

A series of studies on clarification of the in-plane shearing resistance mechanism of various planar type shear elements of timber structures with the modularized modeling method

Masahide MURAKAMI

A unified calculation method with modularized modelling for the in-plane type shear resistance elements of timber structures was devised.

Comparing experiments with calculations by this method, the shear resistance mechanism of the in-plane type shear resistance elements with various specifications was clarified. By summing up the shear performance of individual shear elements with use of the shear performance of the joints and the fasteners, it was enabled to provide a calculation formula that can predict the shear performance of the vertical or horizontal structural elements composed of various shear resistance elements. It was verified using numerical analysis that the calculation method is valid for complicated shear resistance elements.

In order to control the resistance mode assumed in the formula for the sheathed shear walls, the application range of the formula was quantified by using numerical analysis and experiments of both the effect of deformation of studs and that of the shear failure of sheets due to shear buckling.

The results of this series of studies significantly contributed to establishing the current design criteria for small timber structures in Japan, published as "Allowable stress design for wooden post and beam structures."