Continuing the Tradition

After following a family tradition, Anna Sellountou explains her role in the world of deep foundations

By Anna Sellountou, Ph.D., P.E., Pile Dynamics, Inc.

Coming from an engineering family with my father, five uncles, several cousins and in-laws all being engineers, it is not much of a surprise that I decided to follow engineering. Such a choice fit well with my analytical and down-to-earth way of thinking, strong inclination toward math and love for accuracy. There was only one element missing, and that was how to satisfy my creative and artistic quests, which made my decision bounce between architecture and civil engineering. For better or for worse, the more technical nature of civil engineering prevailed and one more engineer was added to the family roster.

As I was getting exposed to the various facets of civil engineering, the geotechnical field impressed me the most. Buildings had to stand today and tomorrow, although founded in soils with a mind of their own, and you, as a geotechnical engineer, had to predict its conceptually complex behavior. You have to deal with the many uncertainties of soil and its inherent variability. Therefore, human judgment is irreplaceable. If that’s not job security, then what is? And that is how my journey started.

I completed my Master’s degree in civil engineering at the National Technical University of Athens (NTUA) in Athens, Greece, and in January of 2000 I came to Houston, Texas to pursue my Ph.D. under Professor Mike O’Neill, a mentor that greatly impacted my developing view of the world and significantly contributed in my subsequent professional growth. Soon after my graduation from the University of Houston in December 2004, I started my career with Fugro. And although my Ph.D. was on augercast piles, driven piles became my main interest.

My years at Fugro were fascinating. I was exposed to several big national and international projects. My start at Fugro coincided with the construction boom of several major LNGs, both in the U.S. and abroad, and I had the luck to work on almost all of them (i.e. Freeport LNG, Golden Pass LNG, Cameron LNG, the Shell Motiva Refinery Expansion, which was one of the largest refinery expansion projects in the U.S. at the time, and the Skikda LNG Reconstruction project in Algeria). That presented the opportunity to experience hundreds of driven piles being installed daily. I remember working with Tim Roberts and performing numerous static load tests, dynamic load tests, hundreds of CAPWAPs, correlating our static analysis predictions with the results from our static load tests and dynamic load tests. It was so exciting when you would see all the pieces coming nicely together. Those were great years.

During tenure at Fugro, I had the chance to work with Frank Rausche and Garland Likins at GRL Engineers and Pile Dynamics, Inc. (PDI). Fugro sent me to GRL/PDI to get formal training on dynamic testing and CAPWAP. Obviously, with all of Fugro’s exposure to pile driving, I had to continuously consult the experts, since dynamic load testing, CAPWAP and drivability studies were my bread and butter. Frank and Garland were very generous with their

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technical support during my time there. They were spending all the
time necessary to address my technical questions and help me with
my analyses. They had genuine interest to all technical issues that
arose (I guess that genuine interest is one of the reasons for their
ever-ending accumulated experience), and would share all their valu-
able knowledge with me. I was wondering when I would get the bill
for their advice... I never did.

Joining PD1 was the next most meaningful step in my career
(after a short break in-between, during which I explored the oil and
gas industry a little, just to realize that staying away from my area
of expertise was not fulfilling enough).

Joining PD1 to work on the research and development side of
depth foundation testing was the next big challenge I was thrilled to
take. I was so excited about the prospect that they had me move all
the way to Cleveland (where the corporate offices are) after 12.5
years of living in Houston. Driving in the snow was definitely a new
experience, but working for PD1 was worth the trouble.

Working alongside PD1's R&D team means working in a
pioneering environment where inventive minds come together to
develop the next deep foundation testing method from conception
to materialization. Here, I have the opportunity to participate in a
very rewarding process, which involves identifying an industry need
and creating an engineering solution for it. As the creation process
demands many engineering disciplines to work together, a team of
civil engineers, electrical engineers, software and hardware people
are joining efforts in order to accomplish a common goal; as you
become an active observant of the various stages and angles of the
development, you are called to participate with your contribution.

It is an intriguing process.

If I have to draw one conclusion so far, it is that design of deep
foundations is a complex matter, and perhaps that is the beauty of
our profession. Many uncertainties are still to be resolved and many
parameters should be considered for realistic analytical modeling, if
that is possible at all. Universal pile design guidelines and databases do
not exist and it is extremely difficult, if not impossible, to quantify all
the parameters that affect pile performance. Simplified design meth-
ods cannot give us consistently reliable answers. Therefore, it is critical
that testing is an integral part of safe and economical pile design.

When I am considering what is most important for our pro-
fession, I cannot convey anything better than to quote Dr. O'Neill's
remark in his Terzaghi Lecture (1998) regarding the design of deep
foundations:

...it requires time and effort by individuals who are dedicated
to excellence in foundation engineering – who consume higher
engineering costs that at the end of the day will lead to greater
economy and greater safety in the constructed foundation.
I am alarmed to see a growing complacency among owners
regarding the technical efforts and related investments that
need to go into foundation design – the belief that foundation
design is somehow a "solved problem," a "done deal" that can
be relegated to former C students or related practitioners who
have little appreciation for the complexities of the problem and
the consequences of wrong decisions. Foundation engineers
must do a better job of selling the benefits of their services to
clients and return to the leadership role that once made them
a valuable resource for society. ▼