



State-Of-The-Art Review on Cyclic Behaviour of Connections Used in CLT Multi-Storey Buildings: Test Results and Modelling

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Author: Branco, Jorge
Sousa, Hélder
Lourenço, Paulo
Ahvenainen, Julia
Aranha, Chrysl

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Summary:

A timber building made of cross-laminated timber (CLT) panels is a modular system where all panels are pre-cut in factory. On site, the single components are then assembled connecting the panels with mechanical fasteners, mainly angle brackets with nails and/or screws, hold-downs, metal plates and self-tapping screws. CLT wall panels are very rigid in comparison to its connections. Thus, connections play an essential role in maintaining the integrity of the structure providing the necessary strength, stiffness and ductility, and consequently, they need close attention by designers. However, there is still a lack of proper design rules for these connections, in particular under cyclic loads, mainly due to a large variety of connectors and connection systems. In this paper, the different properties of connections for CLT buildings, on both monotonic and cyclic behaviour, are described using recent works from different authors. From the bibliography, it is clear that experimental data, regarding both monotonic and cyclic tests, is required for the assessment of the performance of the CLT structural system attending to the interaction between rigid panels and connections. This work evidences results from experimental campaigns and numerical analysis regarding definition and quantification of the cyclic response of CLT connections. Examples regarding monotonic and cyclic tests aimed to evaluate cyclic behaviour of connections through physical parameters, such as the impairment of strength and the damping ratio, are presented and discussed.

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