

Impact of Butt Joints on Flexural Properties of Nail Laminated Timber

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Abstract : Nail laminated timber (NLT) is widely used for constructing timber bridge decks in North America. Butt joints usually exist due to the length limits of lumber, leading to concerns about the decrease of structural performance of NLT. This study aimed at investigating the provisions incorporated in Canadian highway bridge design code on the use of butt joints in wooden bridge decks. Three and five layers NLT specimens with various configurations were tested under 3-point bending test. It was found that the standard equation is capable of predicting the bending stiffness reduction due to butt joints and 1-m band limit in which, one butt joint in every three adjacent lamination is allowed, sounds reasonable. The strength reduction also followed a pattern similar to stiffness reduction. Also reinforcement of the butt joint through nails and steel side plates was attempted. It was found that nail reinforcement recovers the stiffness slightly. In contrast, reinforcing the butt joint through steel side plate improved the flexural performance significantly when compared to the nail reinforcement.

Keywords : nail laminated timber, butt joint, bending stiffness, reinforcement

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