

Stress Transferring Mechanism and Resistance Mechanism on Through Beam Type
Beam- Column Joints for RCS System

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In Japan, many kinds of details on steel beam-reinforced concrete column joints were proposed and many experimental studies were carried out to make sure of seismic performance. There might be data of over 700 specimens. However a rational design method for steel beam-reinforced concrete column joints has not yet been established. To establish a rational design method, it is necessary to clarify stress transfer from the steel beam to the reinforced concrete column experimentally and theoretically.

The inner panel with steel flange width is resisted by prying action. Stress transfer from the inner panel to the outer panel outside steel flange could be classified into two parts; the horizontal strut-and-tie mechanism mobilized on the concrete above and below the embedded steel beam and torsion between the inner panel and the outer panel. As a results of this stress transfer, truss and arch mechanism are developed in the region outside the steel beam. This model was also applied to the joints with the transverse beam. Based on these mechanical models, a method capable of estimating the ultimate strength of interior, exterior and corner joints was proposed.