

5. Mechanism of Stress Transmission Between Steel Frame Foundation Beams and Pile Caps - Confirming Performance Using Partial Frame Test Specimens -

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Buildings with steel frame superstructures typically have foundation beams made of reinforced concrete. However, using steel foundation beams would reduce the cost of the pile foundation by reducing the overall weight of the structure, and would also reduce construction workloads. When using steel foundation beams, stress generated at the pile head during an earthquake must be transmitted to the steel foundation beam through the pile cap, and the mechanism of stress transmission must be confirmed through experiments. We devised a steel foundation beam construction method whereby the pile is embedded in the pile cap to a length equal to the pile diameter. We performed structural studies of the partial frame specimens. These studies confirmed that this approach allows the transmission of stress generated at the pile head to the steel foundation beam through a lever mechanism. The studies also confirmed that strength can be evaluated to a good approximation using existing calculation formulas.

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