

5. Structural Performance of Flat Plate Structure Comprising Slab and Column - Evaluation of Punching Shear Strength of Slab with Opening and Effective Width of Slab -

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A flat plate structure in which a slab is integrated directly into columns without passing through beams enables greater freedom in designing spatial structures due to the absence of beams within the space used. A previous report confirmed basic performance in structural experiments involving a flat plate structure. This included clarifying the slab range that contributes to bend strength. For this report, to expand the range of freedom in design still further, we performed structural experiments to establish shear strength evaluation methods for slabs with openings provided around the columns to accommodate equipment piping, as well as slabs fitted to side columns and corner posts without balconies or other cantilevered sections. These efforts also sought to clarify a method for evaluating the effective width of slabs undergoing seismic force. Through the experiments, the structural performance and the validity of the proposed design method were confirmed.

Key words: Flat Plate, Slab, Openings, Punching shear failure