



Shear Connections with Self-Tapping-Screws for Cross-Laminated-Timber Panels

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Summary:

Cross-Laminated-Timber (CLT) is increasingly gaining popularity in residential and non-residential applications in North America. To use CLT as lateral load resisting system, individual panels need to be connected. In order to provide in-plane shear connections, CLT panels may be joined with a variety of options including the use of self-tapping-screws (STS) in surface splines and half-lap joints. Alternatively, STS can be installed at an angle to the plane allowing for simple butt joints and avoiding any machining. This study investigated the performance of CLT panel assemblies connected with STS under vertical shear loading. The three aforementioned options were applied to join 3ply and 5-ply CLT panels. A total of 60 mid-scale quasi-static shear tests were performed to determine and compare the connection performance in terms of strength, stiffness, and ductility. It was shown that – depending on the screw layout – either very stiff or very ductile joint performance can be achieved.

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