

## Research Diaphragm floor passes the test

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*How well will particleboard apartment floors stand up to earthquakes and high winds? The BRANZ Structural Engineering Section has just completed a test to find out.*

▽ *The floor during the test (viewed from above). The load is applied by the hydraulic ram on the left acting through the three 'bottom' plates. The floor is restrained by the concrete beam at the top of the photograph and the 'timber wall' at the bottom.*

**T**he test floor is the first of four specimens being used to validate a limit state design method for timber structures which is being developed under the Applied Timber Technology Research Project.

This floor represented a typical suspended particleboard floor of a multistorey apartment building. The load imposed by the hydraulic ram (see photo) simulated the earthquake or wind forces introduced by the

bottom plates of the bracing walls of the storey above. The role of the floor diaphragm is to distribute this in-plane loading to the lower storey bracing walls. To make the test more demanding, the floor incorporated an opening for a stairway.

Encouragingly, after 15 cycles of increasing cyclic displacement, the ultimate failure load was within 5% of the estimated load.

*The project is funded jointly by the Building Research Levy and the Foundation for Research Science and Technology. The flooring was supplied by Fletcher Wood Panels.* ◀

