

The Bridge Collapse in Minneapolis (Is North Dakota Safe?)

Sept. 12, 2007 (1:00-1:50 pm at CIE 207, NDSU)

Abstract

The current state of North America's civil infrastructure is in a crisis due to the deterioration of existing infrastructure systems, including ageing, increased service load, and environmental damage. The American Society of Civil Engineers reported an overall grade of D to the infrastructure of the US (ASCE News 2005).

The catastrophic bridge collapse of I-35W (#9340) in Minneapolis happened Aug. 1, 2007 and 13 people were killed by the accident. The bridge was constructed in 1967 and consisted of 14-span steel deck trusses. According to the recent investigation (June 2006) conducted by the Minnesota Department of Transportation (MnDOT), the bridge was *structurally deficient* and noted as *fracture critical* on the truss system. The estimated load at the time of failure was 575 kips based on the report of National Transportation Safety Board (NTSB). Currently, technical investigations are on-going to determine the reasons of the collapse.

The seminar presents an overview of the I-35W bridge on the Mississippi river, including possible reasons of the collapse from a structural engineering perspective. The present state of North Dakota's infrastructure systems is also discussed. The speaker suggests an effective way to improve our infrastructure so that we can minimize such a catastrophic event. An innovative repair method using advanced composite materials, such as carbon fiber reinforced polymers (CFRP), is introduced as a promising structural rehabilitation technique. This state-of-the-art technology will provide the owner with reduced maintenance costs and significant upgrade of the existing structural members in our neighborhood.

Dr. Y. Jimmy Kim, P.Eng.

Dr. Kim is an Assistant Professor of Structural Engineering in the Department of Civil Engineering at North Dakota State University. He received his doctorate in 2006 from Queen's University, Canada. Before pursuing his graduate studies, he worked in the civil engineering industry for 6 years. He is the recipient of a number of awards from the institutional and national competitions, including the NSERC Visiting Fellow in Canadian Government Laboratories, ISIS Canada Student Award of Merit, Award of Excellence by the Ontario Ministry of Public Infrastructure Renewal, and the prestigious NSERC PDF award. He is a member of various professional societies, including the American Concrete Institute (ACI) Committee 440 (Fiber Reinforced Polymer Reinforcement). He authored more than 25 technical papers in the research area of infrastructure rehabilitation using advanced composite materials. He is a licensed Professional Engineer in the Province of Ontario, Canada.

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