

MASTER'S DISSERTATION AT STRUCTURAL MECHANICS

DEPARTMENT OF CONSTRUCTION SCIENCES | FACULTY OF ENGINEERING LTH | LUND UNIVERSITY



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PRESENTATION

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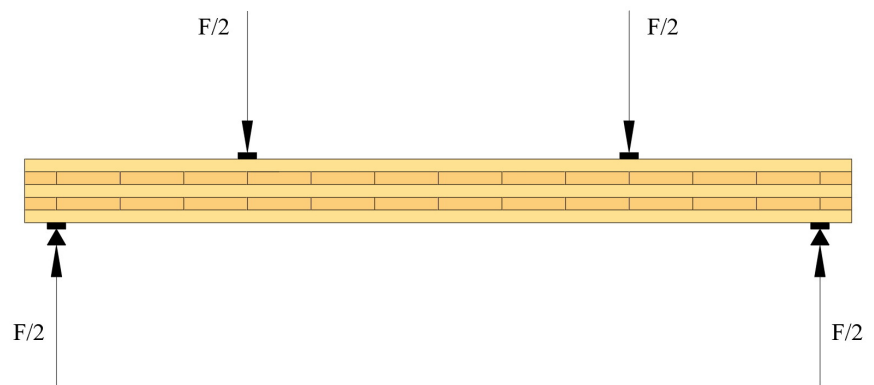
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EVALUATION OF A TESTING METHOD FOR SHEAR STRENGTH AND STIFFNESS PROPERTIES FOR CROSS LAMINATED TIMBER



BACKGROUND

Cross Laminated Timber (CLT) is a relatively new building product, which was first developed in Central Europe and was introduced in Sweden in the late 1990s. Since then, CLT has become more and more popular due to its many advantages related to favorable strength and stiffness properties in comparison to its low weight and possibilities for a high degree of prefabrication. Another general advantage that is often highlighted is the low environmental impact compared to other materials such as concrete and steel.

Despite the increasing popularity and the many advantages of CLT the product is still in the early stages of standardization when it comes to determining the mechanical properties.

AIM

The aim of this project is to evaluate one of the testing methods for shear strength and stiffness in the European product standard for CLT, EN 16351. This will include investigations regarding how different parameters affect the shear strength and stiffness properties to be determined from testing, in particular in relation to rolling shear. These

parameters can for example be:

- Wood species with different stiffness properties.
- Annual growth ring pattern.
- Edge-gluing vs no edge-gluing of lamellas.
- Ratio between the thickness and the width of the lamellas.

METHOD

The first part of the project will consist of a literature study concerning material, stiffness properties, the effect of rolling shear, stiffness of different wood species and technical documents related to testing according to EN 16351.

The project will then continue with calculations according to beam theory and the Finite Element Method (FEM). FE-models of the considered test set up will be developed. 2D or/and 3D models will be created and used to perform the parameter study.

The project will not include any new laboratory testing, but will instead be based on calculations and previous tests.

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