

# CURRENT HOUSING RESEARCH

Social, Economic and Technical Research





## CMHC—HOME TO CANADIANS

Canada Mortgage and Housing Corporation (CMHC) has been Canada's national housing agency for more than 60 years.

Together with other housing stakeholders, we help ensure that Canada maintains one of the best housing systems in the world. We are committed to helping Canadians access a wide choice of quality, affordable homes, while making vibrant, healthy communities and cities a reality across the country.

For more information, visit our website at [www.cmhc.ca](http://www.cmhc.ca)

You can also reach us by phone at 1-800-668-2642  
or by fax at 1-800-245-9274.

Outside Canada call 613-748-2003 or fax to 613-748-2016.

Canada Mortgage and Housing Corporation supports the Government of Canada policy on access to information for people with disabilities. If you wish to obtain this publication in alternative formats, call 1-800-668-2642.

# CURRENT HOUSING RESEARCH

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## INTRODUCTION

Under Part IX of the National Housing Act, the Government of Canada provides funds to Canada Mortgage and Housing Corporation to conduct research into the social, economic and technical aspects of housing and related fields.

*Current Housing Research* is compiled and produced two times a year by the Canadian Housing Information Centre. This publication provides information and access to research which is undertaken and sponsored by the Corporation. It is also available on CMHC's web site at [http://www.cmhc-schl.gc.ca/en/corp/li/horetore/horetore\\_004.cfm](http://www.cmhc-schl.gc.ca/en/corp/li/horetore/horetore_004.cfm)

The publication contains information on completed research reports, new publications, videos and bibliographies, as well as planned and ongoing research projects. An alphabetical title index of items listed is included at the end for quick reference.

The overall arrangement of "*Current Housing Research*" is by broad subject category. Within each subject category, lists of planned and ongoing projects and completed research reports are described.

Each entry can contain the following elements:

- The project or report title;
- A description of the project or report results;
- The CMHC Project Officer who is managing the project;
- The Division within CMHC which is responsible for the project;
- For External Research Projects, the grant recipient undertaking the research;
- A Contract Identification Number (CIDN);
  
- The Status of the project: whether the project is in a planned, ongoing or completed phase. "Planned Projects" are those that are not yet underway, but are likely to be initiated in the current year. "Ongoing Projects" refer to research projects which are currently underway. No reports are yet available. Once the project is completed, and a report is available for distribution, it will be listed as a "Completed Report."
  
- Whether the report resulting from the research project is available and the address where the completed report can be obtained.

To discuss research projects that are recent or ongoing, please call CMHC General Inquiries at (613) 748-2000 and ask for the CMHC Project Officer identified under each project description.

## ACQUIRING THE PUBLICATIONS AND REPORTS CITED AS COMPLETED

The availability section of each completed entry indicates the contact to obtain the item and whether the item can also be found on the Internet. Most items are available from the Canadian Housing Information Centre and can be ordered by using the information on the order form on the next page. We accept orders by regular mail, fax, phone, and via the Internet.

A number of the items cited are available electronically and the URL is included in the listing. CMHC uses an FTP (File Transfer Protocol) server to distribute reports. FTP has been used on the Internet as a means of transferring files between servers and users for many years and it continues to enjoy very wide use today.

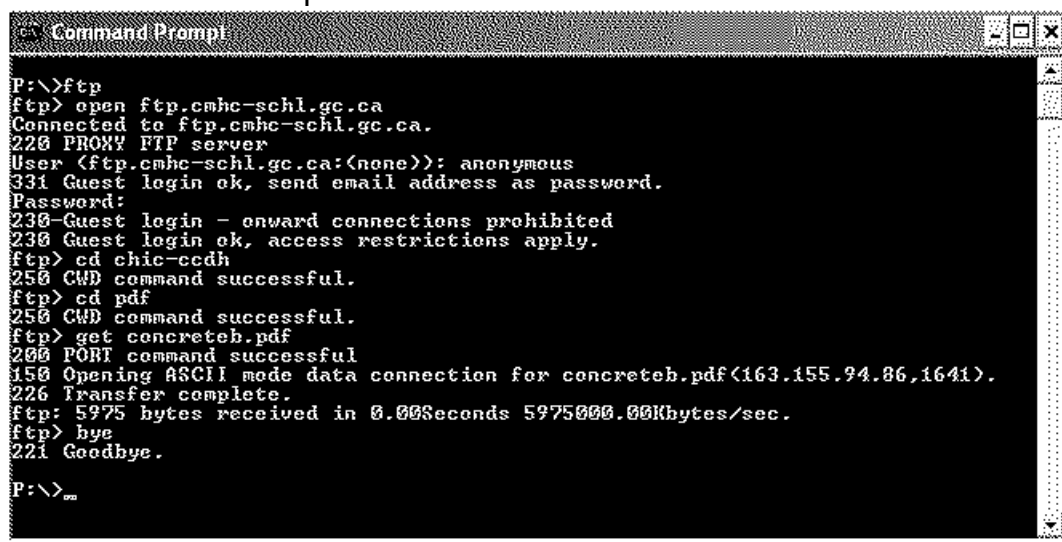
In order to access a file using FTP, software with FTP capabilities is required and there are 3 types of FTP software:

1. Command Line FTP - FTP commands can be entered from a Command line or "DOS Prompt" on all Windows PCs.
2. FTP Client - a purpose built application to connect to FTP servers. These are widely available as commercial products or as shareware or even freeware on the Internet.
3. Some (not all) web browsers - Internet Explorer and Netscape can be used to access FTP files. They use correct protocol when ftp:// is entered in the address bar of the browser.

Example: **ftp://ftp.cmhc-schl.gc.ca/**

Here is an example of using the command line to retrieve a file from FTP.

FTP commands and help are available on PCs



```
P:\>ftp
ftp> open ftp.cmhc-schl.gc.ca
Connected to ftp.cmhc-schl.gc.ca.
220 PROXY FTP server
User (ftp.cmhc-schl.gc.ca:(none)): anonymous
331 Guest login ok, send email address as password.
Password:
230-Guest login - onward connections prohibited
230 Guest login ok, access restrictions apply.
ftp> cd chic-cedh
250 CWD command successful.
ftp> cd pdf
250 CWD command successful.
ftp> get concreteb.pdf
200 PORT command successful
150 Opening ASCII mode data connection for concreteb.pdf(163.155.94.86,1641).
226 Transfer complete.
ftp: 5975 bytes received in 0.00Seconds 5975000.00Kbytes/sec.
ftp> bye
221 Goodbye.

P:\>
```

## CURRENT HOUSING RESEARCH ORDER FORM

If you wish to receive any of the completed reports or research highlights listed, or if you would like to be on the mailing list to receive *Current Housing Research*, please fill out this form and send it to:

Canadian Housing Information Centre  
Canada Mortgage and Housing Corporation  
700 Montreal Road  
Ottawa ON K1A 0P7  
Fax (613) 748-4069  
Telephone 1-800-668-2642  
Email: [chic@cmhc-schl.gc.ca](mailto:chic@cmhc-schl.gc.ca)

### COMPLETED REPORTS REQUESTED



☐ Send copies of above reports, research highlights

☐ Add my name to your mailing list to receive *Current Housing Research*

Name		
Mailing Address (please include e-mail)		
City	Province	Postal Code

## CMHC S EXTERNAL RESEARCH PROGRAM

The objective of the CMHC External Research Program (ERP) is to encourage and enable researchers in the private and non-profit sectors to put forward and carry out relevant, innovative, and high quality housing research projects. Under the Program, financial contributions are made annually to support research investigations into important questions, problems, and issues affecting Canadian housing. CMHC is interested in receiving applications on topics related to existing CMHC housing research.

Applicants to the External Research Program must be Canadian citizens or have permanent resident status in Canada.

Independent researchers as well as those employed in Canadian universities, institutions, private consulting firms, the professions and the housing industry may apply for these grants.

Full-time students at the graduate or under-graduate level are not eligible to apply. Students may be hired to assist in conducting the research, but under no circumstances may they take over responsibility for the direction of the work or the quality of the final report.

Individuals who are full-time federal, provincial or municipal government employees may apply. However, to be eligible, an applicant must apply as a private consultant, and the proposed research must not be part of, or interfere with his/her regular work. CMHC employees are not eligible to receive grants under this Program.

To obtain the Guidelines and Application Form (product #62964):

- visit our Web site at <http://www.cmhc-schl.gc.ca>;
- e-mail: [erp@cmhc-schl.gc.ca](mailto:erp@cmhc-schl.gc.ca); or
- call 1 800 668-2642.

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## TECHNICAL RESEARCH



## ACOUSTICS

### FLANKING SOUND TRANSMISSION IN WOOD FRAME MULTI-FAMILY DWELLINGS PHASE 5: CONSOLIDATION FOR ELECTRONIC DESIGN GUIDE

This project will consolidate the results of current and previous NRC-IRC flanking projects (Phases 2 - 4) and present them in the form of a best practice design guide that is easily accessible and usable by builders, architects, and engineers. This design guide will be the primary resource to aid in the design and construction of structures complying with possible future Canadian building-code mandated Apparent-STC and Apparent-IIC requirements, or other national model codes that use ISO metrics.

**CMHC Project Officer :** Terry Robinson

**CIDN :** 39020900

**Division :** CMHC International

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

**\*NEW\***

## BASEMENTS, FOUNDATIONS & CRAWLSPACES

### BASEMENT WALL INSULATION RETROFIT MONITORING

There have been field observations and research findings in the last several years which suggest that polyethylene as a vapour barrier in many wall assemblies may be excessive, and that other vapour retarder systems may be preferable. The last CMHC research showed that the below-grade portion of interior insulated basement wall assemblies might benefit from more permeability, not less. Various interior insulated assemblies have been suggested as alternatives. This project will measure the moisture performance of different basement interior insulation wall assemblies in 10 real houses to see if the research findings can be substantiated in the field, and to look out for unexpected repercussions in changing the current wall construction practice. Ten Saskatchewan basements have been retrofitted and are being monitored. This research is ongoing.

**CMHC Project Officer :** Don Fugler

**CIDN :** 36970200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### RETROFITTING CRAWL SPACES - FIRST NATIONS DEMONSTRATION

The project will involve the retrofitting of several wet crawl spaces. The retrofits will be well-documented and monitored for a period afterwards to verify effectiveness. The case studies will be used to demonstrate how to fix poorly performing crawl spaces. One demonstration may show inexpensive ways to lift existing houses and retrofit a better crawl space or basement underneath. Other possibilities include crawl space floor regrading, the use of exhaust fans to isolate problem crawl spaces, external utility buildings instead of basements, etc. The project has been prepared in conjunction with First Nations housing authorities and responds to a pressing problem found on many reserves. The crawl space retrofits have been started and will be followed by a year of monitoring.

**CMHC Project Officer :** Don Fugler

**CIDN :** 33050200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## BUILDING MATERIALS

### COMPRESSED EARTHBLOCK (CEB) - STRAWBALE HYBRID BUILDING SYSTEM

This project will investigate the performance of straw bale insulation in combination with compressed earth blocks, as a hybrid building system. Earth blocks are found in many other parts of the world, but their use in Canadian buildings, so far, has been limited. The researcher will be monitoring energy use as well as some of the performance characteristics of the earth blocks. The project has been initiated. The earthblocks have been cast and construction has been proceeding slowly. Because of the wet summer in 2008, 5% cement was added to the mixture for stabilization. Samples of the earthblocks will be tested at Queen's University for compression and bending, and the results compared to other CMHC earth block tests (Dupuy) and more standard construction material such as bricks and concrete masonry. The energy usage of the structure will be recorded through the winter to determine the envelope efficiency of the hybrid structure. Both moisture performance and the extent of crackage will also be monitored for one year after the completion of construction.

**CMHC Project Officer :** Don Fugler

**CIDN :** 36260216

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## DOORS AND WINDOWS

### BEST PRACTICE GUIDE - WINDOWS

In partnership with Natural Resources Canada and the Homeowner Protection Office (British Columbia), CMHC developed this comprehensive and practical technical advisory document for architects, engineers, builders, renovators, window manufacturers, window installers and others involved in the design, specification, construction, installation and interfacing of windows within the exterior wall assembly in both low-rise and high-rise residential construction. This document provides guidance in selecting the appropriate window performance criteria for the intended application and provides installation details to ensure the performance criteria is achieved through the effective continuity of thermal, air, vapour and moisture barriers at the interface between the window units and the wall assembly.

**CMHC Project Officer :** Silvio Plescia

**CIDN :** 30870200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### EVALUATING THE EFFECTIVENESS OF WALL-WINDOW INTERFACE DETAILS TO MANAGE RAINWATER

Based on the need for effective window-wall interface details to manage water intrusion, CMHC is developing a Best Practices Guide for Window Installation that will be applicable to both low-rise wood frame construction and high-rise buildings. To support the development of the Guide, and the needs of the fenestration, wall cladding and flashing industry, CMHC in partnership with the National Research Council (NRC), formed a consortium of interested North American organizations to evaluate specific window-wall interface details to determine how effective the details are in managing rainwater. CMHC and NRC funded the first phase of this multi-year study. The Phase I testing program, highlighting wall-window interface details of interest to CMHC, was completed in the fall of 2008. The window testing program included window frames with and without an integral flange as well as wall assemblies with drainage cavities and wall assemblies with direct-applied claddings. The Phase I final report is available at <http://www.nrc-cnrc.gc.ca/obj/jirc/doc/pubs/b-1229.1/b-1229.1.pdf>. The Phase 2 testing program,

## DOORS AND WINDOWS

which highlights wall-window interface details of interest to the industry has also been completed. The final Phase 2 report will be available upon request from the National Research Council.

**CMHC Project Officer :** *Silvio Plescia*

**CIDN :** 27080200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is available

### EXTERIOR WINDOW SHADING DEVICES FOR THE CANADIAN CLIMATE

This project will identify exterior window shading devices that can improve comfort and reduce household energy consumption in the Canadian climate. Existing technologies will be assessed for performance, durability, ease of integration with building envelope elements and user friendliness. The influence of freezing rain, wet snow, or melting/freezing snow on performance and operation will be assessed. Energy savings potential will be modelled to project savings potential for different Canadian climatic conditions, including the North.

**CMHC Project Officer :** *Ken Ruest*

**CIDN :** 38300200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### SELECTION OF LOW-E COATED GLASS FOR OLDER RESIDENTIAL HIGH-RISE APARTMENT BUILDINGS IN CANADA

Recent research at the Canadian Centre for Housing Technology (CCHT) and the National Research Council Canada (NRCC) revealed that high-solar heat gain low-e coated glass is the most appropriate spectrally selective glass for houses in Canada. However, no similar research has been conducted for older high-rise residential apartment buildings even though they represent a significant proportion of the housing stock. Thus, a complementary research study has been initiated to determine whether high or low solar heat gain glazing in apartment dwellings would be more appropriate for retrofitting into older multi-unit residential buildings to balance the need to control heat losses while encouraging solar gains to help offset space heating loads.

**CMHC Project Officer :** *Woytek Kujawski*

**CIDN :** 38840217

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### THERMAL PERFORMANCE OF WINDOW ASSEMBLIES

CMHC in collaboration with the National Research Council, is undertaking a study to investigate the risk of condensation at the window frame perimeter of the interface assembly as a function of both temperature differential and air leakage rate across the assembly. Depending on the types of windows used and the cladding into which the windows are installed there arise different methods to provide drainage that may also affect air leakage through the assembly. This, in turn, may give rise to the formation of condensation along the window, at the sill or along the window sash and glazing panels. Various window installations, including position of the window unit within the wall assembly and different window-wall interface insulating strategies, will be subjected to temperature and air pressure differentials and various air leakage rates and paths, to investigate the risk to condensation they impose on the window-wall assembly. The project commenced in the summer of 2008. The laboratory testing program has been completed and the final report is being prepared.

**CMHC Project Officer :** *Silvio Plescia*

**CIDN :** 33180200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### ASSESSMENT OF RENEWAL OPPORTUNITIES FOR MULTI-UNIT RESIDENTIAL BUILDINGS

Canadian cities, in particular Toronto, have an extensive inventory of post-war high-rise housing. These multi-unit residential buildings (MURBS) have envelopes and services that are nearing the end of their useful lives. Owners of these buildings will soon have to make decisions for renewal and this implies they will require assistance from designers and building science specialists. This research will provide a comprehensive review of MURB typologies and the development of integrated over-cladding solutions along with associated cost benefit studies that enable improvements in energy efficiency.

**CMHC Project Officer :** Mark Salerno

**CIDN :** 38330201

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### DESIGN SURVEY OF LOW ENVIRONMENTAL IMPACT HOUSING

This research project documented case studies of low environmental impact housing (including net zero energy) in Canada and internationally in similar climates. The goal was to identify criteria and specifications for zero environmental impact housing in Canada, develop best practice models towards achieving this goal, and ultimately share information on these "deep green" housing models for Canadian climatic regions. Case studies and a research report will be developed.

**CMHC Project Officer :** Woytek Kujawski

**CIDN :** 25400200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### DEVELOPMENT OF AN ENERGY MANAGEMENT PILOT PROGRAM FOR SOCIAL HOUSING IN ONTARIO

CMHC is participating in the development of an Energy Management Program and pilot project for social housing. CMHC will be working with the Social Housing Services Corporation of Ontario to develop an Energy Management Program that will provide local social housing providers with the tools needed to evaluate and implement energy and water efficiency measures in their buildings. CMHC support will be used to develop or adopt tools for the Energy Management Program including utility tracking and on-line energy/water audit facilities, standard energy audits, and communication documents for property owners, managers and residents. CMHC will also participate in the evaluation of energy and water efficiency projects in 20 buildings selected to participate in a pilot project to evaluate the costs and benefits of the Energy Management Program. CMHC support will be useful to establish the Program in Ontario and will also provide other provinces with useful information on the development of central energy programs for their social housing stock as well.

**CMHC Project Officer :** Duncan Hill

**CIDN :** 29820200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## DOCUMENTATION OF AN ENERGY MANAGEMENT PLAN FOR SOCIAL HOUSING

CMHC is preparing a report to describe an Energy Management Plan developed for Social Housing Providers. The report will document the organizational structure, processes, tools, documents, financing strategies, reporting, and quality assurance of the program. The final report will be delivered to all provincial and territorial housing agencies so that they may become informed of the Ontario program and to provide them with the opportunity to engage the plan, or any of its individual components, within their own jurisdictions.

**CMHC Project Officer :** *Duncan Hill*

**CIDN :** 36070200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## ENERGY AND WATER EFFICIENCY RETROFITS FOR MULTI-UNIT RESIDENTIAL BUILDINGS

This project will update the CMHC publication that provides building owners and managers of residential multi-unit residential buildings with information on cost-effective energy and water efficiency retrofits to reduce consumption, operating costs and environmental impacts of their buildings.

**CMHC Project Officer :** *Remi Charron*

**CIDN :** 38370200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## ENERGY CONSERVATION IN CANADIAN BUILDINGS USING ADVANCED THERMAL INSULATION

The National Research Council of Canada, Institute for Research in Construction (NRC/IRC) received financial assistance from Canada Mortgage and Housing Corporation (CMHC) and the EcoEnergy Technology Initiative (EcoETI) for the purpose of conducting research on the application of advanced thermal insulation that not only offers higher thermal resistance but is also eco-friendly (i.e. renewable, energy efficient, biodegradable and indigenous). A cradle-to-grave analysis of thermal insulating materials in terms of energy consumption and impact on the environment will also be undertaken to help in the selection of appropriate insulating materials. This study, currently at the end of its first year of work, will be carried out in four tasks over a three year period. Task 1 (Investigation on Advanced Thermal Insulations) has been completed. Task 2 (Cradle-to-Grave Energy Consumption Analysis for Thermal Insulating Materials) and Task 3 (Assess the Thermal Performance of Building Components Constructed with Advanced Thermal Insulating Materials) are currently underway. Task 4 (Demonstrate the Impact of Advanced Thermal Insulating Materials on the Potential Energy Conservation in Canadian Buildings) will be completed thereafter. The project is expected to be completed by the spring of 2012.

**CMHC Project Officer :** *Silvio Plescia*

**CIDN :** 39720200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

**\*NEW\***

### EVALUATING THE EFFECT OF ENERGY-RELATED BUILDING ENVELOPE RETROFIT STRATEGIES FOR HOUSING ON THE WETTING AND DRYING POTENTIAL OF THE WALL ASSEMBLY

This joint research project by NRC-IRC, NRCan and CMHC assesses the impact of two common exterior insulation retrofit strategies on the hygrothermal performance of the retrofitted wall assemblies, compared with the performance of a conventional 2 x 6 stud wall. The project uses full-scale wall testing in actual climate conditions as well as computer modelling. This work assesses the risks associated with interstitial condensation due to the insulation retrofits. The project is complete.

**CMHC Project Officer :** Barry Craig

**CIDN :** 37660200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### EVALUATION OF THE IMPACT OF ENERGY EFFICIENCY AND SUSTAINABLE DEVELOPMENT MEASURES ON AFFORDABLE HOUSING

This External Research Program study will analyze the impact of including energy efficiency and sustainable development (treatment of grey water, "green materials") measures on the operation of community housing buildings. The analysis will deal with actual energy costs vs. projected costs, the costs of maintenance service and the effects on maintenance practices.

**CMHC Project Officer :** Woytek Kujawski

**CIDN :** 36260210

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### INVESTIGATION OF THE PERFORMANCE AND USE OF VACUUM INSULATED PANELS IN NEW AND EXISTING WOOD FRAME CONSTRUCTION

The Canadian housing industry is moving towards producing buildings with high energy efficiency, as demonstrated by CMHC's EQUilibrium<sup>TM</sup> initiative, the RAIC 2030 Challenge and exports of Super E homes. A key component of highly energy efficient housing is a super insulated building envelope. However, using conventional insulation to achieve this leads to very thick building envelope assemblies that present cost, construction, market acceptance and regulatory challenges. This External Research Program study explores the potential for the use of thin highly insulated vacuum insulation panels (VIPs) in new and existing Canadian low rise residential housing in order to meet these challenges in a practical cost effective manner. A report investigating the performance of vacuum insulated panels in wood frame construction is expected to be complete in 2010.

**CMHC Project Officer :** Barry Craig

**CIDN :** 40140206

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## LEAST COST ANALYSIS FOR CANADIAN NEW HOUSING

This External Research Program research project will provide insight on what upgrades could be incorporated into new housing to improve energy efficiency without adding any extra net cost to the homeowner based on life cycle cost analysis. The study will characterize the energy savings against the costs of the energy upgrades to determine at what point declining energy savings no longer support upgrade costs without representing an overall expenditure increase to the homeowner. The research is divided into two parts: 1) Simulation and analysis of energy efficient building upgrade potential for the Canadian residential sector using representative housing data and 2) Simulation and application of the lowest cost upgrade to the house to determine the overall cost with the upgrade(s) to meet energy efficiency objectives.

**CMHC Project Officer :** Woytek Kujawski

**CIDN :** 40140202

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## PERFORMANCE ANALYSIS OF RESIDENTIAL HOT WATER EFFICIENCY DEVICES

This project will look at the energy savings (if any) that come from replacing conventional residential water heaters with tankless (or instantaneous) appliances. The project will assess domestic hot water energy consumption before and after the retrofits of tankless gas-fired water heaters in at least 50 houses so that savings can be compared. Water usage and homeowner satisfaction will also be surveyed. CMHC has engaged the support of two utilities in Ontario and Saskatchewan to help find test houses. Most of the Ontario houses have been obtained and work is continuing to find houses for the Saskatchewan component of the field testing. Monitoring results are expected through 2010 and 2011.

**CMHC Project Officer :** Don Fugler

**CIDN :** 38410200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## STUDY OF ENERGY CONSERVATION OPPORTUNITIES IN THE RETROFIT OF BUILDING ENVELOPES IN LARGE MULTI-UNIT HIGH-RISE RESIDENTIAL BUILDINGS

Many buildings in the Lower Mainland of British Columbia have undergone comprehensive rehabilitation to remedy moisture-related problems. Little or no attention was specifically directed at energy conservation or greenhouse gas emissions. CMHC, the Homeowner Protection Office, City of Vancouver, BC Hydro and Terasen Gas provided funding for this research project to review and assess the effects of building enclosure improvements on the space conditioning energy use in typical high-rise residential buildings in the Lower Mainland of BC and then to develop better strategies that take into account enclosure repairs, energy conservation and greenhouse gas emissions. This project includes the collection of basic building enclosure information and energy (gas and electricity) consumption data for some 39 mid-rise and high-rise buildings in the lower BC mainland. Subsequently, a more detailed analysis will be conducted on several of these buildings to more precisely determine where and how much energy is being consumed. Where buildings have undergone building envelope rehabilitation, this project intends to assess the effects the work has had on the buildings space conditioning energy use. This project is ongoing.

**CMHC Project Officer :** Silvio Plescia

**CIDN :** 38330200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## ENERGY CONSERVATION

### SUPPORT FOR THE DEVELOPMENT OF A NEW CSA STANDARD ON FANS AND MOTORS

The Canadian Standards Association has formed a technical subcommittee on the performance of motor/fan combinations. To ensure that the subcommittee membership includes individuals with residential expertise, CMHC retained the services of a consultant to attend the CSA meetings and provide guidance on residential fan motor efficiency to the standards committee. Several meetings have been held and more will be scheduled prior to voting on the standard.

**CMHC Project Officer :** Don Fugler

**CIDN :** 37730200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### THERMAL, ENERGY AND MOISTURE PERFORMANCE OF ALTERNATIVE (NON-WOODFRAME) HOUSING SYSTEMS

This project will characterize the thermal performance of the increasingly popular Insulated Concrete Form (ICF) housing system and assess the impact of ICF's on whole-house (or building) energy use (particularly in comparison with traditional wood-frame construction). This research project will be useful to evaluate and assess the contribution and impact of any thermal mass benefits embedded in the ICF system (i.e. the concrete) in comparison with the nominal RSI values which comprise the individual components of the system. Two ICF wall assemblies were constructed in the summer of 2009 and installed with sensors and monitoring equipment, into the Field Exposure of Walls (FEWF) test facility at the National Research Council. Monitoring of these walls, exposed to real climate loads, will take place for 1 full year. The project is expected to be completed by December 2010.

**CMHC Project Officer :** Silvio Plescia

**CIDN :** 38350200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

**See also:** SUSTAINABLE BUILDING ENVELOPE RETROFITS FOR EXISTING HOUSES, p. 31  
ASSESSING THE FEASIBILITY OF SUPER ENERGY EFFICIENCY RETROFIT STRATEGIES FOR NORTHERN HOUSES, p. 25

## FIRES & FIRE PREVENTION

### SIMPLE DESIGN TOOLS FOR THE ASSESSMENT OF UPHOLSTERED FURNITURE BURNING IN HOME FIRES

The life safety of occupants and fire fighters will be improved with a better understanding of the effects of upholstered furniture in living and sleeping areas when exposed to fire. This work will provide a simple design tool/model that demonstrates the time elapsed before major fire events occur, and the time elapsed before conditions become untenable. The study will acquire and analyze data, then model and validate it for two houses - one detached unit and one townhouse unit - furnished with typical upholstery. The final report should provide designers with simple tools to evaluate the risk of fire involving different furniture on life safety.

**CMHC Project Officer :** Barry Craig

**CIDN :** 38840219

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## FIRES & FIRE PREVENTION

### SPECIAL INTEREST GROUP ON FIRE PERFORMANCE OF HOUSES

In recent years, Canadian fire death statistics have followed a downward trend. As technological advances introduce new construction practices, building designs and materials into new house construction, the fire protection community needs evidence that safety isn't compromised. The Canadian Commission on Building and Fire Codes (CCBFC) and the Canadian Commission on Construction Materials Evaluation (CCCME) requested information regarding the potential impact of such changes on the fire safety of low-rise housing. In response, NRC's Institute for Research in Construction (IRC), in partnership with CMHC, government, industry, and codes and standards agencies, has undertaken a project to research fires in single-family dwellings and the factors affecting fire safety. The primary objective of this research is to determine the impact of innovative residential construction products and systems on fire safety.

**CMHC Project Officer :** Barry Craig

**CIDN :** 33100200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## HIGH-RISE AND MULTIPLE UNIT CONSTRUCTION

### AIR LEAKAGE CONTROL IN MULTI-UNIT RESIDENTIAL BUILDINGS (MURBS) - DEVELOPMENT OF TESTING AND MEASUREMENT STRATEGIES TO QUANTIFY AIR LEAKAGE

The testing, measurement and quantification of the airtightness performance or air-leakage characteristics of multi-family buildings has not evolved to the same extent that it has in the low-rise, single family home sector. Nevertheless, energy performance, indoor comfort, fire and life safety, amongst other criteria, depend on the airtightness characteristics of not only the envelope but also the unit compartments in multi-family buildings. The objectives of this project will include summarizing the current knowledge related to testing methodologies and protocols for assessing and quantifying the airtightness of multi-family buildings, assessing what other international initiatives exist (whether they are programs or regulations) and evaluating their effectiveness; and how the construction industries in those jurisdictions accommodated the requirements. This research will further knowledge and understanding of airtightness testing and airtightness performance of multi-family buildings and will provide a foundation for advancing this area of study in the Canadian context. This project is expected to be completed by December 2010.

**CMHC Project Officer :** Silvio Plescia

**CIDN :** 39930200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

**\*NEW\***

### DESIGN/CONSTRUCTION OF ENERGY EFFICIENT MULTI-UNIT RESIDENTIAL BUILDINGS (MURBS) IN MILD COASTAL CLIMATES

This project will explore the unique challenges of promoting, designing and constructing energy efficient multi-unit residential buildings (MURBs) in the South Coastal climate of British Columbia. The project will identify the challenges and will explore and evaluate the opportunities for achieving higher levels of energy efficiency in MURBs through improved wall design, increased airtightness and compartmentalization, and efficient and effective mechanical ventilation. Seasonal overheating issues will also be explored as a means of preventing the whole scale adoption of mechanical air-conditioning systems. The project will be implemented in a MURB so that the costs and benefits of the selected measures can be assessed. Based on the outcomes of the project, recommendations for improving the design and construction of energy efficient MURBs in the Lower Mainland of BC will be developed.

## HIGH-RISE AND MULTIPLE UNIT CONSTRUCTION

**CMHC Project Officer :** Woytek Kujawski

**CIDN :** 37530200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### DEVELOPMENT OF AN OCCUPANT ENGAGEMENT STRATEGY TO SUPPORT ENERGY AND WATER EFFICIENCY IN MULTIPLE UNIT RESIDENTIAL BUILDINGS

This project will develop an occupant engagement strategy to improve energy/water efficiency and indoor conditions in multi-unit residential buildings. The project will include a literature search, the development of an engagement strategy (e.g., occupant's guide, behaviour modification approaches, engagement strategies, "reward" possibilities) and the integration of the strategy within a post occupancy evaluation project. The strategy will be tested in a building undergoing a post occupancy performance evaluation to determine the extent to which improvements in performance are possible.

**CMHC Project Officer :** Duncan Hill

**CIDN :** 39730200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

**\*NEW\***

### DEVELOPMENT OF GUIDELINES FOR FAN-COIL UPGRADES TO IMPROVE ENERGY EFFICIENCY AND THE INDOOR ENVIRONMENT IN EXISTING MULTI-UNIT RESIDENTIAL BUILDINGS

This study will undertake an investigation of opportunities to improve the performance of fan-coil systems in existing multi-unit residential buildings in terms of energy efficiency and indoor air quality. The study will review heating/cooling fan-coil design, from the historic to the current, as well as design, installation and manufacturing practices. It will also seek to establish the engineering and scientific basis for fan-coil problems such as mold, rust, leakage and noise and categorize design and maintenance opportunities that can lead to a range of potential remediation approaches with varying capital and maintenance cost implications. Two fan-coil preliminary retrofit guides will be developed for discussion that will cover design, implementation and maintenance, one for a technical (designer) audience and one for an owner-property manager audience.

**CMHC Project Officer :** Mark Salerno

**CIDN :** 36480200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### ENGINEERED BUILDING ENVELOPE SYSTEMS FOR OUTDOOR/INDOOR CLIMATE EXTREMES

CMHC is contributing to a National Research Council project to identify indoor conditions and weather in northern and northern-coastal communities, and select appropriate building envelope assemblies for extreme climates. The project assesses the hygrothermal performance of these assemblies by computational and laboratory testing, measures air leakage by means of blower door tests and produces performance parameters for heating and high humidity climates. The project also analyzes the energy and environmental impact of proposed building envelope assemblies. The research findings will be published in a research report, and presented in seminars throughout Canada and the North.

**CMHC Project Officer :** Barry Craig

**CIDN :** 29600200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## HIGH-RISE AND MULTIPLE UNIT CONSTRUCTION

### HIGH PERFORMANCE THERMAL INSULATION SYSTEMS IN BUILDING APPLICATIONS

CMHC will contribute funding to the Institute for Research in Construction (IRC) in support of its efforts to develop a high performance thermal insulation system and its contributions to a related International Energy Agency Annex in High Performance Insulating Systems. IRC will develop new nano-porous materials for use in vacuum insulation panels and the facility required to test and evaluate the insulation system. Based on the development of the material and the testing, IRC will produce a report on the high performance thermal insulation system it develops and the potential applications and guidelines for use. This project will serve as CMHC's contribution to the building of research capacity at the Institute for Research in Construction in the field of high performance thermal insulation systems. Potential applications within building envelope systems will be conceptualized in order to generate awareness of how this futuristic form of insulation may be eventually applied.

**CMHC Project Officer :** *Duncan Hill*

**CIDN :** 33630200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### REVISIONS TO “BRICK VENEER STEEL STUD BEST PRACTICE GUIDE”

The objective of this project is to produce a revised version of CMHC's “Brick Veneer Steel Stud Best Practice Guide”, published in 1996. New research and user feedback from seminars based on the guide and from CMHC's web site, and recent code changes have resulted in the need for revisions. Partnerships have been developed with interested parties for input, review and promotion, and a consultant was chosen by national competition. The consultant responsible for the revisions is working with an advisory committee, which includes practitioners, industry representatives, manufacturers and regulators, which participates in drafting the new edition. The work includes thorough study of the existing “Brick Veneer Steel Stud Guide” and an analysis of users' feedback. The consultant has completed the final manuscript for review by the steering committee.

**CMHC Project Officer :** *Barry Craig*

**CIDN :** 23780200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## HOUSE CONSTRUCTION

### DESIGN WIND-LOADS FOR RESIDENTIAL PHOTOVOLTAIC SYSTEMS

The University of Western Ontario was awarded an External Research Program grant to undertake a research project to evaluate wind-induced loads on roof-mounted photovoltaic (PV) residential systems; the aim of which is to identify configurations that minimize wind loads on solar panels and roof-cladding systems. The study will be limited to typical 2-storey, single-family homes with roof-mounted PV panels or a PV-Thermal system. The research will investigate various parameters including roof slope, solar panel position and orientation with respect to wind-flow, and height of the panels above the roof surface. The research project is ongoing with completion expected by end of December 2010.

**CMHC Project Officer :** *Silvio Plescia*

**CIDN :** 40140204

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## “GLOSSARY OF HOUSING TERMS” - UPDATE

This project reviews the current edition of “Glossary of Housing Terms” and conducts research to identify new terms and definitions which are missing. The “Glossary of Housing Terms” was last updated in 1995, resulting in the absence of a number of new housing terms, some of which are included in CMHC's new information products. Examples of new housing terms missing from the “Glossary of Housing Terms” include: surfactants, enthalpy recovery ventilator, building science, polyolefin, xeriscaping, pyrite, stachybotrys chartarum and brownfields. All the existing terms and definitions have been reviewed to ensure they are still appropriate and that the definitions are accurate. Construction related acronyms and abbreviations, and terms common to multiple unit residential buildings have also been added. The revised “Glossary of Housing Terms” English manuscript is complete and is being translated. The publication should be available in 2010.

**CMHC Project Officer :** Barry Craig

**CIDN :** 33070200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## IMPROVED PREDICTION OF SEISMIC RESISTANCE OF PART 9 HOUSES

Currently available approaches for the prediction of seismic resistance of conventional wood-frame construction (that is, buildings conforming to Part 9 of the National Building Code of Canada (NBCC)) are not able to predict the seismic resistance in a reliable manner. Experience in earthquakes and recent shake table tests of two-storey specimens have demonstrated generally good performance, but the limitations of this favourable behaviour are not well defined. A funding grant from the CMHC External Research Program has been provided to Forintek Canada Corporation (FP Innovations) to undertake a research project, to develop simple mechanics-based methods for the prediction of seismic resistance of conventional wood-frame (“Part 9”) houses. Forintek investigated the adequacy of the bracing requirements for conventional wood-frame construction as outlined in the 2004 Canadian Wood Council Design Guide (CWC Guide) and the proposed Part 9 of the 2010 NBCC. The results showed an imbalance in the required lengths of braced walls in the short and long directions of rectangular buildings. In most studied cases, neither the 2004 CWC Guide nor the proposals for the Part 9 of the 2010 NBCC meets the seismic requirements of the Part 4 of NBCC 2005 for high seismic zones. To address this imbalance between required lengths of braced walls in short and long directions of a rectangular building in conventional wood-frame construction, the researchers proposed a new calculation method, based on the minimum length of braced wall as a function of the floor area of the building.

**CMHC Project Officer :** Silvio Plescia

**CIDN :** 34380208

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is available

**\*NEW\***

## RACKING PERFORMANCE OF WOOD SHEAR WALLS CONSISTING OF FINGER-JOINTED STUDS

In order to make lumber more sustainable and to reduce cost and waste, the use of finger-jointed wood studs is now permitted in building codes and is becoming increasingly common in residential construction. However, the strength of these studs when subject to tensile stress is not well understood. This 2008 External Research Program project tests the racking strength of finger-jointed wood studs used in shear walls. The data produced by this research will inform the designers of codes and standards of the comparative performance of finger-jointed and regular dimensional lumber studs when used in shear walls. It also measures the effect on racking strength of the number of joints in the stud.

## HOUSE CONSTRUCTION

**CMHC Project Officer :** Barry Craig  
**Division :** External Research Program  
**AVAILABILITY :** Product is not yet available

**CIDN :** 38840206  
**STATUS :** Ongoing

### REDESIGN PRODUCTION PROCESS IN HOUSING CONSTRUCTION USING LEAN PRINCIPLES AND VALUE STREAM MAPPING

The housing construction sector is distinguished from other parts of the construction industry and offers the closest analogy to the manufacturing industry. However, the home building process is still managed in the same way as in other sectors of the construction industry. The aim of this External Research Program project is to develop a lean process for housing construction that improves the efficiency and reduces overall throughput time. The process was developed and tested with a residential development company and summarized in a research report.

**CMHC Project Officer :** Barry Craig  
**Division :** External Research Program  
**AVAILABILITY :** Product is not yet available

**CIDN :** 36260202  
**STATUS :** Ongoing

### SEISMIC ISOLATION OF RESIDENTIAL WOOD FRAME AND LOW- AND MEDIUM-RISE MASONRY BUILDINGS

McMaster University has been granted funding through the CMHC External Research Program to investigate the application of a novel and economical fibre reinforced elastomeric base isolation system for both light-weight wood frame and low- and medium- rise unreinforced masonry residential buildings. The objective is to determine if an economically viable base isolation system can be developed to alter the natural period of the building and isolation system out of the range of maximum earthquake intensity for seismically vulnerable residential buildings. The test program will include the scaled model shake table testing of both fixed-base and isolated-base foundation buildings to assess their dynamic response and a parametric analysis will be conducted for four seismic jurisdictions across Canada to assess the effectiveness of the base-isolation system to mitigate or reduce the seismic loads on the building. Completion of the project is expected by end of 2010.

**CMHC Project Officer :** Silvio Plescia  
**Division :** External Research Program  
**AVAILABILITY :** Product is not yet available

**CIDN :** 38840214  
**STATUS :** Ongoing

### SUSTAINABLE BUILDING SCIENCE BEST PRACTICES

The objective of this project is to consolidate energy-efficient and sustainable building science best practices into one comprehensive illustrated source that will serve as a text book and training manual for building science courses. It will be used in architectural programs at colleges and universities, and by builders and designers. The result of this research will be a common reference that describes sustainable building science for Canadian construction that is based on rigorous scientific research and testing, and energy conservation measures and that demonstrates best practices. It will be tailored to existing teaching curricula and it will be extremely useful to architects, engineers and building scientists resulting in an accurate and common understanding of sustainable building science principles and their interrelationship with one another.

**CMHC Project Officer :** Barry Craig  
**Division :** Policy and Research Division  
**AVAILABILITY :** Product is not yet available

**CIDN :** 35610200  
**STATUS :** Ongoing

## CANADIAN RADON MITIGATION CASE STUDIES

The project will investigate the performance of subslab depressurization radon mitigation systems installed in 20 Canadian houses. Field testing will show whether houses with existing systems have problems with exhaust duct leakage or foundation chilling. The testing will also help quantify the possibility of icing with vertical stacks, the proportion of indoor air that is exhausted from these depressurization systems, and the contribution of these exhaust fans to house depressurization. The results of this research will help to shape Canadian radon mitigation training and the radon advice provided to consumers by CMHC and Health Canada.

**CMHC Project Officer :** Don Fugler

**CIDN :** 39790200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## LET'S CLEAR THE AIR INDOOR AIR QUALITY (IAQ) INITIATIVE

This initiative delivers information on indoor air quality in the home to targeted audiences, the end result of which will benefit Canadian homeowners and occupants. Basic information to increase awareness and appreciation of indoor air problems is through the one-day Let's Clear the Air seminar (for housing and health professionals) or the Build and Renovate to Avoid Mold workshop (for builders, renovators, architects, real estate and insurance appraisers). A two-day Mold Remediation Workshop trains builders, renovators and contractors on how to remediate mold safely and properly. Qualified individuals can also proceed to the CMHC Residential Indoor Air Quality Investigator Training Program. Individuals who complete the training program acquire the skills to inspect homes for IAQ problems and to provide informed advice to homeowners on how to correct these problems. As a private business, they offer their professional services to the public for a fee. For referral purposes, a list of persons having completed the training is available from CMHC offices.

**CMHC Project Officer :** Hugo Lemieux

**CIDN :** 16230300

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Seminar/training is available

## RADON MITIGATION METHODS IN A COLD CLIMATE

The recipient of a 2009 External Research Program grant undertook a phone and literature review to see if the radon mitigation methods in colder climates such as Canada need to be different than the methods outlined in US EPA or ASTM radon documents. Alaska, for one, recommends side wall venting rather than roof top vent stacks that are found in other US states. Amongst the issues explored were fan failures, vent icing, remediation costs, etc. The survey results generally upheld the use of EPA and ASTM protocols, although it was clear that icing did occur with some regularity in climates similar to Canada.

**CMHC Project Officer :** Don Fugler

**CIDN :** 40140207

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### REVIEW OF THE RELATIONSHIP BETWEEN HOUSE VENTILATION RATES AND HEALTH

This work, being led by the Quebec public health agency (INSPQ) and the National Research Council (NRC), is attempting to establish the relationship between adequate ventilation and health (or inadequate ventilation and poor health), through literature searches and appropriate field testing. The project should lead to a better understanding of the relationship between house ventilation and occupant health. If the project establishes a strong correlation between good ventilation and healthy residents, it will be useful material for building codes, medical authorities, ventilation standards, and the ventilation industry. The first year involves house and occupant characterization. All the houses will have two airtightness tests and 4-5 tracer gas air change rate tests, as well as measurements of the indoor air quality and occupant health status. In 2010, half the sample houses will have their ventilation rate increased by 0.15 air changes per hour, and the health status of the asthmatic children will be monitored to see if the increased ventilation results in health benefits.

**CMHC Project Officer :** Don Fugler

**CIDN :** 35560200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### SUPPORT FOR IAQ/HOUSE CHARACTERIZATION AND DATA ANALYSIS - MCMASTER UNIVERSITY CHILD STUDY

CMHC is supporting this multi-year, inter-institute collaborative research study to address the influence of indoor environments on asthma and allergy. The study will follow 5000 pregnant women and their children, from birth to 5 years of age, to understand the indoor environmental exposures that may result in allergic and respiratory disease. Among other things, the research will provide information on housing characteristics, occupant factors related to the operation of the houses and the presence of indoor biological contaminants. The information will allow CMHC to develop housing strategies to help provide for clean indoor air environments in Canadian households. CMHC has led three rounds of in-depth technical training to research assistants who will use home assessment questionnaires during walk-through home visits with the participating families. The pilot phase of the study closed on December 15, 2008, with 200 mothers and children recruited over a two month period. Important information on recruitment strategies, questionnaires, home assessments and birth events has been collected. The questionnaires and home assessments have been reviewed and improved and the study has now moved to the implementation phase, with the four centres in full operation (Vancouver, Edmonton, Winnipeg and Toronto). A fourth training session is planned for replacement research assistants and will take place before March 2011.

**CMHC Project Officer :** Hugo Lemieux

**CIDN :** 35580200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### SURVEY OF CHARACTERISTICS IN HOMES WITH ELEVATED RADON LEVELS

This 2009 External Research Program research will survey houses in a radon-prone area of Winnipeg to discover whether there are common house characteristics that elevate (or reduce) radon concentrations in these houses. The contractor will also be looking at the impact of the application of a simple remedial measure, a floor drain trap, on the radon reduction in these houses.

**CMHC Project Officer :** Don Fugler

**CIDN :** 40140203

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### CONTRIBUTION TO THE INDUSTRIAL RESEARCH CHAIR IN ALLERGENS AND TOXINS FROM MOLDS IN THE BUILT ENVIRONMENT

CMHC is supporting the ongoing research of the National Science and Engineering Research Council Chair on Allergens and Toxins from Molds in the Built Environment at Carleton University.

The purpose of this support is to help address the problem that there is no method to obtain a quick and inexpensive determination of the nature of mold contamination in a house. A more fundamental understanding of the by-products of mold that are harmful to people is needed along with knowledge regarding the thresholds that should be avoided and cheap and reliable ways of classifying moldy and non-moldy houses. The first five years work of the Chair developed the expertise to identify human allergens, produce antibodies specific to each allergen and isolate and test the effect of toxins on lungs from *Stachybotrys chartarum*, *Aspergillus versicolor* and *Penicillium chrysogenum*, three representative fungi found in houses that require large, medium and low amounts of moisture. The second five years, which started in June 2006, will expand the expertise to a larger number of molds to make it feasible to use these reagents as a cheap and reliable way of testing for mold contamination in houses.

**CMHC Project Officer :** Hugo Lemieux

**CIDN :** 34070200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### LITERATURE REVIEW ON HISTOPLASMA, BLASTOMYCES AND CRYPTOCOCCUS GATTII AND THE IMPLICATIONS FOR THE DESIGN, OPERATION AND MAINTENANCE OF HOUSING

This project is being conducted to compile scientific literature on fungi that may be found in and around housing. A thorough literature review of *Histoplasma capsulatum*, *Blastomyces dermatitidis* and *Cryptococcus gattii*, three fungi that cause infectious diseases in people was conducted by a mycology expert. Histoplasmosis occurs from exposure to feces of birds and bats, while blastomycosis occurs after exposure to the spores in soil. Infections due to *Cryptococcus gattii* are limited to Vancouver Island, though cases have been seen in Vancouver. The literature review will form the basis of housing advisories on how to avoid exposure to these fungi in residential settings. The project is a collaborative effort between CMHC and Health Canada.

**CMHC Project Officer :** Hugo Lemieux

**CIDN :** 36350200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### WATER PENETRATION THROUGH THINNER VENEER WALL

Ryerson University was awarded a grant, under CMHC's External Research Program, to undertake this research project to study the potential for reducing the thickness of masonry cladding (or redesigning masonry units to be lighter and use less material) and still maintain acceptable durability and water penetration performance. The project will focus on issues of resistance to water penetration and durability and will specifically investigate the impact of dimensional changes on the water penetration into the wall (air) cavity. The project is ongoing. A final report summarizing this research project is expected by December 2010.

**CMHC Project Officer :** Silvio Plescia

**CIDN :** 36260215

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### ASSESSING THE FEASIBILITY OF SUPER ENERGY EFFICIENCY RETROFIT STRATEGIES FOR NORTHERN HOUSES

This feasibility study will provide knowledge of the opportunities, costs, benefits and implementation challenges associated with a wide scale energy efficiency retrofit project in a northern community. The condition and energy efficiency of houses will be determined and then modelling will be conducted to identify the extent to which energy consumption can be reduced through the application of specific energy efficiency measures. The costs and benefits of the measures will be estimated and the overall energy and cost savings at the community level will be identified. The knowledge gained through this project will be used by the community to determine whether or not a community wide retrofit is feasible and should proceed. Ultimately, the costs of housing operations could be reduced, housing affordability increased and community-wide environmental impact reduced. The project will be completed by the end of 2010 with a report available in the first quarter of 2011.

**CMHC Project Officer :** William Semple

**CIDN :** 39840200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### CMHC CONTRIBUTIONS TO 2010 NORTHERN HOUSING FORUM

This project provided funding for the 2010 Northern Housing Forum that provided a venue for northern housing providers, builders, architects, building scientists and other northern housing professionals to discuss housing projects and innovations across the circumpolar region. In addition, the event provided a forum for discussing ongoing northern housing research, identifying needed northern housing research, and provided an opportunity to develop partnerships for carrying out this work. An organizing committee, chaired by CMHC, developed the conference theme, organized panel discussions and key note speakers on a variety of northern housing topics. An estimated 150 stakeholders attended the event. The 2010 Northern Housing Forum was hosted by the NWT Housing Corporation in Inuvik, NWT from March 22 to 25, 2010.

**CMHC Project Officer :** William Semple

**CIDN :** 38280200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### CMHC/NWTHC NORTHERN SUSTAINABLE HOUSE (A-BASE)

The project will develop a prototype for the construction of culturally appropriate highly energy efficient housing throughout the Northwest Territories (NWT). It is expected that the design and construction and the cost/benefit analysis of the house will assist in facilitating the use of construction details and practices throughout the NWT and the North that significantly improve building performance. Construction of the house will be completed in 2010. The energy performance of the house will be monitored for a period of 15 months post-occupancy to determine the extent to which the performance targets have been realized.

**CMHC Project Officer :** William Semple

**CIDN :** 39850200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## FUNDING SUPPORT FOR THE NORTHERN SCIENTIFIC TRAINING PROGRAMME

The Northern Scientific Training Programme (NSTP) supports northern research studies by providing universities with funding to help offset the costs associated with travel and accommodation in the North. This project provides support for community-based research and support to traditional knowledge through the Arctic Colleges and Northern Research Institutes. The project increases research capacity within the North, contributes to the research work, and provides northern peoples with enhanced learning, training and employment opportunities within their communities. The project will provide funding to the NSTP for a period of five years, from 2009 to 2013.

**CMHC Project Officer :** William Semple

**CIDN :** 37850200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## INTEGRATED DESIGN AND EVALUATION OF A CONSTRUCTED NORTHERN SUSTAINABLE HOUSE (E/2 PROTOTYPE)

In this project, two "Northern Sustainable Houses" have been designed by CMHC in partnership with a Tr'ondek Hwech'in First Nations community in the Yukon and the Nunavut Housing Corporation in Arviat, Nunavut. The houses have been designed to consume less than 50% of the Model National Energy Code of Canada for Houses energy requirements, and are suited to the northern culture and lifestyles. The project has incorporated local knowledge and experience of members of the northern communities and territorial housing providers where the houses were located. Construction of the Tr'ondek Hwech'in House was completed in January, 2008. Materials for the NHC Arviat House were sea-lifted to the community during the summer/fall of 2009 and construction will start in the summer of 2010. The evaluation of the projects will include monitoring the energy performance of the constructed houses, carrying out a cost/benefit analysis of the energy savings of each Northern Sustainable House vs. a typical new house in the community, and carrying out an analysis of the success of the cultural issues being addressed in the design. CMHC facilitated design workshops, was the lead in designing the houses, and is undertaking the performance evaluation of the Northern Sustainable House Prototypes. A 15 month monitoring project and report on the completed Tr'ondek Hwech'in House was completed in December 2009. The project is sponsored in part by the Program for Energy Research and Development (PERD). The research will be completed by December 2011.

**CMHC Project Officer :** William Semple

**CIDN :** 33240200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

**See also:** ENGINEERED BUILDING ENVELOPE SYSTEM FOR OUTDOOR/INDOOR CLIMATE EXTREMES, p. 18  
ACHIEVING 90% REDUCTION IN ENERGY CONSUMPTION IN SUSTAINABLE NORTHERN HOUSES, p. 27  
SUSTAINABLE HOUSING IN THE NORTH, p. 38  
ROLE OF PUBLIC HEALTH INSPECTORS IN MAINTAINING HOUSING IN NORTHERN AND RURAL COMMUNITIES, p. 41  
SURVEY OF ISSUES AND CHALLENGES TO PROVIDING MARKET HOUSING FINANCE IN THE NORTHERN TERRITORIES, p. 47

### DESIGN AND SPECIFICATION OF NET ZERO ENERGY BUILDING ENVELOPE RETROFITS

This research investigates the technical and economic challenges associated with upgrading the building envelopes of older housing as a part of overall renovations that target net zero energy performance levels. This research will help the housing industry understand and undertake highly energy efficient and durable building envelope retrofits to houses. It will include measures to reduce the energy consumption and environmental impact of Canadian housing. It will also provide guidance on how to renew the building envelopes of aging Canadian houses. This will aid in the development of policies and programs to support the environmental agenda of the federal government in the residential sector.

**CMHC Project Officer :** Barry Craig

**CIDN :** 40230200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

**\*NEW\***

**See also:** Socio-economic research on Renovation and Inspection, p. 52

## SUSTAINABLE DEVELOPMENT & HEALTHY HOUSING

### ACHIEVING 90% REDUCTION IN ENERGY CONSUMPTION IN SUSTAINABLE NORTHERN HOUSES

This project applies Net Zero (EQuilibrium™) technology to the design of a house to be built in the Yukon with the objective of having the home consume 90% less energy than the amount used by the house were it to be built to the Model National Energy Code for Houses (MNECH). CMHC provided technical information and support for the designs and architectural drawings prepared by the Tr'ondek Hwech'in First Nation Band. A mechanical consultant with experience in the design of renewable energy systems and proficient with Hot2000 computer modelling designed the mechanical systems, provided layout drawings, and simulated estimated energy consumption for a family of two adults and two children. The energy consumption of the dwelling will be monitored for one year following occupancy. The developer provided a detailed description of the design and technologies used, as well as itemized cost comparisons to a similar house conforming to the MNECH and to the house built by the Tr'ondek Hwech'in First Nation Band. The project will produce a research report that may assist in designing and building sustainable housing and establish the feasibility of near net zero energy houses in the North.

**CMHC Project Officer :** Barry Craig

**CIDN :** 38260200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### DEVELOPMENT OF A SUSTAINABLE PERFORMANCE ASSESSMENT TOOL FOR HOUSING

An External Research project was initiated to develop a sustainability performance assessment tool for housing in Canada. The project provides a framework that permits a broad-scope sustainability assessment of multi-family housing in Canada. The framework is based on SBTool, an internationally accepted assessment tool that allows specific ratings to be produced for a variety of regions and end uses, by adjusting scope, weights and (local) benchmarks. The system covers a full range of environmental, social and economic variables, provides internal calculation tools for the estimation of Green House Gases, based on regional emission values, and also an approximate embodied energy calculator. The SBTool has been calibrated for multi unit residential buildings, but other alternatives, such as mixed use buildings (for example residential and retail) can also be assessed. The SBTool can be downloaded from the <http://www.iisbe.org/sbtool> website.

**CMHC Project Officer :** Woytek Kujawski

**CIDN :** 28920211

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is available on the web

### EARTH TUBES - APPLICABILITY IN THE CANADIAN CLIMATE

This project will investigate the available literature for evidence regarding the performance of residential earth tube ventilation systems. The aim is to determine the extent to which information is available that can validate or dispel whether or not earth tubes are a good option for reducing ventilation related energy use in houses in northern climates and under what conditions this may be the case. There are concerns that earth tubes do not save significant energy and may represent an indoor air quality concern if adverse conditions arise in the buried duct system. Depending on the information found and its relevance to Canadian climate conditions, the necessity for more research on the topic will be determined.

**CMHC Project Officer :** Ken Ruest

**CIDN :** 39710200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

**\*NEW\***

### EQUILIBRIUM™ COMMUNITY DEMONSTRATION INITIATIVE

EQuilibrium™ Communities is a four-year, \$4.2M collaborative sustainable community demonstration initiative of CMHC and NRCan under the ecoACTION umbrella. The objective is to accelerate sustainable community development in Canada through demonstration of sustainable planning and development at the neighbourhood scale. The initiative will provide financial, technical and promotional assistance to neighbourhood development projects which, through their planning, design, implementation and operation, will provide measurable improvements over traditional approaches.

**CMHC Project Officer :** Susan Fisher

**CIDN :** 39550200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

**\*NEW\***

### NSERC CANADIAN UNIVERSITY NETWORK ON "SOLAR ENERGY UTILIZATION IN BUILDINGS"

CMHC is supporting a new Natural Sciences and Engineering Research Council of Canada (NSERC) funded University Network on "Solar Energy Utilization in Buildings", to achieve the objective of enhancing the capacity of the residential industry to develop solar buildings with substantially reduced purchased energy needs. The overall vision of the Network over its five year period will be to advance the adoption of new knowledge, tools, practices and technologies for cost effective construction of solar zero-net-energy buildings in Canada. The main objectives of the Network over its five-year research program are the following:

1. To develop effective techniques for integration of solar collection, storage and utilization systems in the building envelope.
2. To develop and improve solar energy utilization technologies so as to reduce cost and raise overall efficiency.
3. To develop and demonstrate affordable, reliable, building integrated, distributed power generation systems based on solar energy for residential and commercial buildings.
4. To develop simulation design tools and methodology that may be effectively utilized throughout the design process.
5. To transfer these outputs to the end users.

6. To contribute to the development of government policies and programs aimed at fostering the adoption of solar technologies in buildings

CMHC will seek opportunities to transfer the knowledge gained through the network research to stakeholders in the housing industry.

**CMHC Project Officer :** Duncan Hill

**CIDN :** 34020200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### **PAYBACK PERIOD FOR "GREEN" BUILDING FEATURES IN SINGLE FAMILY DETACHED DWELLINGS**

This project built a framework to profile the attributes of various "green" building features available for single family detached dwellings and to estimate the payback periods of different green features. Generic green features were profiled to increase the understanding of consumers, and industry, of the costs and benefits of "building green" in the single family market. The initial 5 to 10 green building feature profiles will be published to enable consumers and the home building industry to objectively evaluate "green" features that they wish to incorporate into their homes.

**CMHC Project Officer :** Woytek Kujawski

**CIDN :** 38320200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### **REGIONAL PILOT DEMONSTRATION OF NET ZERO ENERGY HEALTHY HOUSING**

This project involves the development of a national net zero energy healthy housing demonstration and implementation initiative through an industry partnership to advance new Canadian housing towards a net zero energy consumption and low environmental impact goal. The concept involves the design, construction, demonstration and monitoring of net zero energy healthy houses in a project called the EQUilibrium™ Sustainable Housing Demonstration Initiative. To date, a total of fifteen projects from across the country have been selected in two separate national competition calls. Construction has been completed on 7 projects with the rest expected to follow in the next two years. All constructed EQUilibrium™ projects will be open for public and professional tours for a minimum time period of six months. Demonstrations will permit the EQUilibrium Teams to show their achievements to the residential building industry and consumers. Upon completion of the demonstrations, the houses will be sold and CMHC will monitor the performance of the houses for one year post occupancy. Based on the outcome of this demonstration initiative, CMHC will explore with its partners and stakeholders opportunities to expand this initiative more broadly across Canada. The EQUilibrium™ Sustainable Housing Demonstration Initiative is based on CMHC's five principles for Healthy Housing (Health, Energy, Resources, Environment, and Affordability). It combines passive solar, energy efficient design, construction and appliances, with commercially available grid tied renewable energy systems to achieve net zero energy consumption on an annual basis, reduced GHG emissions, and low environmental impact. The intended results and impacts of the EQUilibrium™ initiative are to develop strategic alliances between industry and government to reduce the energy intensity of our housing sector, mitigate household energy cost increases in the medium term, foster a growing renewable energy and sustainable housing industry in Canada, increase consumer awareness and demand for sustainable housing, and support Canada's goal of reducing pollutant and green house gas (GHG) emissions. The development of the EQUilibrium™ initiative in Canada will also help to ensure Canada's inclusion in competitive international housing markets and our next generation of value added exports. Detailed information on the EQUilibrium™ Initiative and each of the projects is available on the CMHC web site [www.cmhc.ca](http://www.cmhc.ca).

**CMHC Project Officer :** Thomas Green

**CIDN :** 35490200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is available on the web

### SPECIFICATION OF INDICATORS AND SELECTION METHODOLOGY FOR THE EQUILIBRIUM™ DEMONSTRATION COMMUNITIES INITIATIVE

This project will specify the criteria and indicators of sustainability most relevant to Equilibrium™ Communities and an evaluation methodology for selecting, measuring and monitoring demonstration initiative projects. This commitment represents the first steps of a multi year Equilibrium™ Community Demonstration project to be implemented in collaboration with NRCan. Subsequent commitments will be developed for demonstration project selection process management, technical support, project reporting, etc. within the overall Equilibrium™ initiative.

**CMHC Project Officer :** Mark Holzman

**CIDN :** 37940200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** There will be no product  
for this project

**\*NEW\***

### SUPPORT FOR THE CANADIAN TEAM SUBMISSION TO THE SUSTAINABLE BUILDING (SB) 2008 CONFERENCE

This project supported the characterization of the performance of two Canadian MURBs that have implemented a wide range of innovative technologies and practices to reduce overall environmental impacts. The results of the analysis were presented at the SB08 conference as a part of the international showcase of sustainable buildings. This project will help to advance knowledge of the environmental outcomes of green building technologies and practices and provide feedback on the tools developed to undertake this analysis.

**CMHC Project Officer :** Woytek Kujawski

**CIDN :** 37630200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### SUPPORT FOR THE DEVELOPMENT OF A TECHNOLOGY ROADMAP (TRM) FOR SUSTAINABLE HOUSING IN CANADA

Canada Mortgage and Housing Corporation (CMHC), in partnership with Industry Canada (IC) and Natural Resources Canada (NRCan), will support the development of a Technology Roadmap (TRM) for Sustainable Housing. The TRM will be used to focus industry and government resources on realizing opportunities for, and addressing challenges to, sustainable housing. The TRM will be developed through industry consultations and the organization of industry working groups that will identify key areas of work and possible pathways forward. The TRM will be completed in 2010.

**CMHC Project Officer :** Duncan Hill

**CIDN :** 37670200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## SUPPORT FOR THE GREENING OF THE CÔTEAU VERT PROJECT

This research project is documenting the development of a new green affordable housing development - Côteau Vert in Montreal, Quebec. The study will provide information on the process that the development team took to assess, prioritize and ultimately select green products, equipment, systems and practices to be included in the buildings. This includes an analysis of the related costs, benefits and implementation/operational considerations. Quality assurance, commissioning and monitoring protocols will be developed to support the implementation of the innovative features. This research project will provide information for the residential construction industry on one development team's experience regarding the selection and implementation of green building features and technologies in the design of an affordable multi-unit residential building project.

**CMHC Project Officer :** Woytek Kujawski

**CIDN :** 37560200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## SURVEY OF REGULATORY BARRIERS TO SUSTAINABLE HOUSING

This project will assess the extent of regulatory barriers faced by the first EQUilibrium™ design-build teams in the design and construction of their sustainable housing projects. This will provide CMHC with an opportunity to assess regulatory barriers to real, and very recent, sustainable housing projects. The outcome of this work will enable CMHC to better support the next generation of EQUilibrium™ housing and other sustainable housing efforts, contribute to improving residential building standards and construction practices, and support the federal government's environmental agenda.

**CMHC Project Officer :** Douglas Rowland

**CIDN :** 40220200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## SUSTAINABLE BUILDING ENVELOPE RETROFITS FOR EXISTING HOUSES

This project will develop fact sheets on energy and cost-effective strategies to improve the performance of the building envelopes of existing houses and increase awareness of the cost and environmental impacts of these improvements. They will include generic information about materials and components used in building envelopes, and detailed information about installation and connection of materials and components to ensure optimal performance. The fact sheets will illustrate different strategies to improve walls, foundations, openings and penetrations and compare the estimated costs and energy savings of each. Best practice details (from CMHC guides) will illustrate and explain critical construction procedures and concerns. The fact sheets will contain references to useful information and services, such as CMHC publications and the ecoENERGY program. They will contain information about recycling and disposal of construction materials and their effects on the environment, and will increase the reader's awareness of the environmental impact of changes to their houses, and the ways to achieve the best energy efficiency and durability for the least expense. A consultant with substantial knowledge of Canadian wood-frame construction and sustainable housing has been engaged to review literature on the subject and adapt CMHC best practices to address energy efficient building envelope retrofits.

**CMHC Project Officer :** Barry Craig

**CIDN :** 38340200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## SUSTAINABLE DEVELOPMENT & HEALTHY HOUSING

### UPDATE OF PRACTICES FOR SUSTAINABLE COMMUNITIES

This project will review and update content for CMHC's land use planning and development guide, Practices for Sustainable Communities, which is a resource for municipalities, developers/builders and other housing providers on approaches and tools to improve the environmental performance of residential neighbourhoods. The project includes reviewing the publication, adjusting the structure and focus, identifying new content from CMHC and other sources, recommending a final format to be confirmed with CMHC market research, and producing the updated content.

**CMHC Project Officer :** Cynthia Rattle

**CIDN :** 39570200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

**\*NEW\***

**See also:** SUSTAINABLE BUILDING SCIENCE BEST PRACTICES, p. 21

CMHC/NWTHC NORTHERN SUSTAINABLE HOUSE (A-BASE), p. 25

Socio-economic research on Sustainable Development & Healthy Housing, p. 57-59

## WATER CONSERVATION, REUSE & MANAGEMENT

### DO PRESSURIZED AT-GRADE ON-SITE SEWAGE SYSTEMS PROVIDE QUALITY TREATMENT COMPATIBLE WITH THE LANDSCAPE?

At-grade wastewater treatment systems are currently approved for use in Alberta. However, recent research indicates that full sewage treatment does not always occur. This External Research Program study will examine 2-3 installed systems and assess the performance efficiency of an altered distribution pattern. Parameters to be measured include moisture content, bacterial counts, and nutrient content changes in the soil layer to which effluent has been applied.

**CMHC Project Officer :** Catherine Soroczan

**CIDN :** 28920209

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### INNOVATIVE RESIDENTIAL STORMWATER MANAGEMENT FOR SUSTAINABLE HOUSING AND COMMUNITIES

CMHC supported the development of strategies, policies, case studies and tools to support innovative residential stormwater management in Canada. This multi-party partnership included the Canadian Water Network, Environment Canada, and various academic institutions and municipalities across Canada. Information developed by this project will be available through CMHC research reports and studies. Workshops in Vancouver, Calgary, and Toronto were held, attracting participants from government, academia, community groups, developers and consultants. The proceedings will be made available through the Water Quality Research Journal of Canada. The overview article is now available online from CMHC.

**CMHC Project Officer :** Catherine Soroczan

**CIDN :** 36420200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is available on the web

## NEXT GENERATION WATER BALANCE MODEL

CMHC has supported the development of the Water Balance Model - an on-line decision support tool to evaluate the impact of land use planning and site design on stormwater runoff and watershed health. This project will review the newly updated Water Balance Model tool and then field test it on the Don Valley Watershed in order to determine its effectiveness as a modelling tool, its reporting capabilities, and general ease-of-use. Separate work will be undertaken to incorporate a module to account for onsite water reuse.

**CMHC Project Officer :** Catherine Soroczan

**CIDN :** 38400200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## RAINWATER HARVESTING DESIGN MANUAL

Rainwater Harvesting (RWH) has been undertaken sporadically in Canada and has been recently allowed under some provincial codes. However, the lack of technical information on RWH is an impediment to wide scale adoption. Education and training on rainwater system design and installation practices are among the key issues to be addressed to help ensure rainwater harvesting systems are designed and installed properly and perform in a safe and effective manner in residential settings. Accordingly, this project will develop rainwater system design guide and training materials.

**CMHC Project Officer :** Catherine Soroczan

**CIDN :** 39810200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## SUPPORT FOR INTERNATIONAL WATER ASSOCIATION 2010 WORLD WATER CONGRESS

CMHC will support two workshops at the International Water Association's (IWA) World Water Congress 2010 in Montréal. The first workshop will be part of a one day event on New Water. CMHC's half day agenda will showcase small scale residential water reuse with a focus on Canadian, North American current needs, technologies, and regulatory instruments. The second half day workshop will showcase water management issues for northern and remote communities. This international event will provide Canada and CMHC with an opportunity to showcase Canada's role in residential water research and technology, particularly in the areas of water reuse.

**CMHC Project Officer :** Catherine Soroczan

**CIDN :** 39820200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

**\*NEW\***

### SUPPORT FOR NATIONAL ON-SITE WASTEWATER RESEARCH PROGRAM

CMHC in conjunction with the Canadian Water and Wastewater Association and the provincial on-site associations of Ontario, Alberta, and B.C. will work with national stakeholders across the country to address research and policy gaps in the area of decentralized wastewater management. The network will identify and prioritize all research and policy issues, and leverage funding to address these issues and communicate the results across the country. As a starting point, CMHC will support targeted research for the development of on-site wastewater technology verification and installation standards. To date CMHC has supported the Bureau du normalisation du Québec (BNQ) in the development of a national standard for on-site wastewater technology verification. The CAN/BNQ 3680-2009 Onsite Residential Wastewater Treatment Technologies standard is now available through the BNQ website. A second initiative will support the development of a national on-site wastewater installation standard through the Canadian Standards Association.

**CMHC Project Officer :** Catherine Soroczan

**CIDN :** 35720200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is available

### SUPPORT FOR THE CREATION OF A NATIONAL WATER REUSE PROGRAM

CMHC will work with stakeholders from various government levels, associations, private industry and research centres to establish a Canadian national residential water reuse research and development program of work. This program will address gaps including: policy needs, risk analysis, design standards, pricing strategies, technology performance criteria, enhanced pilot testing and technology demonstration, national guidelines and regulations and innovative technology support for export to developed markets. The first project under this program has been the development of a draft national water reuse guideline for toilet application. The final draft was posted for public enquiry in January 2008 and comments are now being incorporated into the final version. The guideline is anticipated to be finalized and available summer 2010.

**CMHC Project Officer :** Catherine Soroczan

**CIDN :** 35730200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### TESTING PROTOCOL FOR ALTERNATIVE RESIDENTIAL WASTEWATER TREATMENT

CMHC will work with the Canadian Standards Association (CSA) and partners from across Canada to develop a new standard for the evaluation of small scale water recycling, or reuse, systems. A rigorous technology verification standard will support the acceptance of water reuse by providing industry with a common standard to test their systems to and demonstrate compliance with. The standard will provide regulatory authorities with some assurance that compliant systems will perform and system designers with a performance reference when specifying alternative residential wastewater treatment systems.

**CMHC Project Officer :** Catherine Soroczan

**CIDN :** 39830200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### WETLAND WASTEWATER TREATMENT FOR ISOLATED DWELLINGS

This project will evaluate the performance of two wetland treatment systems in reducing wastewater contaminants from isolated dwellings including the effects of freeze thaw on operation and performance. A pilot hybrid wetland will be built at the Ontario Rural Wastewater Centre. The Centre has also built a pilot septage reed bed filter system in Eastern Ontario. The project will consider hydraulic and organic loading rates of septage and holding tank wastes and the impacts of the vegetation on treatment as well as climatic effects (precipitation, temperature).

**CMHC Project Officer :** Catherine Soroczan

**CIDN :** 38420200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## SOCIO ECONOMIC RESEARCH

## ABORIGINAL HOUSING

### ABORIGINAL HOUSEHOLD, HOUSING AND COMMUNITY CONDITIONS BASED ON THE 2001 ABORIGINAL PEOPLE'S SURVEY (APS) AND ABORIGINAL CHILDREN'S SURVEY

This study will profile housing and social conditions of Aboriginal people by distinct Aboriginal group (Status Indian, Métis, Inuit, and non-status Indian), looking at conditions on reserves and outside reserves. The research will examine relationships between housing conditions, household characteristics, and other socio-economic factors, including health status, education, labour activity, and income. Various indicators of housing conditions that are available through the APS and Census will be explored, including crowding, need for repair, water quality, features present in or absent from the home, and core housing need. Personal and household characteristics to be investigated include age, gender, education, disability status, mobility, and household type. Specific analyses will examine the relationship between educational performance of Aboriginal children and their housing conditions and the relationship of health to housing conditions.

**CMHC Project Officer :** Candace A Fedoruk

**CIDN :** 3576 0200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### ABORIGINAL HOUSEHOLD, HOUSING AND COMMUNITY CONDITIONS BASED ON THE ABORIGINAL PEOPLE'S SURVEY (APS)

The consultant hired for this project completed consultations with stakeholders both internal and external to CMHC, including all National Aboriginal Organizations (NAOs) and developed an analysis plan and an assessment of data requirements in preparation for the analysis of custom data linking Statistics Canada's post-censal Aboriginal People's Survey (APS) to CMHC's custom 2001 Census-based housing conditions indicators. The resulting custom data is being analysed and applied to the research issues (using the analysis plan developed through the consultation process). The 2001 APS is the single most comprehensive source of information on household, housing and community conditions faced by Canada's Aboriginal Peoples. As the research is completed, research findings will be published via research reports/highlights and at the end it is planned that an electronic data base specific to Aboriginal housing conditions will be developed and released.

**CMHC Project Officer :** Ian Melzer

**CIDN :** 35760200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### CASE STUDIES OF THE CRITICAL PRECONDITIONS FOR ACHIEVING MARKET-BASED APPROACHES TO HOUSING IN FIRST NATION COMMUNITIES

This project consists of eight case studies of First Nation communities that have an established housing system with market characteristics. The studies will identify for each community the necessary and sufficient condition that enabled the market-like system to be implemented or to evolve. The findings from each community will be compared with each other to highlight commonalities and unique solutions and will also be discussed in the light of certain homeownership initiatives on tribal trust lands in the US.

**CMHC Project Officer :** Antoine Pomerleau

**CIDN :** 36800200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## GUIDE TO CITY HOUSING FOR ABORIGINAL PEOPLE

This product will provide Aboriginal people with practical information concerning how to obtain housing in urban centres. The publication will be a guide for those relocating from small rural and remote communities and also for those in urban centres who need further information concerning housing and homeownership.

**CMHC Project Officer :** *Ian Melzer*

**CIDN :** 34130200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## SMALL FOOTPRINTS ON UNBROKEN LAND / HEALING BROKEN LAND

The project will contribute professional advice and services towards a new First Nation development project located on wild unbroken land in coastal BC and / or on previously used industrial or agricultural broken land. Starting with planning workshops and the development of a community plan, then moving towards establishing a renewable energy platform based on a business plan that establishes a continuous revenue stream, a sustainable development strategy and design solution will be produced for housing construction under Section 95 funding and other recently announced programs to produce 150± homes over 5 years. This will be combined with infrastructure funding from Indian and Northern Affairs Canada, Western Economic Diversification Canada, Natural Resources Canada and Human Resources and Social Development Canada. This project will produce a practical demonstration of sustainable planning, design and development models for rural and remote communities elsewhere in Canada. Fully planned and developed communities, complete with renewable energy systems, road, water, waste water and other essential infrastructure, will occur in several First Nation locations. Development models will be produced that encourage incorporation of sustainability principles and that are built upon economic development and capacity building. The ultimate outcome is 100-150 new homes built by community members in a community planned by the community through workshops and design charrettes.

**CMHC Project Officer :** *Allan Dobie*

**CIDN :** 35290200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## SUSTAINABLE HOUSING IN THE NORTH

This research was undertaken to produce a user-friendly plain language research report that provides a background of "northern" (North of 60) housing in Canada, identifies the types of challenges encountered in northern housing in Aboriginal (Inuit, First Nations, Métis) communities and provides best practice examples of sustainable housing (durable, affordable in construction through use of local materials when possible and in maintenance through provision of energy, water and waste water management at a manageable cost). In addition, the report examined sustainable housing components that have proven to be successful in Canada, and in northern countries that have geographic, climatic and resource challenges similar to those in northern Canada and which may be used, or adapted for use, in Canada. The project is complete and the report is being prepared.

**CMHC Project Officer :** *William Semple*

**CIDN :** 32740200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

**See also:** RETROFITTING CRAWL SPACES - FIRST NATIONS DEMONSTRATION, p. 9

## CHILDREN'S ENVIRONMENTS

### HOUSING, NEIGHBOURHOODS AND CANADIAN CHILDREN'S HEALTH OUTCOMES

This External Research Project will use Cycles 1 to 5 of the National Longitudinal Survey of Children and Youth (NLSCY) to examine whether and how much a family's housing choices (owned home, unassisted rental, assisted housing; single family, row housing, etc.) affect child health outcomes. The research will seek to identify which housing and neighbourhood characteristics associated with home ownership, rental, assisted housing and/or type of housing have impacts on health outcomes, and which do not, and how these characteristics interact with housing choices to affect child health outcomes.

**CMHC Project Officer :** Mark Holzman

**CIDN :** 36260205

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### ROLE OF AFFORDABLE HOUSING IN THE WELL-BEING OF CHILDREN: AN EXPLORATORY LONGITUDINAL STUDY

The purpose of this External Research Program study is to develop a feasible and methodologically rigorous longitudinal research strategy that will be used to conduct a multi-city study to understand how the receipt of affordable rental or home ownership housing through the Affordable Housing Program impacts children's development and well-being. The second objective is to pre-test the developed research strategy by conducting a small-scale pilot study. The findings from the pilot will provide useful preliminary data on the impact of affordable housing on the well-being of children, particularly outcomes related to educational attainment. The findings will also be used to further refine the developed research methodology.

**CMHC Project Officer :** Ian Melzer

**CIDN :** 38840202

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## CITY PLANNING AND HUMAN SETTLEMENTS

### COMPARING CANADIAN NEW-URBANIST AND CONVENTIONAL SUBURBAN NEIGHBOURHOODS

This study will gather and compare data from new-urbanist developments and conventional suburban developments to determine if key objectives of these developments have been realized. Variables to be examined include: car usage for weekday urban travel; access to daily destinations; pedestrian connectivity; housing choice; compactness; occupant satisfaction (e.g. pedestrian safety, aesthetic qualities); access to useful public open/green space; and interaction. The study will derive lessons learned about various neighbourhood design features and how well they achieve key objectives. Four new-urbanist developments and four comparable conventional suburban developments have been chosen and surveyed, and an interim report has been submitted and reviewed. Data analysis is complete and the draft final report has been submitted and reviewed. The final report will be published in 2010.

**CMHC Project Officer :** Susan Fisher

**CIDN :** 30610200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### CONTINUING EDUCATION ARTICLES FOR PLANNERS

These CMHC web-based continuous professional learning articles will provide up-to-date and in-depth knowledge to professional planners on leading edge research issues. Two topics are the subject of this project: brownfield regeneration and growth management. The first examines brownfields as an opportunity to relieve pressure for city expansion, while the second looks at growth as an opportunity to apply techniques that will reduce its environmental impact.

**CMHC Project Officer :** Mark Holzman  
**Division :** Policy and Research Division  
**AVAILABILITY :** Product is available

**CIDN :** 34500200  
**STATUS :** Ongoing

## COOPERATIVE AND NON-PROFIT HOUSING

### GOVERNANCE CHALLENGES IN NON-PROFIT HOUSING ORGANIZATIONS

This project focuses on gaining a better understanding of the organizational and operational challenges facing board members and managers of non-profit housing organizations in Quebec. The research examines management strategies that the boards of directors and managers are adopting in the face of increasingly complex financial, maintenance, and support services arrangements. Further, the research looks at factors that motivate individuals to serve on the boards, and it examines the ways in which management succession affects the operation of the organizations.

**CMHC Project Officer :** Hoda Shawki  
**Division :** External Research Program  
**AVAILABILITY :** Product is not yet available

**CIDN :** 38840204  
**STATUS :** Ongoing

### UPDATING “YOUR GUIDE TO RENTING A HOME” AND “GUIDE TO CO-OP HOUSING”

This project will provide for updating of the substantive content of CMHC's online rental guide (“Your Guide to Renting a Home”) annually, and of CMHC's online “Guide to Co-operative Housing” every second year; of the live links contained in these guides every four months, and of the non-link information contained in these guides annually. It will also provide for the handling of enquiries as received and the potential addition of new sections to the guides.

**CMHC Project Officer :** Jim Zamprelli  
**Division :** Policy and Research Division  
**AVAILABILITY :** Product is not yet available

**CIDN :** 39660200  
**STATUS :** Ongoing  
**\*NEW\***

## HOMELESSNESS

### NEXT STEPS: EVALUATING TRANSITIONAL HOUSING FOR THE HOMELESS

This External Research Program study seeks to provide information that can determine the role that transitional shelters can play in the continuum of responses to homelessness. The research will assess the effectiveness of the Next Steps Transitional Shelter program in Victoria, British Columbia; will analyze individual outcomes through a macro-policy lens focused on adequacy of income, housing availability, access to health services, and social inclusion and supports; and will review the effectiveness of integrating research with a service provider's intake and exit processes.

**CMHC Project Officer :** Hoda Shawki

**CIDN :** 40140213

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### ROLE OF PUBLIC HEALTH INSPECTORS IN MAINTAINING HOUSING IN NORTHERN AND RURAL COMMUNITIES

Homelessness remains a major social and health issue in northern and rural communities in part because it remains hidden from the 'public' eye. Various structural elements work towards making homelessness hidden including: no local temporary housing or shelters, rural poverty, a pattern of frequent moves by homeless people among family or friends, and relocation of vulnerable persons to urban areas for services. For public health inspectors, however, the housing conditions of the precariously housed are very visible. The purpose of this External Research Program study is to better understand the role of northern and rural public health inspectors in maintaining housing stock in accordance with health standards and how northern and rural housing challenges are addressed by public health inspectors.

**CMHC Project Officer :** Hoda Shawki

**CIDN :** 40140208

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### USING PHOTOVOICE TO EVALUATE THE IMPLEMENTATION OF SUPPORTIVE HOUSING IN OTTAWA

Photovoice is a participatory action research method that combines photography with other forms of qualitative data collected from interviews, focus groups, or writings. This External Research Program study will use photovoice in the evaluation of eight supportive housing agencies that form the Ottawa Supportive Housing Network (OSHN). The research will develop methods for evaluating the implementation of supportive housing by network members using photovoice, will use photovoice to evaluate the implementation of the participating programs, and will assess the value of photovoice as a program evaluation method.

**CMHC Project Officer :** Hoda Shawki

**CIDN :** 40140211

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## HOUSE CONSTRUCTION INDUSTRY

### MEASURING THE EMPLOYMENT EFFECTS OF RESIDENTIAL CONSTRUCTION AND RENOVATION

The project will build upon earlier research and enhance CMHC's and the housing industry's understandings of the magnitude of the contribution that the residential construction sector makes to employment in the Canadian economy.

**CMHC Project Officer :** Michel Laurence

**CIDN :** 39861000

**Division :** Market Analysis Centre

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## HOUSING

### VIRTUAL SHOWCASE OF HOUSING IN CANADA

This project will assess the viability and options for the creation of a virtual showcase of exemplary housing projects in Canada. This showcase is expected to provide a forum to post leading edge projects which meet pre-set criteria for innovation and quality in a format that facilitates easy comparison.

**CMHC Project Officer :** Douglas B Pollard

**CIDN :** 36500200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## HOUSING AFFORDABILITY

### ACTION RESEARCH ON TRANSPORTATION AND HOUSING AFFORDABILITY

The question driving this External Research Program project is what is the potential for increasing housing choice and affordability in large Canadian cities through the application of sustainable transportation policy? The main goal of the research is to identify municipal transportation policies with the potential for the most positive impact on housing choice and affordability.

**CMHC Project Officer :** Mark Holzman

**CIDN :** 38840209

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### AFFORDABLE HOUSING FOR FAMILIES: ASSESSING THE OUTCOMES

Families who cannot access affordable housing not only face increased housing pressure, but also many other social and economic problems, and risk homelessness. Yet there are currently no new programs in BC for affordable housing for families. This External Research Program project aims to produce important information on outcomes for families in affordable housing for input to policy-making.

**CMHC Project Officer :** Ed Nera

**CIDN :** 34380214

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## HOUSING AFFORDABILITY

### ESSENTIAL SERVICE WORKERS AND HOUSING AFFORDABILITY

This project will develop an overview of mechanisms through which governments in the United States, the United Kingdom, Ireland, Australia, and selected OECD countries determine the degree to which housing is affordable for essential service workers, as well as an overview of affordable housing programs for such workers in these countries. It will also identify strategies which proved to be especially effective and successful in the context of these programs.

**CMHC Project Officer :** Hoda Shawki

**CIDN :** 39650200#

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## HOUSING AND IMMIGRATION

### MOBILITY EXPERIENCES OF IMMIGRANTS AND THE CANADIAN BORN AND HOMEOWNERSHIP

This External Research Program project aims to answer two key research questions. First, do immigrants relocate in Canada more than the Canadian born and if so, at what geographic levels? Second, among immigrants and the Canadian born who relocate, for whom is it more likely to end in homeownership?

**CMHC Project Officer :** Richard Gabay

**CIDN :** 38840210

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## HOUSING EXPORT OPPORTUNITIES

### CAPACITY STUDY OF THE CANADIAN PREFABRICATED PANEL MANUFACTURING INDUSTRY

This study will provide a lexicon of successful export behaviours in the manufactured housing industry and rank them in terms of their importance in achieving successful business. Each will then be described in detail and suggestions offered as to how they may be better disseminated among manufacturers. An estimate of the actual capacity of the Canadian industry able to provide the level of service necessary will also be made. The successful contractor is to identify specific packages of training and technology transfer which can enable these and other companies to achieve success abroad.

**CMHC Project Officer :** Oliver Drerup

**CIDN :** 39970900

**Division :** CMHC International

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## HOUSING EXPORT OPPORTUNITIES

### CASE STUDY FOR THE INTEGRATION OF TECHNICAL, REGULATORY AND COMMERCIAL, SUPPORT FOR HEAT RECOVERY VENTILATORS IN THE UK/IRELAND MARKETS

This project seeks to improve the Canadian heat recovery ventilator (HRV) industry's understanding of the technical, regulatory and commercial challenges to UK/Ireland market penetration and expansion. It will endeavor to increase the number of Canadian HRV manufacturers in possession of U.K. and/or EU regulatory approvals, which will lead to increased sales of Canadian HRVs to the U.K/Ireland and increased Canadian content of Super E housing system exports.

**CMHC Project Officer :** Terry Robinson

**CIDN :** 38780900

**Division :** CMHC International

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### EVALUATION OF COMMERCIAL OPPORTUNITIES FOR CANADIAN HOUSING EXPORTERS GIVEN CURRENT MARKET REALITIES IN THE UK

The purpose of this project is to undertake a critical re-evaluation of the price competitiveness of the Canadian offering, both Super-E and conventional prefabricated housing in the UK market, along with detailed market segmentation intelligence to better identify the real opportunities to re-position the Canadian offering and capitalize on market demand going forward.

**CMHC Project Officer :** Iromi C Amit

**CIDN :** 37960900

**Division :** CMHC International

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

**\*NEW\***

### HOUSING MARKET ASSESSMENT IN CENTRAL AMERICA AND THE CARIBBEAN

The purpose of this project is to provide an assessment of the housing market in Central America and the Caribbean (strengths and weaknesses) in order to explore potential business opportunities for Canadian housing and finance industry participation in those regions.

**CMHC Project Officer :** Terry Robinson

**CIDN :** 37920900

**Division :** CMHC International

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### MARKET INTELLIGENCE ON NEW ENGLAND HOUSING MARKET

CMHC will support Canadian manufacturers with updated market information and intelligence on the Maine housing market by conducting market research specifically on (1) market needs for products that meet the LEED requirements; (2) trends and preferences including product specifications; and (3) changes in relation to NAFTA and cross-border issues. Market information on Maine will be disseminated to Canadian companies.

**CMHC Project Officer :** Ronald Drisdelle

**CIDN :** 38490900

**Division :** CMHC International

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## HOUSING EXPORT OPPORTUNITIES

### REGULATORY SUPPORT FOR WINDOWS IN THE U.K./IRELAND

This project seeks to improve the Canadian wood window industry's understanding of the technical, regulatory and commercial challenges to UK market penetration and expansion. It will endeavor to increase the number of Canadian window manufacturers in possession of U.K. and/or EU regulatory approvals, which will lead to increased sales of Canadian windows to the U.K. and increased Canadian content of Super E housing system exports.

**CMHC Project Officer :** *Terry Robinson*

**CIDN :** 38740900

**Division :** CMHC International

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### RESEARCH ON BUSINESS OPPORTUNITIES IN CHINA - PHASE II

The purpose of this project is to identify and document business opportunities in China and match them with Canadian manufacturers.

**CMHC Project Officer :** *Tulio Conejeros*

**CIDN :** 38510900

**Division :** CMHC International

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### RESEARCH ON EMERGING MARKETS FOR CANADIAN PRODUCTS & SERVICES

The purpose of this project is to report on which countries/areas in the Gulf Cooperation Council, Middle East offer potential export opportunities for Canadian product manufacturers and service providers.

**CMHC Project Officer :** *Brian Eames*

**CIDN :** 39950900

**Division :** CMHC International

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### RESEARCH ON INNOVATIVE/GREEN/NICHE PRODUCTS IN THE U.K.

The purpose of this project is to identify buyers, builders, merchants, distributors and wholesalers in the United Kingdom potentially interested in Canadian housing products, focusing on innovative, green and niche products.

**CMHC Project Officer :** *Terry Robinson*

**CIDN :** 38540900

**Division :** CMHC International

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

**\*NEW\***

### RESEARCH ON STRATEGIES WITH U.S. BUILDERS AND DISTRIBUTION CHANNELS

The purpose of this project is to develop market intelligence reports for specific green building products and U.S. regions, which will help Canadian manufacturers identify opportunities and gain market access and thereby increase the sale of Canadian products to the U.S.

**CMHC Project Officer :** *Terry Robinson*

**CIDN :** 38560900

**Division :** CMHC International

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### RESEARCH ON THE RELATIONSHIPS BETWEEN U.S. BUYERS AND CANADIAN SELLERS

The purpose of this project is to gather market intelligence on U.S. buyers of green building products that will help Canadian manufacturers identify and gain market access, and promote awareness and acceptance of Canadian green building products.

**CMHC Project Officer :** Terry Robinson

**CIDN :** 38570900

**Division :** CMHC International

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### SUPER E PARTNERSHIP IN U.K./IRELAND

This project is a partnership between CMHC and NRCan to assist Canadian housing system suppliers construct homes with high Canadian content that meet stringent performance requirements in the UK/Ireland. CMHC's contribution is directed towards seminars, training for members in the UK/Ireland and Canada, annual Super E member forums, support with project development, quality assurance, testing and trouble shooting. NRCan produces an annual report on the Program's accomplishments.

**CMHC Project Officer :** Brian Eames

**CIDN :** 38760900

**Division :** CMHC International

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

**\*NEW\***

### SUPER E PROGRAM IN FOREIGN MARKETS

The project will contribute to the activities of the Energy Efficient Exporters' Alliance (EEEA) in assisting Canadian housing system suppliers to construct energy efficient, healthy homes with high Canadian content in foreign markets. CMHC's contribution is directed towards seminars, training for members, annual Super E member forums, support for project development, quality assurance, testing and trouble shooting.

**CMHC Project Officer :** Brian Eames

**CIDN :** 40070900

**Division :** CMHC International

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

**\*NEW\***

### SUPPORT FOR JAPAN SUPER E PROGRAM

This project's objective is to provide research and technical support to build Super E demonstration houses in Japan. As Asian consumers and industry stakeholders recognize the importance of energy efficiency and enhanced indoor living environments, interest in Super E is gaining momentum. The promotion of Super E in Japan will promote the sale of Canadian products.

**CMHC Project Officer :** Brian Eames

**CIDN :** 38790900

**Division :** CMHC International

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

**\*NEW\***

## MORTGAGE MARKET INFORMATION FOR CONSUMERS

This project investigates what is being done domestically and internationally in order to help consumers obtain mortgage market information. Access to mortgage market information can help consumers obtain low-cost housing finance and promote efficiency in the primary mortgage market.

**CMHC Project Officer :** *Steven Ehrlich*

**CIDN :** 38010200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## SURVEY OF ISSUES AND CHALLENGES TO PROVIDING MARKET HOUSING FINANCE IN THE NORTHERN TERRITORIES

The goal of this research project is to identify and examine gaps and issues, if any, related to mortgage financing and other issues impeding the financing of market housing in the North. The research will focus on housing financing in the north by examining the issues faced by:

- a) lenders in providing mortgage financing for homeowners and private rental housing; and
- b) individual home-buyers and rental developers in obtaining mortgage loans.

The research will also consider the effects of non-market housing activities (e.g. social housing, territorial government staff housing, and industry-provided worker housing) on housing finance and the growth of market-based housing as it relates to the above-mentioned research focus.

**CMHC Project Officer :** *Elliot Rodger*

**CIDN :** 39590200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

**\*NEW\***

## UPDATING CMHC'S ON-LINE "CONDOMINIUM BUYERS' GUIDE"

This project will update the CMHC existing "Condominium Buyer's Guide", and extend it by adding provincial and territorial fact sheets (analogous to those in the publication, "Your Guide to Renting a Home") since condominium legislation and regulations are made at the provincial /territorial level of government, and by providing the substantive input necessary to convert the resulting guide to a true on-line guide with links to other on-line sources of information (e.g. from provincial /territorial governments and non-governmental organizations).

**CMHC Project Officer :** *Jim Zamprelli*

**CIDN :** 40380200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

**\*NEW\***

## HOUSING INDICATORS AND DATA

### CANADIAN HOUSING OBSERVER 2010

The “Canadian Housing Observer” is a flagship CMHC publication which provides comprehensive and authoritative reporting on the state of Canada’s housing. The Observer is published annually, and is available in print and electronic formats. The analysis presented in the Observer, coupled with the extensive on-line data resources, provides Canada’s housing sector with an indispensable tool for identifying, monitoring and addressing housing trends and issues.

**CMHC Project Officer :** Sandra Baynes

**CIDN :** 40090200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### LOCATION AND GASOLINE PRICE AS COFACTORS IN HOME PRICES

This External Research Program project will assess the possible impacts of changes in gasoline price on home prices in parts of the Toronto and Vancouver regions and discuss the assessment. The hypothesis to be tested is that high or rising gasoline prices enhance the price of centrally located homes in these urban regions in comparison with homes that are less centrally located (and vice versa: low or falling gasoline prices have the opposite effect).

**CMHC Project Officer :** Susan Fisher

**CIDN :** 40140214

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### SEPARATE LAND AND BUILDING PRICE ESTIMATION MODEL

Most property prices observed on the market include both the price of the land and the price of the building. This External Research Program project explores the question of how to determine the contribution of each of these two components to the total transaction price. The research aims to develop a model for the disaggregation of the total price of a property between its land and building components.

**CMHC Project Officer :** Hoda Shawki

**CIDN :** 38840213

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## HOUSING RESEARCH

### MEASURING THE SOCIAL, ECONOMIC AND ENVIRONMENTAL OUTCOMES OF GOOD HOUSING

This research will provide CMHC with a better conceptual and empirical understanding of the relationship between providing good housing and non-shelter outcomes through a literature review which will document developments across the research landscape, summarize key research findings and results, outline the range of methodologies and indicators used to measure the non-shelter outcomes, and discuss the methodological issues faced by researchers. This project will lay out a methodology framework that will be used to guide future research measuring the non-shelter outcomes of good housing.

## HOUSING RESEARCH

**CMHC Project Officer :** Nathalie Roy-Patenaude

**CIDN :** 37820200

**Division :** Strategic Planning

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### OVERVIEW OF THE CURRENT STATE OF KNOWLEDGE ON SOCIETAL OUTCOMES OF HOUSING: DRAFT PHASE II RESEARCH REPORT: ASSESSING THE SOCIETAL OUTCOMES OF HOUSING IN CANADA: AVENUES FOR FUTURE RESEARCH

The objective of this research project was to assess the current state of knowledge regarding linkages between housing and broader societal outcomes, specifically non-housing outcomes related to education, skills development and employment.

A literature review was conducted to assess the current state of knowledge, identify data gaps, examine related methodological challenges and identify future research challenges. The research aimed to address the following questions:

- What is the current conceptual thinking on how housing affects societal outcomes related to education, skills development and employment? How can these be measured and what challenges exist?
- What perspectives exist regarding vulnerable groups with distinct housing needs?
- What are the strengths and weaknesses of the various methodological approaches used to identify, quantify and attribute societal outcomes?

*Prepared by SHS Consulting. Consultant: Ed Starr. CMHC Project Officer: Ed Nera. Ottawa: Canada Mortgage and Housing Corporation, 2009.*

Note: No. 10-001 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site (Order number 66751)

**STATUS :** New Completed Report and Research Highlight

**AVAILABILITY :** Canadian Housing Information Centre and

[ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Rsearch\\_Reports-Rapports\\_de\\_recherche/eng\\_unilingu\\_al/CaI%20MH%2009081\\_\(V\).pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Rsearch_Reports-Rapports_de_recherche/eng_unilingu_al/CaI%20MH%2009081_(V).pdf)

### UNDERSTANDING THE STATUS OF VISITABILITY

The goal of this External Research Program study is to analyze the situation regarding visitable housing in Canada and to determine related barriers, facilitators, best practices, gaps, trends and issues.

Note: No. 08-011 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site (Order number 65959)

**CMHC Project Officer :** Jim Zamprelli

**CIDN :** 34380215

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Research highlight is available

## INFRASTRUCTURE

### ECONOMIC QUANTIFICATION OF THE "SOFT" BENEFITS OF GREEN INFRASTRUCTURE

This External Research Program project is focused on the following question: How can we value the "soft" (difficult to quantify) benefits associated with various types of green infrastructure? The objectives of the study are as follows:-- determine the full range of soft benefits associated with green infrastructure;-- identify the key benefits that are the most feasible to quantify;-- explore evaluation methodologies for each of the key benefits; and -- provide tangible development scenarios showing how the evaluation methodologies could be applied "on the ground".

**CMHC Project Officer :** Douglas B Pollard

**CIDN :** 38840216

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## PERSONS WITH DISABILITIES

### COMPENDIUM OF CANADIAN ACCESSIBLE HOUSING CODES AND STANDARDS

The goal of this External Research Program project is to research technical accessibility requirements for single family homes and multi-family dwellings and to document best practices and innovative design solutions related to accessible housing. The project will develop a database of technical accessibility requirements in each of the Canadian provinces and territories and in select international jurisdictions, as well as a report comparing the accessibility requirements in different jurisdictions and documenting best practices and innovative design requirements.

**CMHC Project Officer :** Hoda Shawki

**CIDN :** 38840205

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### EFFECT OF SNOW AND ICE ON EXTERIOR RAMP NAVIGATION BY WHEELCHAIR USERS

Wheelchair users are particularly affected by snow and ice conditions since previously accessible facilities become inaccessible. This study is the first quantitative analysis of wheelchair mobility on ramps under winter conditions. Eleven manual wheelchair users ascended an exterior ramp at 1:10, 1:12, 1:16 slopes, under packed snow and "packed snow with a freezing rain cover and traction grit" conditions. Vicon motion tracking, video, and questionnaire data were collected to assess biomechanics and subject perceptions. This study confirmed that independent navigation cannot be assumed for all conditions and ramp grades that are accepted under current building codes. All subjects were able to complete the ice-grit conditions independently at all ramp slopes. For snow conditions, the 1:10 grade was insurmountable for many subjects without assistance. The 1:16 grade was preferred for winter ramp navigation. For snow conditions, the transition area from level ground to the ramp incline was the most difficult to traverse. Backwards ramp ascent should be considered for people with sufficient shoulder and trunk range of motion. For ice-grit ramp navigation, two-railing propulsion was preferred due to enhanced trajectory control and reduced wheel slip problems. The amount of grit required and the effective time (i.e., time when embedded grit becomes much less effective) should be addressed in further research. Typical front wheels are not designed for soft snow conditions and few options exist that attempt to address this need. As the first biomechanical evaluation of wheelchair ramp navigation, the outcomes from this study provide a better understanding of wheelchair user strategies for dealing with ramps in winter.

## PERSONS WITH DISABILITIES

Prepared by Edward Lemaire, Patricia O'Neill, Marcel M. Desrosiers, Gordon Robertson. CMHC Project Officer: Jim Zamprelli. Ottawa: Canada Mortgage and Housing Corporation, 2010. (External Research Program Report) 77 pages (15.8 MB)

**STATUS :** New Completed Report

**AVAILABILITY :** Canadian Housing Information Centre and  
[ftp://ftp.cmhc-schl.gc.ca/chic-ccdh/Research\\_Reports-Rapports\\_de\\_recherche/eng\\_unilingu\\_al/CaI\\_MH\\_10E27\\_VV.pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccdh/Research_Reports-Rapports_de_recherche/eng_unilingu_al/CaI_MH_10E27_VV.pdf)

### PATTERNS OF USE OF DIFFERENT TOILET GRAB BAR CONFIGURATIONS

A previous study looking at different toilet grab bar configurations showed that ambulatory and non-ambulatory seniors highly prefer the presence of a grab bar on both sides of the toilet seat contrary to American and Canadian recommended guidelines. This External Research Program study will focus on the "patterns of use" of six (6) different toilet grab bar configurations having grab bars on both side of the toilet seat.

**CMHC Project Officer :** Jim Zamprelli

**CIDN :** 34380216

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### PROFILE HOUSING CONDITIONS OF PERSONS WITH DISABILITIES

The project will analyze data from Statistics Canada's 2001 post censal Participation Activity Limitation Survey (PALS) for the production of a series of research highlights profiling the housing conditions of persons with disabilities - the first based on the 2001 Census data, and subsequent highlights focussing on specific disability areas such as agility and mobility, hearing, seeing, speaking/communication, psychiatric or mental health issues, developmental/intellectual, learning disabilities, as well as the specific needs of children and seniors. These will be based on the 2001 PALS data with links to CMHC's custom core housing need data and a range of socio-economic and demographic characteristics from the Census.

**CMHC Project Officer :** Ian Melzer

**CIDN :** 35780200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is available on the web

### UPDATING AND ENHANCING CMHC PUBLICATIONS REGARDING CONSTRUCTION AND RENOVATION OF HOMES FOR PEOPLE WITH DISABILITIES

The objective of this project is to produce a number of publications in the CMHC About Your House (AYH) series for use by persons with disabilities, architects, occupational therapists, renovators, builders and the general public. Each will be based on information, to be updated, in the publication "Housing for Persons with Disabilities" and will take into account information contained in other FlexHousing™ and Healthy Housing™ publications. The titles for the AYH series include House Plans and Design, Fire Safety, Interior and Exterior Ramps, Kitchens, Bathrooms and Living Spaces, among others.

**CMHC Project Officer :** Jim Zamprelli

**CIDN :** 31960200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is available on the web

## PERSONS WITH DISABILITIES

### WELCOMING HOME: SOCIAL SUPPORT AS A BENEFIT OF CONGREGATE LIVING FOR PERSONS WITH MENTAL ILLNESS

This External Research Program qualitative study will examine the benefits of congregate living for individuals who have a mental illness or a concurrent disorder. Research and direct service experience suggests that residing in a self-contained unit is desirable and there is high demand for this type of housing. The objectives of this study are: to identify the perceived benefits of residing in self-contained units; to determine whether perceived benefits of residing in self-contained units can be achieved by residing in congregate settings; and to determine whether additional gains are provided through congregate living (e.g., greater social support) in addition to the perceived benefits of residing in self-contained units.

**CMHC Project Officer :** Jim Zamprelli

**CIDN :** 38840218

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## RENOVATION AND INSPECTION

### ESTIMATING THE COSTS AND BENEFITS OF HOME RENOVATIONS TO ACCOMMODATE AGING AND DISABILITY

This project will apply the new CMHC cost-benefit framework, or model, to estimate the costs and benefits of home renovations to accommodate aging and disability relative to long-term care institutionalization. The project will include a national survey, involving personal interviews with at least 250 RRAP-D and HASI program beneficiaries and 200 telephone surveys to generate statistically reliable estimates of the costs and benefits. At least 50 caregivers of program beneficiaries will also participate. Following the conduct of the surveys, the resulting cost and benefits of the renovations will be compared with available data on the cost and benefits of long-term care institutionalization. This project will produce estimates of the costs and benefits, and cost-benefit ratios, of home renovations to accommodate aging and disability. Such estimates would be useful to policy at the Federal/Provincial/Territorial/Municipal levels related to funding such housing renovations and to the health services sector, regarding related support services programs for seniors and persons with disabilities. The societal impact on care giving and the health care sector will be examined.

**CMHC Project Officer :** Ian Melzer

**CIDN :** 35440200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

**See also:** Technical Research on Renovation and Inspection, p. 27

## RENTAL HOUSING

### REGULATIONS IN THE RESIDENTIAL CONSTRUCTION INDUSTRY IN QUEBEC AND THEIR EFFECTS ON THE COST OF RENTAL HOUSING

This research assesses the impact of the variety of regulations affecting residential construction in Quebec on the cost of rental housing. The research includes a literature search of residential building regulations and interviews with experts in the housing industry, including building officials in the Ville de Québec, representatives of the Commission de la construction du Québec (CCQ), l'Association de la construction du Québec (ACQ), the Corporation des entrepreneurs généraux du Québec (CEGQ), and several residential builders. The research includes estimates of the costs of

## RENTAL HOUSING

residential construction attributed to these regulations, and their effects on housing rents. The project should be completed in 2010.

**CMHC Project Officer :** Barry Craig  
**Division :** External Research Program  
**AVAILABILITY :** Product is not yet available

**CIDN :** 28920202  
**STATUS :** Ongoing

### UPDATING “YOUR GUIDE TO RENTING A HOME” AND “GUIDE TO CO-OP HOUSING”

This project will provide for updating of the substantive content of CMHC's online rental guide (“Your Guide to Renting a Home”) annually, and of CMHC's online “Guide to Co-operative Housing” every second year; of the live links contained in these guides every four months, and of the non-link information contained in these guides annually. It will also provide for the handling of enquiries as received and the potential addition of new sections to the guides.

**CMHC Project Officer :** Jim Zamprelli  
**Division :** Policy and Research Division  
**AVAILABILITY :** Product is not yet available

**CIDN :** 39660200  
**STATUS :** Ongoing  
**\*NEW\***

## RESIDENTIAL DEVELOPMENT

### CASE STUDIES OF SUSTAINABLE GREENFIELD RESIDENTIAL DEVELOPMENTS

The current approach to residential development that consumes open space on the urban fringe for single-detached dwellings on large lots is recognized as neither economically nor environmentally sustainable. This project is to document sustainable (“green”) residential development case studies from across Canada so that developers, municipalities, housing professionals, and community groups can learn about success stories and replicate these “green” solutions, where applicable.

**CMHC Project Officer :** Mark Holzman  
**Division :** Policy and Research Division  
**AVAILABILITY :** Product is not yet available

**CIDN :** 29490200  
**STATUS :** Ongoing

### CITIZEN'S GUIDE TO DENSITY: UNDERSTANDING RESIDENTIAL DENSITIES IN THE GREATER GOLDEN HORSESHOE

Density targets, a discrete measure of density designed to curb sprawl and encourage compact, sustainable development, are useful benchmarks for planners, architects and developers, but are often unintelligible to the average citizen. Driven by Provincial growth directives, municipalities in the Greater Golden Horseshoe are struggling with how to translate density targets into tangible and meaningful examples. This External Research Program research seeks to demonstrate how this can be done through the development of a handbook that will illustrate and simply communicate residential densities that contribute positively to the public realm.

**CMHC Project Officer :** Cynthia Rattle  
**Division :** External Research Program  
**AVAILABILITY :** Product is not yet available

**CIDN :** 40140218  
**STATUS :** Ongoing

## RESIDENTIAL DEVELOPMENT

### IMPACT OF DEVELOPMENT COST CHARGES ON HOUSING AFFORDABILITY

The objectives of this project are to:

- (1) investigate the impact of development cost charges on the price and affordability of housing in Canada;
- (2) identify the costs and benefits of both infill and new subdivision developments in Vancouver, Calgary, Winnipeg, Toronto, Montreal and Halifax; and
- (3) quantify the up-front and ongoing costs or benefits of infill and new subdivision development on the residents of the new development, residents of existing developments, the local government and the community at large.

**CMHC Project Officer :** Mark Holzman

**CIDN :** 34060200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### IN PURSUIT OF SUSTAINABLE NEIGHBOURHOOD DEVELOPMENT PATTERNS: THE NEXT STEP - A ROAD SAFETY EVALUATION OF ROAD NETWORK PATTERNS, INCLUDING CMHC'S FUSED GRID ROAD NETWORK PATTERN

The objectives of this External Research Program project are:

- (1) to develop models for use by Ottawa planners and engineers to do empirical road safety planning;
- (2) to apply these models in a case study using actual data, to evaluate the level of safety of CMHC's Fused Grid pattern; and
- (3) to compare the road safety of the Fused Grid road network with four other road network patterns.

**CMHC Project Officer :** Mark Holzman

**CIDN :** 38840212

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## SENIORS

### ASSESSING THE IMPLICATIONS OF POPULATION AGING ON THE EXISTING HOUSING STOCK: IMPLICATIONS OF POPULATION AGING FOR REAL HOUSING PRICES

Population aging is a trend that will accelerate in Canada in the next two decades with the aging of the baby boom generation. The goal of this research is to study the effects of population aging on real housing prices in Canada. The project includes a review of the Canadian and the international literature on the effects of demographic changes on real housing prices and the development of an econometric model of these effects for Canada. The model is used to project real housing price changes in Canada and in each province for the next 20 years under different scenarios.

**CMHC Project Officer :** Hoda Shawki

**CIDN :** 37680200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## CERTIFICATION OF SENIORS' RESIDENCES IN QUEBEC: FACILITATING AND CONSTRAINING FACTORS

In February 2007, the Government of Quebec introduced a mandatory process for the compliance certification of all seniors' residences. The development and application of such a process pose major challenges for the different stakeholders in this process in order to meet organizational changes and the standardization of a series of practices that are now imposed in this sector. This External Research Program study aims to highlight the positive factors and constraints perceived by three of the stakeholders in this process, namely, the operators, the agencies and the "Conseil québécois d'agrément" (Quebec certification council).

**CMHC Project Officer :** *Jim Zamprelli*

**CIDN :** 40140212

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## FEASIBILITY OF SMART VOICE TECHNOLOGY TO IMPROVE SUPPORT IN AFFORDABLE SENIORS' HOUSING

Smart technologies facilitate the independent living of older adults. In this External Research Program pilot study, 10 prototype smart voice fridge sensors that provide voice prompts and report activity status will be installed and tested in affordable seniors' housing units to confirm user acceptance and system performance. The feasibility of larger scale implementation will be determined.

**CMHC Project Officer :** *Jim Zamprelli*

**CIDN :** 40140210

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## PROBABLE EFFECTS OF AN AGING POPULATION ON THE HOUSING MARKET: A PROSPECTIVE STUDY

In the coming decades, Quebec will be confronted by an aging population. Though the impacts on employment seem obvious and well documented, the same cannot be said, unfortunately, for the housing field, even though the consequences will be just as important. This research will follow the path baby boomers have been taking since 1965 and will attempt to identify the main upheavals that will affect the housing market from now until 2050.

**CMHC Project Officer :** *Jim Zamprelli*

**CIDN :** 36260206

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## SMART GRAB BARS: A POTENTIAL INITIATIVE TO ENCOURAGE BATH GRAB BAR USE IN COMMUNITY DWELLING OLDER ADULTS

Seniors frequently fall in the bathroom despite the presence of bath grab bars, as they have reported not always using them. This External Research Program project focuses on further developing an unobtrusive device, the smart grab bar, to encourage its use while bathing to decrease the risk of falls, and to evaluate its effectiveness in the target population.

**CMHC Project Officer :** *Jim Zamprelli*

**CIDN :** 38840207

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## SENIORS

### UPDATING THE PUBLICATION "HOUSING FOR OLDER CANADIANS: THE DEFINITIVE GUIDE TO THE OVER 55 MARKET"

This project will focus on updating the publication "Housing for Older Canadians: The Definitive Guide to the Over-55 Market", published by CMHC in 1999. The updated product will comprise a series of shorter publications that are based on updated content and that focus on a narrower range of topics. The new product will be available in both print and web formats and will make the information more accessible to the industry at a time when the market for seniors housing is growing.

**CMHC Project Officer :** Hoda Shawki

**CIDN :** 39690200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

**\*NEW\***

## SOCIAL HOUSING

### REGENT PARK LONGITUDINAL HEALTH STUDY

This study will investigate the effects of the Regent Park Social Housing Revitalization Project - Phase I Redevelopment on the health and well-being of residents, and how interventions in the built environment may reduce health inequalities and improve the lives of low-income, urban populations, using a quasi-experimental research design. The redevelopment plan seeks to: a) create social mix; b) promote positive social interaction (using innovative architectural and urban designs); and c) create affordable home ownership for a subset of residents.

**CMHC Project Officer :** Mark Salerno

**CIDN :** 34470200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### REGENT PARK REVITALIZATION: YOUNG PEOPLE'S EXPERIENCE OF RELOCATION FROM PUBLIC HOUSING REDEVELOPMENT

This External Research Program project will assess the social impacts of relocation of residents — particularly young people aged 12-17 years — during redevelopment of their public housing community. Toronto Community Housing Corporation (TCHC) recently began phased redevelopment of Regent Park, Canada's oldest and largest public housing project.

**CMHC Project Officer :** Cynthia Rattle

**CIDN :** 36260209

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### SOCIAL AND AFFORDABLE HOUSING REDEVELOPMENT AND REGENERATION PROJECTS

The purpose of this project is to examine, through case study research, the redevelopment and regeneration of social and affordable housing. The research will document efforts to address obsolescence in social and affordable housing, that is, buildings that are nearing the end of their lifecycle or where building functionality is incompatible with current tenant and/or community needs. The research will also examine efforts to pursue redevelopment opportunities (e.g. increasing the number of affordable housing units, improving access and movement on site, selling vacant

## SOCIAL HOUSING

land and/or buildings, etc.). The research project is intended to act as a source of information for public and private property owners.

**CMHC Project Officer :** Janet Neves

**CIDN :** 37550200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

**\*NEW\***

### SUPPORTIVE/SUPPORTED HOUSING WITHIN SOCIAL HOUSING

This project will examine the role of social housing in providing the housing component of supported/supportive housing, to include: a description of supported or supportive housing models within social housing and an estimate of its prevalence; an analysis of the experiences with supported/supportive housing within social housing, from the point of view of housing providers, service providers, residents and government agencies; a review of successful partnerships, lessons learned and best practices in the provision of supported/supportive housing.

**CMHC Project Officer :** Jim Zamprelli

**CIDN :** 38220200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

**See also:** DEVELOPMENT OF AN ENERGY MANAGEMENT PILOT PROGRAM FOR SOCIAL HOUSING, p. 12  
DOCUMENTATION OF AN ENERGY MANAGEMENT PLAN FOR SOCIAL HOUSING, p. 13

## SUSTAINABLE DEVELOPMENT & HEALTHY HOUSING

### COMMUNITY ENVIRONMENTAL (CARBON FOOTPRINT) REDUCTION PROJECT

This External Research Program project will test the effectiveness of a community based approach to reducing the environmental carbon footprint of individual households in existing neighbourhoods. It will investigate the differences in footprint between neighbourhood and housing types, the environmental measures most likely to be implemented by residents, and the results of these actions.

**CMHC Project Officer :** Mark Holzman

**CIDN :** 40140217

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### ESTIMATING THE GREEN HOUSE GAS IMPLICATIONS OF LAND-USE PATTERNS: A METHODOLOGY FOR LOCAL GOVERNMENTS

This External Research Program project will develop a dedicated tool to empower communities to define parameters and subsequently assess the energy and greenhouse gas (GHG) emission implications of planning decisions. It will build upon and extend research completed for Salt Spring Island, BC, which examined the long-term greenhouse gas implications of different build-out scenarios and found that significant current GHG emissions savings were achievable. This project will result in a model that can be deployed by small and medium sized communities to measure the greenhouse gas implications of planning scenarios.

**CMHC Project Officer :** Mark Holzman

**CIDN :** 40140215

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## FAMILIES LIVING DOWNTOWN: CHALLENGES AND BENEFITS

This External Research Program study will examine the housing-related experiences of families who are choosing to live in or near downtown areas. It will examine the reasons for their choice, how they are managing their urban life with their children, and the challenges and benefits they experience once they have lived there for some time. These experiences will be related to key objective measures of their own residence and their downtown neighbourhood. This research will complement previous views on how to plan central areas for families by studying the experiences of downtown family residents, those who actually "live their life" there.

**CMHC Project Officer :** Mark Holzman

**CIDN :** 34380210

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## INDEX FOR LANDSCAPE GUIDE FOR CANADIAN HOMES

This project will add the following new and updated features in "Landscape Guide for Canadian Homes": an index, photos of each plant in the plant list, updates to "resources and further reading" section.

**CMHC Project Officer :** Susan Fisher

**CIDN :** 36710200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## POTENTIAL OF REPLOTTING TO IMPROVE THE SUSTAINABILITY OF CITIES IN WESTERN CANADA

This External Research Program project will demonstrate whether the replot legislation extant in western Canada could be used to overcome a weakness often seen in the land development process in urban intensification locales, and thereby show how governments and developers can bring about better developments that will contribute to improving the sustainability of cities.

**CMHC Project Officer :** Cynthia Rattle

**CIDN :** 40140216

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## SUSTAINABILITY INDICATORS FOR COMPUTER-BASED TOOLS IN COMMUNITY DESIGN

This External Research Project will evaluate sustainability indicators for potential integration with widely used geographic information system based modelling and visualization tools. It will refine the content and method of the indicators most suitable for such integration, propose new indicators where necessary, test refined and proposed indicators in a case study project and evaluate the results for broad application.

**CMHC Project Officer :** Mark Holzman

**CIDN :** 34380211

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## SUSTAINABLE COMMUNITY PLANNING AND DESIGN CHARRETTE SUPPORT AND PARTICIPATION

This project will continue to contribute to sustainable community design charrettes by providing financial and event planning assistance and/or direct CMHC staff participation and publication of results for certain selected charrettes. A charrette was held in Fort McMurray, Alta. and Perth, Ontario. There will be another in Winnipeg and other potential charrettes have been identified and are being pursued. Further charrettes were held in Saskatoon for their Rivergreen Ecovillage project and in Smithers, BC in regards to their downtown revitalization plan. Reports on both charrettes are in progress and under review. Research highlights on the Dryden and Sandy Hill charrettes are in the final editing phase.

**CMHC Project Officer :** Mark Holzman

**CIDN :** 34110200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## UNDERSTANDING THE SMART GROWTH GAP

This project will investigate the reasons for the gap between stated municipal policy objectives, which align with the goals of Smart Growth, and the results on the ground. It will aim to answer the following questions:

- What prevents the accomplishment of set goals?
- Are the goals inherently unachievable?
- What are the expected impacts of Smart Growth practices under a normal positive scenario?
- What time lines can be speculated or calculated for prescribed outcomes?
- What strategies are deemed most effective with respect to the level of impact?

The intent of this research is to enable local governments and industry to lay out a strategy that will produce sustained positive outcomes with predictable beneficial effects for the environment and for the well-being of community residents.

**CMHC Project Officer :** Mark Holzman

**CIDN :** 35230200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## UPDATE NEIGHBOURHOOD COMPARISON WEB TOOL

This project will update an existing CMHC Web-based tool (<http://cmhc.ca/en/co/buho/sune/index.cfm>) that compares 6 neighbourhood types for key quality of life, environment and affordability variables in Canada's 5 largest metropolitan areas. The new project will update the census derived data with 2006 census results, since currently much of the data is based on the 2001 census. Two new variables will be added to the comparison: walkability and access to key commercial destinations.

**CMHC Project Officer :** Susan Fisher

**CIDN :** 39560200

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

**\*NEW\***

**See also:** Technical research on Sustainable Development & Healthy Housing, p. 27-32.

### **BUILDING COMMUNITY: THE STORY OF SUPPORTIVE HOUSING FOR YOUNG MOTHERS (SHYM)**

This External Research Program research project employs a case study methodology to study supportive housing arrangements and their impacts on tenants. The project is focused on Supportive Housing for Young Mothers (SHYM), a supportive housing program in Halifax, Nova Scotia, and its effectiveness in providing housing and support services to its tenants. Using in-depth interviews with SHYM tenants as well as the Camberwell Assessment of Need, the study aims to shed light on the tenants' experience at SHYM, the short-term and long-term needs that SHYM is addressing, and the sustainability of the programmatic components of SHYM.

**CMHC Project Officer :** *Hoda Shawki*

**CIDN :** 38840208

**Division :** Policy and Research Division

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

### **HOUSING DIFFICULTIES AND HOUSING PROGRAMS IN THE LIVES OF ABUSED WOMEN**

This External Research Program project intends to learn more about the housing difficulties and experiences of women who have experienced different kinds of interpersonal violence (i.e. spousal, family, and landlord), and to explore how their experiences vary as a function of the kind of violence.

**CMHC Project Officer :** *Sandra Baynes*

**CIDN :** 38840203

**Division :** External Research Program

**STATUS :** Ongoing

**AVAILABILITY :** Product is not yet available

## CMHC RESEARCH REPORT LISTINGS

To provide quick and comprehensive access to CMHC research published on a given topic, the Canadian Housing Information Centre compiles comprehensive listings of housing research produced over a number of years on certain topics. Topics chosen are those for which there is ongoing client interest and/or for which CMHC has published considerable research. To obtain an electronic, faxed or mailed copy of any of the lists below, contact the Canadian Housing Information Centre at: 1-800-668-2642 or e-mail us at: [chic@cmhc.gc.ca](mailto:chic@cmhc.gc.ca)

Listings available at this time include:

◆ Aboriginal Housing	◆ Acoustics
◆ Affordable Housing	◆ Airtightness
◆ Basements, Foundations and Crawl Spaces	◆ Concrete
◆ Condominiums	◆ Cooperative Housing
◆ Environmental Site Assessment and Contaminated Lands	◆ Healthy Housing
◆ Heating and Ventilation	◆ Homelessness
◆ Housing and Women	◆ Housing Export Opportunities
◆ Housing for Older Canadians	◆ Housing for Persons with Disabilities
◆ Indoor Air Pollution	◆ Infrastructure
◆ Lead	◆ Log Home Construction
◆ Manufactured Housing	◆ Moisture Problems
◆ Mortgages and Housing Finance	◆ Newcomers, Immigration & Settlement
◆ Northern Housing	◆ Rental Housing
◆ Residential Construction Waste	◆ Residential Renovation
◆ Self Help Housing	◆ Social Housing
◆ Straw Bale Housing	◆ Sustainable Development
◆ Water Conservation, Reuse and Management	

## ABOUT YOUR HOUSE SERIES

Fact sheets on common housing questions, issues and problems.

These documents are available in HTML and Adobe Acrobat format (pdf) on the CMHC web site at:

[http://www.cmhc.ca/en/co/co\\_001.cfm](http://www.cmhc.ca/en/co/co_001.cfm)

Print copies can be obtained by calling 1-800-668-2642

Order no.	Series no.	Title
62027	CE 1	<p><b>Measuring Humidity in Your Home</b></p> <p>Is there condensation on the windows? Are there wet stains on the walls or ceilings? Is there static or sparks whenever you touch something? Diagnose humidity problems in your home.</p> <p>Aussi disponible en français sous le titre : Mesurer l'humidité dans votre maison</p>
62028	CE 2	<p><b>Combustion Gases in Your Home</b></p> <p>Do you have a gas or oil fired furnace, boiler or water heater? What about a woodstove or fireplace? Take the necessary steps to keep combustion gases out of your home.</p> <p>Aussi disponible en français sous le titre : Les gaz de combustion dans votre maison</p>
62029	CE 3	<p><b>Asbestos</b></p> <p>What is asbestos? Why is it so useful? What problems can asbestos cause and what options does the homeowner have in dealing with them?</p> <p>Aussi disponible en français sous le titre : Amiante</p>
62030	CE 4	<p><b>Hydronic Radiant Floor Heating</b></p> <p>Heating option for homes. Tubes are placed in concrete floor with water running through. Popular in bathrooms and kitchen, and can be done for entire house - new or existing.</p> <p>Aussi disponible en français sous le titre : Système de chauffage à eau chaude par rayonnement à partir du sol</p>
62031	CE 5A	<p><b>Understanding Window Terminology</b></p> <p>This factsheet offers helpful guidance on buying the right type of window for your home. Terminology commonly used in the window industry is also presented.</p> <p>Aussi disponible en français sous le titre : Comprendre la terminologie des fenêtres</p>
62032	CE 6	<p><b>Urea-Formaldehyde Foam Insulation (UFFI)</b></p> <p>What is UFFI? Why was it banned? Should you be concerned about UFFI? How do you know if your home has UFFI?</p> <p>Aussi disponible en français sous le titre : Mousse isolante d'urée-formaldéhyde (MIUF)</p>

## ABOUT YOUR HOUSE SERIES

Order no.	Series no.	Title
60515	CE 7	<b>After the Flood</b> Protect your health and prevent further damage to your home by following this step-by-step guide to restoring your home after a flood. Aussi disponible en français sous le titre : Après une inondation
60516	CE 8	<b>Fighting Mold: The Homeowner's Guide</b> Mold can cause allergies or respiratory disease. Learn how to identify and eliminate mold from your home. Aussi disponible en français sous le titre : Combattre la moisissure -- Guide pour les propriétaires-occupants
62043	CE 9	<b>Maintaining Your HRV</b> For a clean and healthy living environment, review the seven steps to maintaining the Heat Recovery Ventilator (HRV). Aussi disponible en français sous le titre : L'entretien du VRC
60339	CE 10	<b>Wood Heat Safety in an Emergency</b> Whether you often use a wood stove or a fireplace, or are coping with an emergency loss of electricity, learn how to safely use wood to heat your home. Aussi disponible en français sous le titre : Le chauffage au bois en toute sécurité lors d'une situation d'urgence
60356	CE 11	<b>When You Must Leave Your House Due to Prolonged Winter Power Outage</b> A series of practical tips to protect your home in case you are required to evacuate for more than 24 hours because of power failure. Aussi disponible en français sous le titre : Si vous devez quitter votre maison à cause d'une longue interruption de courant en hiver
60360	CE 12	<b>Helping Your Trees Survive Storm Damage</b> Practical pruning advice to restore the health and shape of trees damaged by ice or wind storms. Aussi disponible en français sous le titre : Soins à donner aux arbres endommagés par une tempête
62034	CE 13	<b>Attic Venting, Attic Moisture, and Ice Dams</b> How do you deal with a leak in the ceiling? How should an attic be properly vented? How do you eliminate ice dams? This fact sheet will answer these and other attic related questions. Aussi disponible en français sous le titre : Ventilation du vide sous toit, humidité dans le vide sous toit et formation de barrières de glace

## ABOUT YOUR HOUSE SERIES

Order no.	Series no.	Title
62035	CE 14	<b>Soot Staining on Carpets</b>  Does your carpet have permanent dark stains near baseboards, air registers or under doorways? Find out what causes carpet streaking and what you can do about it.  Aussi disponible en français sous le titre : Taches en traînée sur les moquettes
62036	CE 15	<b>Removing Ice on Roofs</b>  Whether you have a sloped or flat roof, learn techniques that will help you deal with extensive roof icing or ice dam problems.  Aussi disponible en français sous le titre : L'enlèvement de la glace sur les toitures
62037	CE 17	<b>The Importance of Bathroom and Kitchen Fans</b>  Choosing the proper kitchen and bathroom fans is important for improving indoor air quality and maintaining ideal humidity levels.  Aussi disponible en français sous le titre : Importance des ventilateurs de cuisine et de salle de bains
62038	CE 18	<b>How to Read a Material Safety Data Sheet (MSDS)</b>  Reading and understanding the Material Safety Data Sheet (MSDS) provides product information about product hazards and the necessary safety precautions to follow when using it.  Aussi disponible en français sous le titre : Comment déchiffrer une fiche technique sur la sécurité des substances (FTSS)
62039	CE 19	<b>Insulating Your House</b>  Choose the right insulation to reduce the amount of energy you use and to make your home more comfortable.  Aussi disponible en français sous le titre : L'isolation de votre maison
62040	CE 21	<b>Log Homes: Frequently Asked Questions</b>  A list of questions and answers concerning the unique design and building considerations for log homes.  Aussi disponible en français sous le titre : Foire aux questions - maisons en rondins
62041	CE 22	<b>Your Furnace Filter</b>  To reduce exposure to airborne particles, choose the furnace filter that best suits your needs.  Aussi disponible en français sous le titre : Le filtre de votre générateur d'air chaud

## ABOUT YOUR HOUSE SERIES

Order no.	Series no.	Title
62042	CE 23	<p><b>Water-Saving Tips for Your Lawn and Garden</b></p> <p>Often water is applied inefficiently, resulting in significant waste due to over watering, evaporation or run-off. Here are some general watering tips to avoid such waste.</p> <p>Aussi disponible en français sous le titre : Comment entretenir vos pelouses et jardins en économisant l'eau</p>
60417	CE 24	<p><b>Backup Power for Your Home</b></p> <p>The top ten tips in choosing the appropriate backup system to provide electricity to your home in the event of a prolonged power failure.</p> <p>Aussi disponible en français sous le titre : Alimentation de secours pour votre maison</p>
62046	CE 25	<p><b>Carbon Monoxide</b></p> <p>A list of questions and answers dealing with keeping Carbon Monoxide out of your home and to help you choose the right CO detector.</p> <p>Aussi disponible en français sous le titre : Le monoxyde de carbone</p>
62277	CE 26a	<p><b>Hiring a Contractor</b></p> <p>How do you find the "right" contractor for you? What should go in a contract? What are liens, holdbacks and completion certificates? Make sure you get what you want and pay for when hiring a contractor.</p> <p>Aussi disponible en français sous le titre : Le Choix d'un entrepreneur</p>
62351	CE 26b	<p><b>Sample Renovation Contract</b></p> <p>A detailed written contract between you and the contractor you hire is essential to any renovation or home repair project, no matter its size.</p> <p>Aussi disponible en français sous le titre : Modèle de contrat de rénovation</p>
62045	CE 27	<p><b>Choosing a Dehumidifier</b></p> <p>Air that is too damp can cause condensation on windows, water damage to materials, mold and even wood rot. Choose the right dehumidifier to regulate the humidity in your home.</p> <p>Aussi disponible en français sous le titre : Le Choix d'un déshumidificateur</p>
	CE 28	<p><b>The Renovation Project (12 parts)</b></p>
		<p>This series will assist you in making informed decisions before you renovate. Each easy-to-read fact sheet helps you ask the key questions, reviews the available options and discusses the consequences if certain aspects of the renovation are overlooked.</p> <p>Advance planning is the key to successful renovations. These fact sheets help you plan, assess, and avoid surprises. Achieve the results you want by doing your renovation right the first time.</p>

## ABOUT YOUR HOUSE SERIES

Order no.	Series no.	Title
62246	CE 28a	<b>Assessing the Renovation Project</b> <p>Before renovating, it's important to assess your home's current condition to determine if there are significant problems that you must deal with before or during the renovation project.</p> <p>Aussi disponible en français sous le titre : Évaluation des travaux de rénovation</p>
62248	CE 28b	<b>Renovating your Basement - Structural Issues and Soil Conditions</b> <p>Renovating a basement can add value and extra living space to a home. Fixing foundation problems before renovating is essential to preserve the durability and structure of the house.</p> <p>Aussi disponible en français sous le titre : Rénovation du sous-sol - Aspects structuraux et conditions du sol</p>
62250	CE 28c	<b>Renovating Your Basement - Moisture Problems</b> <p>Is there condensation on the basement windows? Are there white chalky stains on the foundation? Do the carpets smell musty? Creating a clean, dry and healthy living space is a critical first step.</p> <p>Aussi disponible en français sous le titre : Avant de rénover votre sous-sol - Problèmes d'humidité</p>
62252	CE 28d	<b>Renovating Your Kitchen</b> <p>The kitchen is often the most used room in the house and kitchen renovations typically have the highest financial payback. Conduct a pre-renovation inspection and prioritize the most desirable features for your new kitchen.</p> <p>Aussi disponible en français sous le titre : Avant de rénover votre cuisine</p>
62254	CE 28e	<b>Renovating Your Bathroom</b> <p>Bathroom renovations offer the second highest financial payback rate and are one of the most common home improvement projects. Use this fact sheet to check for problems before you renovate.</p> <p>Aussi disponible en français sous le titre : Rénovation de la salle de bains</p>
62256	CE 28f	<b>Window and Door Renovations</b> <p>Do you want more natural light in your living area? Are you concerned about security? Before repairing or replacing windows and doors, consider all of the factors outlined in this fact sheet.</p> <p>Aussi disponible en français sous le titre : Nouvelles portes et fenêtres</p>

## ABOUT YOUR HOUSE SERIES

Order no.	Series no.	Title
62258	CE 28g	<p><b>Repairing or Replacing Roof Finishes</b></p> <p>Regular maintenance and periodic roof inspections will identify problems before they cause costly damage to your home. Learn about the key factors that will determine whether you should repair or replace your roof.</p> <p>Aussi disponible en français sous le titre : Avant de réparer ou remplacer le revêtement du toit</p>
62260	CE 28h	<p><b>Repairing and Replacing Materials - Exterior Walls</b></p> <p>Exterior finish materials must prevent rain and snow from penetrating the building and causing moisture damage. Repairing or replacing exterior wall finishes will protect and preserve the durability and structure of the home.</p> <p>Aussi disponible en français sous le titre : Avant de réparer ou remplacer des matériaux - les murs extérieurs</p>
62262	CE 28i	<p><b>Energy Efficient Retrofit - Mechanical Systems</b></p> <p>Upgrading the heating, cooling and ventilation (HVAC) equipment is the best way to create a healthy, comfortable and less expensive home to operate. Before altering these, it is important to understand how the overall performance of the house will be affected.</p> <p>Aussi disponible en français sous le titre : Avant d'améliorer l'efficacité énergétique de votre maison - installations mécaniques</p>
62264	CE 28j	<p><b>Energy Efficient Retrofit - The Building Envelope</b></p> <p>The envelope, or outer layer, of your house separates living space from the outdoor elements. Improving it can result in a better insulated, more airtight home that is easier to heat.</p> <p>Aussi disponible en français sous le titre : Améliorer l'efficacité énergétique - L'enveloppe du bâtiment</p>
62266	CE 28k	<p><b>Assessing the Comfort and Safety of Mechanical Systems</b></p> <p>The heating, ventilating and air conditioning (HVAC) systems are a vital part of your home. Ensure that your mechanical systems are operating safely and efficiently.</p> <p>Aussi disponible en français sous le titre : Évaluation de vos installations mécaniques - confort et sécurité</p>
62268	CE 28L	<p><b>A New Addition</b></p> <p>Before building an addition, clearly identify the features you need and inspect the current structure and mechanical systems to be sure they can support the new addition.</p> <p>Aussi disponible en français sous le titre : Avant de construire une annexe</p>

## ABOUT YOUR HOUSE SERIES

Order no.	Series no.	Title
62044	CE 29	<p><b>Should you get your Heating Ducts Cleaned?</b></p> <p>Should you get your heating ducts cleaned? Will clean ducts result in improved air quality? When is duct cleaning most appropriate? This fact sheet separates fact from fiction.</p> <p>Aussi disponible en français sous le titre : Doit-on faire nettoyer les conduits de chauffage?</p>
63322	CE 30	<p><b>Water Damage, Mold and House Insurance</b></p> <p>You've had water damage in your house due to a burst pipe, a roof leak, or a heavy summer storm. You hope that your insurance will cover the damage. What to do?</p> <p>Aussi disponible en français sous le titre : Moisissure, dommages causés par l'eau et assurance habitation</p>
62226	CE 31	<p><b>Understanding and Dealing with Interactions Between Trees, Sensitive Clay Soils and Foundations</b></p> <p>Is the size, type or siting of a tree affecting your foundation? Understanding the interactions between trees, soils and the foundation can help you avoid foundation shifting, cracks and other damage.</p> <p>Aussi disponible en français sous le titre : Comprendre l'interaction des arbres, du sol d'argile sensible et des fondations et agir en conséquence</p>
65329	CE 32	<p><b>Setback Thermostats</b></p> <p>There are many claims about the energy savings due to setback thermostats. This document quantifies the savings but also describes houses or conditions where setback thermostats are not recommended.</p> <p>Aussi disponible en français sous le titre : Les thermostats programmables</p>
62288	CE 33	<p><b>CMHC Garbage Bag Airflow Test</b></p> <p>This simple test uses an ordinary garbage bag to help you estimate airflow from your furnace registers, bathroom exhaust fan or clothes dryer exhaust.</p> <p>Aussi disponible en français sous le titre : Essai de mesure du débit d'air à l'aide d'un sac à ordures</p>
62795	CE 34	<p><b>Your Septic System</b></p> <p>A primer on the components, operation and proper maintenance of an in-ground septic tank and system.</p> <p>Aussi disponible en français sous le titre : Votre installation d'assainissement</p>
62839	CE 35	<p><b>Hiring a Home Inspector</b></p> <p>One of the best ways to understand about a home's condition, habitability and safety is to hire a professional home inspector.</p> <p>Aussi disponible en français sous le titre : Le Choix d'un inspecteur en bâtiment</p>

## ABOUT YOUR HOUSE SERIES

Order no.	Series no.	Title
62341	CE 36	<b>The Condominium Owners' Guide to Mold</b> Special advice for identifying and removing mold in a condo, and solving the problems that cause it. Aussi disponible en français sous le titre : Guide sur la moisissure à l'intention des copropriétaires
63902	CE 37	<b>The Tenant's Guide to Mold</b> This guide provides tenants of apartment buildings or rental houses with information to understand why mold grows and what they can do if they find mold growing in their unit. Aussi disponible en français sous le titre : Guide sur la moisissure à l'intention des locataires
64066	CE 38	<b>How to Reduce Chemical Contaminants in Your Home</b> This guide focuses on reducing exposure to chemical contaminants in the home, and will help you identify and avoid household products and materials which are sources of chemical contaminants. Aussi disponible en français sous le titre : Réduire les contaminants chimiques dans votre maison
62935	CE 39	<b>Buying a Toilet</b> Advice and tips on what to look for when buying a toilet. Aussi disponible en français sous le titre : L'achat de toilettes
63319	CE 40	<b>Buying a House with a Well and Septic System</b> Information on what to inspect and test if a property has a well and/or septic system. Includes checklists for potential buyers. Aussi disponible en français sous le titre : L'achat d'une maison avec un puits et une installation septique
62953	CE 41A	<b>UV Water Treatment</b> Describes the ultra-violet light water treatment process, and the pros and cons of using such a system. Aussi disponible en français sous le titre : Traitement de l'eau aux rayons ultraviolets (UV)
62898	CE 41B	<b>Water Distillers</b> Everything you ever wanted to know about water distillers from how they work to how to install and maintain them. Aussi disponible en français sous le titre : La distillation de l'eau

## ABOUT YOUR HOUSE SERIES

Order no.	Series no.	Title
62896	CE41C	<b>Water Filters</b> Consumer series of household water treatment options. Water filters are an inexpensive method of additional water treatment. Some filters can remove certain contaminants such as lead. Aussi disponible en français sous le titre : Filtres à eau
62946	CE 41D	<b>Water Softeners</b> Find out how a water softener works and obtain information on whether you should consider installing one. Aussi disponible en français sous le titre : Les adoucisseurs d'eau
62962	CE 41E	<b>Reverse Osmosis Water Treatment</b> Describes the reverse osmosis water treatment process, and provides the pros and cons of using such a system. Aussi disponible en français sous le titre : Filtration de l'eau par osmose inverse
62966	CE 42	<b>Canada's Construction System</b> The purpose of this document is to foster understanding of the elements of the system of construction and operation of buildings and houses in Canada. Aussi disponible en français sous le titre : Système de construction canadien
63890	CE 43	<b>Photovoltaics (PVs)</b> Consumer information piece presenting information on solar electric (photovoltaic) systems for housing Aussi disponible en français sous le titre : Les systèmes photovoltaïques
63134	CE 44	<b>Painting: Walls, Ceilings and Floors</b> This fact sheet provides general information on: selecting paints, e.g. latex (water based) or alkyd (oil based); types of paint and paint finishes, e.g. low or high sheen, sealer, primer, melamine; estimating quantity of paint required; preparing for painting; and painting tips. Aussi disponible en français sous le titre : La peinture : murs, plafonds et planchers.
63144	CE 45	<b>Flooring Choices</b> A quick summary of the advantages, considerations, installation, maintenance, and costs to think about when choosing resilient, laminate, and wood flooring, as well as carpet and ceramic tile. Aussi disponible en français sous le titre : Les revêtements de sol

## ABOUT YOUR HOUSE SERIES

Order no.	Series no.	Title
63349	CE 46	<b>Fighting Asthma in Your House</b> Practical tips to help people with asthma improve the indoor air quality of their home. Aussi disponible en français sous le titre : Combattre l'asthme à la maison
63218	CE47	<b>Home Maintenance Schedule</b> This fact sheet provides a listing of the regular home maintenance tasks which should be done at various times throughout the year to protect the condition of your house. Aussi disponible en français sous le titre : Calendrier d'entretien de votre maison
63227	CE48	<b>Replacing Your Furnace</b> This fact sheet provides information for consumers who are replacing their existing furnace with a new one. It deals with fuel choice, furnace selection, and furnace sizing. Aussi disponible en français sous le titre : Le remplacement d'un générateur de chaleur
63235	CE 49	<b>Getting Your House Ready to Sell</b> Tips for homeowners who wish to get their house ready to sell. Aussi disponible en français sous le titre : Ce qu'il faut faire avant de mettre votre maison en vente
63436	CE50	<b>Avoiding Basement Flooding</b> Basement flooding leads to damage of the finishing material and possible growth of mold. This document reviews why basements flood and how to prevent floods from occurring. Aussi disponible en français sous le titre : Comment prévenir les inondations de sous-sol
63486	CE51	<b>Get to Know Your Soil</b> This fact sheet provides practical tips on how to analyse soil so that you can select the plants that are suited to the soil you have on your property. Once you have determined the soil conditions, it provides tips on how to amend it, if needed. Aussi disponible en français sous le titre : Apprenez à connaître votre sol
63488	CE52	<b>Low-Maintenance Lawns</b> Low-maintenance lawns help to reduce the time, costs, water, pesticides, fertilizer and energy used to maintain lawns. This fact sheet describes the benefits and provides practical tips on how to install and maintain low maintenance lawns, including species selection. Aussi disponible en français sous le titre : Les pelouses à faible entretien

## ABOUT YOUR HOUSE SERIES

Order no.	Series no.	Title
63490	CE53	<b>Rain Gardens: Improve Stormwater Management in Your Yard</b> <p>Rain gardens are landscaped areas designed to receive stormwater and allow it to infiltrate into the soil. This fact sheet describes the benefits and provides practical tips on how to install and maintain gardens.</p> <p>Aussi disponible en français sous le titre : Un jardin pluvial pour mieux gérer les eaux de ruissellement dans votre cour</p>
63492	CE54	<b>Understanding Your New Home Sales Contract</b> <p>This fact sheet provides information on some of the terms and provisions that you may find in a new home sales agreement to illustrate what a contract can cover and an explanation why.</p> <p>Aussi disponible en français sous le titre : Comprendre le contrat de vente de votre maison neuve</p>
63495	CE55	<b>Selecting A New Home Builder</b> <p>This fact sheet provides information on how to find and what to look for and consider when searching for the right builder to build your new home.</p> <p>Aussi disponible en français sous le titre : Le choix d'un constructeur d'habitations</p>
63637	CE56	<b>Preventing Falls on Stairs</b> <p>This fact sheet tells you about some of the ways you can reduce the risk of falling on or from residential stairs.</p> <p>Aussi disponible en français sous le titre : Comment prévenir les chutes dans les escaliers</p>
63730	CE57	<b>Efficient, Convenient Wood Heating</b> <p>This is a short guide to the proper use of woodburning appliances in homes: what appliances to choose, how to operate them efficiently, what wood to burn, how to cut and store it, etc.</p> <p>Aussi disponible en français sous le titre : Le chauffage au bois pratique et efficace</p>
63683	CE58	<b>The ABC's of Windows</b> <p>This document will help consumers understand and select window performance levels with respect to airtightness, rain penetration and wind resistance appropriate for their climatic (and geographical) location and exposure conditions.</p> <p>Aussi disponible en français sous le titre : L'ABC des fenêtres</p>

## ABOUT YOUR HOUSE SERIES

Order no.	Series no.	Title
63911	CE59	<p><b>Should You Test the Air in Your Home for Mold?</b></p> <p>Testing the air in their home or apartment for mold is usually the first thing many people ask for when they suspect the presence of mold or have discovered mold growth. This fact sheet explains why air testing is not recommended, why an investigation by a trained professional is more useful and what to do if testing is deemed necessary.</p> <p>Aussi disponible en français sous le titre : Faut-il faire analyser l'air de la maison pour déceler la présence de moisissures?</p>
63822	CE60	<p><b>What to Do After a Fire</b></p> <p>Protect your health and prevent further damage to your home by following this detailed guide on the steps to restore your home after a fire.</p> <p>Aussi disponible en français sous le titre : Que faire après un incendie</p>
64092	CE61	<p><b>Renovating Your Basement for Livability</b></p> <p>This About Your House describes how renovating a full-height basement can be a relatively easy and cost-effective way to add new living space to your house.</p> <p>Aussi disponible en français sous le titre : Rénovation du sous-sol - objectif d'habitabilité</p>
64064	CE62	<p><b>Lead in Older Homes</b></p> <p>This About Your House describes where lead is found in older homes and who is at risk to lead exposure. It also describes procedures for testing lead in soil, water, paint, and dust.</p> <p>Aussi disponible en français sous le titre : Le plomb dans les vieilles maisons</p>
65023	CE63a	<p><b>Accessible Housing by Design - Ramps (Large Print)</b></p> <p>For anyone who needs to make their house accessible to someone who uses a wheelchair or other mobility device, this About Your House sheds light on the design and construction of ramps for the home. After reading this publication, you will understand how a ramp should be built, the materials that should be used and things to take into consideration before building a ramp for your home.</p> <p>Aussi disponible en français sous le titre : Une habitation accessible dès la conception - Les rampes d'accès (à gros caractères)</p>

## ABOUT YOUR HOUSE SERIES

Order no.	Series no.	Title
65080	CE63b	<p><b>Accessible Housing by Design - Appliances (Large Print)</b></p> <p>The design of an appliance can make it very easy or very difficult to use. If you have a disability, limitations in an appliance's design can make it almost impossible to use. Using the principles of Universal Design, this About Your House will help you select an appliance by outlining important design considerations, making helpful suggestions and explaining the safety features of appliances.</p> <p>Aussi disponible en français sous le titre : Une habitation accessible dès la conception — les appareils (à gros caractères)</p>
65542	CE63c	<p><b>Accessible Housing by Design - Lifts &amp; Residential Elevators</b></p> <p>Residential lifts and elevators can benefit many people— particularly seniors who want to remain in their homes despite a loss of mobility, strength or agility. This About Your House tells you about the types of residential lifts and elevators that are commonly available in Canada. It also tells you about some of the things you should consider when you choose and install an elevator or lift in your home.</p> <p>Aussi disponible en français sous le titre : Une habitation accessible dès la conception - élévateurs et ascenseurs résidentiels</p>
65544	CE63d	<p><b>Accessible Housing by Design - Residential Hoists and Ceiling Lifts</b></p> <p>A residential hoist or ceiling lift can help people who have difficulty safely moving themselves or others in or out of bed, or in or out of a bathtub. This About Your House tells you about the types of residential hoists and ceiling lifts that are commonly available in Canada. It also tells you about some of the issues you should consider when you choose and install a hoist or ceiling lift in a house, condominium or apartment.</p> <p>Aussi disponible en français sous le titre : Une habitation accessible dès la conception - les lève-personnes résidentiels</p>
65588	CE63e	<p><b>Accessible Housing by Design - Kitchens</b></p> <p>A home designed and constructed to reflect the principles of Universal Design is safer and more accommodating to the diverse range of ages and abilities of people who live in and visit this home. This About Your House discusses the Universal Design kitchen, which considers efficient design, efficiency of effort, adaptability, ease of cleaning, audibility and safety in order to provide a comfortable and safe space for all family members.</p> <p>Aussi disponible en français sous le titre : Une habitation accessible dès la conception - les cuisines</p>

## ABOUT YOUR HOUSE SERIES

Order no.	Series no.	Title
65686	CE63f	<p><b>Accessible Housing by Design: Bathrooms</b></p> <p>A bathroom designed and constructed according to the principles of universal design should be comfortable and safe for all family members, regardless of age or ability. This About Your House outlines the design considerations and elements of a universally designed bathroom, from manoeuvring space and ease of cleaning to grab bars and walk-in bathtubs and showers.</p> <p>Aussi disponible en français sous le titre : Une habitation accessible dès la conception - salle de bains</p>
65889	CE63g	<p><b>Accessible Housing by Design: Home Automation</b></p> <p>The use of technology and automation in the home can help create living spaces that are convenient and energy efficient, that minimize the potential for accidents, and result in a house that is able to adapt to life's changes. Home automation provides many benefits to people with physical, sensory and mental disabilities, allowing them to live more independently. This AYH describes systems and devices that can control elements of your home environment . lighting, appliances, telephones, home security and mechanical, entry and safety systems . resulting in an environment that is more accommodating to everyone who lives there or visits, regardless of age or physical ability.</p> <p>Aussi disponible en français sous le titre : Une habitation accessible dès la conception - Domotique</p>
66091	CE63h	<p><b>Accessible Housing by Design: Fire Safety for You and Your Home</b></p> <p>People with disabilities and seniors are more likely to be injured in a fire than the general population as they are often unable to evacuate independently and quickly, and are not prepared with a fire safety plan. This About Your House provides many quick and easy steps that you can take to prevent fires in your home and plan for fire and emergency situations and minimize accidents ensuring that your home occupants, especially people with disabilities and seniors family are safe.</p> <p>Aussi disponible en français sous le titre : Une habitation accessible dès la conception - la sécurité-incendie pour assurer votre protection et celle de votre habitation</p>
66348	CE64	<p><b>How to Get the Ventilation That You Need in Your House</b></p> <p>This document provides a guide to using the ventilation systems in your house to provide adequate fresh air to residents.</p> <p>Aussi disponible en français sous le titre : Comment bien ventiler votre maison</p>

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Order no.	Series no.	Title
65009	CE65	<b>Garden Suites</b> <p>With municipal approval, a garden suite is a self-contained unit, set on relative's property with an existing single family house. This publication provides introductory information on garden suites for seniors or persons with disabilities.</p> <p>Aussi disponible en français sous le titre : Les pavillons-jardins</p>
65527	CE66A	<b>How to Lock Out Crime - Home Security 101</b> <p>This fact sheet walks you through an assesment of your home's current security; includes a checklist that can help you assess what needs to be improved.</p> <p>Aussi disponible en français sous le titre : Gare au crime - La sécurité à domicile 101</p>
65529	CE66B	<b>How to Lock Out Crime - Home Security - Exterior</b> <p>This fact sheet gives you suggestions on how to improve security from the exterior of your home through lighting strategies and home visibility.</p> <p>Aussi disponible en français sous le titre : Gare au crime - La sécurité à domicile - L'extérieur</p>
65531	CE66C	<b>How to Lock Out Crime - Home Security—Alarms</b> <p>This fact sheet gives you information to help you decide whether an installed burglar alarm is the right choice for you. Two types of systems are discussed, the perimeter alarm system and the area alarm system.</p> <p>Aussi disponible en français sous le titre : Gare au crime - La sécurité à domicile - Les avertisseurs</p>
65533	CE66D	<b>How to Lock Out Crime - Home Security - Doors</b> <p>This fact sheet suggests ways you can improve your door security.</p> <p>Aussi disponible en français sous le titre : Gare au crime - La sécurité à domicile - Les portes</p>
65535	CE66E	<b>How to Lock Out Crime - Home Security - Windows</b> <p>This fact sheet suggests ways to improve the security performance of your windows.</p> <p>Aussi disponible en français sous le titre : Gare au crime - La sécurité à domicile - Les fenêtres</p>
65537	CE66F	<b>How to Lock Out Crime - Home Security - Patio Doors</b> <p>This fact sheet suggests ways to improve the security of one of the favourite targets of burglars: patio doors.</p> <p>Aussi disponible en français sous le titre : Gare au crime - La sécurité à domicile - Les portes-fenêtres</p>

## ABOUT YOUR HOUSE SERIES

Order no.	Series no.	Title
65539	CE66G	<p><b>How to Lock Out Crime: Home Security -- Common Sense</b></p> <p>Even if all the required bolts, hinges, latches and alarms have been installed, good home security cannot be achieved without first adopting the common-sense precautions outlined in this fact sheet.</p> <p>Aussi disponible en français sous le titre : Gare au crime - La sécurité à domicile - Une affaire de bon sens</p>
66343	CE67	<p><b>Attached Garages and Indoor Air Quality</b></p> <p>Attached garages, while convenient, can move vehicle-based pollutants into houses. The document shows how to avoid this source of pollution.</p> <p>Aussi disponible en français sous le titre : Les garages attenants et la qualité de l'air intérieur</p>
66497	CE68	<p><b>Secondary Suites</b></p> <p>Secondary suites can provide affordable living space and intensify urban development without adding new buildings. This article explains what the homeowner should consider before building or renovating a secondary suite.</p> <p>Aussi disponible en français sous le titre : <b>Appartements accessoires</b></p>
65548	CE70	<p><b>Equilibrium: Healthy Housing for a Healthy Environment</b></p> <p>CMHC's EQUilibrium housing initiative is a powerful new movement in sustainable housing. It can help homeowners reduce their energy bills, protect their families' health, reduce greenhouse gas emissions, and keep the environment clean for generations to come.</p> <p>Aussi disponible en français sous le titre : Equilibrium : maison saine pour un environnement sain</p>

## ABOUT YOUR APARTMENT SERIES

Order no.	Series no.	Title
63419	AEI	<p><b>Solving Odour Transfer Problems in Your Apartment</b></p> <p>One of the most common problems experienced by the occupants of apartment buildings is the transfer of objectionable odours from one apartment to another. Tobacco smoke and cooking odours top the list of complaints. This fact sheet explains how odours are transferred, and offers a number of potential solutions. Some are very easy to implement and others should be done with the agreement of the building management. Some are trial and error. Solving the problem can take perseverance.</p> <p>Aussi disponible en français sous le titre : Enrayez la transmission d'odeurs dans votre appartement</p>

## ABOUT YOUR APARTMENT SERIES

Order no.	Series no.	Title
63904	AE2	<p><b>Reducing Noise in Your Apartment</b></p> <p>This article provides basic information about the behaviour of sound and noise and suggests ways to improve the peace and tranquility in your apartment or condominium.</p> <p>Aussi disponible en français sous le titre : Atténuation du bruit dans votre appartement</p>
65013	AE3	<p><b>Dealing with Power Outages</b></p> <p>Lengthy power outages rarely occur in Canada, but when they do, they can affect your comfort and safety. This fact sheet, intended specifically for occupants of multi-unit residential buildings, will help you plan ahead for, and deal with, power outages in your apartment building. Topics include, amongst others, contents of an emergency kit, use of alternate power, and summer and winter power failures.</p> <p>Aussi disponible en français sous le titre : Les pannes de courant</p>
65050	AE4	<p><b>Fire Safety</b></p> <p>Each year, many Canadians are injured or die in house or apartment fires. This fact sheet, intended specifically for occupants of multi-unit residential buildings, offers practical fire prevention tips and important information regarding smoke alarms. It will also help you create an escape plan for you and your family, and instruct you on what to do should a fire occur in your apartment.</p> <p>Aussi disponible en français sous le titre : La sécurité-incendie</p>
65041	AE5	<p><b>Improving Your Security and Safety</b></p> <p>This About Your Apartment fact sheet, intended specifically for occupants of multi-unit residential buildings, provides practical advice on how to protect yourself, your family, and your belongings. It highlights the types of security and safety features you may have in your building and how to use them effectively. Topics include, amongst others, proper locks for windows and doors, neighbourhood security, preventing falls from windows and balconies, combustion safety, and carbon monoxide.</p> <p>Aussi disponible en français sous le titre : Pour une meilleure sécurité chez soi</p>
65297	AE6	<p><b>Dealing with Pests</b></p> <p>Most people can relate to the surprise, shock and revulsion of coming across pests in their homes. This fact sheet, intended specifically for occupants of multi-unit residential buildings, will help you prevent and reduce infestations in your apartment by describing how insects enter homes and what they need to survive. Topics include pest proofing your apartment, Integrated Pest Management (IPM), and health concerns associated with pests and pesticides.</p> <p>Aussi disponible en français sous le titre : La lutte contre les parasites</p>

## ABOUT YOUR APARTMENT SERIES

Order no.	Series no.	Title
66002	AE7	<p><b>The Tenant's Guide to Mold</b></p> <p>This fact sheet is intended for people living in rented apartments and offers practical information on mold problems beginning with an overview of mold and its causes, why it is a concern, and how to identify a mold problem and estimate its severity.</p> <p>Aussi disponible en français sous le titre : Guide sur la moisissure à l'intention des locataires</p>
65975	AE8	<p><b>Energy and Water Saving Tips for Your Apartment</b></p> <p>This fact sheet has energy- and water-saving tips that can save you money and make your apartment more comfortable. It lists things you can do yourself and things you can do in co-operation with your building's management</p> <p>Aussi disponible en français sous le titre : Conseils pour économiser l'énergie et l'eau dans votre appartement</p>

## ABOUT YOUR HOUSE SERIES

### ABOUT YOUR HOUSE - NORTH SERIES

#### VOTRE MAISON - DOSSIER DU NORD

The North About Your House series is a series specifically designed around day to day northern solutions as well as innovative northern models of building practices which work under cold climate conditions. In this series you will find examples of how to use structural panels in the high arctic, means to cleanse wastewater in the North as well as demonstrated ways of constructing a roof which can withstand northern conditions and how to choose a foundation system which will work in any of the northern communities.

Order no.	Series no.	Title
62303	North Series 1	Building with Structural Panels -- Repulse Bay
62304	Dossier du Nord	Maison à panneaux isolants de construction à Repulse Bay
62295	North Series 2	On-site Wastewater Reclamation Systems for the North
62297	Dossier du Nord 2	Installations de recyclage sur place des eaux usées dans le nord
62329	North Series 3	Snowshoe Inn, Fort Providence Co-generation Model
62330	Dossier du Nord 3	Modèle de cogénération du Snowshoe Inn, Fort Providence
62298	North Series 4	Residential Foundation Systems for Permafrost Regions
62299	Dossier du Nord 4	Fondations pour les bâtiments résidentiels construits sur le pergélisol
62154	North Series 5	Eagle Lake Healthy House
62155	Dossier du Nord 5	La maison saine d'Eagle Lake
62313	North Series 6	Arctic Hot Roof Design
62314	Dossier du Nord 6	Conception de toits chauds pour climat arctique
63050	North Series 8	How to Prevent Plumbing and Heating Vent Stack Freeze-up
63051	Dossier du Nord 8	Prévenir le gel des colonnes de ventilation de plomberie et des conduits d'évacuation de l'appareil de chauffage
63394	North Series 9	Fancoil Integrated Combination Heat and Domestic Hot Water Systems
63395	Séries du Nord 9	Installation de chauffage des locaux et de l'eau intégrée à un ventilo-convecteur

## RESEARCH HIGHLIGHTS: TECHNICAL SERIES

Brief descriptions of CMHC research papers you may wish to obtain. These research highlights are available in HTML and Adobe Acrobat format (pdf) on the CMHC web site at:

<http://www.cmhc-schl.gc.ca/publications/en/rh-pr/index.html>

Print copies can be obtained by calling **1-800-668-2642**

Order no.	Series no.	TITLE
66702	09-112	Sloping Sand Filters for On-Site Wastewater Treatment
66608	09-111	Effectiveness of HEPA Vacuuming on Mold in Houses
66602	09-110	Evaluating the Feasibility and Developing Design Requirements and Tools for Large-scale Rainwater Harvesting in Ontario
66590	09-109	Ecologically Engineered Stormwater Management — Five Case Studies
66598	09-108	Assessment of Ecologically Engineered Stormwater Management
66569	09-107	Monitoring Results for the Factor 9 Home
66555	09-106	Effectiveness of Dehumidifiers in Controlling Moisture in Houses
66564	09-105	Understanding Vapour Permeance and Condensation in Wall Assemblies
66541	09-104	The Northern Sustainable House: An Innovative Design Process
66474	09-103	Canada at the 2007 Solar Decathlon Competition
66476	09-102	Code Requirements and Costs of Incorporating Accessory Apartments in Houses
66373	09-101	Seabird Island Monitoring
66333	09-100	Long Term Performance of Slab-on-Grade House Foundations in Regina, Saskatchewan
66135	08-107	Effect of Mesh and Bale Orientation on the Strength of Straw Bale Walls
66097	08-106	Analysis of Renewable Energy Potential in the Residential Sector through High-Resolution Building-Energy Simulation
66063	08-105	Fixing Houses with High Radon -A Canadian Demonstration
66060	08-104	Approaching Net-Zero Energy in Existing Housing
65961	08-103	Laboratory Depressurization Test for Residential Gas Appliances - Part 2
65916	08-102	Development and Assessment of Crawl Space Remediation Strategies
65830	08-101	Benchmarking Home Energy Savings from Energy-Efficient Lighting
65903	08-100	Assessment of Natural Ventilation for Canadian Residential Buildings

## RESEARCH HIGHLIGHTS: TECHNICAL SERIES

Order no.	Series no.	TITLE
65861	07-124	Residential Solar Mass Wall Analysis for Canada
65843	07-123	Understanding Vapour Permeance and Condensation in Wall Assemblies
65828	07-122	Straw Bale Construction in Atlantic Canada
65834	07-120	The Effects of Programmable Fan Controllers on Ventilation, Air Distribution and Energy Use
65863	07-119	Monitored Thermal Performance of ICF Walls in MURBs
65891	07-118	Preserved Wood as a Potential Source of Arsenic and Fungi in the Foundation Walls of Homes
65684	07-117	Investigation of the Performance of Residential Electronic Filters in Actual Use
65680	07-116	Drainwater Heat Recovery Performance Testing at CCHT
65649	07-115	Whistle Bend Planning and Design Charrette
65546	07-114	Wind-Rain Relationships in Southwestern British Columbia
65322	07-113	Sustainable Northern Development Charrette in Yellowknife
65302	07-112	Research on Green Rooftops and Walls in Québec City
65417	07-111	Field Testing of Valved Soffit Vent Performance in Protecting Roof and Attic in Strong Winds
65378	07-110	Action Plan for Sustainable Practices - Implementation Strategies for the Residential and Business Sections in the Greater Toronto Area
65365	07-109	Testing Oil-fired Appliance Depressurization Spillage
65352	07-108	Boiler Piping Study
65350	07-107	Southeast False Creek Integrated Design Process Workshops
65375	07-106	Evaluation of Water-Efficient Toilet Technologies to Carry Waste in Drainlines
65033	07-105	Performance Evaluation of Retrofitted Solid Masonry Exterior Walls
65421	07-104	High-Performance Stucco for Housing
65346	07-103	Economic Assessment of Residential Basement System Insulation Options
65295	07-102	The Effects of Reflective Interior Shades on Cooling Energy Consumption at the CCHT Research Facility

## RESEARCH HIGHLIGHTS: TECHNICAL SERIES

Order no.	Series no.	TITLE
65336	07-101	A Discussion Paper: Indoor Air Quality Investigations of Houses used for Marijuana Grow Operations
65344	07-100	Relationship Between Moisture Content and Mechanical Properties of Gypsum Sheathing
65104	06-114	Old North End, Saint John, New Brunswick Community Planning and Housing Charrette
65187	06-113	Green Roofs: A Resource Manual for Municipal Policy Makers
65100	06-112	Arviat Community and Housing Design Charrette
65259	06-111	Validation of an Onsite Wastewater Risk Assessment Model
65257	06-110	Impact of Water Softeners on Septic Tanks - Field Evaluation Study
65092	06-109	Occupancy-based Classification System for Design and Construction of Residential Basements
65243	06-108	Field Assessment of a NuAir AIMS eKOCOMFORT™ Unit
65245	06-107	The eKOCOMFORT Field Assessment Program
65274	06-106	West Coast Green Roof Performance at BCIT's Green Roof Research Facility
65035	06-104	Household Environmental Monitoring - A Strategy to Help Homeowners Reduce Their Environmental Impact
64994	06-103	Identifying and Removing Pollutants from Heat Recovery Ventilators
65002	06-102	Evaluation of Air Leakage Control Measures to Compartmentalize Newly Constructed Suites in a High- Rise Residential Building
64934	06-101	Green Phoenix Integrated Design Charrette for Sustainable Affordable Housing
64958	06-100	Performance Evaluation of the Almon Street Multi-Unit Residential Building
64942	05-120	Investigating Moisture in Seasonal Housing
64940	05-119	Energy and Water Consumption Load Profiles in Multi-Unit Residential Buildings
64911	05-117	Predicting Time to Fogging of Insulated Glass Units
64913	05-116	Nunavut Research 2003-2005
64908	05-115	Study of Poured-in Place Concrete Wall Assemblies in Coastal British Columbia

## RESEARCH HIGHLIGHTS: TECHNICAL SERIES

Order no.	Series no.	TITLE
64855	05-114	Reduction of Airborne Particles in Houses with Occupants Having Respiratory Ailments
64904	05-113	Duct Leakage Tests in Small Diameter Ducting System
64853	05-112	Assessment of Suite Compartmentalization and Depressurization in New High-rise Residential Buildings
64806	05-111	Laboratory Depressurization Test for Residential Gas Appliances
64843	05-110	Remote Monitoring and Control of On-site Wastewater Treatment, Recycling, and Reuse Systems
63928	05-109	Initial Material Characterization of Straw Light Clay
63945	05-107	Fire Experience, Smoke Alarms and Sprinklers in Canadian Homes: CMHC Research to 2005
63669	05-106	"The Land We Live on is our Home" The 'Gameti Ko' Project Second Community-led Workshop
63876	05-105	Testing the Adhesion of Air- Barrier Membranes in Wall Assemblies
63848	05-104	Ice Damming Field Research
63836	05-103	Assessment of the Energy Performance of Two Gas Combo-Heating Systems
63838	05-102	Development of Micro-CHP Technology Assessment Capability at CCHT
63818	05-101	Effects of ECPM Furnace Motors on Electricity and Gas Use
63816	05-100	Effects of Thermostat Setting on Energy Consumption
63745	04-131	Water Reuse Standards and Verification Protocol
63741	04-130	Dry and Comfortable Floors in Existing Basements
63733	04-128	Dynamic Buffer Zone (DBZ) System Performance
63728	04-127	Comparison of Under-Floor Insulation Systems
63726	04-126	Update of Roof Truss Designs with Nailing Schedules
63641	04-125	Residential Sources of Lead
63677	04-124	Summary of Research on Water Resistive Barriers
63675	04-123	Assessing the Impact of Thickness on the Performance of Stucco Cladding
63673	04-122	Comparison and Analysis of Provincial Builder and Renovator Industry Programs

## RESEARCH HIGHLIGHTS: TECHNICAL SERIES

Order no.	Series no.	TITLE
63635	04-121	Field Testing of "Spillage- Resistant" Appliances
63465	04-119	Diagnosing Attic Performance by Snow- and Frost-Melt Patterns
63620	04-118	Performance of Sprayed Polyurethane Foam on Indoor Foundation Walls
63615	04-117	Analysis of Ventilation System Performance in New Ontario Houses
63612	04-116	Energy Needs and Availability in Housing
63571	04-115	Building Canada: Phase One
63555	04-114	Investigating Claims Against Home and Property Inspectors
63557	04-113	Installation Guide for Residential Wood I-Joist Floor Systems
63547	04-112	Canadian Home Inspectors and Building Officials National Initiative Phase II: Development of National Certification and Accreditation Models
63528	04-111	Characterizing the Condominium Population of the Greater Ottawa Area, 1969-2002
63540	04-110	Strategies for Reducing Building Energy Use Via Innovative Building Envelope Technologies
63511	04-109	Maximum Performance Testing of Popular Water-Efficient Toilet Models
63542	04-108	Garage Performance Testing
63503	04-107	Survey of In-Suite Space and Domestic Hot Water Heating Systems In Multi-Residential Buildings
63400	04-105	Field Testing of an Integrated Ventilation Space Conditioning System for Apartments
63413	04-104	Practical Measures for the Prevention of Basement Flooding Due to Municipal Sewer Surcharge
63407	04-103	House Dust: A Useful Tool To Assess Microbial Contamination In Homes
63390	04-102	Calgary Integrated Design and Sustainable, Affordable Housing Charrette
63365	04-101	Residential Combustion Spillage Monitoring
63376	04-100	Improved Make-up Air Supply Techniques
63382	03-134	Safe Housing for Lightly Contaminated Lands
63370	03-133	Residential Combustion Venting Failure - A Systems Approach

## RESEARCH HIGHLIGHTS: TECHNICAL SERIES

Order no.	Series no.	TITLE
63374	03-131	The Canadian Residential Duct and Chimney Survey
63326	03-129	Monitoring the Performance of a Retrofitted Preserved Wood Foundation
63333	03-128	Review of Hygrothermal Models for Building Envelope Retrofit Analysis
63328	03-127	Static and Dynamic Earthquake Testing of Rainscreen Stucco Systems for B.C. Residential Wood-Frame Construction
63339	03-125	Water Penetration Resistance of Windows - Study of Codes, Standards, Testing and Certification
63367	03-124	Water Penetration Resistance of Windows: Study of Manufacturing, Building Design, Installation and Maintenance Factors
63315	03-123	Integrated Community Solutions: Regina's Affordable, Sustainable Housing Design Charrette
63294	03-122	The Impact of Requiring HVAC System Design Submittal on System Performance
63280	03-121	Ventilation Systems for Multi-Unit Residential Buildings: Performance Requirements and Alternative Approaches
63243	03-119	Reduction of Air Intake Contamination in High-Rise Residential Buildings
63257	03-118	Investigation of a Ground-Source Heat Pump Retrofit to an Electrically Heated Multi-Family Building
63237	03-117	Influence of an Electronic Air Cleaner on Indoor Ozone
63225	03-116	Qualification of the Degree of Acoustic Comfort Provided by Multi-Family Buildings - Phase II
63233	03-115	Case Studies of Major Energy Retrofits
63208	03-114	Technology Roadmap for Intelligent Buildings
63223	03-113	Dawson City Demonstration Monitoring Northern Ventilation
63206	03-112	Guidelines for On-Site Measurement of Moisture in Wood Building Materials
63204	03-111	Comparison of Modeled and Monitored Performance of a Wall Insulation Retrofit in a Solid Masonry Building
63214	03-110	Integrated Design Charrette for a Sustainable UniverCity Community
63200	03-109	Proper Retrofit Furnace Sizing
63188	03-108	Re-Sale of Leaky Condos: Did the Buyer Know?

## RESEARCH HIGHLIGHTS: TECHNICAL SERIES

Order no.	Series no.	TITLE
63194	03-107	Design of Durable Joints Between Windows and Walls
63192	03-106	Cooling Rates of Houses During Extended Power Failures
63190	03-105	Penetration of Outdoor Particles Into a Residence
63186	03-104	Indoor Particulate and Floor Cleaning
63182	03-103	Incompatible Building Materials
63175	03-102	Seville Theatre Redevelopment Project: Integrated Design Process
63172	03-101	Mandatory Home Inspections on Resale Homes in Ontario
63132	03-100	Rain Water Harvesting and Grey Water Reuse
63102	02-137	Multi-Residential High Efficiency Clothes Washer Pilot Project
63065	02-135	Monitored Performance of an Innovative Multi-Unit Residential Building
62637	02-133	Positive Pressure Ventilation for High-Rise Buildings
63035	02-132	Alternative Wall Systems for Low-Rise Housing
63053	02-130	Evaluation of Vapour Diffusion Ports on Drying of Wood-Frame Walls Under Controlled Conditions
63044	02-129	Investigation Protocol for Evaluation of Post-Tensioned Buildings
63019	02-128	"Northern Landscaping: A Guide to Restoring Plants and Soil in Northern Communities"
63015	02-127	LeBreton Flats District Heating System Performance Assessment
63017	02-125	Healthy Indoors: Achieving Healthy Indoor Environments in Canada
62995	02-124	Dual-Flush Toilet Testing
62997	02-123	Green Roof Infrastructure Workshop
63022	02-120	Study of High-Rise Envelope Performance in the Coastal Climate of British Columbia
62976	02-118	Compliance of Ventilation Systems Installed to Meet Proposed Changes to the 1995 NBCC
63104	02-117	Research Project on the Noise Produced by DWV Pipes Made of Cast Iron, PVC and ABS
62894	02-116	Wood Usage in Straw Bale House Construction
62892	02-115	Energy Use in Straw Bale Houses

## RESEARCH HIGHLIGHTS: TECHNICAL SERIES

Order no.	Series no.	TITLE
62890	02-114	Defining the Convective Driving Force for Soil Gas Intrusion into Houses
63116	02-112	Community Energy Management – Foundation Paper
62881	02-109	Composite Masonry Wall Ties
62888	02-108	Noise Isolation Provided by Gypsum Board Partitions
62955	02-105	Achieving Healthy Indoor Environments: A Review of Canadian Options
62944	02-104	Technology Dissemination: Triggering Innovation Adoption in Canada's Home Construction Industry
62950	02-103	Moldy Houses: Why They Are and Why We Care & Additional Analysis of Wallaceburg Data: the Wallaceburg Health and Housing Studies
62968	02-102	Transforming Your Practice: Integrated Design Charrettes for Sustainable Buildings
62876	02-101	Healthy High-Rise: A Guide to Innovation in the Design and Construction of High-rise Residential Buildings
62960	02-100	Final Assessment of Conservation Co-op's Greywater System
62747	01-142	Analysis of the Annual Energy and Water Consumption of Apartment Buildings in the CMHC HiSTAR database
62745	01-141	The Sustainable Home Water System
62743	01-140	2001 Building Failures Study
62741	01-139	The Envelope Drying Rates Analysis Study
62739	01-138	Innovative On-Site Wastewater Treatment
62737	01-137	Evaluation of Urban Drainage for Basement Flood Proofing
62735	01-136	Protection of Basements Against Flooding Trends and Impacts of Drainage Regulations
62731	01-134	Technical Impediments to Use of the Existing On-Site Sewage System of Host House to Service Garden Suite on Same Property
62729	01-133	Lower Cost Alternative for Municipal Sewer Inspection and Maintenance
62727	01-132	Assessment of the Takla Landing Contour Trench Wastewater Disposal System
62723	01-130	The Ontario Wall Drying Project Phase 2
62721	01-129	The Ontario Wall Drying Project (1991)

## RESEARCH HIGHLIGHTS: TECHNICAL SERIES

Order no.	Series no.	TITLE
62715	01-126	Monitoring of Cavity Humidity Levels at Canada Life Building
62713	01-125	A Commissionable Air Barrier System for the Building Envelope
62709	01-123	Air Leakage Characteristics, Test Methods and Specifications for Large Buildings
62707	01-122	Air Infiltration from Attached Garages in Canadian Houses
62705	01-121	Canadian Municipal Water Conservation Initiatives
62701	01-119	The BREEAM Green Leaf Environmental Assessment Protocol for Multi-Residential Buildings
62699	01-118	Quality Assurance Protocol Test Drive by CMHC and Polygon Construction Management Ltd
62697	01-117	Stormwater Management Alternatives
62693	01-115	Commissioning Guide for the Toronto Healthy Houses Water Systems
62691	01-114	Peak-Day Irrigation Demand Reduction Monitoring
62689	01-113	Evaluating the Performance of On-Site Sewage Disposal Systems
62687	01-112	Advancing the "Light Grey Option": Making Residential Greywater Use Happen
62685	01-111	Estimation of the Contribution of Phosphorus From On-Site Sewage Disposal Systems to Lakes
62679	01-108	Domestic Cold Water Booster Pump Control Monitoring Pilot Program
62677	01-107	Impact of Added Insulation on Air Leakage Patterns
62675	01-106	Thermostat Settings in Houses with In-floor Heating
62673	01-105	Case Study on Basement Renovations
62671	01-104	Monitoring the Performance of an EIFS Retrofit on a 15-Storey Apartment Building
62669	01-103	Energy Use Patterns in Off-Grid Houses
62667	01-102	"Plex" Housing: A Renewed Tradition
62663	01-100	WATERSAVE: Water Reclamation System Design Tool

## RESEARCH HIGHLIGHTS: SOCIO-ECONOMIC SERIES

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Order no.	Series no.	TITLE
66808	10-002	Longitudinal Study of Housing for Mental Health Consumer-Survivors
66751	10-001	Overview of the Current State of Knowledge on Societal Outcomes of Housing
66748	09-024	2006 Census Housing Series: Issue 6 — Off-reserve Status Indian Households: Housing Conditions and Core Housing Need
66640	09-023	Inventory and Assessment of Sustainable Community Best Practice Guides for the Canadian Housing Sector
66634	09-022	2006 Census Housing Series: Issue 5 — Canada's Census Metropolitan Areas (CMAs)
66611	09-021	Recycling Catholic Convents and Religious Institutional Buildings into Affordable and Alternative Housing: Three Case Studies
66642	09-020	Livable Lanes: A Study of Laneway Infill Housing in Vancouver and Other Growing B.C. Communities
66606	09-019	Extended Characterization of Individuals Experiencing Occasional and Persistent Core Housing Need (2002-2004)
66627	09-018	Transit-Oriented Development (TOD): Canadian Case Studies
66560	09-016	2006 Census Housing Series: Issue 4 — Growth in Household Incomes and Shelter Costs, 1991-2006
66539	09-015	PerthWorks — A Small Town Sustainable Neighbourhood Project
66553	09-014	2001 Participation and Activity Limitation Survey: Issue 1 — Profile of the Housing Conditions of Canadians Aged 15 Years and Older with a Mobility and/or an Agility Disability
66472	09-013	Impact of Economic Cycles on the Incidence of Core Housing Need in Canada
66464	09-012	Housing Persons With an Intellectual Disability in Intentional Communities: Identifying Relevant Physical and Governance Structures
66422	09-011	Preconditions Leading to Market Housing on Reserve
66418	09-010	Rivergreen Ecovillage Design Charrette, Saskatoon
66401	09-009	Government-imposed Charges On New Housing In Canada

## RESEARCH HIGHLIGHTS: SOCIO-ECONOMIC SERIES

Order no.	Series no.	TITLE
66389	09-008	Affordability Challenges and Rental Market Dynamics in Small Nova Scotia Communities with Community College Campuses
66303	09-007	2001 Census Housing Series: Issue 14 Household Mobility and Core Housing Need
66383	09-006	2006 Census Housing Series Issue 3 — The Adequacy, Suitability, and Affordability of Canadian Housing, 1991 - 2006
66360	09-005	2006 Census Housing Series Issue 2: the Geography of Core Housing Need, 2001 - 2006
66381	09-003	Affordability Trends 1981–2001: An Analysis of Selected Metropolitan Regions in Canada
66387	09-002	Settling In: Newcomers in the Canadian Housing Market, 2001–2005
66391	09-001	Low-Income Urban Households Not in Core Housing Need
66337	08-020	Breaking Ground: A Fused Grid Neighbourhood in Calgary
66279	08-018	2001 Census Housing Series Issue 13: Housing Conditions of Women and Girls
66206	08-017	Adapting Your Home to Living with Dementia
66141	08-016	2001 Census Housing Series: Issue 12 – Housing Conditions of Visible Minority Households in Canada
66139	08-015	City of Dryden-Sustainable Waterfront Development Plan
66099	08-014	Community Indicators for an Aging Population
66086	08-013	Giving Pedestrians an Edge—Using Street Layout to Influence Transportation Choice
66071	08-012	Taming the Flow — Better Traffic and Safer Neighbourhoods
65959	08-011	Understanding the Status of Visitability in Canada
65674	08-010	Neighbourhood Effects and Concentration Levels of Aboriginal People in Large Canadian Cities
66004	08-009	Adapting Homes to Extend Independence - Case Study of 13 Frail Seniors in Quebec City Suburbs
65935	08-008	The Role of Housing in Aboriginal Student Success - Post-Secondary Institutions in Vancouver
65590	08-006	Feasibility of Risk Management as a Subject for Capacity Building in First Nations Communities
65845	08-004	2006 Census Housing Series Issue 1: Demographics and Housing Construction

## RESEARCH HIGHLIGHTS: SOCIO-ECONOMIC SERIES

Order no.	Series no.	TITLE
65913	08-003	Impacts of the Aging of the Canadian Population on Housing and Communities
65901	08-002	The Dynamics of Housing Affordability
65933	08-001	Life Cycle Costing Tool for Community Infrastructure Planning
65836	07-022	2001 Census Housing Series Issue 11: Profile of the Housing Conditions of Persons with Disabilities
65682	07-018	Housing Situation and Needs of Recent Immigrants in Montreal, Toronto, and Vancouver
65672	07-017	Supportive Housing for Homeless and Hard-to-House Seniors: An In-Depth Case Study
65670	07-016	How Effective Are Bathtub Grab Bars for Stopping a Fall When You Lose Your Balance?
65660	07-015	The Old Grace Hospital Site Charrette
65658	07-013	A Plan for Rainy Days: Water Runoff and Site Planning
65560	07-011	Growth Management and Affordable Housing in Greater Toronto
65553	07-010	Housing Issues Facing Seasonal Workers
65550	07-009	Fire Prevention in Aboriginal Communities Manual and DVD
65644	07-008	Urban Acupuncture - A Methodology for the Sustainable Rehabilitation of "Society Buildings" in Vancouver's Chinatown into Contemporary Housing
65429	07-007	Urban Form and Social Inclusion
65427	07-006	An Examination of Life Lease Housing Issues
65431	07-005	Case Study: A Geographic Information System (GIS) as a Tool for First Nations Housing Management, Planning and Safety
65424	07-004	West Hills Subdivision Sustainable Development Charrette
65361	07-003	Wood Buffalo Affordable Housing Project Charrette
65348	07-002	Establishing the National Council on Self-Help Housing
65340	07-001	Housing Options Upon Discharge from Correctional Facilities
64804	06-024	Urban Aboriginal Households: A Profile of Demographic, Housing and Economic Conditions in Canada's Prairie and Territories Region
65308	06-023	Senior's Housing for seniors: A Feasibility Study
65293	06-022	Impact of the 2010 Winter Olympic Games on the Vancouver and Sea-to-Sky Housing Markets

# RESEARCH HIGHLIGHTS: SOCIO-ECONOMIC SERIES

Order no.	Series no.	TITLE
65253	06-021	Structural Analysis of Montreal's Real Estate Market
65231	06-020	Requalification of Suburbs and Regulatory Frameworks: Current Situation and Easing Measures
65235	06-019	Profile of Rooming House Residents
65233	06-018	Establishing On-reserve Housing Authorities
65220	06-017	Profile and Prospects of the Factory-built Housing Industry in Housing
65185	06-016	Gaining Community Acceptance of Affordable Housing Projects and Homeless Shelters
65218	06-015	Brownfield Redevelopment for Housing: Case Studies
65216	06-014	Impacts of Ethnic Changes on the Housing Market in the Rivière-des-Prairies District of Montréal
65183	06-013	Saline Creek Plateau Sustainable Community Design Charrette
65291	06-012	Renovation and Repair Referral and Advisory Service for Seniors and Others Who Are Homeowners
65086	06-011	Housing Allowance Options for Canada
65096	06-010	Housing Discrimination Against Victims of Domestic Violence
65048	06-009	The Economic Impact of Residential Construction on Reserves
65011	06-008	Housing for Adults with Intellectual Disabilities
65017	06-007	The Transferability of the "Safe in the City" Approach to Youth Homelessness Prevention in Canada
65025	06-006	Accessory Apartment Regulations in Census Metropolitan Areas in Canada
64990	06-005	Estimates of the Private and Societal Costs and Benefits of Homeownership in Selected Canadian Cities
64984	06-004	Issues, Impediments and Opportunities to Using Designated Land On-reserve for Affordable Housing
65006	06-003	Household Income, Net Worth and Housing Affordability in Canada
64981	06-002	The Rutland Transit Centre Design Workshop - Kelowna, British Columbia
64992	06-001	2001 Census Housing Series Issue 10: Aging, Residential Mobility and Housing Choices
64944	05-038	A Framework for Cost-Benefit Analysis of HASI and RRAP-D

## RESEARCH HIGHLIGHTS: SOCIO-ECONOMIC SERIES

Order no.	Series no.	TITLE
64936	05-037	Student Housing in Canada: Developing a Methodology to Collect Data and Information
64931	05-036	Smart Growth in Canada: A Report Card
64906	05-035	Cost Effectiveness of Eviction Prevention Programs
64900	05-034	An Exploration of Housing Options for Aboriginal People in Edmonton, Alberta and Winnipeg, Manitoba
64903	05-033	Life Lease Supportive Housing: Combining the Best Aspects of Housing and Complex Care
64897	05-032	Sustaining the Non-Profit Housing Sector in British Columbia
64863	05-031	Searchable Database of Supportive Housing for Seniors in Canada
64861	05-030	Architecture for Elder Health in Remote British Columbia: A Nisga'a-led Research
64851	05-029	Issues and Strategies for Shared Accommodation
64031	05-027	Homelessness, Housing and Harm Reduction: Stable Housing for Homeless People with Substance Use Issues
64845	05-026	Temporary Supportive Housing for Aboriginal People and Their Families
63931	05-024	Case Study on the Carma Centre for Excellence in Home Building and Land Development
64126	05-023	Costing Mechanism to Facilitate Sustainable Community Planning - Background Research and Costing Framework
64062	05-022	Sustainability, Planning Practice, Housing Form and Environmental Protection in the Toronto Region's Oak Ridges Moraine
63653	05-021	Uses of Development Cost Charges
63975	05-020	A Legal Framework for Supportive Housing for Seniors: Options for Canadian Policy Makers
64121	05-019	Social Housing in the Context of Rural Depopulation
63950	05-018	Homeless Applicants' Access to Social Housing
63972	05-017	Acceptance of Manufactured Housing in First Nations Communities in Atlantic Canada
63970	05-016	City of Yorkton Downtown Redevelopment Planning Charrette
63981	05-014	Variations in Housing Prices in Canada
63948	05-013	Brownfield Redevelopment for Housing: Literature Review and Analysis

## RESEARCH HIGHLIGHTS: SOCIO-ECONOMIC SERIES

Order no.	Series no.	TITLE
63918	05-012	The Impact of Zoning and Building Restrictions on Housing Affordability
63916	05-011	Measuring the Effort Needed to Climb Access Ramps in a Manual Wheelchair
63913	05-010	Critical Success Factors for Community Land Trusts in Canada
63922	05-009	Housing and Non-housing Construction Labour
63906	05-008	Evaluating Arterial Road Configuration Options for a New Community
63844	05-007	Variability in Construction Insurance and Alternative Insurance Solutions
63820	05-006	2001 Census Housing Series Issue 9 Revised: The Housing Conditions of Canada's Seniors
63814	05-005	Maintenance and Renovation: Opportunities to Improve Accessibility to Existing Residential Buildings
63840	05-004	2001 Census Housing Series Issue 8 Revised: Households Spending at least 50% of their Income on Shelter
63802	05-003	Housing Stability Validity Study
63812	05-002	Women Offenders: Characteristics, Needs and Impacts of Transitional Housing
63834	05-001	Aboriginal Housing: Local Materials and Design Preferences
63882	04-043	First Nation Economies: A Comparative Perspective. A Socio-Economic Baseline Study Between First Nation Communities and Non-First Nation Communities
63810	04-042	2001 Census Housing Series Issue 7 Revised: Immigrant Households
63797	04-041	Initial Demographic Analysis of the Home-Building Industry and Succession Planning
63795	04-040	Filtering in Housing
63758	04-039	Evolving Housing Conditions in Canada's Census Metropolitan Areas, 1991-2001
63760	04-038	Applying Fused Grid Planning in Stratford, Ont.
63692	04-037	Ideas that Work: Best Practices in Affordable Housing Management
63695	04-036	2001 Census Housing Series Issue 6 Revised: Aboriginal Households
63685	04-035	Developing a Methodology for Tracking Homeless People over the Long Term

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63618	04-033	A Review of Training and Delivery Options Concerning Aboriginal Housing
63592	04-032	An International Comparison of Housing Need Indicators in Australia, Canada, England and the United States
63600	04-031	An Examination of the use of Domestic Space by Inuit Families Living in Arviat, Nunavut
63639	04-030	The National Summit on Affordable Homeownership
63596	04-029	Comprehensive Community Planning: Experiences in Aboriginal Communities
63573	04-028	Intergenerational Homesharing and Secondary Suites in Quebec City Suburbs
63580	04-027	2001 Census Housing Series: Issue 5 - Growth in Household Incomes and Shelter Costs, 1991-2001
63575	04-026	Strategies to Preserve the Existing Rental Housing Stock in Greater Vancouver
63561	04-025	Refugee Housing Information Needs: Research Conducted in the Region of Niagara
63551	04-024	Assessment of the Outcomes for Habitat for Humanity Homebuyers
63526	04-022	UniverCity: Assessing Consumer Demand for Sustainable Development
63501	04-021	Residential Integration of Youth Migrants in Quebec
63518	04-020	The Impact of the 1988 Basel Capital Accord and Prognosis for the Future
63509	04-019	Housing, Long Term Care Facilities, and Services for Homeless and Low-income Urban Aboriginal People Living with HIV/AIDS
63507	04-018	Lessons Learned from the Use of Performance Assessment Measures to Implement Sustainable Communities
63445	04-017	Transitional Housing: Objectives, Indicators of Success and Outcomes
63463	04-016	Housing and Population and Health - Research Framework
63440	04-014	Residential Intensification Case studies: Built Projects
63372	04-013	Insurance In Residential Construction: An Environmental Scan
63428	04-012	Consumer Support and Protection in Mortgage and Home Equity Based Borrowing: The U.S. Experience and Canadian Comparisons

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63434	04-011	Town of Milton Eco-tech Village Pilot Project Urban Design Charrette: Making Choices Towards Sustainability
63438	04-010	Housing Education Program: Eastmain Pilot Project
63415	04-009	Quantifying Universal Design: A Program for Implementation
63584	04-008	2001 Census Housing Series: Issue 4 Revised - Canada's Metropolitan Areas
63403	04-007	2001 Census Housing Series: Issue 3 Revised- The Adequacy, Suitability and Affordability of Canadian Housing
63405	04-006	House Prices, Borrowing Against Home Equity, and Consumer Expenditures
63380	04-005	Quality of Location and Quality-of-Life in Central Montréal Neighbourhoods
63378	04-004	Canadian Housing Fire Statistics
63417	04-003	Tools for Planning Long-Term Urban Sustainability: The Cities <sup>PLUS</sup> Design Charrettes
63337	04-002	Residential Intensification Case Studies: Municipal Initiatives
63306	04-001	2001 Census Housing Series: Issue 2 Revised - The Geography of Household Growth and Core Housing Need, 1996-2001
63363	03-024	An Examination of First Nations Housing Management Training Programs
63352	03-023	Housing Needs of Low Income People Living in Rural Areas: Literature Review
63330	03-021	Housing Quality and Children's Socioemotional Health
63296	03-019	Housing Options for Elderly or Chronically Ill Shelter Users
63206	03-018	Residential Integration of Youth with Immigrant Backgrounds in Montréal
63285	03-017	2001 Census Housing Series: Issue 1 - Housing Affordability Improves
63292	03-016	Comparison of Provincial and Territorial Rental Practices
63287	03-015	Applicability of a Continuum of Care Model to Address Homelessness
63283	03-014	Governance in Organizations Addressing Homelessness
63255	03-013	Life Lease Housing in Canada: A Preliminary Exploration of Some Consumer Protection Issues

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63278	03-011	Literature Review of Socio-economic Trends Affecting Consumers and Housing Markets
63245	03-010	Evaluation of Optimal Bath Grab Bar Placement for Seniors
63239	03-009	Impact of the Home Buyers' Plan on Housing Demand
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63231	03-007	Recycle: Lifecycle - How to Renovate for Change
63221	03-006	Family Homelessness: Causes and Solutions
63177	03-005	A Study of Tenant Exits from Housing for Homeless People
63210	03-004	The Housing Construction Industry: Challenges and Opportunities for the 21st Century
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63140	03-001	Home\$ave: Building Investments in Housing Assets
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63078	115	Levies, Fees, Charges and Taxes on New Housing (2002)
63071	114	Effects of Urban Aboriginal Residential Mobility
63055	112	Housing Options for Women Living Alone in Rural Areas
63046	111	Sustainable Community Design Demonstration in Okotoks, Alberta: Testing Consumer Receptivity
62793	110	The Evolving Impact of E-commerce on Canadian Home Ownership Finance Access and Affordability
62791	109	The Cost of FlexHousing
62789	108	Innovative Housing for Homeless Youth
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62785	106	An Evaluation of Housing Taxation Measures
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62779	103	Sustainable Community Planning and Development: Design Charrette Planning Guide
62777	102	Initiatives to Maintain Rooming House/Single Room Occupancy Stock and Stabilize Tenancies
62775	101	Pro-Home: A Progressive, Planned Approach to Affordable Home Ownership
62773	100	Evaluating Housing Stability for People with Serious Mental Illness at Risk of Homelessness
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