



Recent Development of Performance-Based Wind Design for Tall Buildings

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Abstract:

Proper design of buildings in the urban region for extreme wind and seismic loads is one of the main concerns for structural engineers. However, vulnerability of short and tall buildings to these loads is different. In general, excluding the local impact of wind load such as imposing damage on the attachment of roof, shorter buildings are more sensitive to seismic load, while taller building to wind load. The current philosophy for seismic design lies on utilization of inelastic behavior of structural elements for extreme load. Whereas wind design is based on elastic behavior for both levels of serviceability and strength. Wind load on tall buildings is so large and, in some cases, even exceeds the seismic load. Hence, allowance of inelastic behavior could result in more logical and economical design and is a key to developing more resilient performance-based wind design (PBWD). Here, the nature of wind and seismic loads is compared and substantial connections between components of current wind design and performance-based seismic design (PBSD) are explored. As a result, a new methodology for the design of tall buildings based on integrated PBSD and PBWD is introduced. In this seminar, recent development and procedures on practical models of PBWD will be presented.

Bio:



Prof. Thomas Kang, PhD, PE, is a professor in the Department of Architecture & Architectural Engineering at Seoul National University (SNU), Korea. Before that, he was a professor in the School of Civil Engineering and Environmental Science at the University of Oklahoma. He also has held various affiliated positions in the U.S., Japan and South Africa, including UCLA, University of Illinois at Urbana-Champaign, University of Hawaii at Manoa, University of Tokyo and University of Cape Town. Prof. Kang received his PhD from UCLA, his MS from Michigan State, and his BS from SNU. He is a Fellow of Post-Tensioning Institute (PTI) and American Concrete Institute (ACI), and a member of National Academy of Engineering of Korea.

He received several prestigious awards, including the Kenneth B. Bondy Award for Most Meritorious Technical Paper as Lead Author from PTI in 2012 and 2023, the Wason Medal for Most Meritorious Paper as Lead Author from ACI in 2009, and the Martin P. Korn Award as Responsible Author from PCI (Precast/Prestressed Concrete Institute) in 2023. He currently serves as an Editor-in-Chief for the Journal of Wind & Structures and as the Associate Editor for the PTI Journal. Prof. Kang has published over 175 international journal papers, including over 50 in ACI Structural Journal, over 15 in ASCE Journal of Structural Engineering, and over 15 in PTI / PCI Journals. His research interests include the design and behavior of reinforced, prestressed and post-tensioned concrete structures, as well as dynamic effects (wind, seismic, fire and shock) on structures.

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1310 Yeh Student Center