



Gabriel Moulin Studio, San Francisco

Samuel Jacobz

J. DONOVAN JACOBS

1908–2000

Elected in 1969

“Contributions to the science and art of tunnel construction through the invention of the tunnel sliding floor for rapid excavation.”

BY WILLIAM W. EDGERTON
SUBMITTED BY THE NAE HOME SECRETARY

JOSEPH DONOVAN JACOBS, a leader and innovator in the underground construction industry, died August 26, 2000, at the age of 91.

Born on Christmas Eve 1908 in the small town of Motley, Minnesota, Don was the son of a bank manager and former schoolteacher. He graduated from high school at the age of 15 and, too young to start college, took a job with the local telephone company. Demonstrating the initiative that would characterize him throughout his life, he installed phones, collected delinquent accounts, and substituted on the switchboard. In the evenings he worked as a radio salesman, calling on local residents to demonstrate the battery-powered receivers that represented the cutting-edge technology of the day.

At age 17 he enrolled in Saint John’s University in Collegeville, MN, where he spent two years and gained a solid foundation in the humanities. In 1927 he moved to Minneapolis, where he spent the next six years alternating between college and work. When he graduated from the University of Minnesota in 1934 with a BS in civil engineering, the Depression was in full force, and of the 52 aspiring engineers in his class, only five, whose fathers headed contracting or engineering firms, had prospects for employment.

With little to go on but his own motivation, Don landed a job driving a truck to the construction site of the Fort Peck Dam in eastern Montana. Once on-site he parlayed his presence into an office job and, eventually, engineering responsibilities for the joint venture of Mason and Walsh, the firm responsible for the diversion runnels and control shafts. Having proven his engineering skills, the work connection stuck. Walsh and Walsh-sponsored joint ventures kept Don employed for the next 17 years.

In 1937 Don married Virginia O'Meara, whom he met while working in Montana. The two settled into a company cottage while Don worked on an industrial water supply project for the city of Birmingham in Alabama. With the conclusion of this project, the young couple settled in New York, where Don served as a field engineer for the Queens-Midtown Tunnel and then as a designer of special construction equipment on the Delaware Aqueduct. This was followed by a stint as an estimator in Walsh's New York office. Don was rounding out his experience as an engineer.

During World War II Don was a buyer of heavy equipment for the construction of a US airbase in Trinidad, West Indies. He also designed special equipment for a Jersey City shipyard of Walsh-Steers, which entailed building landing craft for the US Navy. In 1943 he was transferred to Cleveland to serve as district engineer for the construction of priority wartime bridges and docks.

After the war ended, Don was appointed district engineer for Walsh in San Francisco. From 1947 to 1954 he worked on 11 dams and large tunnels in the western United States. In 1954 he was appointed chief engineer on the construction of two dams and 15 miles of large tunnels on Australia's landmark Snowy Mountains Hydroelectric Scheme for the joint venture of Kaiser-Walsh-Perini-Raymond (KWPR). Before accepting the assignment in Australia, Don told his employers of his desire to start his own consulting practice in San Francisco, and together they negotiated a contract that allowed him to return to San Francisco once the project was under way.

In midsummer of 1955 Don returned from Australia and

hung out his shingle as a consulting construction engineer. His first client was his former employer, KWPR. A year later, in December 1956, having attracted a nucleus of capable engineers, he incorporated Jacobs Associates.

In 1959 he conceived and patented the Jacobs Sliding Floor, also known as the “Magic Carpet.” This self-propelled trackway system significantly increased efficiency in drill-and-blast hard rock tunneling methods when drill jumbos, mucking machines, and muck cars were rail-mounted. The Sliding Floor sped up the switching of muck cars behind the mucking machine, and moved the rail-mounted drill jumbo and mucking machine in and out from the tunnel face—eliminating the time-consuming and labor-intensive job of laying track at the tunnel face for each round of excavation. Equipped with a semiautomatic track magazine that placed full-length haulage track at the rear of the floor on a well-compacted invert, the method simultaneously saved labor costs and provided better track.

Don not only personally performed professional engineering services throughout the world but also served as a consultant or member of a consulting board to owner entities on an impressive variety of public works, such as the Oroville Dam, Berkeley Hills Tunnel, Crystal Springs Tunnel, and San Fernando Tunnel, all in California; Honolulu’s Wilson Tunnel; Litani River Project, Lebanon; continued work on Australia’s Snowy Mountains Hydroelectric Scheme; Seattle’s Metropolitan Sewer Tunnels; Churchill Falls Hydroelectric Project, Labrador; Sea Level Canal Board, Panama; Arizona Power Commission; Libby Dam Railroad Tunnel, Montana; and City Water Tunnel Number Three, New York.

In addition, he excelled as an inventor of construction equipment, and authored numerous technical articles as well as a chapter on “Some Tunnel Failures and What They Have Taught” in *Hazards in Tunnelling and on Falsework* (Institution of Civil Engineers [ICE], 1975). He also coauthored the *AIME Underground Mining Methods Handbook* (Society of Mining Engineers of AIME, ed. W.A. Hustrulid; 1982).

Don made significant contributions to underground engineering for many years and was a recognized leader in

the industry. He was a member or fellow of the American Society of Civil Engineers, American Institute of Mining and Metallurgical Engineers, Australian Institute of Engineers, and National Society of Professional Engineers.

In recognition of his many accomplishments, in 1969 he was elected to the NAE, and in 1980 the Beavers, a national organization of construction contractors, awarded him the Golden Beaver Award for engineering. The following year he was awarded The Moles annual nonmember Award for Outstanding Achievement in Construction, in recognition of his "Contributions to Tunnel Design and Construction and his Innovations in Tunnelling Practices which have brought him Worldwide Acclaim."

Don left an important legacy to his now 60-year-old company: a stable foundation for growth and a set of lasting values. In its new incarnation—McMillen Jacobs Associates (through a Jacobs Associates merger with McMillen LLC)—the company retained its employee-owned identity and is still going strong. From a one-man consulting firm in 1955 it has grown to a well-respected and internationally known engineering and construction firm serving the sizable civil, underground, and water resources markets, with 22 offices in North America, Australia, and New Zealand.

Don's legacy to the civil engineering community is the advancement of construction engineering in the difficult, uncertain geologic conditions inherent to underground construction. He made engineering a much more important part of the construction process by bringing advanced design methods to temporary construction facilities. And as a consultant to owner-agencies, he increased the efficiency of the construction industry as a whole by incorporating constructability aspects into the design of permanent facilities.

Virginia died in 1995. Don is survived by their children John and Judy Jacobs (Diablo, California), and grandchildren Jill Jacobs-Barr (Chicago) and Patrick Donovan Jacobs (Oakland). His son John followed in his father's footsteps in the construction industry by serving as an executive at Dillingham Construction (Pleasanton, CA) from 1969 to 1998.

