

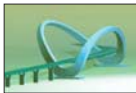
# T.Y. LIN – ENGINEER EXTRAORDINAIRE

*(A tribute to one of the greatest engineers of the 20th century)*

By: Ir. Chin Mee Poon, Standing Committee on Publications



Prof. T.Y. Lin in front of the Shah Alam Stadium designed by him.  
(Photo courtesy of Ir. Wang Loo Min of T.Y.Lin (S.E.A.) Sdn. Bhd.)



Nanning Bridge, China, one of Prof. T.Y. Lin's last projects. Now in detail design, when it is completed by end 2004, it will be the only one of its kind.

I was shocked when I heard that Prof. T.Y. Lin had passed away on 15 November 2003.

I still remember the occasion when Prof. T.Y. Lin came to the Engineering Faculty of University of Malaya in the early 1970s to address the faculty members and undergraduates. He was obviously pleased to be introduced as an avid ballroom dancer in addition to being an outstanding structural engineer. He specialised in prestressed concrete and the bridge structures he had designed to overcome various extremely difficult obstacles were really impressive. As an undergraduate, I was completely mesmerised by his lecture and his ability to make a complicated subject look so simple.

I was fortunate enough to meet Prof. T.Y. Lin again in 1980 when he conducted a seminar on prestressed concrete in Singapore. Again, the big smile on his face, the big voice from his small build, and the big projects mentioned in his lectures commanded the full attention of the packed audience.

I could still remember vividly the way he described how he came up with solutions to some difficult engineering problems while flying. An idea suddenly struck and he would grab hold of any paper available and started to draw sketches and scribble notes on it. When he got back to his office, he would pass the paper to his engineers for further analysis and

refinement, and, voila! an elegant engineering design had been developed.

Born in China on 14 November 1912, Lin Tung-Yen had a strong aptitude for calculations. He was enrolled in Jiaotong University's Tangshan Engineering College at the age of 14. After he graduated with a bachelor's degree in civil engineering in 1931, he moved on to pursue his graduate studies at the University of California, Berkeley in the United States. He gained early recognition in his field with his master's thesis on direct moment distribution. The innovative paper advanced structural analysis and was the first student thesis published by the American Society of Civil Engineers.

After obtaining his master's degree in civil engineering in 1933, Lin returned to China to work with the Ministry of Railways. He became chief bridge engineer of the Yunnan-Chongqing Railway four years later at the age of 25, and oversaw the survey, design and construction of more than 1,000 bridges throughout China's mountainous regions.

In 1941, Lin married Margaret Kao. Five years later, while Lin was working in Taiwan, he accepted an invitation to join UC Berkeley's faculty. It was here that Lin began his groundbreaking research in prestressed concrete, dramatically simplifying the design process for using the material, which combines the tensile strength of steel tendons

with the compressive strength of concrete. Colleagues said the research on prestressed concrete spearheaded by Lin was instrumental in popularising the material, which was relatively unknown in the United States at the time.

Lin believed so strongly in the material that he helped assemble in San Francisco in the summer of 1957 the first World Conference on Prestressed Concrete, which was attended by 1,200 engineers, scientists and manufacturers.

"The results of this international gathering, coupled with T.Y.'s pioneering work to perfect the use of prestressed concrete, changed the history of building, making possible today's high-rises and graceful long-span structures that can bear heavy loads, withstand earthquakes and hurricanes and cost little to maintain," said Scordelis, Lin's former colleague.

During his tenure at UC Berkeley,



Prof. T.Y. Lin with some participants of the "T.Y. Lin Asian Seminar on Prestressing in the 80s", held in Singapore on 26 March 1980  
(Photo courtesy of Ir. Chin Mee Poon)

Lin served as chair of the Division of Structural Engineering and Structural Mechanics and as director of the Structural Engineering Laboratory from 1960 to 1963. He was appointed campus-wide Professor of Arts and Science for the 1968-69 academic year to advance interdisciplinary teaching. And from 1969-70, during a turbulent time on campus, Lin chaired UC Berkeley's Board of Educational Development.

It was in the midst of the Cold War that Lin developed one of his boldest ideas: Connecting Alaska to Siberia with a bridge across the Bering Strait. He called the proposed structure the "Intercontinental Peace Bridge" because he saw the span as a critical link that could foster better relations between the United States and Russia. For Lin, bridges had become the tangible symbol of his desire to not only connect two bodies of land, but to span cultures and politics.

In 1986, President Ronald Reagan presented Lin with the prestigious National Medal of Science, the country's highest scientific honour.

Lin proposed other daring projects such as a 14-km long bridge connecting Spain and Morocco

across the Strait of Gibraltar. With its unprecedented 5000m spans, the bridge, if built, would become the world's longest suspension bridge.

In 1954, Lin founded the firm T.Y. Lin and Associates to help translate the ideas of prestressed concrete into practical applications. The firm's name was changed to T.Y. Lin International in the late 1960s to reflect the firm's growth and worldwide presence.

Lin retired from UC Berkeley in 1976 to lead T.Y. Lin International full-time. He left the firm in 1992, five years after it had been sold, and went on to form San Francisco-based Lin Tung-Yen China, Inc., which focuses on various engineering projects in China.

Lin took particular pride in the role he played in influencing the redevelopment of Pudong, a fast developing area east of the Huangpu River in Shanghai. As a result of his suggestion to lease out land in Pudong to pay for bridges linking the area to the rest of Shanghai, there are now 10 bridges and tunnels crossing Huangpu River and 6 more are being planned.

Lin received numerous honours throughout his career, including a

Fulbright Award for study in Belgium in 1953 and election to the National Academy of Engineering in 1967. He was the first recipient of the American Society of Civil Engineers' Outstanding Lifetime Achievement in Design Award. The Society renamed its annual Prestressed Concrete Award the T.Y. Lin Award. In 1976, Lin received the Berkeley Citation, one of the campus's most distinguished honours, and in 1994, he was named UC Berkeley's California Alumnus of the Year.

Lin also contributed more than 100 technical and research papers and authored or co-authored three widely used textbooks in structural engineering. I still have my copy of "Design of Prestressed Concrete Structures" (2nd edition) by T.Y. Lin that I bought in 1972 for RM20. It was published in 1963 and it incorporated the load-balancing method, developed by Lin himself, that had greatly simplified the design of statically indeterminate structures. The book was a standard textbook for my undergraduate studies in civil engineering.

In 1988, Lin donated his home in El Cerrito, California, to UC Berkeley to endow the T.Y. and Margaret Lin Chair in Engineering and a dean's discretionary fund at the College of Engineering. He had designed the home in prestressed concrete to include a 1,000 sq. ft. dance floor.

Lin is survived by Margaret, his wife of 62 years, a son, a daughter, 4 younger sisters, 2 younger brothers and 5 grandchildren.

Prof. T.Y. Lin had contributed much towards the advancement of structural engineering in his relatively long lifespan of 91 years. He will be fondly remembered as one of the greatest engineers of the 20th century and one who, rather than blindly following the codes of practice, seeks to apply the laws of nature. ■