

Abstract

The high performance in-plane of cross laminated timber (CLT) panels has created a potential for the use of CLT members act as diaphragms in steel structures. The behaviour of this diaphragm system depends strongly on the connections involved in linking the panels together and to the steel members. A study of the connections at both locations was made using experimental testing of two connection designs for the panel-to-panel case, and the development of a staggered lag screw connection for the panel-to-steel beam case. The results showed good performance for the double spline and fully-threaded inclined screws panel-to-panel connections. The lag screw connection showed high strength, stiffness, and ductility. The CSA Standard O86-09 was found to best predict the strength of both types of connections. Characteristic design stiffness values were presented for the stiffness at low levels of displacement and the initial, elastic stiffness.

Keywords: cross laminated timber (CLT); timber connections; static mechanical properties; hybrid construction.