



Bern University
of Applied Sciences



Empa

Materials Science and Technology



Timber Bridges

International Conference on Timber Bridges ICTB2021^{PLUS}

09-12 May 2022

Final Program

Welcome to Bern University of Applied Sciences in Biel

Dear Conference Participants,

We are pleased to welcome you to the International Conference on Timber Bridges- ICTB2021^{PLUS}.

At this conference young researchers as well as old hands in the field of timber bridges get the opportunity to share their own knowledge while –at the same time- learning from others. The presentations cover topics from the enhancement of wooden materials and components for new timber bridges to the assessment, strengthening and monitoring of existing bridges, both modern and historic ones. Following the conference, in which the theoretical foundations are highlighted, a field trip and excursion to existing old and new timber bridges will provide the opportunity to learn from real cases and continue the knowledge exchange on-site.

We hope you enjoy it.

Organizer

Andreas Müller | Bettina Franke | Robert Widmann | Steffen Franke

Bern University of Applied Sciences, Biel, Switzerland

Empa, Abteilung Ingenieur-Strukturen, Dübendorf, Switzerland

Conference venue

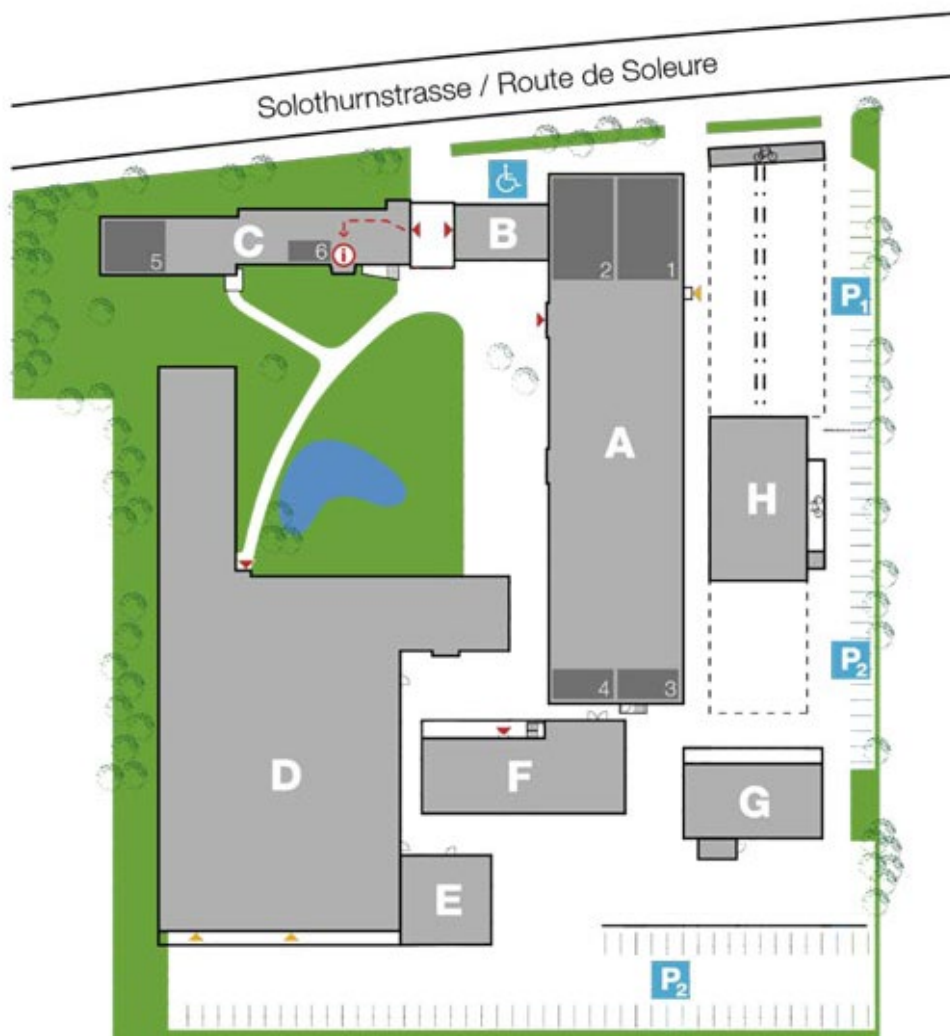
Bern University of Applied Sciences
Department Architecture, Wood and Civil Engineering
Solithurnstrasse 102, 2504 Biel/Bienne
Auditorium A0.01

- ▶ Biel/Bienne can be reached easily by (direct) trains from the three international airports Zurich, Geneva, and Basel.
- ▶ Limited public parking places are available at conference venue (parking fee will apply, see P1 on situation plan) Alternatively, there are parking places available at Tissot Arena. Exit tickets can be purchased at the registration desk. Reduced daily rate CHF 10.-.
- ▶ Public transport is recommended, from main station Biel/Bienne take bus no. 2 direction "Orpundplatz" (every 10 Min) until stop "Zollhaus/Octroi". It takes about 15 minutes + 3 min walk to the conference venue

Information

- ▶ The registration desk is open during the venue and will help you with further queries.
- ▶ Please respect, that there are ongoing school terms and research work at the campus and the laboratory.
- ▶ Pictures/Movies at the laboratory are not permitted.
- ▶ There is a non-smoking policy within the buildings and laboratories.
- ▶ WLAN access is provided by EDUROAM or using the following Guest login:
Network: "bfh-open" *after an SMS verification, temporary internet access can be used free of charge*

Situation Plan, Bern University of Applied Sciences, Biel/Bienne



A Lecture building

- 1. Auditorium A0.01
- 2. Foyer

B Cafeteria

C Administration building

- i. Reception
- 5. Aula
- 6. Conference room C (first floor)

Technology park (D, E & F)

D Testing laboratory

E Laboratory and energy centre

F Laboratory and grinding shop

G Wood yard

H Sawmill

Our Key Note Speakers



Infrastructure made of wood - opportunities for decarbonization of the public sector

Stefan Zöllig, Timbatec Timber Construction Engineers Switzerland Ltd., Switzerland



The road to durable bridge design: An experience from Québec

Caroline Frenette, Université du Québec à Rimouski (UQAR), Canada



Wooden bridges enrich the world

Frank Miebach, Ingenieurbüro Miebach, Germany



Modern timber bridges

Rune Abrahamsen, Moelven Limtre AS, Norway



History and development stages in timber bridge construction in Switzerland

Robert Widmann, Empa, Switzerland



Andreas Müller, Bern University of Applied Sciences, Switzerland

Program Overview

- ▶ The conference starts on Monday with the one-day technical tour at the main train station.
- ▶ The hybrid conference with keynote and technical sessions starts on Tuesday as shown on the detailed program. As registered participant (onsite and online) you have access to all technical sessions as live stream. Q&A and a public and private chat between participants and exhibitors are provided too. Please follow for the online access the instruction received per E-mail.
- ▶ In addition, all technical session and full papers will be made available on an online platform. Link will be provided.
- ▶ All times refer to Zurich time (CEST)

Monday, 9 th May 2022	7.30 am	Meeting time for Technical Tour – Region Fribourg, full day Main train station SBB, Bahnhofplatz 4, 2502 Biel/Bienne
	6.00 pm	Welcome Event, Bern University of Applied Science
	6.30 pm	Official Opening of Timber bridge working model, Bern University of Applied Sciences
Tuesday, 10 th May 2022	8.30 am	Opening of Conference, Technical Sessions
Wednesday 11 th May 2022	8.30 am	Technical Sessions
	6.00 pm	Visit and conference dinner at Omega Museum, Biel/Bienne
	9.00 pm	Dessert time at Schüss park, next to Omega Museum
Thursday, 12 th May 2022	8.30 am	Technical Sessions
	3.00 pm	Closing of Conference
Friday, 13 th May 2022	8.30 am	Optional tour – Swiss wildlife bridges, half day

09.05.2022 Monday	10.05.2022 Tuesday	11.05.2022 Wednesday	12.05.2022 Thursday	13.05.2022 Friday
Meeting time 7.30 am	Registration Desk Opening Day 1	Technical Desk Opening Day 2	Technical Desk Opening Day 3	Optional Tour Swiss wild life timber bridges Rynetel and Neuenkirch
Technical Tour "Timber Bridges" Start: Biel/Bienne Main Train Station	KEYNOTE - Session Coffee Break	KEYNOTE - Session Coffee Break	KEYNOTE - Session Coffee Break	
	Technical Sessions	Technical Sessions	Technical Sessions	
	Lunch	Lunch	Lunch	
	Exhibition	Exhibition	Exhibition	
	KEYNOTE - Session Technical Sessions	Technical Sessions	EC 5 -2 Session - public -	
	Digital Exhibition Coffee Break	Digital Exhibition Coffee Break	Closing Conference Fare well coffee	
	Technical Sessions	Technical Sessions	EC 5 -2 Meeting - closed -	
	Closing Day 1	Closing Day 2		
	Welcome Event Official Opening of Timber Bridge Working Model		Conference evening at OMEGA-Museum	

Monday, 9th May 2022

Full day tour, included in Onsite Ticket, no special registration required

Start: Monday 9th May 2022, 7.30 am

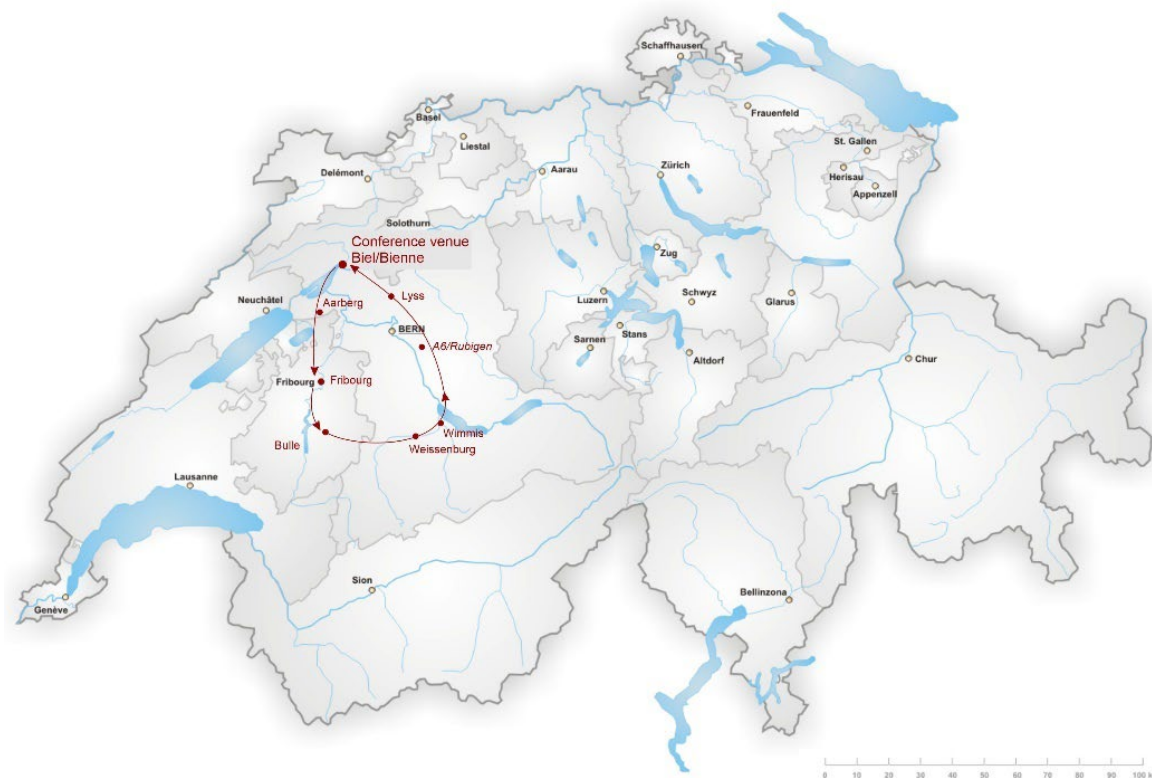
Return: 6.00 pm, Bern University of Applied Sciences, directly to Welcome Event

Location: Main train station, Bahnhofplatz 4, 2502 Biel
GPS 47.13315945047261, 7.243012813571095

Program – Details in the “Tour-Book” (printed version at the tour available)

Technical tour to historic and nowadays timber bridges in region Fribourg.

- ▶ Several visiting stops on historic and nowadays timber bridges
- ▶ Social stop at chocolate factory “Maison Cailler”
- ▶ During lunch time we will pass the “Jaun-Pass”.
You can enjoy the view to Swiss alps and your lunch package provided.
- ▶ In the afternoon, an easy walk is planned between the two bridges in Wimmis.
Please be prepared with your footwear and clothes.



Source: https://de.m.wikipedia.org/wiki/Datent:Karte_Schweiz.png



Tuesday, 10th May 2022

- 7.30 Registration
- 8.30 Opening ICTB2021^{PLUS} - *Andreas Müller, Bettina Franke, Robert Widmann, Steffen Franke*
- 8.35 Welcome from Bern University of Applied Sciences – *Frédéric Pichelin, Head of R&D*
- 8.45 Welcome from Federal Office of Environmental of Switzerland
- 8.55 ICTB2021^{PLUS} Housekeeping, explanation of conference techniques – *Steffen Franke*

9.00 Infrastructure made of wood - opportunities for decarbonization of the public sector
Keynote Speaker - Stefan Zöllig, Switzerland

9.30 Coffee Break – Exhibition Hall

Technical Session – Session chair Robert Widmann

- 10.00 Våla bridge - Timber network arch footbridge in Ringeby, Norway
Anna Weronika Ostrycharczyk, Arne Værnes – Norway
- 10.20 Two new pedestrian and cycle bridges between Rapperswil and Auenstein, Switzerland
Kurt von Felten, Milo Zimmerli - Switzerland
- 10.40 Innovative large timber foodbridges and dynamic testing in Spain
Julio Vivas, Álvaro Magdaleno, Soledad Rodriguez, Antolín Lorenzana - Spain
- 11.00 Fruttli-and Rigiaa-Bridge, Timber-UHPC composite structure
Edgar Kälin, Peter Rogenmoser - Switzerland
- 11.20 A new pedestrian bridge made of regional beech wood in Adliswil
Andreas Burgherr, Ciril Stadler - Switzerland
- 11.40 Pedestrian and cyclist bridges made with durable hardwoods
Marcus Schiere, Jos Peters - Netherlands

12.00 Lunch - Exhibition Hall

Digital Exhibition – 7 Minute Pitches of Exhibitors and Sponsors

- 13.00 *Hüsser Holzleimbau AG, neue Holzbau AG, Timbatec Timber Construction Engineers Switzerland Ltd. & Timber Structures 3.0 AG*

Technical Session – Session chair Steffen Franke

- 13.30 The road to durable bridge design: An experience from Québec
Keynote Speaker - Caroline Frenette, Canada
- 14.00 Design, construction and maintenance of structurally protected timber bridges
Antje Simon, Markus G. Jahreis, Johannes Koch - Germany
- 14.20 Robust Timber bridges without cladding
Frank Miebach - Germany
- 14.40 Structural Rehabilitation of a Historic Covered Bridge: Bridgeport Covered Bridge
Lawrence Jones, Brian Wiens - USA

Digital Exhibition – 7 Minute Pitches of Exhibitors and Sponsors

- 15.00 *ProGeo Monitoring Systeme & Services GmbH & Co. KG, VSL (Schweiz) AG*

15.30 Coffee Break - Exhibition Hall

Technical Session – Session chair James Wacker

- 16.00 A reliable method for moisture content measurement at inspections and the results from nine Swedish Timber Bridges, *Niclas Björngrim, Per-Anders Fjellström, Göran Berggren- Sweden*
- 16.20 Effectiveness of structural protection measures for timber bridges – results of a long-term moisture monitoring, *Johannes Koch, Antje Simon, Markus G. Jahreis- Germany*
- 16.40 Monitoring systems for timber bridges – Moisture content and swinging behaviour
Steffen Franke, Bettina Franke, Marcus Schiere, Sébastien Bonifacio, Andreas Müller - Switzerland

17.00 Closing of the day - *Robert Widmann, Bettina Franke*

Wednesday, 11th May 2022

8.25 Opening – *Andreas Müller, Bettina Franke*

8.30 Wooden bridges enrich the world
Keynote Speaker - Frank Miebach, Germany

9.00 Modern timber bridges
Keynote Speaker - Rune Abrahamsen, Norway

9.30 Coffee Break

Technical Session – Session chair Kjell Arne Malo

10.00 Advanced data logging system for moisture monitoring of timber bridges - background and large scale application, *Kai Simon, Jürgen Hezel, Simon Aicher - Germany*

10.20 Characterization and assessment of the mechanical properties of spruce foundation piles retrieved from bridges in Amsterdam, *Giorgio Pagella, Geert Ravenshorst, Wolfgang Gard, Jan Willem van de Kuilen - Netherlands*

10.40 Climate respectively moisture induced stresses in block-glued glulam members of timber bridges
Bettina Franke, Marcus Schiere, Steffen Franke - Switzerland

11.00 Vibration serviceability of timber pedestrian bridge based on field test and analysis
Shingo Kato, Hideyuki Honda and Atsushi Toyoda - Japan

11.20 Study of the dynamic response of a timber pedestrian bridge during different construction stages
Jens Bergenudd, Jean-Marc Battini, Roberto Crocetti, Costin Pacoste - Sweden

11.40 New concepts for timber bridge decks without cross beams: Stress laminated decks and interlocked laminated decks, *Tormod Dyken, Hauke Burkart - Norway*

12.00 Lunch

Digital Exhibition – 7 Minute Pitches of Exhibitors and Sponsors

13.00 *IMMER AG, Rotho Blaas srl, EuroTec GmbH*

Technical Session – Session chair Caroline Frenette

13.30 Details for timber bridges with asphalt wearing surfaces
Andreas Müller, Marcus Schiere - Switzerland

13.50 Direct trafficable waterproofing and wearing courses for timber decks,
Dirk Uebelhoer, Mareike Vogel, Thomas Volkmer, Adrian Willi Wick - Switzerland

14.10 Creating a connecting between asphalt wearing surface and timber bridge decks
Marcus Schiere, Andreas Müller, Nicolas Bueche, Christian Angst - Switzerland

14.30 Setting the Standard – Advancements in wood bridge design in the Canadian highway bridge design code
Andrew Lehan, David Moses - Canada

14.50 Fatigue strength of axially loaded steel rods bonded in European ash glulam
Bruno Maurer, Ernst Gehri, Thomas Strahm, René Steiger, Christian Affolter - Switzerland

15.10 Exploring fatigue rules for timber structures in Eurocode 5
Kjell Arne Malo, Francesco Mirko Massaro, Haris Stamatopoulos - Norway

15.30 Coffee Break

Technical Session - Session chair Bettina Franke

16.00 Assessment of glulam structures: moisture monitoring and investigation on the effect of climatic conditions on durability, *Placide Uwizeyimana, Marianne Perrin, Florent Eyma - France*

16.20 Defect Identification Coupled with Grayscale Image Enhancement Technology
Junwon Seo, Euseok Jeong, James Wacker - USA

16.40 Evaluating the Efficacy of Ground-Penetrating Radar as an Inspection Tool for Timber Bridges
C. Adam Senalik, James P. Wacker, Xiping Wang - USA

17.00 Closing of the day - *Robert Widmann, Bettina Franke*

18.00 Conference Dinner – Omega Museum Biel/Bienne

Thursday, 12th May 2022

8.55 **Opening** - *Steffen Franke, Bettina Franke*

9.00 History and development stages in timber bridge construction in Switzerland
Keynote Speakers - *Robert Widmann, Andreas Müller - Switzerland*

9.30 **Coffee Break**

Technical Session – Session chair Roberto Crocetti

10.00 First Swiss wildlife bridge made with timber
Lukas Rügsegger - Switzerland

10.20 Climate and moisture monitoring system in the timber wildlife crossing 'Rynetel'
Sébastien Bonifacio, Marcus Schiere, Andreas Müller - Switzerland

10.40 Preliminary moisture-relevant monitoring results of a timber wildlife bridge
Karim Ghazi Wakili, Jan Maurer, Andreas Müller - Switzerland

11.00 Structural yield of a pedestrian bridge made of CLT-concrete, connected by screws and by notches
Gonzalo Moltini, Gonzalo Cabrera, Vanesa Baño - Spain

11.20 Notched Connections for Timber-Concrete Composite Bridges – Investigations on the Fatigue Behaviour
Simon Mönch, Ulrike Kuhlmann - Germany

11.40 Sharp metal for timber connections
Paolo Grossi, Stephan Schindlauer - Italy

12.00 **Lunch**

Eurocode 5-2 Session – Robert Widmann

13.00 Overview EN 1995-2:2022xx, *Matthias Gerold*

13.25 Durability, Maintenance and Inspection of Timber bridges, *Andreas Müller, Matthias Gerold*

13.50 Annex D Examples for Detailing, *Matthias Gerold*

14.10 Vibration, Deflections, *Patricia Hamm*

14.30 TCC and Integral Bridges, *Jörg Schänzlin, Alfredo Dias*

14.50 **Closing of Conference** - *Andreas Müller, Bettina Franke, Robert Widmann, Steffen Franke*

15.00 **Farewell Coffee**

* as per 30.04.2022, subject to changes

Friday, 13th May 2022

Optional Technical Tour – Swiss wildlife bridges

Half day tour, registration required

Start: Friday 13th May 2022, 8.30 am

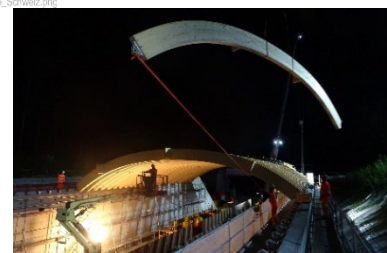
End: 1.00 pm at Neuenkirch, afterwards return to Biel/Bienne or possible direct transfer to train station Luzern or airport Zurich

Location: Main train station, Bahnhofplatz 4, 2502 Biel
GPS 47.13315945047261, 7.243012813571095

Program

Optional technical tour to first wildlife timber bridges in central Switzerland.

- ▶ 1st visiting stop at wildlife bridge Rynetel, Suhr, A1
- ▶ 2nd visiting stop at wildlife bridge Neuenkirch, Luzern, A2
- ▶ Technical presentations and explanations at the bridges
 - “Planning, challenges and curiosities”
 - “Quality assurance and monitoring systems”
 - “Scientific experiences regarding traffic and climate impact”
- ▶ Light Lunch provided



Source photos: www.timbatec.com/

Bern University of Applied Sciences
Architecture, Wood and Civil Engineering
Solothurnstrasse 102
CH-2504 Biel

ictb21@bfh.ch
www.bfh.ch/ictb

Funding Partners



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Office for the Environment FOEN
Action Plan Wood



**Swiss National
Science Foundation**

Sponsor ^{PLUS}



Holzbaingenieure Thun · Bern · Zürich · Wien
Ihr Partner für anspruchsvolle Holzbauten



Sponsors

