

## 6. Steel Plate Reinforcement of Openings in RC Beams - An Experimental Study on Shear Performance -

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Building reuse, a newly emerging issue in Japan, has created demand for construction methods capable of responding flexibly to various customer requirements, such as change of use of an existing building. Some retrofits require the formation of new openings for pipes in existing beams. A simple reinforcement method using steel plates was developed to meet these requirements. Reinforcing around the new openings with steel plates, anchor bolts, and epoxy adhesive improves the shear performance of the beams. While this approach can be expected to improve shear performance through simple construction measures, the effectiveness of these reinforcements had not been fully demonstrated.

Our study involved structural experiments carried out to confirm the effectiveness of this method. The results confirm that the shear performance of beams reinforced by this method is equal to or better than that of beams without openings. The results also confirm that the proposed design equation evaluates shear capacity with an adequate margin for safety.

**Key words:** Retrofit construction, Seismic strengthening, Reinforced concrete, Beams with Openings, Shear performance