



## An Overview of CLT Research and Implementation in North America

<https://research.thinkwood.com/en/permalink/catalogue759>

Author: Pei, Shiling  
 Rammer, Douglas  
 Popovski, Marjan  
 Williamson, Tom  
 Line, Philip  
 van de Lindt, John

Year of Publication: 2016

Country of Publication: Austria

Format: Conference Paper

Material: CLT (Cross-Laminated Timber)

Topic: Market and Adoption

Keywords: Market  
 North America  
 Building Development  
 Research

Language: English

Conference: World Conference on Timber Engineering

Research Status: Complete

Notes: August 22-25, 2016, Vienna, Austria

**Summary:**

Although not yet seen as common practice, building with cross laminated timber (CLT) is gaining momentum in North America. Behind the scenes of the widely publicized project initiatives such as the Wood Innovation Design Centre Building in Canada and the...

Online Access: Free

**Resource Link**

[https://www.fpl.fs.fed.us/documnts/pdf2016/fpl\\_2016\\_pei001.pdf](https://www.fpl.fs.fed.us/documnts/pdf2016/fpl_2016_pei001.pdf)



## Comparative Energy Consumption Study on Tall Cross Laminated Timber Buildings for U.S. Climates

<https://research.thinkwood.com/en/permalink/catalogue1636>

Author: Pei, Shiling  
Khavari, Ali  
Tabares-Velasco, Paulo  
Zhao, Shichun

Year of Publication: 2016

Country of Publication: Austria

Format: Conference Paper

Material: CLT (Cross-Laminated Timber)

Application: Wood Building Systems

Topic: Energy Performance

Keywords: US  
Energy Efficiency  
Internal Loads  
Climate

Language: English

Conference: World Conference on Timber Engineering

Research Status: Complete

Notes: August 22-25, 2016, Vienna, Austria  
p. 3134-3141

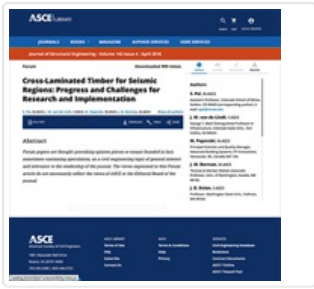
### Summary:

Tall building (higher than 8 stories) construction using Cross laminated timber (CLT) is a relatively new trend for urban developments around the world. In the U.S., there is great interest in utilizing the potential of this new construction material. By analyzing a ten-story condominium building model constructed using building energy...

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### Resource Link

<http://hdl.handle.net/20.500.12708/172> [↗](#)



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

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

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

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

Research Status: Complete

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



## Cross-Laminated Timber Rocking Wall with Replaceable Fuses: Validation through Full-Scale Shake Table Testing

<https://research.thinkwood.com/en/permalink/catalogue2027>

Author: Blomgren, Hans-Erik  
Pei, Shiling  
Powers, Joshua  
Dolan, James  
Wilson, Alex  
Morrell, Ian  
Jin, Zhibin

Year of Publication: 2018

Country of Publication: South Korea

Format: Conference Paper

Material: CLT (Cross-Laminated Timber)

Application: Walls

Topic: Seismic  
Design and Systems

Keywords: Shake Table Tests  
Full-Scale

Language: English

Conference: World Conference on Timber Engineering

Research Status: Complete

Online Access: Free

### Resource Link

[https://www.researchgate.net/publication/327164531\\_CROSS-LAMINATED\\_TIMBER\\_ROCKING\\_WALL\\_WITH\\_REPLACEABLE\\_FUSES\\_VALIDATION\\_THROUGH\\_FULL-SCALE\\_SHAKE\\_TABLE\\_TESTING](https://www.researchgate.net/publication/327164531_CROSS-LAMINATED_TIMBER_ROCKING_WALL_WITH_REPLACEABLE_FUSES_VALIDATION_THROUGH_FULL-SCALE_SHAKE_TABLE_TESTING)



# Determination of Seismic Performance Factors for CLT Shear Wall Systems

<https://research.thinkwood.com/en/permalink/catalogue770>

Author: Amini, M. Omar  
van de Lindt, John  
Rammer, Douglas  
Pei, Shiling  
Line, Philip  
Popovski, Marjan

Year of Publication: 2016

Country of Publication: Austria

Format: Conference Paper

Material: CLT (Cross-Laminated Timber)

Application: Shear Walls

Topic: Connections  
Seismic

Keywords: Angle Bracket  
Cyclic Tests  
US  
Quasi-Static  
Seismic Performance Factors

Language: English

Conference: World Conference on Timber Engineering

Research Status: Complete

Notes: August 22-25, 2016, Vienna, Austria

Summary:

This paper presents selected results of connector testing and wall testing which were part of a Forest Products Lab-funded project undertaken at Colorado State University in an effort to determine seismic performance factors for cross laminated timber (C...

Online Access: Free

## Resource Link

[https://www.fpl.fs.fed.us/documnts/pdf2016/fpl\\_2016\\_amini001.pdf](https://www.fpl.fs.fed.us/documnts/pdf2016/fpl_2016_amini001.pdf)



## Developing Seismic Performance Factors for Cross Laminated Timber in the United States

<https://research.thinkwood.com/en/permalink/catalogue124>

Author: van de Lindt, John  
 Amini, M. Omar  
 Rammer, Douglas  
 Line, Philip  
 Pei, Shiling  
 Popovski, Marjan

Organization: Canadian Association for Earthquake Engineering

Year of Publication: 2015

Country of Publication: Canada

Format: Conference Paper

Material: CLT (Cross-Laminated Timber)

Application: Walls

Topic: Seismic  
 Mechanical Properties  
 Connections

Keywords: Angle Bracket  
 Shear Test  
 Strength  
 Stiffness  
 Uplift Test  
 US

Language: English

Conference: The 11th Canadian Conference on Earthquake Engineering

Research Status: Complete

Notes: July 21-24, 2015, Victoria, BC, Canada

Online Access: Free

### Resource Link

<https://www.researchgate.net/publication/280560310>



## Development and Full-Scale Validation of Resilience-Based Seismic Design of Tall Wood Buildings: The NHERI Tallwood Project

<https://research.thinkwood.com/en/permalink/catalogue1477>

Author: Pei, Shiling  
van de Lindt, John  
Ricles, James  
Sause, Richard  
Berman, Jeffrey  
Ryan, Keri  
Dolan, Daniel  
Buchanan, Andrew  
Robinson, Thomas  
McDonnell, Eric  
Blomgren, Hans-Erik  
Popovski, Marjan  
Rammer, Douglas

Year of Publication: 2017

Country of Publication: New Zealand

Format: Conference Paper

Material: CLT (Cross-Laminated Timber)

Application: Walls  
Wood Building Systems

Topic: Design and Systems  
Seismic

Keywords: Tall Wood  
Post-Tensioned  
Rocking Walls  
Resilience-Based Seismic Design  
Shaking Table Test

Language: English

Conference: New Zealand Society for Earthquake Engineering Conference

Research Status: Complete

Notes: April 27-29, 2017, Wellington, New Zealand

Summary:

With global urbanization trends, the demands for tall residential and mixed-use buildings in the range of 8~20 stories are increasing. One new structural system in this height range are tall wood buildings which have been built in select locations around the world...

Online Access: Free

**Resource Link**

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[http://db.nzsee.org.nz/2017/O5C.2\\_Ryan.pdf](http://db.nzsee.org.nz/2017/O5C.2_Ryan.pdf) ↗



## Development of Seismic Performance Factors for Cross Laminated Timber: Phase 2

<https://research.thinkwood.com/en/permalink/catalogue803>

Author: van de Lindt, John  
Rammer, Douglas  
Pei, Shiling

Organization: Forest Products Laboratory

Country of Publication: United States

Format: Report

Material: CLT (Cross-Laminated Timber)

Application: Wood Building Systems

Topic: Seismic

Keywords: Seismic Performance Factors  
US

Research Status: In Progress

### Summary:

A collaborative project between the Forest Products Laboratory and Colorado State University to develop seismic performance factors for cross laminated timber is underway. The project requires application of the FEMA P-695 methodology, which is purposely...

### Resource Link

<https://www.fpl.fs.fed.us/documnts/rips/fplrip-4719-019.pdf>





## Direct Displacement Design of Tall CLT Building with Deformable Diaphragms

<https://research.thinkwood.com/en/permalink/catalogue1650>

Author: Bolvardi, Vahab  
Pei, Shiling  
van de Lindt, John  
Dolan, James

Year of Publication: 2016

Country of Publication: Austria

Format: Conference Paper

Material: CLT (Cross-Laminated Timber)

Application: Wood Building Systems

Topic: Design and Systems  
Seismic

Keywords: Inter-Story Isolation  
Displacement-Based Design  
Simulation

Language: English

Conference: World Conference on Timber Engineering

Research Status: Complete

Notes: August 22-25, 2016, Vienna, Austria  
p. 3506-3514

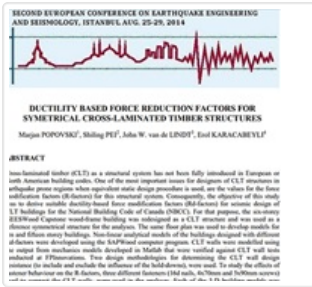
### Summary:

In order to cope with the speed of urbanization around the world especially in areas of high seismicity, researchers and engineers have always been investigating cost-effective building systems with high seismic performance. Cross Laminated Timber (CLT) is a wood based material that is suitable for tall building construction. However, the...

Online Access: Free

### Resource Link

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



# Ductility Based Force Reduction Factors for Symmetrical Cross-Laminated Timber Structures

<https://research.thinkwood.com/en/permalink/catalogue446>

Author: Popovski, Marjan  
Pei, Shiling  
van de Lindt, John  
Karacabeyli, Erol

Organization: European Association of Earthquake Engineering

Year of Publication: 2014

Country of Publication: Canada

Format: Conference Paper

Material: CLT (Cross-Laminated Timber)

Application: Wood Building Systems  
Walls

Topic: Mechanical Properties  
Seismic

Keywords: Force Modification Factors  
Ductility  
National Building Code of Canada  
Fasteners  
Seismic Performance

Language: English

Conference: Second European Conference on Earthquake Engineering and Seismology

Research Status: Complete

Notes: August 25-29, 2014, Istanbul, Turkey

Online Access: Free

## Resource Link

<http://doi.org/10.13140/RG.2.1.2534.3523>