

# Maintenance and Renovation

## Books and Research Reports

Canada Mortgage and Housing Corporation

*Moisture and Air: Householder's Guide, Problems and Remedies*

Ottawa: Canada Mortgage and Housing Corporation

1989

“This document is intended to help you find some of the typical signs of moisture and air quality problems in your house, to identify the probable causes and to propose practical solutions. Many household problems can be solved if a householder does one or more of the following: change practices, perform maintenance or minor repairs, have a professional contractor make major repairs.”

Available at: VPL, CMHC

Canada Mortgage and Housing Corporation

*About Your House*

Ottawa: Canada Mortgage and Housing Corporation

1995, 1996

“Instead of guessing whether or not you have a humidity problem inside your house, why not find out for sure? If you live in a damp house, or if you have ever experienced flooding, your home may be breeding an often-invisible and always unwelcome intruder - mold. Mold can cause allergies and respiratory disease. The toxins it produces can wear down the immune system — leaving people, especially children, vulnerable to many illnesses. If you discover mold, it is important to destroy it quickly. It is equally as important that you take precautions before you begin. Whether you do the job yourself or hire a contractor, the following steps should be taken to destroy molds and prevent them from re-infecting your home.”

Available at: VPL, CMHC

Canada Mortgage and Housing Corporation

*Building Solutions: A Problem Solving Guide for Builders and Renovators*

Ottawa: Canada Housing and Mortgage Corporation

1998

Available at: BCIT, VPL, CMHC

Canada Mortgage and Housing Corporation

*Building Envelope Rehabilitation: Consultant Guide* Second Edition

Ottawa: Canada Housing and Mortgage Corporation

2001

“One of three publications addressing the rehabilitation of wood frame buildings in coastal BC, this document is more focused on the consultants' role in rehabilitation. The guide is intended to provide a better understanding of the technical concepts, issues and rehabilitation process.”

Available at: VPL, CMHC

Canada Mortgage and Housing Corporation

*Building Envelope Rehabilitation Owner/Property Manager Guide*

Ottawa: Canada Mortgage and Housing Corporation

2001

“One of three publications addressing the rehabilitation of wood frame buildings in coastal B.C., this document is directed towards owners and property managers. The guide is intended to provide a better understanding of the technical concepts, issues and rehabilitation process.”

Available at: VPL, CMHC

Condominium Home Owners Association

*“Get to Know” and “How to Care” for your Balcony*

: New Westminster: CHOA Journal

2004

“Most problems associated with water infiltration and premature deterioration of balcony components can be related to the design of the balcony, construction deficiencies, durability or compatibility of the materials used, lack of maintenance and renewal of balcony components, improper maintenance of balcony components, or some combination of these factors”.

Available at: CHOA, HPO

Homeowner Protection Office

*Building Envelope Maintenance Bulletin, Maintenance Matters #1, Paints, Stains and Coatings*

Vancouver: Homeowner Protection Office

2006

“This bulletin helps to identify the different paints, stains and coatings that are commonly applied on the exterior of your building, identifying the maintenance that must be performed, how often maintenance must be performed, who should be called for service, and importance of preparation before painting.”

Available at: CHOA, HPO

Homeowner Protection Office

*Building Envelope Maintenance Bulletin, Maintenance Matters #2, Maintaining Your Roofing*

Vancouver: Homeowner Protection Office

2006

“This bulletin provides a description of roof types, the importance of developing a roofing maintenance plan, how often roofs should be maintained and who should be called for service. Also included is a checklist of common roof inspection and maintenance items and suggested actions.”

Available at: CHOA, HPO

Homeowner Protection Office

*Building Envelope Maintenance Bulletin, Maintenance Matters #3, Avoiding Condensation*

Vancouver: Homeowner Protection Office

2006

“This bulletin provides information on condensation, sources of moisture in the home, how to avoid condensation problems, and dealing with persistent condensation problems.”

Available at: HPO

Homeowner Protection Office

*Building Envelope Maintenance Bulletin, Maintenance Matters # 4, Residential Windows and Exterior Doors*

Vancouver: Homeowner Protection Office

2006

“Provides information on inspection and maintenance to ensure good long-term performance of windows and exterior doors and aids in recognizing when professional assistance is required. Also included is a checklist of common window and door maintenance items and suggested actions.”

Available at: CHOA, HPO

Homeowner Protection Office

*Exposed Wood Structures*

Vancouver BC: Homeowner Protection Office

2011

There is a long tradition of wood construction of residential buildings in British Columbia. Wood is valued for its strength, cost effectiveness and natural visual qualities. In addition to its use in structural framing, wood is used as a finishing and cladding material. Much of the wood used in buildings is concealed in walls and building interiors. However, in many buildings, wood elements are also used on the building exterior and are exposed to the environment. Examples of exposed wood elements include siding and trim, posts, decks, walkways, stairs, balcony guards and fences.

Homeowner Protection Office

*Creating and Implementing a Building Envelope Maintenance and Renewals Program*

Vancouver, BC: Homeowner Protection Office

2013

In this bulletin we will look at how to create and implement a maintenance and renewals program that will protect your building’s assets and the owners' investment.

Homeowner Protection Office

*Building Envelope Maintenance Bulletin, Maintenance Matters # 5, Sealants*

Vancouver: Homeowner Protection Office

2009

“This bulletin provides information on inspection and maintenance of sealants to ensure the integrity of building envelopes to prevent water and air leakage and aids in recognizing when professional assistance is required. Also included is a checklist of common sealant maintenance items and suggested actions.”

Available at: CHOA, HPO

Homeowner Protection Office

*Building Envelope Maintenance Bulletin, Maintenance Matters # 6, Decks and Balconies*  
Vancouver: Homeowner Protection Office  
2009

“This bulletin provides information on inspection and maintenance of decks and balconies to prevent water leakage and damages and aids in recognizing when professional assistance is required. Also included is a checklist of common decks and balconies maintenance items and suggested actions.”

Available at: CHOA, HPO

Homeowner Protection Office

*Building Envelope Maintenance Bulletin, Maintenance Matters # 7, Building Envelope Maintenance and Renewals Planning*

Vancouver: Homeowner Protection Office  
2009

“This bulletin provides information on the importance of maintaining the building envelopes, and the key documents owners need to keep to support effective maintenance and renewal planning. Also included is the tips in recognizing when professional assistance is required and suggested actions.”

Available at: CHOA, HPO

Simmons, H.L

*Repairing and Extending Weather Barriers*  
New York: Van Nostrand Reinhold  
1989

This is the “first of eight volumes in Van Nostrand Reinhold’s Building Renovation and Restoration Series. The data includes a description of each weather barrier, recommendations about how they are supposed to be installed and maintained, the reasons they fail, and the industry’s recommendations for repairing and extending them and for installing them over existing materials.”

Available at: BCIT, VPL, CMHC

## Articles

Anthony, Ronald W.. 2010. Nondestructive Evaluation: Wood. *APT Bulletin* 4: 1-6  
Available at: UBC

Barret, Bart B. ; James M. Falls. 2012. Common Perils of Ceramic Floor Tile Systems. *Forensic Engineering 2012 San Francisco, California*

Bibee, D. V., K. L. Johnson, et al.. 2010. Air Sealing Existing Homes with Foam-in-a-Can Rivals Energy Cost Benefits of CFLs. *Proceedings of Thermal Performance of Exterior Envelopes of Whole Buildings XI Florida, USA*  
Available at: Public Libraries of B.C., ASHRAE

Bin, Guoshu; Parker, Paul. 2012. Measuring buildings for sustainability: Comparing the initial and

retrofit ecological footprint of a century home - The REEP House. *Applied Energy* 0: 24-32  
Available at: UBC

Blaszak, Katarzyna M. . 2011. Toward sustainability: Prioritizing retrofit options for toronto's single-family homes. *13th Canadian Conference on Building Science and Technology (CCBST) Winnipeg, MB*

Byrne, Aimee; Byrne, Gerard; Davies, Anna; Robinson, Anthony James. 2013. Transient and quasi-steady thermal behaviour of a building envelope due to retrofitted cavity wall and ceiling insulation. *Energy and Buildings* 0: 356-365  
Available at: BCIT, UBC

C. Legge, J. S.. 2010. The Paloma CO-OP Rehabilitation Case Study Examining the Challenges to Energy Upgrades. *Proceedings of International Conference of Building Envelope Systems and Technology (ICBEST) Vancouver, British Columbia*  
Available at: BCIT, CMHC, HPO

Chantrelle, Fanny Pernodet; Lahmidi, Hicham; Keilholz, Werner; Mankibi, Mohamed El; Michel, Pierre. 2011. Development of a multicriteria tool for optimizing the renovation of buildings. *Applied Energy* 4: 1386-1394  
Available at: UBC

Christoph Buxbaum, W. G., S. Kircher, Carinthia U.of Applied Sciences, Spittal an der Drau, and O. Pankratz, Haidershofen, and A. Seiler. 2010. Thermal Rehabilitation of Existing Buildings with Vacuum Insulation Panel. *Proceedings of Building Enclosure Science and Technology (BEST2) Conference Portland, USA*  
Available at: HPO, BCIT

Coffelt, D.; Hendrickson, C.. 2012. Case Study of Occupant Costs in Roof Management. *Journal of Architectural Engineering* 4: 341-348  
Available at: BCIT, UBC

Dabija, A.-M.. 2010. Policies and Possibilities for Refurbishing the Existing Buildings in Romania. *Proceedings of International Conference of Building Envelope Systems and Technology (ICBEST) Vancouver, British Columbia*  
Available at: BCIT, CMHC, HPO

Dam, John. 2011. Improving Hygrothermal Performance of a Historic Building in British Columbia. *APT Bulletin* 4: 47-52  
Available at: UBC

Das, S.; Chew, M.. 2011. Generic Method of Grading Building Defects Using FMECA to Improve Maintainability Decisions. *Journal of Performance of Constructed Facilities* 6: 522-533  
Available at: BCIT, UBC

Deurinck, Mieke; Saelens, Dirk; Roels, Staf. 2012. Assessment of the physical part of the temperature takeback for residential retrofits. *Energy and Buildings* 0: 112-121  
Available at: BCIT, UBC

E. Brandt, T. B.-N.. 2010. Refurbishment of Facades – External vs. Internal Additional Insulation. *Proceedings of International Conference of Building Envelope Systems and Technology (ICBEST) Vancouver, British Columbia*  
Available at: BCIT, CMHC, HPO

Fatiguso, Fabio ; Giambattista De Tommasi . 2008. Technological Features and Decay Processes of A "New" Building Type at The Beginning of XX Century. *IIDBMC International Conference on Durability of Building Materials and Components Istanbul, Turkey*

Flores-Colen, I.; de Brito, J.; Freitas, V.. 2010. Discussion of Criteria for Prioritization of Predictive Maintenance of Building Façades: Survey of 30 Experts. *Journal of Performance of Constructed Facilities* 4: 337-344  
Available at: BCIT, UBC

Flores-Colen, Ines; de Brito, Jorge. 2010. A systematic approach for maintenance budgeting of buildings façades based on predictive and preventive strategies. *Construction and Building Materials* 9: 1718-1729  
Available at: UBC

Gaiao, C.; de Brito, J.; Silvestre, J.. 2011. Inspection and Diagnosis of Gypsum Plasterboard Walls. *Journal of Performance of Constructed Facilities* 3: 172-180  
Available at: BCIT, UBC

Garrido, M. A.; Paulo, P. V.; Branco, F. A.. 2012. Service life prediction of façade paint coatings in old buildings. *Construction and Building Materials* 0: 394-402  
Available at: UBC

Hadi, M.; Saeed Alrudaini, T.. 2012. New Building Scheme to Resist Progressive Collapse. *Journal of Architectural Engineering* 4: 324-331  
Available at: BCIT, UBC

Hallberg, Daniel ; Jan Akander ; Bojan Stojanovic; Mikael Kedb. 2008. Life Cycle Management System - A Planning Tool Supporting Long-Term Based Design and Maintenance Planning. *IIDBMC International Conference on Durability of Building Materials and Components Istanbul, Turkey*

Hamid Heidarali, ; Sophie Mercier, . 2011. A Design Approach to Envelope Remediation of Heritage Buildings: Field Monitoring of Salt Building. *13th Canadian Conference on Building Science and Technology (CCBST) Winnipeg, MB*

Harvey Jr, Donald W.; Schuller, Michael P.. 2010. Nondestructive Evaluation: Structural Performance of Masonry. *APT Bulletin* 2/3: 1-8  
Available at: UBC

Kelly, N. J.; Cockroft, J.. 2011. Analysis of retrofit air source heat pump performance: Results from detailed simulations and comparison to field trial data. *Energy and Buildings* 1: 239-245  
Available at: BCIT, UBC

Kramer, M. A., B. Hubbs, et al.. 2010. Monitoring of Historic Structures for Whole-Building Improvements. *Proceedings of Thermal Performance of Exterior Envelopes of Whole Buildings XI Florida, USA*  
Available at: Public Libraries of B.C., ASHRAE

Leafblad, Janelle L. ; Searls, Carolyn L. . 2010. Evaluation and Repair of Thin Brick Veneer Facades. *Journal of ASTM International*  
Available at: UBC, Public Libraries of B.C.

Luccioni, Bibiana; Rougier, Viviana C.. 2011. In-plane retrofitting of masonry panels with fibre reinforced composite materials. *Construction and Building Materials* 4: 1772-1788  
Available at: UBC

Ma, Zhenjun; Cooper, Paul; Daly, Daniel; Ledo, Laia. 2012. Existing building retrofits: Methodology and state-of-the-art. *Energy and Buildings* 0: 889-902  
Available at: BCIT, UBC

Mainka, G.-W. and H. Winkler. 2010. Influence of New External Protective Glazing on Historic Painted Windowpanes in Medieval Churches. *Proceedings of Thermal Performance of Exterior Envelopes of Whole Buildings XI Florida, USA*  
Available at: Public Libraries of B.C., ASHRAE

Mata, É., A. S. Kalagasidis, et al.. 2010. Retrofitting Measures for Energy Savings in the Swedish Residential Building Stock— Assessing Methodology. *Proceedings of Thermal Performance of Exterior Envelopes of Whole Buildings XI Florida, USA*  
Available at: Public Libraries of B.C., ASHRAE

Maxwell, B.. 2011. Investigation and Repair of a Four-Story Building Damaged by Yazoo Clay. *Journal of Performance of Constructed Facilities* 1: 45-49  
Available at: BCIT, UBC

Mellet, James S.; Smith, Shelley E.. 2010. Using Ground-Penetrating Radar to Investigate Historic Masonry Buildings. *APT Bulletin* 2/3: 47-56  
Available at: UBC

Menassa, Carol C.. 2011. Evaluating sustainable retrofits in existing buildings under uncertainty.

*Energy and Buildings* 12: 3576-3583

Available at: BCIT, UBC

Mesinga, P., J. Straube, et al.. 2010. Assessing the Freeze-Thaw Resistance of Clay Brick for Interior Insulation Retrofit Projects. *Proceedings of Thermal Performance of Exterior Envelopes of Whole Buildings XI Florida, USA*

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

Michael A. Lacasse ; Brian Kyle; Aurelie Talon; Daniel Boissier; Thibaut Hilly; Khaled Abdulghani. 2008. Optimization of the Building Maintenance Management Process Using A Markovian Model. *11DBMC International Conference on Durability of Building Materials and Components Istanbul, Turkey*

Moradias, P. A.; Silva, Pedro D.; Castro-Gomes, J. P.; Salazar, M. V.; Pires, L.. 2012. Experimental study on hygrothermal behaviour of retrofit solutions applied to old building walls. *Construction and Building Materials* 0: 864-873

Available at: UBC

Morelli, Martin; Svendsen, Svend. 2013. Investigation of interior post-insulated masonry walls with wooden beam ends. *Journal of Building Physics* 3: 265-293

Available at: UBC

Moropoulou, Antonia ; Kyriaki Polikreti ; Petros Moundoulas ; Eleni Aggelakopoulou . 2008. Classification of Restoration Mortars by Principal Component Analysis and Correlation Between Their Properties and Synthesis. *11DBMC International Conference on Durability of Building Materials and Components Istanbul, Turkey*

Muir, Anthony; Gjerde, Morten. 2010. Evaluation of fluid pressures applied to the building envelope during maintenance. *Architectural Science Review* 3: 333-339

Available at: UBC

Nabinger, Steven; Persily, Andrew. 2011. Impacts of airtightening retrofits on ventilation rates and energy consumption in a manufactured home. *Energy and Buildings* 11: 3059-3067

Available at: BCIT, UBC

Olgay, V. and C. Seruto. 2010. Whole-Building Retrofits: A Gateway to Climate Stabilization. *ASHRAE Transactions* 116(2): 244-251

Available at: BCIT, UBC

Olgay, Victor; Seruto, Cherlyn. 2010. Whole-Building Retrofits: A Gateway to Climate Stabilization. *ASHRAE Transactions* 2: 244-251

Available at: BCIT, UBC

Osmancikli, Gokhan; Ucak, Senay; Turan, Fatma Nur; Turker, Temel; Bayraktar, Alemdar. 2012. Investigation of restoration effects on the dynamic characteristics of the Hagia Sophia bell-tower

by ambient vibration test. *Construction and Building Materials* 0: 564-572  
Available at: UBC

Pashina, Keith A.; Talafous, Steven M.. 2010. Common Sense and Masonry Repair. *Journal of ASTM International*  
Available at: UBC, Public Libraries of B.C.

Paul E. Totten, . 2011. Retrofitting and modernization of existing buildings. *13th Canadian Conference on Building Science and Technology (CCBST) Winnipeg, MB*

Pereira, A.; Palha, F.; de Brito, J.; Silvestre, J. D.. 2011. Inspection and diagnosis system for gypsum plasters in partition walls and ceilings. *Construction and Building Materials* 4: 2146-2156  
Available at: UBC

Pinard, Sebastien; Fraisse, Gilles; Menezo, Christophe; Renzi, Virginie. 2012. Experimental study of a chimney enhanced heat emitter designed for internal renovation of buildings. *Energy and Buildings* 0: 169-178  
Available at: BCIT, UBC

Ralph E. Moon. 2012. Interpreting Continuous v. Repeated Water Damage. *Forensic Engineering 2012 San Francisco, California*

Rasmussen, T. V.. 2010. Post-Insulation of Existing Buildings Constructed between 1850 and 1920. *Proceedings of Thermal Performance of Exterior Envelopes of Whole Buildings XI Florida, USA*  
Available at: Public Libraries of B.C., ASHRAE

Rocha, P.; Rodrigues, R.. 2013. Methodology for Architectural Design Based on the Perspective of Maintenance: Application and Analysis of External Wall Openings. *Practice Periodical on Structural Design and Construction* 2: 78-82  
Available at: UBC

Rose, A. A. a. B.. 2010. Upgrade of Glazing at Guggenheim Museum. *Proceedings of Building Enclosure Science and Technology (BEST2) Conference Portland, USA*  
Available at: HPO, BCIT

Rysanek, A. M.; Choudhary, R.. 2013. Optimum building energy retrofits under technical and economic uncertainty. *Energy and Buildings* 0: 324-337  
Available at: BCIT, UBC

Santa-Maria, Hernan; Alcaino, Pablo. 2011. Repair of in-plane shear damaged masonry walls with external FRP. *Construction and Building Materials* 3: 1172-1180  
Available at: UBC

Schnabel, Lorraine. 2011. Mortar Analysis Part 3: Buying the Right Services. *APT Bulletin* 1: 1-4

Available at: UBC

Silva, Pedro C. P.; Almeida, Manuela; Braganca, Luis; Mesquita, Vasco. 2013. Development of prefabricated retrofit module towards nearly zero energy buildings. *Energy and Buildings* 0: 115-125

Available at: BCIT, UBC

Sousa, Vitor; Almeida, Nuno; Meireles, Ines; de Brito, Jorge. 2011. Anomalies in Wall Renders: Overview of the Main Causes of Degradation. *International Journal of Architectural Heritage* 2: 198-218

Available at: UBC

Stazi, F.; Mugianesi, E.; Munafo, P.. 2012. Recommendation for restoration of Modern buildings with stone cladding and steel windows: A multi-disciplinary approach on a significant case study. *Construction and Building Materials* 0: 728-737

Available at: UBC

Stazi, Francesca; Veglio, Ambra; Di Perna, Costanzo; Munafo, Placido. 2013. Experimental comparison between 3 different traditional wall constructions and dynamic simulations to identify optimal thermal insulation strategies. *Energy and Buildings* 0: 429-441

Available at: BCIT, UBC

Streeter, Kelly. 2010. Information Technology for Building Documentation. *APT Bulletin* 4: 33-38

Available at: UBC

Tomazevic, M. . 2013. Seismic strengthening and redesign of old masonry buildings: following the new trends. *12th Canadian Masonry Symposium Vancouver, BC*

Tupenaite, Laura; Zavadskas, Edmundas Kazimieras; Kaklauskas, Arturas; Turskis, Zenonas; Seniut, Mark. 2010. Multiple criteria assessment of alternatives for built and human environment renovation. *Journal of Civil Engineering & Management* 2: 257-266

Ueno, K.. 2010. Residential Exterior Wall Superinsulation Retrofit Details and Analysis. *Proceedings of Thermal Performance of Exterior Envelopes of Whole Buildings XI Florida, USA*

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

Van Gelder, Liesje; Janssen, Hans; Roels, Staf. 2012. Retrofitting cavity walls â€ˆ probabilistic study of energy savings and moisture risks. *5th International Building Physics Conference (IBPC) Kyoto, Japan*

Wido Quist ; Rob van Hees ; Silvia Naldin ; Timo Nijland . 2008. The Perception of Small Scale Damage and Repairs of Natural Stone. *11DBMC International Conference on Durability of Building Materials and Components Istanbul, Turkey*

Wood, B.. 2012. Maintenance Integrated Design and Manufacture of Buildings: Toward a Sustainable Model. *Journal of Architectural Engineering* 2: 192-197  
Available at: BCIT, UBC

Zennaro, Pietro ; Katia Gasparini . 2008. The Maintenance of Colour on Finishing Coats. *I1DBMC International Conference on Durability of Building Materials and Components Istanbul, Turkey*