

Award-winning paper in 2010

Papers published in *Structures and Buildings* are eligible for awards from the Institution of Civil Engineers. Papers from any of the ICE journals can be nominated for several awards. In addition, each journal has awards dedicated to their specific subject area.

On Monday 24 October 2011, ICE president Peter Hansford presented awards to the following paper published in *Structures and Buildings* in 2010. The editorial panel nominated their best papers and an awards committee chaired by Barry Clarke allocated the award.

Frederick Palmer Prize

The Frederick Palmer Prize, presented for the best paper on structures or buildings, was awarded to: Lawson RM and Richards J (2010) Modular design for high-rise buildings. *Proceedings of the Institution of Civil Engineers – Structures and Buildings* 163(3): 151–164, <http://dx.doi.org/10.1680/stbu.2010.163.3.151>.

Abstract

Modular construction is widely used for residential buildings of four to eight storeys and there is pressure to extend this relatively new form of construction to 12 storeys or more. This paper reviews recent modular technologies, and also presents load tests and the analysis of light steel modular walls in compression. A design method for high-rise modular applications is presented taking account of second-order effects and installation tolerances. For the modular walls tested, it was found that the plasterboard and external sheathing boards effectively prevent minor axis buckling of the C sections, so that failure occurred either by major axis buckling or local crushing of the section. In all cases, the results of the tests on 75 mm and 100 mm deep $\times$ 1.6 mm thick C sections exceeded the design resistance to BS 5950-5 by 10 to 40%. However, an eccentricity of 20 mm in load application reduced the failure load by 18 to 36% owing to local crushing of the C section. Tension tests on typical connections between the modules and corridors gave a failure load of 40 kN, which is adequate to transfer wind forces to a braced core and also to provide tying action in the event of loss of support to one corner of a module. Corner posts provide enhanced compression resistance but their buckling

resistance is dependent on the sway stiffness of the wall panel. It is also shown that the notional horizontal force approach for steel structures presented in BS 5950-1 should be increased for modular construction.



ICE President Peter Hansford presents the Frederick Palmer Prize to Jane Richards and Mark Lawson