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GEOSYNTHETIC
APPLICATIONS

Bob Koerner – A Retrospective of a Giant in Geosynthetics

Perspectives from
Those Who Knew Him

Bob Koerner at the entrance to the GSI offices and laboratory in Folsom, PA in 2016. (Photo courtesy of Dennis Degnan Photography.)

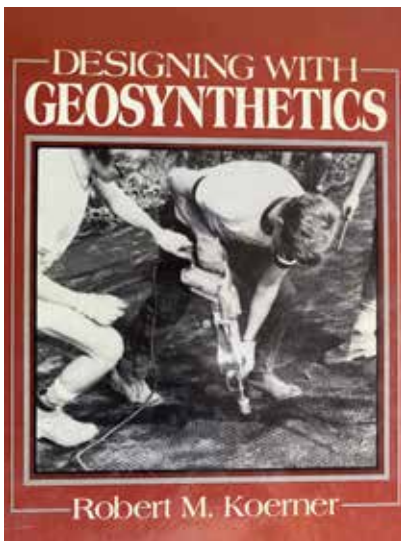


By Mark H. Wayne, PhD, PE, M.ASCE,
Robert Swan, Jr.,
Ragui Wilson-Fahmy, PhD, PE, M.ASCE,
Te-Yang Soong, PhD, PE, M.ASCE, and
Jorge Zornberg, PhD, PE, M.ASCE

Within the geosynthetics industry and the discipline of geotechnical engineering, Dr. Robert M. Koerner, PhD, PE, D.GE, NAE, Dist.M.ASCE, will always be remembered for his boundless energy and enthusiasm for geosynthetics. Space limitations prevent us from delving too deeply into his background, but a short summary of his career would include a lifelong love of teaching, primarily at Drexel University (Drexel) in Philadelphia, PA, worldwide recognition in the field of geosynthetics, and founder of the Geosynthetic Research Institute (GRI) and the Geosynthetic Institute (GSI) to develop and transfer knowledge, assess and critique geosynthetics, and provide services to their members. He also authored or co-authored more than 750 papers on geosynthetics and geotechnical topics in journals and at national and international conferences, of which the most widely known is believed to be his textbook *Designing with Geosynthetics*, now in its sixth edition. Outside of this lifelong effort, he was an avid runner, biker, and swimmer. He would always let everyone know the time and place to meet for a morning run whenever he was on the road. For further details about his background, please see the obituary that was published in the March/April 2020 issue of *GEOSTRATA*, and his GeoLegend interview article in the September/October 2014 issue.



A "jog" along a beach.



The first edition of *Designing with Geosynthetics*.

This article is a compilation of thoughts about Koerner from five people who knew him in different ways. Each provides one or more unique remembrances that may not be well known about this giant of our industry. The authors hope that readers will discover additional insights into the geosynthetics industry and Koerner's role in shaping it, how he helped promote the use of geosynthetics in geotechnical applications, and why his work was so powerful that several of the authors of this article say they will continue to follow his legacy.

Mark H. Wayne

I originally met Dr. Koerner as an undergraduate student at Drexel. At the time, I was studying both structural and geotechnical engineering, with the thought that either path would lead to an exciting journey in my future as an engineer. For my geotechnical engineering courses, I found Dr. Koerner's method of teaching to be very interesting. He always ensured that his students had a firm grasp of the concepts. He was well known as a practicing engineer and would often cover more information than was included in the textbooks, based on his many years of experience. What was most enjoyable as a student was the fact that if we had a one-hour class, he literally had several carousels of slides. For those younger readers who have always used PowerPoint, it's hard to convey how expensive and time-consuming it was to create slides. Further, as information changed, the old slides had to be discarded, so it took a lot of effort, but Dr. Koerner kept everything current.

During my senior year, Dr. Koerner approached me in the basement of Drexel's main building, home of the central computer center we all used. He handed me a thick bound document with a lot of red markings and said, "Please read this over the weekend, and if you like what you see, consider staying at Drexel to pursue a master's degree." This happened to be the first

edition of *Designing with Geosynthetics* that I was lucky to review just after the editor sent it back to Dr. Koerner for further revisions. I was so impressed with this fairly new industry that I took him up on his offer and stayed on to obtain my PhD.

Throughout my graduate studies, I discovered that one constant about him was his patience with every student. No matter how busy, he always made time to sit down with his students and those from industry who visited daily. I think many of us remember the pizza days, where we all got together just to talk about anything on our minds. At many of these events, which were commonly held at the end of the week, we'd sometimes have an industry guest join us. It was great hearing from those in the industry, and this further inspired us to continue with geosynthetics. Outside of life on campus, Dr. Koerner encouraged his students to get involved with the American Society for Testing and Materials (ASTM). This way, we could work with industry to standardize the tests we were developing and running to get the answers needed for the design of civil infrastructure applications. So, it's fair to say that Dr. Koerner was a great teacher and mentor who really helped direct me into an industry that's even more vibrant because of his active involvement.

Robert Swan

Being an educator is one of the most fulfilling professions that a person can pursue, but I didn't start out my career with the expectation of ever becoming a professional educator. I had the typical struggles through my early years as an undergraduate student while attending Drexel in the early 1980s, until I was on my first Cooperative Work (Co-Op) assignment with the City of Philadelphia Water Department's Materials Testing Laboratory. There, I was exposed to the wonderful world of materials testing and evaluation. I was assigned to work under a much older gentleman, Grover Reeves, who took

the time to teach me the way around the soil and concrete testing laboratory. Then one day Grover asked me if I ever heard about a material that he called a “geo fabric”? I said no, but I bet I could find somebody at Drexel who might know what it was.

The next day I went into school and found a professor in the civil engineering department who knew about “geo fabrics.” This professor, Dr. Robert Koerner, didn’t know me from a hole in the wall, but he stopped what he was doing and took the time to explain all about his world of “geo fabrics,” aka “geosynthetics.” Little did I realize then that this professor had set in motion the path for my future career. He didn’t *have* to take the time to talk with me, of course, as he was very busy, but he *did* take the time, and he also mentored and encouraged me to work harder with my studies (somehow, he was aware of my struggles with school). Later in my school career, I ran into him many more times as an instructor and eventually as my senior design group advisor. Over time, he demonstrated an extraordinarily strong work ethic, which he encouraged through his class instruction and advising. He even took a chance on me by asking me to apply for graduate school and be a member of his research team — even though I was not the exceptional student one would expect to see attending graduate school. He knew that I would work hard to master the material and be successful. It was his work ethic and encouragement that I have taken as the model to follow throughout my life and career.

As I rose through the ranks and through different facets of my career, from an employee to a business owner to an educator, I’ve always taken the time to teach and encourage others the same way that Dr. Koerner did on that spring afternoon when I asked the question, “What is a geo fabric?” In everything I do, I try to demonstrate by example, good work ethic, hard work, and dedication to one’s craft.



Bob with an early transmissivity unit at the GSI lab in 1989.

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Paula and Bob Koerner in their favorite family portrait.

In a strange twist of fate, a number of years ago I found myself in a position to become a professional educator... a college professor. Who would have thought?

Therefore, when I'm asked what my teaching philosophy is, I say that I teach by example. I believe that the way people carry themselves says a lot about what they believe in. I believe that learning is achieved through a rigorous academic program of study. Such a program helps ensure that students develop the necessary skills and study habits to succeed in employment after graduation. By requiring students to work hard to learn new material, it

expands their knowledge and shows them their expanded capabilities. Of course, a rigorous academic program of study has little value to students if they feel that they are left to fend for themselves. Overall learning requires faculty support to nurture students who need help. This is what I took away from my experience with studying under and working with Dr. Koerner.

Ragui Wilson-Fahmy

Thirty years ago, when I started working with Dr. Koerner as a research professor at the Geosynthetic Research Institute (GRI), I already had obtained my PhD degree a few years earlier

in the UK. My PhD research work consisted of investigating the reinforcement function of geotextiles in bearing capacity applications. Understandably, geosynthetics in reinforcement applications became one of my main research interests at that time.

At GRI, thanks to Dr. Koerner, I learned of the many other applications of geosynthetics in addition to the more recent developments in the reinforcement function. This made me understand why Dr. Koerner was so fascinated with the geosynthetic field, which was growing at a fast rate. Dr. Koerner always joked by quoting a line from the movie *The Graduate*, in which a man named Mr. McGuire tells Dustin Hoffman, who played the graduate role, "I want to say one word to you. Plastics." His enthusiasm was contagious. Dr. Koerner gave credence to the use of geosynthetics by developing GRI standards for geosynthetics before ASTM standards were developed. These standards were carefully written based on extensive research work combining theory and practice performed under Dr. Koerner's direction. The geosynthetic standards that were developed addressed many aspects of geosynthetics evaluation and assured consultants that geosynthetics can be controlled and their long-term performance verified.

In addition to this standards work, Dr. Koerner led an effort to inform the engineering community that the benefits and functions of geosynthetics are substantial. He promoted geosynthetics via numerous published papers and technical reports, the yearly GRI Conferences, and, of course, his textbook *Designing with Geosynthetics*, with its several editions that were needed to keep up with the fast growth in knowledge and the development of new products. I greatly benefited from working with Dr. Koerner, not only because of his knowledge, but also because of his self-discipline and dedication to his work. After working for five years at GRI, I moved

to the consulting field. My acquired knowledge at GRI and keeping up with the latest developments enabled me to perform design for many projects involving geosynthetics in various applications.

I want to take this opportunity to also talk about Dr. Koerner at a personal level. I will never forget being invited by Dr. and Mrs. Koerner (Paula) to spend Thanksgiving dinner at their home, first just me, and later with my wife and kids when they joined me in the U.S. Dr. Koerner and Paula knew how tough it was to start a new life in a new country, and they didn't want us to spend Thanksgiving alone. They were kindhearted, always expressing their thoughts with a warm and caring smile. I will never forget their positive impact on my life.

Te-Yang Soong

Without exaggeration, Dr. Koerner (whom I can never — and will never — call Bob) gave me a career and changed my life. I came to this country 30 years ago. On orientation day, as a young foreign graduate student, I was immediately astonished by two things on Drexel's campus. First, graduate students could openly party in broad daylight! And second, there was a world-renowned guru on the faculty: Dr. Robert Koerner. It was Dr. Jonathan Cheng who advised me to drop any conflicting classes and get myself signed up for Dr. Koerner's "Designing with Geosynthetics" course. Dr. Cheng told me, "It would be a shame to come to Drexel's Department of Civil Engineering and not be associated with Koerner." Turns out, that was some of the most important advice that I've ever received! I did exactly what I was told. The rest is history.

Professionally, it was an honor and a privilege to become part of GRI and to be able to call Drs. Robert Koerner, Grace Hsuan, George Koerner, Arthur Lord, Ragui Wilson-Fahmy, Jonathan Cheng, Mark Wayne, and Dhani Narejo my colleagues. It opened so many



Invited speakers for Geo-Chicago 2016. Bottom row l to r: Grace Hsuan, Sam Allen, George Koerner, Te-Yang Soong, Mark Wayne, Shobha Bhatia. Top row l to r: Dimitar Alexiew, Erol Guler, Bob Holtz, Rudy Bonaparte, Roman Hryciw, Bob Koerner.

Dr. Koerner always joked by quoting a line from the movie *The Graduate*, in which a man named Mr. McGuire tells Dustin Hoffman, who played the graduate role, "I want to say one word to you. Plastics."



Bob Koerner's personal geosynthetic research laboratory – his roof!

doors and presented so many opportunities for me throughout my career. I proudly tell people that there's never been a need for me to prepare a resume for the purpose of finding a job. From my master's to my doctorate study, from being a PhD candidate to becoming a research engineer/university lecturer, from working in academia to working in consulting, and when facing many other professional opportunities, being Professor Koerner's last PhD student was the only resume item that I needed.

Every time I heard other people telling horrible stories about their graduate advisors and how they were mistreated and taken advantage of, I felt that much more grateful to work

for such a fair and generous advisor. It is very unusual, if not unheard of, for a foreign student like myself to have so many opportunities to go to big conferences all over the country and the world to present my work and be recognized by the entire industry. Some graduate students are highly intellectual, but merely cheap laborers who do all the hard work just so their advisor can keep all the credit and glory. It's true to say that my experience was entirely different.

Working for Dr. Koerner for nine years allowed me to observe him close-up. He inspired and taught me so many lessons that have benefitted my life. I want to share two specific lessons that I'm still working on to improve myself.

First, Dr. Koerner was highly efficient. He never procrastinated. I can still recall seeing him cross items off his daily "to-do list" one by one. According to Mrs. Koerner, this list was usually generated during his routine morning run. His workday only ended when he had finished every item on the list. I believe successful people are always highly efficient and self-disciplined. Dr. Koerner was unquestionably a great testimony to that theory.

Second, Dr. Koerner was a true and genuine educator. I was amazed when I saw him — after a long day of dealing with administrators, research funders, and industry colleagues — still sitting in front of his computer. He would be crafting personal responses to email questions from students in Asia or Africa, typing messages key-by-key, as he was not a particularly good typist. The guru himself would spend his personal time answering basic questions from people on the other side of the world. In him, I saw the legacy of a true educator who genuinely cared and whose influence was unbounded by time or geographical limits.

Words cannot express how much Dr. Koerner impacted my life and how much his passing still hurts me. All I can hope is that his legacy will live on in the many people he has influenced, myself included, for many years to come.

Jorge Zornberg

In addition to masterfully supervising students and researchers at Drexel University and GSI, Dr. Bob Koerner mentored so many of us as well. More specifically, those of us who were lucky enough to have bumped into him in a conference session, committee meeting, or professional presentation. This is because he was particularly keen on mentoring young professionals, sharing his time with them selflessly, and thus forever marking their career paths. And such mentoring often became a feast if the young professional colleague was eager to discuss... geosynthetics!

I'm one of the many professionals (then young professionals... but long ago) who came across Bob in a casual professional meeting and left this meeting having gained a lifelong mentor. I met him during the Geosynthetics 1997 Conference in Long Beach, CA. From that point on, such meetings became unplanned and impromptu, yet were crucially important (they typically took place at a geotechnical or geosynthetics conference). And while technical issues were certainly a central part of our conversations, they did not overshadow, but rather were intermixed with, discussions on other important issues, such as career paths, the future of the geosynthetics industry, and updates on our growing families.

These yearly meetings became somewhat limited after Bob stopped

traveling to out-of-state events in recent years. When not traveling, Bob would continue his interactions (quite intensively, indeed) from GSI's Philadelphia office. Because I missed our in-person interaction, I visited with him at the GSI office in October 2019, some six weeks before his passing. I took a photo of Bob, taken while visiting with him in Philadelphia and catching up with him on the geosynthetics industry, as well as many other big-picture topics. "Do you want to see some ongoing testing on the durability of erosion control products?" Bob asked. "Sure. Where are the samples?" I answered. "Here on my roof!" Bob replied. This certainly merited a picture of him with his rooftop samples — proudly continuing to enrich my knowledge about geosynthetics.

On behalf of the army of protégés that Dr. Koerner has guided, knowingly or perhaps not, throughout his entire professional career, I would like to toast him: a giant in our geotechnical profession, a visionary of new technologies, and yet, at the same time, a fatherly engineer who always found the time to generously steer the vocation that so many of us share.

What Did We Learn?

From our shared experiences, readers should recognize several similar themes concerning Dr. Koerner's influence on our careers as well as the careers of others within the industry. The common themes show that Dr. Koerner:

- Was a great teacher and mentor to his students, as well as those within and outside of the geosynthetics and geotechnical engineering community

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- Had an extraordinarily strong work ethic, which he encouraged through his class instruction, advising, mentoring, and self-discipline
- Was very supportive of the need for inclusion and sharing of his knowledge with anyone and everyone without hesitation
- Recognized early on the importance of developing geosynthetic standards to encourage growth in the use of geosynthetics within the civil infrastructure industry through GRI and ASTM
- Saw the need to compile and share the most current methods on designing and evaluating geosynthetics through the various editions of his textbook *Designing with Geosynthetics*.

Most importantly, Dr. Koerner's overwhelming enthusiasm about working within the geosynthetic field was so contagious that it influenced everyone he met. One could not help but to become involved within the geosynthetic industry after he encouraged you to give it a try. He truly recognized that there's no "I" in the word "team" and welcomed all to be members of the "team" to grow the geosynthetics industry to where it is today. Dr. Robert M. Koerner was truly a giant of our industry and will always be remembered as a kind, giving, nurturing individual through his teaching, mentoring, and guidance. 

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