

Keynote Paper

Seismic resistance of precast and prefabricated structures with pure dry connections

*Thomas Kang ¹⁾

¹⁾ Department of Architecture & Architectural Engineering, Seoul National University,
Seoul, Korea

¹⁾ tkang@snu.ac.kr

ABSTRACT

The keynote presentation will introduce innovative precast and pre-fabricated systems with pure dry connections developed by Prof. Kang's research team and research collaborators. Design features, experimental findings derived from simulated seismic test and construction benefits associated with the developed system are shared in this presentation.

By means of bolting, head-clamping or shear key connections, precast concrete (PC) members and/or structural steel members are rigidly connected. Given the dry connections have sufficient reversed cyclic resistance and/or full beam or column moment-transferring capacity, PC and steel components can be pre-fabricated and assembled on the job site with tolerances accommodated for through use of slotted holes, small heads, etc. Filling of gaps with mortar or grout can be performed after assembly of all structural wall panels and frame elements.

Three system types introduced are: 1) PC wall panels with shear keys and pre-fabricated steel plates without grouting; 2) coupled PC shear wall systems with pre-fabricated steel link beams; and 3) PC beam-column frames with or without in-fill slabs or wall panels.

One unique feature of the third system is self-supporting or self-standing columns with no props and/or guys. And grouting may follow afterwards. Additionally, no shores are needed for beams, and slabs are rigidly connected to the beams on all the four sides. More details may be found in the related publication and upcoming presentation.

¹⁾ Professor and Director of ICEE