

...> **BRIAN HUBBS, P.Eng., BEP**

### Expertise & Role

Mr. Hubbs has over 16 years experience as a consultant focused exclusively in the field of building science. His experience includes hundreds of building enclosure investigations and repairs. This work encompasses both high and low-rise commercial, institutional and residential building projects in various cities and climatic regions across Canada and the United States.

Brian has extensive experience with a variety of building enclosure systems, components, and materials. This experience includes steep and low-slope roofing systems, wall cladding of all types (masonry, EIFS, concrete, metal panel, stucco, wood, vinyl siding etc.), windows, glazing, glass/metal curtain walls and skylights, as well as below-grade and plaza waterproofing systems.

Brian regularly leads new construction building envelope design, integration, field review and capital planning projects on high-rise commercial, multi-unit residential, and wood frame buildings. This work includes the Concord Pacific Site in Vancouver, BC, which involved conceptual and detailed design review, verification and implementation of all building envelope elements on 16 high and mid-rise buildings forming part of the largest residential development in North America.

Brian has extensive experience dealing with the design, forensic investigation, and repair of pressurized high humidity buildings in cold climates.

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

### Education

B.A.Sc. University of Waterloo, Waterloo, Ontario. Civil Engineering, Management Science Option, 1991

### Memberships & Awards

Association of Professional Engineers & Geoscientists of British Columbia

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

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

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

Insulating Glass Manufacturers Alliance (IGMA) Technical Services Committee

British Columbia Building Envelope Council.

Brian also served for several years on the Technical Committee, for the Glazing Contractors of British Columbia

### Senior Building Science Specialist



### Guideline & Research Projects

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

- ...> Performance Monitoring of Rainscreen Wall Assemblies in Vancouver British Columbia – 2007, Canada Mortgage and Housing Corporation (CMHC), Homeowner Protection Office (HPO), British Columbia Housing Management Commission (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 installation of a comprehensive 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 the study have been used by the industry to validate the performance of rainscreen wall assemblies and hygrothermal models. In addition, the results 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 two national studies are the most comprehensive analysis of the variety of factors influencing window water penetration performance.

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- ...> 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 North-West. This project examined the interaction of HVAC, the performance of the building envelope as well as the impact of the occupants to develop practical recommendations for achieving acceptable indoor air quality, as well as quantity and distribution of heat for occupant comfort and condensation control.
- ...> University of British Columbia, School of Architecture, ARCH 351, 2001-2004, “Forensic Investigation and Repair - Belkin Art Gallery.”
- ...> “Canadian High Performance Residential Building Envelope Systems”, Can/Asia Conference, Canadian Mortgage and Housing Corporation, Vancouver, B.C., 2000
- ...> “The Role of the Building Envelope Consultant” Construction Defects Conference, The Seminar Group, Portland OR, 2006
- ...> “Current Window Installation Trends” BC Hydro Task Group, Vancouver, B.C., 2005
- ...> “Mass Concrete Walls-Thermal Analysis” UK Warranty Providers, Home Protection Office, Vancouver, BC, 2003
- ...> Water Penetration Resistance of Windows, Alberta Building Envelope Council, Calgary, 2002 and British Columbia Building Envelope Council, Vancouver, 2001
- ...> “Waterproofing Performance Expectations” British Columbia Building Envelope Council, Vancouver, 2004
- ...> “The Building Envelope Rehabilitation Process” Home Protection Office Information Sessions, Vancouver, B.C, 2000-2003.
- ...> “Risk Management”, Walsh Construction Seminar, Seattle, WA, 2005
- ...> Upcoming trends - “The New Window Installation Standard and The New CMHC Windows Best Practice Guide” Glazing Contractors Association of British Columbia, Vancouver, BC, 2006
- ...> “Performance Monitoring of Rainscreen Wall Assemblies”, Portland Building Envelope Council, Portland OR, 2007

### 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 envelope performance problems. As an indication of his unbiased opinion and trust in the industry it is not uncommon for a group of defendants to accept Mr. Hubbs as an objective technical expert for all parties in order to avoid other, more costly conflict resolution options.

### Publications

- ...> “Building Performance Monitoring” Proceedings from 9th Canadian Conference on Building Science and Technology.
- ...> “Integration of occupant lifestyle, building enclosure, architectural and HVAC design on the performance of exterior walls in multi-unit residential buildings”, Proceedings from 10th Canadian Conference on Building Science and Technology. Ottawa, Ontario, 2005.
- ...> “Cast-in-Place Concrete Cladding: Is It All Its Cracked Up To Be?” Proceedings from 11th Canadian Conference on Building Science and Technology. Banff, Alberta, 2007
- ...> “Hygrothermal Performance and Drying Potential of Wood Frame Rainscreen Walls in Vancouver’s Coastal Climate”. Proceedings from 11th Canadian Conference on Building Science and Technology. Banff, Alberta. March 2007.
- ...> “Building Envelope Performance Monitoring and Modeling of West Coast Rainscreen Enclosures”. Proceedings from 3rd International Building Physics Conference. Montreal, Quebec. August 2006.
- ...> “Balancing the Control of Heat, Air, Moisture, and Competing Interests.” Proceedings from 11th Canadian Building Science and Technology Conference. Banff, Alberta. March 2007.

### Presentations & Lectures

Brian regularly speaks at seminars, conferences and guest lectures. A sample of these presentations include:

- ...> University of Oregon, School of Architecture, ARCH 471-571. Co-development of a Building Enclosure course and lecturing to fourth year and graduate architectural students at the University of Oregon, 2005-2007.