

Advanced Modelling of Cross Laminated Timber (CLT) Panels in Bending

<https://research.thinkwood.com/en/permalink/catalogue1796>

Author: Franzoni, Lorenzo
 Lebé, Arthur
 Lyon, Florent
 Forêt, Gilles

Publisher: HAL archives-ouvertes.fr

Year of Publication: 2015

Country of Publication: Germany

Format: Presentation

Material: CLT (Cross-Laminated Timber)

Application: Wood Building Systems

Topic: Mechanical Properties

Keywords: Bending
 Model
 Panels
 Shear
 Stiffness
 Failure Behavior
 Shear Force
 Reference Test

Language: English

Conference: Euromech Colloquim 556 Theoretical Numerical and Experimental Analyses of Wood Mechanics

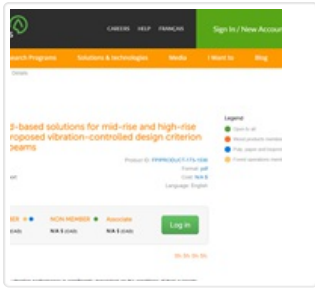
Research Status: Complete

Notes: May 2015, Dresde, Germany

Online Access: Free

Resource Link

<https://hal.archives-ouvertes.fr/hal-01270289>



Advanced Wood-Based Solutions for Mid-Rise and High-Rise Construction: Proposed Vibration-Controlled Design Criterion for Supporting Beams

<https://research.thinkwood.com/en/permalink/catalogue1178>

Author: Hu, Lin
Organization: FPInnovations
Year of Publication: 2018
Country of Publication: Canada
Format: Report
Application: Floors
Topic: Acoustics and Vibration
Mechanical Properties
Keywords: Floor Supporting Beam
Bending Stiffness
Language: English
Research Status: Complete

Summary:

For wood floor systems, their vibration performance is significantly dependent on the conditions of their supports, specifically the rigidity of the support. Detrimental effects could result if the floor supports do not have sufficient rigidity. This is special ture for floor supporting beams. The problem of vibrating floor due to flexible supporting beams can be solved through proper design of the supporting beams. However, there is currently no criterion set for the minimum requirement for floor supporting beam stiffness to ensure the beam is rigid enough. Designers' current practice is to use the uniform load deflection criteria specified in the code for designing the supporting beams. This criterion is based on certain ratios of the floor span (e.g. L/360, L/480 etc.). The disadvantage of this approach is that it allows larger deflections for longer-span beams than for shorter beams. This means that engineers have to use their experience and judgement to select a proper ratio, particularly for the long-span beams. Therefore, a better vibration-controlled design criterion for supporting beams is needed.

It is recommended to further verify the ruggedness of the proposed stiffness criterion for floor supporting beams using new field supporting beam data whenever they become available.

Online Access: Free

Resource Link

<https://library.fpinnovations.ca/en/permalink/fpipub49834>



Ambient Vibration Tests of a Cross-Laminated Timber Building

<https://research.thinkwood.com/en/permalink/catalogue313>

Author: Reynolds, Thomas
Harris, Richard
Chang, Wen-Shao
Bregulla, Julie
Bawcombe, Jonathan

Publisher: ICE Publishing

Year of Publication: 2015

Country of Publication: United Kingdom

Format: Journal Article

Material: CLT (Cross-Laminated Timber)

Application: Wood Building Systems
Shear Walls

Topic: Wind

Keywords: Damping
Dynamic Movement
In Situ
Multi-Storey
Stiffness
Modal Properties
Ambient Vibration Method

Language: English

Research Status: Complete

Series: Proceedings of the Institution of Civil Engineers - Construction Materials

ISSN: 1747-6518

Online Access: Free

Resource Link

<https://doi.org/10.1680/coma.14.00047>



Analysis of Rotational Stiffness of the Timber Frame Connection

<https://research.thinkwood.com/en/permalink/catalogue2763>

Author: Johanides, Marek
Kubíncová, Lenka
Mikolášek, David
Lokaj, Antonín
Sucharda, Oldrich
Mynarcik, Petr

Publisher: MDPI

Year of Publication: 2020


Format: Journal Article
Material: Glulam (Glue-Laminated Timber)
Application: Frames
Topic: Connections
Keywords: Rotational Stiffness
Frame Connection
Screw
Numerical Model
FEM
Finite Element Model
Mechanical Fasteners
Language: English
Research Status: Complete
Series: Sustainability

Summary:

Initially, timber was considered only as an easily accessible and processable material in nature; however, its excellent properties have since become better understood. During the discovery of new building materials and thanks to new technological development processes, industrial processing technologies and gradually drastically decreasing forest areas, wood has become an increasingly neglected material. Load-bearing structures are made mostly of reinforced concrete or steel elements. However, ecological changes, the obvious problems associated with environmental pollution and climate change, are drawing increasing attention to the importance of environmental awareness. These factors are attracting increased attention to wood as a building material. The increased demand for timber as a building material offers the possibility of improving its mechanical and physical properties, and so new wood-based composite materials or new joints of timber structures are being developed to ensure a better load capacity and stiffness of the structure. Therefore, this article deals with the improvement of the frame connection of the timber frame column and a diaphragm beam using mechanical fasteners. In common practice, bolts or a combination of bolts and pins are used for this type of connection. The subject of the research and its motivation was to replace these commonly used fasteners with more modern ones to shorten and simplify the assembly time and to improve the load capacity and rigidity of this type of frame connection.

Online Access: Free

Resource Link

<https://doi.org/10.3390/su13010156> 



Analytical Modeling of Lateral Strength and Stiffness of Inclined Self-Tapping Screw Connection

<https://research.thinkwood.com/en/permalink/catalogue2651>

Author: Zhao, Ruihan
Organization: University of Alberta
Country of Publication: Canada
Topic: Mechanical Properties
Connections
Keywords: Self-Tapping Screws
Lateral Strength
Lateral Stiffness
Withdrawal
Yield
Embedment
Research Status: In Progress

Summary:

The objective of this research is to develop models for predicting lateral strength and stiffness of connections containing inclined self-tapping screws, by considering the contribution of the withdrawal and yield properties of the screws and embedment properties of the connecting members.

Resource Link

<https://www.ualberta.ca/engineering/research/groups/timber-systems/research/irc-research/track-1.html> [↗](#)



An Evaluation of Strength Performance of the Edge Connections between Cross-laminated Timber Panels Reinforced with Glass Fiber-reinforced Plastic

<https://research.thinkwood.com/en/permalink/catalogue2424>

Author: Song, Yo-Jin
Lee, In-Hwan
Hong, Soon-Il

Publisher: North Carolina State University

Year of Publication: 2019

Country of Publication: United States

Format: Journal Article

Material: CLT (Cross-Laminated Timber)

Application: Wood Building Systems

Topic: Connections

Keywords: Strength
Panels
Glass Fiber-Reinforced Plastic
Tensile-Type Shearing Test
Self-Tapping Screws
Stiffness
Larch

Language: English

Research Status: Complete

Series: BioResources

Online Access: Free

Resource Link

https://ojs.cnr.ncsu.edu/index.php/BioRes/article/view/BioRes_14_4_7719_Song_Strength_Performance_Cross_Laminated



An Innovative Hybrid Timber Structure in Japan: Performance of Column and Beams

<https://research.thinkwood.com/en/permalink/catalogue1759>

Author: Shioya, Shinichi
Koga, Takeshi
Kumon, Yuto
Otsuki, Kazuaki
Uchimura, Kohei

Year of Publication: 2016

Country of Publication: Austria

Format: Conference Paper

Material: Glulam (Glue-Laminated Timber)

Application: Beams
Columns

Topic: Mechanical Properties

Keywords: Japanese Cedar
Reinforcement
Steel Bars
Epoxy
Flexural Stiffness
Flexural Strength
Reverse Cyclic Loading
Force-Displacement Curves
Strain Distribution
Failure
Numerical Analysis

Language: English

Conference: World Conference on Timber Engineering

Research Status: Complete

Notes: August 22-25, 2016, Vienna, Austria
p. 5058-5067

Summary:

In this paper, bending behaviours in hybrid composite glulam timbers reinforced using deformed steel bars and epoxy resin adhesives (RGTSB) are presented. The technique RGTSB was developed in order to improve flexural stiffness and strength in glulam timbers...

Online Access: Free

Resource Link

<http://hdl.handle.net/20.500.12708/172>



Application of Modern Wood Product Glulam in Timber Frame with Tenon- Mortise Joints and its Structural Behavior

<https://research.thinkwood.com/en/permalink/catalogue2469>

Author: Wu, Guofang
Zhong, Yong
Gong, Yingchun
Ren, Haiqing

Publisher: Tech Science Press

Year of Publication: 2019

Country of Publication: United States

Format: Journal Article

Material: Glulam (Glue-Laminated Timber)

Topic: Connections
Mechanical Properties

Keywords: Tenon-Mortise Joint
Monotonic Loading
Adhesive
Stiffness
Moment Carrying Capacity

Language: English

Research Status: Complete

Series: Journal of Renewable Materials

Online Access: Free

Resource Link

<https://doi.org/10.32604/jrm.2019.06229>



Assessment of Disproportionate Collapse for Multi Storey Cross Laminated Timber Buildings

<https://research.thinkwood.com/en/permalink/catalogue1664>

Author: Mpidi Bitu, Hercend
Currie, Neil
Tannert, Thomas

Year of Publication: 2016

Country of Publication: Austria

Format: Conference Paper

Material: CLT (Cross-Laminated Timber)

Application: Wood Building Systems

Topic: Connections
Mechanical Properties

Keywords: Rotational Stiffness
Multi-Storey
Ductility
Loading

Language: English

Conference: World Conference on Timber Engineering

Research Status: Complete

Notes: August 22-25, 2016, Vienna, Austria
p. 3725-3733

Summary:

This paper investigates the risk of disproportionate collapse following extreme loading events. The methodology mimics a sudden removal of a loadbearing wall of a twelve-storey CLT building. The ductility-demand from the dynamic simulation is checked against the ductility supplied by the structural components and their connections...

Online Access: Free

Resource Link

<http://hdl.handle.net/20.500.12708/172> 



Assessment of Dynamic Characteristics of Multi-Storey Timber Buildings

<https://research.thinkwood.com/en/permalink/catalogue1786>

Author: Hummel, Johannes
Seim, Werner

Year of Publication: 2016

Country of Publication: Austria

Format: Conference Paper

Material: CLT (Cross-Laminated Timber)
Light Frame (Lumber+Panels)

Application: Wood Building Systems

Topic: Acoustics and Vibration
Mechanical Properties
Seismic

Keywords: Natural Frequency
Multi-Storey
Force-Based Design
Stiffness
Deformation

Language: English

Conference: World Conference on Timber Engineering

Research Status: Complete

Notes: August 22-25, 2016, Vienna, Austria
p. 5819-5828

Summary:

This paper discusses the impact of the natural frequency of multi-storey timber structures, focusing on force-based seismic design. Simplified approaches to determine the frequency of light-frame and cross-laminated timber structures are investigated. How stiffness parameters for simple two-dimensional analysis models can be derived from the different contributions of deformation...

Online Access: Free

Resource Link

<http://hdl.handle.net/20.500.12708/172> 