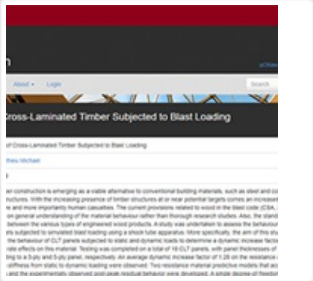


Behaviour of Cross-Laminated Timber Subjected to Blast Loading

Author:	Poulin, Mathieu
Organization:	University of Ottawa
Year of Publication:	2019
Country of Publication:	Canada
Format:	Thesis
Material:	CLT (Cross-Laminated Timber)
Topic:	Mechanical Properties
Keywords:	Blast Loading
Language:	English
Research Status:	Complete
Online Access:	Free

Resource Link

http://dx.doi.org/10.20381/ruor-22923

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

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

Author:	Schneider, Johannes
	Stiemer, Siegfried
	Tesfamariam, Solomon
	Karacabeyli, Erol
	Popovski, Marjan
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
Research Status:	Complete
Notes:	July 15-19, 2012, Auckland, New Zealand

Summary:

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

Performance of Steel Energy Dissipators Connected to Cross-Laminated Timber Wall Panels Subjected to Tension and Cyclic Loading

https://research.thinkwood.com/en/permalink/catalogue652

Author:	Kramer, Anthonie
	Barbosa, André
	Sinha, Arijit
Publisher:	American Society of Civil Engineers
Year of Publication:	2016
Country of Publication:	United States

Format:	Journal Article
Material:	CLT (Cross-Laminated Timber)
Application:	Walls
Topic:	Connections
	Seismic
Keywords:	Energy Dissipation
	Digital Image Correlation
	Strain Behavior
	Yield Behavior
Language:	English
Research Status:	Complete
Series:	Journal of Structural Engineering

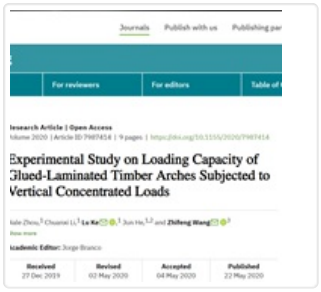
Summary:

This paper presents a new alternative energy dissipation solution to be used with cross-laminated timber (CLT) self-centering walls. CLT is a relatively new building product in North America and could potentially be used for high-rise construction. The development of high-performance seismic design solutions is necessary to encourage innovative structures and the design of these structures to new heights. The objective of this paper is to propose a wall-to-floor connection system that is easy to install and replace (structural fuse) after the occurrence of a large damaging event. The proposed energy dissipators are fabricated following concepts used in developing steel buckling restrained steel braces (BRB), having a milled portion, which is designed to yield and is enclosed within a grouted steel pipe. The connection system is investigated experimentally through a test sequence of displacement-controlled cycles based on a modified version of the test method developed by the American Concrete Institute (ACI) to facilitate development of special precast systems (ACI T1.1-01 Acceptance Criteria for Moment Frames Based on Structural Testing). Digital Image Correlation (DIC) was used to analyze strain behavior of the milled portion, as well as track movement of the panels during quasi-static uniaxial and cyclic testing. The results show the yield behavior and energy dissipation properties of the connection system. Damage was focused primarily in the energy dissipators, with negligible deformation and damage to the CLT panels and connections.

Online Access: Free

Resource Link

https://www.researchgate.net/profile/Andre_Barbosa7/publication/287405873_Performance_of_Steel_Energy_Dissipators_Connected_to_Cross-Laminated_Timber_Wall_Panels_Subjected_to_Tension_and_Cyclic_Loading/links/5c83f2c491851c695067e78c/Performance-of-Steel-Energy-Dissipators-Connected-to-Cross-Laminated-Timber-Wall-Panels-Subjected-to-Tension-and-Cyclic-Loading.pdf



Experimental Study on Loading Capacity of Glued-Laminated Timber Arches Subjected to Vertical Concentrated Loads

https://research.thinkwood.com/en/permalink/catalogue2581

Author:	Zhou, Jiale
	Chuanxi, Li
	Ke, Lu
	He, Jun
	Wang, Zhifeng
Publisher:	Hindawi
Year of Publication:	2020
Format:	Journal Article
Material:	Glulam (Glue-Laminated Timber)
Application:	Arches
Topic:	Design and Systems
Keywords:	In-Plane Loading
	Capacity
	Douglas-Fir
	Model
	Failure Modes
Language:	English
Research Status:	Complete
Series:	Advances in Civil Engineering

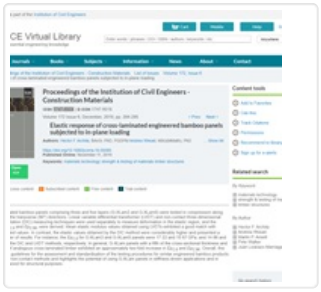
Summary:

Glued-laminated timber arches are widely used in gymnasiums, bridges, and roof trusses. However, studies on their mechanical behaviours and design methods are still insufficient. This paper investigates the in-plane loading capacity of circular glued-laminated timber arches made of Douglas fir. Experiments were conducted on four timber-arch models with different rise-to-span ratios under concentrated loads at mid-span and quarter-point locations. The structural responses, failure modes, and loading capacity of the timber arch specimens were obtained. The results show that the timber arches presented symmetric and antisymmetric deformation under mid-point and quarter-point loading conditions, respectively. The downward shifting of the neutral axis of the cross section was observed under mid-point loading condition, which contributes to higher loading capacity compared to that under quarter-point loading condition. The loading condition significantly affects the ultimate loads and the strain distribution in the cross section. Based on the design formula in current standards for timber structures, an equivalent beam-column method was introduced to estimate the loading capacity of the laminated timber arches under vertical concentrated loads. The moment amplification factor in the formula was compared and discussed, and the value provided in the National Design Specification for Wood Construction was recommended with acceptable accuracy.

Online Access: Free

Resource Link

https://www.hindawi.com/journals/ace/2020/7987414/



Elastic Response of Cross-Laminated Engineered Bamboo Panels Subjected to In-Plane Loading

https://research.thinkwood.com/en/permalink/catalogue2305

Author:	Archila-Santos, Hector
	Rhead, Andrew
Publisher:	ICE Publishing
Year of Publication:	2019
Country of Publication:	United Kingdom
Format:	Journal Article
Material:	Other Materials
Application:	Walls
	Wood Building Systems
Topic:	Design and Systems
Keywords:	G-XLam
	Panels
	Strength
	Stiffness
Language:	English
Research Status:	Complete
Series:	Proceedings of the Institution of Civil Engineers - Construction Materials
ISSN:	1747-650X
Online Access:	Free

Resource Link

https://doi.org/10.1680/jcoma.16.00080

Performance of Two-Storey CLT House Subjected to Lateral Loads

https://research.thinkwood.com/en/permalink/catalogue376

Author:	Popovski, Marjan
	Gavric, Igor
	Schneider, Johannes
Organization:	FPInnovations
Year of Publication:	2014
Country of Publication:	Canada
Format:	Report
Material:	CLT (Cross-Laminated Timber)
Application:	Wood Building Systems
Topic:	Connections
	Design and Systems
Keywords:	Lateral Loads
	North America
	Building Codes
	Full Scale
	Quasi-Static
	Monotonic Loading
	Cyclic Loading
	Failure Mechanism
Language:	English
Research Status:	Complete

Summary:

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. A two storey full-scale model of a CLT house was tested under quasi-static monotonic and cyclic lateral loading in two directions, one direction at a time. In total five tests were performed; one push-over and two cyclic tests were conducted in the longer symmetrical direction (E-W), and two cyclic tests were performed in the shorter asymmetrical direction (N-S). In addition, before and after each test, natural frequencies of the house in both directions were measured. The main objective of the tests was to investigate 3-D system behaviour of the CLT structure subjected to lateral loads. The CLT structure subjected to lateral loads performed according to the design objectives.

Online Access: Free

Resource Link

https://library.fpinnovations.ca/en/permalink/fpipub6024

Flexural Response of Glued Laminated (Glulam) Beams Subjected to Blast Loads

https://research.thinkwood.com/en/permalink/catalogue492

Author:	Lacroix, Daniel
	Viau, Christian
	Doudak, Ghasan
Year of Publication:	2014
Country of Publication:	Canada
Format:	Conference Paper
Material:	Glulam (Glue-Laminated Timber)
Application:	Beams
Topic:	Mechanical Properties
Keywords:	Strain
	Flexural Behaviour
	Blast Loads
Language:	English
Conference:	World Conference on Timber Engineering
Research Status:	Complete
Notes:	August 10-14, 2014, Quebec City, Canada

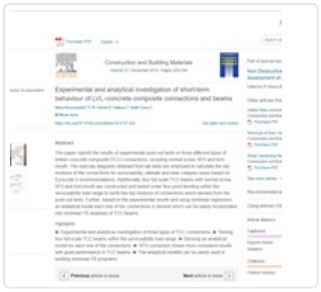
Summary:

An extensive body of research is currently available on the behaviour of concrete and steel structures when subjected to blast threats, however, little to no details on how to address the design or retrofitting of wood structures are available. In this paper, preliminary results, both experimental and analytical, are presented on the flexural behaviour of glulam beams under high strain rates. A total of three 80 mm x 228 mm x 2,500 mm glulam beams with a clear span of 2,235 mm were subjected to simulated blast loads using a shock tube. The preliminary experimental results showed that a brash tension failure mode was observed on the tension laminate. It was also shown that a simplified SDOF model, using linear elastic resistance curves, was capable of predicting the failure displacement and level of damage with reasonable accuracy.

Online Access:	Free

Resource Link

http://schd.ws/hosted_files/wcte2014/ba/ABS313_Lacroix_web.pdf



Experimental and Analytical Investigation of Short-Term Behaviour of LVL–Concrete Composite Connections And Beams

https://research.thinkwood.com/en/permalink/catalogue150

Author:	Khorsandnia, Nima
	Valipour, Hamid
	Crews, Keith
Publisher:	ScienceDirect
Year of Publication:	2012
Country of Publication:	Netherlands
Format:	Journal Article
Material:	LVL (Laminated Veneer Lumber)
	Timber-Concrete Composite
Application:	Beams
Topic:	Connections
	Design and Systems
	Mechanical Properties
Keywords:	Four Point Bending Test
	Screws
	Load Deflection
	Model
	Full Scale
Language:	English
Research Status:	Complete
Series:	Construction and Building Materials

Summary:

This paper reports the results of experimental push-out tests on three different types of timber–concrete composite (TCC) connections, including normal screw, SFS and bird-mouth. The load-slip diagrams obtained from lab tests are employed to calculate the slip modulus of the connections for serviceability, ultimate and near collapse cases based on Eurocode 5 recommendations. Additionally, four full-scale TCC beams with normal screw, SFS and bird-mouth are constructed and tested under four-point bending within the serviceability load range to verify the slip modulus of connections which derived from the push-out tests. Further, based on the experimental results and using nonlinear regression, an analytical model each one of the connections is derived which can be easily incorporated into nonlinear FE analyses of TCC beams.

Online Access:	Free

Resource Link

https://doi.org/10.1016/j.conbuildmat.2012.07.022

Behaviour of Glued-Laminated (Glulam) Beams and Columns Subjected to Simulated Blast Loads

https://research.thinkwood.com/en/permalink/catalogue1549

Author:	Lacroix, Daniel
	Doudak, Ghasan
Year of Publication:	2016
Country of Publication:	Austria
Format:	Conference Paper
Material:	Glulam (Glue-Laminated Timber)
Application:	Beams
	Columns
Topic:	Mechanical Properties
Keywords:	Blast Loads
	Static Loads
	Dynamic Loads
	Dynamic Tests
Language:	English
Conference:	World Conference on Timber Engineering
Research Status:	Complete
Notes:	August 22-25, 2016, Vienna, Austria p. 1199-1206

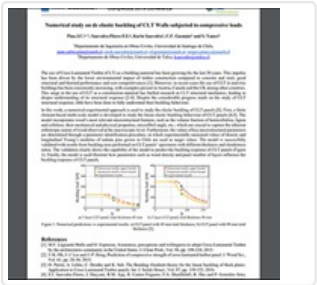
Summary:

This paper presents preliminary results from an experimental program investigating the dynamic behaviour of glulam beams and columns subjected to simulated blast loads. A total of eight glulam beams and columns were tested destructively under static and dynamic loads. Based on the dynamic tests conducted on the beams, an increase in strength under dynamic loading, relative to that measured under the static loading, was observed. A material predictive model that accounts for high strain-rate effects is developed. The experimental displacement-time histories were reasonably well predicted through a single-degree-of-freedom approach which used the proposed resistance model as input.

Online Access: Free

Resource Link

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



Numerical Study on De Elastic Buckling of CLT Walls Subjected to Compressive Loads

https://research.thinkwood.com/en/permalink/catalogue2169

Author:	Saavedra Flores, Erick
	Saavedra, Karin
	Pina, Juan Carlos
	Yanez, Sergio
	Guzmán, Carlos Felipe
Year of Publication:	2019
Country of Publication:	Sweden
Format:	Conference Paper
Material:	CLT (Cross-Laminated Timber)
Application:	Walls
Topic:	Design and Systems
	Connections
Keywords:	Buckling
	Panels
	Buckling Behavior
	Buckling Loads
Language:	English
Conference:	CompWood
Research Status:	Complete
ISBN:	978-91-88898-64-7
Online Access:	Free

Resource Link

https://open.lnu.se/index.php/compwood/article/download/1810/1737