RDH BUILDING SCIENCE

Lorne Ricketts | M.A.Sc., P.Eng.

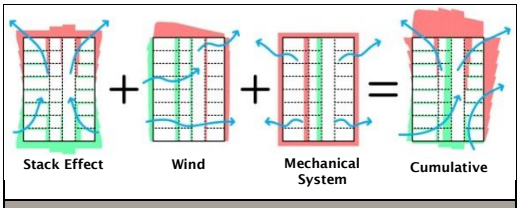
Associate, Building Science Engineer

Lorne Ricketts is a building science engineer, specializing in new construction, investigation, and research work.

Expertise + Experience

On new construction and retrofit projects Lorne consistently provides assistance with building enclosure design review, determination of enclosure thermal performance, building energy code compliance, and field review. In other types of projects Lorne also provides building enclosure condition assessments, forensic investigations, building monitoring and testing, assembly modeling, and laboratory and field testing services.

As a student, Lorne completed a Master's degree at the University of Waterloo focused on airflow in high-rise multi-unit residential buildings and included extensive testing and monitoring. As a result, his work has developed the industry's understanding of airflow in and around buildings and how it affects both energy consumption and indoor air quality.



Schematic Representation of Drivers of Airflow Within and Through Buildings

Lorne's practical experience combined with his theoretical training and proficiency with state-of-the-art thermal and hygrothermal (heat, air, and moisture) software modeling tools allows him to analyze and design durable, energy efficient building enclosures. By combining his building science knowledge and previous project experience, he provides insightful design consulting and construction review of building enclosures for new buildings and retrofit work.

Lorne is an Associate and shareholder of RDH and is committed to the ongoing success of RDH projects.

Education

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

B.A.Sc., Civil Engineering, University of British Columbia

Memberships

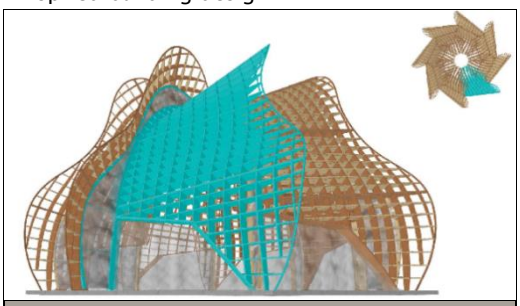
P.Eng., Association of Professional Engineers and Geoscientists of British Columbia (APEGBC)

Associate Member, American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)

Typical Projects

NEW CONSTRUCTION

- Brentwood Town Centre Redevelopment, Towers 1 and 2, Burnaby, BC – Provided thermal modelling and energy code consulting to ensure compliance and as part of building code compliance, LEED energy modelling, and BC Hydro New Construction incentive program application.
- Bella Bella Passive House, Bella Bella, BC – Performed enclosure consulting to assist with design and construction of a durable energy efficient building enclosure for this innovative modular Passive House project, including detailing to meet the stringent airtightness requirements.
- Yasodhara Ashram Temple, Kootenay Bay, BC – Ongoing enclosure consulting to assist with design of uniquely complex lotus flower inspired building design.



Yasodhara Ashram Temple - Design Concept

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- Hygrothermal and thermal simulation of enclosure systems for new construction projects.

RESEARCH + FORENSICS

Lorne provided services for:

- Energy Consumption and Conservation in Mid and High Rise Residential Building in British Columbia
  This large scale study first analyzed multi-unit residential building energy consumption and developed strategies to improve the efficiency of both new and existing multi-family residential buildings. A building was then retrofitted as a pilot project to demonstrate the potential energy savings from incorporating energy efficiency measures in to enclosure renewals work. Lorne's role included thermal modeling of enclosure assemblies, as well as extensive testing of the pilot building including measurements of airtightness and ventilation.
- Study of Conventional Roof Performance
  This study examined the field hygrothermal and thermal performance of conventional roof assemblies with different insulation arrangements and membrane colours. Lorne was the primary author of this research study and was involved with the study design, monitoring equipment installation, and analysis.
- Sloped Wood-Frame Attic Roof Study
  This study investigated causes and potential remedies for commonly occurring issues with wood-frame vented attic roof assemblies in the Pacific Northwest climate.

Test roof with monitoring equipment installed

- Whole Building Airtightness Study
  This study assessed the state of the art of whole building airtightness in North America through surveying of industry and compilation of over 700 airtightness test results. The study has been used as part of developing airtightness requirements for building energy codes.
- R22+ Effective Walls in Wood-Frame Construction in British Columbia
  This guide consolidates information on above and below grade wall assemblies for low-rise wood-frame buildings which are capable of meeting R-22 or greater effective thermal performance, as required by the 2014 Vancouver Building Bylaw and represents a significant increase in the required level of performance from previous codes. Lorne was the primary author of this guide.

EXISTING BUILDINGS

Lorne provided design, field review and testing services for:

- The Belmont, Vancouver, BC – This 13-storey multi-unit residential building energy efficient renewal project was the recipient of the 2013 Technical Achievement Award from the Canada Green Building Council and Sustainable Architecture & Building magazine.
- Tournament Capital Centre, Kamloops, BC – Provided testing and investigation services for this large multi-use sports complex includes an indoor track, pool, workout areas, and gymnastics facility.
- Forensic investigations of existing buildings including specialized testing such as: airtightness testing, infrared thermography, tracer gas testing, monitoring, and etc.
- Hygrothermal and thermal simulation of enclosure systems as part of forensic investigations for existing building assembly design. Projects include: The Belmont, The Murray Hotel, Port Royal, and The Exchange.

Publications + Presentations

Lorne has also produced numerous publications and regularly presents at seminars and conferences throughout North America. Some examples include:

- "An Illustrated Guide to R22+ Effective Walls in Wood-Frame Construction in British Columbia Design Guide." Produced for the Homeowner Protection Office (HPO) and City of Vancouver, 2015.
- "R22 Walls & Insulating For the Future." Presented at RCI Western Canada Wall Assemblies and Sloped Roofs Half Day Seminar, Vancouver, BC, October 2015.
- "Energy Efficient Building Envelope Retrofits." Presented at BuildEx Express, Vancouver, BC, October 2015.

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- "Ventilation in Multi-Family Buildings." Presented at Annual Westford Symposium on Building Science (Summer Camp), Westford, MA, August 2015.
- "Pressure Differences and Airtightness in Tall Buildings – Theory & Reality." Presented at BEST4 Conference, Kansas City, MO, April 13-15, 2015.
- "Energy Efficient Retrofit of a High-Rise Multi-Family Building." Paper presented at BEST4 Conference, Kansas City, MO, April 13-15, 2015.
- "The Problems With and Solutions for Ventilated Attics." Paper presented at 30th RCI International Convention & Trade Show, March 5-10, 2015.
- "A Field Study of Airflow in a High-Rise Multi-Unit Residential Building." Paper presented at Canadian Conference on Building Science and Technology, Toronto, ON, October 28-30, 2014.
- "State of the Art of Multi-Unit Residential Building Airtightness: Test Procedures, Performance, and Industry Involvement." Paper presented at Canadian Conference on Building Science and Technology, Toronto, ON, October 28-30, 2014.
- "Corridor Pressurization System Performance in Multi-Unit Residential Buildings." Paper presented at ASHRAE 2014 Annual Conference, June 29-July 2, 2014.
- "Conventional Roofing Assemblies: Measured Thermal Benefits of Light to Dark Roof Membranes and Alternate Insulation Strategies." Paper presented at 2014 RCI Symposium on Building Envelope Technology, March 20-25, 2014.
- "Airflow in High-rise Multi-unit Residential Buildings with Respect to Ventilation and IAQ." Paper presented at ASHRAE IAQ 2013 Conference, Vancouver, BC, October 15-18, 2013.
- "A Field Study of Airflow in a High-Rise Multi-Unit Residential Building." M.A.Sc. Thesis, University of Waterloo, Waterloo, ON, 2014.