hartman** - Founder and Principal Engineer, Hartman Engineer with a focus on cofferdams and retaining structures, consisting of field work, design, problem solving, and research.

**Mike Justason** - Product Manager, Birmingham Foundation Solutions and involved in the investigation and feasibility of installing heating and cooling systems in pile foundations.

**Ed Kavazanjian** - PE and Associate Professor of CE at Arizona State Univ. with consulting experience and work with the design of driven piles for bridges, buildings, wharves and retaining walls requiring deep foundations.

**Garland Likins** - President and head of product development at Pile Dynamics. Participant in the analytical and experimental development of the PDA at Case Western Reserve Univ.

**Harry Robbins** - President of Palmetto Pile Driving, Charleston, SC. and President of PDCA. Founder and First President of the first local chapter of PDCA - Pile Driving Contractors Association of South Carolina.

**Rusty Signor** - Founder/Owner of Signor Enterprises specializing in deep piling foundations and marine repair, construction and equipment rental.

**Gerald Verbeek** - Gerald is responsible for marketing Profound's Foundation Pile Diagnostic and Monitoring Systems in the US. President of VMS, he consults with US firm conducting overseas business and European firms in the US markets.

**Robert Verkyk** - Robert is President and Founder of SCCI, Tampa, FL. He hold a B.S. in Mechanical Engineering and a Masters in Business Administration. Robert holds a General Contractors license in six states and is a Prof. Member of ASME.

### KEYNOTE SPEAKERS

**The Honorable Phil Hardberger** - Mayor, City of San Antonio, Texas. Opening General Session, Friday, March 3.

**David Brown, P.E.**, Chief General Engineering Section, Galveston District, Corps of Engineers. Luncheon, Friday, March 3.



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Attendee Name: \_\_\_\_\_ Companion Name: \_\_\_\_\_

Phone: \_\_\_\_\_ Email: \_\_\_\_\_ Fax: \_\_\_\_\_

## Pre-Conference Short Course Registration - Thursday, March 2, 2006

	# Attendees	Price
<input type="checkbox"/> FHWA Inspectors Short Course (8:00 AM - 5:00 PM)	_____	\$ 145.00
<input type="checkbox"/> Introduction to Wave Equations (1:00 PM - 5:00 PM) Includes the 1 hr. "Applications of LRFD in Driven Pile Design"	_____	\$ 95.00
	<b>Short Course Total</b>	_____

## Main Conference Registration

	# Attendees	Price
<input type="checkbox"/> PDCA Member	_____	\$350.00
<input type="checkbox"/> Non Member	_____	\$425.00
<input type="checkbox"/> Companion Program	_____	\$150.00
	<b>Main Conference Registration Total</b>	_____

## Exhibitor Registration

		Booth
<input type="checkbox"/> PDCA Member (Includes one Main Conference Registration)	_____	\$ 900.00
<input type="checkbox"/> Non Member (Includes one Main Conference Registration)	_____	\$1100.00
<input type="checkbox"/> Additional Space (Same Company., Mbr or Non, side-by-side)	_____	\$ 400.00
<input type="checkbox"/> Additional Exhibitor Attendee @ \$300.00 Each (Includes Main Conference Registration)	_____	_____
	<b>Total</b>	_____
	<b>Exhibitor Registration Total</b>	_____

## Sponsorship Registration (Call PDCA for details on Sponsorships 888.311.7322)

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<input type="checkbox"/> Continental Breakfast (4)      \$ 300.00 Each	<input type="checkbox"/> Ladies Tea Breakfast (3)      \$350.00 Each

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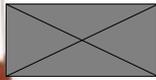
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# MEMBERSHIP BENEFITS

## General Membership Information

### **We are the premier association for pile-driving contractors**

The PDCA was founded in 1996 to promote 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 project 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, networking opportunities abound at the PDCA. 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 complimentary basis.

## Educational Conferences and Meetings

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

- The Winter Roundtable, held each February 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 College Professors Piling Institute, held at Utah State University in Logan, Utah. Up to 25 professors, from major engineering schools, are invited to participate in an intensive, week-long 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



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our industry. As a member, you'll receive discounts on advertising in the magazine.

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

The PDCA also sells "The Pile Design Manual," an FHWA manual on the design and construction of driven piles. Order forms are available on the PDCA Web site.

## Connect Worldwide at [www.piledrivers.org](http://www.piledrivers.org)

The PDCA's newly redesigned Web site at [www.piledrivers.org](http://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

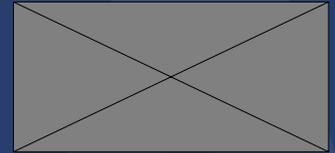
Membership in the PDCA provides opportunities for recognition and leadership. Positions are available on the PDCA board of directors and various committees that impact the industry. The PDCA recognizes noteworthy contributions to the industry with our "Driven Pile Project of the Year" award, giving opportunities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



## 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 \_\_\_\_\_

Email \_\_\_\_\_

City/State/Zip \_\_\_\_\_

Home Page \_\_\_\_\_

### Step 3. Method of Payment

Attached is my payment of \$\_\_\_\_\_ for annual dues.

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- Composite Piles
- H-Piles

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General

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- Sales
- Other \_\_\_\_\_
- Other \_\_\_\_\_

**C. Technical Affiliate Only** (check all that apply)

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- 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)

- |                                     |                             |                             |                             |                             |                             |                             |                                 |
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**Step 5. Sponsorship: Who told you about PDCA?**

Member Name \_\_\_\_\_

**Step 6. Method of Payment**

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# Daytona International Speedway Modifications

By Lindsay Williams



Aerial Innovations, Inc.

Daytona International Speedway, home of the Daytona 500, is renowned for the high-status “Great American Race,” drawing in thousands of die-hard fans every year since 1959.

As part of the recent modifications to Daytona International Speedway, a new tunnel was constructed under the race track’s Turn One to provide better vehicular and pedestrian access to the infield. It is large enough to allow haulers and motor coaches the ability to enter and exit the track while races are in progress.

The speedway hosts two major NASCAR annual races, the Daytona 500 in February and the Pepsi 400 in July, in addition to numerous other races throughout the year. This created a need for a very tight construction schedule. The race schedule dictated that the project begin immediately after the 2004 Pepsi 400 and be completed in time for testing in January 2005.

Ed Waters & Sons took the high-risk, high-profile job when only one

other contractor would even submit a bid. The contract required the design, installation, and removal of a sheet pile retaining walls to protect an excavation depth of 26’ below grade.

“The greatest obstacle to construction encountered was the schedule,” said Wayne Waters. “The project had to begin immediately after the Fourth of July race and the entire tunnel completed by December.”

The Speedway hosts nine major weekends of races, featuring everything from NASCAR to the World Karting Association. The top-line track is also reserved each year for more than two solid months for testing and development of various race vehicles. Rarely a week goes by that the track isn’t used for some kind of event, including civic and social assemblies, car shows, athletic games, photo “shoots,” production vehicle testing, and police motorcycle training.

The general contractor decided that the fastest means of completing the tunnel would be to use the “cut and cover” method. In other words, take

out a section of the race track, excavate to the required depth, construct the tunnel, place backfill, then reconstruct the missing section of the track. The tight time frame meant there was no room for error.

“The work on the sheeting and shoring operation was performed by working 6-10 hour days,” said Waters.

Sheeting was provided by PDCA member Piling Products, Inc. (PPI). Another PDCA member, Pile Equipment Company, supplied a stand-by-vibratory hammer. The site was comprised of loose to medium dense sands with shell to a depth of about 30 feet. Below that depth were very dense sands. Since the required cut was 26 feet deep in some places, the piling required was CZ-128, 31’ to 35’ in length.

“Driving was sometimes hard in the final five feet,” said Waters, “so we used an ICE 812 to drive them to tip elevation.”

The depth of excavation required that the sheet pile wall be restrained. The width of the excavated trench and the nature of the permanent tunnel

structure eliminated conventional internal bracing as an option. External wall restraints were required. To accomplish this task, Ed Waters & Sons utilized helical anchors manufactured by PDCA member A.B. Chance. As the excavation progressed, holes were cut in the sheet pile wall through which helical anchors were screwed into the soil until they achieved a desired resistance. The anchors were then attached to the sheet pile wall through the use of a double-channel wale. This system provided a wide-open trench that allowed tunnel construction to proceed as rapidly as possible.

Ed Waters & Sons completed the installation of the sheet pile walls two weeks ahead of schedule. Therefore, the subcontractors following the sheet pile work were required to start earlier than the schedule showed. This proved to be vital in efforts to meet the concrete deadline, since those two weeks were desperately needed as a result of the active 2004 Hurricane Season.

“The most remarkable aspect and probably the one thing that set the

project off on the right start, was the fact that the sheeting installation was done in half of the time shown on the project schedule. As a result, the activities following accelerated their efforts to catch up,” said Waters.

Daytona Beach was affected by three hurricanes during the course of the work. This was the basic environmental concern of the project. Hurricane-related rains caused flooding, which overwhelmed the dewatering system. The excavated trench resembled a lake at times. In the end, despite being fast-tracked, and requiring week-end and night work, there were no incidents or accidents.

In order to keep on schedule for such a high-profile and fast-track job, planning and communication were a must. Ed Waters and Sons’ superintendent of 35 years, James Davis, was chosen as the on-site superintendent and reported directly to Wayne Waters. Mandatory on-site meetings were held daily at 6:30 a.m. with the general contractor and project management team.



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“The most interesting thing about the project to me was visibly watching the literal demolition of the 250-foot wide piece of the speedway for this tunnel construction,” said Waters.

The removal of the section of race-track is a very sensitive issue at best. Precautions were taken to assure that no damage occurred to the adjacent track. To minimize vibration and noise, vibratory hammers were utilized for sheeting installation.

“There was a total of 700 feet of trench and 1400 wall feet of steel sheeting piling,” he said. “The piling was extracted in November so that the track could be replaced by the end of December.”

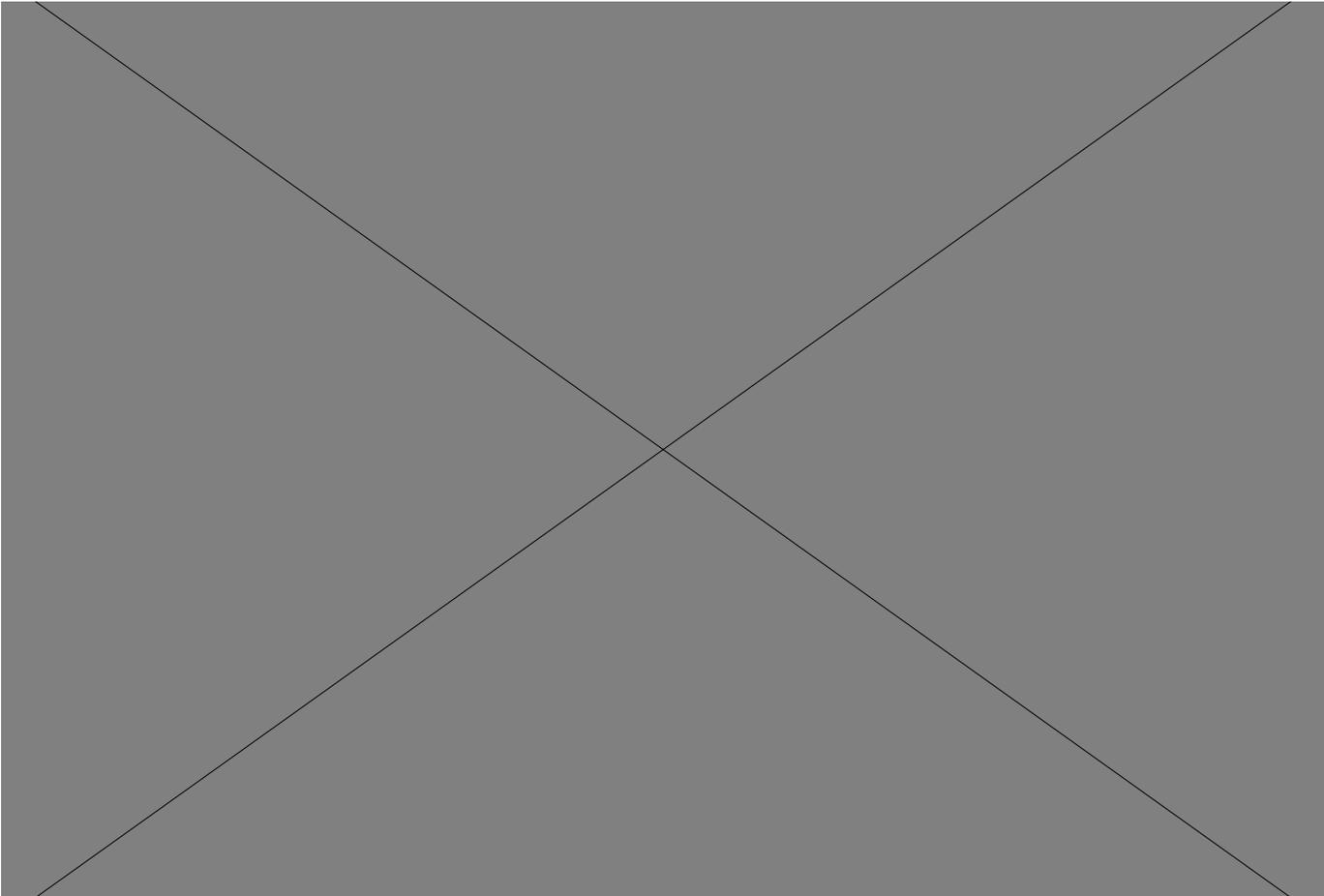
Daytona’s racetrack renovations also include a uniquely designed Fan Zone, a waterfront vehicle parking area, much-needed new garages and a Gatorade Victory Lane, which allows fans to become more of a part of the final celebration.▼



**Joseph W Kidd, P.E.**

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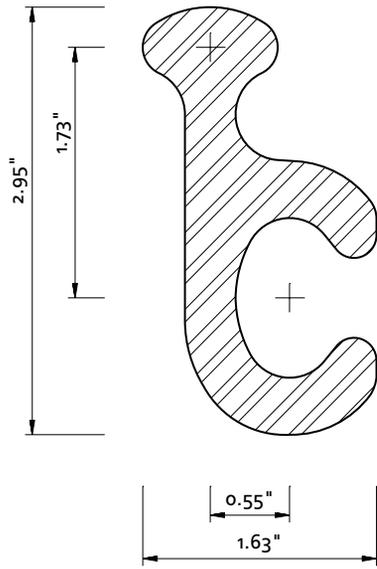
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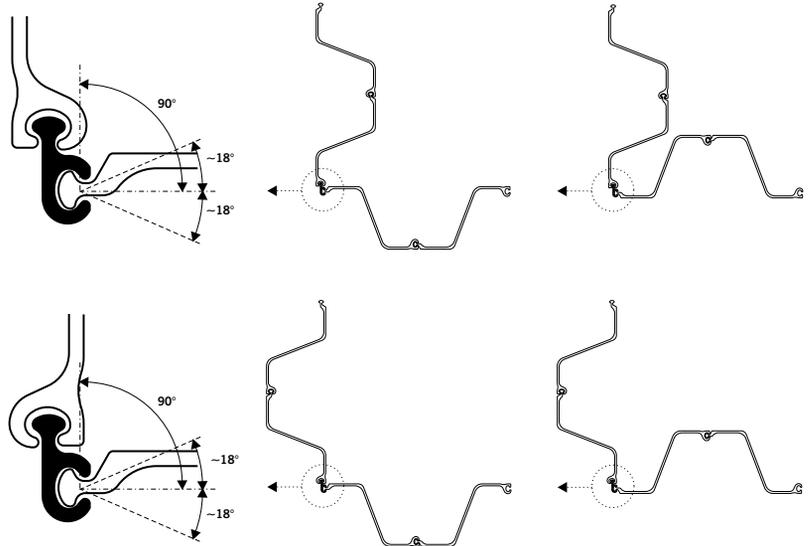


**Weight:** 7.3 lbs/ft (10.9 kg/m)

**Steel grade:** Astm A572 Grade 50 (S 355 GP)

## Proper Interlocking Examples

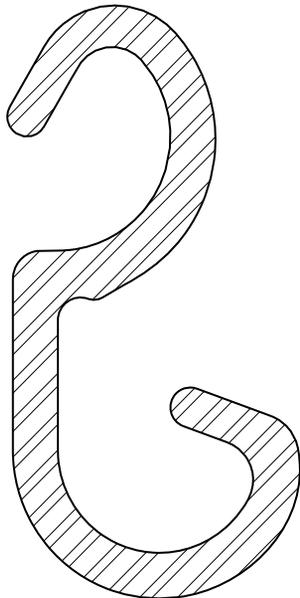
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# ⌘ V20

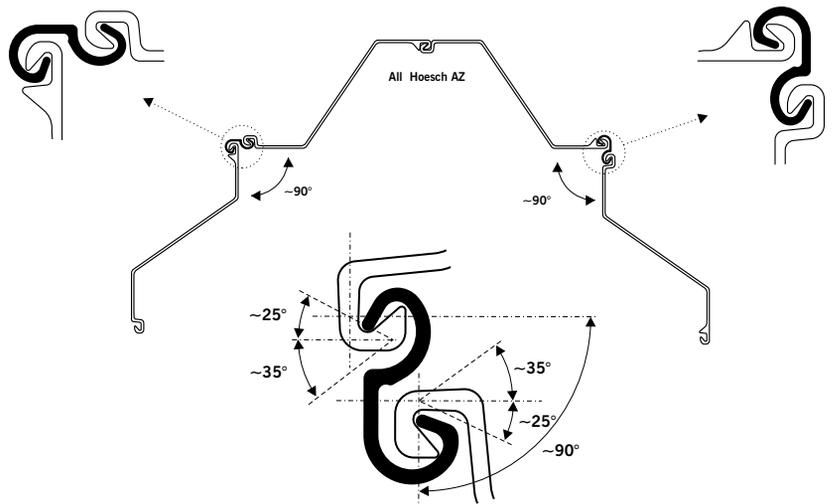
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**Applications:** 90° corner (~25° to ~155°)



**Weight:** 8.9 lbs/ft (13.2 kg/m)

**Steel grade:** Astm A572 Grade 50 (S 355 GP)



## Installation Guidelines:

1. Thread the connector into the interlock while the sheet pile is out of the ground.
2. Adjust the connector to the appropriate position.
3. Tack or spot-weld the connector in place (typically a 10" weld attaching the connector to the sheet pile at the top is sufficient.)
4. Drive/extract the sheet (with the connector attached) as you would normally.

	For PZ and PZC (Ball + Socket)		
	<b>PZ 90</b>	Corner (~50° to ~130°)	<b>Page 3</b>
	<b>PZ Tee</b>	Tee Corner (~50° to ~130°)	<b>Page 4</b>
	<b>Joker</b>	Tee Corner (~50° to ~130°)	<b>Page 5</b>
	<b>Bullhead</b>	Tee Corner (~50° to ~130°)	<b>Page 6</b>
	<b>CBF</b>	Tee Corner (~50° to ~130°)	<b>Page 7</b>
	<b>Colt</b>	Corner (~25° to ~65°)	<b>Page 8</b>
	<b>Cobra</b>	Corner (~115° to ~155°)	<b>Page 9</b>
	<b>PBS-M/ PBS-F</b>	PZ / PZC + Peiner Beam	<b>Page 10</b>
	<b>BBS-M/ BBS-F</b>	PZ / PZC + Domestic Beam	<b>Page 11</b>
	<b>WOM/ WOF</b>	PZ / PZC + Pipe Weld-on	<b>Page 12</b>
	For All AZ and Hoesch 1706, 1806, 1856 and 1906 (U-Piles/Larssen)		
	<b>V 20</b>	Corner (~25° to ~155°)	<b>Page 13</b>
	<b>VTS</b>	Tee Corner (~45° to ~135°) Circular driving	<b>Page 14</b>
	<b>VT</b>	Tee Corner (~45° to ~135°) Omega corner	<b>Page 15</b>
	<b>Omega 12</b>	Omega corner Jagged U-Walls	<b>Page 16</b>
	<b>V 22</b>	Larssen Interlock + Pipe Weld-on	<b>Page 17</b>
	<b>PL</b>	Larssen Interlock + Peiner Beam	<b>Page 18</b>
	<b>PLZ I/ PLZ II</b>	Peiner Beam + Larssen-Z Piles	<b>Page 19</b>

	For Hoesch-Z Piling (with a width of 22.64 inches or 575 mm)		
	<b>HZ 90</b>	Corner (~45° to ~135°)	<b>Page 20</b>
	<b>HZT</b>	Tee Corner (~45° to ~135°)	<b>Page 21</b>
	<b>HZ</b>	Variable weld-on	<b>Page 22</b>
	<b>PHZ-Claw (PZL)</b>	Hoesch-Z + Peiner Beam	<b>Page 22</b>
	<b>PHZ-Knob (PZR)</b>	Hoesch-Z + Peiner Beam	<b>Page 23</b>
	For Hoesch-Z Piling (with Hoesch Interlock and a width of 30.15 inches or 675 mm)		
	<b>HZn 90</b>	Corner (~45° to ~135°)	<b>Page 24</b>
	<b>HZTn</b>	Tee Corner (~45° to ~135°)	<b>Page 25</b>
	<b>HZn Knopf</b>	Weld-on	<b>Page 26</b>
	<b>HZn</b>	Variable weld-on	<b>Page 27</b>
	For PS-Flat Sheet		
	<b>SWC 120</b>	120° Y Pile	<b>Page 28</b>
	<b>SWC 90</b>	90° Tee Pile	<b>Page 29</b>
	<b>SWC 60</b>	60° Y Pile	<b>Page 30</b>
	<b>SWC 30</b>	30° Y Pile	<b>Page 31</b>
	<b>SWC</b>	Weld-on	<b>Page 32</b>
	Sealing sheet piling		
	<b>WADIT®</b>	Non-toxic hot cast interlock sealant impervious to weather	<b>Page 33</b>

# Safety Thoughts for Pile Drivers for a Successful 2006

By Mark J. Rice, Esq.

Safety is the pre-eminent concern on any project. Safety runs through the veins of most contractors, and especially, pile drivers. Safety pays dividends – not only in the reduction of injuries, but in smoother more profitable projects, lower insurance premiums, better morale, and improved customer relations. This article touches on a few timely safety issues for the pile driving industry, and how to ensure the “Safety First” mentality can be applied in practice on piling projects.

## Over Head Loads and The OSHA Safety Orders

Most piling is done with cranes and booms, with piles driven vertically using leads after being lofted into place. Most crane work for piling involves at least three hoist and brake drums for hammer, pile, and leads. Most crane operators have but two feet and two eyes, but they have the benefit of the foreman, lead man or spotter, and rest of the pile crew to assist as eyes, ears, and support. These coordinated tasks are critical lifts in many cases. While often routine, the risk of injury or property damage can be great, even catastrophic, from even a moment's lapse of attention, or breach of proper procedure.

Most state occupational safety regulations have some safety orders specific to pile driving. However, many of these orders are fairly vague, and difficult to interpret just by reading the safety regulations. Often, these safety regulations are inartful attempts by legislators or occupational safety department heads to reflect their view of “best practices” in the field, at the time of the enactment. In the years since these safety standards have been announced, the piling industry and know-how has continued to become more sophisticated, and project challenges more and more unique. It is not clear that the Safety Orders have kept pace with new developments, equipment, and the additional length of many new driven piles. Pile rigs are getting bigger and more productive, meaning longer piles are more common. Therefore, best practices involves periodic review of the Safety Orders applicable to piling, especially on projects with new challenges and equipment (or unusually tight space requirements) to ensure the field practice comports with the safety orders.

Safety Orders concerning overhead loads can be particularly difficult to interpret. Clearly, all regulations prohibit a person to stand directly underneath a lofted pile, or under an active hammer. But, what about a 150 foot long pile, while being lofted from horizontal to vertical? Is the load an “overhead load” if directly overhead, or within the radius of where such a pile might fall by operator error? Some OSHA penalty cases use the concept of a “Zone of Danger” to characterize what is meant by an overhead load. Then, what constitutes the “Zone”?

California recently revised its overhead load legislation, which can be found at [www.dir.ca.gov/oshasb/piledriving2nd15-day.pdf](http://www.dir.ca.gov/oshasb/piledriving2nd15-day.pdf), including its meeting minutes crafting the new Safety Order. The safety minutes reflect a terrific discussion of the tension between practical application and the choice of words in a statute. The California OSHA Advisory Committee first determined that the Federal OSHA definition of an “overhead load” was too broad and was unworkable, onerous, and unreasonable. The Federal Standard is at 29 CFR 1926.603 (c) (5) specifies a danger zone equal in diameter to twice the distance of the longest pile – meaning a project would literally have to stop each time a long pile is lofted. Instead, California OSHA chose to develop safety based concepts and not use exact measurements, which can be both onerous and not truly achieve safety. Cal OSHA chose to adopt a “zone of danger” concept, and emphasize that welders splicing piling, wear hoods, and need protection from falling objects in particular since they, unlike other crew members, are not able to “look up” during welding.

In California's new Construction Safety Orders 1600 and 1601, relating to piling, contain the following key terms and concepts:

1. “A danger zone” shall be delineated around the operating hammer where employees involved in cutting, chipping, or welding shall be prohibited to protect them from the hazards of falling objects. The employer shall establish the danger zone.
2. Cal OSHA initially proposed, then deleted, a requirement for written “site specific safety plan” or SSSP, developed by a competent person, before the start of the job. However, many state agencies require as part of their specifications, that the contractor and its piling subcontractor each submit a site specific pile handling plan. Site specific pile handling plans are today's “best practice” especially on challenging projects with longer piles and tighter access.
3. Had OSHA made this the law, its criteria would have been that an SSSP include an outline of the construction plan, a list of potential safety and health hazards, and the steps and procedures necessary to protect employees (including methods to minimize exposure to drill or hammer; to provide safe access, handling, storage and set up; a work schedule and minimum number of employees needed to safely complete each step; special job procedures and trainings for shoring; emergency response; traffic control; confined spaces; proximity to overhead lines; and work over water).

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Has your state updated its piling safety orders? Do they make sense in light of current piling methods? Consider doing what others have, and join the OSHA advisory board, and help implement practical safety rules that take into account real situations in the field.

**Critical Lift Plans**

Pre-planning of critical lifts, and use of written critical lift plans, are an integral part of safety redundancy. Such plans avoid the risk of "seat of the pants" improvising in the field by a foreman or operator that is not carefully thought through, or which do not factor in fully all the loading data and site criteria. Often, what is needed is a call to the customer or prime contractor to change the space available for the operation rather than proceed into a "make do" situation. A critical lift plan should be based on a full and proper assessment of the full load, hammer, leads, pile, sheaves, friction, rope, etc. Like a football team working from a playbook, over-learning the game plan through advanced planning, training, and repetition can be a great resource to protect employees and the jobsite from accidents.

**Soil Conditions And Access**

Pile driving proposals typically require the customer to provide level, all weather access, and call for mats as an extra cost in case of uneven or soft ground. Procedures for verifying proper compaction are important to ensure that the promised access and soil conditions are kept and maintained.

**Utilities – Overhead And Underground**

Most states require all crane work be at a specified distance away from overhead power lines. With laser measuring devices now available, knowing the distance from a boom and an overhead line should be simple. Pile driving proposals should provide that such obstruction, above and below ground, are removed by the customer prior to piling work and at no cost to the pile driving contractor.

Underground utilities pose unique problems, especially with the advent of more costly and risky pipelines and ducts for fiber optics and jet fuel. The as-built drawings for underground infrastructure are often inaccurate. Potholing techniques are not always up to standard. Most states have a form of "Call USA" statute (USA meaning "Underground Service Alert") where utilities will mark their utilities upon a call to a designated utility clearing house. The marking assists in determining where to pothole, but the contractor still needs to verify the exact location of the utility, usually with hand tools. Failure to call USA can lead to strict liability to the utility and damages not only for repair, but business interruption to third parties relying on telecommunications, water, or gas lines.

**Safety Meetings And Ongoing Training**

Most contractors use a Monday morning "tailgate meeting" format led by the project foreman, and the primary conduit to alert the workforce to site specific risks. To be effective, these

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meetings need to be tailored to the risks at hand, interactive, and periodically attended by upper management (superintendents). Such corporate interest invariably communicates a bottom line message – these trainings are serious and all employees are expected to be attentive. It also expresses a company's valuing of its workforce and its safety.

Pile Driving Techniques, access issues, and safety requirements often change, so periodic safety tune-ups at foremen meeting levels, or in a corporate safety review or audit are worth doing. Safety is often about planning for space, presetting procedures, and ensuring attention and a lack of hurrying during critical junctures. Safety woven into project management concepts will improve both safety and project management.

#### Your Crane Maintenance Program

Well maintained equipment, properly suited to the task at hand, is a key safety component. Are the operating and maintenance manuals up to date, and on the crane? Are the maintenance records kept by equipment, including repair costs, labor, as well as daily, and 40 hour and 90 hour inspections? Are the certifications up to date? Is the equipment being used and accessorized consistent with manufacturer's recommendations? Are the load charts accurate and posted in the cab? All these questions are valuable to review as part of a safety audit.

#### Learning From Mistakes – What Really Causes Accidents?

Accidents, in construction and in life in general, are largely avoidable and preventable. More often than not, the cause of an accident is simple inattention, combined with a lack of pre-planned "escape route." Hurrying, lack of space, and misused equipment are often contributors to an accident risk.

Think of safety as a project schedule unto itself. The more space, more time, and more pre-planning that is available, will generally translate into improved safety and afford a greater margin for safety. Build your project plan based around safety redundancy, buffer space and recovery space. Use "what if" scenarios to contingency plan for problem events so they can be recovered from without an accident happening.

Finally, keep in mind that all safety is driven by human beings – your own employees and the personnel of others. Be realistic about the level of expertise, attentiveness and safety training of each employee, and the team chemistry for each crew and its foreman. Keep safety foremost in everyone's mind, and safety will not be a "reminder" but a fundamental premise of the work. For pile driving inspectors and engineers, consider safety in the project design and set a tone in project meetings that safety concerns will be honored. A "Safety First" environment will ensure a smooth project and protect the project and personnel from accidents. ▼

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*Mark J. Rice is an attorney specializing in construction law including the representation of pile driving companies in collections, claims, insurance and risk management. He can be contacted at [markjrice@aol.com](mailto:markjrice@aol.com).*

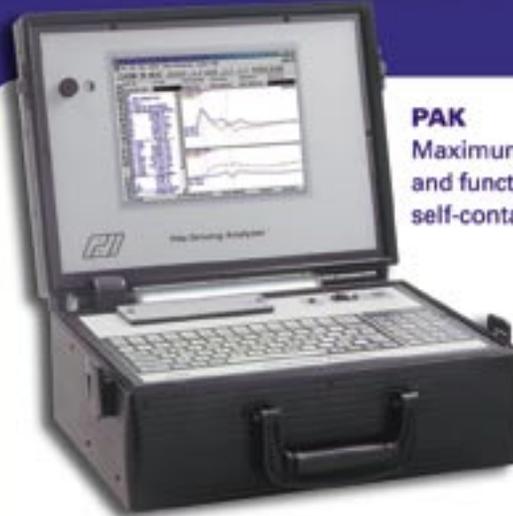
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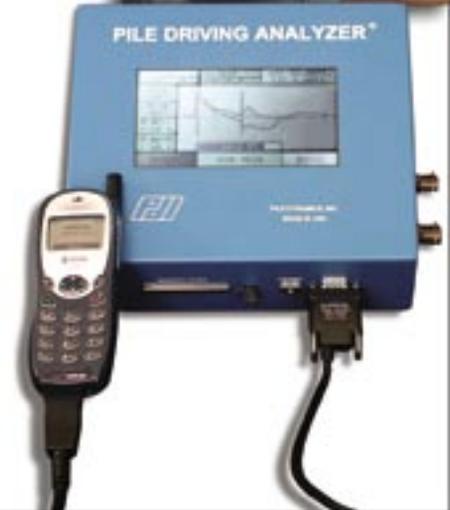
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# Design of Prestressed Concrete Piles for Seismic Loads Adds a New Dimension

McLeod C. Nigels, P.E. FPCI Senior Associate Davis & Floyd, Inc.

The design of piling in the Charleston, S.C. Area has become more focused on seismic design with the advent of the International Building Code.<sup>1</sup> Regardless of the type of pile selected, design involves a greater awareness of the need for ductility in pile foundations. In years past, the selection and design of piles for use in building foundations has been a simple process in which standard designs were considered for vertical loads. The selection of piles simply meant estimating gravity loads and dividing those loads by allowable axial loads on piles. The piles used were generally 10" square. Lateral loads due to wind or earthquake were taken by providing batter piles. It was general practice to assume that the reactions from lateral loads became axial loads on the batter piles, so piles were not assumed to be subjected to bending moments.

A presentation by Margason<sup>2</sup> in 1977 called attention to the fact that batter piles fared poorly in recent San Francisco earthquakes. If batter piles were not to be used in cases where they had been used in the past, vertical piles were to be called upon to provide enough bending moment capacity to provide lateral resistance. This required piles to be

Table 1: section properties and allowable concentric loads for the three commonly available building foundation piles.						
Size (Inches)	Area (Sq. In.)	Prestress Strands	Effective Prestress	Allowable Axial Load In Tons F'c		
				5000	6000	7000
10	100	4-7/16"	804	71	88	104
12	144	4-1/2"	750	104	128	151
14	196	6-1/2"	819	140	172	204

Figure 1.

stronger and, as a result, piles became larger. Whereas piles were 10" square, they are now generally 12" or 14".

Larger piles are often used in bridge and marine construction but these larger piles require heavier handling and driving equipment than that generally found at building construction sites.

Fig. 1 provides a table showing section properties and allowable concentric loads for the three commonly available building foundation piles. The table also includes a list of the commonly used prestress strand for each pile with the corresponding calculated effective prestress after losses.

Along with greater need for bending capacity, the analysis of piles for

seismic loads indicated the need for greater ductility. Research performed and articles written indicated the need for greater confinement of the "core" of the pile in order to provide greater ductility. The "core" is defined as the central portion of the pile cross section defined by the spiral. Sheppard<sup>3</sup> reported on research done regarding the behavior of prestressed concrete piles subjected to curvatures similar to those to which piles are subjected to during an earthquake. A method to analyze flexural strength and ductility by increasing the spiral reinforcing is presented in a paper by Joen and Park<sup>4</sup>. The results of research conducted in New Zealand are summarized by a later

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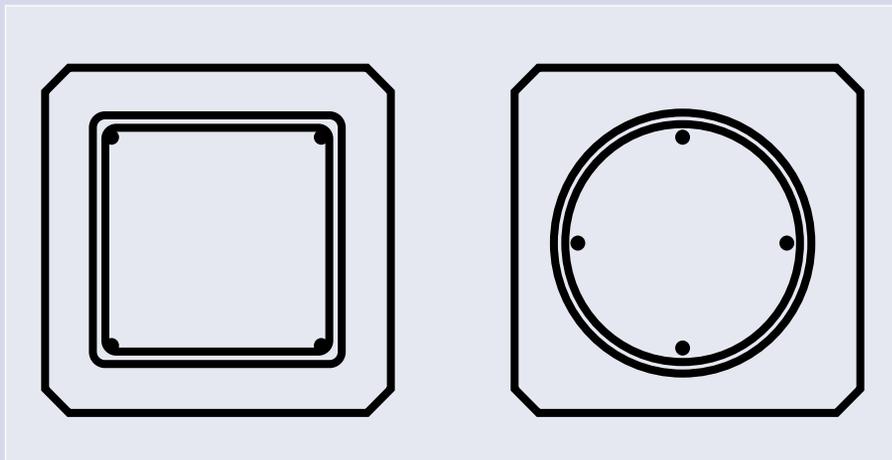


Figure 2.

paper by Joen and Park<sup>5</sup>. Fig. 2 shows typical cross sections of piles, both with square and circular spiral.

### Typical Sections through Piles

Circular spiral wire is generally much larger than the W3.4 wire formerly used as standard spiral. Seismic spiral is circular because of the desire to use the spiral in direct hoop tension to confine the core. (In addition, it becomes impractical to attempt to bend the larger wire in a square).

The upper portion of a pile surrounded by soil and subjected to seismic loads is referred to as the “ductile zone”. The IBC requires that the ductile zone be at least the upper 35 ft. of the pile and that the spiral ratio in this region meet certain criteria. A series of equations is provided and the spiral ratio is required to equal certain minimums. The spiral in the lower portion of the pile, below the ductile region is required to be equal to half that required within the ductile zone. Therefore it is usual practice to provide a spiral pitch throughout the lower portion of the pile twice that provided in the ductile zone.

In 12” square piles it has become the usual practice to provide seismic spiral in the ductile zone consisting of W10 wire at 2” pitch. W10 Wire has a diameter of 0.34-in, close to 3/8”. 14” square piles are usually provided with

W12 Wire at 2” pitch within the ductile region. Such heavy wire is a much more important portion of the cost of a prestressed concrete pile than the W3.4 wire was in days gone by before seismic design was considered. Not only is the cost of the wire a concern, but the congestion caused by the closely spaced wire in the form is of primary concern as well. Whereas a contractor casting concrete in a building column has to cast concrete down both sides of a column spiral, the pre-caster is faced with the task of casting through two layers of confinement reinforcement along the length of the form. Fig. 3 illustrates congestion when 12” square piles are prestressed using 6 strands and reinforced using W10 Wire spiral @ 2” pitch.

### Pile Connections

In the design of pile foundations, piles often are required to be designed for uplift or fixity at the head of the pile. The Code (1808.2.23.1.1) requires reinforcing at the interface between the pile and the pile cap. Reinforcing for this usage can consist of prestressing strand and/or mild steel reinforcing. The four usual options are:

- 1) Cast the pile longer than required, with mild steel added if necessary. Cut the top of the pile off after driving, exposing the strands and/or dowels.



Photo courtesy Palmetto Pile Driving

Figure 3.

- 2) Cast dowels extending from the pile head. Cut holes in the driving helmet or spud so that the helmet or spud can fit over the extending dowels.
- 3) Drill dowel holes in the pile after driving and grout dowels into the holes.
- 4) Cast dowel holes in the pile and grout dowels into the dowel holes after driving.

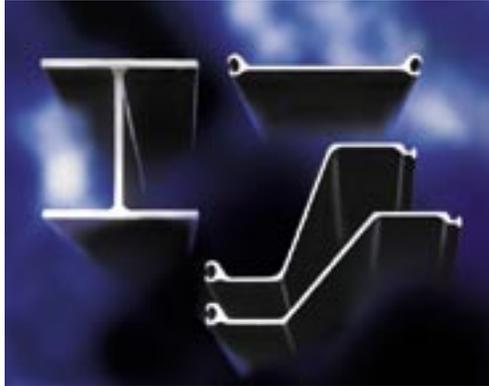
In this area, the generally accepted practice is to cast dowel holes. This avoids the necessity of cutting off the top of the pile as required under (1), cutting holes in the driving head under (2), or field-drilling dowel holes as required under (3) above.

The dowel hole is generally formed with spiral metal tubing similar to that used in post tensioning sheathing.

The selection of the diameter and length of the dowel hole depends upon the size of the dowel required. The length must accommodate the development length of the dowel and, usually, the development length of the strand. Fig. 4 illustrates design considerations.

The size and number of dowel holes that can be safely provided at the head of a pile must be limited. If

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Section Designation	AREA		WIDTH		HEIGHT		WEIGHT (MASS)				MOMENT OF INERTIA		SECTION MODULUS				SURFACE AREA					
	in <sup>2</sup>	cm <sup>2</sup>	in	mm	in	mm	lb/ft	kg/m <sup>2</sup>	lb/ft <sup>2</sup>	kg/m <sup>2</sup>	in <sup>4</sup>	cm <sup>4</sup>	Per Single	Per Wall	Per Single	Per Wall	Total Area	Nominal Area*	ft <sup>2</sup> /ft	m <sup>2</sup> /m	ft <sup>2</sup> /n	m <sup>2</sup> /m
<b>P222</b>	11.9	76.6	22.0	559	9.0	228.6	40.3	60.1	22.0	107	151	6301	32.5	532	17.7	952	4.92	1.50	4.48	1.37		
<b>P227</b>	12.1	78.2	18.0	457	12.0	304.8	40.5	61.3	27.5	134	282	11734	45.3	742	30.2	1622	4.93	1.50	4.48	1.37		
<b>PS27.5</b>	13.4	86.6	19.7	500	—	—	45.1	67.9	27.8	136	5.02	209	3.19	52.2	1.94	104	4.58	1.40	3.88	1.18		
<b>PS31</b>	15.2	98.2	19.7	500	—	—	50.9	77.0	31.5	154	5.51	229	3.35	55.0	2.04	110	4.58	1.40	3.87	1.18		

\*Note: Nominal coating area excludes socket interior and ball of interlock.

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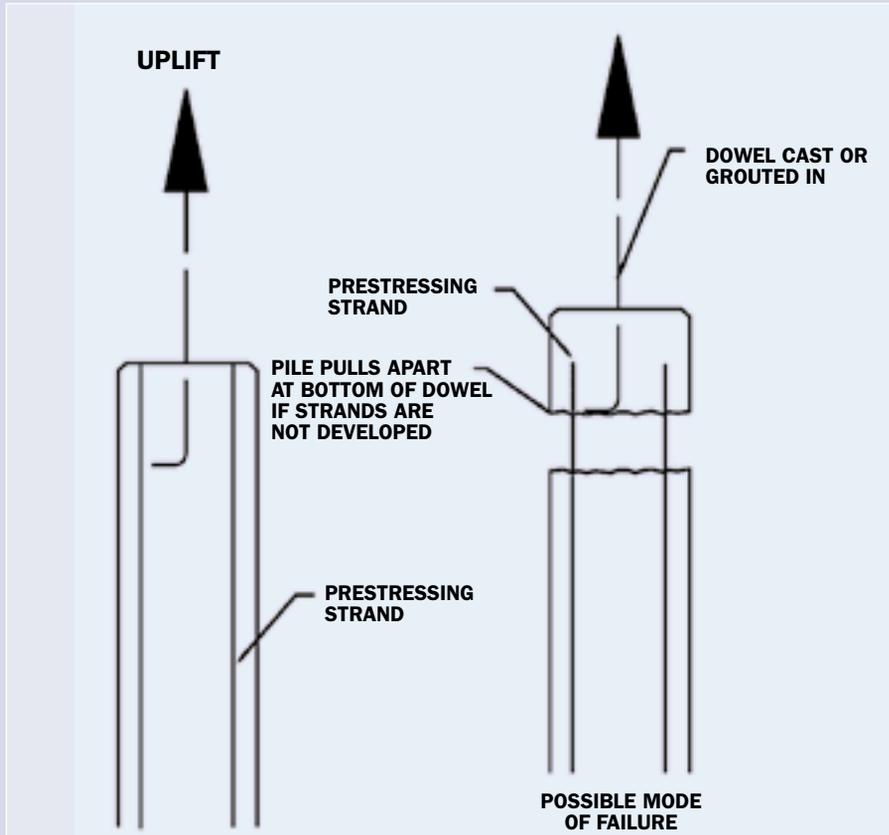


Figure 4.

the cross section of the pile is excessively reduced and hard driving is encountered, the result can be damage to the pile due to driving stresses. In the case of 10" piles, experience has shown that the number of dowel holes must be limited to two. For other piles, as a general rule of thumb, the cross

section should not be reduced more than approximately 6 percent. Most dowel holes are 1¾" dia. for smaller piles and 2" dia. for others. The number of dowel holes provided in 12" and 14" piles is generally limited to four.

A paper<sup>6</sup> by the author discusses the design of dowel connections for uplift.

The design of piles to resist lateral loads due to earthquake has changed the design of pile foundations. However, even with the increased cost due to seismic spiral, prestressed concrete piles remain the piling of choice in the local area as they have been for more than forty years. ▼

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- <sup>3</sup> Sheppard, D.A., "Seismic Design of Prestressed Concrete Piling," PCI JOURNAL, V.28, No. 2, March-April 1983, pp. 20-49.
- <sup>4</sup> Joen, P.H., and Park, R., "Flexural Strength and Ductility Analysis of Spirally Reinforced Prestressed Concrete Piles," PCI JOURNAL, V.35, No. 4, July-August 1990, pp. 64-83.
- <sup>5</sup> Joen, P.H., and Park, R., "Simulated Seismic Load Tests on Prestressed Concrete Piles and Pile-Pile Cap Connections," PCI JOURNAL, V.35, No. 6, November-December 1990, pp. 42-61.
- <sup>6</sup> Nigels, McLeod C., "Prestressed Concrete Tension Piles and Their Connections", PCI JOURNAL, V.43, No. 4, July-August 1998, pp 138-140.

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## PDCA Member

# William J. Lytle of Midlantic Piling

**Midlantic Piling's humble beginnings started on Sept. 5, 1990 with two silent partners and an office in the basement of William J. Lytle's York Pennsylvania home.**

By *William A. Lytle*



The Lytle family poses in front of the World War II Memorial in Washington, D.C.

These days, with about 20 employees and an office located outside of a residential neighborhood, this father-son company is able to take on more high-profile projects. And those projects produce just as much personal and patriotic satisfaction as they improve prominence among the piling community.

The company is still under the leadership of William J. Lytle, with his son, William A. Lytle stepping in as Secretary Treasurer of Business Operations.

Of the many projects under Williams A. Lytle's belt, there are two that stand out above the rest.

"Raven's Stadium in Baltimore and the World War II Memorial in the National Mall in Washington D.C.," says Lytle. "Obviously, by the titles, both projects appear to be more socially relevant than an interstate highway bridge or an industrial warehouse. These projects were important to our firm in ways greater than our marketing image."

Since most of the company's work is non-descript, the end result is usually buried, leaving no visible reminders that Midlantic was ever involved.

However, when the Maryland Stadium Authority offered the foundation package as a separate contract in the summer of 1996, the fact that Midlantic Piling was able to compete signaled to the local construction industry that it was a viable subcontractor in the market, says Lytle.

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World War II Memorial in Washington, D.C.

Due to the tight schedule of Richard Goettle, the prime contractor, and production demands, Midlantic Piling was contracted to supplement the effort.

News of constructing a new monument dedicated to the veterans of WWII hit home hard for William J. Lytle. As a former Marine and armed with a vast knowledge of the geology of the area, he secured the contract with Tompkins Gunley Walsh to create the concrete tribute in fall of 2001 at the National Mall.

Ultimately more than 550 H-piles were driven, says Lytle. Steel sheeting also was required to construct the underground utilities and storm water vault.

“With the steady growth of the company and the backlog this project provided we were able to purchase



Raven's Stadium in Baltimore, MD

our first new crawler crane, a Link-Belt LS-218H,” he says. “Previously, we had met our requirements through our refurbished truck cranes and rentals.”

At the completion of the project, William J. Lytle acquired a personal sense of joy when he met General P.X. Kelley, U.S. Marine Corps (ret.), a former Villanova classmate and chairman of the American Battle Monuments Commission overseeing the construction at the contractor's appreciation event in May of 2004.

After executing those projects with such perfection, it is no wonder that Midlantic prides itself on its client relations and their philosophy, which is based on mutual respect.

“The client is looking to us to perform

a specialized classification of work in a professional, competitive and efficient manner,” says Lytle. “We are comfortable with the limited scope of a subcontractor.”

When it comes to the basis of the company's success, Lytle is adamant that simply getting the work done is the main factor.

Price, he says, can be important. But schedule and competence are the driving factors. Occasionally, there have been some instances of general contractors seeing Midlantic's quote and deciding to do the job themselves, thinking: “How hard could it be?”

But they have no idea of the testing and procedures that must be addressed prior to just installing a pile, Lytle says. These same general contractors have



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**Lytle touts safety as being incredibly vital to the business. The fact that Midlantic is a subcontractor exclusively without the pressures and problems that go along with being the prime contractor is key for just how safely the company runs its operations. Their work is limited to driven piling for foundations and support of excavation.**

become more comfortable leaving the pile driving specialty to subcontractors than taking the risk themselves.

Lytle touts safety as being incredibly vital to the business. The fact that Midlantic is a subcontractor exclusively without the pressures and problems that go along with being the prime contractor is key for just how safely the company runs its operations. Their work is limited to driven piling for foundations

and support of excavation.

“Our limited scope assists in our safe operating environment in that the work cycle is routine,” he says. “The jobs change, but the process remains.”

Since the company’s founding in 1990, the Lytle’s managed to keep intact a core group of loyal employees, many of who started at the bottom and worked their way up, from crewmember to leadership.

Lytle says he does it that way so they become familiar with the work and the company’s specific approach to the operations.

“Treat everyone fairly,” he says. “Demand the best and give the best. Each position brings its own responsibility and importance to the organization.”

And as a union company, Midlantic finds that the union life can ease things up when the workload requires additional staffing. The union provides skilled, trained and experienced personnel and can satisfy any requirement with a person who is already up to speed with the operation.

William J. Lytle, president of Midlantic, graduated from Villanova University in 1960. Married to his wife, Patricia, for 45 years, they have three daughters, Julie, Mary Lynne, and Karen in addition to son William A. Lytle. The latter Lytle graduated from the University of Notre Dame in 1987. He has been married to wife Sharon for 14 years, with son Bill and daughters Sarah Rose and Maggie.▼

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# PDCA **Calendar of Events**

## **PDCA 10th Anniversary Annual Conference**

Hilton Palacio Del Rio • San Antonio, Texas • March 2 - 4, 2006

See pages 8 through 14 of this issue for more conference information and registration forms.

### **March 8, 2006:**

**Seminar on Foundation Testing and Analysis.** The seminar is geared towards geotechnical, structural engineers and construction engineers, as well as to contractors and other professionals involved in the design, construction and specification of deep foundations. Suitable for those new to this field.

### **March 9, 2006:**

**Pile Driving Analyzer and CAPWAP Workshop.** Geared towards Pile Driving Analyzer and CAPWAP users interested in sharpening their skills; engineers, foundation testing professionals, students and professors already familiar with the basic concepts of deep foundation dynamic testing and analysis.

### **March 10, 2006:**

**Wave Equation Workshop (GRLWEAP).** This seminar is geared to all engineers interested in an introduction or a refresher to the GRLWEAP software for pile driving simulation and analysis. A portion of the workshop is devoted to the theory of wave equation.



  
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# PDCA New Member List

We would like to welcome the following new members. Please visit the PDCA Web site at [www.piledrivers.org](http://www.piledrivers.org) and click on Member Search for complete contact information on all members.

## New Contractor Members

### Ahrens Piledriving

Cheyenne, Wyoming  
Contact: Mark Ahrens  
Services provided: Bulkheads, deep excavation, marine, pile driving

### Foundation Materials

New Orleans, Louisiana  
Contact: Paul Tassin  
Services provided: Pile driving, general contractor

### Franks Casing Crew and Rental

Lafayette, Louisiana  
Contact: Donnie Crain  
Services provided: Marine, pile driving, off-shore, pipe sales, equipment sales & rental

### Herlihy Mid-Continent Co.

Romeoville, Illinois  
Contact: Arthur Haggerty  
Services provided: Bridge building, docks & wharves, earth retention, general, highway & heavy civil, marine, pile driving

### Kuhn Construction

Hokessin, Delaware  
Contact: M. Lawrence Kuhn  
Services provided: Docks & wharves, marine, pile driving

### McDowell NW Piling, Inc.

Contact: Michael McDowell  
Kent, Washington  
Services provided: Pile driving contractor, earth retention, general contracting

### Pilotes Y Entibamientos Ltda

Santiago, Chile  
Contact: Roberto Born  
Services provided: Pile driving

### Saddlebrook Construction

Pickens, South Carolina  
Contact: Don White  
Services provided: Pile driving contractor, bridge building, earth retention, general contracting, highway & heavy civil

### Sea & Shore Contracting

Boston, Massachusetts  
Contact: Michael Lally  
Services provided: Bulkheads, deep dynamic compaction, deep excavation, docks & wharves, earth retention, general contracting, marine, pile driving

### Sun Marine Maintenance

Frankford, Delaware  
Contact: Michael R. Jahnigen  
Services provided: Pile driving contractor, bulkheads, docks & wharves, marine

### Waterfront Marine Construction

Virginia Beach, Virginia  
Contact: Ken Sutton  
Services Provided: Bridge building, bulkheads, general contracting, highway & heavy civil, marine, pile driving

### WH Engineering

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Services Provided: Bridge building, earth retention, highway & heavy civil, pile driving

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### Steve Kiser

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