



## Dr. Randy Van Straaten

Dr. Randy Van Straaten is the President and a Building Science Specialist at the recently established Building Enclosure Labs Inc (BELi) in London Ontario. Previously, he worked as RDH Building Science with roles including managing new construction and existing building enclosure consulting projects.

He also lectures on Building Science for Retrofits at George Brown College and Building Performance Assessments at Toronto Metropolitan University.

### Academic

Associate member in Yeates School of Graduate Studies, Ryerson University

- Building Performance Assessment Sessional Professor (Fall term 2022)
- Volunteer on examination committee for students researching masonry decay

Spring Term 2022 Sessional Professor

- Building Science for Retrofits - George Brown College

Spring Term 2021 Sessional Professor

- Building Science - Fanshawe College
- Building Science for Retrofits - George Brown College
- Sustainability and the Built Environment - Fanshawe College

Spring Term 2011 Sessional Professor

- Building Science - University of Waterloo

Ph.D., Civil and Environmental Engineering, Western University, London, ON

M.A.Sc., Building Engineering, Civil Engineering Dept., University of Waterloo, ON

### pre-BELi Projects

Randy previously managed the masonry decay risk assessment group at RDH's Waterloo lab which conducted field review, testing, moisture analysis, [randy@beli-eng.com](mailto:randy@beli-eng.com)

and monitoring for a wide array of retrofit projects. A recent project of note was providing these services and forensic investigation of failure of imported brick cladding for a project at Southern New Hampshire University.

Embodied carbon analysis the Net Zero Carbon Certification for Mohawk College's The Joyce Centre for Partnership & Innovation.

Building enclosure consultant for Humber College Barrett Centre for Innovation Technology covering design reviews through field reviews for the project.

Assisted in whole building air tightness testing of new 11 storey Seattle apartment building for City of Seattle Energy Code requirements.

Provided whole building air tightness testing of a new York Region District School Board highschool.

Provided forensic investigation of a large Rosedale home to address attic frost and wanted damage problems during construction. This included conducting an infrared survey with blower door pressurization to identify air barrier and ductwork air sealing issues. Provided field inspections to confirm the deficiencies were addressed.

Randy recently conducted a life cycle costing study of cladding options for mid- and high-rise MURB for EIFS Council of Canada including detailed thermal and life cycle cost performance analysis.

Building enclosure consulting for multi-unit residential and university buildings including design reviews, thermal analysis, submittal review, mock-up review, and field reviews.

Full scale wind exposure testing of residential wall and roof assemblies at the Insurance Research Lab for Better Homes at Western University.

### BELi Projects

Completed a decarbonization study for the existing London Fire Station #10. The investigation included air tightness testing of the garage and living areas, infrared thermal images to identify air leakage locations, quantification of potential air sealing repair impacts using the crack method, thermal bridging calculations, a cost estimate for fenestration and overcladding options. The exercise involved several visits to the hall and communications with the chiefs and firemen.

Costing study to upgrade the City of London's next new firehall to the high performance Passive House standard. The study was based on a recently completed firehall and the scope included identifying air barrier and thermal bridging issues within the design details. Further scope include developing massing solutions, insulation upgrades, HVAC system upgrades, and associated costing.

Randy has provided forensic investigation and repair support for the new Woodstock Rehab Clinic to address air leakage and condensation problems. This included conducting an infrared survey with blower door pressurization to identify air barrier and thermal bridging problems. Provided retrofit design detail and specifications for addressing.

**71 Wellington St., London, Ontario N6B 2K4**

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Expert witness for the White vs JHTI case and testing laboratory and expert witness for METLife vs JHTI case covering large scale wood decay failures in New Zealand housing.

Enbridge Savings-by-Design workshops for new and retrofit building projects including Museum London, RBC Place convention centre, and Windsor Media Arts building. Randy developed and presented building envelope upgrades solutions for these existing buildings.

Providing thermal performance analysis for the enclosure for new KF Aerospace Centre for Excellence hanger in Kelowna B.C to meet the thermal bridging assessment requirements of NECB 2020.

Embodied carbon analysis for the Spuzzum Community Centre addition as part of their Net Zero Carbon and Green and Inclusive Community Building Program grant applications.

Pembina Institute Reframed Lab Initiative aimed at scaling up deep retrofits. Randy is on a team conducting a feasibility study and schematic design for HVAC replacement and overcladding a 3 storey building.

Assisted with development and optimization of a total building envelope system including walls and fenestration for Flynn which is optimized for thermal performance, construction speed, wall thickness and embodied carbon.

Randy routinely provides building envelope design review and field reviews for new construction and retrofits of existing buildings. This includes providing engineering reviews of non-prescriptive approaches of new/imported building materials and systems.

### Publications

- Van Straaten, R. and Zhang, K.
- Charron, E. and Van Straaten, R. *Interior Insulation Retrofitting Heritage Masonry Buildings - Best Practice Dos and Don'ts*. OAA Sustainable Built Environment Committee 2021.
- Charron, E. and Van Straaten, R. "Technical: Retrofitting Heritage Masonry Buildings". *Canadian Architect*, Feb. 1, 2021.
- "Clay Brick Material Properties" Association of Preservation Technology, Miami, FL, Nov 23, 2019.
- "Continuous Exterior Insulation: Increase Durability and Decreased Energy" Owens Corning/Dorcen/Northern Facades event, London, ON, June 2019.
- Van Straaten, Randy "Retrofitting Masonry Buildings in Cold Climates: When and What to Test" *RCI Interface*, July 2017.
- Van Straaten, Randy A. "Pressure Equalization of Wind-Induced Pressures on Residential Vinyl

Siding Cladding in Full-Scale." Doctoral thesis, Western University 2017.

- Van Straaten, Randy, Trevor Trainor, and John Straube. "Wind-Washing Effects on Mineral Wool Insulated Sheathing." Paper presented at the ASHRAE Performance of the Exterior Envelopes of Whole Buildings XIII, Clearwater Beach, FL, December 2016.
- Van Straaten, Randy, Trevor Trainor, and Chris Schumacher. "Critical Freeze-Thaw Saturation Measurement of In-Service Masonry." Paper presented at the ASHRAE Performance of the Exterior Envelopes of Whole Buildings XIII, Clearwater Beach, FL, December 2016.
- Roppel, Pat, Ivan Lee, Randy Van Straaten, and Jamie Mackay. "Guiding Design Teams by Hygrothermal Energy and Thermal Comfort Analysis while Managing Uncertainty." Paper presented at the ASHRAE Performance of the Exterior Envelopes of Whole Buildings XIII, Clearwater Beach, FL, December 2016.
- Van Straaten, R, Straube J., and A. Lukachko, "Durability and Resilience of Tall Buildings with Precast Concrete Enclosure Systems" Paper presented at CSCE Conference, London, ON, June 2016
- Van Straaten, Randy and Trevor Trainor. "Improving Access to the Frost Dilatometry Methodology for Assessing Brick Masonry Freeze Thaw Degradation Risk." Paper presented at CCBST 2014, Toronto, ON, October 2014.
- Ueno, Kohta, John Straube, and Randy Van Straaten. "Field Monitoring and Simulation of a Historic Mass Masonry Building Retrofitted with Interior Insulation." Paper presented at the ASHRAE Performance of the Exterior Envelopes of Whole Buildings XII, Clearwater Beach, FL, December 2013.
- Ueno, Kohta, Phil Kerrigan, Honorata Loomis, and Randy Van Straaten. "Retrofit of a Multifamily Mass Masonry Building in New England." *Building America Program*, U.S. Department of Energy, Oak Ridge, TN, February 2013.
- Ueno, Kohta, Randy Van Straaten, and Chris Schumacher. "Interior Insulation of Mass Masonry Walls: Joist Monitoring, Material Test Optimization, Salt Effects." *Building America Program*, U.S. Department of Energy, Oak Ridge, TN, May 2013.
- Ueno, K., and R. Van Straaten. Expert Meeting Report. Interior Insulation Retrofit of Mass Masonry Wall Assemblies. No. DOE/GO-102012-3475. *Building Science Corporation*, Somerville, MA (United States), 2012.
- Loomis Honorata, Kohta Ueno, and Randy Van Straaten. "Byggmeister Test Home: Cold Climate Multifamily Masonry Building

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- Condition Assessment and Retrofit Analysis." *Building America Program*, U.S. Department of Energy, Golden, Oak Ridge, TN, September 2012.
- Van Straaten, Randy, Greg Kopp, and John Straube. "Testing Water Penetration Resistance of Window Systems Exposed to "Realistic" Dynamic Air Pressures." Paper presented at ICBEST, Vancouver, BC, June 2010.
- Van Straaten, Randy. "Loss prevention begins at home." *Institute for Catastrophic Loss Reduction* 3, no. 1 (2009) Toronto, ON.
- Van Straaten, Randy et al. "Correlation between Air Tightness and Air Quality in Mongolian Houses." Paper presented at Indoor Air Conference, Beijing, China, 2005.
- Van Straaten, Randy et al. "Mongolian Housing Energy Efficiency Study and Recommendations for Clean Development Mechanism Project." Report for United Nations Development Program – Mongolia UNDP Office, Ulaanbaatar, Mongolia, 2004.
- Straube, John, Randy Van Straaten, and Eric Burnett. "Field Studies of Ventilation Drying." Paper presented at the Performance of the Exterior Envelopes of Whole Buildings IX ASHRAE, Clearwater, FL, December 2004.
- Van Straaten, Randy. "Measurement of ventilation and drying of vinyl siding and brick clad wall assemblies." Master's thesis, University of Waterloo, 2004.
- "Clay Brick Material Properties" Association of Preservation Technology, Miami, FL, Nov 23, 2019.
- "Continuous Exterior Insulation: Increase Durability and Decreased Energy" Owens Corning/Dorken/Northern Facades event, London, ON, June 2019.
- "Introduction to new technologies in sustainable design" Union Gas Event, Windsor, ON, May 2019.
- "Examining the Intersections between Green Buildings and New Technologies" CaGBC Building Last Change, Vancouver, BC, May 2019.
- "Interior Insulation Retrofit Risk Assessment for Heavy Masonry Buildings" Morrison Hershfield, Vancouver, BC, May 2019.
- "Airtightness, Thermal Bridging, and Achieving Better Overall Thermal Performance" Union Gas Event, Waterloo, ON, September 2018.
- "Interior Insulation Retrofits of Old Buildings" RDH Waterloo Lab Event, Waterloo, ON, June 2018.
- "Interior Insulation Retrofits of Old Buildings" Passive House Alliance, Chicago, IL, May 2018.
- "Large Building Airtightness: Where We're at and Where We're Going." Presented at Construct Canada, Toronto, ON, December 2016.
- "Pressure Equalization for Wind Load Reduction." Presented at RDH Building Science Laboratories LAB Event, Waterloo, ON, September 2016.
- "Case Studies and Myths of Masonry Building Retrofit Insulation." Presented at Building Science Laboratories LAB Event, Waterloo, ON, January 2015.
- "Impact of Wind Washing on Fibrous Insulated Sheathing Thermal Performance." Presented at ROXUL Seminar, Kitchener, ON, October 2014.
- "Improving Access to the Frost Dilatometry Methodology for Assessing Brick Masonry Freeze Thaw Degradation Risk." Presented at CCBST Conference, Toronto, ON, November 2014.

## Presentations

- "Masonry Interior Insulation Retrofit Thermal Performance and Freeze Thaw Risk" IIBEC Building Enclosure Symposium Milwaukee Nov. 14, 2022.
- "Ensuring Success in Interior Insulation Retrofits of Masonry Walls" APTI Detroit, Nov 10, 2022.
- "Hygrothermal Models For Heavy Wall Retrofits Assessments To Masonry Material Properties" CCBST Toronto October 27, 2022
- "Low Carbon Solutions for Multi-Unit Residential" BCBEBC Building Research Committee April 20, 2021.
- "Stack Effect in Buildings" Enbridge Natural Gas Webinar Series, Nov. 16, 2020.
- "What's not to like about XPS and ccSPF" Embodied Carbon Network, Webinar, May 19, 2020
- "The Lifecycle Cost of Cladding – First Costs, Thermal Performance, Operations and Maintenance" The Building Show, Toronto, ON., Dec 5, 2019.