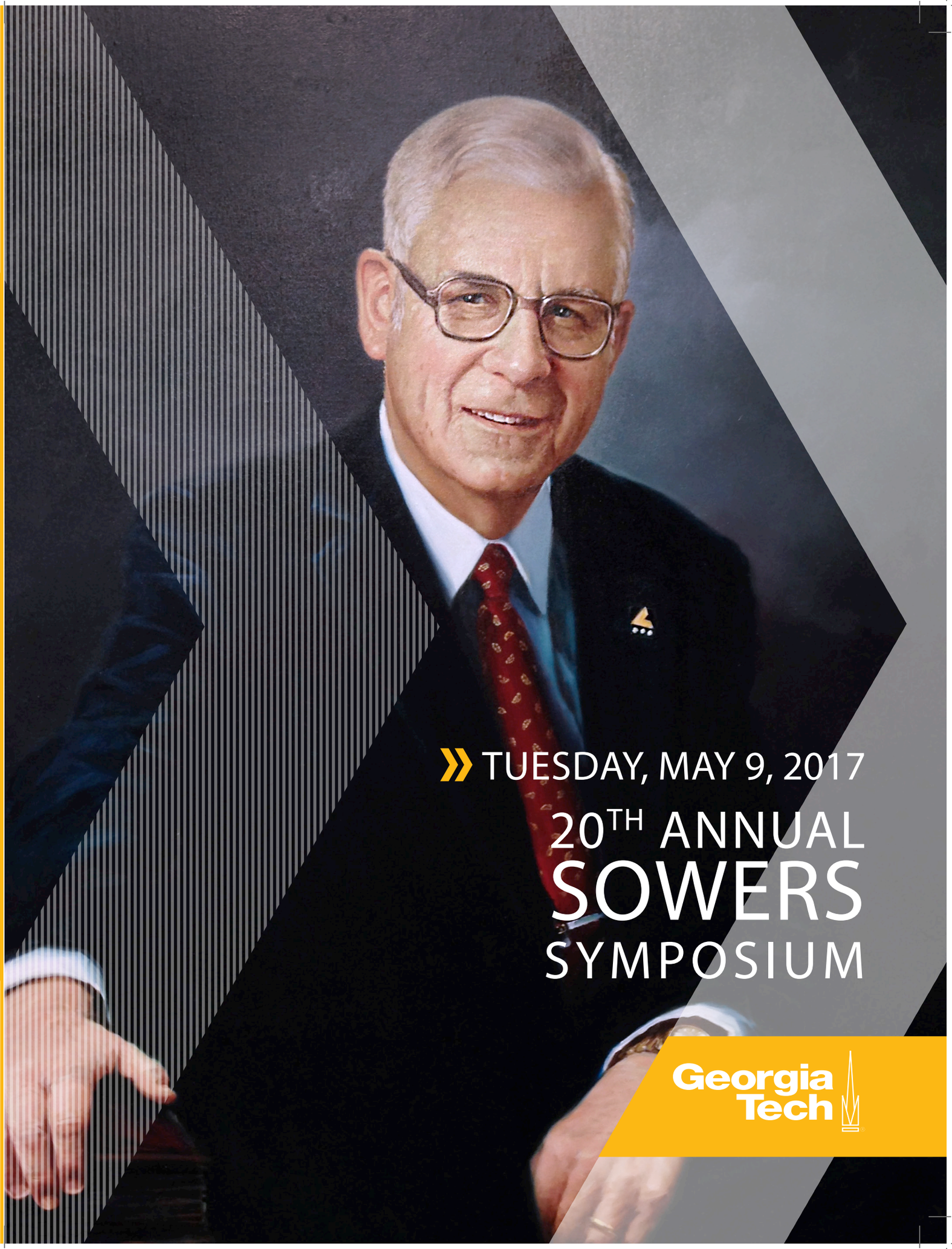

» TUESDAY, MAY 9, 2017

20TH ANNUAL SOWERS SYMPOSIUM

Georgia Tech

A CONTINUING TRIBUTE

For 50 years, Professor Emeritus George F. Sowers served a unique and dual role as a faculty member at the Georgia Institute of Technology and as a senior consultant at Law Engineering, Inc. (the predecessor to MACTEC, Inc. and Amec Foster Wheeler). A civil engineer and geologist, he consulted worldwide on substantial civil projects in the United States and Europe, large earth- and rock-fill dam construction in Asia, and deep permafrost conditions in northern Greenland. Truly, he was "world class." A master of anecdotes, his vivid recollection of case studies and his elegant approach to engineering captivated students and professionals alike. His Terzaghi Lecture at the 1979 annual convention of the American Society of Civil Engineers (ASCE) was "There Were Giants on the Earth in Those Days," and it brought to life stories of ancient earthwork and massive construction projects completed several thousand years ago by native Americans.

Professor Sowers was active in numerous professional societies at the local, national and international level. He held offices in several of these groups, including ASCE, the International Society for Soil Mechanics and Foundation Engineering (ISSMFE), the American Society for Testing and Materials (ASTM), the U.S. Committee on Large Dams, the Seismological Society of America, and the Association of Engineering Geologists.

He was the author and co-author of eight books, including the classic textbook *Introductory Soil Mechanics and Foundations: Geotechnical Engineering*, which enjoyed four English editions as well as versions in Spanish and Mandarin Chinese. His last book, *Building on Sinkholes: Design and Construction of Foundations in Karst Terrain*, was published in 1996 by ASCE. Professor Sowers authored more than 140 technical papers and received many prestigious awards, including the Georgia Tech Teacher of the Year award (1971), the Georgia Society of Professional Engineers Engineer of the Year award (1973), the Herschel Prize from the Boston Society of Civil Engineers (1976), the Middlebrooks Award (1977 and 1994), the ASCE Martin Kapp Lecture (1985), the ASCE Brooks Award (1990), the ASCE Forensic Engineer of the Year award (1994), and the Terzaghi Award (1995). In 1994, Professor Sowers was elected to the National Academy of Engineering.

SOWERS IN INDONESIA, 1986. PHOTOS COURTESY MRS. GEORGE F. SOWERS AND LAW ENGINEERING AND ENVIRONMENTAL SERVICES, INC.

AGENDA

» 2:45 PM
Arrival and Registration

» 3:30 PM
State of the Art
Rick Deschamps, Ph.D., P.E.
Vice President of Engineering
Nicholson Construction
Canonsburg, Pennsylvania

» 4:15 PM
State of the Practice
Bruce L. Kutter, Ph.D.
Professor
University of California
Davis, California

» 5 PM
Reception and exhibits

» 6 PM
Dinner

» 7 PM
Acknowledgements and Awards

» 7:20 PM
Remembering George F. Sowers
G. Wayne Clough, Ph.D., P.E.
Secretary Emeritus, Smithsonian Institution
President Emeritus, Georgia Institute of Technology
Atlanta, Georgia

» 7:40 PM
Sowers Lecture
Richard J. Bathurst, Ph.D., P.Eng., F.EIC, F.CAE
Professor, GeoEngineering Centre
Royal Military College of Canada
Kingston, Ontario, Canada

» 8:40 PM
Adjourn

GEORGE F. SOWERS, PORT OF SAVANNAH FIELD TRIP

G-I ASCE GEO-INSTITUTE Georgia Chapter

Georgia Tech School of Civil and Environmental Engineering
College of Engineering

STATE OF THE ART

Numerical Modeling Continues to Provide Geotechnical Engineers with New Insights Numerical modeling was first used by geotechnical engineers more than 50 years ago. Dr. G. Wayne Clough — a gentleman known very well in this community — and his coworkers were instrumental in transitioning this technology from the aerospace industry into mainstream geotechnical engineering analysis and design. Although the use of numerical modeling is becoming almost routine, characterizing the soil remains the primary challenge in using the approach as a predictive tool for deformation analysis.

Depending on the geologic environment, natural soils are inherently heterogeneous, anisotropic, stress level dependent, and often partially drained relative to the rate of construction. Constitutive models attempting to capture real behavior are too complex to be useful, because obtaining the input parameters are impractical, if not impossible. These facts impose limits on the accuracy of predictions of deformation that one should expect. However, numerical modeling can be a powerful tool in applications where existing models are nonexistent or inadequate. Numerical modeling helps us to explore and identify new failure mechanisms and to take advantage of three-dimensional influences that are often neglected.

The presentation will focus on two recent case histories wherein three-dimensional modeling was used in the design for novel landslide stabilization systems: 1) The use of long (30m) and widely spaced (30m) shear walls to stabilize a slide in a deep lacustrine clay, and 2) The use of battered piles and anchors to stabilize an active slide in colluvium that was moving up to 20 mm/day during construction.

Rick Deschamps is Vice President of Engineering for Nicholson Construction Company. He is responsible for overall engineering design and technical risk abatement with emphasis on design build, alternative design, and value engineering efforts. Rick's experience is unique in that he spent significant portions of his career working in design and academics before moving to construction. He has used numerical modeling as a tool throughout his career.

Rick's experience includes designing and constructing projects involving deep foundations, excavation support structures, ground improvement, ground modification, slope stabilization, and remediation of embankment and concrete gravity dams.

RICK DESCHAMPS, PH.D., P.E.
VICE PRESIDENT OF ENGINEERING
NICHOLSON CONSTRUCTION
CANONSBURG, PENNSYLVANIA

STATE OF THE PRACTICE

Physical and Numerical Modeling and Design of Rocking Shallow Foundations

Rocking footings, if designed correctly, have a well-defined moment capacity, a significant energy dissipation capability, and a gravity-driven self-centering tendency. Rocking footings may therefore be considered as important working components of seismic force resisting systems for bridges and buildings. As the moment capacity is approached, a gap opens under one edge of a rocking footing and the soil yields under the loaded edge; then, during unloading, gap closure returns the footing near its original position. Hence, suitably designed rocking shallow foundations may be regarded as cheap seismic isolation mechanisms.

Simplified models of rocking foundations have been codified (ASCE 41-13). Validation of simplified models can be accomplished by comparison to results of experiments and by comparison to more rigorous numerical models. Advances in design procedures depend on distilling the physics of the problem to practical design tools. Distilling the physics requires understanding that can be developed by hypothesis-based model tests designed to test the accuracy of predictions of rigorous numerical models and practical design procedures.

Results from centrifuge and 1 g model tests have demonstrated that settlements and permanent deformations of rocking footings are tolerable unless either the foundation soil bearing capacity is insufficient or large amounts of soil ravel into the gap during rocking. Model tests have included dynamic and slow cyclic tests on individual rocking footings and on footings that are part of bridge or building systems.

Although relatively complex numerical methods (e.g., solid finite elements or Beam on Nonlinear Winkler Foundation models) are able to predict both demand and some aspects of performance, it is shown that relatively simple methods (e.g., spectral methods, including displacement-based design and nonlinear dynamic analysis of stick models with nonlinear springs) adequately predict seismic displacement demands on rocking foundations.

Bruce L. Kutter obtained his B.S. and M.S. in Civil Engineering from the University of California, Davis, and his M.Phil. and Ph.D. from Cambridge University. At Cambridge, he studied under Dr. R.G. James and also worked with Professor Schofield, developing and using equipment for modeling earthquakes on geotechnical centrifuges. In 1983, he was appointed to the civil engineering faculty at UC Davis. He served as Managing Director, Director and then in 2009, he was promoted to be a researcher at the UC Davis Center for Geotechnical Modeling. The CGM operates one of the premier earthquake geotechnical centrifuges in the world. He has received the American Society for Testing and Materials International C. A. Hogentogler Award, the Norman Medal and Arthur M. Wellington Prize from the American Society of Civil Engineers, and was named the 2015 International Society of Soil Mechanics and Geotechnical Engineering Schofield Lecturer.

BRUCE L. KUTTER, PH.D.

PROFESSOR

UNIVERSITY OF CALIFORNIA, DAVIS

DAVIS, CALIFORNI

SOWERS LECTURE

Lessons Learned from Physical and Numerical Modeling of Full-Scale MSE Wall Tests at RMC A long-term research program was carried out at the Royal Military College of Canada (RMC) between 1998 and 2011 with the objective of gathering quantitative data on the behavior of mechanically stabilized earth (MSE) walls under carefully controlled (laboratory) conditions. The research program was funded by a consortium of 12 U.S. state departments of transportation together with Canadian funding agencies. Fourteen heavily instrumented 3.6m-high, full-scale reinforced soil walls were constructed with geogrid and welded wire reinforcement layers. Instrumentation included strain gauges and extensometers attached to reinforcement layers, connection load cells, horizontal and vertical toe load cells, earth pressure cells, and displacement measuring devices at the wall face and at the backfill surface. For the hard-face walls, more than 300 separate instruments were sampled simultaneously during and after construction. Eleven walls were constructed with the same sand backfill material and were uniform surcharge loaded in stages to load levels well beyond working stress levels. Each wall was designed to isolate the influence of one of the following factors on wall performance: wall facing type, wall batter angle, reinforcement type, stiffness, and spacing (number of layers).

This lecture describes the experimental design, examples of measured data, how the data have been used to verify numerical models, and how the data have guided the development of reinforcement stiffness-based design methods for internal stability design of MSE wall systems.

Richard J. Bathurst is Professor of Civil Engineering at the Royal Military College of Canada and Queen's University in Kingston, Ontario. He is currently the President of the Engineering Institute of Canada, Past-President of the Canadian Geotechnical Society, Past-President of the International Geosynthetics Society, and Past-President of the North American Geosynthetics Society. Dr. Bathurst's current research activities focus on the use of geosynthetic and metallic reinforcement in earth retaining wall systems, numerical modeling, seismic performance and design of these systems, probabilistic design of reinforced and unreinforced soil structures, reliability-based design, and load and resistance factor design (LRFD) calibration of soil-structures. Dr. Bathurst serves on committees of the Canadian Highway Bridge Design Code and the National Building Code of Canada. He is editor of the peer-reviewed technical journal *Geosynthetics International* and is an editorial board member of six other technical journals.

RICHARD J. BATHURST, P.ENG., PH.D., F.EIC, F.CAE

PROFESSOR, GEOENGINEERING CENTRE

ROYAL MILITARY COLLEGE OF CANADA

KINGSTON, ONTARIO, CANADA

OUR HISTORY

The Georgia Geo-Institute Chapter of the American Society of Civil Engineers owes its very existence to George Sowers. Beginning in the mid 1950s, a small group of local geotechnical engineers met to have dinner and talk about current geotechnical engineering activities. The group was chaired by then-professor George Sowers and would meet two or three times a year. Some notables of the six to 10 engineers who typically attended these fledgling geotechnical committee meetings were Clyde Kennedy from Law Engineering, Bob Crisp of the Army Corps of Engineers, and various engineers from the Georgia Highway Department. During the mid to late 1960s, the meetings became less frequent and eventually faded away.

In 1978, Professor Sowers encouraged two former students — Robert J. Stephenson, then Director of the Corps of Engineers Materials Lab in Marietta, Georgia, and Tom Billings, also a Corps employee — to work with him in reactivating the group. The following month, the first meeting of the newly reorganized Geotechnical Committee, with Billings as chairman, met at Oga's Barbeque on Northside Drive, thus creating what has become an avid attachment to barbecue meals for our meetings. George Sowers gave the initial presentation to those in attendance. Meetings continued at Oga's until it went out of business. Then meetings were moved to the Dunphy Hotel until it also went out of business. During the early 1980s, the group struggled to find a suitable meeting place and tried several venues with varying success. In 1986, presentations were taking place in a basement meeting room at the Royal Coach Hotel. In November of that year, Joel Galt, who later served a term as committee chairman, arranged for the Geotechnical Committee to meet at the Georgia Power Company building. This new location had many advantages over our previous meeting places. Fittingly, the first speaker in this new venue was George Sowers. With a recurring meeting place at the Georgia Power building, our programs began to stabilize and grow. Each year since the early 1990s, the committee has strived to have a program at an outdoor venue. These meetings have been catered by various barbecue restaurants, and accompanied by cold liquid refreshments. They are a good time of fellowship for all of our colleagues.

Now in its 20th year, our George F. Sowers Symposium is appropriately built on a partnership between practice and academia that emulates Sowers' career. In 1993, Geotechnical Committee Chairman Mike Turner met with Dr. Jean-Lou Chameau, chair of Georgia Tech's School of Civil Engineering, and members of the School's Geotechnical Engineering Program to initiate an annual event (at that time unnamed) with well recognized individuals to deliver an academic lecture at the School in the afternoon and an applied lecture to practicing geotechnical engineers in the evening. The success of this early joint-lecture series, and the inspiration George Sowers was to all of us, led to the formal establishment of the Sowers Lecture in 1998. The first Sowers Lecture was delivered by its namesake's former student, Dr. G. Wayne Clough, BCE 1964, MSCE 1965, who was the first alumnus to become president of Georgia Tech.

PREVIOUS LECTURES

YEAR	SOWERS LECTURE	STATE OF THE PRACTICE	STATE OF THE ART
1998	G. Wayne Clough		
1999	J. Michael Duncan		
2000	Richard E. Goodman		
2001	Robert M. Koerner		
2002	Harry G. Poulos	William F. Brumund	Richard Finno
2003	John B. Burland	Allen Marr	Stephen G. Wright
2004	Kenneth H. Stokoe, II	Edward Cording	Andrew Whittle
2005	Fred H. Kulhawy	Mike Lewis	Chuck Dowding
2006	R. Kerry Rowe	Raymond Seed	Don J. DeGroot
2007	Eduardo Alonso	Ed Kavazangian	Ross Boulanger
2008	Michele Jamiolkowski	Steven Kramer	George Filz
2009	Thomas D. O'Rourke	Robert Bachus	Craig H. Benson
2010	David E. Daniel	John T. Germaine	David O. Potyondy
2011	Keith Kelson	Dan Brown	Cino Viggiani
2012	Bengt H. Fellenius	Jeffrey R. Keaton	Jorge B. Zornberg
2013	Paul W. Mayne	Ken Been	C. Guney Olgun
2014	Richard J. Jardine	Kyle M. Rollins	Ellen M. Rathje
2015	Jonathan Bray	Scott Anderson	Youssef Hashash
2016	Rudy Bonaparte	Roger Chandler	Roman Hryciw

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GEORGE F. SOWERS

20TH ANNUAL

SOWERS SYMPOSIUM

PROGRAMS FROM 15 OF OUR 19 PREVIOUS SYMPOSIA.

Inside LAW

A Newsletter for Members of the Law Companies

DECEMBER 1996

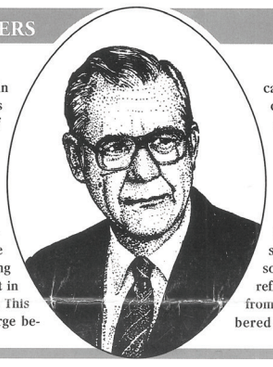
IN THIS ISSUE

Warmest Wishes Throughout This Holiday Season

From Your Family at Law Companies

THERE WERE GIANTS ON THE EARTH IN THOSE DAYS

GEORGE F. SOWERS 1921-1996



There were Giants on the Earth in Those Days. When George Sowers picked these words for the title of one of his well-known lectures, he was thinking of ancient earthwork construction on the North and South American continents. But when many of his former colleagues and students reflect on these words, they see them most appropriately describing George F. Sowers and his impact in the days between 1947 and 1996. This is the period during which George became a giant to many in various communities: The Law community, the Georgia Tech community, the geotechnical engineering community, and to his family and the community in which they lived. At the memorial service held October 16, 1996, to honor and celebrate the life of Professor Sowers, representatives from some of these communities shared reflections on his life. Clay Sams from Law's Charlotte office remembered George's influence on LAW.

"George's career with Law Engineering started at the same time as did his career at Georgia Tech, in 1947. While a student at Harvard, George responded to a joint advertisement by Georgia Tech and LAW for a professor for Georgia Tech and a consultant for LAW. At the time, LAW was a small testing laboratory without any engineers except its new president, Mr. George Nelson. With Professor Sowers' presence, he and Mr. Nelson, together, are credited with starting LAW on a course that took it to heights neither of them at the time imagined were possible. Today, LAW is one of the foremost engineering firms of its type in the world, thanks in large part to the influence of Professor George Sowers."

Clay went on to state that "George's dual careers with LAW and Georgia Tech have served both organizations very well. At Georgia Tech he achieved the highest honors attainable in teaching. At LAW, he assumed the highest positions in the company: Senior Consultant and, for a time, Chairman of the Board of Directors. At Georgia Tech, he taught hundreds and hundreds of students and influenced the course of careers and lives of many of them. At LAW, he likewise taught and influenced many.

Clay mentioned qualities that made George so special:

Infectious Enthusiasm

"George's constant enthusiasm about his work always amazed me. He brought a love of engineering and excitement into a classroom, or a project situation, that was motivating to those around him. He always said, 'If your job's not fun, get out!' Very few people who got to work with George ever got out."

High Energy

"The Lord blessed George with an exceptional amount of physical and mental stamina. In the early 1970s, in addition to teaching three days per week at Georgia Tech and consulting on technical engineering work at LAW, George was drafted to serve as the Chairman of LAW's Board of Directors. I recently came across copies of some of George's work schedules for that time period, and looking backward in time, I'm not sure how he did it. In one typical three week's period, here is how it went:

Monday - South Carolina Consulting Trip - Duke Power
Tuesday through Sunday - Sao Paulo Brazil - Lecturing and Consulting

Monday - Morning at office, afternoon at Georgia Tech
Tuesday - North Carolina Consulting Trip
Wednesday - Morning in office, afternoon teaching at Tech
Thursday through Saturday - Denver, Colorado
Sunday - Home with family - Church, Grade Papers

Monday - Morning at office, afternoon at Tech
Tuesday - Florida - Hearing for Nuclear Power Plant
Wednesday - Morning at office, afternoon at Tech
Thursday & Friday - Seattle, Washington

"You might think he couldn't have done all these jobs well, but I tell you, he did. I believe his students from Georgia Tech will verify they never felt neglected or short-changed, and we at LAW felt the same way. You or your project were always the most important thing George had to think about or to work on when you were with him."

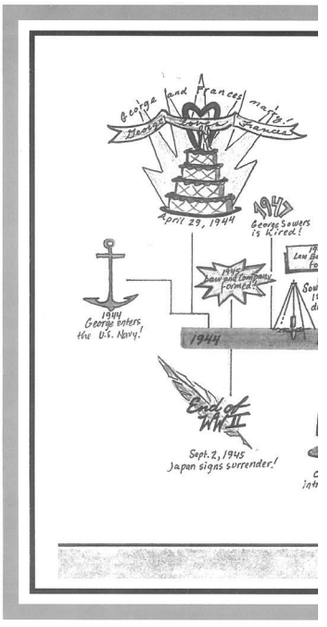
Integrity

"George frequently gave younger engineers various pieces of advice on the ethical principals he wanted applied while working at LAW. Among those I remember most vividly went something like this: 'If your profits are too low, it means you're either not working hard enough or not charging the client a fair price for your work. On the other hand, a profit that is too high means you probably aren't doing enough work of sufficient quality to be worth what you're charging the client.'

"To me, this kind of guidance is what George provided best, and the respect he enjoyed made the recipients of the guidance take it to heart."

Sense of Humor

"George had a wonderful sense of humor, a quality that made working with or for him all the more enjoyable. I shall never forget the time George and I were participating in a protracted judicial proceeding in North Carolina in which a stubbornly persistent attorney for the other side was repeatedly asking George the same question about "just how hard is the rock that will provide the support for the proposed foundation?" George would give him the answer, and then, in a futile attempt to get a slightly different answer with which to discredit George, the attorney would ask the question again, with just a slight difference in wording. When the question came back for perhaps the 4th time, George told the opposing attorney the rock was "about as hard as your head," upon which the proceedings broke up temporarily, as even the judge laughed."



This Time Line was created for and prese

Love of Giving His Acquired Knowledge and Experience to Others

"This, in my opinion, was the most important quality of George Sowers. He spent practically his entire working life doing this. He did it both verbally and in writing. The list of his technical publications is over 150 items, so long that it takes about 15 pages just to list them."

Just as surely as Professor Sowers had a huge influence within the Law community, he perhaps shaped the careers and the professionalism of even more people through the Georgia Tech community. Dr. Paul Mayne, Professor of Geotechnical Engineering at Georgia Tech, included the following reminiscences during the memorial celebration:

"George Sowers was a master of anecdotes. He told more stories, had more experiences, remembered more examples, and could recall them all from memory, more than anyone else I ever knew. It was George's vivid storytelling and recollection of real case studies that captivated his audience and won the admiration of so many of his students and fellow engineers. In every story George told, there were lessons to be learned. For students of civil engineering, this meant careful

thought and
followed in o
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engineering."

"One of Georg
was forensic
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Washington, D
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he had recent
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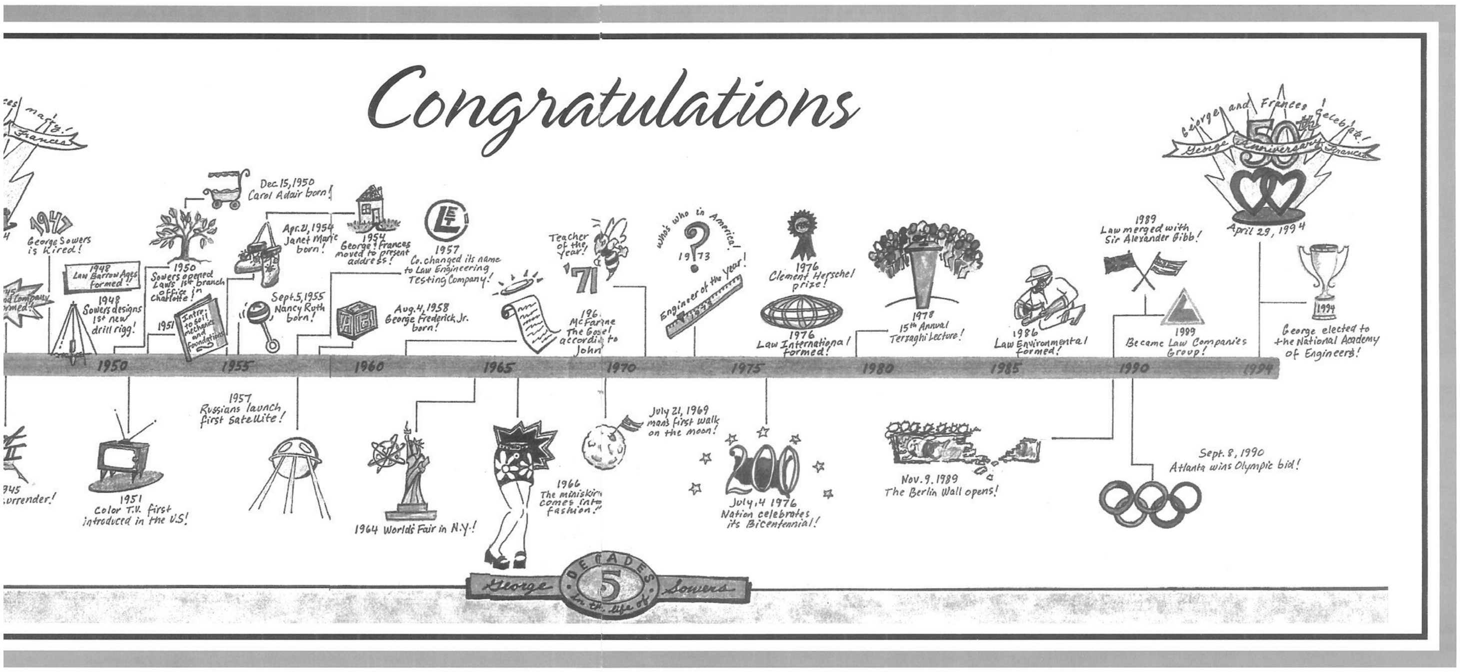
George deta
mistakes, errors, and poor judg
contractor, the engineers, and
project. Lessons were to be learn
talk, I remember Karen, my fi
expressing great surprise bec
understood the technical present
of George's great virtues: His abili
simply and clearly so that all of us

"A few years later at Georgia Tech
co-teaching the graduate course
It was no small task organizing
with George flying from one part of
to provide his expert opinion on in
I only hope that someday I might
the accomplishments that George d
lifetime."

George was active in many pro
including:

- The Executive Committee o
  The American Society of Ci
- Vice President for the Inter
  of Soil Mechanics & Found
- Earthquake Engineering Re

continued on page 2



...reated for and presented to George and Francis Sowers on the day of their 50th Wedding Anniversary, which just happened to fall on the same day as LAW's Technical Excellence Celebration at Callaway Gardens on April 29, 1994.

thought and procedures to be followed in order to protect the safety and welfare of the public. In this regard, George told not only stories, he told parables in civil engineering."

"One of George's great specialties was forensic engineering, or the study of failed civil engineering works. At a 1984 seminar in Washington, D.C., he spoke of the construction difficulties and subsequent failure of a large earthen dam in Java, Indonesia, for which he had recently been retained as part of the investigative team. George detailed the blatant ...s, and poor judgments made by the ... engineers, and politicians for the ...s were to be learned. At the end of the ...er Karen, my fiancee at the time, ...at surprise because she actually ...technical presentation. This was one ...t virtues: His ability to explain matters ...ly so that all of us could understand."

...r at Georgia Tech, George and I were ... graduate course on Rock Mechanics. ... task organizing our class schedules ...g from one part of the globe to the next ...pert opinion on international projects. ... someday I might achieve a fraction of ...ents that George did during his exciting

...ive in many professional societies,

...tive Committee of ...ican Society of Civil Engineers

...dent for the International Society ...chanics & Foundation Engineering

...e Engineering Research Institute

- National Society for Professional Engineers
- American Society for Testing and Materials
- Geological Academy of Science
- U.S. National Society of Soil Mechanics
- U.S. Committee on Large Dams
- Seismological Society of America
- Association of Engineering Geologists

Professor Sowers was the author and co-author of eight books. His most recent book entitled "Building on Sinkholes" is just now being published for distribution. He is an author of over 140 technical papers, many which have received prestigious awards. Some of these include:

- The first engineering faculty at GT chosen for "Teacher of the Year Award," 1971
- Engineer of the Year Award by the Georgia Society of Professional Engineers, 1973
- The Herschel Prize - The Boston Society of Civil Engineers, 1976
- The ASCE Middlebrooks Award in 1977
- The Terzaghi Lecture in 1979
- The ASCE Martin Kapp Lecture in New York, 1985
- The Brooks Award, 1990
- The ASCE Middlebrooks Award, 1994
- The ASCE Terzaghi Award, 1995

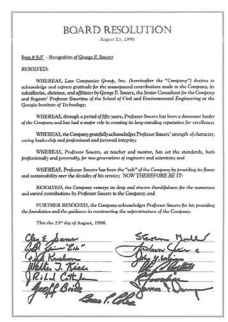
Dr. Mayne closed his remarks by reminding all that Professor Sowers was truly gifted in many ways.

"George Sowers loved his work. He was truly and uniquely a full-time consultant AND a full-time professor. He was a civil engineer AND a geologist. He

was a great man AND a humble man. He was serious business AND he was quite humorous. He was pragmatic and direct. He was a very giving and sharing person."

"This academic year marks George's 50th year association with Georgia Tech. We have been very fortunate to have had the chance to share his experiences, advice, and valuable lessons. At Georgia Tech, we loved George Sowers and we will ensure that his legacy will continue. Three years ago, we established the George F. Sowers Distinguished Graduate Student Award: a coveted prize bequeathed only to our best in geotechnical engineering. In our future, we can all find comfort in knowing that George lives on through the students he has taught, the colleagues he has touched, and the many influential and professional contributions he has made throughout the world."

Dr. James Wallace, Director of Engineering and Science at LAW, was asked to speak as a representative of the thousands of students that flocked to Professor Sowers classes.



BOARD RESOLUTION

August 23, 1996

Item # 9-F. - Recognition of George F. Sowers

RESOLVED:

WHEREAS, Law Companies Group, Inc. (hereinafter the "Company") desires to acknowledge and express gratitude for the unsurpassed contributions made to the Company, its subsidiaries, divisions, and affiliates by George F. Sowers, the Senior Consultant for the Company and Regents' Professor Emeritus of the School of Civil and Environmental Engineering at the Georgia Institute of Technology;

WHEREAS, through a period of fifty years, Professor Sowers has been a dominant leader of the Company and has had a major role in creating its long-standing reputation for excellence;

WHEREAS, the Company gratefully acknowledges Professor Sowers' strength of character, caring leadership and professional and personal integrity;

WHEREAS, Professor Sowers, as teacher and mentor, has set the standards, both professionally and personally, for two generations of engineers and scientists; and

WHEREAS, Professor Sowers has been the "salt" of the Company by providing its flavor and sustainability over the decades of his service; NOW THEREFORE BE IT:

RESOLVED, the Company conveys its deep and sincere thankfulness for the numerous and varied contributions by Professor Sowers to the Company; and

FURTHER RESOLVED, the Company acknowledges Professor Sowers for his providing the foundation and the guidance in constructing the superstructure of the Company.

This the 23rd day of August, 1996.

"Like many others here today, I was a student of Professor Sowers at Georgia Tech. I was in his undergraduate classes almost 40 years ago. Following that, I was in his graduate classes. Then I was privileged to be on the faculty with him at Georgia Tech and, finally, largely through his influence, I worked with him for almost 30 years at Law Companies. Through this entire period I continued to learn from George Sowers. I'm not sure that anyone could pay a higher compliment to George than to thank him for being a great teacher. He believed that the most valuable members of society are those who teach, whether in a formal classroom setting or in the outside world. Occasionally, he would note some tendency in me to be a teacher, and when he would mention it I would feel highly honored. But George was on a higher plane as a teacher than most of us. When I was a student at Georgia Tech, I would ask my fellow students what courses they planned to take the following term, and they would answer, "Whatever Professor Sowers is teaching." His classes were always full—not only because they were important parts of the curriculum, but because he was both entertaining and, most importantly, because he taught with authority. Many days he would come into class with his boots still on having just returned from a construction site. He would tell us about the problems he had just solved and, within a few days, he would present more details by showing slides of the project to the class."

"Through his international consulting work, his writing (both in technical journals and text books), his work in professional societies, and through his teaching, he became preeminent in his field. But above all, I believe the teaching awards were perhaps his most gratifying recognition."

"I would like to mention one other recognition—well deserved—that he received recently and that he seemed to really appreciate. That recognition was in the form of a resolution of thanks for his contribution to the Law Companies."

The resolution was from the Board of Directors of the Law Companies and is reproduced below:

For decades, George Sowers was a pioneer in geotechnical engineering on a national and international level, and unequaled in his communication of this knowledge. Colleagues remark that his extraordinary gift for communicating ideas was what set him apart from others in his field. He was renowned for explaining even the most technically complex problems in lay-person language, a gift that inspired and fortified client confidence in LAW. As Clarence Zimmerman explained, "Professor Sowers made what LAW did seem important and artful enough that potential clients never hesitated to hire LAW."

The enormous gap left by Professor Sower's passing will never be filled, but his legacy lives on here at LAW. As Bruce Cavan relates, "George Sowers saw LAW as a company with a heritage of problem-solvers, founded in sound engineering and good science above everything else. He wanted us to give good value to our clients." George Sowers, co-founder of LAW, revered leader, will always be remembered for the solid foundation upon which we continue to build.

Photo 1: Professor Sowers pictured here in Java at the Saguling abutment.

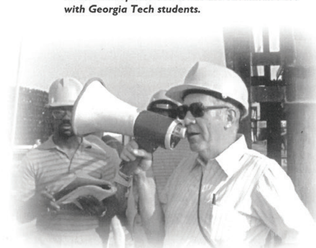
Photo 2: George and Francis celebrating the dedication of the Sowers Training Room at LAW Kennesaw.

Photo 3: George and Francis in a relaxed moment at the Sowers Training Room dedication.

Photo 4: Professor Sowers receives Engineer of the Year Award for 1973.

Photo 5: Board Resolution given to Professor Sowers by the Board of Directors from the Law Companies.

Photo 6: Professor Sowers at the Savannah Port with Georgia Tech students.



GEORGE F. SOWERS

20TH ANNUAL

SOWERS SYMPOSIUM

A REMEMBRANCE OF GEORGE SOWERS AS IT APPEARED IN THE DECEMBER 1996 LAW ENGINEERING NEWSLETTER.

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