



KARL H. FRANK



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Spring 2019 Khan Distinguished Lecture Series

The Fazlur Rahman Khan Distinguished Lecture Series honors Dr. Fazlur Rahman Khan's legacy of excellence in structural engineering and architecture

Initiated and Organized by **PROFESSOR DAN M. FRANGOPOL**

The Fazlur Rahman Khan Endowed Chair of Structural Engineering and Architecture
Department of Civil and Environmental Engineering, ATLSS Engineering Research Center,
Lehigh University

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KARL H. FRANK

Consultant and Professor Emeritus of The University of Texas at Austin,
Austin, TX

“The Role of Quality Control in Some Notable Bridge Problems”

Friday, April 12, 2019 – 4:30 pm

Location: Whitaker Lab 303, Lehigh University, 5 E. Packer Avenue, Bethlehem, PA

<http://www.lehigh.edu/frkseries>

In step with the abounding vitality of the time, structural engineer **Fazlur Rahman Khan** (1929-1982) ushered in a renaissance in skyscraper construction during the second half of the 20th century. Fazlur Khan was a pragmatic visionary: the series of progressive ideas that he brought forth for efficient high-rise construction in the 1960s and '70s were validated in his own work, notably his efficient designs for Chicago's 100-story John Hancock Center and 110-story Sears Tower -- the tallest building in the United States since its completion in 1974.



Fazlur Rahman Khan

Lehigh endowed a chair in structural engineering and architecture and has established this lecture series in Khan's honor. It is organized by **Professor Dan M. Frangopol**, the university's first holder of the Fazlur Rahman Khan Endowed Chair of Structural Engineering and Architecture, and sponsored by the Departments of Civil & Environmental Engineering, and Art, Architecture & Design.

Karl Frank is the retired Chief Engineer with the Hirschfeld Industries which he joined after 43 years at the University of Texas at Austin. He is a Professor Emeritus of The University of Texas at Austin. Prior to joining the University he worked at FHWA Office of Research where he was involved in the development of the fracture control plan for steel bridges. He currently is a consultant to the National Steel Bridge Alliance. He has 50 years' experience in the research and design of fabricated steel. He is an active member of AREMA, AWS, NSBA, and RCSC. He has authored many of the design provision for welded and bolted connections, plate girder strength, and fatigue of welded details used in the design of fabricated steel structures. He has a bachelor of civil engineering from the University of California at Davis, and a M.S. and Ph.D. from Lehigh University. He is an emeritus member of the Steel Bridge and the Fabrication and Inspection Committees of the Transportation Research Board. He was awarded the Raymond C. Reese Research Prize and the James R. Croes Medal from ASCE and the Life Time Achievement Award from AISC.

The Role of Quality Control in Some Notable Bridge Problems. The role of quality control in the problems that occurred in 3 major bridges will be presented. Often quality control of bridge structures is solely concerned with the quality of the contractors building the bridge. Quality control in the design office is also critical and should not be overlooked. In addition, the designer needs to heed the warnings in the specifications when specifying products. A note on the plans while clearly written is also no guarantee of quality if they are not enforced during fabrication. A tale of 3 bridges illustrating the importance of the control quality from design, material selection, and through to fabrication will be presented.

FAZLUR RAHMAN KHAN (1929 - 1982) One of the foremost structural engineers of the 20th century, Fazlur Khan epitomized both structural engineering achievement and creative collaborative effort between architect and engineer. Only when architectural design is grounded in structural realities, he believed — thus celebrating architecture's nature as a constructive art, rooted in the earth — can "the resulting aesthetics ... have a transcendental value and quality." His ideas for these sky-scraping towers offered more than economic construction and iconic architectural images; they gave people the opportunity to work and live "in the sky." Hancock Center residents thrive on the wide expanse of sky and lake before them, the stunning quiet in the heart of the city, and the intimacy with nature at such heights: the rising sun, the moon and stars, the migrating flocks of birds. Fazlur Khan was always clear about the purpose of architecture. His characteristic statement to an editor in 1971, having just been selected Construction's Man of the Year by *Engineering News-Record*, is commemorated in a plaque in Onterie Center (446 E. Ontario, Chicago): **"The technical man must not be lost in his own technology. He must be able to appreciate life; and life is art, drama, music, and most importantly, people."**



1 PDH will be awarded to eligible attendees for each lecture

Please contact the Khan Chair office at 610-758-6123 or Email: infrk@lehigh.edu with any questions.