

1. Experimental Study on Structural Performance of Precast Reinforced Concrete Beam-column Joints

Hiroshi Hosoya, Takuo Kotake

In order to increase construction efficiency, improve productivity and reduce construction period, research is being conducted to develop a new precast concrete construction method. In this study, the structural performance of precast concrete beam-column joints was examined by conducting loading tests using the type of the hole penetrating the column main reinforcement in the beam-column joint, position of the mechanical joint of beam main reinforcement and concrete strength as parameters. The tests produced the following findings.

The precast concrete specimen exhibited a failure process nearly similar to that of a cast-in-place reinforced concrete specimen. There were no great variances in cracking. In the precast concrete specimen, no significant variation was found in maximum strength and deformation capacity according to the method of molding the hole penetrating the column main reinforcement in the beam-column joint and the position of the mechanical joint of beam main reinforcement. There was no great difference between precast concrete and cast-in-place reinforced concrete specimens in percentage of deformed elements at the beam-column joint and in change in equivalent viscous damping factor. As a result of comparison of beam shear force-drift angle curves, it was verified that the maximum strength and deformation capacity of the precast concrete specimen were equal to or higher than those of the cast-in-place reinforced concrete specimen.

Keywords: Reinforced concrete, precast concrete, beam-column joints, loading tests, structural performance, mechanical joints

Keywords: reinforced concrete, precast concrete, beam-column joints, loading tests, structural performance, mechanical joints