UNIVERSITY of HOUSTON

CULLEN COLLEGE of ENGINEERING

Department of Civil & Environmental Engineering

CIVE 6111 Graduate Seminar

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Takenaka Corporation
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RC Beam-column joints, Hinge relocation,
Steel fiber reinforcement concrete, Seismic retrofit

Friday, September 22, 2017
2:45PM-3:45PM
Classroom Business Building (CBB) Room 122

Abstract
My presentation concerns research works for the development of two advanced reinforcement concrete beam-column joint systems and a seismic retrofit method using butterfly-shaped concrete blocks.

Firstly, I will present about reinforced concrete beam-column joints using plastic hinge relocation technique. This technique intends to move the plastic hinge location away from beam-ends. Therefore, the damage in beam-column joints can considerably be reduced. Furthermore, by using such technique, planning holes at beam-ends becomes possible by implementing some steel detailing.
This technique uses basically double layer reinforcement for beam main bars with headed anchors.

Secondly, I will present about steel fiber reinforced concrete interior beam-column joints with headed steel bars as longitudinal reinforcement for beams. This technique was developed to increase the efficiency of precast structural members. By using steel fiber reinforced concrete at beam-column joints, shear reinforcement may be omitted. I did some experimental tests and FEM analyses to elucidate the stress transfer mechanism at beam-column joints.

At last, I will present about a retrofit method using butterfly-shaped concrete blocks. A shear wall is built by laying the concrete blocks using glue to join them. Then the voids within the blocks and spaces between the shear wall and the structural elements surrounding the wall are filled using high strength grout. This retrofit method can transfer stresses due to horizontal loads through the shear wall by interlocking of the blocks. I will present these three parts and illustrate my presentation with actual projects.

About the speaker:

Satoshi Kake graduated with a bachelor degree from National Institute of Technology, Kure College in 2011. He studied RC shear walls of low-strength concrete. After that, he enrolled in the master's course of architectural Engineering in Osaka University and graduated in 2013. He studied external shear strengthening methods of existing RC beams by carrying out some experimental tests and FEM analyses. Since then, he has been working in the Research & Development Institute of Takenaka Corporation. He has studied various subjects including seismic behavior of RC beam-column joints, seismic retrofit methods of RC buildings and seismic behavior of Ultra-high strength concrete columns.