John B. Skilling

JOHN B. SKILLING

1921–1998

Elected in 1965

"Pioneering building engineer."

BY WILLIAM J. BAIN, JR.
SUBMITTED BY THE NAE HOME SECRETARY

JOHN B. SKILLING was one of the greatest men I have known—a legendary structural engineer, a lyrical designer, and one of the top conceptual skyscraper engineers in the world. In the 1960s, *Engineering News-Record* (ENR) called him the prototype of the modern structural engineer. Years later, mainstream media dubbed him the Man of Steel. A true innovator, John B. Skilling died in Seattle on March 5, 1998, at 76, just two years after retiring from Skilling Ward Magnusson Barkshire.

John was born on October 8, 1921, in Los Angeles. He entered the engineering field early when he worked on federal construction projects during the summers with his father, who was a civil engineer. These projects took his family from city to city, eventually bringing them to the Pacific Northwest, where John would later put down roots and raise his own family.

After graduating from Kent Senior High School in 1940, John enrolled at the University of Washington. When the war intervened, he worked at the Boeing Company, for which he later designed hangars with impressive long-span roofs. After the war, John returned to the University of Washington, where he earned a B.S. in civil engineering in 1947.

John then joined the structural engineering firm of W. H. Witt Company, where he was made a partner after just three years. The firm subsequently underwent several incarnations and name changes, but John stayed with the firm for 50 years—his entire professional life. When John eventually took over as head of the firm, it became known as Skilling Ward Magnusson Barkshire. Under John's leadership, the company was responsible for the structural engineering of more than 1,000 buildings in 36 states and 16 countries, garnering more than 85 awards for excellence in structural design.

According to *Who's Who in Engineering* (1998), John was "personally responsible for the structural design of many of the most significant structures in the U.S." These structures included more than 75 high-rise buildings (four of the world's 10 tallest at the time) and more than 40 long-span structures.

Early projects included the IBM Building (1963) in Pittsburgh, the first exterior-space-frame office building and the first building to use 100,000 psi high-strength steel.

For the Seafirst Headquarters Building (1969) in Seattle, John used a Vierendeel truss to form the exterior walls. All loads were carried by the four corner columns and the central elevator core, which left flexible spaces on the upper floor interiors that were free of columns and open, uninterrupted entrances to the building from the plaza.

These engineering innovations plus the original structural design of Seattle's IBM Building (1964) led to receiving the commission to engineer the quarter-mile-high twin towers of the New York World Trade Center (1972). John and colleague Les Robertson used three studies that were "firsts" in the field; a comprehensive wind-environmental study, a boundary-layer wind-tunnel study, and a human-sensitivity-to-building-motion study. The World Trade Center was also the first building to use prefabricated, multiple-column-and-spandrel steel wall panels. And it was the first building to use mechanical damping units to reduce wind excitation. The buildings withstood a bombing attack in 1993 but unfortunately were unable to survive the dual terrorist attack in 2001.

For Seattle's Kingdome (1976), John and his colleague John (Jack) V. Christiansen made good use of John's pioneering work in the 1950s on thin-shell concrete structures. With double curvature shapes in the roof, the Kingdome became the largest thin-shell concrete structure in the world.

John's Seafirst Headquarters Building had only four exterior corner columns, but even those four were eliminated for the Rainier Tower (1977). The result is a daring, flared, concrete pedestal that covers only a quarter of the site at ground level allowing for more open views of the surrounding classical buildings. The first rental floor is 12 stories above the ground, providing excellent views and, thus, higher leasing rates. This concept, created by John, is an example of how much responsibility he had for the architectural forms of his buildings.

At 76 stories, John's Columbia Seafirst Center (1985), still Seattle's tallest building, was the first in which composite columns were used at the apexes to reduce wind sway in a triangular-braced building. It was also the first time multilayer viscoelastic dampers were attached to the braces of a high-rise building to reduce wind-induced accelerations.

For the Washington State Convention and Trade Center (1988), John conceived of economical, yet creative ways for the building to span 12 lanes of freeway and three city streets. To accomplish this, he used braced, multichord trusses, which required more than 2,500 different structural-steel connection details.

One of the last projects I worked on with John was Seattle's Two Union Square (1989), at the time, the most economical building of its height ever built. In this building, he pioneered the use of steel tubes filled with a record-breaking high-strength concrete of 20,000 psi as interior columns. Using this technique, which has since become standard in the industry, we were able to provide 10 corner offices on each typical rental floor. By developing hyper-efficient viscoelastic dampers, he reduced the number of necessary dampers to only 16 for the entire 56-story building.

Throughout his career, John received formal recognition from many leading organizations in his field, as well as from the city of Seattle. In 1965, he was the first structural engineer ever to be elected a member of NAE. The following year, ENR named him Construction Man of the Year. My own profession awarded him the American Institute of Architects (AIA) prestigious Allied Professions Medal, as well as an honorary membership in the AIA Seattle chapter. John was named Engineer of the Year three times—by the Consulting Engineers Council of Washington (now ACEC), by the Structural Engineers Association of Washington, and by the Washington Society of Professional Engineers. He also shared an American Iron and Steel Institute Design in Steel Award with Minoru Yamasaki and Perry Johanson. John owned 13 patents related to railcar suspension. Seattle Mayor Norm Rice declared June 3, 1994, John Skilling Day.

In addition to his membership in NAE, John was affiliated with many organizations including American Society of Civil Engineers (Fellow); American Concrete Institute (ACI); ACI Committee on Shell Construction; American Institute of Steel Construction; International Association for Bridge and Structural Engineering; International Association for Shell and Spatial Structures; National Research Council Building Research Advisory Board; Seismic Design Committee, National Academy of Engineering; Society of American Military Engineers; and Structural Engineers Association of Washington.

John was the most positive, solution-oriented engineer I have ever met. No matter how difficult the problem, he always thought that somehow an effective design solution could be worked out. I believe he was a genius. It was amazing to watch him play with forms in the most lyrical and poetic ways and reduce construction costs at the same time. He was also a teacher; he understood the complexities of structural engineering so well that he made things seem simple, even for us architects with whom he collaborated so well.

John was a fun, upbeat man. He was the kind of person who needed only a flip chart and some markers to make his pitch to the World Trade Center Commission. He was the kind of man who, as the story goes, twisted his own leg back around after a skiing accident. He was proud of his family—his wife of many years, Mary Jane Skilling, who was his perfect counterpart and the rock from which he flew, his children, his profession, and his firm. He was always intensely competitive and had incredible drive, but he was never too busy to stop and explain his concepts to the rest of us in words—and diagrams—so we could understand.

Like his tall buildings that are always in motion, John never seemed to slow down. His brilliance, along with his energy, enthusiasm, and innovation provided momentum for everyone of us who was fortunate enough to work with him.

His daughter, Ann, remembers him:

> As a husband and father, John brought his enthusiasm to everything that he did. Whether it was building a miniature railroad for his children, researching recipes to create an elaborate Chinese dinner, or playing tennis and golf, he always gave a hundred percent. He was also fond of puzzles and games of all kinds, which we frequently played together as a family.
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> His professional creativity often found a place at home. Most fathers would have built a model airplane with their sons; ours chose to build a full size color TV. To John, there was never a problem that could not be solved and never a reason to be pessimistic about anything life had to offer. His life positive attitude guided our family life.

Survivors include his wife Mary Jane, daughters Susan and Ann, son Bill, and siblings Virginia, Donald, Bill, and Helen.