



Kord Wissmann, PhD, PE, D.GE, M.ASCE

By Kaitlin Hall, S.M.ASCE, Wenyong Rong, EIT, S.M.ASCE, Yewei Zheng, A.M.ASCE,
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Kord Wissmann

Kord Wissmann has more than 30 years of experience in the geotechnical engineering community. He obtained his B.S. in civil engineering from Virginia Tech in 1987 and an M.S. in geotechnical engineering from the University of California–Berkeley in 1988. Upon graduation, he worked as a geotechnical engineer at Harding Lawson Associates and Fluor Daniel, Inc., before returning to Virginia Tech to earn his PhD under the guidance of Dr. George Filz in 1995. After graduation, Wissmann worked for Shannon and Wilson, Inc., as a senior and principal geotechnical engineer until joining Geopier Foundation Company, Inc. as chief engineer in 1998. He was promoted to vice president in 2000 and president in 2002, a role that continues today.

Wissmann has been an active leader within the Geo-Institute (G-I), culminating as the organization's president from 2015–2016. He holds 21 U.S. patents and has authored or co-authored more than 30 technical papers and journal articles. He also has earned numerous military honors and decorations while serving as a civil engineering officer in the Air National Guard. In 2000, he received the Virginia Tech Department of Civil and Environmental Engineering's Outstanding Young Alumnus Award, and in 2016 its Distinguished Alumnus Award.

Q: How did you decide to pursue a career in geotechnical engineering as well as a graduate education?

Like many people in our professional community, I first wanted to be a structural engineer. That was until I took a seepage course from Mike Duncan at Virginia Tech. It was a fantastic experience because he brought the mystery and excitement of the unknown in geotechnical engineering to the classroom. The combination of science, art, mystery, and the unknown was fascinating to me! That course and one person changed my career, which may be a lesson for all of us as we contemplate the impact we may have on others.

Mike Duncan also changed the way I thought about the importance of graduate studies. When I was a senior, I asked him about career options. He told me, and I'll never forget it: "Beg, borrow, or steal, but do what it takes to get yourself into graduate school." Wayne Clough was also at Virginia Tech at the time, and served as my de facto advisor. I asked him where I should go. He encouraged me to go to Berkeley, and that's just what I did.

Q: Who has influenced you professionally?

Certainly Mike Duncan, Wayne Clough, and George Filz, but I also received great guidance from Jim Mitchell and Tom O'Rourke. I mention Jim and Tom because both are storied researchers, amazing practitioners, and have incredible insight into the problems they solve. But more importantly, they are even better people than they are professionals. That's what we're on this world for: to do good things. People who can do good things change the world. Maybe that's another lesson for us all.



Geopier Impact Pier® jobsite visit for the new Istanbul International Airport project in Istanbul, Turkey (2018).

There's nobody like geotechnicals because we're "feet on the ground, head in the clouds" just a bit, and we see all the spectrums of life. Geos are definitely the best people on the earth!



Receiving Virginia Tech's Department of Civil Engineering Distinguished Alumni Award, Blacksburg, VA (2016).



Driving driven precast concrete piles in Batangas, Philippines (1992).

Q: How did education help you solve problems encountered during your career?

I did a very practical PhD at Virginia Tech on cellular cofferdams that was funded by the U.S. Army Corps of Engineers. This work helped develop my analytical skills, mostly related to finite-element analysis. Then, years later when I was working on the Big Dig in Boston, there was a cellular cofferdam that moved too much. It was essential to understand why this structure had moved because 200 to 300 people were working down below in an excavation on the unwatered side of the cofferdam. If it failed, these workers would be killed, simple as that. I was asked to come in and analyze the problem. I used the analytical skills I acquired while working on my PhD with Filz to develop a possible driving mechanism. We believed the cause was a soft layer at the bottom of the structure, even though we had no data to support the presence of this hypothetical layer. Sure enough, we put one boring down the



Cellular cofferdam for Boston's "Big Dig" project that experienced excessive lateral deformations.

middle, and we found that soft layer — the culprit of the issue! It ended up being stable, but we needed to understand this because the consequences of failure were just too great.

Q: What's the most important difference between contracting and consulting work for a geotechnical engineer?

There are two distinct differences, in my view. The first is risk. In consulting, you can define your risk much more easily than you can in specialty geotechnical contracting. In specialty contracting, you're given a set of boring logs and you own that site. What happens on that site comes right back to you in terms of both design and construction. As you accept a certain amount of risk and uncertainty, the key is to bound the problem. We know what's really risky (e.g., soft ground sites), and we know what's less risky (e.g., stiff ground sites). You focus attention on the risky sites. After knowing what to spend time focusing on, you bound the problem by testing your installations to confirm



With Prof. Thomas O'Rourke after Dr. O'Rourke's presentation of his Terzaghi Lecture, Phoenix, AZ (2016).

design assumptions. I believe this is just a simple outgrowth of the Observational Approach. The second significant difference is the difference in culture. Contracting is a bit more hard-nosed. You must be okay with conflict, know how to manage it, and find constructive ways to meet the needs of the project stakeholders.

Q: What are the most exciting aspects about serving as president of Geopier Foundation Company?

You know, I have the best job in America. I really do. Because I get to do everything! I get to develop new systems for Geopier and our parent company, Tensar, and test them in the field to see if they work. Often they don't work, at least not initially, but sometimes they do! I get to engineer these systems and develop design methods. I also get to meet with the best geotechnical consulting engineers around the country to talk to them about helping address their project issues in a good way. I get to run the company, and I get to go up to New York and meet with lenders and financial people who have invested in our enterprise. I get to work with the world's greatest team of engineers right here at Geopier.



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Bicycling Haleakala Volcano, Maui, Hawaii (2016).

Q: What was your greatest accomplishment while serving as G-I president?

That's an interesting question. As a company president, I see things in terms of business metrics and business governance. I brought a business perspective to the G-I board of governors. I helped the board marry the strategic plan to an annual operating plan. In doing so, I also uncovered that we had very little understanding of our customers. We didn't even call our customers our customers, and we have four groups of them: students, educators, practitioners, and contractors — each with very different sets of needs. Understanding their different needs, and then orienting G-I's programs to serve each customer group, was something we made great progress with.

Q: From your perspective as a former G-I president, how can geotechnical engineers provide meaningful service to the professional community?

Like most things that you do in life, you get back what you put in. The more you put into your professional development, the more you'll get back. In the G-I, as you work on a specific end deliverable, you expand your sphere of influence. Then,



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when you want to make career or technical decisions, you have a huge network of friends, peers, and colleagues that you didn't have before — well beyond your colleagues at work. So it's really a self-fulfilling thing to be very involved in the G-I. Also, I firmly believe that it's our professional responsibility. Most of us have been so fortunate to have been surrounded by amazing mentors and people who invested in our education and our careers, and I believe we have a personal responsibility to give back. Giving back doesn't have to be to the G-I, or even to the profession. You might give back to a local high school, your community, or your country, but you and I have a responsibility to give back simply because of the benefits we've received from others.

Q: What are the profession's greatest strengths and challenges?

The first part's easy — its greatest strength is people. We have the world's greatest people in this profession. There's nobody like geotechnicals because we're “feet on the ground, head in the clouds” just a bit, and we see all the spectrums of life. Geos are definitely the best people on the earth!

The profession's greatest challenge is stagnation in development, which has led to commoditization. As painful as it might be to admit, one professor can often do similar research things as another professor, and one set of consultants can by and large do the same thing as another set of consultants. Therefore, the only way to differentiate between services provided is by price, and that's called commoditization. It's due to lack of innovation.

Q: What innovations do you see for the geotechnical engineering community over the next 20 years?

There are some great opportunities! We are the most data-rich professional community I know, but the data are housed in the data-storage rooms of each consultant. If we can find a way to harness and access that data uniformly, we become a big data type of profession with a huge opportunity to study big data and data trends. I know one consulting company that's doing this, and it's completely changing their deliverables. Further changes in business models from design-bid-build to design-build are unleashing innovation because there's a financial reward for bringing new concepts and techniques to the table.



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The authors with Wissman. L to r: Yewei Zhang, Wenyong Rong, Kord Wissmann, Tugce Baser, and Kaitlin Hall.

Q: Among your patents, which one is your favorite, and how did you develop the idea?

My colleagues can attest that I have way more “bad” ideas than good ones. But you have to kiss a lot of frogs to find a prince, and when a prince appears, it can lead to really good outcomes. My favorite patent was conceived when we were trying to figure out how to make one of our displacement tools more effective. The tool consisted of a tube we drove in the ground and filled with stone. When the tube was lifted, stone fell out the bottom and then compacted with a tamper head that looked like a donut. But as you can imagine, the area under the donut was well compacted, but the stone in the middle was not. We had to figure out how to keep that from happening, and we knew that any kind of mechanical valve wouldn’t withstand the harsh environment of stones falling past it. I was on an airplane late one night, flying into Roanoke, VA, half asleep, and I’m thinking, “How can we make this thing work?” What came to me was to create something that would take up the void space in the rock. We did this by hanging constrictors vertically from inside the compaction head. The constrictors avoided interfering with the rock during extraction, but bunched together during compaction. This reaction caused the rock to bind up in the bottom and self-plug to form a compaction surface. Like many solutions, it was very unique and very simple. People have told me that it was incredibly clever.

Q: What advice do you have for young geotechnical engineers, and what single attribute or skill do they need most?

Beyond getting the best education that you can, recognize that we’re a people profession. Your power and influence in this profession depends on your ability to lead and influence the people around you. You don’t have to be an extrovert to do well. You can be an introvert and still expand your sphere and

influence quite effectively by simply seeking to engage with the people around you.

Given that you have good technical skills, your ability to work with teams of people and to influence people around you will be key. These attributes include being a good follower and a good leader. You also must be a good listener so you can understand the other person’s perspective before you talk about your own. Unfortunately, too many of us don’t do that. Other keys are making people feel like they want to be part of your team, and making your customers want to bring you back for the next proposal. Those are the skills that are the most influential and allow you to expand your sphere of influence.

Q: What’s your most significant contribution to the geotechnical engineering profession?

Compared to so many others, I frankly don’t consider myself to have made any fundamental contribution to our profession, especially when considering the storied legends of our field such as Jean-Louis Briaud, Bob Holtz, George Meyerhof, Mike Duncan, Harry Seed, Clyde Baker, Dick Handy, and the list goes on and on. These folks have had tremendous influence on our profession. But if I had a noteworthy contribution, it would be the ability to bring engineering, construction, people, and business together to inspire teams to achieve great things. I don’t know if that’s right or not, but that’s the best answer I have. **BS**

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