7. Experimental Study on Structural Performance of RC Flat Beam Systems - Loading Experiments of RC Flat Beam to Column Joint Specimens -

Hajime Yamagiwa, Takeshi Kishimoto, Keisei Hamaguchi, Kozo Hattori

Using RC flat beams to build multiunit residences confers various advantages, improving the design freedom and providing high ceilings and windows. However, the evaluation method of the bending strength of RC flat beams considering the influence of the beam main reinforcement out of the column width and the shear strength of the RC flat beam and column joint remains unclear.

To obtain a design equation to evaluate such strengths, we performed structural experiments using RC flat-beam to column joint specimens with beam widths two to three times column width. The experimental values exceeded calculated values for the bending strength of flat beams of beam width corresponding to around twice the column width. In cases involving beam widths around three times the column width, the experimental values obtained were below calculated values, the effects of beam main reinforcement out of the column width were lower, and crack widths at the same deformation angle grew significant. We confirmed that the equation proposed, a modified version of a previous equation, can be used to effectively evaluate the shear strength of an RC flat beam and column joint. We also confirmed that neither the orthogonality beam nor the vertical through hole affected performance.

Key words: RC flat beam, column joint, partial frame test, bending strength, shear strength, hinge relocation