



Advanced Wood-Based Solutions for Mid-Rise and High-Rise Construction: Structural Performance of Post-Tensioned CLT Shear Walls with Energy Dissipators

<https://research.thinkwood.com/en/permalink/catalogue1472>

Author: Zhiyong Chen
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Paul Symons

Organization: FPInnovations

Year of Publication: 2018

Country of Publication: Canada

Format: Report

Material: CLT (Cross-Laminated Timber)
Glulam (Glue-Laminated Timber)
LVL (Laminated Veneer Lumber)
LSL (Laminated Strand Lumber)

Application: Shear Walls

Topic: Design and Systems
Mechanical Properties
Seismic

Keywords: Compression Tests
Compression Strength
Energy Dissipation
Post-Tensioned
Pres-Lam
Monotonic Loading
Reverse Cyclic Loading

Language: English

Abstract:

The latest developments in seismic design philosophy have been geared towards developing of so called "resilient" or "low damage" innovative structural systems that can reduce damage to the structure while offering the same or higher levels of safety to occupants. One such innovative structural system is the Pres-Lam system that is a wood-hybrid system that utilizes post-tensioned (PT) mass timber components in both rigid-frame and wall-based buildings along with various types of energy dissipators. To help implement the Pres-Lam system in Canada and the US, information about the system performance made with North American engineered wood products is needed. That information can later be used to develop design guidelines for the designers for wider acceptance of the system by the design community. ...

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Resource Link

https://fpinnovations.ca/Extranet/Pages/AssetDetails.aspx?item=/Extranet/Assets/ResearchReportsWP/16802.pdf#.Wzz6h_IKiUI



Ambient Vibration Tests of a Cross-Laminated Timber Building

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

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

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

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>



Analytical Approach to Establishing the Elastic Behavior of Multipanel CLT Shear Walls Subjected to Lateral Loads

<https://research.thinkwood.com/en/permalink/catalogue1236>

Author: Daniele Casagrande
Ghasan Doudak
Luigi Mauro
Andrea Polastri

Publisher: American Society of Civil Engineers

Year of Publication: 2018

Country of Publication: United States

Format: Journal Article

Material: CLT (Cross-Laminated Timber)

Application: Shear Walls

Topic: Mechanical Properties
Seismic

Keywords: Panels
Lateral Loads
Analytical Approach
Hold-Down
Joints
Stiffness
Elastic Strength

Language: English

Series: Journal of Structural Engineering

Abstract: Structures assembled with cross-laminated timber (CLT) panels, and designed to resist gravity and lateral loads, are being considered as viable options for low-rise to mid-rise buildings. In this paper, an analytical approach based on the minimum total potential energy principle has been developed in order to determine the mechanical behavior of 1-story multipanel CLT walls...

Online Access: Payment Required

Resource Link

[https://doi.org/10.1061/\(ASCE\)ST.1943-541X.0001948](https://doi.org/10.1061/(ASCE)ST.1943-541X.0001948)



Capacity-Based Design for Cross-Laminated Timber Buildings

<https://research.thinkwood.com/en/permalink/catalogue1255>

Author: Md Shahnewaz
Thomas Tannert
Shahria Alam
Marjan Popovski

Organization: Structures Congress

Publisher: American Society of Civil Engineers

Year of Publication: 2017

Country of Publication: United States

Format: Conference Paper

Material: CLT (Cross-Laminated Timber)

Application: Wood Building Systems
Shear Walls

Topic: Mechanical Properties
Connections

Keywords: In-Plane Stiffness
Strength
Non-Linear Springs
Finite Element Analysis
Hysteretic Behaviour
Cyclic Loading

Language: English

Conference: Structures Congress 2017

Notes: April 6–8, 2017, Denver, Colorado

Abstract:

The use of cross-laminated timber (CLT) in residential and non-residential buildings is becoming increasingly popular in North America. While the 2016 supplement to the 2014 edition of the Canadian Standard for Engineering Design in Wood, CSAO86, provides provisions for CLT structures used in platform type applications, it does not provide guidance for the in-plane...

Online Access: Payment Required

Resource Link

<https://doi.org/10.1061/9780784480427.034>



CLT Buildings Laterally Braced with Core and Perimeter Walls

<https://research.thinkwood.com/en/permalink/catalogue1663>

Author: Andrea Polastri
Cristiano Loss
Luca Pozza
Ian Smith

Year of Publication: 2016

Country of Publication: Austria

Format: Conference Paper

Material: CLT (Cross-Laminated Timber)

Application: Shear Walls

Topic: Connections
Seismic

Keywords: Multi-Storey
Numerical Models
X-RAD

Language: English

Conference: World Conference on Timber Engineering

Notes: August 22-25, 2016, Vienna, Austria
p. 3706-3715

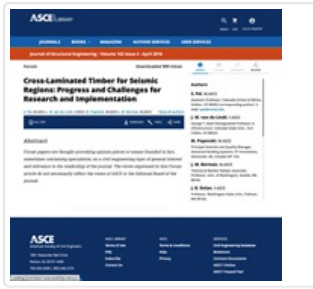
Abstract:

In this work the behaviour of hybrid multi-storey buildings braced with Cross-Laminated-Timber (CLT) cores and shear-walls is studied based on numerical analyses. Two procedures for calibrating numerical models are adopted and compared to test data and application of provisions in current design codes. The paper presents calibration of...

Online Access: Free

Resource Link

<http://repositum.tuwien.ac.at/obvutwoa/content/pageview/1649372> ↗



Cross-Laminated Timber for Seismic Regions: Progress and Challenges for Research and Implementation

<https://research.thinkwood.com/en/permalink/catalogue162>

Author: Shiling Pei
John van de Lindt
Marjan Popovski
Jeffrey Berman
Daniel Dolan
James Ricles
Richard Sause
Hans-Erik Blomgren
Douglas Rammer

Publisher: American Society of Civil Engineers

Year of Publication: 2014

Country of Publication: United States

Format: Journal Article

Material: CLT (Cross-Laminated Timber)

Application: Shear Walls

Topic: Seismic

Keywords: Lateral Loads
Prefabrication
US

Language: English

Series: Journal of Structural Engineering

Online Access: Free

Resource Link

http://www.adivbois.org/wp-content/uploads/Int_0_Tech_Cross-laminated-timber-for-seismic-regions-progress-and-challenges-for-research-and-implementation.pdf



Cyclic Testing and Simulation of Hold Down Connections in Radiata Pine CLT Shear Walls

<https://research.thinkwood.com/en/permalink/catalogue1605>

Author: Franco Benedetti
Victor Rosales
Alexander Opazo

Year of Publication: 2016

Country of Publication: Austria

Format: Conference Paper

Material: CLT (Cross-Laminated Timber)

Application: Shear Walls

Topic: Connections
Mechanical Properties

Keywords: Pine
Hold-Down
Hysteretic Model
Cyclic Loading

Language: English

Conference: World Conference on Timber Engineering

Notes: August 22-25, 2016, Vienna, Austria
p. 2041-2050

Abstract:

Structures built with cross laminated timber (CLT) are an attractive alternative to traditional construction materials in terms of environmental performance and habitability, but its structural behavior is not well understood for each timber specie. This work provides a comprehensive study of the structural behavior of radiata pine...

Online Access: Free

Resource Link

<http://repositum.tuwien.ac.at/obvutwoa/content/pageview/1607773>



Damage Assessment of Connections used in Cross-Laminated Timber Subject to Cyclic Loads

<https://research.thinkwood.com/en/permalink/catalogue225>

Author: Johannes Schneider
Erol Karacabeyli
Marjan Popovski
Siegfried Stierner
Solomon Tesfamariam

Publisher: American Society of Civil Engineers

Year of Publication: 2014

Country of Publication: United States
Format: Journal Article
Material: CLT (Cross-Laminated Timber)
Application: Shear Walls
Topic: Connections
Seismic
Keywords: Fasteners
Damage Index (DI) Method
Brackets
Load Displacement
Hysteretic
Language: English
Series: Journal of Performance of Constructed Facilities
Notes: [https://doi.org/10.1061/\(ASCE\)CF.1943-5509.0000528](https://doi.org/10.1061/(ASCE)CF.1943-5509.0000528)

Abstract:

Cross-laminated timber (CLT) products are gaining popularity in the North American market and are being used in midrise wood buildings, in particular, in shearwall applications. Shearwalls provide resistance to lateral loads such as wind and earthquake loads, and therefore it is important to gain a better understanding of the behavior of CLT shearwall systems during earthquake events. This paper is focused on the seismic performance of connections between CLT shearwall panels and the foundation. CLT panels are very stiff and energy dissipation is accomplished by the connections. A literature review on previous research work related to damage prediction and assessment for wood frame structures was performed. Furthermore, a test program was conducted to investigate the performance of CLT connections subjected to simulated earthquake loads. Two different brackets in combination with five types of fasteners were tested under monotonic and cyclic loading protocols. In total, 98 connection tests were conducted and the monotonic load-displacement curves and hysteretic loops were obtained. In this paper, an energy-based cumulative damage assessment model was calibrated with the CLT connection test data. Finally, a correlation between the damage index and physical damage is provided.

Online Access: Free

Resource Link

https://www.researchgate.net/profile/Solomon_Tesfamariam2/publication/273615958_Damage_Assessment_of_Connections_Used_in_Cross-Laminated_Timber_Subject_to_Cyclic_Loads/links/558e5e4908aed6ec4bf37398/Damage-Assessment-of-Connections-Used-in-Cross-Laminated-Timber-Subject-to-Cyclic-Loads.pdf



Damage Assessment of Cross Laminated Timber Connections Subjected to Simulated Earthquake Loads

<https://research.thinkwood.com/en/permalink/catalogue70>

Author: Johannes Schneider
Siegfried Stiemer
Solomon Tesfamariam
Erol Karacabeyli
Marjan Popovski

Year of Publication: 2012

Country of Publication: New Zealand

Format: Conference Paper

Material: CLT (Cross-Laminated Timber)

Application: Shear Walls

Topic: Connections
Seismic

Keywords: Damage
Panels
North American Market

Language: English

Conference: World Conference on Timber Engineering

Notes: July 15-19, 2012, Auckland, New Zealand

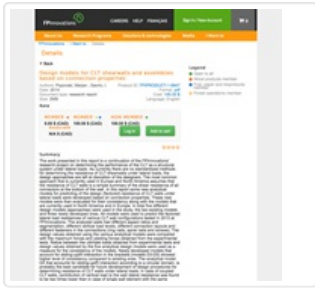
Abstract:

Wood-frame is the most common construction type for residential buildings in North America. However, there is a limit to the height of the building using a traditional wood-frame structure. Cross-laminated timber (CLT) provides possible solutions to mid-...

Online Access: Free

Resource Link

<https://www.researchgate.net/publication/274959672>



Design Models for CLT Shearwalls and Assemblies Based on Connection Properties

<https://research.thinkwood.com/en/permalink/catalogue369>

Author: Marjan Popovski
Igor Gavric
Organization: FPInnovations
Year of Publication: 2014
Country of Publication: Canada
Format: Report
Material: CLT (Cross-Laminated Timber)
Application: Shear Walls
Topic: Connections
Keywords: Lateral Loads
Analytical Model
North America
Europe
Language: English

Abstract:

The work presented in this report is a continuation of the FPInnovations' research project on determining the performance of the CLT as a structural system under lateral loads. As currently there are no standardized methods for determining the resistance of CLT shearwalls under lateral loads, the design approaches...

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<https://fpinnovations.ca/Extranet/Pages/AssetDetails.aspx?item=/Extranet/Assets/ResearchReportsWP/3093.pdf#.Wme9z3anGUk>