



**Brian Hubbs** | P.Eng.

## Managing Principal, Senior Building Science Specialist

Brian Hubbs has over 25 years' experience as a consultant practicing exclusively in the field of façade engineering and building science.

### Expertise + Experience

Brian is recognized by his peers as being a practical engineer and researcher who consistently delivers innovative solutions. He has a unique blend of theoretical and hands-on knowledge gained from completing hundreds of building enclosure investigations and rehabilitation projects as well as from façade engineering and construction review of building enclosures for new buildings. Brian's experience includes work on both high and low-rise commercial, institutional and residential building projects in many cities and in virtually all climatic regions across Canada and the United States.

Brian has extensive experience with a variety of building enclosure systems, components, and materials. This includes steep and low-slope roofing systems, wall claddings of all types, windows, stick built and unitized curtain wall, glazing and structural glass walls and skylights, as well as below-grade and plaza waterproofing systems. Brian also has extensive experience designing, testing and constructing unique high-rise building facades with unitized curtain wall, skylights, and window-wall systems manufactured offshore in Asia and Europe.

Brian is skilled in the design, forensic investigation, and repair of pressurized high humidity natatoriums, museums, and galleries in cold climates.

An engaging and vibrant presenter, Brian regularly speaks at seminars, conferences, and guest lectures on a range of building science topics.

Brian is a Managing Principal and shareholder of RDH and as such participates in the overall direction and management of the firm.

### Education

B.A.Sc., Civil Engineering (Management Science Option), University of Waterloo, ON

Building Envelope Professional (BEP), AIBC/APEGBC program

### Memberships

Brian has participated in many industry associations and standards committees during his career including:

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

Associate Member, CSA A500-16, Technical Committee on Building Guards

Member, CSA A119, Technical Committee on Performance Standards for Windows

- CSA A440 Windows
- AAMA/WDMA/CSA 101/I.S.2/A440-05 Standard/Specification for windows, doors, and unit skylights
- AAMA/WDMA/CSA 101/I.S.2/A440S1-07 Canadian Supplement to AAMA/WDMA/CSA 101/I.S.2/A440-05

Member, CAN/CSA A440.4 Subcommittee on the Recommended Practice for the Installation of Windows, Doors, and Skylights - CSA A440.4

Member, NBC, Joint Part 5 & Part 9 Task Group on Harmonized Window, Door and Unit Skylight Standard 101/I.S.2/A440.

Member, Insulating Glass Manufacturers Alliance (IGMA) Technical Services Committee

Member, ASTM International, Technical Committee D08 on Roofing and Waterproofing

Member, British Columbia Building Envelope Council (BCBEC)

Member, Technical Committee, Glazing Contractors Association of British Columbia



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## Typical Projects

### NEW CONSTRUCTION

Brian regularly leads building enclosure design, integration, and field review projects. Some examples include:

- Westbank, Shangri-La, Vancouver, BC
- Intravest, Honua Kai development, Hawaii
- ASPAC, Coal Harbour Development (over a dozen-high rise towers), Vancouver, BC
- Concord Pacific, Centerville Development (16 high-rise towers), Vancouver, BC
- Nisga'a Museum, New Aiyansh, BC
- Barrow Hospital, Barrow, Alaska

### INVESTIGATION AND REHABILITATION

Brian has provided investigation, design, and construction review for rehabilitation programs to address the enclosure failures on over 50 high-rise and low-rise buildings in British Columbia and the Pacific Northwest. Some of these include buildings with challenging special use requirements, such as:

- Alberta Art Gallery, Edmonton, AB
- Fernie Aquatic Centre, Fernie, BC
- UBC Museum of Anthropology, Vancouver, BC
- Belkin Art Gallery, Vancouver, BC
- Seattle Asian Art Museum, Seattle, WA
- Museum of History and Industry, Seattle, WA

## Expert Support

The legal community recognizes Brian's expertise and experience. He is regularly asked to provide expert reports and testimony regarding design and construction-related building enclosure performance problems. As an indication of his unbiased opinion, groups of defendants have accepted Brian as an objective technical expert for all parties in order to avoid other, more costly conflict resolution options.

## Guideline + Research Projects

As one of the key contributors to the evolution of building enclosure technology in British Columbia, Brian has led landmark policy, guideline and research related initiatives including:

- Performance Monitoring of Rainscreen Wall Assemblies in Vancouver, BC (2007, CMHC, HPO and BCHMC). This project was initiated as a result of recommendations from the Barrett Commission to ensure that new rainscreen wall designs were performing as expected. The

project included the design and implementation of a comprehensive long term monitoring system on five buildings, which incorporated new rainscreen wall assemblies. Data from the first five years in service was collected and analyzed. Results from this study have been used to improve rainscreen wall designs for the coastal climate and make them less vulnerable to internal moisture sources and condensation.

Brian has had a significant author role in the following guideline and research projects:

- Best Practice Guide: Wood Frame Envelopes in the Coastal Climate of British Columbia (1998, CMHC). This guideline has become the benchmark for wood frame construction in British Columbia.
- Building Envelope Rehabilitation Guides; one for consultants, and one for property managers and owners (2001, CMHC). These guideline documents contributed to a consistent approach to the evaluation, design and implementation of construction for moisture-damaged buildings.
- Water Penetration Resistance of Windows – Study of Manufacturing, Building Design, Installation and Maintenance Factors & Study of Codes, Standards, Testing and Certification (2003, CMHC, BC HPO). These national studies are the most comprehensive analysis of the variety of factors influencing window water penetration performance.
- Study of Poured-in-place Concrete Wall Performance in Coastal British Columbia (2004, CMHC, BC HPO). Variables impacting this increasingly popular construction type were examined, and design and construction guidelines were developed.
- Development of a new comprehensive Best Practice Guide – Windows publication, addressing the selection of appropriate windows and design of the wall to window interface for use across North America.
- Field Survey and preparation of a guideline for Heating Ventilation and Air Conditioning (HVAC) for multi-unit residential construction in the U.S. Pacific Northwest.

## Publications

A sample of Brian's more recent papers includes:

- "Condensation and Indoor Air Quality Problems as a Result of High Performance Building Enclosures – The Need for Integrated Design and a New Investigation Protocol." Paper presented at Building Envelope Technology Symposium, San Antonio, TX, 2010.



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- “Monitoring of Historic Structures for Whole Building Improvements.” Paper presented at 2010 International Building Envelope Systems and Technologies (ICBEST) Conference, Vancouver, BC, June 2010.
- “Moisture Transport by Osmotic Flow through Waterproofing Membranes – Towards the Development of Osmosis Resistant Membranes.” Paper presented at 2010 International Building Envelope Systems and Technologies (ICBEST) Conference, Vancouver, BC, June 2010.
- “Osmosis and the Blistering of Polyurethane Waterproofing Membranes.” Paper presented at 2nd Building Enclosure Science and Technology (BEST2) Conference, Portland, OR, April 2010.
- “A New Paradigm for the Design of Sustainable Buildings.” Paper presented at 2nd Building Enclosure Science and Technology (BEST2) Conference, Portland, OR, April 2010.
- “Long Term Building Performance Monitoring – What Have We Learned.” Paper presented at RCI Building Envelope Technology Symposium, San Diego, CA, October 2008.
- “Hygrothermal Performance and Drying Potential of Wood Frame Rainscreen Walls in Vancouver’s Coastal Climate.” Paper presented at 11th Canadian Conference on Building Science and Technology, Banff, AB, March 2007.
- “Balancing the Control of Heat, Air, Moisture, and Competing Interests” Paper presented at 11th Canadian Conference on Building Science and Technology, Banff, AB, March 2007.
- “Building Envelope Performance Monitoring and Modeling of West Coast Rainscreen Enclosures.” Paper presented at 3rd International Building Physics Conference, Montreal, QC, August 2006.
- “Cast-in-Place Concrete Cladding: Is It All It’s Cracked Up To Be?” Paper presented at 11th Canadian Conference on Building Science and Technology, Banff, AB, 2007.