

## 6. Experimental Study on Structural Performance of RC Flat Beam System - Part 2 : Evaluating Torsional Strength -

Masaya Akitake, Takeshi Kishimoto, Hajime Yamagiwa, Keisei Hamaguchi

In apartment complexes, the use of RC flat beams, in which the beam width is larger than the column width in compensation for making the beam depth smaller than the normal beam, has advantages such as improvement of planning and enlargement of effective ceiling heights and window openings. Our previous reports discussed a series of experiments (1 and 2) involving partial framing consisting of RC flat beams and columns with beam widths two to three times wider than the column widths. These studies confirmed that a design equation modified from the existing equation is capable of assessing the bending capacity of RC flat beams and the shear capacity of RC flat beam-column connections with adequate safety margins, taking into account main reinforcements of the beams arranged outside the column width.

This study involved a partial frame structure experiment (3rd series) intended to confirm the validity of the design equation and to expand its scope of application. The design formula for torsion confirmed that the torsional capacity of the orthogonal beam and the hang-out part can be evaluated while providing an adequate margin for safety based on their cumulative capacity. We also confirmed that the shear capacity of the RC flat beam-column connection can be evaluated with an adequate safety margin using the formula previously proposed.

**Keywords:** RC flat beam, column joint, torsional strength, flexural strength, shear strength