

Registration is Now Open

Venue: Bob Wright Centre (BWC), University of Victoria

NHICE-04 Presents

Three (3) Professional Workshops (CPD Eligible with Paid Registration) (26th August 2024)

WUFI® Workshop

Organizer: Manfred Kehr (Wiss, Janney, Elstner Associates Inc., USA)

Introduction to Building Decarbonization

Organizers: Mehdi Ghobadi (National Research Council of Canada); Davoud Heidari (National Research Council of Canada); Ivan Lee (Morrison Hershfield (now Stantec)); Zahra Teshnizi (City of Vancouver); Jennifer O'Connor (Athena Sustainable Materials Institute)

Climate Change and Housing, New Tools and Perspectives for Engineers and Industry

Organizers: Wilma Leung (BC Housing); Ren Bai (BC Housing); Lexy Relph (Morrison Hershfield (now Stantec)); Connie Davis (First Nations Housing and Infrastructure Council); Robin Hawker (Introba); Presenter (Province of B.C.)

Seven (8) Keynote Speakers (27th and 28th August 2024)



Brahim Benmokrane

Professor,
Ph.D., P. Eng., FRSC, FACI,
FCSCE, FIIFC, FCAE, FICI,
FBEI, University of
Sherbrooke, Canada



Jan Carmeliet

Professor,
Ph.D., ETH Zürich,
Switzerland



Danilo Caron

Indigenous and Black
Engineering and
Technology (IBET)
Momentum Fellow,
University of British
Columbia,
Canada



Mehdi Ghobadi

Research Officer and LCA
Theme Lead,
Ph.D., MBA, National
Research Council of
Canada, Canada



Michael Green

Founder and Principal,
B.Arch, Ph.D. (honorary),
Architect AIBC, AIA, AAA,
FRAIC, MG Architecture
Inc., Canada



Brenda Martens

Practitioner and
Educator,
O.B.C., B.Sc., CSBA, TRUE
Advisor, LEED Fellow,
Canada



Mario Medina

Professor,
Ph.D., P.E. Texas A&M
University, USA



Guido Wimmers

Dean, Dr. Tech., Dipl.Ing.,
Arch. (NL), MRAIC, LEED
AP, P.Eng.,
British Columbia Institute
of Technology,
Canada

50 + Technical Presentations (27th and 28th August 2024)

Sponsored and/or supported by:





NHICE-04 Program^{1,2,3,4}

Venue: University of Victoria - [Bob Wright Centre \(BWC\)](#)

Day 1 – Monday, 26 August 2024

Workshops (CPD Eligible with Paid Registration)	
Workshop 1 (08:00 a.m. to 05:00 p.m.)	WUFI® Workshop Organizer: Manfred Kehrner (Wiss, Janney, Elstner Associates Inc., USA)
Workshop 2 (09:00 a.m. to 05:00 p.m.)	Introduction to Building Decarbonization Organizers: Mehdi Ghobadi (National Research Council of Canada); Davoud Heidari (National Research Council of Canada); Ivan Lee (Morrison Hershfield (now Stantec)); Zahra Teshnizi (City of Vancouver); Jennifer O'Connor (Athena Sustainable Materials Institute)
Workshop 3 (12:00 noon – 04:30 p.m.)	Climate Change and Housing, New Tools and Perspectives for Engineers and Industry Organizers: Wilma Leung (BC Housing); Ren Bai (BC Housing); Lexy Relph (Morrison Hershfield (now Stantec)); Connie Davis (First Nations Housing and Infrastructure Council); Robin Hawker (Introba); Presenter (Province of B.C.)
Welcome Reception (05:00 p.m. to 06:30 p.m.)	

¹ Preliminary Program

² Time in Victoria, BC, Canada

³ Time allocated for paper presentation: 12 minutes presentation + 3 minutes discussion

⁴ Time allocated for keynote presentation: 30 minutes presentation + 5 minutes discussion

Conference at a Glance

Time	Day 2 – Tuesday, 27 August 2024			Day 3 – Wednesday, 28 August 2024	
	Session				
08:30 a.m. to 09:00 a.m.	Networking and Registration			Networking and Registration	
09:00 a.m. to 10:30 a.m. 90 minutes	Session 01 Welcome & Housekeeping Keynote 1 - Danilo Caron, IBET Momentum Fellow, UBC, Canada. (35 minutes) Keynote 2 - Dr. Mehdi Ghobadi, National Research Council, Canada. (35 minutes)			Session 05 Welcome & Housekeeping Keynote 5 – Michael Green, MG Architecture Inc. Canada (35 minutes)	
				S5-01	S5-02
				Paper IDs: 16, 26, 41	Paper IDs: 20, 44, 46
10:30 a.m. to 10:45 a.m. 15 minutes	Refreshment Break				
10:45 a.m. to 12:30 p.m. 105 minutes	Session 02 Keynote 3 - Dr. Brahim Benmokrane, University of Sherbrooke, Canada. (35 minutes)			Session 06 Keynote 6 – Dr. Mario Medina, Texas A&M University, USA. (35 minutes)	
	S2-01	S2-02	S2-03	S6-01	S6-02
	Paper IDs: 3, 7, 30, 35	Paper IDs: 1, 54, 63, 74	Paper IDs: 21, 37, 56, 64	Paper IDs: 24, 34, 48, 28	Paper IDs: 38, 39, 40, 61
12:30 p.m. to 01:30 p.m. 60 minutes	Lunch Break				
01:30 p.m. to 03:00 p.m. 90 minutes	Session 03 Keynote 4 – Dr. Jan Carmeliet Professor, ETH Zürich, Switzerland. (35 minutes)			Session 07 Keynote 7 – Brenda Martens, Practitioner and Educator, Canada. (35 minutes)	
	S3-01	S3-02	S3-03	S7-01	S7-02
	Paper IDs: 33, 05, 13	Paper IDs: 11, 8, 9	Paper IDs: 67, 17, 15	Paper IDs: 22, 70, 32	Paper IDs: 42, 49, 25
03:00 p.m. to 03:15 p.m. 15 minutes	Refreshment Break				
03:15 p.m. to 05:15 p.m. 120 minutes	Session 04 S4-01 Paper IDs: 6, 12, 19, 47, 55, 78			Session 08 Keynote 8 – Dr. Guido Wimmers, BCIT, Canada (35 minutes) Closing Interactive Plenary - Stepping Together Towards Integrating Indigenous Perspectives into Engineering Culture and Practice (Panelists: Danilo Caron, Adam Phillips, David Ward, Kear Porttris), (60 minutes) Closing Remarks	
		S4-02	S4-03		
		Paper IDs: 75, 76, 45, 43, 66, 18, 72	Paper IDs: 50, 51, 60, 27		
05:15 p.m. to 06:00 p.m.	Refreshment Break				
06:00 p.m. to 09:00 p.m.	Networking Reception & Conference Banquet				

Day 2 – Tuesday, 27 August 2024

08:30 a.m. to 9:00 a.m.	Networking and Registration
09:00 a.m. to 10:30 a.m.	Session 01
Keynote Presentation 01	Welcome and Housekeeping Messages (20 minutes)
Keynote Presentation 02	Relational Project Delivery, <i>Danilo Caron, IBET Momentum Fellow, UBC, Canada.</i> (30+5=35 minutes)
Keynote Presentation 03	How Much Retrofit is Enough?, <i>Mehdi Ghobadi, National Research Council, Canada.</i> (30+5= 35 minutes)
10:30 a.m. to 10:45 a.m.	Refreshment Break (15 minutes)
10:45 a.m. to 12:30 p.m.	Session 02
Keynote Presentation 03	Recent Canadian Developments Related to FRP Reinforcement for Sustainable and Resilient Concrete Structures, Design Codes, and Field Applications, <i>Brahim Benmokrane, University of Sherbrooke, Canada.</i> (30+5= 35 minutes)
	S2-01 (Life Cycle Assessment)
Paper ID 03	wbLCA Study of Residential Archetype Building Retrofit, <i>M. Ghobadi, M. Bartko</i>
Paper ID 07	Enhancing Reliability of Life Cycle Assessment of Construction Materials through Variability Management, <i>D. Heidari, M. Ghobadi</i>
Paper ID 30	Review of Methodologies for Calculating Embodied Carbon in Geosynthetic Materials, <i>Song Xue, Cheng Lin</i>
Paper ID 35	Towards a Sustainable Future: The Role of Life Cycle Assessment in CLT-Based Construction, <i>M. Alsati, T.M. Froese</i>
	S2-02 (Construction Materials - I)
Paper ID 01	Automating the Reclaimed Construction Material Supply Chain: A Western Ontario Case Study, <i>Adama Olumo, Carl Haas</i>
Paper ID 54	Experimental Observations of Melting and Solidification Processes of Paraffin-based Phase Change Materials Inside Clear Cylindrical Tubes for Building Energy Systems Thermal Regulation, <i>X. Sun, Z. Peng, M. Medina, H. Zhang</i>
Paper ID 63	Green Shield: Advancements in Low-VOC, Sustainable Anti-Corrosive Coatings for Environmental Compatibility, <i>P. Raizad, R. Gupta, L. Sharma</i>
Paper ID 74	Alkali-Induced Surface Modification of Lignocellulose Fibres Using SEM - A NaOH Tréatment Approach, <i>S. Ajabshir, R. Gupta</i>
	S2-03 (Sustainable Systems)
Paper ID 21	An Integrated Framework for Enhancing Resilience in Facilities: Addressing CO2 Emissions in Hazard-Prone Environments, <i>R. Ouache, D. Bristow</i>
Paper ID 37	Research on Urban Water Resources and Drainage Systems Model Inputs in Response to Climate Change: A Case Study of Slope Change Using Shannon Entropy Index in Saanich Area, <i>Z. Zhang, C. Valeo</i>
Paper ID 56	The Impact of Structural Soils Supporting Urban Tress on the Urban Heat Island Effect, <i>M. Zhao, C. Valeo, P. Constable, R. Gupta, P. Mukhopadhyaya, J. He, A. Chu</i>
Paper ID 64	Energy-Water Balance Modeling of Treed Stormwater Infrastructure for Mitigating the Urban Heat Island: A Review, <i>J. Liu, C. Valeo, P. Mukhopadhyaya, P. Constable, R. Gupta, J. He, A. Chu</i>
12:30 a.m. to 1:30 p.m.	Lunch Break (60 minutes)
1:30 p.m. to 3:00 p.m.	Session 03
Keynote Presentation 04	Urban Climate Modelling and Heat Wave Mitigation, <i>Dr. Jan Carmeliet Professor, ETH Zürich, Switzerland.</i> (30+5= 35 minutes)
	S3-01 (Climate Impact)
Paper ID 33	Future building simulation climate files for the city of Ottawa incorporating potential effects of climate change, urban heat island, and nature-based solutions, <i>A. Gaur, H. Lu, Z. Jandaghian, M. A. Lacasse</i>
Paper ID 05	Traverse Measurement of Urban Microclimate in Local Climate Zones (LCZs), <i>L. Ji, L. Wang, A. Gaur, H. Lu, M. A. Lacasse</i>
Paper ID 13	Assessing the Impact of Climate Change and Heat Mitigation Strategies on Urban Temperature Patterns in Coastal Cities, <i>F. Azargoshasbi, L. Minet</i>
	S3-02 (Nature Based Solutions)
Paper ID 11	Combatting Urban Heat Islands with Nature-Based Solutions (NBS): a Correlation between NBS and Ambient Temperature in Vancouver, Canada, <i>Z. Jandaghian, A. Laouadi, A. Gaur, H. Lu, M. Lacasse</i>
Paper ID 08	Analysis of the impact of vegetation on outdoor thermal comfort using urbanMicroclimateFoam, <i>A. Kubilay, D. Derome, J. Carmeliet</i>
Paper ID 09	Sheltering of wind-driven rain on building facades by urban trees, <i>L. Giroux-Gauthier, A. Kubilay, J. Carmeliet, D. Derome</i>
	S3-03 (Construction Materials - II)
Paper ID 67	Investigation of Thermal and Energy Characteristics in Fenestration Systems with Solid-Solid Phase Change Materials, <i>H. Arasteh, W. Maref, H. Saber</i>
Paper ID 17	Evaluating the Biocompatibility of Ceramic Materials for Artificial Reef Construction, <i>L. O'Reilly, S. Willerth</i>
Paper ID 15	Influence of Steam Curing Parameters on Concrete Strength and Optimization at 28 Days, <i>R. Azhari Elsir Elnour</i>
3:00 p.m. to 3:15 p.m.	Refreshment Break (15 minutes)

3:15 p.m. to 5:15 p.m.	Session 04
	S4-01 (Sustainable Infrastructure)
Paper ID 06	Architectural Qualities of Award Winning, Global, Multi-Unit Residential Buildings and Analysis of Barriers in the Canadian Context, <i>T. Peters, T. Lea, M. Touchie, W. O'Brien</i>
Paper ID 12	The Techno-Economics of (Re-) Introducing Inter-City Tram-Trains in Low-Density Areas, <i>G. Lovegrove, H. Mohammed, T. Boray, K. Workun, D. McGrath</i>
Paper ID 19	Identifying Barriers and Opportunities for Rapid Mitigation of Greenhouse Gas Emissions of Canadian Civil Infrastructure, <i>J. Sauer, I.D. Posen, S. Saxe</i>
Paper ID 47	Using Aerogel Windows to Improve the Energy Efficiency of Canadian Buildings: An analysis of energy use, emissions and costs across Canadian climates, <i>A. Abouyoussef, K. Hewage, R. Sadiq</i>
Paper ID 55	Total Energy Yield Potential of Building-Integrated Photovoltaic Thermal (BIPVT) Systems in Vancouver, Canada, <i>Z. Abebe, F. Tariku, P. Mukhopadhyaya</i>
Paper ID 78	Modelling of Reduction GHG Emissions from Solid Waste in Canada, <i>S Goodarzinezhad, B. Goodarzinezhad</i>
	S4-02 (Resilient Infrastructure)
Paper ID 75	Climate Resiliency of the Built Environment: Assessing Vulnerability and Analyzing Incidents of Technical Systems, <i>A. Bozorgzadeh, C. Buitenhuis, A. Mofidi, R. Hazlet</i>
Paper ID 76	Development of a Climate Resiliency Training Program for Building Sector Professionals, <i>H. Radhakrishnan, V. Brunetaud, P. Cobb</i>
Paper ID 45	Importance of Empathy and Cultural Collaboration in Building (and Rebuilding) Thriving Communities, <i>E. Wilson, D. Dunne, T. Bergen, P. Mukhopadhyaya</i>
Paper ID 43	Impact of Imposed Drift on the Air Tightness of Windows in High Importance and Post Disaster Buildings, <i>D. Gam, T. Bergen, M. Fakoor, S. Kwan</i>
Paper ID 66	Social Housing and Post-Disaster Accommodation for Vulnerable Communities, <i>A. Iqbal</i>
Paper ID 18	Effect of Local Climate Conditions on the Thermal Response of Steel-Concrete Composite Bridge Girder, <i>M.B. Nayeem, A.H.M.M. Billah</i>
Paper ID 72	Thermal Resilience of New and Vintage Multifamily Buildings in British Columbia, <i>M. Mahmoodzadeh, V. Gretka, P. Mukhopadhyaya</i>
	S4-03 (New Tools, Technologies, Materials and Methods)
Paper ID 50	Accelerating the rate of deep retrofit adoption: How data can help overcome the non-technical barriers, <i>M. Gutland, R. Evins</i>
Paper ID 51	Ensembled learning methods for compressive strength prediction of eco-friendly rice husk ash concrete, <i>M. Awan, L. Yaqoob, S. Rehman</i>
Paper ID 60	Thermal Integrity Profiling of Cast-In-Place Piles Using Distributed Fiber Optic Sensors: literature review and parametric study, <i>S. Mahjoubi, M. Sun, C. Lin</i>
Paper ID 27	A mini review on internally filled natural fiber reinforced polymer (FRP) tubes for structural applications, <i>H. Ahmad, K. Hewage, R. Sadiq</i>
05:15 p.m. to 06:00 p.m.	Refreshment Break
06:00 p.m. to 09:00 p.m.	Networking Reception & Conference Banquet

Day 3 – Wednesday, 28 August 2024

08:30 a.m. to 9:00 a.m.	Networking and Registration
09:00 a.m. to 10:30 a.m.	Session 05
	Welcome and Housekeeping (05 minutes)
Keynote Presentation 05	Leadership in a Vacuum of Innovation, <i>Michael Green, Principal at Michael Green Architecture (MGA), Canada.</i> (30+5= 35 minutes)
	S5-01 (Timber Construction - I)
Paper ID 16	Moment connections in the minor strength axis of cross-laminated timber panels, <i>A. Hosseini, M. Shahnewaz, C. Dickof, J. Zhou, T. Tannert</i>
Paper ID 26	Brittle failure of cross-laminated timber connections with self-tapping screws, <i>A. Einipour, G. Armstrong, A. Salenikovich, J. Zhou, T. Tannert</i>
Paper ID 41	Numerical study of wetting-induced stress in self-tapping screws in steel-to-timber connections, <i>J. Zhang, L. Zhou, C. Ni</i>
	S5-02 (Sustainable Buildings)
Paper ID 20	Resilient and Sustainable Retrofit Strategies of Residential Buildings to Mitigate Overheating, <i>Z. Xiao, A. Laouadi, L. Wang</i>
Paper ID 44	Comparative Study and Benchmarking of Embodied Carbon in the Structural Design of Concrete Residential Buildings in Vancouver, BC and Toronto, ON markets, <i>D. Arciaga, D. Mattman, D. Pekar</i>
Paper ID 46	Realities of Curtain Wall Renewal in the 21st Century: Can Glass Skyscrapers Be Modernized for Contemporary Energy Standards?, <i>M. Reid, M. Fakoor</i>
10:30 a.m. to 10:45 a.m.	Refreshment Break (15 minutes)
10:45 a.m. to 12:30 p.m.	Session 06
Keynote Presentation 06	Phase Change Materials in Combination with Existing Insulation for a Superior Thermal Performance of Building Walls, <i>Mario Medina, Texas A&M University, USA.</i> (30+5= 35 minutes)
	S6-01 (Timber Construction - II)
Paper ID 24	Decarbonizing Canada's Built Environment Using Wood, <i>J. Tourrilhes, M. Mohammad, M. Williamson, R. Coxford</i>
Paper ID 34	The behaviour of precast UHPC nodes for timber structures: A numerical study, <i>A. Abdallah, M. Shahnewaz, C. Dickof, L. Tobber</i>
Paper ID 48	Experimental study of brittle failure of Cross Laminated Timber (CLT) connections with inclined self-tapping screws, <i>H. Wang, L. Zhou, Y. Chui</i>
Paper ID 28	Post-failure performance of point-supported CLT floors, <i>H. Ganjali, M. Shahnewaz, C. Dickof, T. Tannert</i>
	S6-02 (Nature-Based and Sustainable Solutions)
Paper ID 38	Experimental Studies on Building-Integrated Nature-based Solutions for the Marine Climate of British Columbia, <i>N. N. Win, R. Mara, C.C.V. Chan</i>
Paper ID 39	Investigation of Flow Length Effect on the Hydrological Performance of Natural Based Solutions (NBS) on Commercial Roofs, <i>M. Dabas, S. Molleti, J. Saragosa</i>
Paper ID 40	Critical review of the Prefabricated Roof Assemblies (PRA) in the North American Roofing Market, <i>M. Dabas, S. Molleti</i>
Paper ID 61	Sustainable Alternatives in construction: investigating the carbon reduction potential of Hempcrete, <i>S. Monshet, T. Froese</i>
12:30 p.m. to 1:30 p.m.	Lunch Break (60 minutes)
1:30 p.m. to 3:00 p.m.	Session 07
Keynote Presentation 07	The Time Value of Carbon, <i>Brenda Martens, Practitioner and Educator, Canada.</i> (30+5= 35 minutes)
	S7-01 (Sensors and Software)
Paper ID 22	Estimation of building materials moisture content with the aid of capacitance sensors and machine learning, <i>M. Karoglou, E. I. Koutras, A. Bakolas, G. Mustapha, P. G. Asteris</i>
Paper ID 32	Simplified model for green roofs and walls for integration in building simulation software, <i>A. Laouadi, Z. Jandaghian</i>
Paper ID 70	Understanding Low-Slope Extensive Automated Leak Detection Systems, <i>J. Teetaert, S. Abbasian, J. Hermes, J. Dakin</i>
	S7-02 (Materials and Systems)
Paper ID 42	Use of Scheffer Index for Understanding Wood Decay Risk in South Central British Columbia, <i>L. Peer</i>
Paper ID 49	Determining the Repeatability of Whole-Building Airtightness Testing Subject to Varying Climatic Conditions, <i>B. Croyle, P. Mukhopadhyaya</i>
Paper ID 25	Influence of Insulation Material Properties on the Hygrothermal Performance of a Thick-Wall Assembly with an Exterior Air Barrier under Forced Convection, <i>A. Conroy, G. Wimmers, P. Mukhopadhyaya</i>
3:00 p.m. to 3:15 p.m.	Break (15 minutes)
3:25 p.m. to 5:15 p.m.	Session 08
Keynote Presentation 08	Taking Prefab Mainstream, <i>Guido Wimmers, BCIT, Canada.</i> (30+5= 35 minutes)
Closing Interactive Plenary	Stepping Together Towards Integrating Indigenous Perspectives into Engineering Culture and Practice, <i>D. Caron, A. Phillips, D. Ward, C. Davis, K. Porttrris</i> (60 minutes)
	NHICE-04 Closing Remarks