World Academy of Science, Engineering and Technology
International Journal of Structural and Construction Engineering
Vol:11, No:04, 2017

# Cyclic Behaviour of Wide Beam-Column Joints with Shear Strength Ratios of 1.0 and 1.7

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**Abstract :** Beam-column connections play an important role in the reinforced concrete moment resisting frame (RCMRF), which is one of the most commonly used structural systems around the world. The premature failure of such connections would severely limit the seismic performance and increase the vulnerability of RCMRF. In the past decades, researchers primarily focused on investigating the structural behaviour and failure mechanisms of conventional beam-column joints, the beam width of which is either smaller than or equal to the column width, while studies in wide beam-column joints were scarce. This paper presents the preliminary experimental results of two full-scale exterior wide beam-column connections, which are mainly designed and detailed according to ACI 318-14 and ACI 352R-02, under reversed cyclic loading. The ratios of the design shear force to the nominal shear strength of these specimens are 1.0 and 1.7, respectively, so as to probe into differences of the joint shear strength between experimental results and predictions by design codes of practice. Flexural failure dominated in the specimen with ratio of 1.0 in which full-width plastic hinges were observed, while both beam hinges and post-peak joint shear failure occurred for the other specimen. No sign of premature joint shear failure was found which is inconsistent with ACI codes’ prediction. Finally, a modification of current codes of practice is provided to accurately predict the joint shear strength in wide beam-column joint.

**Keywords :** joint shear strength, reversed cyclic loading, seismic vulnerability, wide beam-column joints
**Conference Title :** ICCSEE 2017 : International Conference on Civil, Structural and Earthquake Engineering
**Conference Location :** Paris, France
**Conference Dates :** April 18-19, 2017