

Dissertation Release

11.05.2022

Enhancing performance of timber-concrete composite floors by a dovetail splice joint

Title of the dissertation	Dovetail splice joint - a continuity connection for two-way timber-concrete composite plates
Contents of the dissertation	<p>In modern timber construction, demand for long spans and light structures has led to floor serviceability issues. One solution is to design the floors as timber-concrete composite (TCC) structures, characterized by for example high stiffness. Recently, interest in two-way TCC plates has arisen due to potential for even higher stiffness and a larger freedom of support placement. The two-way plates can be fabricated by using cross-bonded wood panels. However, a stiff connection between timber panels is essential for effective two-way systems. In this thesis, a novel stiff connection, a dovetail splice joint, that requires no use of steel or glueing, is proposed.</p> <p>The main aims of the work were to investigate the mechanical behaviour of the new dovetail splice joint and its performance as a lateral continuity connection in two-way LVL-concrete composite floors. The research consisted of three main parts: (i) investigations of the shear behaviour of timber-concrete contacts and development of a related contact model, (ii) investigations of the behaviour of the dovetail splice joint under axial in-plane loads and (iii) investigations of the performance of two-way TCC floor plates with the dovetail splice joint. Methodologically, the work combines experiments and numerical modelling.</p> <p>The results indicate that the joint can achieve a high stiffness, making it applicable for the intended purpose. Based on the experimental and numerical results, the jointed timber panels in a TCC plate could be treated as a continuous layer.</p>
Field of the dissertation	Civil Engineering
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Time of the defence	10 June 2022 at 13:00 hours
Place of the defence	Aalto University School of Engineering, Otakaari 1, 02150 Espoo, Finland, lecture hall M1
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Electronic dissertation	https://aaltodoc.aalto.fi/handle/123456789/114151
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