

research seminar

Computational Design of Unbonded Post-tensioned Concrete Structures

- **DR. THOMAS KANG**, *Seoul National Univ. & Univ. of IL at Urbana-Champaign*

Post-tensioned (PT) concrete systems are extensively used for a wide array of applications today such as high-rise multi-story buildings, long-span bridge structures and nuclear containment structures. The systems are made valuable by fully utilizing concrete compressive strength and very high-strength steel, and through proper design, by controlling cracking, deflection and confinement. Currently, PT concrete remains one of the most challenging areas in computational modeling; particularly unbonded PT concrete systems. This is due to the complexity of the transfer of unbonded PT tension force in steel to concrete, sliding and friction behavior at the tendon/sheathing interface and shear-flexure interactive behavior in 3D slab-column connections with unbonded tendons. As such, the structural mechanism is difficult to understand, often leaving some uncertainty in design. In order to keep improving the structural design of unbonded PT concrete structures, the speaker's research team has put a lot of efforts in developing relevant computational methods. In this seminar, this development process is presented. With the help of newer computational techniques, previous experimental programs can be reevaluated, and many other areas where experimental assessment is usually very difficult can be researched. Here, the techniques of using a general purpose finite element package and using a nonlinear finite element formulation are both adopted. The computational design of unbonded PT concrete structures will be developed and evolved further by practitioners and practicing scholars.

Biographical Sketch

Prof. Thomas Kang is an Associate Professor at Seoul National University (SNU), an Adjunct Lecturer & Visiting Professor at the University of Illinois at Urbana-Champaign, and a licensed Professional Engineer in California. Prior to joining SNU in 2011, he was an Assistant Professor at the University of Oklahoma and on the teaching faculty of UCLA. He received his PhD from UCLA, his MS from Michigan State University, and his BS from Seoul National University. He is Fellow of American Concrete Institute (ACI) and Fellow of Post-Tensioning Institute (PTI). In 2009 and 2013, he received prestigious paper awards as Lead Author from ACI and PTI, respectively; Wason Medal for Most Meritorious Paper and Kenneth B. Bondy Award for the Most Meritorious Paper.

**Wednesday
November 9
2016**

Time: 4:00 pm

**Location:
124 Civil Engr.**