



JACK V. CHRISTIANSEN

1927–2017

Elected in 1985

“For imaginative developments in design and construction of concrete shell structures of record span, particularly in areas of high seismicity.”

BY TYLER S. SPRAGUE

SUBMITTED BY THE NAE HOME SECRETARY

JOHAN VALDEMAR CHRISTIANSEN, an American designer of thin-shell concrete structures and structural engineer of the largest free-standing concrete dome in the world—the Seattle Kingdome—died August 16, 2017, at the age of 89.

Jack Christiansen made a name for himself as a consulting structural engineer in Seattle, embracing the connections among engineering, architecture, and construction disciplines to become a prolific designer of shell structures in the Pacific Northwest. Celebrated around the world for his creative structural designs, he designed over 100 shell structures, including warehouses, churches, convention halls, and bridges. Beginning with simple barrel-vaulted forms, he was later inspired by the work of the master builder Felix Candela and adopted more complex, doubly curved shell geometries such as the hyperbolic paraboloid. He saw these shell structures as both architecturally striking and easily constructible.

He was born September 28, 1927, in Chicago to Christian Valdemar Christiansen, who worked for the Bowman Dairy Company, and Louise Linderoth Christiansen. The family moved to Oak Park, Illinois, in 1937.

Jack studied architectural engineering at the University of Illinois, Urbana-Champaign, where he discovered his love of structural design, graduating in 1949 with a bachelor’s degree

with high honors. He received a master's degree in structural engineering from Northwestern University in 1950 before working for the architecture engineering firms Perkins and Will, and Shaw Metz and Dolio in Chicago.

Seeking a life of adventure, he and his wife Sue moved to the Pacific Northwest in 1952, settling on Bainbridge Island in Puget Sound, a short ferry ride from Seattle. From this location, Jack could work in downtown Seattle and also have easy access to the Olympic Mountains to the west. He was an avid mountaineer, climbing all over the world and becoming one of only a few climbers to summit over 100 peaks in the Olympic Range. His love of engineering was matched by his love of mountaineering adventure.

In Seattle he joined the consulting engineering firm W.H. Witt in 1952. The firm became Skilling, Helle, Christiansen, Robertson in 1967 and rose to international prominence with the structural design of the World Trade Center Towers in New York City (the firm continues today as Magnusson Klemencic Associates).

Christiansen worked closely with the architect Minoru Yamasaki to design the thin, delicate concrete structures and towers for the US Science Pavilion for the 1962 Seattle World's Fair, a project often credited with winning the World Trade Center commission for Yamasaki. The two men also worked together on the North Shore Congregation Israel in Glencoe, Illinois (1964) and the Carleton College West Gymnasium (1964).

Christiansen was a favored collaborator of many other Modern architects in the Pacific Northwest, including Paul Kirk, Fred Bassetti, and the early partners of NBBJ. Yet he explored the expressive geometrical forms of thin-shell concrete structures in his own way, giving his work a distinct characteristic and recognizable Modern signature.

He believed that the structure of a building should be a noticeable part of its overall design: "Visually apparent structural clarity has a universal appeal. In a building, this expresses itself in a natural and orderly flow of loads from the

top of the building down through the building structure to the foundations.”¹

Christiansen’s signature projects in the Pacific Northwest include Montlake Pedestrian Bridge at the University of Washington (1958), Ingraham High School (with NBBJ, 1958), the Pacific Architect and Builder building (with A.O. Bumgardner, 1958), the Exhibition Hall (now Pacific Northwest Ballet; with Paul Kirk, 1962), the Mercer Island Beach Club (with Kirk, 1966), and the Boeing Museum of Flight (with Ibsen Nelson, 1983).

Through his work at the firm, Christiansen pushed his thin-shell concrete structures to increasingly long spans. In 1968 he worked with the New Orleans architects of Curtis and Davis to design the Rivergate Exhibition Hall along the Mississippi River—a collection of massive, “humpbacked” barrel vaults spanning 253 feet to create expansive interior space.

But his crowning achievement was the design of the Seattle Kingdome, a segmental concrete dome structure spanning a space over 660 feet in diameter. Built as a publicly funded, multipurpose arena, the Kingdome played an essential role in the growth of Seattle, bringing large-scale professional sports teams to the Pacific Northwest for the first time.

Working in collaboration with the architects at NBBJ, Christiansen designed the Kingdome to accommodate not only numerous configurations but also the extreme inflationary economic times of the early 1970s. His design found maximum efficiency in its concrete structure, enabling the project to be completed under dire financial circumstances, but with a necessarily utilitarian appearance. He referred to the Kingdome as his “symphony in concrete” and likened it to the Roman Coliseum, believing in its ability to last “over 1000 years.” Its dramatic implosion in 2000, precipitated by the changing demands of professional sports, marked yet another transition in Seattle.

Christiansen commonly professed his love of structural engineering. “Being an engineer was a lot of fun because of

¹ Quoted in Sprague T. 2019. *Sculpture on a Grand Scale: Jack Christiansen’s Thin Shell Modernism*. Seattle: University of Washington Press.

the finished product," he said. "A building is a great big thing, and you can see it, and touch it. It's like you are creating sculpture on a grand scale."

According to Jon Magnusson, former CEO of Magnusson Klemencic Associates, "Jack was certainly one of the most creative engineers that I have ever met. When he worked with trace paper and a soft pencil on structural concepts, he actually created art. He set the example for the whole firm of how structure could, and should, be architecture. His love and talent for architecture became embedded in the DNA of our firm and lives on to this day."

Christiansen retired from the firm in 1983 and worked as an educator at the University of Washington and then as an independent consultant. He was elected to the NAE in 1985, and awarded the Eduardo Torroja Medal by the International Association of Shell and Spatial Structures in 2016.

Jack was preceded in death in 2010 by his beloved wife of 60 years, Gertrude Suzanne (Sue; née Hasselquist). He is survived by children Janet (Torre) Jorgenson, Karin (Shigeki) Kajita, Robert Christiansen, John (Vivian) Christiansen, and Nelda (Clif) Swiggett, and six grandchildren.

