## WCTE 2014
### CONFERENCE PROGRAM

**Monday, August 11 - Morning**

### Hall 200A
**WCTE/FPS Opening and Plenary Session**

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<thead>
<tr>
<th>Time</th>
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<th>Presenter, Affiliation, Country</th>
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<tbody>
<tr>
<td>08:30 – 08:45</td>
<td>WCTE/FPS Opening Ceremony</td>
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<tr>
<td>08:45 – 09:15</td>
<td>Keynote 1. Québec: the City that Wood Built</td>
<td>Jean-Claude Mercier, Canada</td>
</tr>
<tr>
<td>10:15 – 10:45</td>
<td>Special address from the Honourable Greg Rickford</td>
<td>Minister of Natural Resources and Minister for the Federal Economic Development Initiative for the Northern Ontario</td>
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### Hall 200BC
**Coffee Break - Exhibition and Poster Display**

### Hall 206A
**Materials and Products**

<table>
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<tr>
<th>Time</th>
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<th>Presenter, Affiliation, Country</th>
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<tbody>
<tr>
<td>11:00 – 11:20</td>
<td>Potential of CLT Produced from Non-Structural Grade Australian Pinus Radiata</td>
<td>Christophe Sigrist, Bern University of Applied Sciences, Switzerland</td>
</tr>
<tr>
<td>11:20 – 11:40</td>
<td>Feasibility of Using Poplar as Cross Layer to Fabricate Cross-Laminated Timber</td>
<td>Meng Gong, University of New Brunswick, Canada</td>
</tr>
<tr>
<td>11:40 – 12:00</td>
<td>Estimation of Bending Stiffness, Moment Carrying Capacity and Internal Shear Force of Sugi CLT Panel</td>
<td>Minoru Okabe, Center for Better Living, Japan</td>
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### Hall 206B
**Connections**

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<tr>
<th>Time</th>
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<th>Presenter, Affiliation, Country</th>
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<tbody>
<tr>
<td>11:00 – 11:20</td>
<td>An Algorithm for the Shear Check of Dowelled Connections with Combined Moment and Lateral Loading</td>
<td>Panagiotis Patlakas, Southampton Solent University, UK</td>
</tr>
<tr>
<td>11:20 – 11:40</td>
<td>Moment Resistance of Post-and-Beam Joints with Concealed Metallic Connectors</td>
<td>Sang-Joon Lee, Korea Forest research Institute, Korea</td>
</tr>
<tr>
<td>11:40 – 12:00</td>
<td>Design Method for Coupled-Splice Timber Moment Connections</td>
<td>Pouyan Zarnani, University of Auckland, New Zealand</td>
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### Hall 204AB
**Structural Systems**

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<tr>
<th>Time</th>
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<th>Presenter, Affiliation, Country</th>
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<tbody>
<tr>
<td>11:00 – 11:20</td>
<td>Development of Ultra-Thin Timber-Concrete Composite Upgrades</td>
<td>Jonathan Skinner, Ramboll UK Ltd., UK</td>
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<tr>
<td>11:20 – 11:40</td>
<td>Linear Elastic Behaviour of T-Shaped Timber-to-Concrete Beam With Uncertain Parameters</td>
<td>Marc Oudjene, Université de Lorraine, France</td>
</tr>
<tr>
<td>11:40 – 12:00</td>
<td>Timber-Steel Hybrid Beams for Multi-Storey Buildings: Design Criteria, Calculation and Tests</td>
<td>Wolfgang Winter, Vienna University of Technology, Austria</td>
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### Monday, August 11 - Morning

#### Hall 205ABC

**WCTE 4.1 MODERATOR**

**INNOVATIVE STRUCTURES**

**Iztok Sustersic, CBd, Slovenia**

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<th>TIME</th>
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<tbody>
<tr>
<td>11:00 – 11:20</td>
<td>Field Testing on Innovative Timber Structures</td>
<td>Claude Leyder, ETH Zürich, Switzerland</td>
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<tr>
<td>11:20 – 11:40</td>
<td>A Modular Timber Construction System of Hollow-Box Elements</td>
<td>Roman Hausammann, Bern University of Applied Sciences, Switzerland</td>
</tr>
<tr>
<td>11:40 – 12:00</td>
<td>Seismic Shaking Table Testing of Glass-Timber Buildings</td>
<td>Bostjan Ber, Kager Hisa, Slovenia</td>
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#### Hall 202

**WCTE 5.1 MODERATOR**

**SERVICEABILITY/FIRE SAFETY/REHABILITATION**

**Andrew Harmsworth, GHL Consultants Ltd., Canada**

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<tbody>
<tr>
<td>11:00 – 11:20</td>
<td>Monitoring of Vertical Movement In a 5-Storey Wood Frame Building in Costal British Columbia</td>
<td>Jieying Wang, FPInnovations, Canada</td>
</tr>
<tr>
<td>11:20 – 11:40</td>
<td>Structural Safety Thanks to Quality: Plan Robustness, Build with Checks, Monitor Permanently</td>
<td>Andreas Müller, Bern University of Applied Sciences, Switzerland</td>
</tr>
<tr>
<td>11:40 – 12:00</td>
<td>Long-Term In-Situ Measurements of Displacement, Temperature and Relative Humidity in a Multi-Storey Residential CLT-Building</td>
<td>Erik Serrano, Linnaeus University, Sweden</td>
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#### Hall 200A

**WCTE 6.1 MODERATOR**

**ARCHITECTURAL ACHIEVEMENTS I**

**Michael Flach, University of Innsbruck, Austria**

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<tbody>
<tr>
<td>11:00 – 11:20</td>
<td>Glulam Structures in New Suspended Walkways in Brasilia, Brazil</td>
<td>Roberto Lecomte De Mello, Spirale Architecture, Brazil</td>
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<tr>
<td>11:20 – 11:40</td>
<td>Hollow Timber Poles: Te Wharehou O Tuhoe Living Building Challenge</td>
<td>Mark Batchelar, mb Consulting Engineers, New Zealand</td>
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<tr>
<td>11:40 – 12:00</td>
<td>South Hedland Performance Shell. South Hedland, Western Australia</td>
<td>Patrick Beale, University of Western Australia, Australia</td>
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#### Hall 2000

**LUNCH
EXHIBITION AND POSTER DISPLAY**
<table>
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<tr>
<th>HALL 206A</th>
<th>MATERIALS AND PRODUCTS</th>
<th>CROSS-LAMINATED TIMBER II</th>
<th>WCETE 1.2</th>
<th>MODERATOR</th>
<th>PRESENTER, AFFILIATION, COUNTRY</th>
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<td>TIME</td>
<td>TITLE</td>
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<tr>
<td>13:40 – 14:00</td>
<td>Efficient Measurement of Elastic Constants of Cross Laminated Timber Using Modal Testing</td>
<td>Jianhui Zhou University of New Brunswick, Canada</td>
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<tr>
<td>14:00 – 14:20</td>
<td>Diagonal Compression Test on Cross-Laminated Timber Panels</td>
<td>Roberto Tomasi University of Trento, Italy</td>
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<tr>
<td>14:20 – 14:40</td>
<td>Bending Strength of Cross Laminated Timber Beams Loaded in Plane</td>
<td>Marcus Flaig Karlsruhe Institute of Technology, Germany</td>
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<tr>
<td>14:40 – 15:00</td>
<td>Time-Dependent Behaviour of CLT</td>
<td>Ciprian Pirvu FPInnovations, Canada</td>
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<tr>
<td>15:00 – 15:20</td>
<td>Creep and Duration of Load Characteristics of Cross Laminated Timber</td>
<td>Shiro Nakajima Building Research Institute, Japan</td>
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<tr>
<td>13:40 – 14:00</td>
<td>Fracture of Mortise Members Due to Changes in Peg Spacing in Timber Frame Joints</td>
<td>Daniel Hindman Virginia Tech, U.S.A.</td>
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<tr>
<td>14:00 – 14:20</td>
<td>Splitting of Beams Caused by Multiple Connections Along the Beam Span</td>
<td>Ad Leijten TU Eindhoven, The Netherlands</td>
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<tr>
<td>14:20 – 14:40</td>
<td>Effects of Self-Tapping Screws as Reinforcements in Beam Supports on the Determination of the Global Modulus of Elasticity in Bending</td>
<td>Roland Maderebner University of Innsbruck, Austria</td>
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<tr>
<td>14:40 – 15:00</td>
<td>Highly Efficient Strengthening of Local Load Introduction Areas of Engineering Wood Structures Using Polymer Concrete Grouting</td>
<td>Wolfram Haedicke Bauhaus University Weimar, Germany</td>
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<tr>
<td>15:00 – 15:20</td>
<td>Experimental and Numerical Analyses of Timber-Concrete Shear Connection</td>
<td>Abdelhamid Bouchair Université Blaise-Pascal, France</td>
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<th>HALL 204AB</th>
<th>STRUCTURAL SYSTEMS</th>
<th>COMPOSITE SYSTEMS II</th>
<th>WCETE 3.2</th>
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<tr>
<td>13:40 – 14:00</td>
<td>Development of Large-Scale Load-Bearing Timber-Glass Structural Elements</td>
<td>Erik Serrano Linnaeus University, Sweden</td>
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<tr>
<td>14:00 – 14:20</td>
<td>Experimental Investigation of the Bending Behaviour of Timber-to-Timber Composite-Section Beams</td>
<td>Sam Salem Lakehead University, Canada</td>
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<tr>
<td>14:40 – 15:00</td>
<td>Experimental Tests of Cross-Laminated Timber Floors for Timber-Steel Hybrid Structures</td>
<td>Cristiano Loss University of Trento, Italy</td>
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<tr>
<td>15:00 - 15:20</td>
<td>Keel-Web Element - Novel Wood-Based Lightweight Element for Wide Spans</td>
<td>Simon Aicher MPA University of Stuttgart, Germany</td>
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### Hall 205ABC

**Buildings and Structures**

**Moderator:** Dan Dolan, Washington State University, U.S.A.

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<tr>
<td>13:40 – 14:00</td>
<td>Earthquake Response Estimation of Wooden House with New Brace Fastener</td>
<td>Tomoki Furuta, Daichi Institute of Technology, Japan</td>
</tr>
<tr>
<td>14:00 – 14:20</td>
<td>Enhancing Dynamic Performance of Lightweight Superstructures Using Supplementary Damping</td>
<td>Ebenezer Ussher, University of New Brunswick, Canada</td>
</tr>
<tr>
<td>14:20 – 14:40</td>
<td>Multi-Scale Modelling of Timber-Frame Structures Under Seismic Loading</td>
<td>Laurent Daudeville, Université Joseph-Fourier, France</td>
</tr>
<tr>
<td>14:40 – 15:00</td>
<td>Numerical Analysis of Timber-Frame Structures with Infill Under Seismic Loading</td>
<td>Florent Vieux-Champagne, Université Joseph-Fourier, France</td>
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<tr>
<td>15:00 – 15:20</td>
<td>Seismic Analysis of Three-Hinge Glulam Tudor Arches Using the FEMA P-695 Methodology</td>
<td>Finley Charney, Virginia Tech, U.S.A.</td>
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### Hall 202

**Serviceability/Fire Safety/Rehabilitation**

**Moderator:** Andrea Frangi, ETH, Switzerland

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<tr>
<td>13:40 – 14:00</td>
<td>Modelling and Measurement of the Dynamic Performance of a Timber Concrete Composite Floor</td>
<td>Richard Hough, Arup, Australia</td>
</tr>
<tr>
<td>14:00 – 14:20</td>
<td>Noise and Vibration Control of Light-Frame Wood Joist Floors Topped with Concrete</td>
<td>Lin Hu, FPInnovations, Canada</td>
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<tr>
<td>14:20 – 14:40</td>
<td>Effect of End Support Conditions on the Vibrational Performance of Cross-Laminated Timber Floors</td>
<td>Saul Hernandez Maldonado, University of New Brunswick, Canada</td>
</tr>
<tr>
<td>14:40 – 15:00</td>
<td>Assessment of Timber Floor Vibration Performance: a Case Study in Italy</td>
<td>Daniele Casagrande, University of Trento, Italy</td>
</tr>
<tr>
<td>15:00 – 15:20</td>
<td>Vibration Serviceability Design Analysis of Cross-Laminated-Timber Floor Systems</td>
<td>Ebenezer Ussher, University of New Brunswick, Canada</td>
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### Hall 200A

**Past, Present and Future**

**Moderator:** David Moses, Moses Structural Engineers Inc., Canada

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<tr>
<td>13:40 – 14:00</td>
<td>Swimming-Pool Building Made with X-Lam Panels</td>
<td>Alfredo Dias, University of Coimbra, Portugal</td>
</tr>
<tr>
<td>14:00 – 14:20</td>
<td>Laminated Wooden Structure of the Gipsy Entertainment Centre in Moscow</td>
<td>Miljenko Haiman, University of Zagreb, Croatia</td>
</tr>
<tr>
<td>14:20 – 14:40</td>
<td>Re-Building Trimble Navigation Offices Using a Damage-Limiting Seismic System</td>
<td>Andrew Brown, Opus International Consultants, New Zealand</td>
</tr>
<tr>
<td>14:40 – 15:00</td>
<td>CESM Soccer Center in Montreal - Timber Engineering Case Study. Part I</td>
<td>Louis-Philippe Poirier, SNC Lavalin, Canada</td>
</tr>
<tr>
<td>15:00 – 15:20</td>
<td>CESM Soccer Center in Montreal - Timber Engineering Case Study. Part II</td>
<td>Étienne Mondou, Nordic Engineered Wood, Canada</td>
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### Hall 200BC

**Coffee Break - Exhibition and Poster Display**
## Monday, August 11 - Afternoon

### Hall 206A
**Materials and Products**
**Cross-Laminated Timber III**
**Daniel Hindman, Virginia Tech, U.S.A.**

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<tr>
<td>15:40 – 16:00</td>
<td>Effect of Growth Ring Orientation on the Rolling Shear Properties of Wooden Cross Layer Under Two-Plate Shear Test</td>
<td>Meng Gong, University of New Brunswick, Canada</td>
</tr>
<tr>
<td>16:00 – 16:20</td>
<td>Evaluation of the In-Plane Shear Strength of CLT</td>
<td>Sylvain Gagnon, FPInnovations, Canada</td>
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<tr>
<td>16:20 – 16:40</td>
<td>Evaluating Rolling Shear Strength Properties of Cross-Laminated Timber by Torsional Shear Tests and Bending Tests</td>
<td>Minghao Li, University of Canterbury, New Zealand</td>
</tr>
<tr>
<td>16:40 – 17:00</td>
<td>Duration-of-Load Effect on the Rolling Shear Strength of Cross-Laminated Timber: Duration-of-Load Tests and Damage Accumulation Model</td>
<td>Yuan Li, University of British Columbia, Canada</td>
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### Hall 206B
**Connections**
**Connections Performance II**
**Pouyan Zarnani, University of Auckland, New Zealand**

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<tr>
<td>15:40 – 16:00</td>
<td>Use of Double-Threaded Self-Tapping Screws for In-Situ Repair of Cracked Timber Connections</td>
<td>Stephen Delahunty, University of New Brunswick, Canada</td>
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<tr>
<td>16:00 – 16:20</td>
<td>Experimental Study on Nail Connection Performance of Stand-Based Wood Composites</td>
<td>Hyung Suk Lim, University of British Columbia, Canada</td>
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<tr>
<td>16:20 – 16:40</td>
<td>Withdrawal of Axially Loaded Connectors from Timber Elements - Theory and Validation</td>
<td>Haris Stamatopoulos, Norwegian University of Science and Technology, Norway</td>
</tr>
<tr>
<td>16:40 – 17:00</td>
<td>Investigation of Lumber Shear-Out in Tension Web Joints in Metal-Plate Connected Wood Trusses</td>
<td>Agron Gjinolli, Universal AET, U.S.A.</td>
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### Hall 204AB
**Structural Systems**
**Composite Systems III**
**Peggi Clouston, University of Massachusetts, U.S.A.**

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<tr>
<td>15:40 – 16:00</td>
<td>Long-Term Experimental Investigation of Timber Composite Beams in Cyclic Humidity Conditions</td>
<td>Keith Crews, University of Technology, Sydney, Australia</td>
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<tr>
<td>16:00 – 16:20</td>
<td>Long-Term Performance of Adhesively Bonded Timber-Concrete-Composites</td>
<td>Thomas Tannert, University of British Columbia, Canada</td>
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<tr>
<td>16:20 – 16:40</td>
<td>Determination of Damage Equivalent Factors for the Fatigue Design of Timber-Concrete Composite Road Bridges with Notched Connections</td>
<td>Katrin Stephan, MPA University of Stuttgart, Germany</td>
</tr>
<tr>
<td>16:40 – 17:00</td>
<td>Fatigue Design of Wood-Concrete-Composite Systems</td>
<td>Leander Bathon, Wiesbaden University of Applied Sciences, Germany</td>
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## HALL 205ABC
### BUILDINGS AND STRUCTURES
#### BUILDINGS (SEISMIC) II
**John van de Lindt, Colorado State University, U.S.A.**

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<tr>
<td>15:40 – 16:00</td>
<td>Seismic Risk Reduction for Soft-Story Woodframe Buildings: Test Results and Retrofit Recommendations from the NEES-Soft Project</td>
<td>John van de Lindt, Colorado State University, U.S.A.</td>
</tr>
<tr>
<td>16:00 – 16:20</td>
<td>Performance-Based Seismic Retrofit Methodology of Soft-Story Woodframe Buildings with Full-Scale Shake Table Test Validation</td>
<td>Pouria Bahmani, Colorado State University, U.S.A.</td>
</tr>
<tr>
<td>16:20 – 16:40</td>
<td>Observed Performance of Soft-Story Woodframe Building Retrofitted with CLT Rocking Walls</td>
<td>Asif Iqbal, Opus International Consultants, New Zealand</td>
</tr>
<tr>
<td>16:40 – 17:00</td>
<td>Seismic Performance of Distributed Knee-Brace (DKB) System as a Retrofit for Soft-Story Wood-Frame Buildings</td>
<td>Mikhail Gershfeld, California State Polytech University, U.S.A.</td>
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## HALL 202
### SERVICEABILITY/FIRE SAFETY/REHABILITATION
#### SERVICEABILITY III
**Erik Serrano, Linnæus University, Sweden**

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<td>15:40 – 16:00</td>
<td>Experimental Evaluation of Vibration Propagation Characteristics of a Timber House</td>
<td>Seiichiro Ukyo, Forestry and Forest Products Research Institute, Japan</td>
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<tr>
<td>16:00 – 16:20</td>
<td>Model Calibration of Wooden Structure Assemblies - Using EMA and FEA</td>
<td>Åsa Bolmsvik, Linnæus University, Sweden</td>
</tr>
<tr>
<td>16:20 – 16:40</td>
<td>Ambient Vibration Testing and Modal Analysis of Multi-Storey Cross-Laminated Timber Buildings</td>
<td>Thomas Reynolds, University of Bath, UK</td>
</tr>
<tr>
<td>16:40 – 17:00</td>
<td>The Risk Basis for Height and Area Limits in North American Building Codes</td>
<td>Keith Calder, Sereca Fire Consulting Ltd., Canada</td>
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## HALL 200A
### PAST, PRESENT AND FUTURE
#### ARCHITECTURAL ACHIEVEMENTS III
**Gary Williams, Timber Systems Limited, Canada**

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<td>15:40 – 16:00</td>
<td>Wooden Structures in Brasil: Present Situation and Perspectives</td>
<td>Helio Olga Souza Jr., Ita Construtora Ltda, Brazil</td>
</tr>
<tr>
<td>16:00 – 16:20</td>
<td>A Study on Historical Tall Wood Buildings in Canada</td>
<td>Kenneth Koo, FPInnovations, Canada</td>
</tr>
<tr>
<td>16:20 – 16:40</td>
<td>Massive Wood Use in Institutional Buildings: Lessons Learned from 3 Recent Case Studies</td>
<td>Marie-Odile Marceau, McFarlane Marceau Architects, Canada</td>
</tr>
<tr>
<td>16:40 – 17:00</td>
<td>Wood as a Core Strategy to Win an Architectural Competition</td>
<td>Normand Hudon, Coarchitecture, Canada</td>
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## WCETE WELCOME RECEPTION
**Musée de la Civilisation**
### WCtE/FPS Plenary Session

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<td>08:30 – 08:45</td>
<td>Housekeeping</td>
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</tr>
<tr>
<td>08:45 - 09:45</td>
<td>Keynote 3. Wood Products and Construction; a Cornerstone of the Emerging Bio-Economy</td>
<td>Ian de la Roche, Canada</td>
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</table>

### Coffee Break - Exhibition and Poster Display

### Materials and Products

#### Grading and Quality Control

**Moderator:** Helen Griffin, Canadian Wood Council, Canada

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<tr>
<th>Time</th>
<th>Title</th>
<th>Presenter, Affiliation, Country</th>
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<tbody>
<tr>
<td>10:20 – 10:40</td>
<td>Three Dimensional Fibre Orientation Models for Wood Based on Laser Scanning Utilizing the Tracheid Effect</td>
<td>Anders Olsson, Linnaeus University, Sweden</td>
</tr>
<tr>
<td>10:40 – 11:00</td>
<td>Strength Grading of Timber in Europe with Regard to Different Grading Methods</td>
<td>Peter Stapel, Technische Universität München, Germany</td>
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<tr>
<td>11:00 – 11:20</td>
<td>Safety of Timber – An Analysis of Quality Control Options</td>
<td>Andriy Kovryga, Technische Universität München, Germany</td>
</tr>
<tr>
<td>11:40 – 12:00</td>
<td>Structural (Performance) Class Potential for North America</td>
<td>Eric Jones, Canadian Wood Council, Canada</td>
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</tbody>
</table>

### Innovative Connections I

**Moderator:** Hans Blass, Karlsruhe Institute of Technology, Germany

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<tr>
<th>Time</th>
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<th>Presenter, Affiliation, Country</th>
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<tbody>
<tr>
<td>10:20 – 10:40</td>
<td>Behaviour of Bond Lines in DVW Reinforced Timber Connections</td>
<td>Daniel Brandon, University of Bath, UK</td>
</tr>
<tr>
<td>10:40 – 11:00</td>
<td>Joint with Large Diameter Fastener Constructed for Large Span Truss Girders</td>
<td>Miljenko Haiman, University of Zagreb, Croatia</td>
</tr>
<tr>
<td>11:00 – 11:20</td>
<td>Novel Steel Tube Connection for Hybrid Systems</td>
<td>Johannes Schneider, University of British Columbia, Canada</td>
</tr>
<tr>
<td>11:20 – 11:40</td>
<td>High-Performance Timber Composite Joints for Spatial Round Wood Truss Structures</td>
<td>Kay-Uwe Schober, Mainz University of Applied Sciences, Germany</td>
</tr>
<tr>
<td>11:40 – 12:00</td>
<td>Hybrid Joints with Casted Concrete for Timber Truss Girders</td>
<td>Peer Haller, Dresden University of Technology, Germany</td>
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</table>

### Traditional Structures

**Moderator:** Richard Harris, University of Bath, UK

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<tr>
<th>Time</th>
<th>Title</th>
<th>Presenter, Affiliation, Country</th>
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</thead>
<tbody>
<tr>
<td>10:20 – 10:40</td>
<td>Traditional Timber Frames</td>
<td>André Jorissen, Eindhoven Univ. of Technology, The Netherlands</td>
</tr>
<tr>
<td>10:40 – 11:00</td>
<td>Sensitivity of Timber Hyperstatic Frames to the Stiffness of Step and Ridge Joints</td>
<td>Thierry Descamps, Université du Mons, Belgique</td>
</tr>
<tr>
<td>11:00 – 11:20</td>
<td>Theoretical and Experimental Study of Traditional Japanese Cogged Joint</td>
<td>Keita Ogawa, Nagoya Université, Japan</td>
</tr>
<tr>
<td>11:20 – 11:40</td>
<td>Seismic Resisting Mechanism and Formulations of Traditional Wooden Joints with Wedges</td>
<td>Hideaki Tanahashi, Ritsumeikan University, Japan</td>
</tr>
<tr>
<td>11:40 – 12:00</td>
<td>Blockhaus System: Experimental Characterization of Corner Joints and Shear Walls</td>
<td>Roberto Tomasi, University of Trento, Italy</td>
</tr>
</tbody>
</table>
### TUESDAY, AUGUST 12 - MORNING

#### HALL 205ABC
**BUILDINGS AND STRUCTURES**
**TALL BUILDINGS I (CANADIAN GUIDE)**
Erol Karacabeyli, FPInnovations, Canada

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<tr>
<th>TIME</th>
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<tbody>
<tr>
<td>10:40 – 11:00</td>
<td>Design and Construction of Tall Wood Buildings: A Guide for Fire-Safety Design</td>
<td>Andrew Harmsworth, GHL Consultants Ltd., Canada</td>
</tr>
<tr>
<td>11:00 – 11:20</td>
<td>Design and Construction of Tall Wood Buildings: Framework for Quality Assurance of Glued Wood Components Fabricated on Site</td>
<td>Ciprian Pirvu, FPInnovations, Canada</td>
</tr>
<tr>
<td>11:40 – 12:00</td>
<td>Design and Construction of Tall Wood Buildings: A Guide For Building Enclosure Design</td>
<td>Jieying Wang, FPInnovations, Canada</td>
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#### HALL 202
**SERVICEABILITY/FIRE SAFETY/REHABILITATION**

**FIRE SAFETY I**
Joseph Su, National Research Council, Canada

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<tbody>
<tr>
<td>10:20 – 10:40</td>
<td>Behaviour of Coated Wood Tested in a Cone Calorimeter</td>
<td>Josef Kögl, University of Innsbruck, Austria</td>
</tr>
<tr>
<td>10:40 – 11:00</td>
<td>Charring Rate of Intumescent Fire Protective Coated Norway Spruce</td>
<td>Josef Kögl, University of Innsbruck, Austria</td>
</tr>
<tr>
<td>11:00 – 11:20</td>
<td>Capacity Prediction of Bonded Beech Joints Under Normal and Elevated Temperatures</td>
<td>Till Valée, Fraunhofer IFAM, Germany</td>
</tr>
<tr>
<td>11:20 – 11:40</td>
<td>Thermo-Mechanical Behavior of Timber in Shear: An Experimental Study</td>
<td>Abdelhamid Bouchair, Université Blaise-Pascal, France</td>
</tr>
<tr>
<td>11:40 – 12:00</td>
<td>Fire Resistance of Primary Beam – Secondary Beam Connections in Timber Structures</td>
<td>Stefan Winter, Technische Universität München, Germany</td>
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#### HALL 200A
**PAST, PRESENT AND FUTURE**
**DESIGN AND DESIGN TOOLS**
Alfredo Dias, University of Coimbra, Portugal

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<tbody>
<tr>
<td>10:20 – 10:40</td>
<td>Design of Multi-Story Timber Building Using Multi-Objective Particle Swarm Optimization</td>
<td>Stephanie Armand Decker, Université de Bordeaux, France</td>
</tr>
<tr>
<td>10:40 – 11:00</td>
<td>Okonflex IT-Tool For Configuring Wooden House Constructions</td>
<td>Anton Kraler, University of Innsbruck, Austria</td>
</tr>
<tr>
<td>11:00 – 11:20</td>
<td>A Form Finding Method for Post Formed Timber Grid Shell Structures</td>
<td>Bernardino D’Amico, Edinburgh Napier University, UK</td>
</tr>
<tr>
<td>11:20 – 12:00</td>
<td>Beyond Endurance: Modular Prefab Timber Façades – Sustainable PlusEnergy Strategies for Wooden Cladding Systems in Multi-Storey Timber Buildings</td>
<td>Magnus Larsson, Ordinary Ltd., UK</td>
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#### HALL 2000
**GUEST LECTURE**

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<tbody>
<tr>
<td>12:30 – 13:00</td>
<td>The Role of Forest Products in Sustainable Building for a Green Economy of the Future</td>
<td>Paola Deda, UNECE/FAO, Switzerland</td>
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<tr>
<td>Time</td>
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<td>Presenter, Affiliation, Country</td>
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<tr>
<td>13:40 – 14:00</td>
<td>The Behaviour of Plank (Tongue and Groove) Wood Decking Systems Under the Effects of Concentrated Load</td>
<td>Kevin Rocchi, University of Ottawa, Canada</td>
</tr>
<tr>
<td>14:00 – 14:20</td>
<td>Composite Action Evaluation for Modern Pre-fabricated Wood I-Joist Floor Systems</td>
<td>Ned Waltz, Weyerhaeuser, U.S.A.</td>
</tr>
<tr>
<td>14:20 – 14:40</td>
<td>Sandwich Panels with Holes</td>
<td>André Jorissen, Eindhoven UT, The Netherlands</td>
</tr>
<tr>
<td>14:40 – 15:00</td>
<td>Effect of Round Holes in High Shear Zones of Laminated Veneer Lumber</td>
<td>Peggi Clouston, University of Massachusetts, U.S.A.</td>
</tr>
<tr>
<td>15:00 – 15:20</td>
<td>Experimental Analysis of Slender Timber Columns of Pinus SPP</td>
<td>Jorge Daniel De Melo Moura, Londrina State University, Brazil</td>
</tr>
<tr>
<td>13:40 – 14:00</td>
<td>Load-Slip Behaviour of Timber-to-Concrete Connections Reinforced with Punched Metal Plate</td>
<td>El-Mahdi Meghlat, University of Tizi-Ouzou, Algeria</td>
</tr>
<tr>
<td>14:00 – 14:20</td>
<td>Performance of an Innovative Roof to Top Plate Connection</td>
<td>Matthew Lovell, Rose-Hulman Institute of Technology, U.S.A.</td>
</tr>
<tr>
<td>14:20 – 14:40</td>
<td>Evaluation on Dynamic Performance of Glulam Frame Structure Composed of Slotted Bolted Connection System</td>
<td>Kohei Komatsu, Kyoto University, Japan</td>
</tr>
<tr>
<td>14:40 – 15:00</td>
<td>An Innovative Connection System for CLT Structures: Experimental – Numerical Analysis</td>
<td>Albino Angeli, Rothoblaas, Italy</td>
</tr>
<tr>
<td>15:00 – 15:20</td>
<td>SHERPA-CLT-Connector for Cross-Laminated Timber (CLT) Elements</td>
<td>Anton Kraler, University of Innsbruck, Austria</td>
</tr>
<tr>
<td>13:40 – 14:00</td>
<td>Analysis of Engineered Design Provisions for Perforated Shear Walls</td>
<td>Daniel Lawless, DrJ Engineering, U.S.A.</td>
</tr>
<tr>
<td>14:00 – 14:20</td>
<td>Semi Rigidity of Traditional Timber Floors – Modelling Aspects of Horizontal Diaphragms for Seismic Loading</td>
<td>Eric Fournely, Université Blaise-Pascal, France</td>
</tr>
<tr>
<td>14:20 – 14:40</td>
<td>Distribution of Chord Forces in Large Panelized Wood Roof Diaphragms</td>
<td>Weichiang Pang, Clemson University, U.S.A.</td>
</tr>
<tr>
<td>14:40 – 15:00</td>
<td>Simulation of the Lateral Drift of Multi-Storey Light Wood Frame Buildings Based on a Modified Macro-Element Model</td>
<td>Zhiyong Chen, University of New Brunswick, Canada</td>
</tr>
<tr>
<td>15:00 – 15:20</td>
<td>Design of Wood Frame and Podium Structures Using Linear Dynamic Analysis</td>
<td>Grant Newfield, RJC Consulting Engineers, Canada</td>
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</table>
## BUILDINGS AND STRUCTURES

**TALL BUILDINGS II**

Robert Malczyk, Equilibrium Consulting Inc., Canada

### TIME | TITLE | PRESENTER, AFFILIATION, COUNTRY
---|---|---
13:40 – 14:00 | Wind-Induced Vibration of Mid- to High-Rise Wood Buildings – Is it an Issue? | Lin Hu, FPInnovations, Canada
14:00 – 14:20 | Nearly High-Rise Timber Buildings in Germany - Projects, Experiences and Further Development | Stefan Winter, Technische Universität München, Germany
14:20 – 14:40 | Integrating Cross-Laminated Timber Panels to Construct Buildings to 20 Levels | John Chapman, University of Auckland, New Zealand
14:40 – 15:00 | Wind-Induced Motions of “Treet” - A 14-Storey Timber Residential Building in Norway | Magne Bjertnæs, Sweco Norway, Norway
15:00 – 15:20 | Structural Design and Assembly of “Treet” - A 14-Storey Timber Residential Building in Norway | Rune B. Abrahamsen, Sweco Norway, Norway

## SERVICEABILITY/FIRE SAFETY/REHABILITATION

**FIRE SAFETY II**

Christian Dagenaïs, FPInnovations, Canada

### TIME | TITLE | PRESENTER, AFFILIATION, COUNTRY
---|---|---
13:40 – 14:00 | Behaviour of Non-Metallic Shear Connections in Fire | Daniel Brandon, University of Bath, UK
14:00 – 14:20 | Fire Resistance of Metal-Plate-Connected Wood Trusses in the Floor Assemblies | Hisa Takeda, LGS Canada, Canada
14:40 – 15:00 | Shear Strength of LVL Box Beams in Fire Conditions | Andrew Buchanan, University of Canterbury, New Zealand
15:00 – 15:20 | Predicting the Fire Performance of Small, Exposed Wood Members | Jason Smart, American Wood Council, U.S.A.

## PAST, PRESENT AND FUTURE

**TRENDS IN WOOD CONSTRUCTION I**

Wolfgang Winter, Vienna University of Technology, Austria

### TIME | TITLE | PRESENTER, AFFILIATION, COUNTRY
---|---|---
13:40 – 14:00 | Timber Structures in Brazil: Past, Present and Future | Carlito Calil Junior, University of São Paulo, Brazil
14:00 – 14:20 | Smart Cities in Wood, Strategies and Recommendations to Prepare the Timber Industry | Michael Flach, University of Innsbruck, Austria
14:20 – 14:40 | Strategies and Policies Implemented in Québec to Support the Increased Use of Wood in Non-Residential Construction | Louis Poliquin, cecobois, Canada
14:40 – 15:00 | Construction Value Pathways: Trends and Research Results | Paul Lansbergen, Forest Products Association of Canada, Canada

## COFFEE BREAK - EXHIBITION AND POSTER DISPLAY
### Hall 206A: Materials and Products

#### WCfE 1.6

**Moderator:**

Tomi Toratti, Finnish Construction Industries, Finland

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<tr>
<td>15:40 – 16:00</td>
<td>Characterizing Influence of Laminate Characteristics on Elastic Properties of Single-Layer of Cross-Laminated Timber</td>
<td>Jan Niederwestberg, University of New Brunswick, Canada</td>
</tr>
<tr>
<td>16:00 – 16:20</td>
<td>Load Carrying Behaviour of Naturally Grown Round Wood</td>
<td>Matthias Frese, Karlsruhe Institute of Technology, Germany</td>
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<tr>
<td>16:20 – 16:40</td>
<td>Modeling Longitudinal Tensile Failure Load of Larix Gmelinii Finger-Jointed Lumber</td>
<td>Haiqing Ren, Chinese Academy of Forestry, China</td>
</tr>
<tr>
<td>16:40 – 17:00</td>
<td>Investigations to the Compression Strength Perpendicular to the Grain of Spruce Wood Depending on the Loading Situation and Comparisons with Current Standards</td>
<td>Clemens Le Leve, University of Innsbruck, Austria</td>
</tr>
<tr>
<td>17:00 – 17:20</td>
<td>Investigation on Elements Presenting Cracks in Timber Structures</td>
<td>Steffen Franke, Bern University of Applied Sciences, Switzerland</td>
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### Hall 206B: Connections

#### WCfE 2.6

**Moderator:**

Thomas Tannert, University of British Columbia, Canada

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<tr>
<td>15:40 – 16:00</td>
<td>Reliability Study for Performance of Timber Roof Connections Under Wind Forces</td>
<td>Geoff Boughton, TimberED Services, Australia</td>
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<tr>
<td>16:00 – 16:20</td>
<td>Directional Dependency in an OSB Sheathing-to-Framing Mechanical Connection</td>
<td>Johan Vessby, Linnaeus University, Sweden</td>
</tr>
<tr>
<td>16:20 – 16:40</td>
<td>Design of Multiple-Bolted Connections for Laminated Veneer Lumber</td>
<td>Borjen Yeh, APA - The Engineered Wood Association, U.S.A.</td>
</tr>
<tr>
<td>16:40 – 17:00</td>
<td>Four Dowels in a Column Compared to a One Dowel Connection</td>
<td>Jan Siem, Norwegian University of Science and Technology, Norway</td>
</tr>
<tr>
<td>17:00 – 17:20</td>
<td>Mechanical Behavior of Bolted Glulam Beam-to-Column Connections</td>
<td>Xiaobin Song, Tongji University, China</td>
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### Hall 204A: Structural Systems

#### WCfE 3.6

**Moderator:**

Ario Ceccotti, National Research Council, Italy

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<tr>
<td>15:40 – 16:00</td>
<td>Mechanically Jointed CLT Panels for Wall, Floor and Timber-Concrete Composite Structures</td>
<td>Petr Kuklik, Czech Technical University in Prague, Czech Republic</td>
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<tr>
<td>16:00 – 16:20</td>
<td>Racking Resistance and Ductility of CLT Shear Walls Under Horizontal and Vertical Loads</td>
<td>Motoi Yasumura, Shizuoka University, Japan</td>
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<tr>
<td>16:20 – 16:40</td>
<td>Lateral Loading Tests on CLT Shear Walls by Assembly of Narrow Panels and by a Large Panel with an Opening</td>
<td>Naohito Kawai, Kogakuin University, Japan</td>
</tr>
<tr>
<td>16:40 – 17:00</td>
<td>Performance of Two-Storey CLT House Subjected to Lateral Loads</td>
<td>Marjan Popovski, FPInnovations, Canada</td>
</tr>
<tr>
<td>17:00 – 17:20</td>
<td>Dynamic and Static Lateral Load Tests on Full-Sized 3-Storey CLT Construction for Seismic Design</td>
<td>Takahiro Tsuchimoto, Building Research Institute, Japan</td>
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### Hall 205ABC
#### Buildings and Structures
**Assessment / Upgrading**
Kjell A. Malo, Norwegian University of Science and Technology, Norway

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<tr>
<td>15:40 – 16:00</td>
<td>Lightweight Deck Replacement Systems for Historic Covered Timber Bridges</td>
<td>James Wacker, USDA FS Forest Products Laboratory, U.S.A.</td>
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<tr>
<td>16:00 – 16:20</td>
<td>Structural Properties Evaluation of Unique Boat House Using Oblique Nuki</td>
<td>Yasuhiro Hayashi, Kyoto University, Japan</td>
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<tr>
<td>16:20 – 16:40</td>
<td>The Proof Loading vs. Duration of Load Effects in Regard to the Reassessment of Timber Structures</td>
<td>Jochen Köhler, Norwegian University of Science and Technology, Norway</td>
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<tr>
<td>16:40 – 17:00</td>
<td>Lateral Load Tests of Houses Damaged in the Christchurch New Zealand Earthquakes</td>
<td>Hugh Morris, University of Auckland, New Zealand</td>
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<tr>
<td>17:00 – 17:20</td>
<td>Wood Gives New Life to a Concrete Colossus</td>
<td>Ana Golmajer, CBD, Slovenia</td>
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### Hall 202
#### Serviceability/Fire Safety/Rehabilitation
**Fire Safety III**
Andrew Buchanan, University of Canterbury, New Zealand

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<tr>
<td>15:40 – 16:00</td>
<td>Implementation of Fully Coupled Heat and Mass Transport Model to Determine the Behaviour of Timber Elements in Fire</td>
<td>Tomaz Hozjan, University of Ljubljana, Slovenia</td>
</tr>
<tr>
<td>16:00 – 16:20</td>
<td>Fire Behaviour of Large Scale Wooden Roof Structures</td>
<td>Veronika Hofmann, Technische Universität München, Germany</td>
</tr>
<tr>
<td>16:20 – 16:40</td>
<td>Fire Resistance of Light Timber Frame Wall and Floor Assemblies</td>
<td>Petr Kuklík, Czech Technical University in Prague, Czech Republic</td>
</tr>
<tr>
<td>16:40 – 17:00</td>
<td>Full-Scale Fire Tests of 3-Storey Wooden School Building</td>
<td>Yuji Hasemi, Waseda University, Japan</td>
</tr>
<tr>
<td>17:00 – 17:20</td>
<td>Development of a Canadian Fire-Resistance Design Method for Massive Wood Members</td>
<td>Christian Dagenais, FPInnovations, Canada</td>
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### Hall 200A
#### Past, Present and Future
**Trends in Wood Construction II**
Carlito Calil Junior, University of São Paulo, Brazil

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<tr>
<td>15:40 – 16:00</td>
<td>Hybridised Australian Cross-Laminated Timber (ACLT) and Orientated Strand Board (OSB) Wall Panels – A Case Study</td>
<td>David Bylund, University of Western Australia, Australia</td>
</tr>
<tr>
<td>16:40 – 17:00</td>
<td>Wood-Based Construction in Urban Context - Optimization Concepts for Increased Resource Efficiency</td>
<td>Wolfgang Winter, Vienna University of Technology, Austria</td>
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</table>
### Hall 200A
**WCTE/FPS Plenary Session**

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<td>08:30 – 08:45</td>
<td>Housekeeping</td>
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### Hall 200BC
**Coffee Break - Exhibition and Poster Display**

### Hall 206A
**Materials and Products**

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<tr>
<td>10:20 – 10:40</td>
<td>Bamboo Reinforced Glulam Beams: An Alternative to Punched Metal Plate, GFRP and CFRP Reinforced Glulam Beams</td>
<td>César Echavarria, Universidad Nacional de Colombia, Colombia</td>
</tr>
<tr>
<td>10:40 – 11:00</td>
<td>Composite Elements of Basalt Fibre Rods and Low-Grade Glulam</td>
<td>Gary Raftery, University of Auckland, New Zealand</td>
</tr>
<tr>
<td>11:00 – 11:20</td>
<td>Flexural Response of Glued-Laminated (Glulam) Beams Subjected to Blast Loads</td>
<td>Daniel Lacroix, University of Ottawa, Canada</td>
</tr>
<tr>
<td>11:20 – 11:40</td>
<td>Remaining Load-Bearing Behaviour of Glued-Laminated Timber Beams – Potential in Respect to Structural Robustness</td>
<td>Jochen Köhler, NTNU, Norway</td>
</tr>
<tr>
<td>11:40 – 12:00</td>
<td>Identification of Weak Sections in Glulam Beams Using Calculated Stiffness Profiles Based on Lamination Surface Scanning</td>
<td>Jan Oscarsson, SP Technical Research Institute of Sweden, Sweden</td>
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### Hall 206B
**Connections**

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<tbody>
<tr>
<td>10:20 – 10:40</td>
<td>Design Equations for Dowel Embedment Strength and Withdrawal Resistance for Threaded Fasteners in CLT</td>
<td>Shawn Kennedy, Université Laval, Canada</td>
</tr>
<tr>
<td>10:40 – 11:00</td>
<td>Influencing Parameters on the Experimental Determination of the Withdrawal Capacity off Self-Tapping Screws</td>
<td>Andreas Ringhofer, Graz University of Technology, Austria</td>
</tr>
<tr>
<td>11:00 – 11:20</td>
<td>Metal Work Used in Timber Engineering</td>
<td>Petr Sejkot, Czech Technical Univ. in Prague, Czech Republic</td>
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<tr>
<td>11:20 – 11:40</td>
<td>Failure Modes In CLT Connections</td>
<td>Mohammad Mohammad, FPInnovations, Canada</td>
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<tr>
<td>11:40 – 12:00</td>
<td>Shear Properties of Timber-to-Timber Joints with Large Size Self-Tapping Screws</td>
<td>Kenji Kobayashi, Shizuoka University, Japan</td>
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### Hall 204AB
**Structural Systems**

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<tr>
<td>10:20 – 10:40</td>
<td>An Analytical Estimation on Seismic Performance of 3 Story Construction with “Sugi” CLT Panels Depending on Connection Properties</td>
<td>Tatauya Miyake, Nihon System Sekkei Architects &amp; Engineers, Japan</td>
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<tr>
<td>10:40 – 11:00</td>
<td>Non-Linear Modelling of the Three and Seven Storey X-Lam Buildings Tested Within the SOFIE Project</td>
<td>Massimo Fragiacomo, University of Sassari, Italy</td>
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<tr>
<td>11:00 – 11:20</td>
<td>Application of Translational Tuned-Mass Dampers on Seven Storey Building Tested Within the SOFIE Project</td>
<td>Massimo Fragiacomo, University of Sassari, Italy</td>
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<tr>
<td>11:20 – 11:40</td>
<td>Structural Characterization of Multi-Storey Buildings with CLT Cores</td>
<td>Davide Trutalli, University of Padua, Italy</td>
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<tr>
<td>11:40 – 12:00</td>
<td>Progress on the Development of Seismic Resilient Tall CLT Buildings in the Pacific Northwest</td>
<td>Shiling Pei, Colorado School of Mines, U.S.A.</td>
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### BUILDINGS AND STRUCTURES

**Moderator:** Marjan Popovski, FPinnovations, Canada

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<tr>
<td>10:20 – 10:40</td>
<td>Design of Timber Structures in a Digital World</td>
<td>Kolbein Bell Norwegian University of Science and Technology, Norway</td>
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<td>10:40 – 11:00</td>
<td>Partial Factors Versus Design Values</td>
<td>Tuomo Poutanen TU Tampere, Finland</td>
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<td>11:00 – 11:20</td>
<td>An Approach for Estimating Seismic Force Modification Factor of Hybrid Building Systems</td>
<td>Zhiyong Chen University of New Brunswick, Canada</td>
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<td>11:20 – 11:40</td>
<td>Specific Design of Light Timber Framed Multi-Storey Buildings for New Zealand</td>
<td>David Carradine BRANZ, New Zealand</td>
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<td>11:40 – 12:00</td>
<td>Design of a 6-Storey Light-Frame Timber Building in Québec City</td>
<td>François Chaurette cecobois, Canada</td>
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### SERVICEABILITY/FIRE SAFETY/REHABILITATION

**Moderator:** Stefan Winter, München Technische Universität, Germany

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<tr>
<td>10:40 – 11:00</td>
<td>Reliability of Sprinkler Systems During and After a Seismic Event and Application to Tall Wood Buildings</td>
<td>Andrew Harmsworth GHL Consultants Ltd., Canada</td>
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<td>11:00 – 11:20</td>
<td>Fire Risk Evaluation Methods for Wood-Based Construction in Urban Context</td>
<td>Wolfgang Winter Vienna University of Technology, Austria</td>
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<td>11:40 – 12:00</td>
<td>Contemporary Mid-Rise Timber Buildings in Japan, 2013</td>
<td>Mikio Koshihara University of Tokyo, Japan</td>
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### PAST, PRESENT AND FUTURE

**Moderator:** Caroline Frenette, cecobois, Canada

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<tr>
<td>10:20 – 10:40</td>
<td>Modeling of the Hygroscopic Behavior of Coated Wood Panels Submitted to Accelerated Aging</td>
<td>Jérôme Dopeux Plateforme technologique Bois-Construction du Limousin, France</td>
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<td>10:40 – 11:00</td>
<td>Prediction Models of the Water Vapor Diffusion Behavior of Wood-Based Panels</td>
<td>Norbert Ruether Fraunhofer Institute for Wood Research, Germany</td>
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<tr>
<td>11:00 – 11:20</td>
<td>Sustainable Wooden Envelope for Subtropical Regions – The Realization and Validation in Japan</td>
<td>Yutaka Goto TU Chalmers, Sweden</td>
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<td>11:20 – 11:40</td>
<td>Cross-Laminated Timber: Towards a Consistent Structural Insulated Panel for Passive Buildings in Belgium</td>
<td>Vladimir Rodríguez Trujillo Calatan Institute of Wood, Spain</td>
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<td>11:40 – 12:00</td>
<td>Multi-Storey Residential Buildings in CLT – Interdisciplinary Principles of Design and Construction</td>
<td>Andreas Ringhofer Graz University of Technology, Austria</td>
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### HALL 206A  MATERIALS AND PRODUCTS

**MODERATOR**
David Kretschmann, USDA FS Forest Products Laboratory, U.S.A.

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<tr>
<td>13:40 – 14:00</td>
<td>Analysis of Finger Joints from Beech Wood</td>
<td>Bettina Franke, Bern University of Applied Sciences, Switzerland</td>
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<td>14:00 – 14:20</td>
<td>Experimental Study of Multi-Layered Beams Made of Beech Timber Glued with Different Adhesives</td>
<td>Marc Oudjene, Université de Lorraine, France</td>
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<td>14:20 – 14:40</td>
<td>Structural Light Weight Construction Panel Based on Beech Wood</td>
<td>Martin Lehmann, Bern University of Applied Sciences, Switzerland</td>
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<td>15:00 – 15:20</td>
<td>Hardwood Glulams - Emerging Timber Products of Superior Mechanical Properties</td>
<td>Zachary Christian, MPA University of Stuttgart, Germany</td>
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### HALL 206B  CONNECTIONS

**MODERATOR**
Mohammad Mohammad, FPInnovations, Canada

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<tr>
<td>13:40 – 14:00</td>
<td>Mechanical Behaviour of Dovetail Connections for Cross-Laminated Timber Wall Elements</td>
<td>Josef Kögl, University of Innsbruck, Austria</td>
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<tr>
<td>14:00 – 14:20</td>
<td>High Performance Cross-Laminated Timber Shear Connection with Self-Tapping Screw Assemblies</td>
<td>Ilana Danzig, Equilibrium Consulting Inc, Canada</td>
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<tr>
<td>14:20 – 14:40</td>
<td>Screwed Joints in Cross-Laminated Timber Structures</td>
<td>Georg Flatscher, Graz University of Technology, Austria</td>
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<td>14:40 – 15:00</td>
<td>Pull-Out Strength Properties of Lagscrewbolt Connection in Cross-Laminated Timber</td>
<td>Takuro Mori, University of British Columbia, Canada</td>
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<tr>
<td>15:00 – 15:20</td>
<td>Numerical Simulation for the Seismic Behaviour of Mid-Rise CLT Shear Walls with Coupling Beams</td>
<td>Jingjing Liu, Kyoto University, Japan</td>
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### HALL 204AB  STRUCTURAL SYSTEMS

**MODERATOR**
Stefano Pampanin, University of Canterbury, New Zealand

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<tr>
<td>13:40 – 14:00</td>
<td>Design and Testing of Post-Tensioned Timber Wall Systems</td>
<td>Francesco Sarti, University of Canterbury, New Zealand</td>
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<td>14:00 – 14:20</td>
<td>Seismic Design of Floor Diaphragms in Post-Tensioned Timber Buildings</td>
<td>Daniel Moroder, University of Canterbury, New Zealand</td>
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<td>14:20 – 14:40</td>
<td>Timber Core-Walls for Lateral Load Resistance of Multi-Storey Timber Buildings</td>
<td>Andrew Dunbar, University of Canterbury, New Zealand</td>
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<td>14:40 – 15:00</td>
<td>The Interaction of Slip-Friction Connectors and Shear Key in a Rocking Timber Shear Wall with Elasto-Plastic Behaviour</td>
<td>Pierre Quenneville, University of Auckland, New Zealand</td>
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<tr>
<td>15:00 – 15:20</td>
<td>Damage Avoidance Design of Timber Structures Using High-Force-to-Volume Damping Devices</td>
<td>Massimo Fragiaccomo, University of Sassari, Italy</td>
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<tr>
<td>13:40 – 14:00</td>
<td>Shear Behavior of On-Site Timber Stress-Laminated Box-Beam Bridges</td>
<td>Humihiko Gotou, Akita University, Japan</td>
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<td>14:00 – 14:20</td>
<td>A Review of Design Criteria for Vibrational Response of Pedestrian Timber Bridges</td>
<td>Anna Ostrycharczyk, Norwegian University of Science and Technology, Norway</td>
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<td>14:20 – 14:40</td>
<td>Block Glued Glulam - Bridges, Beams and Arches</td>
<td>Simon Aicher, MPA University of Stuttgart, Germany</td>
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<td>14:40 – 15:00</td>
<td>Design and Construction of a 160-metre-long Wood Bridge in Mistissini, Québec</td>
<td>Grégoire Richard, Dessau, Canada</td>
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<td>15:00 – 15:20</td>
<td>Service Life Assessment of Timber Highway Bridges in USA Climate Zones</td>
<td>James Wacker, USDA FS Forest Products Laboratory, U.S.A.</td>
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<tr>
<td>13:40 – 14:00</td>
<td>Numerical Analysis of a Church in Venice for the Study of the Influence of Timber Piling Degradation in the Foundations on the Structure in Elevation</td>
<td>Giulia Bettiol, University of Padua, Italy</td>
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<td>14:00 – 14:20</td>
<td>Use of Wood for Countermeasures Against Liquefaction</td>
<td>Atsurnori Numata, Tobishima Corporation, Japan</td>
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<td>14:20 – 14:40</td>
<td>Seismic Performance of a Wooden Temple Inferred from Earthquake Observation and Seismic Diagnosis</td>
<td>Toshiaki Sato, Tokyo University of Science, Japan</td>
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<td>14:40 – 15:00</td>
<td>Seismic Retrofit of Soft-Storey Timber Buildings with Energy Dissipating Floor-Wall Connections</td>
<td>Asif Iqbal, Opus International Consultants, New Zealand</td>
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<tr>
<td>15:00 – 15:20</td>
<td>Seismic Shaking Table Testing of a Reinforced Concrete Frame with Masonry Infill Strengthened with Cross-Laminated Timber Panels</td>
<td>Iztok Sustersic, CBD, Slovenia</td>
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<tr>
<td>13:40 – 14:00</td>
<td>Development of Modular Wooden Buildings with Focus on the Indoor Environmental Quality</td>
<td>Michael Flach, University of Innsbruck, Austria</td>
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<td>14:00 – 14:20</td>
<td>Updating of U.S. Wood Product Life-Cycle Assessment Data for Environmental Product Declarations</td>
<td>Rick Bergman, USDA FS Forest Products Laboratory, U.S.A.</td>
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<td>14:20 – 14:40</td>
<td>Wood-Based Building Products Environmental Assessment According to the Environmental Product Declaration Standard</td>
<td>Lauri Linkosalmi, Aalto University, Finland</td>
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<td>14:40 – 15:00</td>
<td>Carbon Aspects Promote Building with Wood</td>
<td>Arno Fruehwald, University of Hamburg, Germany</td>
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<td>15:00 – 15:20</td>
<td>Integration of Québec Wood Industry Data in the Québec LCI Database: How Can the Industry Directly Benefit?</td>
<td>Hugues Imbeault-Tétreault, CIRAIG, Canada</td>
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### HALL 206A

**WCTE 1.9**

**MODERATOR**

**HAJIQING REN, CHINESE ACADEMY OF FORESTRY, CHINA**

**TIME** | **TITLE** | **PRESENTER, AFFILIATION, COUNTRY**
--- | --- | ---
15:40 – 16:00 | Understanding the Structural Properties of Moso Bamboo to Engineer Sustainable Structural Bamboo Products | Patrick Dixon, Massachusetts Institute of Technology, U.S.A.
16:00 – 16:20 | Experimental Behaviour of Structural Size Glued Laminated Guadua Bamboo Members | Juan Correal, University of Los Andes, Colombia
16:20 – 16:40 | Development of Engineered Bamboo | Keith Crews, University of Technology, Sidney, Australia
16:40 – 17:00 | Evaluation of the Mechanical Properties of Cross-Laminated Bamboo Panels by Digital Image Correlation and Finite Element Modelling | Hector Archila, University of Bath, UK
17:00 – 17:20 | The Potential Use of Timber from Palm Trees for Building Purposes | Leila Fathi, University of Hamburg, Germany

### HALL 206B

**WCTE 2.9**

**MODERATOR**

**ADRIAN LEIJTEN, EINDHOVEN UNIVERSITY OF TECHNOLOGY, THE NETHERLANDS**

**TIME** | **TITLE** | **PRESENTER, AFFILIATION, COUNTRY**
--- | --- | ---
15:40 – 16:00 | Post-Tensioned Timber Connections. Experimental Analysis of the Long-Term Behavior | Flavio Wanninger, ETH Zurich, Switzerland
16:00 – 16:20 | Influence of Moisture Content on Timber Elements with Dowel-Type Fastener | Jérôme Dopeux, Plateforme technologique Bois-Construction du Limousin, France
16:20 – 16:40 | Fatigue Design of Adhesive Connections Using Perforated Steel Plates | Leander Bathon, Wiesbaden University of Applied Sciences, Germany
16:40 – 17:00 | Effects of Changes in Moisture Content in Reinforced Glulam Beams | Philipp Dietsch, Technische Universität München, Germany
17:00 – 17:20 | Finite Element Models of Effects of Moisture on Bolt Embedment and Connection Properties of Glulam | Henry Kiwelu, University of Dar es Salaam, Tanzania

### HALL 204AB

**WCTE 3.9**

**MODERATOR**

**WEICHIANG PANG, CLEMSON UNIVERSITY, U.S.A.**

**TIME** | **TITLE** | **PRESENTER, AFFILIATION, COUNTRY**
--- | --- | ---
15:40 – 16:00 | Performance of Shear Walls with Wood Screws Under Reversed Cyclic Loading | Chun Ni, FPInnovations, Canada
16:00 – 16:20 | Structural Performance of Shearwalls Studded with Small-diameter Round Timber Under Cyclic Lateral Load | Enchun Zhu, Harbin Institute of Technology, China
16:20 – 16:40 | Research and Application of Timber-Steel Hybrid Structures | Minjuan He, Tongji University, China
16:40 – 17:00 | Response of Low-Cost Timber Frame Walls with Caña Brava and Mortar Subjected to Earthquake Loading | Christian Málaga-Chuquitaype, Imperial College of London, UK
17:00 – 17:20 | Evaluation of Restoring Force Characteristics of Mud-walls Considering Effect of Wall-Height for Seismic Structural Design | Hiroyuki Nakaji, Tottori University of Environmental Studies, Japan
### BUILDINGS AND STRUCTURES

**Hybrid Building Systems**

**Moderator:** Massimo Fragiacomo, University of Sassari, Italy

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<tr>
<td>15:40 – 16:00</td>
<td>Nonlinear Dynamic Analyses of Novel Timber-Steel Hybrid System</td>
<td>Michael Fairhurst, University of British Columbia, Canada</td>
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<td>16:00 – 16:20</td>
<td>Seismic Detailing of Post Tensioned Timber Frames</td>
<td>Thomas Armstrong, University of Canterbury, New Zealand</td>
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<td>16:20 – 16:40</td>
<td>Non-Linear Numerical Modelling of a Post-Tensioned Timber Frame Building with Hysteretic Energy Dissipation</td>
<td>Tobias Smith, University of Canterbury, New Zealand</td>
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<td>16:40 – 17:00</td>
<td>Shaking Table Testing of a Multi-Storey Post-Tensioned Glulam Building</td>
<td>Stefano Pampanin, University of Canterbury, New Zealand</td>
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<tr>
<td>17:00 – 17:20</td>
<td>Lateral Behavior of Post-Tensioned Cross-Laminated Timber Walls Using Finite Element Analysis</td>
<td>Zhouyan Xia, Technische Universität München, Austria</td>
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### SERVICEABILITY/FIRE SAFETY/REHABILITATION

**Rehabilitation II**

**Moderator:** Roberto Tomasi, University of Trento, Italy

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<td>15:40 – 16:00</td>
<td>Assessment, Reinforcement and Monitoring of Timber Structures: FPS Cost Action FP1101</td>
<td>Jorge M. Branco, University of Minho, Portugal</td>
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<td>16:00 – 16:20</td>
<td>Wood Buildings and Fire in Historical Urban Context, in Edo (Former Tokyo) and Vienna</td>
<td>Atsuko Tani, Vienna University of Technology, Austria</td>
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<td>16:20 – 16:40</td>
<td>Damage Behaviour of Taiwanese Traditional Dieh-Dou Timber Frame</td>
<td>Sok Yee Yeo, National Cheng Kung University, Taiwan</td>
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<td>16:40 – 17:00</td>
<td>Structural Study for Conservation of Group of Traditional Timber Houses in South Nias, Indonesia</td>
<td>Yuka Yasui, Mie University, Japan</td>
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<td>17:00 – 17:20</td>
<td>Load Carrying Capacity of Large Mortise and Tenon Joints in Wooden Mitre Gates</td>
<td>Wolfgang Gard, Delft University of Technology, The Netherlands</td>
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### PAST, PRESENT AND FUTURE

**Environment and LCA II**

**Moderator:** Dominique Gauzin-Müller, Ekologik/EK, Germany

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<td>15:40 – 16:00</td>
<td>Environmental Properties of Timber Buildings in Life Cycle - From European Viewpoint</td>
<td>Annette Hafner, Technische Universität München, Germany</td>
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<tr>
<td>16:00 – 16:20</td>
<td>Environmental Performance of Innovative Wood Building Systems Using Life-Cycle Assessment</td>
<td>Caroline Frenette, cecobois, Canada</td>
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<td>16:20 – 16:40</td>
<td>Potential Energy Saving by Using Wooden Panel in Bathrooms</td>
<td>Kristine Nore, Norwegian Institute of Wood Technology, Norway</td>
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<td>16:40 – 17:00</td>
<td>Potential Analysis of the Energy and Climate Performance of Wood-Concrete Hybrid Building Structures</td>
<td>Jeno Balogh, Metropolitan State University of Denver, U.S.A.</td>
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<td>17:00 – 17:20</td>
<td>A Comparison of the Embodied Energy and Embodied Carbon of a Timber Visitor Centre in Ireland with its Concrete Equivalent</td>
<td>Desmond Dolan, National University of Ireland, Ireland</td>
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### Hall 206A - Materials and Products (NEW STRUCTURAL PRODUCTS)

**Moderator:** Simon Aicher, MPA University of Stuttgart, Germany

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<td>Tectonic Strategies for Using Fast-Growing, Low-Grade Softwoods for Engineered Wood Products</td>
<td>Patrick Fleming, University of Cambridge, UK</td>
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<td>09:20 – 09:40</td>
<td>Structural Performance of Accoya® Wood Under Service Class 3 Conditions</td>
<td>Matthew Roberts, Accsys Technologies, U.S.A.</td>
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<td>09:40 – 10:00</td>
<td>High-Tech Timber Beam® – A High-Performance Hybrid Beam System Made of Composites and Timber</td>
<td>Martin Kaestner, Bauhaus-University Weimar, Germany</td>
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<td>10:00 – 10:20</td>
<td>Application of Moulded Wooden Tubes as Structural Elements</td>
<td>Peer Haller, Dresden University of Technology, Germany</td>
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### Hall 206B - Connections

**Moderator:** Abdelhamid Bouchair, Université Blaise-Pascal, France

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<tr>
<td>09:00 – 09:20</td>
<td>Manufacturing Gluing-In Rods Under Low Temperatures Using Induction Heating</td>
<td>Till Vallée, Fraunhofer Institute of Wood Research, Germany</td>
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<td>09:20 – 09:40</td>
<td>Connection for Round Wood Timber Members Using Multiple Glued-In Rods</td>
<td>Alfredo Dias, University of Coimbra, Portugal</td>
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<td>09:40 – 10:00</td>
<td>Timber Joints with Glued-In FRP Rods</td>
<td>Thomas Tannert, University of British Columbia, Canada</td>
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<td>10:00 – 10:20</td>
<td>Advancement of Glued-In Rods Using Polymer Concrete as Composite Material</td>
<td>Kay-Uwe Schober, Mainz University of Applied Sciences, Germany</td>
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### Hall 204AB - Structural Systems

**Moderator:** Ian Smith, University of New Brunswick, Canada

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<tr>
<td>09:00 – 09:20</td>
<td>Informed Design from FEM Analysis of Wood Shoring Used in Urban Search and Rescue</td>
<td>Dan Wheat, University of Texas, U.S.A.</td>
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<td>09:20 – 09:40</td>
<td>Equivalent Viscous Damping for CLT Infilled Steel Moment Frame Structures</td>
<td>Matiyas Bezabeh, University of British Columbia, Canada</td>
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<td>09:40 – 10:00</td>
<td>Wood Laminates for Utility Scale Wind Turbine Blades: Numerical Evaluation of the Shear Strength of an Angle-Ply Wood Laminate</td>
<td>Rachel Koh, University of Massachusetts, U.S.A.</td>
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<td>10:00 – 10:20</td>
<td>In-Plane Stiffness of Cross-Laminated Timber Floors</td>
<td>Sepideh Ashtari, University of British Columbia, Canada</td>
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### HALL 205ABC
#### BUILDINGS AND STRUCTURES
**Moderator:** Ying Hei Chui, University of New Brunswick, Canada

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<td>Ghazanfarah Hafeez, University of Ottawa, Canada</td>
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**Moderator:** Joseph Loferski, Virginia Tech, U.S.A.

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