

Laying a Career Foundation

Brent Robinson, P.E. of GRL Engineers, Inc. and Pile Dynamics, Inc. shares his story about getting involved in deep foundations

By Brent Robinson, P.E.

I was introduced to the profession of deep foundation engineering when I walked through the door of Frank Rausche's office, interviewing for a co-op position at GRL Engineers, Inc. I was a junior at Case Western Reserve University, studying civil engineering with a bent toward environmental engineering. I wish I remembered more about the interview, but I suppose the results matter most – Frank took a chance, and I found a career.

That co-op introduced me to stress waves, soil mechanics, driven piles, nondestructive testing and the value of international and academic collaboration. It informed my choices for the rest of my undergraduate degree, supplementing the environmental electives with geotechnical courses. Dr. Adel Saada's foundations course was fascinating, difficult and entertaining. In 1999, after completing my degree, I started full-time with GRL doing high strain dynamic pile testing and other nondestructive testing.

I saw pile driving on all its scales. We monitored small diameter closed end steel pipe piles driven with diesel hammers in New York and large diameter open end pipe piles driven with underwater hydraulic hammers offshore Saudi Arabia. We tested timber piles in Ohio, H-piles in California, concrete piles off barges in Alabama and recycled polymer piles in New Jersey. There is tremendous variation in the way our profession designs, constructs and pushes forward driven pile foundations.

While dynamic testing was in my blood, it was also clear further education would broaden my experience. When my wife matched in North Carolina for her medical residency, I went back to graduate school at North Carolina State University (NC State). Under the direction of Drs. Mohammed Gabr and Roy Borden, I learned soil mechanics, foundation design, geosynthetics and how they direct large multi-year research projects. The Constructed Facilities Laboratory's geotechnical and structural efforts in large-scale testing are also making important contributions to the practice.

NC State has a close partnership with the North Carolina Department of Transportation (DOT). With responsibility for a network of roadways from the Atlantic coast to the Appalachian Mountains, there is no shortage of geotechnical problems for the DOT to manage. I helped on projects looking at pile bent design and roadway construction techniques. What really struck me was the larger interactions between the faculty and students at NC State and the engineers at the DOT, and the partnerships that developed to push both the DOT's and the civil engineering department's efforts forward.

Returning to GRL and Pile Dynamics in 2010, I became more aware of how the interaction between universities, state and federal agencies, private engineering consultants and construction firms have significantly improved our practice. As Garland Likins and Frank Rausche described in the Member Profile in



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the third quarter 2012 issue of *PileDriver* magazine, GRL and Pile Dynamics were effectively launched from research projects performed at Case Western Reserve University and supported by the Ohio Department of Transportation, the Federal Highway Administration and many, many patient pile driving contractors. The decade-long shift to design-build projects and LRFD has also created a movement toward foundation systems that increasingly incorporate set-up over time in designs, mostly at the request of designers and contractors pushing to expedite construction. I would also echo Robert Thompson's comments in this space earlier this year, in that the shift toward LRFD and design-build is leading to the driving of greater numbers of large diameter open ended pipes. The design methods and evaluation of load carrying capacity is still catching up to what we can reasonably install, and I have no doubt there will be additional research projects necessary to optimize our design of these foundation systems.

My current position at Pile Dynamics allows me to discuss dynamic testing methods and operations with people all over the country and around the world, in conjunction with PDCA. Again, the applications of the technology to a country or region's typical

construction practices always show surprising new ways of thinking and new applications.

Our efforts to keep GRLWEAP up-to-date also put us into contact with the members of the hammer manufacturing community. They keep us on our toes with their constant improvement and changes to their fleets of hammers. As we redevelop increasingly urban environments, we are seeing these manufacturers adapt to the more stringent construction requirements with variable energy hammers, noise mitigation devices and improved methods of quality control. PDCA has also helped with this, developing noise and vibration databases to help its members fairly evaluate driven piles for potentially tightly controlled sites.

But all that is what I do as an engineering professional. Angela, my wife of almost 10 years, and Sonia and Julia, my six- and one-year-old daughters, share in these experiences directly or indirectly. They tolerate my identification of diesel hammers on road trips and are always happy to see me when I come home after being away for business. We enjoy traveling together, sharing movies and visiting Cleveland's world-class museums and other cultural resources.

All in all, it is my pleasure to be a part of the vibrant and constantly interesting profession of deep foundations. I always enjoy seeing the new situations our clients are encountering on their projects, working out the puzzles of how best to model these situations and trying to convey what we learn to the broader engineer and contractor community. I also appreciate the efforts of those who keep PDCA running, as the volunteer efforts of its members and the significant efforts of its staff require energy and time. I look forward to continuing GRL and Pile Dynamics' long commitment to improving pile driving practice through PDCA. ▼

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