John Lowe, III

JOHN LOWE III

1916–2012

Elected in 1974

"For leadership in the development and application of the principles of soil mechanics."

BY INGO FOX
SUBMITTED BY THE NAE HOME SECRETARY

JOHN LOWE III, renowned both in the United States and internationally as a preeminent civil engineer in the field of geotechnical engineering, died on January 2, 2012, at the age of 95. He had been a senior partner at the New York consulting engineering firm TAMS (formerly Tippetts-Abbett-McCarthy-Stratton) until his retirement in 1983, after which he continued his career as a much-respected US and international private consultant and chaired the US Society on Dams (USSD; formerly USCOLD).

John was born on March 14, 1916, on New York City's Upper East Side and grew up in Throggs Neck in the Bronx. He attended Townsend Harris High School (in Flushing, Queens), a school for students gifted in mathematics and science, from which he graduated in 1932 at the age of 16. Later he made his home with his family on Grandview Boulevard in Yonkers, where he lived until 2011. He spent the last year of his life in Seattle with his wife Jeanne and their two daughters.

John received his bachelor of science degree in engineering from City College of New York (CCNY) in 1936. The next year he received his master of science degree in engineering from MIT, where he studied under Professors Karl Terzaghi and Arthur Casagrande, whom many consider the founding fathers of modern soil mechanics. Needing employment before

continuing his work toward a doctorate, John took a teaching position at the University of Maryland, where he stayed until 1940 when an instructor position opened at MIT. He continued to work toward his doctorate under associate professor Donald W. Taylor of MIT, with some side work on defense projects. In 1945 he transferred to the Navy's D.W. Taylor Model Basin in Bethesda, Maryland, to work on ship hulls as a physicist.

On a personal recommendation from Karl Terzaghi, John joined the Knappen Engineering Firm in Manhattan in October 1945. The firm was looking for someone highly motivated and qualified to start up a soils department in support of various contracts recently awarded by the US Army Corps of Engineers. John was only the 11th employee when he joined. In the postwar years the firm grew exponentially across the United States and overseas and as a consequence expanded its partnership. In 1951 it became known as Tippetts-Abbett-McCarthy-Stratton. The firm established its headquarters in midtown Manhattan and soon earned a world-class reputation.

As chief soils, foundation, and dam engineer and head of the firm's geotechnical group, John's responsibilities and staff grew in concert with the expanding firm. He was made an associate partner in 1956 and full partner in 1962. He retired in 1983 as a senior partner, leaving behind an invaluable legacy in his body of work on the design of civil and dam engineering projects.

At the same time he maintained his close links with the academic world and demonstrated his passion to give and serve by teaching night classes as an adjunct professor at New York University from 1949 to 1951 and as a lecturer in soil mechanics at CCNY from 1953 to 1960.

As head of the TAMS geotechnical group John used a comprehensive soil mechanics testing laboratory in the basement of the firm's building, developing, among other things, the gradient-controlled consolidation test, a novel approach to estimating time-dependent settlement in cohesive soils. He was also responsible for the development of a new and improved method for taking undisturbed subsurface soil samples, as well as a breakthrough in the limit-equilibrium

stability method of analysis for the design of embankment dam slopes. The Lowe-Karafiath method, as it is now known, has since been incorporated in state-of-the-art computer software packages that are accepted as standard tools for the design of slopes and earth embankments.

John worked on a diverse range of civil engineering projects—ports and harbors, airports, bridge pier foundations, tunnels, and highways—but the main body of his design work was on dams and their ancillary structures. He was involved in the planning, design, and supervision of construction and rehabilitation of more than 45 dams in the United States, South America, Africa, the Middle East, and Asia. Of special note among these was his work in Morocco, where TAMS designed and supervised the construction of three dams. For his work and leadership on the Hassan Addakhil Dam on the Ziz River, King Hassan II of Morocco decorated John as Commander of the Order of Alaouites.

With his relentless quest to find new applications, John developed a novel approach for the use of existing construction materials in dam projects through the use of roller-compacted concrete (RCC), now considered a very cost-effective lean mix of cement and semi-dry petrous aggregates compacted in layers and used in many applications around the world. RCC was first applied in 1960 for the upstream cofferdam at Shihmen Dam in Taiwan, a TAMS project. Nowadays it is widely used for the construction of gravity dams at a fraction of typical construction costs for conventional concrete gravity dams and, in some cases, earth dams.

The most exceptional challenge in John's engineering career and one that occupied almost two decades of his professional life was his design work and participation in the construction supervision of the Tarbela Dam in Pakistan. This was an additional example of the highly successful use of RCC.

Located on the Indus River at the foothills of the Himalayas, some 75 km northwest of Islamabad in the district of Abbottabad, the Tarbela Dam is a megasized multipurpose hydro project and is the capstone of the Indus Basin Plan and 1960 Water Treaty that was effected between India and

Pakistan after partition. John was a lead engineer in the early investigations for this very large ($1.8 billion, 1968 USD) and politically important project. He participated during the entire period of design, construction, and remedial works. Today we are used to multibillion-dollar projects, but in 1968 Tarbela was the largest civil engineering contract ever awarded, and could not have been carried forward without the assistance of the World Bank and grants and loans from a number of donor countries. The responsible agency in charge of the project was the Water and Power Development Authority of Pakistan.

This project presented enormous new design and construction challenges for TAMS. Of particular significance were the occurrences that beset the project during the first filling of the dam reservoir in 1974, as well as several critical follow-up events resulting from a series of complex factors. Thanks to John's sheer energy and unyielding determination to put things right, the necessary remedial works to address these challenges were completed successfully without major delays from the projected start date for supplying irrigation water to the lower Indus Valley in 1975. This was followed in mid-1977 by urgently needed generation of hydroelectric power.

John travelled to Pakistan more than 45 times during that period. He also was the driving force behind reservoir sedimentation studies in the early 1980s; reanalysis of the seismic resistance of all project structures based on updated seismicity studies; seismic risk studies; and more comprehensive and thorough knowledge of the tectonic environment affecting the project site. This information was not available at the time of the project inception, design, and construction.

This project was a prototype and was instrumental in further progress in civil engineering understanding and hydraulic modeling for similar structures. The advances and lessons learned were communicated through international presentations and technical papers in engineering and specialty conferences and journals. The resulting insights were fundamental in the advancement and understanding of

civil engineering in complex geologic settings and hydrology, and in the disciplines of geology, geotechnical engineering, hydraulics, seismicity, sedimentation, instrumentation, and the "observational method" (first proposed by the Casagrande brothers). Through John's initiative the project attracted the attention and participation of a number of leading US and international consultants in many of the key disciplines.

John also found the time to contribute engineering chapters to four technical books, publish more than 35 technical papers in professional journals, and present at national and international conferences both in the United States and overseas. He gave six honorary lectures: the Eighth Terzaghi Lecture in 1971, the Fourth Nabor Carrillo lecture in 1978, the second annual lecture of the US Commission on Large Dams (USCOLD) in 1982, the Marty Kapp lecture in 1986, the keynote address of the Roller-Compacted Concrete II Conference in 1988, and the Mueser Rutledge Lecture in 1997.

In addition, he served as chair or moderator at engineering symposia and conferences and held significant positions in professional societies. He chaired the Geotechnical Engineering Division of the American Society of Civil Engineers (ASCE) and USCOLD. He was also an ASCE fellow and a member of the International Committee on Large Dams (ICOLD), International Society of Rock Mechanics, the Moles (an association of contractors in heavy construction), and the four-member board of consultants to USCORPS Chief Engineers in Washington, DC (1960–1982). He was a life member of the University Club of New York City.

John was honored by election in 1974 to the National Academy of Engineering, and in 1982 he received the CCNY Townsend Harris Medal for extraordinary lifetime achievements in his field.

John enjoyed a variety of interests. At a young age, he gathered rocks and minerals. When he traveled internationally as an adult, he collected small artifacts and ancient coins. He was a keen photographer everywhere he went, keeping up with each new generation of still cameras and some movie cameras, each of which became part of his large and ever

expanding collection. He loved watches and Swiss Army knives. He read widely and kept up to date on current issues and events. He was committed to keeping up a diary in Lefax notebooks where he recorded all manner of professional and personal details, especially aspects of his personal health fitness regime, including biometric cycle graphs.

In addition to a basic exercise routine that included jogging, push-ups, sit-ups, and stretching, John enjoyed a number of sports, including downhill skiing into his 80s and tennis, which he played throughout his life until he was 90. And harking back to his days as a young gymnast, John would sometimes insist with a twinkle in his eye on demonstrating that he could "stand on his ear," occasionally in his office in his business suit. He enjoyed ping pong and camping with his family, and he was a dedicated gardener/farmer well into his 80s, spending many happy hours working in the side lot at his house in Yonkers. He was also an active member of the Asbury Methodist Church in Crestwood, New York.

Beyond his highly technical and professional personality, his diverse interests, and his athleticism, John had uncommonly strong interpersonal skills and charisma that commanded respect and loyalty and ingratiated him with a wide professional, social, and family circle of friends. He was deeply devoted to his wife Jeanne; they were both gregarious, and she was an exceptional cook and hostess—they loved to entertain guests at home and away.

John Lowe III was an inspiration and mentor to many. His clear thinking, instincts, enthusiasm, and energy were his hallmark, particularly during the sometimes difficult periods throughout his long career. He was always firm yet a very generous and gentle person, a good listener, someone who led from the front and yet always managed to find the time to help others. He helped establish soils laboratories, mentored geotechnical engineers both in the States and abroad, and became one of the profession's most respected authorities. He was always ready to serve and will be greatly missed.

John is survived by Jeanne Wright Lowe, his wife of 68 years, son Jonathan in Tampa, daughters Barbara and Heather in Seattle, grandchildren Alicia and Alan, and great-granddaughters Sarah and Amanda.