



## ROY G. JOHNSTON

1914–2008

Elected in 1981

*“For distinguished contributions and service in the field of structural engineering and earthquake-resistant design of buildings.”*

BY GREGG E. BRANDOW

SUBMITTED BY THE NAE HOME SECRETARY

**R**OY G. JOHNSTON, cofounder of the structural engineering firm Brandow & Johnston and one of the nation’s most prominent structural engineering leaders, died on March 13, 2008, at the age of 94. He had practiced the profession he loved for 67 years, retiring in 2002 at the age of 88.

Roy Johnston enjoyed the practice of structural engineering, and those who were clients, employees, students, and fellow professionals were treated with technical insight, passion, and professionalism. When an engineering conversation mentioned “Roy,” there was never a question who that was. Roy’s legacy in buildings is well over 10,000, and the skyline of Los Angeles is a tribute to his ingenuity and technical skills. Roy influenced the profession of structural engineering and the advancement of seismic design through his involvement from California to Washington, D.C. Roy was one of the most widely admired structural engineers of the 20th century.

Roy G. Johnston was born on January 7, 1914, in Chicago and moved with his Swedish immigrant parents to California’s central valley when he was 7. His father was a cabinetmaker in Sweden and became a carpenter and later a small contractor. After the 1929 stock market crash, the Johnston family moved to the Los Angeles area, where Roy and his brother Paul attended Alhambra High School. His father encouraged the boys to get

a good education, and they both excelled. Roy was active on the track team and debating team, and he was encouraged to pursue a track scholarship at the University of Southern California. In the end he did get a debating scholarship, which made it possible for him to attend USC.

Having worked for his father at a young age in construction, Johnston gained an early-on insight into construction and a desire to be an engineer. He found that USC had a program in civil engineering geared toward the design professional, and with Professors Fox and David M. Wilson as mentors and friends, Roy gained the skills that launched his career.

Roy graduated cum laude with a B.S. in civil engineering in 1935. After a brief time with the Los Angeles County Building Department, he worked for seven years with Clyde Deuel, a Los Angeles engineering consultant, and designed his first buildings, such as the I. Magnin store on Wilshire Boulevard, and seismically strengthened schools in the aftermath of the 1933 Long Beach earthquake. When World War II started, he moved to the Lummus Company and worked for George Brandow, a colleague from USC, in refinery design. The military needed 100-octane gasoline for the bombers, and Roy started the design of the 27 “cat crackers” refining systems. When George moved over to Union Oil Company in charge of the fieldwork at the refinery, Roy became chief engineer for Lummus. Despite their efforts to enlist in the military, Roy and George were kept in their critical war-related activities.

At the close of World War II and at the encouragement and backing of a leading Los Angeles architect, John C. Austin, Johnston joined forces with George Brandow and started their consulting firm with their first project, the Business Administration Building at the University of California at Los Angeles. The partnership flourished because of the postwar boom in buildings in Los Angeles and because Roy and George were natural partners, complementing each other’s talents and skills. This was the beginning of a pattern of long relationships with the prominent architects of Southern California, such as William Pereira, Welton Becket, Edward Durell Stone, Claud Beelman, Adrian Wilson, I. M. Pie, Langdon & Wilson,

Gensler, and others. For the next 50 years, Roy and his partners tackled over 400 projects per year. The list of projects is a true legacy and includes the original university campuses at the University of California, Irvine, and Pepperdine, the Lockheed L1011 Assembly Complex in Palmdale, the Fluor Irvine Corporate Headquarters, five medical centers for Kaiser, the Palm Springs Regional Airport, and high-rise buildings that define the skyline of Southern California and San Diego.

The 1933 Long Beach earthquake occurred while Roy was in college. The aftermath influenced the structural design he learned in his classes and started the evolution of building code requirements that continues today. Roy was more than a leading practitioner in seismic design. He was an active leader in the development of the code requirements. In 1956 he was instrumental in lifting the 150-foot height limit on buildings in Los Angeles and soon after designed the building that exceeded the 12-story height limit. He participated in the Structural Engineers Association of California's development of the first "Blue Book," Recommended Lateral Force Requirements and Commentary, in 1959, which later was adopted by the Uniform Building Code. He became president of the Structural Engineers Association of Southern California in 1961 and president of the Structural Engineers Association of California in 1962.

Shortly after the 1971 San Fernando earthquake, Roy was asked to testify before a congressional committee that was investigating the earthquake and, in particular, the collapse of the Veterans Administration (VA) Hospital in Sylmar. Within a few days the investigation was complete and the need for an ongoing committee to assess the risk to other VA hospitals was apparent. In 1973 the Advisory Committee on Structural Safety of Veterans Administration Facilities was appointed with five members, Roy filling the structural engineer position. This committee developed a program for the VA that undertook investigations and research to implement requirements for earthquake-resistant design for VA hospital facilities throughout the country. The program addressed risk and priorities, developed standards for structural evaluations and

nonstructural protection, and implemented a review program. The program spent about \$2 billion per year for the retrofitting and remodeling of old hospitals and the construction of new facilities. Roy's 18 years on the committee were a primary reason for its success.

Roy was appointed as a member of the Building Seismic Safety Council (BSSC) and was its chairman from 1982 to 1985. In 1988 he chaired the Program on Abatement of Seismic Hazards to Lifelines. Roy was instrumental in the early success of BSSC and the development of seismic design guidelines for the National Earthquake Hazard Reduction Program (NEHRP) of a national program on seismic design.

Roy joined the Earthquake Engineering Research Institute (EERI) in 1962 and was an active member of the organization for many years. He was twice a director, was vice president, and was on the conference committee for the World Conference on Earthquake Engineering in San Francisco in 1984. His leadership in charge of finances helped make the conference both a technical and a financial success. Roy was one of an EERI team of 10 engineers invited by the Chinese government to tour China in 1980 and discuss seismic design problems with Chinese engineers. Their team consisted of the first Americans to witness the devastation of the Tangshan earthquake, which killed a reported 240,000 people three years earlier.

Roy participated in the U.S.-Japan Committee in the early 1980s, which was a program of the National Science Foundation to test some full-scale buildings. Using the Japanese testing facility, a six-story building was constructed and subjected to earthquake motions utilizing jacks and a reaction wall. That was the first project composed of university researchers and practitioners from both countries.

Roy was appointed to California's Board of Registration for Professional Engineers by Governor Ronald Reagan in 1970, served for two 4-year terms, and was chair for two years. He guided the board through political distrust of licensing boards with his professionalism and "debating skills."

Governor George Deukmejian appointed Roy to California's State Building Standards Commission in 1986, where he served

two 4-year terms. Roy found that the commission, which reviewed, approved, and published state building standards, had to address many complex areas of energy conservation, handicap accessibility, fire and life safety, and seismic safety. His wise judgment helped move the state's building code development forward.

Roy Johnston's career spanned almost 70 years, from hand calculations and slide rules to computers. He always stressed that engineering judgment was critical in developing engineering approaches to complex problems. In an interview he said:

I remember they used to tell us, "You may not know the exact answer, but if you can establish the limits, and there is a band within which it will fall:  $B$  cannot be more than or less than  $B$ , then you can use your judgment." In those days we used to say that engineering was 25 percent calculations and 75 percent judgment and experience. The proportions have changed now, but judgment is still a very critical factor. In those days, of course, you could not depend on computers.

Roy was recognized with the Los Angeles Chamber of Commerce Construction Industries Award in 1981 with his partner George, the USC Engineering Alumnus Award for Outstanding Achievement in 1982, the Institute for the Advancement of Engineers Southern California Engineer of the Year Award in 1985, and the Structural Engineering Association of Southern California's Engineer of the Year Award in 1990. In 2000 the Institute for the Advancement of Engineering presented Roy with the Lifetime Achievement Award. Roy was elected to the National Academy of Engineering in 1981.

Besides a passion for golf, Roy's interests were family, church, and an appreciation for higher education. In reverse order, Roy served for 25 years on the Board of Trustees at Westmont College in Santa Barbara, being chairman from 1972 to 1988. During this time he also served as a director of the Independent Colleges of Southern California.

Roy was a generous man of great integrity whose Christian

faith led him to serve in positions of leadership at the Pasadena Covenant Church for over 50 years. He was adept at consensus building and understood the importance of giving everyone who would be affected an early voice in decision making.

Roy used to say that if he had not been an engineer, he would have been a teacher. His natural affinity for educational tasks was clear in his approach to work assignments in his firm, trying always to assign tasks that fit the person's knowledge and skills while also providing opportunities for learning. Roy occasionally taught university courses, was a valued panelist in university-sponsored professional education seminars, and at age 71 traveled to Indonesia to teach a short course in seismic design. His primary contributions to education, however, were made at Westmont College in Santa Barbara, where he served for 32 years as a member of the Board of Trustees, including 18 years as chair. In this role he developed considerable expertise in the issues inherent in higher education, from personnel support to public relations, and served as a director of the Independent Colleges of Southern California.

Roy's leisure time was filled with family, travel, and golf. Of all his accomplishments, he was particularly proud of the two occasions on which his golf score bested his age. His relationships with his family brought him continuing joy and were characterized by unflinching trust and support.

Predeceased by his first wife Naomi (*nee* Harmon), Roy is survived by his wife Lucille (*nee* Peterson); daughter Judith Johnston, professor emerita in the School of Audiology and Speech Sciences, University of British Columbia; son Robert Johnston, professor of theology and culture, Fuller Theological Seminary, Pasadena, and his wife Catherine Barsotti; granddaughters Elizabeth Johnston, attorney, and Margaret Browne, Montessori teacher; and his brother Paul Johnston, retired pediatric surgeon, and his wife Lillian (*nee* Rogstad) and their children.

