Books and Research Reports

Allen, E.
*Architectural Detailing: Function, Constructability, Aesthetics*
New York: John Wiley & Sons
1992
“Describes systematically and in readily usable form the principles by which good architectural
details are designed. The principles are laid out in 83 brief but profusely illustrated ‘detail
patterns’. The first section examines each of the patterns and illustrates several instances of
its use. The latter part demonstrates the execution of these patterns in the design of key
details for three different buildings types.”
Available at: BCIT

Allen, E.
*How Buildings Work* Second Edition
New York: Oxford University Press
1995
“We expect our buildings to do many things: stand up, shelter us from weather, keep us
comfortable, provide clean water for drinking and clean air for breathing, dispose of our wastes,
give us privacy and security, power everything from tools to toasters, and connect us with the
world outside through windows, doors, telephones, and mailboxes. They should be easy to move
around in, and should not require excessive expense to maintain. But how does a building do all
this? This is the question Edward Allen addresses so engagingly in the completely revised and
updated second edition of How Buildings Work…this easy-to-read work reveals virtually every secret
of a building's function: how it stands up, keeps its occupants safe and comfortable, gets built,
grows old, and dies--and why some buildings do this so much better than others.“ [This is a very
easy to understand and complete primer. If you’re having problems understanding the basics of the
building envelope as discussed by the experts, read this.]
Available at: BCIT; UBC; VPL

Allen, W.
*Envelope Design for Buildings*
Oxford: Architectural Press
1997
“Concerned not with the aesthetics of the design, but with the components of a building that
actually separate the outside elements from the interior environment, such as the roofs, walls,
and basement. Focusing on concepts, processes, and ideas rather than numbers or specific designs,
describes old and new materials and how they fit together and react to each other, and the factors
involved with design and specification that affect the construction of the building and its
ultimate performance in providing shelter and protection.” Chapter headings include the
indoor and outdoor climate, the envelope, cavity wall systems, curtain walls, and “timber-framed”
walls for low-rise construction. [Note that this is a British publication and as such has
different terms of reference. “Timber framing” is called light wood framing or platform framing
in Canada and the United States.]
Available at: BCIT, UBC

ASHRAE
Handbook of Fundamentals
Atlanta: American Society of Heating, Refrigerating and Air Conditioning Engineers 2005
“The ASHRAE Handbook-Fundamentals covers basic principles and data used in the HVAC&R industry.
This 2005 edition includes a new chapter 26, Insulation for Mechanical Systems, discusses thermal
and acoustical insulation for mechanical systems in residential, commercial, and industrial
facilities, including design, materials, systems, and installation for pipes, tanks, equipment,
and ducts. Chapter 28, Climatic Design Information, is extensively revised and has expanded table
data for each of the 4422 stations listed (USA/Canada/World), more than three times as many
stations as in the 2001 edition.”
Available at: BCIT, UBC, VPL

Barrett, Dave
The Renewal of Trust in Residential Construction: Commission of Inquiry into the Quality of
Condominium Construction in British Columbia
: Submitted to The Lieutenant-Governor in Council Government of British Columbia. 1998
“A Commission of Inquiry into the Quality of Condominium Construction in British Columbia was
appointed by the Minister of Municipal Affairs, through an Order in Council, on April 17, 1998 to
review the adequacy of protection, and accountability to, consumers for faulty condominium
construction, and to determine the reasons for, and the factors contributing to, faulty
construction. The Commission was also asked to recommend any measures needed to ensure consumer
protection and accountability for this construction.”
Available at: BCIT, VPL, UBC, HPO,

Barrett, Dave
The Renewal of Trust in Residential Construction: Commission of Inquiry into the Quality of
Condominium Construction in British Columbia, Part II
: Submitted to The Lieutenant-Governor in Council Government of British Columbia. 2000
Part II of the June 1998 publication of the same title.
Available at: VPL, UBC, HPO

Canada Mortgage and Housing Corporation
Best Practice Guide: Wood-Frame Envelopes
Ottawa: Mortgage and Housing Corporation 1999
“Based on the most effective practices used on construction sites across Canada, this
manual/CD-ROM package outlines the essential building science principles for quality wood-frame walls. Created for builders and designers, the kit addresses the need for interior air quality and moisture management necessary because of improved construction techniques, higher levels of insulation and air leakage control introduced in recent years. Practical information on need-to-know topics such as heat and moisture transfer, wood shrinkage and maintenance is combined with 14 best practices on three types of wall assemblies. You'll also get 18 special details for major components such as foundations, window openings and floor cantilevers. Sample specifications on the CD-ROM can easily be customized to your own circumstances.”

Available at: BCIT, UBC, VPL, CMHC

Canada Mortgage and Housing Corporation

Best Practice Guide: Building Technology Wood-Frame Envelopes in the Coastal Climate of British Columbia
Ottawa: Canada Mortgage and Housing Corporation
1999

“This publication/CD-ROM package was produced for builders and designers faced with the unique challenges of wood-frame home construction in B.C.'s coastal areas characterized by a high frequency of wind-driven rain. Endorsed by the Building Envelope Research Consortium and the Canadian Wood Council, you'll gain a better understanding of building science and learn how to construct reliable, durable and economical envelopes. Topics cover the prevention of wood decay; controlling moisture sources; application of the rain-screen principle to cladding; heat flow; most appropriate materials; and developing a building envelope maintenance and renewal plan. The CD-ROM features 53 best practice CAD drawings. Easy-to-use format covers the important principles behind the management of moisture in wood-frame wall systems.”

Available at: BCIT, UBC, VPL, CMHC, HPO

Canada Mortgage and Housing Corporation

Rain Penetration Control: Applying Current Knowledge
Ottawa: Canada Mortgage and Housing Corporation
1999

“This document focuses primarily on rain penetration control in walls and windows. Other wetting mechanisms include condensation and exposure to ground…Following a discussion of several approaches to water penetration in walls, including architectural design, there is a detailed explanation of the rain-screen principle and its application to contemporary buildings. Designers are further challenged to incorporate the Pressure Equalized Rain-Screen (PER) principles…To help design rainscreen curtain walls CMHC developed Rainscreen software. It allows designers to vary the parameters of their rain screen system and graphically see the resulting dynamic pressure distribution on cladding and air barrier (backpan) layers.”

Available at: VPL, CMHC

Canada Mortgage and Housing Corporation

Ice Damming Field Research
Ottawa: Canada Mortgage and Housing Corporation
2001
“Ice damming arises from differential melting and freezing of snow on a roof, and can damage roofing materials and cause water leakage inside the house. This research report documents repairs on residential buildings to address ice damming problems, and examines whether these repairs are successful in eliminating ice dams and their underlying causes.”

Available at: CMHC

Canada Mortgage and Housing Corporation
Research Report: 2001 Building Failures Study
Ottawa: Canada Mortgage and Housing Corporation
2002
“A summary of the most frequent deficiencies reported in 15 high-rise condominiums and a comparison of failure trends.”
Available at: CMHC

Canadian Home Builders’ Association
Canadian Home Builders’ Association Builders’ Manual
Ottawa: The Association
2001
“The CHBA builders’ manual summarizes the basic principles and techniques of leading edge home building in Canada. It is not intended to be an exhaustive treatment of building science or design, rather it outlines the fundamental principles of building high quality, energy and resource efficient homes with enough detail to show how they can be applied to the houses that builders are currently building. This manual represents the latest initiative of the Association to inform Canadian builders, as well as practitioners in other countries, of construction techniques resulting in housing which is better built, more comfortable, more energy efficient and more environmentally sensitive than ever before.”
Available at: BCIT

FP Innovations,
Guide for Designing Energy-Efficient Building Enclosures for Wood-Frame Multi-Unit Residential Buildings in Marine to Cold Climate Zones in North America
Vancouver: FP Innovations
2013
This new industry resource was developed by FPIInnovations, in partnership with the Homeowner Protection Office, Canadian Wood Council and RDH Building Engineering. The Guide is intended to help architects, engineers, designers and builders improve the thermal performance of building enclosures of wood multi-unit residential buildings. It looks at design and construction best practices and material used to ensure durable performance. As a companion to the Building Enclosure Design Guide of HPO, this Guide expands on the energy efficiency of building enclosures.

FPIInnovations
Pathways to High-performance Housing in British Columbia
Vancouver, BC, Canada: FPIInnovations
2014
This guide focuses on design and construction strategies and detailed measures to improve the energy efficiency of homes in British Columbia. It provides guidelines for designers and builders who are interested in the design and construction of single-family and small multi-family buildings that are substantially more energy efficient and lower in environmental impact than traditionally built homes. This guide focuses on design and construction strategies and detailed measures to improve the energy efficiency of homes in British Columbia. It provides guidelines for designers and builders who are interested in the design and construction of single-family and small multi-family buildings that are substantially more energy efficient and lower in environmental impact than traditionally built homes.

Developed jointly by FPInnovations, the Homeowner Protection Office, BC Hydro, FortisBC and the City of Vancouver, this free 220-page publication is available in PDF format. Available at: HPO

Homeowner Protection Office,
*Building Envelope Guide for Houses*
Burnaby: Homeowner Protection Office
2007
This easy-to-use guide provides practical information on the design and construction of the building envelope for new homes constructed in accordance with Part 9 of the 2006 British Columbia Building Code (BCBC) and the 2007 Vancouver Building By-law (VBBL). The Guide recognizes the complex ways that moisture influences building envelope durability and performance in the range of climate zones in British Columbia. It helps builders, designers and trades to put into practice the new Part 9 code provisions, including the new requirement for a rainscreen in the building envelope assembly of houses built in B.C.'s coastal or high moisture index regions.

Homeowner Protection Office,
*Compatibility of Fasteners and Connectors with Residential Pressure Treated Wood*
Vancouver: Homeowner Protection Office
2011
Best practices for types of fasteners and connectors to be used in contact with treated wood.

Homeowner Protection Office.; RDH Building Engineering Ltd.,
*Building Enclosure Design Guide: Wood-Frame Multi-Unit Residential Buildings*
Burnaby: Province of British Columbia & Homeowner Protection Office
2011
The Guide is intended for industry professionals involved with the design and construction of building enclosures of multi-unit, wood-frame residential buildings. Described as the industry’s most widely accepted reference on building enclosures, it’s an invaluable resource for builders, architects, designers, industry educators and others. The Guide explores the latest research, design and construction best practices. It offers practical solutions to ensure high-performance in new multi-unit residential construction. This includes building enclosure design and best practices for wood-frame construction in five and six-storey mid-rise buildings.
Hutcheon, N.B. and G. Handegord

*Building Science for a Cold Climate*

Ottawa: National Research Council of Canada, Institute for Research in Construction
1995

“Regarded by many as the definitive work on building in cold climates, this 400-plus page book will help you design buildings resilient enough to withstand Canada's harsh winters. The content is essential to understanding cold-climate building practices. The book systematically explains how the fundamental principles of physical science apply to building in Canada. The authors illustrate how various building approaches and materials affect the performance of buildings and their parts. Topics include heat transfer, solar radiation, wind, air leakage and ventilation, and water and buildings. The authors have employed numerous equations and illustrations to complement their information and have included references at the end of each chapter for those who wish to investigate certain areas further. *Building Science for a Cold Climate*, published in 1983 and still highly relevant today, serves as an excellent text for those in training and would be equally at home on the reference shelf of even the most seasoned.” [Although focused on cold climates, the basic building science is equally applicable to the coastal climate of British Columbia. Good source for data.]

Available at: BCIT, VPL, UBC, NRC-IRC

Huth, M. W.

*Understanding Construction Drawings*

Clifton Park, NY: Thomson Delmar Learning
2005

“Updated to the 2003 International Building and Residential Codes, the fourth edition of *Understanding Construction Drawings* continues to highlight a range of real construction projects - from residential dwellings to commercial structures. This enhanced edition takes a detailed approach to reading construction drawings by providing thorough coverage that builds the foundation for a broad understanding of the entire construction process, beginning with a simple duplex home that focuses readers on the fundamentals of views, lines, basic dimensioning, and symbols. Next, coverage of a multi-level single family home goes into more depth in orienting and cross-referencing drawings. The third section explores multifamily construction and is accompanied by more complex drawings for practice and more advanced interpretations. The final portion of the book introduces readers to elements of commercial construction, including structural steel, masonry, and reinforced concrete. A set of drawings accompanies each building so that readers can apply important skills and gain a real-world understanding of construction drawings.”

Available at: BCIT

Johnson, G.F.

*Alberta Building Envelope Failure Analysis*

Edmonton: Alta: Alberta Municipal Affairs
1991

“The walls, in particular, and building envelopes in general, of less than twenty year old medium and high rise residential buildings in Alberta have shown a marked reduction in performance. The principal objective of this study was to develop recommendations and strategies which, when
applied to the design, construction and maintenance of envelopes of the subject building categories, will significantly reduce the incidence of envelope failure and will result in a minimum cost, maximum benefit relationship in instances where envelope repair is required.”

[According to the author, Gary Johnson, this study shows that envelope failures are not a recent, nor a strictly British Columbia problem.]

Available at: VPL

Kesik, T. J.

*Canadian Wood-Frame House Construction*

Ottawa: Canada Mortgage and Housing Corporation

2005

“The updated version for the latest National Building Code contains new illustrations, sizing tables, planning notes and tips on healthy housing to improve indoor air quality and reduce environmental impact. An indispensable tool for builders, renovators and do-it-yourselfers, covering everything from site excavation to completion. Topics include: concrete work, footings and foundations; framing all parts of the house; roof sheathing; exterior finishes, trims and millwork; plumbing, heating and wiring; vapour and air barriers; insulation, fire and sound control; ventilation; interior wall and ceiling finishes, floor coverings; stairs, eaves, chimneys, and much more.”

Available at: BCIT, UBC, VPL, CMHC

Latta, J.K.

*Windows and Roofs for the Canadian Climate: A Summary of the Current Basis for Selection and Design*

Ottawa: National Research Council of Canada, Division of Building Research

1979

“This text brings together the Canadian Building Digests, Building Science Seminars, and other publications relating to the design of building enclosures in Canada. Serving as a building science primer the information is still valid today.”

Available at: VPL, UBC, NRC-IRC

Lewis G. Harriman, III, and Joseph W. Lstiburek

*The ASHRAE Guide for Buildings in Hot & Humid Climates*

: ASHRAE

2009

“The expanded second edition of The ASHRAE Guide for Buildings in Hot and Humid Climates triples the size of this popular reference, adding information on building enclosures, dehumidification, sustainability, mold avoidance, energy reduction, and much more—all tightly focused on the needs of owners, architects, and engineers who build and manage buildings in hot and humid climates. The book includes six chapters that discuss critical crosscutting issues for architecture, engineering, and building management along with eleven chapters of detailed and practical solutions to everyday problems in each area. This expanded second edition provides a richly illustrated summary of the state of the art in building science, moisture management, and techniques for reducing energy consumption in hot and humid climates, all based on real-world
field experience as well as on recent ASHRAE research.”

Lstiburek, J.  
*Builder’s Guide to Structural Insulation Panels (SIPs) for all Climate*  
: Building Science Press  
2008  
This builder's guide addresses construction in all hygro-thermal regions with extreme to low rain exposure zones for building enclosures and mechanical systems suited for a Class II interior climate - that is an interior climate that is temperature controlled, vapor pressure moderated and air pressure moderated. In other words houses, apartments, condominiums, townhouses, and manufactured housing. Information on specialized enclosures such as pools, spas and ski lodges in extreme climates can be found in the Appendices.

Lstiburek, J.  
*Building’s Guide to Cold Climates*  
Westfor, MA: Building Science Corporation  
2004  
“The North American Cold Climate edition of the Builder's Guide is augmented to provide the building industry with the latest and best practical information on how to apply building science principles to structures as systems in colder regions. A concise, graphically rich technical manual, it contains over 150 detailed illustrations showing the latest details and techniques to effectively implement energy and resource efficient residential construction with revised sections on: Foundations, Walls, Roofs and an expanded discussion of Vapour Barriers, Additional Appendixes plus a newly added Glossary of Terms. The new guide embodies much of what is now known about building homes that are affordable, durable, energy efficient, healthy, safe, comfortable and environmentally responsible.”  
Available at: BCIT

Lstiburek, J.  
*Building’s Guide to Hot-dry/Mixed-dry Climates*  
Westfor, MA: Building Science Corporation  
2004  
“The North American Hot-Dry/ Mixed-Dry Climate edition of the Builder's Guide now provides the building industry with the latest and best practical information on how to apply building science principles to structures as systems with revised sections on: Foundations, Walls, Roofs and an expanded discussion of Vapor Barriers, Additional Appendixes plus a newly added Glossary of Terms.”  
Available at: BCIT

Lstiburek, J.  
*Building’s Guide to Mixed-humid Climates*  
Westfor, MA: Building Science Corporation  
2005  
“The North American Mixed Climate edition of the Builder's Guide now provides the building
industry with the latest and best practical information on how to apply building science principles to structures as systems in mixed-humid "temperate" climate regions.”
Available at: BCIT

Lstiburek, J.
Building’s Guide to Hot/humid Climates
Westfor, MA: Building Science Corporation
2005
“The Builder's Guide will provide the building industry with the latest and best practical information on how to apply building science principles to structures as systems in hot-humid climate regions.”
Available at: BCIT

Lstiburek, J.
H2NØ
: Building Science Press
2008
"H2NØ is a book about HVAC-Heating, Ventilating, and Air Conditioning with an emphasis on moisture control-how mechanical systems might help or hinder keeping buildings dry. It talks about hardware, the components that make up our air conditioning systems. And it talks about fundamentals-thermodynamics, heat transfer, refrigeration, psychrometrics, load calculations-the underlying sciences. Air conditioning is at once fairly simple yet widely misunderstood. H2NØ peels away layers of myths and old wives’ tales, revealing the 80% that most everyone should understand, and highlighting the 20% that your HVAC professional had better understand. H2NØ is written for people who do not work in the HVAC trades or professions, but are interested in the health and comfort of buildings and their occupants. That would include architects, contractors, owners, facility managers, and students pursuing careers in these professions. And we should not forget the people who are running businesses and institutions-teachers, preachers, doctors and nurses, merchants, manufacturers, suppliers, executives, and perhaps most important of all homeowners-who are chronically confounded by their air conditioning systems."

Mathis, R. Christopher
Insulating Guide
: Building Science Press
2007
"This Guide provides builders and contractors with a variety of proven techniques for properly insulating a home. Part I represents general insulating and air sealing principles applicable to almost any construction project. Part II provides specific recommendations and best practices for many common residential construction details - from the foundation to the roof. While this Guide does not address every possible insulating system or air sealing technique, it does provide jobsite-proven examples for builders seeking to achieve superior levels of energy efficiency. The details shown have been built by numerous builders in a wide variety of successful beyond-code projects across the country. The insulating and air sealing principles and practices presented here are intended to be immediately applicable to almost any residential construction project.
Employing these techniques will help builders minimize their risk of callbacks while maximizing the likelihood of achieving superior levels of energy efficiency and overall home performance.

Monteyne, D. and J. O’Connor
*Wood-Frame Construction Practice in North America: An Annotated Bibliography*
Vancouver: Forintek Canada Corporation
2000
“This document is a list and review of 170 current published materials and web sites that deal with the design and construction of most types of wood buildings in North America, including both light and heavy timber framing. The focus is the structural use of wood rather than exterior or interior finishing, millwork, shingles, or other such components, although many books in this list cover all these topics. This bibliography also includes some items on related issues such as material properties, building systems, wood use, sustainable design, indoor air quality, new products, marketing, research, and testing. Most of the listings are recent, generally limited to those published since 1980, and largely restricted to publications originating within North America. Commentary provided for each item includes a description of the content and intended audience, as well as an opinion regarding quality of the document and its likely effectiveness in influencing the practice of wood design and construction. The literature search was aimed at materials targeted to architects, engineers, professional builders, and owner-builders/clients. This exercise is one step in examining how these specifiers get their information about wood and wood construction, and what is the nature and quality of that information. Also included is a brief history of wood building in North America.”
Available at: BCIT, Forintek Canada Corporation

Ontario New Home Warranty Program and the Ministry of Municipal Affairs and Housing
*High-Rise Residential Construction Guide*
Toronto: Ontario New Home Warranty Program
1995
“This handbook seeks to avoid the problems experienced in “high-rise” development of the condominium units enrolled under the Ontario New Homes Warranty Program. Details of every element of the building from foundations and parking garages to roof anchors are included as well as a checklist.”
Available at: VPL

RDH Building Engineering Ltd.,
*Energy Consumption and Conservation in Mid- and High-Rise Residential Buildings in British Columbia*
Burnaby: Homeowner Protection Office
2012
The main objectives of this research were to review and assess the effects of building enclosure improvements on the space conditioning energy use in typical mid- and high-rise multi-unit residential buildings in the Lower Mainland of British Columbia and Victoria, and to develop better strategies that take into account enclosure repairs, energy conservation and greenhouse gas emissions. Contributing partners to this project include: CMHC, HPO, BC Hydro, Fortis BC, City of
General References: Building Science, Building Envelope and Durability

Vancouver and RDH Building Engineering.

Roppel, Patrick ; Cianfrone, Christian and Norris, Neil
Building Envelope Thermal Bridging Guide
Vancouver, BC, Canada: BC Hydro Power Smart
2014
This guide explores how the building industry in British Columbia can meet the challenges of reducing energy use in buildings, in part by effectively accounting for the impact of thermal bridging. Most practitioners will find PART 1 and Appendices A and B to be most useful. PART 1 outlines how to effectively account for thermal bridging. Appendices A and B provide a catalog of common building envelope assemblies and interface details, and their associated thermal performance data. Researchers and regulators will be interested in PART 2 and PART 3, and Appendices C to E. They contain the cost-benefit analysis, and discussion on significance and further insights, of using this guide to mitigate thermal bridging in buildings. Co-funded by BC Hydro Power Smart, the Canadian Wood Council, Fortis BC, FPInnovations and the Homeowner Protection Office, this guide was prepared by engineering firm Morrison Hershfield Ltd. in conjunction with key stakeholders, partners and industry advisors.
Available at: HPO

Rose, W. B.
Hoboken, N.J.: John Wiley & Sons
2005
“This practical guide illuminates an essential understanding of the ‘whys’ of moisture problems, including valuable information on how water behaves and how its performance can be anticipated and managed in building design. With a special emphasis on water’s role in creating mold, an issue of growing concern and liability, Water in Buildings offers the most up-to-date information on rainwater management, below-grade water management, foundations, wall and roof construction, mechanical systems, moisture, and more. This guide features:- Clear explanations of how water interacts with building materials and equipment- An in-depth exploration of the paths of leaks- Numerous case studies on such well-known structures as Mount Vernon, Independence Hall, and Wingspan (Frank Lloyd Wright)- Numerous descriptive drawings and photographs.”
Available at: BCIT

Ruddick, J.N.R
Field Investigations on the Application of ACQ Treated Wood and Use of Metal Fasteners and Connectors in Residential Construction
Vancouver: Homeowner Protection Office
2006
“Chromated Copper Arsenate (CCA) treated lumber has been phased out for most exterior residential applications and is being replaced with Alkaline Copper Quaternary (ACQ). The copper levels in the ACQ treated wood are significantly greater than in the CCA treated wood, which increases the risk of galvanic corrosion on metal fasteners, connectors and anchors. Manufacturer guidelines and related literature suggest appropriate metal hardware be used with ACQ treated wood. A field
survey was carried out at a sample of building sites in the Lower Mainland region to determine
whether compatible metal components are specified and used, and whether there is an indication of
premature corrosion of metal components. Research partners include HPO and the Technical Research
Committee of the Canadian Home Builders Association of BC who assisted in identifying builders to
participate in the field survey.”
Available at: HPO

Rumbarger J. and R. J. Vitullo
*Architectural Graphic Standards for Residential Construction*
New York: John Wiley & Sons
2003
“Created exclusively for professionals working in residential design and construction, this guide
combines key information culled from the tenth edition of Architectural Graphic Standards with
all-new material on residential design. This special volume provides thousands of standard
architectural details and guidelines and is an easy reference for anyone designing or constructing
a residential project. In step with current practices, this volume includes the latest guidelines
for: 1) Energy efficiency, 2) Accessibility, 3) HVAC and indoor air quality, and 4) Green
construction.”
Available at: BCIT

Said, N.M.
*Moisture Measurement Guide for Building Envelope Applications*
Ottawa: for Research in Construction, National Research Council Canada
2004
“This document reviews literature and describes moisture measurement methods for field monitoring
applications of building envelopes with emphasis on continuous monitoring applications. Example
measurements and guidance on applications of moisture measurement methods are also presented.
Reviewed measurement methods are grouped according to measurement principles (resistance-,
voltage-, capacitance-, microwave-, or thermal-based methods). Resistance and voltage-based
sensors are most suitable for continuous monitoring applications. They can be readily connected to
a data logging system. Voltage-based moisture sensors are usually used to measure time-of-wetness
of surfaces. Their main weakness is durability, which can be quite short in outdoor applications.
Resistance-based sensors are used to monitor changes in wetness level within materials as well as
time-of-wetness of surfaces. They are durable and can be fabricated in-house. Their challenge is
for an instrumentation system that can measure a wide range of electrical resistance from few ohms
to several hundred M ohms. Alternatively, electric resistances can be measured indirectly in terms
of voltage using a half-bridge electric circuit.”
Available at: NRC-IRC

Schittch, C.
*In Detail, Building Skins: Concepts, Layers, Materials*
Munich: Institut fur International Architekur-Documentation GmbH
2001
“In recent years the facades of a building have become increasingly significant due to
unconventional choices of materials and the use of innovative technology. More and more the external surfaces are being perceived and designed as an integral part of the building…Focusing on the choice of materials and their application, the aesthetic qualities and the technical possibilities are presented in carefully selected international examples.”

Available at: Book retailers

Straube J. and E. Burnett
Building Science for Building Enclosures
Westfor, MA: Building Science Corporation
2005
“This book is intended for the building professional: the engineer, architect or technical specialist involved in the design, construction, operation, maintenance, repair, and renovation of buildings. The focus is on predicting and understanding the heat, air, and moisture response of the building enclosure, i.e., walls, windows, roofs, below-grade construction. The text moves from the fundamental physics to more practical applications for all climate regions, including worked example calculations of heat flow, vapor diffusion and air leakage condensation through building enclosures.”

Available at: BCIT, HPO

Structural Engineering Institute, American Society of Civil Engineers
Guideline for Condition Assessment of the Building Envelope
Reston, Va.: American Society of Civil Engineers
2000
“This Standard provides a guideline and methodology for assessing the condition and performance of existing building envelope systems and components, and identifying problematic and dysfunctional elements. As the adaptive reuse, rehabilitation, and improvement of existing buildings have assumed a more prominent role… the ability to accurately assess the conditions of a building is imperative. The condition of the building envelope is most important since failures can result in safety and health problems, as well as structural damage. Proper evaluation of the building envelope is often the first step toward stabilization and rehabilitation of the building. This Standard is a compilation of basic information, procedures, and references, and will be an asset to the investigator developing a logical approach to the assessment of the building envelope in order to focus on fundamental defects rather than outward symptoms.”

Available at: Structural Engineering Institute

Trechsel, H. R. and M. Bomberg
Moisture Control in Buildings: The Key Factor in Mold Prevention 2nd Edition
: ASTM International
2009
“Twenty-eight comprehensive chapters focus on the major issues involved in the process of moisture resistive construction. This one-of-a-kind publication provides the latest and most important information relating to moisture problems in buildings. Three new chapters have been added to make this the ultimate publication on moisture control: 1. Details and Practice discusses design details suitable for preventing moisture problems in service. • 2. Quality Management in
Design and Construction discusses the need for and application of quality control and management during design and construction for preventing moisture problems in service.  

3. Towards Development of Methods for Assessment of Moisture-Originated Damage looks to the future. The latest edition is divided into four parts:  

1. Fundamentals—addresses moisture transfer, condensation, and evaporation.  
2. Applications—discusses the technologies that affect the moisture balance in buildings and the techniques used to determine the suitability of materials, components, systems, and structures.  
3. Construction Principles and Recommendations—covers new and existing commercial and high buildings, new and existing residential buildings, and manufactured and historic buildings.  
4. Implementation—discusses implementation mechanisms.”

Available at: BCIT

Articles

Abdelouhab, Malya; Collignan, Bernard; Allard, Francis. 2010. Experimental study on passive Soil Depressurisation System to prevent soil gaseous pollutants into building. *Building and Environment* 11: 2400-2406  
Available at: BCIT, UBC

Abuku, Masaru; Fukushima, Akira; Tsukidate, Tsukasa; Iba, Chiemi; Watanabe, Hirofumi; Ogawa, Akihiro. 2012. Periodic alternation between intake and exhaust of air in dynamic insulation: A preliminary study. *5th International Building Physics Conference (IBPC) Kyoto, Japan*

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC
Available at: UBC

Available at: UBC

Available at: Public Libraries of B.C., ASHRAE


Available at: BCIT, UBC


An, Jae-Yoon; Kim, Sumin; Kim, Hyun-Joong; Seo, Janghoo. 2010. Emission behavior of formaldehyde and TVOC from engineered flooring in under heating and air circulation systems. *Building and Environment* 8: 1826-1833
Available at: BCIT, UBC


Available at: UBC

Available at: UBC
General References: Building Science, Building Envelope and Durability

Available at: BCIT, UBC

Angst, Vanessa; Malo, KjellArne. 2013. Moisture-induced stresses in glulam cross sections during wetting exposures. *Wood Science and Technology* 2: 227-241
Available at: UBC

Available at: BCIT, UBC

Available at: HPO, BCIT

Araujo Reis-Menezes, Adriana; Gambale, Walderez; Cintra Giudice, Mauro. 2011. A Survey of Fungal Contamination on Books in Public Libraries with Mechanical and Natural Ventilation. *Indoor and Built Environment* 4: 393-399
Available at: UBC

Arens, E., M. A. Humphreys, et al.. 2010. Are 'class A' temperature requirements realistic or desirable?. *Building and Environment* 45(1): 4-10
Available at: BCIT, UBC

Arvidsson, Jesper; Mjornell, Kristina; Ruud, Svein; Johansson, Pernilla; Noren, Joakim; Harderup, Lars-Erik; Jarnehammar, Anna. 2012. Wood Framed Buildings of the Future. *5th International Building Physics Conference (IBPC) Kyoto, Japan*

Available at: UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC
Available at: BCIT, CMHC, HPO

Available at: UBC

Available at: BCIT, UBC

Available at: UBC

Baizhan Li; Wenjie Li; Hong Liu; Runming Yao; Meilan Tan; Shenglan Jing; Xiaolei Ma. 2010. Physiological Expression of Human Thermal Comfort to Indoor Operative Temperature in the Non-HVAC Environment. *Indoor and Built Environment* 2: 221-229
Available at: UBC


Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC
Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: Public Libraries of B.C., ASHRAE

Available at: UBC

Available at: HPO, BCIT

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

villages, millenium water. *Proceedings of the 12th Canadian Conference on Building Science and Technology Montreal, Quebec*

Bitter, Frank; Muller, Birgit; Muller, Dirk. 2010. Estimation of odour intensity of indoor air pollutants from building materials with a multi-gas sensor system. *Building and Environment* 1: 197-204
Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: UBC

Borge-Diez, David; Colmenar-Santos, Antonio; Mur-Pérez, Francisco; Castro-Gil, Manuel. 2013. Impact of passive techniques and clean conditioning systems on comfort and economic feasibility in low-cost shelters. *Energy and Buildings* 0: 414-426
Available at: BCIT, UBC

Available at: UBC

Available at: UBC

44(11): 44-49
Available at: BCIT, UBC

Brian Stroik,. 2010. Why a Mock Up, Because the Owner Expects it Done Right. Building Enclosure Science & Technology Conference (BEST2) Portland, OR


Available at: BCIT, UBC

Available at: UBC


Available at: BCIT, UBC


Available at: Public Libraries of B.C., ASHRAE

Available at: UBC

Available at: BCIT, UBC

Available at: UBC

Available at: BCIT, UBC, VPL

Busque, P. M.. 2010. Review of High-rise Construction. *Proceedings of Building Enclosure Science and Technology (BEST2) Conference Portland, USA*
Available at: HPO, BCIT

Available at: BCIT, CMHC, HPO

Bwalya, A.C. et. al.. 2010. Survey results of combustible contents and floor areas in Canadian multi-family dwellings. *Fire Technology* 46 (1) : 1-20
Available at: BCIT, UBC, NRC-IRC


Available at: BCIT, CMHC, HPO

Available at: BCIT, UBC

Available at: BCIT, UBC
Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: Public Libraries of B.C., ASHRAE

Available at: BCIT, CMHC, HPO

Chen, Chun; Zhao, Bin; Zhou, Wanting; Jiang, Xinyi; Tan, Zhongchao. 2012. A methodology for predicting particle penetration factor through cracks of windows and doors for actual engineering application. *Building and Environment* 0: 339-348
Available at: BCIT, UBC

Available at: BCIT, UBC
General References: Building Science, Building Envelope and Durability

Available at: BCIT, UBC


Available at: BCIT, UBC

Available at: BCIT, UBC

Colantonio, A. and G. McIntosh . 2007. The Differences between large buildings and residential infrared thermographic inspections is like night and day. *Proceedings of the 11th Canadian Conference on Building Science and Technology Conference Banff, Alberta*

Collignan, Bernard; Lorkowski, Christophe; Améon, Roselyne. 2012. Development of a methodology to characterize radon entry in dwellings. *Building and Environment* 0: 176-183
Available at: BCIT, UBC

Available at: BCIT, UBC

constance thivierge; jieying wang; graham finch. 2011. building with clt panels - durability issues. *13th Canadian Conference on Building Science and Technology (CCBST) Winnipeg, MB*


General References: Building Science, Building Envelope and Durability

Available at: UBC

Available at: UBC


Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Davis, G. H.. 2010. Inherent risk of going green. *Proceedings of Building Enclosure Science and Technology (BEST2) Conference Portland, USA*
Available at: HPO, BCIT


de Gracia, Alvaro; Rincon, Lídia; Castell, Albert; Jimenez, Melanie; Boer, Dieter; Medrano, Marc; Cabeza, Luisa F.. 2010. Life Cycle Assessment of the inclusion of phase change materials (PCM) in experimental buildings. *Energy and Buildings* 9: 1517-1523
Available at: BCIT, UBC

Available at: UBC

Available at: Public Libraries of B.C., ASHRAE

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: UBC

Drzik, Milan; Mihalka, Peter; Matiasovsky, Peter. 2012. Experimental and numerical analysis of the boundary layer on a vertical plate at low temperature differences. *Journal of Building Physics* 4: 309-326
Available at: UBC

Available at: UBC

General References: Building Science, Building Envelope and Durability

Available at: BCIT, UBC


Available at: BCIT, CMHC, HPO


Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC


Eri Gavanski; Gregory A. Kopp; Arnold Ashton; Craig Miller; Murray J. Morrison. 2012. Damage to Residential Construction from the Tornadoes in Vaughan, Ontario, on August 20, 2009. *Forensic Engineering 2012 San Francisco, California*


Erin Walsh; Scott Tezak. 2012. Findings and Recommendations of FEMA's Mitigation Assessment Team
General References: Building Science, Building Envelope and Durability

Investigations of the Spring 2011 Tornado Outbreaks. *Forensic Engineering 2012 San Francisco, California*


Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC


Finch, Graham; Hubbs, Brian; Bombino, Robert. 2010. Moisture Transport by Osmotic Flow through Waterproofing Membranes â€” Toward the Development of Osmosis-Resistant Membranes. *Thermal Performance of the Exterior Envelopes of Whole Buildings XI International Conference* Figure 1: 1-8

Available at: BCIT, UBC

Available at: BCIT, UBC

Frenette, Caroline D.; Bulle, Cecile; Beauregard, Robert; Salenikovich, Alexander; Derome, Dominique. 2010. Using life cycle assessment to derive an environmental index for light-frame wood wall assemblies. *Building and Environment* 10: 2111-2122
Available at: BCIT, UBC

Available at: BCIT, UBC
Fucic, Aleksandra; Fucic, Lino; Katic, Jelena; Stojković, Ranko; Gamulin, Marija; Seferović, Enes. 2011. Radiochemical indoor environment and possible health risks in current building technology. *Building and Environment* 12: 2609-2614  
Available at: BCIT, UBC

Available at: HPO, BCIT

Available at: BCIT, CMHC, HPO

Available at: HPO, BCIT

Available at: BCIT, CMHC, HPO

Available at: BCIT, UBC

Available at: BCIT, UBC

Garcia-Gafaro, Carlos; Erkoreka, A.; Escudero-Revilla, César; Flores, Ivan; Martinez-Fontecha, Jon; Lizarraga, J. M. Sala. 2012. Experience gained in the Thermal Characterization of Building Components by using Paslink Test Cells. *5th International Building Physics Conference (IBPC) Kyoto, Japan*

Available at: BCIT, CMHC, HPO

1818-1828
Available at: BCIT, UBC

Available at: UBC

Available at: BCIT, UBC

Available at: BCIT, UBC, VPL


Available at: BCIT, UBC

Gerns, E. A. and J. D. Freedland. 2005. Construction sequencing: understanding the implication of failure and effective repairs for historic cladding systems. *American Society of Civil Engineers*

Available at: BCIT, UBC

Available at: BCIT, UBC

Graham Davis. 2010. The inherent risk of going green. *Building Enclosure Science & Technology Conference (BEST2) Portland, OR*


Graham Finch, ; Eric Burnett, ; Warren Knowles,. 2010. Energy Consumption in Mid and High Rise
Residential Buildings in British Columbia. Building Enclosure Science & Technology Conference (BEST2) Portland, OR


Grenga, Paolo N.; Gallagher, Michael J.; McGahan, Megan E.; Raymond, Danielle M.; Priefer, Ronny. 2011. Assessment of Airborne Total Volatile Organic Compounds of Niagara Falls Residences as Compared to Resident Lifestyle. Indoor and Built Environment 2: 226-231
Available at: UBC

Gumpertz, W.H. and D.A. Rutila. 1999. Building durability-know what you know or let’s use the knowledge we already have, before improving upon it. Proceedings of the 8th International Conference on Durability of Materials and Components Vancouver, British Columbia
Available at: VPL

Gunschera, Jan; Mentese, Sibel; Salthammer, Tunga; Andersen, Jan Rud. 2013. Impact of building materials on indoor formaldehyde levels: Effect of ceiling tiles, mineral fiber insulation and gypsum board. Building and Environment 0: 138-145
Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: UBC

Available at: UBC

Available at: BCIT, UBC

Han, Hyunjoo; Tai Kim, Jeong. 2010. Application of high-density daylight for indoor illumination. *Energy* 6: 2654-2666
Available at: UBC

Hang, Yin; Qu, Ming; Zhao, Fu. 2012. Economic and environmental life cycle analysis of solar hot water systems in the United States. *Energy and Buildings* 0: 181-188
Available at: BCIT, UBC


Available at: BCIT, UBC

Available at: Public Libraries of B.C.

Available at: BCIT, UBC


Available at: BCIT

Available at: BCIT, UBC

Several Corrosive and Non-Corrosive Drywalls and Effects of Drywall Finish on XRF Strontium Detection. *Journal of Testing and Evaluation*
Available at: UBC

Available at: UBC, CMHC

Available at: BCIT, UBC


Available at: BCIT, UBC

Hibino, Yu; Hokoi, Shuichi; Yoshida, Katsuaki; Takada, Satoru; Nakajima, Masanori; Yamate, Miho. 2012. Thermal Physiological Response to Local Heating and Cooling during Sleep. *5th International Building Physics Conference (IBPC) Kyoto, Japan*

Himpe, Eline; Trappers, Leen; Debacker, Wim; Delghust, Marc; Laverge, Jelle; Janssens, Arnold; Moens, Jan; Van Holm, Marlies. 2013. Life cycle energy analysis of a zero-energy house. *Building Research & Information* 4: 435-449


Available at: HPO, BCIT

Available at: Public Libraries of B.C., ASHRAE

Hong Soo Lim; Kim, Gon. 2010. Predicted Performance of Shading Devices for Healthy Visual Environment. *Indoor and Built Environment* 4: 486-496
Available at: UBC

Hong Soo Lim; Kim, Gon. 2010. Spectral Characteristics of UV Light Existing in Indoor Visual
Environment. *Indoor and Built Environment* 5: 586-591
Available at: UBC

Hong, Won-Kee; Park, Seon-Chee; Kim, Jin-Min; Kim, Seung-Il; Lee, Seung-Geun; Yune, Dai-Young; Yoon, Tae-Ho; Boong Yeol Ryoo,. 2010. Development of Structural Composite Hybrid Systems and their Application with regard to the Reduction of CO2 Emissions. *Indoor and Built Environment* 1: 151-162
Available at: UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: UBC

Available at: BCIT, UBC

Available at: BCIT

Available at: Public Libraries of B.C.

Hua, Jinjing; Ouyang, Qin; Wang, Yiran; Li, Hui; Zhu, Yingxin. 2012. A dynamic air supply device used to produce simulated natural wind in an indoor environment. *Building and Environment* 0: 349-356
Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, CMHC, HPO

Available at: UBC

Available at: BCIT

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, CMHC, HPO

Available at: BCIT, CMHC, HPO
Available at: UBC


Available at: UBC

Available at: BCIT, UBC


Jiang, Hai; Lu, Lin; Sun, Ke. 2010. Simulation of particle deposition in ventilation duct with a particle–wall impact model. *Building and Environment* 5: 1184-1191
Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC


Available at: BCIT, UBC
Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: HPO, BCIT

Kang, Dong Hwa; Choi, Dong Hee; Lee, Seung Min; Yeo, Myoung Souk; Kim, Kwang Woo. 2010. Effect of bake-out on reducing VOC emissions and concentrations in a residential housing unit with a radiant floor heating system. *Building and Environment* 8: 1816-1825
Available at: BCIT, UBC

Available at: UBC

Available at: UBC

Available at: UBC

Kashif, Ayesha; Ploix, Stephane; Dugdale, Julie; Le, Xuan Hoa Binh. 2013. Simulating the dynamics of occupant behaviour for power management in residential buildings. *Energy and Buildings* 0: 85-93
Available at: BCIT, UBC

Available at: BCIT, UBC

Keirnyn Ross, M. Z., Mike Khazzam. 2010. The Ultimate Envelope - Honest, Effective and Affordable. *Proceedings of Building Enclosure Science and Technology (BEST2) Conference Portland, USA* Available at: HPO, BCIT

Keirnyn Ross, ; Marc Zuluaga, ; Mike Khazzam,. 2010. The Ultimate Envelope â€“ Honest, Effective AND Affordable. *Building Enclosure Science & Technology Conference (BEST2) Portland, OR*


Kesik, T., S. Melnichuk, K., Pressnail, and D. D. Rose. 2009. Designing envelopes for cold climates using a limit states design approach and life cycle cost analysis. *Proceedings of the 12th Canadian Conference on Building Science and Technology Montreal, Quebec*


Kharrufa, Sahar N.; Adil, Yahyah. 2012. Upgrading the building envelope to reduce cooling loads. *Energy and Buildings 0*: 389-396 Available at: BCIT, UBC


Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Kim, Gon; Jeong Tai Kim,. 2010. UV-Ray Filtering Capability of Transparent Glazing Materials for Built Environments. *Indoor and Built Environment* 1: 94-101
Available at: UBC

Available at: BCIT, UBC

Kim, Jeong Tai; Kim, Gon. 2010. Overview and new developments in optical daylighting systems for building a healthy indoor environment. *Building and Environment* 2: 256-269
Available at: BCIT, UBC

Kim, Jeong Tai; Shin, Ju Young; Yun, Geun Young. 2012. Prediction of Discomfort Glares from Windows: Influence of the Subjective Evaluation of Window Views. *Indoor and Built Environment* 1: 92-97
Available at: UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Kim, Wonwoo; Kim, Jeong Tai. 2010. A distribution chart of glare sensation over the whole visual field. *Building and Environment* 4: 922-928
Kim, Wonwoo; Jeong Tai Kim,. 2011. The Scope of the Glare Light Source of the Window with Non-uniform Luminance Distribution. *Indoor and Built Environment* 1: 54-64
Available at: UBC

Available at: UBC

Available at: HPO, BCIT

Available at: UBC

Available at: UBC

Kolarik, Barbara; Gunnarsen, Lars; Traberg-Borup, Steen. 2012. Design Requirements for Sensing and Detoxification Devices to be Used in Large Public Spaces. Literature Review on Typical Pollutants and Their Concentrations. *Indoor and Built Environment* 3: 358-373
Available at: UBC

Kolarik, Barbara; Gunnarsen, Lars; Logadottir, Asta; Funch, Lis Winther. 2012. Concentrations of Formaldehyde in new Danish Residential Buildings in Relation to WHO Recommendations and CEN Requirements. *Indoor and Built Environment* 4: 552-561
Available at: UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC
Korjenic, Azra; Bednar, Thomas. 2010. Transformation of Fundamental Parameters for Energy Demand and Indoor Temperature from Room Level to Building Level. *Journal of Building Physics* 4: 327-355
Available at: UBC

Kosir, Mitja; Krainer, Ales; Kristl, Ziva. 2012. Control system for active regulation of building envelope performance. *5th International Building Physics Conference (IBPC) Kyoto, Japan*


Kramer, Rick; van Schijndel, Jos; Schellen, Henk. 2012. Simplified thermal and hygric building models: a literature review. *5th International Building Physics Conference (IBPC) Kyoto, Japan*

Available at: BCIT, UBC

Available at: Public Libraries of B.C., ASHRAE

Available at: BCIT, UBC

Available at: BCIT, CMHC, HPO

Available at: BCIT, UBC

Available at: BCIT, CMHC, HPO

General References: Building Science, Building Envelope and Durability

*Columbia*
Available at: BCIT, CMHC, HPO

Available at: VPL


Available at: BCIT, UBC


Available at: BCIT, UBC

Available at: BCIT, UBC

Lawton, M. 2010. Troubleshooting During Design. *Proceedings of Building Enclosure Science and Technology (BEST2) Conference Portland, USA* Available at: HPO, BCIT


Available at: BCIT, CMHC, HPO

Lee, Donghoon; Lee, Sungho; Kim, Jeong Tai; Kim, Sunkuk. 2012. A Lifecycle Health Performance Tree
Lee, Goonjae; Na, Youngju; Kim, Jeong Tai; Kim, Sunkuk. 2013. A Computing Model for Lifecycle Health Performance Evaluations of Sustainable Healthy Buildings. *Indoor and Built Environment* 1: 16-27
Available at: UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: HPO, BCIT

Available at: BCIT, UBC

Liu, Jing; Yao, Runming; McCloy, Rachel. 2012. A method to weight three categories of adaptive thermal comfort. *Energy and Buildings* 0: 312-320
Available at: BCIT, UBC

Available at: BCIT, UBC
Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Lstiburek, J. W. 2009. 5 Fundamental changes in the last 50 years. *ASHRAE Journal* 51(7): 54-56+54+56
Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Lstiburek, J. W. 2010. Pressure is on. *ASHRAE Journal* 52(9): 78-86
Available at: BCIT, UBC

Available at: BCIT, UBC

Lu, Xiaoshu; Lu, Tao; Viljanen, Martti; Kibert, Charles J. 2013. A new method for controlling CO2
in buildings with unscheduled opening hours. *Energy and Buildings* 0: 161-170
Available at: BCIT, UBC

Lu, Yang; Liu, Jing; Yoshino, Hiroshi; Lu, Bingnan; Jiang, Anxi; Li, Fen. 2012. Use of Biotechnology Coupled with Bake-Out Exhaust to Remove Indoor VOCs. *Indoor and Built Environment* 6: 741-748
Available at: UBC

Available at: BCIT, UBC

Available at: Public Libraries of B.C., ASHRAE


Available at: Public Libraries of B.C., ASHRAE


Available at: BCIT, CMHC, HPO

Available at: UBC

Available at: BCIT, UBC
Available at: BCIT, UBC

Marion, Michael; Tiffonnet, Anne Lise; Santa-Cruz, Alina; Makhloufi, Rachid. 2011. Study of the resistances to transfer of gaseous pollutant between material and indoor air. *Building and Environment* 2: 356-362
Available at: BCIT, UBC

Mark Lawton, ; David Ricketts, . 2012. Guidelines for the Practice of Building Enclosure Engineering. *Building Enclosure Science & Technology Conference (BEST3) Atlanta, GA*

Available at: UBC

Available at: UBC

Available at: BCIT, UBC

Available at: Public Libraries of B.C., ASHRAE

Available at: BCIT, CMHC, HPO

Available at: BCIT, UBC


McLeod, Phil; Fay, Roger. 2011. The cost effectiveness of housing thermal performance improvements
Available at: UBC

Available at: UBC

McNabola, Aonghus; Oâ€™Luanaigh, Niall; Gallagher, John; Gill, Laurence. 2013. The development and assessment of an aspiration efficiency reducing system of air pollution control for particulate matter in building ventilation systems. *Energy and Buildings* 0: 177-184
Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, CMHC, HPO


Minjung Maing,. 2012. Physical or Virtual? : Effectiveness of virtual mockups of building envelope systems. *Building Enclosure Science & Technology Conference (BEST3) Atlanta, GA*

Available at: UBC

Available at: BCIT, UBC

Available at: UBC


Available at: BCIT, UBC

Available at: BCIT, UBC

Moon, Jin Woo; Kim, Jong-Jin. 2010. ANN-based thermal control models for residential buildings. *Building and Environment* 7: 1612-1625
Available at: BCIT, UBC

Available at: BCIT, UBC

Mora, Rodrigo; Bitsuamlak, Girma; Horvat, Miljana. 2011. Integrated life-cycle design of building enclosures. *Building and Environment* 7: 1469-1479
Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Mui, KW; Wong, LT; Hui, KW. 2012. Downtime of in-use water pump installations for high-rise residential buildings. *Building Services Engineering Research and Technology* 2: 181-190
Available at: BCIT, UBC

Durability of Building Materials and Components Istanbul, Turkey

Na, UngJin; Kwon, Seung-Jun; Chaudhuri, SamitRay; Shinozuka, Masanobu. 2012. Stochastic model for service life prediction of RC structures exposed to carbonation using random field simulation. *KSCE Journal of Civil Engineering* 1: 133-143

Available at: BCIT, UBC

Available at: BCIT, CMHC, HPO

Nes, D., and J. Wells. 2009. Building envelope failure analysis due to precipitation ingress in Northern Climate. *Proceedings of the 12th Canadian Conference on Building Science and Technology Montreal, Quebec*

Available at: BCIT, UBC

Available at: BCIT, UBC

Nunnelly, R. M. . 2008. Mold: A design or operations issue?. *Engineered Systems* 25(7) : 36-42
Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC
Oldewurtel, Frauke; Sturzenegger, David; Morari, Manfred. 2013. Importance of occupancy information for building climate control. Applied Energy 0: 521-532
Available at: UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Ordonez, Javier; Modi, Vijay. 2011. Optimizing CO2 emissions from heating and cooling and from the materials used in residential buildings, depending on their geometric characteristics. Building and Environment 11: 2161-2169
Available at: BCIT, UBC

Orehounig, Kristina; Mahdavi, Ardeshir; Doppelbauer, Eva-Maria; Loibl, Wolfgang; Totzer, Tanja. 2012. The impact of climate change and local microclimatic variance on building design decision making. 5th International Building Physics Conference (IBPC) Kyoto, Japan

Available at: BCIT, UBC

Available at: BCIT, CMHC, HPO

Available at: UBC

Available at: BCIT, UBC

Park, Jae Hong; Yoon, Ki Young; Hwang, Jungho. 2011. Removal of submicron particles using a carbon fiber ionizer-assisted medium air filter in a heating, ventilation, and air-conditioning (HVAC) system. *Building and Environment* 8: 1699-1708
Available at: BCIT, UBC

Paul Creighton, D. M. 2010. The Reconstruction of a Perfectly Adequate Occupied Corporate HQ. *Proceedings of International Conference of Building Envelope Systems and Technology (ICBEST)* Vancouver, British Columbia
Available at: BCIT, CMHC, HPO

Available at: BCIT, CMHC, HPO

Available at: BCIT, UBC


Peffer, Therese; Pritoni, Marco; Meier, Alan; Aragon, Cecilia; Perry, Daniel. 2011. How people use thermostats in homes: A review. *Building and Environment* 12: 2529-2541
Available at: BCIT, UBC

Pei, Lixia; Zhou, Jingru; Zhang, Lizhi. 2013. Preparation and properties of Ag-coated activated carbon nanocomposites for indoor air quality control. *Building and Environment* 0: 108-113
Available at: BCIT, UBC

Philip Parker, C. L. 2010. Thermal and Hygrothermal Analysis in Building Envelope Commissioning. *Proceedings of Building Enclosure Science and Technology (BEST2) Conference Portland, USA* Available at: HPO, BCIT

Philip Parker,; Cara Lozinsky,. 2010. Thermal and hygrothermal analysis in building envelope commissioning. *Building Enclosure Science & Technology Conference (BEST2) Portland, OR*

Available at: UBC
General References: Building Science, Building Envelope and Durability

Available at: BCIT, UBC

Popescu, Razvan Stefan; Blondeau, Patrice; Jouandon, Eric; Costes, J. C.; Fanlo, J. L.. 2013. Elemental modeling of adsorption filter efficiency for indoor air quality applications. *Building and Environment* 0: 11-22
Available at: BCIT, UBC


Available at: BCIT, CMHC, HPO

Available at: BCIT, UBC


Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC
Rishi Gupta, ; Bill McEwen,; Amrit Basra,. 2013. Effect of temperature and aging on dimensional changes of bricks and mortar used for masonry veneer. *12th Canadian Masonry Symposium Vancouver, BC*

Available at: UBC


Rodrigo Mora, ; Fitsum Tariku, ; Girma Bitsuamlak,. 2012. Performance-Risk Analysis For the Design of High-Performance Affordable Homes. *Building Enclosure Science & Technology Conference (BEST3) Atlanta, GA*


Available at: HPO, BCIT

Available at: HPO, BCIT

Ryu, Ji-Won; Jung, Eung-Ho; Kim, Dae-Wuk; Choi, Dong-Sik; Hoyano, Akira. 2012. Analysis of Thermal Environment of External Space following the Fence Demolition Campaign in Detached Housing Area. *5th International Building Physics Conference (IBPC) Kyoto, Japan*

Available at: BCIT, CMHC, HPO

Available at: BCIT, UBC

Available at: BCIT, UBC
Available at: UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: UBC

Available at: BCIT, UBC

Sanati, Leyla; Utzinger, Michael. 2013. The effect of window shading design on occupant use of blinds and electric lighting. *Building and Environment* 0: 67-76
Available at: BCIT, UBC

Available at: BCIT, UBC


Available at: BCIT, UBC

Available at: BCIT, UBC
Schweiker, Marcel; Brasche, Sabine; Bischof, Wolfgang; Hawighorst, Maren; Voss, Karsten; Wagner, Andreas. 2012. Development and validation of a methodology to challenge the adaptive comfort model. *Building and Environment* 0: 336-347  
Available at: BCIT, UBC


Sennes, Vincent; Felonneau, Marie-Line; Gombert-Courvoisier, Sandrine; Ribeyre, Francis. 2013. How Do Households Perceive Risks at the Scale of the Environment in Their Own Home?. *Indoor and Built Environment* 2: 422-432  
Available at: UBC

Seo, Janghoo; Ataka, Yuji; Kato, Shinsuke; Kim, Jeong Tai. 2013. Long/Short-Term Performance Test for Evaluating the Reduction of Indoor Formaldehyde Using Sorptive Building Materials. *Indoor and Built Environment* 1: 52-60  
Available at: UBC

Available at: UBC

Available at: BCIT, UBC

Available at: Public Libraries of B.C., ASHRAE

Available at: UBC

Available at: UBC


Sicurella, Fabio; Evola, Gianpiero; Wurtz, Etienne. 2012. A statistical approach for the
Available at: BCIT, UBC

Silva, Wilton; Pereira; Silva, Laerson; Duarte; e Silva, Cleide M. D. P. S.; Nascimento, Pedro L. 2011. Optimization and simulation of drying processes using diffusion models: application to wood drying using forced air at low temperature. *Wood Science and Technology* 4: 787-800
Available at: UBC

Available at: UBC

Available at: BCIT, UBC

Available at: UBC


Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC
Stazi, Francesca; Mastrucci, Alessio; Munafò, Placido. 2012. Life cycle assessment approach for the optimization of sustainable building envelopes: An application on solar wall systems. Building and Environment 0: 278-288
Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: UBC

Available at: UBC

Available at: UBC

Stroik, B. 2010. Commissioning the Building Enclosure. Proceedings of Building Enclosure Science and Technology (BEST2) Conference Portland, USA
Available at: HPO, BCIT

Available at: HPO, BCIT


Available at: BCIT, UBC

Available at: BCIT, UBC
Available at: BCIT, UBC


Available at: BCIT, CMHC, HPO

Available at: BCIT, UBC

Tadas, Prasauskas; Dainius, Martuzevicius; Edvinas, Krugly; Linas, Kliucininkas; Maksim, Kireitseu; Axel, Zerrath. 2011. Comparative characterization of particle emissions from asbestos and non-asbestos cement roof slates. *Building and Environment* 11: 2295-2302
Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: UBC

Available at: UBC


Tariku, Fitsum ; Kumar Kumaran.; Paul Fazio., 2010. Development and benchmarking of a new whole
building hygrothermal model. *Building Enclosure Science & Technology Conference (BEST2) Portland, OR*

Available at: BCIT, UBC

Available at: Public Libraries of B.C., ASHRAE

Available at: BCIT, UBC

Available at: HPO, BCIT

Available at: Public Libraries of B.C.

Available at: UBC

Todorovic, Marija S.; Kim, Jeong Tai. 2012. Beyond the science and art of the healthy buildings daylighting dynamic control's performance prediction and validation. *Energy and Buildings* 0: 159-166
Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC
General References: Building Science, Building Envelope and Durability

*ASHRAE Transactions* 116(1): 358-364
Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: HPO, BCIT

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Tuohy, P. R., Sue; Nicol, Fergus; Humphreys, Mike; Boerstra, Atze. 2010. Twenty first century standards for thermal comfort: fostering low carbon building design and operation. *Architectural Science Review* 53(1): 78-86(9)
Available at: UBC

Tuohy, Paul; Roaf, Sue; Nicol, Fergus; Humphreys, Mike; Boerstra, Atze. 2010. Twenty first century standards for thermal comfort: fostering low carbon building design and operation. *Architectural Science Review* 1: 78-86
Available at: UBC

Available at: BCIT, UBC

Available at: UBC

Available at: BCIT, CMHC, HPO

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

General References: Building Science, Building Envelope and Durability

*Proceedings of the 4th International Building Physics Conference: Energy Efficiency and New Approaches Istanbul, Turkey*

Villafruela, Jose Manuel; Castro, Francisco; San Jose, Julio Francisco; Saint-Martin, Julien. 2013. Comparison of air change efficiency, contaminant removal effectiveness and infection risk as IAQ indices in isolation rooms. *Energy and Buildings* 0: 210-219
Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, CMHC, HPO

Wagdy Anis,. 2010. Six ways for condensation in buildings. *Building Enclosure Science & Technology Conference (BEST2) Portland, OR*

Available at: BCIT, UBC

Available at: UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: UBC

Available at: UBC

BSCE, BCIT-HPO 62 May, 2015
Warren Knowles; Brian Hubbs; Paul Kernan; Graham Finch. 2010. A New Paradigm for the Design of Sustainable Buildings. *Building Enclosure Science & Technology Conference (BEST2) Portland, OR*

Available at: BCIT, UBC

Wei, Shengxian; Li, Ming; Lin, Wenxian; Sun, Yanlin. 2010. Parametric studies and evaluations of indoor thermal environment in wet season using a field survey and PMV–PPD method. *Energy and Buildings* 6: 799-806
Available at: BCIT, UBC

Welle, Benjamin; Rogers, Zack; Fischer, Martin. 2012. BIM-Centric Daylight Profiler for Simulation (BDP4SIM): A methodology for automated product model decomposition and recomposition for climate-based daylighting simulation. *Building and Environment* 0: 114-134
Available at: BCIT, UBC


Available at: BCIT, UBC, VPL

Available at: BCIT, CMHC, HPO

Available at: BCIT, CMHC, HPO

Available at: UBC
Available at: BCIT, UBC


Available at: UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Xu, Qiujuan; Zhang, Yinping; Mo, Jinhao; Li, Xinxiao. 2013. How to Select Adsorption Material for Removing Gas Phase Indoor Air Pollutants: A New Parameter and Approach. *Indoor and Built Environment* 1: 30-38
Available at: UBC

Available at: BCIT, UBC

Yang, Jeong-Hoon; Kim, Taeyeon; Cheong, Chang Heon. 2013. Supply airflow control algorithm of a floor-standing room air-conditioner to achieve thermal comfort for residential housing in summer. *Building and Environment* 0: 227-238
Available at: BCIT, UBC

Available at: BCIT, UBC
General References: Building Science, Building Envelope and Durability

Kevser Co. 2008. Durability of external wood-frame door system, a case study. *11DBMC International Conference on Durability of Building Materials and Components Istanbul, Turkey*

Ye, Hong; Wang, Kai; Zhao, Xiaofeng; Chen, Feng; Li, Xuanqi; Pan, Lingyang. 2011. Relationship between construction characteristics and carbon emissions from urban household operational energy usage. *Energy and Buildings* 1: 147-152
Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC


You, Wei; Qin, Menghao; Ding, Wo Wo. 2012. Improving building facade design using integrated simulation of daylighting, thermal performance and natural ventilation. *5th International Building Physics Conference (IBPC) Kyoto, Japan*

Yu, Chuck W.F.; Kim, Jeong Tai. 2012. Long-term Impact of Formaldehyde and VOC Emissions from Wood-based Products on Indoor Environments; and Issues with Recycled Products. *Indoor and Built Environment* 1: 137-149
Available at: UBC

Yu, Chuck W.F.; Kim, Jeong Tai. 2012. Low-Carbon Housings and Indoor Air Quality. *Indoor and Built Environment* 1: 5-15
Available at: UBC

Available at: UBC

Available at: BCIT, UBC

General References: Building Science, Building Envelope and Durability

Shape Grammar to Capture Building Style. *Journal of Computing in Civil Engineering* 1: 113-130
Available at: BCIT, UBC

Zari, Maibritt Pedersen. 2012. Ecosystem services analysis for the design of regenerative built environments. *Building Research & Information* 1: 54-64

Available at: BCIT, CMHC, HPO

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: BCIT, UBC

Available at: UBC

Available at: UBC

Zhong, Ke; Yang, Xiufeng; Kang, Yanming. 2010. Effects of ventilation strategies and source locations on indoor particle deposition. *Building and Environment* 3: 655-662
Available at: BCIT, UBC

Available at: BCIT, UBC