

COMPENDIUM
OF
RESEARCH 2003 & 2004

Issued also in French under the title: ***Compendium de recherche 2003 et 2004***

Publié aussi en français sous le titre : ***Compendium de recherche 2003 et 2004***

INTRODUCTION

Canada Mortgage and Housing Corporation, the federal Government's housing agency, is responsible for administering the *National Housing Act*.

Under Part IX of the *National Housing Act*, the Government of Canada provides funds to CMHC to conduct research into the social, economic and technical aspects of housing and related fields, and to undertake the publishing and distribution of the results of this research. CMHC therefore has a statutory responsibility to make widely available, information which may be useful in the improvement of housing and living conditions.

This Compendium of Research has been compiled to publicize and increase access to the research reports produced under research programs sponsored by the Corporation during 2003 and 2004. A few reports not included in the earlier compendiums have also been added.

ARRANGEMENT

The abstracts of completed research reports and publications are arranged by broad subject areas. A title index can be found at the end of the Compendium.

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ABORIGINAL HOUSING

BUILDING A SUSTAINABLE FUTURE: SEABIRD ISLAND FIRST NATION SUSTAINABLE COMMUNITY DEMONSTRATION PROJECT

The Seabird Island First Nation near Agassiz, BC, in partnership with CMHC, the Department of Indian and Northern Affairs (INAC) and Broadway Architects (Sieniuc + de Ridder) of Vancouver built a sustainable community demonstration project. This project consisted of seven homes that incorporated CMHC's Healthy Housing and FlexHousing design concepts. It is the first on-reserve development of its kind in the world. Six of these homes were funded within the guidelines of CMHC's Non-Profit On-Reserve Housing Program (Section 95), while the seventh home was co-funded by CMHC, INAC and more than 20 sponsors.

The main goals of this project included:

- to demonstrate an integrated approach to designing sustainable housing
- to develop housing models that address key housing issues facing Aboriginal people living on reserve across Canada and to provide viable, long-lasting solutions for improving the housing stock on reserves
- to incorporate traditional design elements reflecting the community's culture and heritage.

The Seabird Island project forms part of the Seabird Island First Nation's Sustainable Community Plan. The basic concepts of sustainable planning are addressed in the report and these include the following attributes: affordable, durable, energy efficient, achievable, flexible, healthy, environmentally responsible and community oriented. These sustainable planning principles are illustrated by short descriptions and diagrams of rainscreens, a wind turbine, solar roofs, earth tubes and radiant heat floors and preheated domestic water.

The report also offers a step-by-step description of how other First Nations can implement a sustainable community project and also includes a checklist of sustainable features. The report concludes with a listing of the main partners in the project and their roles as well as a listing of sponsors and their business areas. A product directory of the main building suppliers with their contact information is also provided.

Prepared by Broadway Architects. CMHC Project Officer: Allan Dobie. Vancouver: Indian and Northern Affairs Canada, Seabird Island First Nation and Canada Mortgage and Housing Corporation, 2003. 36 pages

Nota : Aussi disponible en français sous le titre : Bâtir un avenir écologique : Première Nation Seabird Island projet de démonstration - collectivité durable

AVAILABILITY : CMHC Information Products (Order number 63553)

BUILDING COMMUNITIES: FIRST NATIONS BUILDING ENVIRONMENTALLY SUSTAINABLE HOUSING

This publication focuses on proven alternative construction methods, materials and techniques to achieve Healthy Housing and environmentally sustainable community development and economic development. "Building Communities" outlines and explains new and efficient:

- Construction methods and materials;
- Cutting-edge technologies for electrical co-generation;
- Biological sewage and waste water treatment and purification systems;

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- Alternative methods for heat generation;
- Innovative transportation systems for use in remote/fly-in communities.

“Building Communities” outlines the importance of planning to create an integrated approach to Healthy Housing and environmentally sustainable community development. It illustrates and explains some examples of Healthy Housing systems. It provides the principles that CMHC uses to guide and develop Healthy Housing, as well as the principles Onkwehonwene Anishnabek Sustainable Integrated Systems (OASIS) uses to achieve an integrated approach to environmentally sustainable community and economic development in First Nations. It provides updates on:

- The Eagle Lake Healthy House and micro-infrastructure;
- The Mohawk community of Tyendinaga, planned sustainable Healthy Housing subdivision;
- The Mohawk Community of Kahnawake, straw bale construction method and their planned sustainable community;
- Micro-infrastructures and self-contained utility development.

In addition, it uses as examples:

- The Pikangikum first Nation proposed 16-unit Healthy House project; and
- The Sheshegwaning First Nation Environmental Management Strategy.

Prepared by Morgan Green, Onkwehonwene Anishnabek Sustainable Integrated Systems. Ottawa: Canada Mortgage and Housing Corporation, c2002. 62 pages

Nota : Aussi disponible en français sous le titre : Bâtissons ensemble : Les Premières nations construisent des logements respectueux de l’environnement

AVAILABILITY : CMHC Information Products (Order number 63063)

EFFECTS OF URBAN ABORIGINAL RESIDENTIAL MOBILITY

Urban residential mobility is the movement of individuals or households within the same urban area. Aboriginal people living in urban areas move more frequently than non-Aboriginal people do. For example, in 1991, the urban Aboriginal mobility rate was 1.8 times higher than the rate among non-Aboriginal people.

Past research has indicated that while there are many reasons why Aboriginal people move so frequently, housing seems to be almost always important. Aboriginal people move in search of more affordable, suitable and adequate housing. They also move because of family reasons, for example, household size changes, conflict or breakdown; and because they are often looking for better access to community services or employment opportunities.

High mobility among urban Aboriginal people can affect social service agencies that provide services for Aboriginal people, as well as their clients. This research explored the effects of urban Aboriginal residential mobility on agencies that provide social services to Aboriginal people, and their clients, in two Canadian cities where proportions of Aboriginal people are high— Regina, Saskatchewan and Winnipeg, Manitoba.

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Prepared by Saskatchewan Indian Institute of Technologies. CMHC Project Officer: Marcelle Marie Gareau. Ottawa: Canada Mortgage and Housing Corporation, 2004. 56 pages

Note: No. 114 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre and
ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilingual/Report_Effects_w.pdf

EXAMINATION OF THE USE OF DOMESTIC SPACE BY INUIT FAMILIES LIVING IN ARVIAT, NUNAVUT

During the summer of 2002, the author spent two months living in the community of Arviat, Nunavut, documenting patterns of housekeeping among Inuit families. The objective of the project was to answer the following question: Are the domestic activities of Inuit families compatible with the spatial configuration of Euro-Canadian house models currently used in the Canadian Arctic? Observations of Inuit space use were organized into a relational database, and used in combination with the spatial analysis of houses occupied by Inuit families. The spatial analysis was completed using a number of innovative computer-based techniques for analyzing architecture developed at Space Syntax Laboratories, University College London. This project represents the first time these techniques have been applied in Canada.

Recent ethnographic fieldwork in the Canadian Arctic has revealed differences in the patterning of domestic activities by Inuit and Euro-Canadian families. These differences are reflected in the types of activities Inuit families carry out, and how these activities are distributed within houses. The majority of Inuit family activities occur in integrated spaces such as living rooms and kitchens, because daily activities provide an important context for social interaction among family members. The use of space syntax analysis to examine houses built over the past 50 years in the Canadian north indicates a trend towards floor plans with narrow view fields and a greater number of smaller rooms. This trend reflects the increasing importance of individualism and privacy in Euro-Canadian society, and is not compatible with the more collective forms of social interaction that characterize Inuit families. These results should be of importance to architects and planners interested in designing and building houses that better reflect the cultural values and lifestyles of Inuit families.

Prepared by Peter C. Dawson. CMHC Project Officer: Marcelle M. Gareau. Ottawa: Canada Mortgage and Housing Corporation, 2003. (External Research Program Research Report) 86 pages

Note: No. 04-031 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilingual/RR%20Examination\(w\).pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilingual/RR%20Examination(w).pdf)

ABORIGINAL HOUSING

HABITAT AUTOCHTONE ET LE GENRE : UNE APPROCHE SENSIBLE DE LA POPULATION CREE DE CHISASIBI: RAPPORT FINAL DE RECHERCHE

Cree communities in Northern Quebec have undergone significant change since the first Euro-Canadians arrived on their land. Their traditions, houses and dietary habits have been profoundly influenced by the Western way of life. This study was conducted in the Village of Chisasibi, which was planned in 1980 on the basis of a new urban framework and new, fully equipped houses.

Traditionally, Native women and Cree women, in particular, have played an important role in the lives of their communities. Following the European conquest of Canada, Native women lost their status and were no longer consulted in the planning of their houses. Nonetheless, they were still responsible for domestic tasks, the upbringing of their children and the maintenance of the cultural identity of their communities.

The first part of the study deals with the women's opinions of the physical and functional aspects of their housing. The second part examines the experiences of the traditional lives of residents before they were integrated into the North American lifestyle. The results of this study, which involved about 40 women, revealed a considerable gap between living habits, residents' needs and existing housing. Hunting activities, extended families, early pregnancies and extreme weather conditions are some of the specific aspects of Cree culture. However, none of these aspects have been taken into account in the design of units and the materials used over the past 20 years.

The study revealed that new layouts designed by the residents did take some of the aforementioned cultural parameters into account. However, it is still essential that the traditions and needs of Native residents be taken into account when designing new units and that due consideration be given to rapid economic development and the social and cultural transformations of the Cree.

Prepared by V. Bhatt and M. Chagny. CMHC Project Officer: Phuong-Diep Nguyen. Ottawa: Canada Mortgage and Housing Corporation, 2002. (CMHC External Research Program Report) 124 pages.

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-ccd/h/Research_Reports-Rapports_de_recherche/fr_unilingue/RR%20Habitat_FINAL%20\(w\)REV.pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccd/h/Research_Reports-Rapports_de_recherche/fr_unilingue/RR%20Habitat_FINAL%20(w)REV.pdf)

HOME SAFE HOME: THE COWICHAN RECLAMATION PROJECT

In the late 1990s, Cowichan Tribes, a first Nations community on Vancouver Island, was inundated with concerns over household mould and related health problems. Due to the extent and severity of the mould problem, many band members are or have become very sensitive to their environment and have developed a myriad of symptoms, the majority affecting the respiratory system.

In 2001, Cowichan Tribes, Indian and Northern Affairs Canada (INAC), the Canada Mortgage and Housing Corporation (CMHC), and Health Canada, along with Jacques Whitford Environment Ltd., banded together to confront this potential health crisis that affected virtually every family on the Cowichan Indian Reserve. To solve the problem and guard against future reoccurrence of

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the crisis, the partners embarked on possibly the most comprehensive residential mould study and abatement project ever attempted in North America.

This booklet describes the Cowichan mould crisis which affected the Cowichan community mentally, physically, emotionally, socially, and spiritually and outlines the steps taken by the Project Team members to resolve the situation. The wisdom gained in the Cowichan community is applicable for other First Nations and non-native communities across Canada. The housing construction and maintenance standards, abatement strategies, tenant agreements and training programs developed during the pilot project provide useful reference material for other communities facing a mould problem.

Ottawa: Canada Mortgage and Housing Corporation; Vancouver: Cowichan Tribes; Indian and Northern Affairs Canada, British Columbia Region, 2003. 32 pages

Nota : Aussi disponible en français sous le titre : Maison propre, maison saine : Projet d'assainissement des habitations cowichan

AVAILABILITY : CMHC Information Products and from the BC Region Public Enquiries line: 604-666-8695; Toll free: 1-800-665-9320

HOUSING EDUCATION PROGRAM PHASE A: A SUMMARY AND CONSULTATION REGARDING EXISTING RENTAL HOUSING IN CREE COMMUNITIES (EASTMAIN PILOT PROJECT) 2001: FINAL REPORT

This project arises from the acknowledgement that the concept of rent in Cree culture is neither clear nor obvious. Based on the experience of CMHC and the Cree Housing Authority, both long involved in housing issues, and the skills and experience of the consultants and architects, the project attempted to reveal the inadequacies between the rental system and the residents' needs and expectations.

The initial task of this project (Phase A) was to summarise the existing financial arrangement regarding housing, as envisioned by CMHC, the Cree Housing Authority and the local government of Eastmain, and then to communicate the system within the Cree community of Eastmain. This involved the development of visual communication tools explaining the existing rental housing system and the organisation of a public consultation process. This consultation was intended to present and inform the tenants about rental housing concepts and offered also an opportunity to discuss a Native vision of this system. Their concerns, comments and reactions would provide essential information during this exchange. The study attempted to reveal:

- The structural, social, and cultural deficiencies inherent to the actual rental system
- Factors that lead toward non-payment of rent
- Possibilities for future research paths that serve to break the pattern of non-payment of rent.

Prepared by the CRA (Martin Desgagné) and box architectures (Isabelle Champagne and Maïti Chagny) for the Cree Nation of Eastmain and Eastmain Rental Housing Department with the financial support from CMHC, the Cree Regional Authority and the Cree Nation of Eastmain. Ottawa: Canada Mortgage and Housing Corporation, 2003 (CMHC External Program Research Report) 62 pages

Note: No. 04-010 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre and [ftp://ftp.cmhc-schl.gc.ca/chic-ccd/h/Research_Reports-Rapports_de_recherche/eng_unilingual/RR%20Education_FINAL\(w\).pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccd/h/Research_Reports-Rapports_de_recherche/eng_unilingual/RR%20Education_FINAL(w).pdf)

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INTER CULTURAL COMMUNICATION OF CMHC INFORMATION PRODUCTS: FINAL REPORT

In commissioning the Inter Cultural Communication of CMHC Information Products Project, CMHC undertook a proactive initiative designed to develop criteria to assess the applicability and relevance of its information products to Aboriginal target audiences.

CMHC recognizes that the availability of relevant and culturally appropriate housing information with regards to an array of housing matters, including management, construction, repairs, capacity building, and training is of growing importance. Yet, CMHC research to date indicates that many of its publications are not currently relevant to Aboriginal people.

Where materials have been specifically geared towards Aboriginal people, they have been very successful in reaching the intended audience(s). Consequently, CMHC sought to embark on the Inter Cultural Communication of CMHC Information Products Project to create an Aboriginal-focused communications strategy and review select information products to improve CMHC's communications with Aboriginal target audiences and ensure that CMHC information materials are distributed as widely and effectively as possible.

The final report includes a comprehensive listing of Aboriginal communities and organizations; identification of the targeted audience's various preferred means of receiving information; a communication plan and product distribution strategy; evaluation of relevant publications; and recommendations on how to broaden the existing CMHC web site to meet the needs of Aboriginal users.

Prepared by Chignecto Consulting Group Inc. CMHC Project Officer: Marcelle Gareau. Ottawa: Canada Mortgage and Housing Corporation, 2003. ca. 347 pages

AVAILABILITY : On a loan basis only from the Canadian Housing Information Centre

MOLD MATTERS: A RESOURCE GUIDE FOR FIRST NATIONS HOUSING PROVIDERS

This Resource Guide is a practical list of sources for information that can lead First Nations to become knowledgeable and expert on how to deal with moisture and mold problems. Many of the resources, programs and services can also assist First Nations to better build, renovate and maintain homes which are less likely to develop problems.

This Resource Guide will be useful for individuals who are involved in housing and may have to deal with moisture and mold problems. These people include: housing managers, housing co-ordinators, housing maintenance and repair staff, technical service providers, builders, renovators.

The Resource Guide is divided into the following seven sections:

- Understanding Mold
- Preventing and Eliminating Mold
- Home Maintenance
- Quality House Construction
- Comprehensive Community Planning and Housing Policy Development
- Government Programs
- Directory of Resources

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Ottawa: Canada Mortgage and Housing Corporation, 2003. 1 loose-leaf volume.

Nota : Aussi disponible en français sous le titre : Moissure : une matière nuisible d'importance : guide des ressources disponibles pour les fournisseurs de logements des Premières Nations

AVAILABILITY : CMHC Information Products (Order number 63432)

REVIEW OF TRAINING AND DELIVERY OPTIONS CONCERNING ABORIGINAL HOUSING

One of the consequences of the growing Aboriginal population and of the greater control Aboriginal groups have over their housing portfolio, is that Aboriginals' housing skills in the areas of management, construction and repairs will become increasingly important. In view of this, and of budget constraints, training will need to become as effective as possible.

The overall project objective was to identify training approaches that were innovative, could supplement the more conventional approach of a teacher-student exchange and could be successfully applied to future housing-related Aboriginal training programs.

Information was sought both nationally and internationally from public, private and Aboriginal sources involved in the delivery of training programs to address the following main research themes:

- What housing-related training and training delivery approaches have been used over the last 10 years?
- What innovative training and delivery approaches, other than the conventional techniques of teacher/student exchange, have been successfully applied in reference to Aboriginal People and First Nations communities in Canada?
- Where can funding for unconventional training and delivery ventures be obtained?

The research was carried out in two phases. The initial phase included a review of a wide variety of alternative and innovative training programs dealing with numerous training topics including, but not limited to, housing-related training. The researchers also examined geographical and cultural variances in defining successful training initiatives and what was innovative.

The review encompassed initiatives that were undertaken during a 10-year period (1991 to 2001) in Canada and abroad. Approximately 60 training programs were reviewed as part of the initial phase of the research. For the second phase, eleven training programs in the preliminary review were identified as providing innovative and alternative training techniques that applied to Aboriginal People in Canada in the area of housing related training. An in-depth analysis was undertaken of these eleven initiatives.

Prepared by Turtle Island Associates. CMHC Project Officer: Marcelle Marie Gareau. Ottawa: Canada Mortgage and Housing Corporation, 2004. 87 pages

Note: No. 04-033 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-ccdh/Research_Reports-Rapports_de_recherche/eng_unilingual/CHIC-Review%20Traning\(w\).pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccdh/Research_Reports-Rapports_de_recherche/eng_unilingual/CHIC-Review%20Traning(w).pdf)

ABORIGINAL HOUSING

SHARING THE STORY: EXPERIENCES IN FIRST NATIONS, INUIT AND NORTHERN COMMUNITIES COMPREHENSIVE COMMUNITY PLANNING

This document shares the stories of community planning in some First Nations, Inuit and northern communities in Canada. The communities have different backgrounds, circumstances and priorities. This results in a rich diversity of planning experiences from which much can be learned.

These stories focus on some of the most current and relevant challenges and opportunities facing First Nations, Inuit, and northern communities today. The planning topics and communities are discussed in the following theme areas:

- Community relocations and land base expansions;
- Northern communities;
- Rural and urban communities;
- First Nations Land Management Act (FNLMA) Communities; and
- Self-government Communities

Each planning theme area has a brief overview, followed by the community profiles. Every community profile is unique. These profiles are good examples of the different kinds of community planning approaches that other First Nations, Inuit and Northern communities may wish to learn from. This tool exists to help communities learn from each other while increasing their own sustainability and empowerment.

This project was supported by Indian and Northern Affairs Canada, Public Works and Government Services Canada and the Canada Mortgage and Housing Corporation.

Ottawa: Published under the authority of the Minister of Indian Affairs and Northern Development, 2004. 129 pages

Nota : Aussi disponible en français sous le titre : Anecdotes de réussite : Expériences des collectivités inuites, autochtones et nordiques en matière de planification communautaire globale

Note: No. 04-029 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Available on the Internet at: www.pwgsc.gc.ca/rps/inac. Print copies can be obtained from 1-800-567-9604 (TTY only 1-866-553-0554)

ACOUSTICS

CASE STUDY: RETROFIT ACOUSTIC TREATMENTS IN A HERITAGE APARTMENT BUILDING

Several units in a five-story 1927 apartment building in Ottawa were recently renovated. The original walls and ceilings were finished with lath and plaster and some walls were balloon framed, in which the vertical framing is continuous for several floors. The owner tested the

noise reduction of the floor between two apartments of identical floor plans, one above the other, and

ACOUSTICS

wanted to improve the sound isolation between the apartments. Test data on STC and IIC ratings for new materials and construction can be found in the National Building Code. However, little data is available on the sound transmission characteristics of earlier construction with lath and plaster. A retrofit project was undertaken with advice from an acoustic specialist and support by CMHC.

The acoustical effectiveness of several retrofit techniques for the floor/ceilings in the apartment were tested and documented on the basis of technical merit, cost, and airborne sound and impact isolation. Two retrofit strategies were undertaken; the first involving the removal of the existing lath and plaster ceiling and its replacement with drywall on resilient channel supports; the second involving the application of drywall on resilient channel supports over the lath and plaster ceiling, which had been perforated with holes to reduce the potential of acoustic coupling. The ceiling cavities were filled with sound insulation in all cases.

All retrofit treatments improved the acoustic isolation of the floor assembly. However, the most expensive strategy that involved removal of the existing ceiling improved the acoustic performance of the floor assembly less than the cheaper strategy. The reasons for the inferior performance of the more expensive repair are not identified in this study; however, it is believed that the balloon framing might have caused some sound leaks in the vicinity of the first retrofit strategy, which contributed to a decrease in the apparent sound performance of the floor.

Prepared by Hugh Williamson Associates Inc. Ottawa: Canada Mortgage and Housing Corporation, 2004. 19 pages

AVAILABILITY : Canadian Housing Information Centre and
[Ftp://ftp.cmhc-schl.gc.ca/chic-ccdhd/Research_Reports-Rapports_de_recherche/eng_unilingual/Retrofit\(W\).pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccdhd/Research_Reports-Rapports_de_recherche/eng_unilingual/Retrofit(W).pdf)

FLANKING TRANSMISSION IN MULTI-FAMILY DWELLINGS: PHASE II

This report contains the results and analysis from a 33-month research project to examine flanking transmission in wood framed construction that might be used in multifamily dwellings. The project focus and construction details were decided by a Steering Committee formed from technical representatives from each of the project partners: CMHC, Forintek Canada Corporation, Marriott International, National Research Council Canada, Owens Corning, Trus Joist, and USG Corporation.

The primary concern of the project was the effect of using continuous structural elements that pass under a partition wall between two horizontally separated dwellings. Continuous structural elements such as subfloor sheathing, and/or joists, are often used in buildings that must withstand increased dynamic loading due to high winds or seismic velocities. However, these details often occur in single family dwellings so many of the results and recommendations in this report are applicable to situations where improved sound insulation is desired between rooms in the same dwelling.

The method of small perturbations, or changes, to a common construction involving a continuous structural element was used to assess the effect of various construction details on the airborne and impact sound insulation.

Prepared by T.R.T. Nightingale, R.E. Halliwell, and J. D. Quirt. CMHC Project Officer: Luis de Miguel. Ottawa: Institute for Research in Construction, National Research Council Canada, 2002.

AVAILABILITY : On a loan basis from the Canadian Housing Information Centre

ACOUSTICS

QUALIFICATION DU DEGRÉ DE CONFORT ACOUSTIQUE PROCURÉ PAR LES IMMEUBLES MULTILOGEMENTS : PHASE II

In the study entitled "Qualification du degré de confort acoustique procuré par les immeubles multilogements – Phase I" submitted to CMHC on July 10, 1996, MJM Acoustical Consultants Inc. proposed a method of monitoring and evaluating the insulation of noise produced by human activity, plumbing and the mechanical equipment of multi-family buildings intended to be sold as condominiums. This Phase II report describes the validation process used for the criteria that were proposed during Phase I, based on studies undertaken by CMHC between 1980 and 1996, and suggests a protocol for assessing the degree of acoustic comfort in a unit located in a multi-unit residential building.

Prepared by Michel Morin and Jean-Marie Guérin, MJM Acoustical Consultants Inc. CMHC Project Officer: Jacques Rousseau. Ottawa: Canada Mortgage and Housing Corporation, 2002 (CMHC External Research Program Report) 63 pages

Note: No. 03-116 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre

BASEMENTS, FOUNDATIONS & CRAWLSPACES

COMPARISON OF UNDER-FLOOR INSULATION SYSTEMS: FINAL REPORT

The purpose of this study was to monitor and evaluate the thermal and economic performance of three under-floor insulation products over a heating season. Instrumentation was installed in four houses, three with under-floor insulation and one with no insulation beneath the slab. Data was gathered from February to June 2004. The temperature profiles through the floor for bubble pack and steel-skinned polyurethane insulations were compared to the performance for no insulation and 50 mm of XPS, which are materials with known properties. The effective RSI-values for in-situ performance for the three insulations were calculated from the monitored data. The material cost, in conjunction with the in-situ thermal resistance was used to compare the cost/benefit performance of the three insulation materials.

Prepared by Enermodal Engineering Limited. CMHC Project Officer: Darrel Smith. Ottawa: Canada Mortgage and Housing Corporation, 2004. 33 pages

Note: No. 04-127 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilingual/Under-Floor%20Insulation\(web\).pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilingual/Under-Floor%20Insulation(web).pdf)

BASEMENTS, FOUNDATIONS & CRAWLSPACES

DRY AND COMFORTABLE FLOORS IN EXISTING BASEMENTS: FINAL REPORT

A literature survey was carried out to identify options available for finishing basement floors in existing houses which are subject to minor, moderate or major types of moisture problems. The following six types of floor finishing options were identified: paints and coatings, cleanable and disposable coverings, conventional area coverings, built-up floor systems, non-insulated built-up floor systems and insulated drainage mats with a new sub-floor. The suitability of each of these floor finish options was assessed for the three classes of moisture problems.

Prepared by Gary Proskiw, Proskiw Engineering Ltd. And Bert Phillips, Unies Ltd. CMHC Project Officer: Don Fugler. Ottawa: Canada Mortgage and Housing Corporation, 2004. 42 pages

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilingual/RR%20Dry%20&%20Comfortable\(w\).pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilingual/RR%20Dry%20&%20Comfortable(w).pdf)

NEUTRALISATION DU POTENTIEL DE GONFLEMENT DES REMBLAIS DE FONDATION PAR DES INJECTIONS DE COULIS SPÉCIAUX : RAPPORT FINAL

Numerous cases of buckling were reported in the Saint Lawrence Lowlands: these cases are related to oxidation of sulphur (mainly pyrite) in the backfill aggregate or the underlying rock. Therefore, a method of stopping expansion of the backfill must be developed and validated. The Université de Sherbrooke's Rock Mechanics and Geology Engineering Laboratory (LMRGA) presented a research proposal to the Canada Mortgage and Housing Corporation (CMHC) to conduct a technical feasibility study of grouting foundation backfill. Tests aimed at stopping expansion were conducted in order to coat the aggregate, thus avoiding the sulphur oxidation responsible for expansion following the oxidation/neutralization process.

The method was first tested using CBR (California Bearing Ratio) moulds containing reactive aggregate. A larger cube was then used to simulate foundation walls. The aggregate studied is an expansive pyritic shale. Various pozzolanic-blastfurnace cement-based formulations with additives (Eucon37 superplasticizer and Euco-NivoL anti-bleeding agent from Euclid Admixture Canada) were necessary in order to identify the appropriate procedure for an acceptable injection.

Successful injection is closely linked to the permeability of the backfill, which in turn depends on granulometric distribution and degree of compaction. As the height of the CBR mould is fairly similar to that of a basement backfill, the proposed injection method could be applied to basements affected by expansion problems. On the other hand, injection can prove difficult in garage backfill that is approximately 1m thick.

Prepared by Achour Bellaloui, Gérard Ballivy, Patrice Rivard. CMHC Project Officer: Jacqueline I Meunier-Bureau. Ottawa: Canada Mortgage and Housing Corporation, 2003.

AVAILABILITY : Canadian Housing Information Centre and
ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/fr_unilingue/RR-neutralisation%20FR.pdf

BASEMENTS, FOUNDATIONS & CRAWLSPACES

PRACTICAL MEASURES FOR THE PREVENTION OF BASEMENT FLOODING DUE TO MUNICIPAL SEWER SURCHARGE: FINAL REPORT

Municipal sewers can be filled to capacity with rain water during large storm events. When sewers are surcharged, they can back up into basement drains and cause flooding inside houses, with significant costs and potential health effects. This report describes the mechanisms of basement flooding during these events and describes ways to prevent these occurrences. The report starts with a review of recent basement flooding literature. The research included a survey of 24 Canadian municipalities, and the report lists the types of sewer systems in these cities, the frequency of flooding events, what they are doing to minimize flooding, and the details of flood prevention programs. Several municipalities have information on flood prevention on their web sites, and this material is referenced. This report concludes with recommendations, both for governments and homeowners, on how to avoid basement flooding due to sewer surcharge and why this should be a priority.

Prepared by Ted Kesik and Kathryn Seymour. CMHC Project Officer: Don Fugler. Ottawa: Canada Mortgage and Housing Corporation, 2003. (External Research Program Research Report) 95 pages

Note: No. 04-104 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilin_gual/RR_Practical_measures_\(w\).pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilin_gual/RR_Practical_measures_(w).pdf)

PRESERVED WOOD FOUNDATION WALL CAVITY ARSENIC AND MOLD STUDY

A field study was conducted to investigate the airborne concentrations of arsenic and total fungi in the finished exterior basement wall cavities in a group of ten houses constructed with pressure treated wood foundations (PWFs). The houses ranged in age from 18 to 26 years old and were located in various locations throughout the province of Saskatchewan, Canada.

Air samples were collected by drawing air from three or four different locations in the lower portions of the finished (insulated and sheeted) exterior wall cavities in each house. The air samples were analyzed for temperature, relative humidity, airborne arsenic concentration and total fungi concentration and fungi type. Physical observations of the general condition of the exterior and interior of the foundation walls were also collected.

The results from the study indicated that the airborne arsenic levels in the exterior wall cavities were very low. All of the measured arsenic concentrations were at or below 0.00039 ug/L. The airborne total fungi concentrations and fungi types were highly variable but frequently indicated the presence of fungal contaminant sources. The visual condition of the exterior and interior foundation walls was not a reliable predictor of the wall cavity airborne fungi characteristics.

Prepared by Figley Consulting Associates Ltd. CMHC Project Officer: Virginia Salares. Ottawa: Canada Mortgage and Housing Corporation, 2004 (External Research Program Research Report). 16 pages

AVAILABILITY : Canadian Housing Information Centre and
ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilingual/PDF_web_preservedwood.pdf

BASEMENTS, FOUNDATIONS & CRAWLSPACES

RENDEMENT DU POLYURÉTHANE GICLÉ SUR LES MURS DE FONDATION: RAPPORT FINAL

In addition to being a more costly insulation method, should there be any doubt about the long-term performance of sprayed polyurethane on interior walls?

In order to shed light on this issue, this research consisted in evaluating the performance of polyurethane from the standpoint of its effectiveness and bond durability on different types of foundation walls (poured concrete, concrete blocks or rubble) and providing an opinion on the quality of its cellular structure after five years or more of installation.

The results are conclusive: sprayed polyurethane behaves very well in the medium and long terms from the standpoint of its adhesion to the foundation and adjacent materials, the conservation of its cellular properties and its homogeneity.

Prepared by Jean-Claude Faucher, Consul-Tech JCF, Service-conseil technique en habitation. CMHC Project Officer: Don Fuger. Ottawa: Canada Mortgage and Housing Corporation, 2004. 48 pages

Note: No. 04-118 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site

AVAILABILITY : Canadian Housing Information Centre and
ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/fr_unilingue/dc20079296%20finalweb.pdf

BUILDING MATERIALS

INCOMPATIBLE BUILDING MATERIALS: A REPORT DOCUMENTING PREMATURE FAILURE IN RESIDENTIAL CONSTRUCTION RESULTING FROM MATERIAL INCOMPATIBILITY

The purpose of this project was to research and document building material incompatibility problems found in low-rise residential construction. Building material incompatibility situations were identified through a literature search as well as a survey of the home building industry. The research report includes 35 cases of incompatibility problems, citing generic examples of incompatible materials. Solutions for the problems were solicited from expert sources (e.g. manufacturers). This information is useful for builders and renovators to help them identify in advance potential incompatibility problems and solutions.

Prepared by: J.F. Burrows Consulting. CMHC Project Officer: Darrel Smith. Ottawa: Canada Mortgage and Housing Corporation, 2003. (Housing Technology Series) 49 pages.

Nota : Aussi disponible en français sous le titre : Matériaux de construction incompatibles

Note: No. 03-103 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : The research highlight and report are available in hard copy from CMHC Information Products (Order number: 63263) as well as on CMHC's web site at <http://www.cmhc.ca/publications/en/rh-pr/tech/03-103-e.html>.

BUILDING MATERIALS

STATIC AND DYNAMIC EARTHQUAKE TESTING OF RAINSCREEN STUCCO SYSTEMS FOR BRITISH COLUMBIA RESIDENTIAL WOOD FRAME CONSTRUCTION

Without substantial improvements to the earthquake preparedness of British Columbia's housing infrastructure, the consequences of a large earthquake could be devastating. Non-structural building components, such as stucco cladding and drywall, can have a major influence on earthquake performance. This research evaluated the earthquake performance of rainscreen stucco cladding (i.e. air cavity behind it) vs. non-rainscreen. Both systems were shown to have the potential to eliminate major structural earthquake damage in residential wood-frame buildings (single family and multi-unit construction). However, refinements to current stucco construction practice will make a major contribution to capitalizing on this mitigation potential. In particular, the use of 50-mm (2 in.) staples as lath fasteners should replace the current practice of nails, and plywood strapping secured with roofing nails should be used in rainscreen stucco construction. This CD-ROM includes the revised 2003 research report, the research highlights, the 9 appendices, and a video of the seismic tests.

Study undertaken by the University of British Columbia, Dept. of Civil Engineering under contract to Canada Mortgage and Housing Corporation (CMHC). Principal investigators: Helmut G.L. Prion, Carlos E. Ventura, M. Kharrazi, and Graham B. Taylor. Funded by CMHC, the Homeowner Protection Office, and the British Columbia Housing Management Commission. CMHC Project Officer: Silvio Plescia. Ottawa: CMHC, 2004. 1 CD-ROM

Note: No. 03-127 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre

CHILDREN'S ENVIRONMENTS

HOUSING QUALITY AND CHILDREN'S SOCIOEMOTIONAL HEALTH

This External Research Project (ERP) examined whether housing form and quality are related to the socio-emotional health of children. It used standardized measures of housing quality and mental health, two major housing forms (single family and low-rise cluster), and considered the role of various potentially moderating influences, including socioeconomic status and indoor population density to answer the basic question: "How, if at all, does housing form and quality affect the socio-emotional health of urban Canadian children?" The findings of the study assert the presence of a link between housing quality and children's socio-emotional health. Child behaviour problems, as assessed by parents, occurred when the physical condition of the residence's interior and exterior, and the neighbourhood, as assessed by both teachers and parents, was worse. These relations remained after controlling for household income, parent's education, parent's mental health status, child's gender, and time lived in the residence, and the relations were not significantly moderated by any of these factors.

Prepared by Robert Gifford for Optimal Environments Inc. CMHC Project Officer: Fanis Grammenos.
Ottawa: Canada Mortgage and Housing Corporation, 2003 (CMHC External Program Research Report)
76 pages

CHILDREN S ENVIRONMENTS

Note: No. 03-021 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre and
ftp://ftp.cmhc-schl.gc.ca/chic-ccd/h/Research_Reports-Rapports_de_recherche/eng_unilingual/chilrensociohealth.pdf

CITY PLANNING AND HUMAN SETTLEMENTS

QUALITÉ D'UN LIEU ET QUALITÉ DE VIE : UNE ANALYSE DES QUARTIERS CENTRAUX DE MONTRÉAL

This research project deals with quality of life and quality of location in the central districts of Montréal. This study is based on the concept of quality of location and also on the concepts of sustainability, well-being and quality of life.

The first part of the report presents a principal component analysis of the quality of a location, using the census data by census sector for the overall new city of Montréal. This data includes socio-demographic variables, socio-economic variables, labour market variables, variables related to the means of transportation to the workplace, linguistic variables, a migration variable, and different housing descriptors concerning the age, maintenance, type, value and cost of dwellings, as well as household size. There were three principal component analyses: the first was done using the population data, the second was focused on the housing data, and the third combined both the population and housing variables. The principal component analysis combining both the population and housing data revealed the main dimensions according to which the residential space is organized in Montréal.

The second part deals with the analysis of the survey data on quality of life and quality of location perceived by the residents of three Montréal districts. The selected sampling territories were the following three boroughs:

- The first was the Plateau Mont-Royal borough, which is almost entirely dominated by the family status composed mainly of single people living alone and by travel on foot or bicycle.
- Then, there was the Côte-des-Neiges borough, which stands out on account of the ethnicity factor.
- Lastly, the third sampling territory was the Hochelaga-Maisonneuve borough, which constitutes a homogeneous space compared to the first two boroughs.

An analysis of the survey data revealed some interesting results depending on the districts, on the one hand, and with regard to subjective quality of life, on the other.

Prepared by André Langlois and Claude Marois. Ottawa: Canada Mortgage and Housing Corporation, 2003. (External Research Program Research Report) 153 pages

STATUS : New Completed Report

AVAILABILITY : Canadian Housing Information Centre

CONCRETE

ARCHITECTURAL PRECAST CONCRETE WALLS: BEST PRACTICE GUIDE

This guide and accompanying CD-ROM is a fully illustrated summary of current information on architectural precast concrete and provides designers with an understanding of the product, recommended design details and site practices. The guide discusses the types of panels, their manufacture, transport and installation and basic design considerations. The user is then presented with the fundamentals of building envelope performance, as it pertains to precast panels, through to best practice assemblies, details and specifications.

Prepared by Morrison Hershfield Ltd. A joint venture of Canada Mortgage and Housing Corporation and Public Works Government Services Canada in collaboration with the Canadian Precast/Prestressed Concrete Institute. CMHC Project Officer: Luis de Miguel. Ottawa: Canada Mortgage and Housing Corporation, c2002. 115 pages + CD-ROM

Order number: 62984 **Price: \$89.00 + GST and handling charges

Nota : Aussi disponible en français sous le titre : Murs en béton architectural préfabriqué : Guide des règles de l'art

AVAILABILITY : CMHC Information Products

CONSUMER PROTECTION

RE-SALE OF LEAKY CONDOS: DID THE BUYER KNOW?

This study investigates the transparency of transactions of re-sale condos in the coastal climate area of BC. The motivation for the study was concern that the impact of BC's leaky condo phenomenon is exacerbated by the sale of affected units to subsequent buyers without full disclosure. There are standard clauses which are recommended for use in real estate contracts that mandate the use of investigative tools that are designed to reveal the true nature of the property being purchased. Despite the existence of these tools, there are many cases where the process failed. It is not known if the investigative tools are adequate to discover problems that may exist in the re-sale condo, if real estate agents are consistently employing recommended clauses in the Contract that would require the investigations to be employed, or if the buyer understands the information they receive.

The premise of this study was that by examining cases where the process failed, it may be possible to understand how it happens. Forty cases in the coastal climate area were reviewed.

The results of the study showed that during the time period of the cases studied (1996-2002), use of the recommended clauses had increased over time. Contracts of Purchase and Sale for transactions that occurred since 1999 more consistently used the investigative tools. However, there continues to be ambivalence – from buyers and their buyer agent - to the value of professional property inspections. Since 1999, a professional property inspection was only employed in 50% of the transactions studied.

The conclusion is that the investigative tools are flawed in various ways, the Contract of Purchase and Sale may still fail to request all the documentation and there is little assistance for the buyer in understanding and analyzing the information they receive.

CONSUMER PROTECTION

Prepared by Nancy Bain. CMHC Project Officer: Darrel Smith. Ottawa: Canada Mortgage and Housing Corporation, 2003. (CMHC External Research Program Report) 58 pages

Note: No. 03-108 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre and
ftp://ftp.cmhc-schl.gc.ca/chic-ccdh/Research_Reports-Rapports_de_recherche/eng_unilin_gual/RR_Leaky_Condos_EN.pdf

CONTAMINATED LANDS

AN INTRODUCTION TO ENVIRONMENTAL SITE ASSESSMENTS. REVISED EDITION

As many as 20,000 underground storage tanks across Canada are thought to be leaking, and this is just a part of the growing problem of contaminated sites. This primer describes the nature and extent of contaminated sites, and explains in non-technical language the structured three-phase process of conducting an environmental site assessment (ESA). Anyone involved in real estate dealings will find this publication useful, as more and more organizations are requiring ESAs as a condition of transaction.

Ottawa: Canada Mortgage and Housing Corporation, 2003. 26 pages

Nota : Aussi disponible en français sous le titre : Introduction à l'évaluation environnementale des sites

AVAILABILITY : CMHC Information Products (Order number 62102) and the CMHC web site

REPORT ON RESEARCH PROJECT ON SAFE HOUSING FOR LIGHTLY CONTAMINATED LANDS: FINAL DRAFT REPORT, WELLS, BC

The objective of this project was to determine the predictive accuracy of site-specific risk assessments that have been carried out for residential sites prior to remediation. CMHC was specifically interested in reassessing indoor pollutant levels in residential housing units, following remediation. Suitable sites for this project were required to:

- i) have a known degree of soil contamination;
- ii) be located in Canada;
- iii) have been cleaned up to a prescriptive standard or preferably to a level established by a risk assessment; and
- iv) be either in the planning stage, the construction stage, or new (less than one year old).

Based on the above criteria, Wells, BC was selected as a suitable site as it met most of the study criteria.

Gold mining and ore processing had been carried out near Wells for over 50 years. Trailings high in arsenic had been used as fill within the residential community. An investigation and

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clean-up was undertaken and completed by the BC Ministries of Health and Environment in 1993. The clean-up criterion for arsenic in soil was set at 150 µg/g. Following remediation, Golder (1993) was retained to conduct a quantitative risk assessment for risks posed by arsenic in various media to residents of Wells. The primary purpose of conducting the risk assessment was to determine whether the risk levels to residents exposed to town soils containing arsenic concentrations between 30 and 150 mg/g was acceptable (Golder 1993). Based on all of the exposure pathways considered in risk assessment, the conclusion was that the non-cancer and cancer risk to residents of Wells was negligible and that the pathways driving risk were fugitive dust inhalation and lake-side tailings ingestion.

Considering the above, the purpose of the CMHC/Golder (1999) study was to show whether houses adjacent to the highest concentrations of tailings, particularly new houses, were adequately protected by the clean-up criteria set by the BC government study. The objectives of the current investigation were to: i) compare current concentrations of arsenic in soil and dust to those concentrations used in the original risk assessment and ii) reassess the relative importance of soil and dust exposure pathways (e.g., inhalation of household dust) compared to the findings of the original risk assessment.

A total of 22 houses were identified as being suitable candidates for this study and residents of 15 of those houses agreed to participate in the study. Where possible, the current investigation replicated the methods used in obtaining the soil and dust data in the original risk assessment (Golder 1993). Results from three of the fifteen houses were somewhat suspect as major home or yard renovations were in progress. As well, two of the residents ran hospitality-based businesses in their houses, somewhat distorting the residential nature of the study.

The difference between the concentrations of arsenic in yard soil and house dust reported in the current investigation and in the 1993 risk assessment were evaluated using the confidence limit for the difference of means test. The results indicated that concentrations of arsenic in soil were not statistically different from those collected in 1993. However, the dust samples showed roughly twice the arsenic concentrations of the 1993 study and the difference of means tests indicated that mean concentrations of arsenic in dust were significantly different. When the carcinogenic risks were recalculated using the new concentration of house dust, the health risk estimates still fell within acceptable risk levels set by the Province of BC.

Based on the results, potential health risks to residents of Wells were considered acceptable even though concentrations of arsenic in house dust were approximately two times higher in the current investigation than concentrations in the previous risk assessment. Overall, the current investigation confirmed the predictions of the original risk assessment conducted by Golder (1993), which was that the soil clean up level of 150 µg/g arsenic was adequate for the protection of residents in Wells.

Prepared by Golder Associates. CMHC Project Officer: Don Fugler. Ottawa: Canada Mortgage and Housing Corporation, 2003. 51 pages

AVAILABILITY : Canadian Housing Information Centre

CONTAMINATED LANDS

REPORT ON SAFE HOUSING FOR LIGHTLY CONTAMINATED LANDS RESEARCH PROJECT: PACIFIC PLACE STUDY RESULTS

The objective of this project was to evaluate the predictive accuracy of site-specific risk assessments for lightly contaminated lands redeveloped for residential land use through post-remediation and development monitoring. This study presents the results of the research program conducted at an apartment located at the Pacific Place site (Parcel 2), located along the False Creek waterfront, in Vancouver, BC.

Pacific Place, the former site of EXPO '86, is an 82 hectare parcel of waterfront land that has been primarily developed for housing use. The study apartment is located in the immediate area of a former oil-gasification plant with tar contamination. The below-grade component of the structure consists of three stories of parking with apartments above-grade. Contaminants of concern include polycyclic aromatic hydrocarbons (PAH), benzene, toluene, ethylbenzene and xylene (BTEX) and metals. The remediation for this building lot involved the removal of highly contaminated soil to approximately 5 to 6 m depth; however, tar contamination had migrated deeper making complete remediation below the proposed building difficult and uneconomical. Engineering control measures implemented included installation of a clay liner below a portion of the foundation and sealing of building walls.

The risk assessment for this site concluded there would be no significant soil gas migration and intrusion, and that human exposure from these contamination sources would be negligible. To confirm the risk assessment findings, a monitoring program, consisting of measurement of VOC concentrations in soil gas, building sump water, and parkade (indoor) air, and a tracer test to measure soil gas intrusion were conducted.

The testing program indicated low to non-detect concentrations in sump water. The VOC concentrations in parkade air and soil gas were similar and on the same order as published background levels for residential dwellings. The fact that the parkade and soil gas concentrations were similar suggests that soil gases would not be a significant contributor to parkade and hence residential concentrations. An innovative helium tracer test was subsequently used to estimate soil gas intrusion into the parkade. The test involved injection of helium below the ground floor slab at several injection points, followed by monitoring of helium levels in the parkade. The calculated soil gas entry rate based on the tracer test was about 0.2 m³/hr., or about 10 times lower than a theoretical rate of 2.5 m³/hr. determined from a calculation procedure developed for CMHC.

In summary, there is a small, but measurable, influx of soil gases into the parkade caused by parkade ventilation and depressurization. The contribution of soil gas VOC to the parkade concentrations is low because of the amount of dilution air infiltrated into the parkade or induced by parkade exhaust fans. As well, contaminant concentrations in the soil gases were very low in the samples taken. The findings of this study are consistent with the original risk assessment and confirm that exposure to contaminated soil gases is not a significant exposure pathway for residents.

Prepared by Golder Associates. CMHC Project Officer: Don Fugler. Ottawa: Canada Mortgage and Housing Corporation, 2003. 55 pages

AVAILABILITY : Canadian Housing Information Centre

COOPERATIVE AND NON-PROFIT HOUSING

CAPITAL REPLACEMENT PLANNING MANUAL FOR CO-OPERATIVE AND NON-PROFIT HOUSING PROVIDERS = MANUEL DE PLANIFICATION DU REMPLACEMENT D'IMMOBILISATIONS : ÉDITION À L'INTENTION DES ORGANISMES DE LOGEMENTS COOPÉRATIFS ET SANS BUT LUCRATIF

Co-operative and non-profit housing providers need capital reserve funds to be ready to pay for major replacements and repairs as their buildings age. This manual shows you how to develop a step-by-step capital replacement plan (CRP). It will help you to budget and pay for major replacements without large rent increases or emergency funding. You can use a spreadsheet program to produce your CRP, or obtain our free companion software, Capital Replacement Planning Software. Written for non-technical or non-financial housing corporation administrators, the manual also includes very detailed life expectancy guidelines for all housing components.

Produced by the Canadian Housing and Renewal Association in collaboration with the Co-operative Housing Federation of Canada and the Ontario Non-Profit Housing Association. Ottawa: Canada Mortgage and Housing Corporation, 2003. 132 pages Bilingual

AVAILABILITY : Available in full text on CMHC web site + from CMHC Information Products (Order number 63171)

CAPITAL REPLACEMENT PLANNING SOFTWARE - WINDOWS 95/98 = APPLICATION DE PLANIFICATION DU REMPLACEMENT D'IMMOBILISATIONS - WINDOWS 95/98

The interactive Capital Replacement Planning Software (CRPS) makes it easy for you to develop your CRP. You can enter and edit data, calculate annual reserve requirements, run “what-if” scenarios, and print professional quality reports for Board approval. This CD is the companion to the Capital Replacement Planning Manual (Windows 95/98 version).

Ottawa: Canada Mortgage and Housing Corporation, 2003. 1 CD-ROM Bilingual

AVAILABILITY : CMHC Information Products (Order number 63202)

CAPITAL REPLACEMENT PLANNING SOFTWARE - XP VERSION = APPLICATION DU PLANIFICATION DU REMPLACEMENT D'IMMOBILISATIONS - - XP VERSION

The interactive Capital Replacement Planning Software (CRPS) makes it easy for you to develop your CRP. You can enter and edit data, calculate annual reserve requirements, run “what-if” scenarios, and print professional quality reports for Board approval. This CD is the companion to the Capital Replacement Planning Manual (Windows XP version).

Ottawa: Canada Mortgage and Housing Corporation, 2003. 1 CD-ROM Bilingual

AVAILABILITY : CMHC Information Products (Order number 63203)

COOPERATIVE AND NON-PROFIT HOUSING

CONVERTING ALEXANDRA PARK INTO THE ATKINSON CO-OPERATIVE: AN EVALUATION OF THE PROCESS

In 1990 residents of Alexandra Park, a public housing development located in downtown Toronto, began to explore tenant self-management. By 1993, with assistance from representatives from the co-op sector, and later more formally, the Co-operative Housing Federation of Toronto (CHFT) in 1995, residents started to take steps towards converting to a self-managing non-profit residential co-operative. More than 10 years later, in 2002, residents are much closer to their goal of becoming a co-operative. Agreements are still being negotiated between the Atkinson Co-operative (the new co-operative established to manage Alexandra Park) and the Toronto Community Housing Corporation that now controls the public housing development.

This study documents and evaluates the conversion process at Alexandra Park and identifies lessons that can be learned from this experience. The study used a variety of research methods including participant observation, a literature review, a review of all relevant documentation pertaining to the conversion, key informant interviews and focus groups with residents.

Prepared by Linda Lapointe, Lapointe Consulting Inc. in association with Jorge Sousa. CMHC Project Officer: Vern Barkwell. Ottawa: Canada Mortgage and Housing Corporation, 2002 (CMHC External Research Program Report) 116 pages

AVAILABILITY : Canadian Housing Information Centre and
ftp://ftp.cmhc-schl.gc.ca/chic-ccdh/Research_Reports-Rapports_de_recherche/eng_unilingual/RR_Alexandra_Park.pdf

CO-OPERATIVE HOUSING PROGRAMS EVALUATION = ÉVALUATION DES PROGRAMMES DES COOPÉRATIVES D'HABITATION

This evaluation investigated the housing and other benefits provided through the federal co-operative housing programs. The purpose was to determine whether co-operative housing programs have provided adequate, affordable, democratically controlled and member operated housing for low- and moderate-income households and whether there are other benefits of co-operative housing. Although federal funding for new co-operative housing projects was terminated in 1993, loan and subsidy assistance on existing co-operative housing has continued since 1993 for 1,976 projects containing 65,273 housing units. The current evaluation included this total stock of co-operative housing assisted through four federal programs since 1973 which continue to receive housing subsidies amounting to roughly \$200 million annually.

This evaluation used a comparative methodology to assess differences between co-operative housing and other tenures (including non-profit and private rental and condominium ownership), and to compare the co-operative housing funded under the four federal housing programs. Multiple sources of data were used where possible to provide relevant indicators.

The evaluation concluded that:

- Overall, the 1,976 co-operative housing projects with 65,273 housing units financed under federal programs since 1973 are providing adequate, affordable housing for low- and moderate-income households and residents' involvement in their housing has generated additional benefits such as improved security of tenure and quality of life.

COOPERATIVE AND NON-PROFIT HOUSING

- The government expenditures are enabling households that would otherwise not be able to afford alternatives to rental housing to achieve benefits not available in rental housing such as greater security of tenure and resident control of their housing.
- The main challenges for the future are in areas such as ensuring efficient utilization of the co-operative stock, ensuring the affordability of the housing provided, addressing repair needs to maintain conditions and resolving financial difficulties that some co-operatives experience.

Prepared by Audit and Evaluation Services, Canada Mortgage and Housing Corporation. Ottawa: CMHC, 2003. 1 CD-ROM Bilingual

AVAILABILITY : Canadian Housing Information Centre

RISK MANAGEMENT FOR FEDERAL CO-OPERATIVE HOUSING PROGRAMS: A MODEL FOR THE ADMINISTERING AGENCY: FINAL REPORT

This study was prepared by the Co-operative Housing Federation of Canada for CMHC in connection with the cooperative housing sector's proposal for the creation of a new agency to administer cooperative housing. It identifies the risks associated with the cooperative housing portfolio and the relative importance of these risks. It also outlines absolute and relative performance indicators to assess and identify risks and outlines a monitoring model based on these indicators. Finally, the study outlines a strategy for intervention by the prospective agency to address the identified risks.

Ottawa: Co-operative Housing Federation of Canada, 2002. 44 pages plus appendices

AVAILABILITY : Available on loan from: Canadian Housing Information Centre

DOORS AND WINDOWS

WATER PENETRATION RESISTANCE OF WINDOWS: STUDY OF CODES, STANDARDS, TESTING, AND CERTIFICATION

Recent CMHC surveys including "The Survey of Building Envelope Failures in the Coastal Climate of British Columbia" and "Wall Moisture Problems in Alberta Dwellings" revealed that exterior moisture penetration through and/or around windows (at window wall interfaces) is a significant contributor to the envelope moisture problem. The objective of this research project, funded by Canada Mortgage and Housing Corporation in partnership with the Homeowner Protection Office and the British Columbia Housing Management Commission, was to conduct a detailed review of the Canadian Window Standard CSA A440, together with all its attachments, to review the test requirements related to moisture penetration as outlined in the standards, and to review, assess and evaluate the window certification programs and processes. This research project identified recommended solutions and opportunities for alleviating these moisture problems into the wall assembly from the window/wall interface. This study complements a companion study "Leakproofing Windows, Phase I - Fabrication, Installation and Maintenance" in which the primary window leakage paths and causal factors are identified from insitu window-wall performance records. The CSA A440 Window Standards Committee is

considering the adoption of and harmonizing with the North American Fenestration Standards (NAFS). This project also

DOORS AND WINDOWS

attempts to consolidate the potential impact that NAFS may have on the performance of windows if adopted by the window standards committee. This research project has been completed and the Research Highlight Technical Series 03-125 “Water Penetration Resistance of Windows - Study of Codes, Standards, Testing, and Certification” has been published.

AVAILABILITY : CMHC Information Products and CMHC web site

WATER PENETRATION RESISTANCE OF WINDOWS: STUDY OF MANUFACTURING, BUILDING DESIGN, INSTALLATION AND MAINTENANCE FACTORS

The purpose of this study was to determine the primary leakage paths and causes of water penetration associated with windows and the window to wall interface. Accomplishment of this goal facilitated development of recommendations for various industry sectors in addressing water penetration issues. The study does not address other performance issues associated with windows such as condensation control, air tightness and structural adequacy.

A companion project to the current study addresses water penetration issues associated with windows in the context of codes, standards and certification processes. The results of that study are reported on separately in a report titled Water Penetration Resistance of Windows – Codes, Standards, Testing and Certification.

Windows were grouped into generic types based on base frame material and rain penetration control strategy so that a smaller number of window categories could be considered. Six primary leakage paths through or around windows were established. A comprehensive list of causal factors that may contribute to the various leakage paths was developed.

With this background established as context for the evaluation of windows and the window to wall interface, the assessment proceeded with input from various industry sectors; manufacturing, testing and certification, building & interface design and field review, installation, and maintenance and renewals. The evaluation began with the assessment of the likelihood of particular leakage paths occurring for each window type, and the level of consequential damage that may occur for each leakage path and window type. Each window type was also assessed for the likelihood that particular causal factors contribute to a leakage path. Finally, the potential impact that industry sectors can have in addressing the causal factors was assessed.

The results of the study indicate that the dominant leakage paths of concern are those associated with the window to wall interface, both through the window assembly to the adjacent wall assembly and through the window to wall interface with the adjacent wall assembly. Consistent with this finding, it was noted that the A440 B rating performance criteria for water penetration control does not identify leakage associated with these leakage paths, nor is there a requirement for testing of the installed window assembly. A wide range of causal factors were found to contribute to leakage activity.

A key study finding was the fact that the selection of windows and the design of the window to wall interface failed to consider localized exposure conditions such as overhang protection provided by building features, or the local topography. The Manufacturing sector and Building &

Interface Design and Field Review sectors have the most significant opportunities to impact positively on the performance of windows and the window to wall interface.

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The key recommendations include the assessment of micro exposure conditions in the specification and selection of windows, as well as in the design of the window to wall interface. In general, all sectors need to have a greater focus on the installed window and associated details. One of the key components of this focus is the provision of some redundancy in water penetration control through the installation sub-sill drainage. A water penetration testing protocol needs to be developed and mandated for the installed window assembly.

Prepared by RDH Building Engineering Limited. Principal investigator: David R. Ricketts. Sponsors: Canada Mortgage and Housing Corporation, Homeowner Protection Office, Vancouver, B.C., and British Columbia Housing Management Commission. CMHC Project Officer: Silvio Plescia. Ottawa: CMHC, 2003. 1 CD-ROM

AVAILABILITY : Canadian Housing Information Centre

ENERGY CONSERVATION

CASE STUDIES OF MAJOR HOME ENERGY RETROFITS: FINAL REPORT

To meet targets for greenhouse gas production in Canada, the residential sector will have to significantly reduce energy consumption in existing houses. A 1995 CMHC report suggested that houses built prior to 1989 will have to reduce energy consumption on average by about 40%. This is a big reduction, one that is rarely realized in programs funded by government or the utilities. The object of this CMHC PERD (Program for Energy Research and Development) research, is to see whether relatively normal houses can have their total energy usage reduced by 40%. Saskatchewan Research Council were hired to determine this. Five houses were selected and the energy retrofits were completed by December 2001. Monitoring through 2002 established that the 40% goal could be achieved, but by only one of the five houses. The other four houses had energy reductions of 24 to 31%. The report discusses which retrofits were particularly successful and why most houses failed to meet the 40% goal. The rate of return on the retrofit costs borne by the homeowners was about 9%.

Prepared by Robert S. Dumont, Tom J.L. MacDermott, Jerry T. Makohon, Larry S. Snodgrass, Building Performance Section, Manufacturing/Value-Added Processing, Saskatchewan Research Council. CMHC Project Officer: Don Fugler. Ottawa: Canada Mortgage and Housing Corporation, 2003.

Note: No. 03-115 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre

COMPARISON OF MODELED AND MONITORED PERFORMANCE OF A WALL INSULATION RETROFIT IN A SOLID MASONRY BUILDING

In 1997, CMHC was involved in the renovation of a building with solid masonry walls. Part of the renovation involved the addition of insulation to the interior of the solid masonry walls. This retrofit technique is contentious within the construction industry as it is thought to cause wall durability problems due to freeze thaw cycles, interstitial condensation and thermally induced stresses. Monitoring of the project shows that the wall systems are thus far performing well.

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CMHC engaged a consultant to use a hygrothermal modelling tool to assess the degree to which the tool can track the wall performance monitoring conducted to date and to assess the long-term performance of the retrofitted wall system. The project found that modelling tools can be set up to provide comparable output results of the conditions actually monitored in the wall assemblies. However, the success of such an effort is highly dependent upon the knowledge of the modeller, the availability of information on material properties and knowledge of the working boundary conditions. The research concluded that once the modelling is reconciled with the monitoring data, the model can then be used to evaluate the impact of variables such as the use of different systems, climate, geographical location, etc. on the performance of the retrofitted wall assembly. The project also made several recommendations with respect to monitoring and modelling procedures that should be used to improve the overall quality of the evaluation.

Prepared by John Straube and Chris Schumacher. CMHC Project Officer: Duncan Hill. Ottawa: Canada Mortgage and Housing Corporation, 2003. 52 pages

Note: No. 03-111 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre and
ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilin_gual/final.pdf

ENERGY AND WATER EFFICIENCY IN MULTI-UNIT RESIDENTIAL BUILDINGS: A USER GUIDE AND TECHNICAL MANUAL FOR PROPERTY MANAGERS AND OWNERS

Implementing energy and water efficiency is a crucial consideration for today's property managers and building owners. Energy and water costs in multi-residential buildings can account for anywhere from 25% to 50% of total operating costs. While amendments to building codes and standards over the past 20 years have improved energy and water performance in newer buildings, over 50% of housing was constructed prior to 1980. Few of those have been upgraded to today's standards of energy efficiency. Improving energy and water efficiency can decrease operating costs, reduce maintenance fees, lower tenant turnover rates, increase the asset value of property, and extend the life of the building.

CMHC, in partnership with the Ontario Ministry of Municipal Affairs and Housing (OMMAH), has developed a manual that details energy and water efficiency measures for existing multi-unit residential buildings. The document is based on a manual originally developed by the Ontario Ministry of Housing in the early 1980's. The new manual offers proven, current energy efficiency measures for the building envelope, mechanical, electrical, and domestic hot water heating systems.

Both the User Guide and Technical Manual are designed to assist property managers in implementing an energy and water conservation program in mid- and high-rise residential

buildings. They can be used to help organize activities, develop detailed energy and water conservation plans, and provide an understanding of which energy and water efficiency measures are best.

The User Guide provides advice on how to manage activities, from conducting an energy/water preliminary assessment, determining appropriate conservation measures, estimating payback and the development of an energy/water plan.

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The Technical Manual outlines in detail more than 60 energy and water conservation measures for multi-unit buildings. Each provides basic details on assessing the viability of measures in relation to the specific requirements of buildings, as well as recommendations on integrating measures into ongoing maintenance, repair and/or renovation/retrofit work. Each measure can be used in isolation, in selected groupings, or integrated into any maintenance, repair and/or renovation/retrofit work on the building.

Note: Individual energy and water efficiency measures have been placed on the CMHC high-rise website as the energy and water efficiency "Tip of the Week". The manual will form a part of the reference material for a series of energy management seminars being organized by the Ontario Non-Profit Housing Association.

Prepared by The Cedaridge Group Ltd., Engineering Interface Ltd., REIC Ltd., and Chalifour Marcotte & Associés. Ottawa: Canada Mortgage and Housing Corporation, 2002, c2004. 207 pages

Order number 63074 Price: \$24.95 + GST and handling charges

Nota : Aussi disponible en français sous le titre : Conservation de l'eau et de l'énergie dans les immeubles résidentiels : guide de l'utilisateur et manuel technique à l'intention des propriétaires et des gestionnaires d'immeubles

AVAILABILITY : CMHC Information Products

FINANCIAL MEASURES TO REDUCE GREEN HOUSE GASES IN THE HOUSING SECTOR THROUGH ENERGY EFFICIENCY: A SURVEY

The specific objectives of this project were to:

- Identify and describe a long list of existing financial incentives for homeowner energy efficiency improvements in Canada and the United States through a literature review and interviews with key informants;
- Develop seven case studies of the most promising financial incentive programs in order to obtain information on key design and critical success factors through additional key informant interviews;
- Establish a background context of information for use in the potential development of financial incentives for improving residential energy efficiency in Canada.

This final report is structured as follows:

- Section 1 contains market and GHG emission related information for the residential sector and describes the public policy rationale for increasing public investments in residential energy efficiency.
- Section 2 contains a review of GHG emissions from residential housing and related transportation emissions as well as relevant Canadian policy developments.
- Section 3 reviews and defines different types of financial instruments with examples and information on the overall status of their application in Canada and the United States.

- Section 4 provides the rationale for selecting seven case studies for further study.
- Section 5 contains general findings on critical success factors, general market research and design criteria for future program development and consideration.
- Section 6 contains the conclusion and recommendations.

The report provides seven detailed case studies and over sixty general case studies on a wide range of financial measures to improve residential energy efficiency. A number of key 'lessons

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learned' in terms of their design and implementation for maximum market penetration are provided. These lessons could form the basis of a national home energy efficiency retrofit strategy.

Prepared for: CMHC, NRCan and Environment Canada. Prepared by: Peck & Associates in association with EnerQuality Corporation & Pollution Probe. CMHC Project Officer: Fanis Grammenos. Ottawa: Canada Mortgage and Housing Corporation, 2003. 109 pages

AVAILABILITY : Canadian Housing Information Centre and
ftp://ftp.cmhc-schl.gc.ca/chic-ccdh/Research_Reports-Rapports_de_recherche/eng_unilingual/FINAL-2003WEB-R.pdf

GREENHOUSE GAS REDUCTIONS IN SUBURBAN SETTINGS

This report explores the greenhouse gas (GHG) reductions possible in suburban households through electrical load reduction in the house, and replacing the gas-powered commuter car with an electric vehicle (EV). The goal of the project was to look at innovative ways of reducing greenhouse gas emissions in households, and to help Canadians meet the 'one tonne challenge' set out in the federal government's Climate Change plan.

A base house case was built for typical electrical loads in houses with gas or oil heating systems, with an exploration of a range of standard and innovative appliance, lighting and electronic load reduction options. The scenario was modelled in four Canadian urban centres with large numbers of short and long-haul commuters for Halifax, Montreal, Toronto and Vancouver. Electric vehicles and conversion kits available in Canada and the US are included, as are European production model EVs.

The project shows how to reduce electrical loads by about 60% (or at least 19 kWh daily) for an overall cost of \$27,500. This comprises \$14,000 for retrofits, \$8,000 for heat & domestic hot water improvements, and \$5,500 for solar DHW plus 300 watts of photo voltaic panels. The electricity saved could then be used to power an electric vehicle between 80 km (larger EV) to 180 km (small EV). Overall greenhouse gas reductions of up to 13 tonnes annually are possible (versus the average total of 22.2 tonnes per family).

Author: Shawna Henderson. Research undertaken by: Abri Sustainable Design & Consulting. CMHC Project Officer: Christopher Ives. Ottawa: Canada Mortgage and Housing Corporation, 2004. 81 pages

AVAILABILITY : Canadian Housing Information Centre

MULTI-UNIT RESIDENTIAL BUILDING ENVELOPES DESIGNED FOR RENEWABLE ENERGY: HALIFAX, NOVA SCOTIA

Passive solar energy collection, solar control, and natural ventilation techniques have been used to heat, cool and light buildings from prehistoric times. Many of these techniques consciously

crafted building envelopes to control heat and light between dwelling units and the outdoors. However, most designers of modern multi-unit residential buildings (MURBs) have largely overlooked these opportunities for a variety of reasons. Increasing fossil fuel costs and more sophisticated engineering analysis tools such as network airflow analysis and computational fluid dynamics software have encouraged the design of renewable energy approaches. However, there is still a widespread perception in the Canadian design industry that renewable energy technologies are inherently expensive.

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The report looks at various renewable energy approaches for MURBs: passive space heating, semi passive space heating, passive cooling, semi passive cooling, passive ventilation, daylighting and solar domestic water heating and focuses on a recently constructed project in Halifax, Nova Scotia.

An integrated design process (IDP) was used in formulating the design. An IDP is an approach that brings together all of the parties that influence the design of a building as well as those that use the building at the very early stages of the design process. The goal of an IDP is to arrive at optimal building performance solutions while keeping costs within budgetary constraints.

The report describes typical MURB constructions currently in use in the Maritimes, energy costs and modeling, climatic factors, energy efficiency performance indicators, building form issues, estimated system costs and energy savings costs by employing renewable energy measures. An industry survey of building industry professionals in the Halifax area was carried out in order to estimate the existing utilization of energy related technologies in MURBs as well as the interest in the future use of these technologies. The authors conclude with a list of recommendations regarding the informational requirements of builders of MURBs with respect to renewable energy.

Prepared by Chris Mattock and Ian Theaker, Habitat Design + Consulting and Integral Design / Engineering. CMHC Project Officer: Sandra Marshall. Ottawa: Canada Mortgage and Housing Corporation, 2004. 85 pages

AVAILABILITY : On a loan basis from Canadian Housing Information Centre

SMALL-SCALE RENEWABLE ENERGY SYSTEMS, GRID-CONNECTION AND NET METERING: AN OVERVIEW OF THE CANADIAN EXPERIENCE IN 2003

This report documents the experience of small-scale grid-connected renewable energy power producers in Canada and provides an overview of the grid-connect and net metering policies of electric utilities across the country as of March 2003. It also provides background and resources for those who are interested in establishing their own grid-connected systems. For the purposes of this study, renewable energy systems were defined as: Photovoltaics (PV), Building Integrated Photovoltaics (BIPV), Wind and Microhydro. Also, hybrid systems (any combination of the latter four) were included. The system sizes were limited to what a homeowner or a small to medium size commercial venture might install cost-effectively.

Prepared by Shawna Henderson and Jeff Bell, Abri Sustainable Design & Consulting. CMHC Project Officer: Christopher Ives.. Ottawa: Canada Mortgage and Housing Corporation, 2003. (External Research Program Research Report) 125 pages

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilingual/RR_Renewable_Energy_EN\(w\).pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilingual/RR_Renewable_Energy_EN(w).pdf)

ENERGY CONSERVATION

STRATEGIES FOR REDUCING BUILDING ENERGY USE VIA INNOVATIVE BUILDING ENVELOPE TECHNOLOGIES: FINAL REPORT

A research project was undertaken to evaluate the opportunities to reduce, recover and generate energy at the building envelope in existing multi-unit residential buildings. The research was conducted by a multi-disciplinary team of engineers, architects, building envelope consultants and representatives of the property management sector. The project reviewed new and emerging building envelope technologies that could help to reduce energy consumption in existing buildings, primarily based on experiences in European apartment buildings. Building integrated photovoltaics, solar water heating, solar air heating, insulation and window retrofits and double façade technologies were included in the review. For the most part, it was found that the current economics and risk associated with many of the available technologies can undermine the attractiveness of such technologies for property owners and managers. Two technologies (solar air heating and enclosing balconies) were found to offer attractive energy savings especially if the technologies are incorporated into a larger renovation project and the benefits derived from offsetting future repair costs are considered.

Prepared by Enermodal Engineering Limited in association with Halsall Associates Limited, Greenwin Property Management. CMHC Project Officer: Sandra Marshall. Ottawa: Canada Mortgage and Housing Corporation, 2003. 30 pages

Note: No. 04-110 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-cedh/Research_Reports-Rapports_de_recherche/eng_unilin_gual/RR%20Strategies%20FINAL\(w\).pdf](ftp://ftp.cmhc-schl.gc.ca/chic-cedh/Research_Reports-Rapports_de_recherche/eng_unilin_gual/RR%20Strategies%20FINAL(w).pdf)

FIRES & FIRE PREVENTION

CANADIAN HOUSING FIRE STATISTICS

This report examines benchmarks and indicators related to Canadian housing fire losses, based primarily on statistics over the period 1980 to 1999. The high level statistical components used to establish fire risk in housing are fire incidence, fire deaths, fire injuries and fire damage. These four components are related to benchmarks, based on population, numbers of residential units and fire incidence. Statistics for both the Canadian population at large and First Nations are evaluated. Assessments are made based on residential unit type, ages of victims, urban-rural location, household size and crowding, household age and condition and ignition scenarios. Differences in fire risk between pre- and post-1980 residential units are identified. Recommendations for improvements in current fire data collection are suggested.

Prepared by Ken Richardson Fire Technologies Inc. in collaboration with Fuller Information. CMHC Project Officer: Mark Holzman. Ottawa: Canada Mortgage and Housing Corporation, 2004 (External Research Program Research Report). 98 pages

Note: No. 04-004 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-cedh/Research_Reports-Rapports_de_recherche/eng_unilin_gual/Housing%20Fire%20FINAL\(w\).pdf](ftp://ftp.cmhc-schl.gc.ca/chic-cedh/Research_Reports-Rapports_de_recherche/eng_unilin_gual/Housing%20Fire%20FINAL(w).pdf)

HEATING AND VENTILATION

ANALYSIS OF VENTILATION SYSTEM PERFORMANCE IN NEW ONTARIO HOUSES

Canada Mortgage and Housing Corporation (CMHC) has been interested in the development of residential ventilation standards and the integration of mechanical ventilation into Canadian building codes. Ontario's Building Code has a unique approach to mechanical ventilation, with the use of a bathroom exhaust fan to promote the required air exfiltration and a furnace fan to distribute the infiltrating air to all parts of the house. CMHC wanted to know if this simple system was proving effective for homeowners, so it commissioned a survey be conducted over a sample of 120 houses built after 1995 over three regions in Ontario.

The results show that exhaust-only ventilation systems (EOV) were installed in over 75% of the Ontario houses sampled. Heat recovery ventilators (HRV) were the next most frequent system. In houses with exhaust-only systems, most homeowners simply activated the exhaust fan, not knowing that the furnace fan was an integral part of an effective ventilation system. The report also describes other survey findings such as homeowner satisfaction with their ventilation systems, the frequency of window condensation, and seasonal window opening patterns.

Report: Ranya Sherif. Field Testing: Caroline Prochazka, Ranya Sherif, P. Christopher Timusk. CMHC Project Officer: Don Fugler. Ottawa: Canada Mortgage and Housing Corporation, 2004. 24 pages

Note: No. 04-117 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilin_gual/DC-20077853\(w\)-RR-Analysis.pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilin_gual/DC-20077853(w)-RR-Analysis.pdf)

DEMONSTRATION OF DUCT INSTALLATION IN HOUSES PREVIOUSLY WITHOUT DUCTING

Natural gas has recently become available in New Brunswick and other Maritime Provinces, and home owners are slowly beginning to convert from traditional fuels of electricity, oil and wood. Not only are these home owners considering a change in fuel, but the availability of new technology is prompting them to consider alternate heating distribution system types. This project involved working with a heating contractor in Fredericton, New Brunswick to monitor the installation of new forced air heating systems in three older houses previously without such systems. Air flows were measured, recorded and compared with design air flows and measured air capacity of the blower. A photographic record illustrates obstacles faced by the heating contractor, which can force deviation from original system design.

The objectives of this project were:

- To record those obstacles and challenges faced by heating contractors engaged to install forced air heating systems in houses previously without such systems;
- To evaluate the effect of such obstacles on the ability of the forced air system to deliver design air flows throughout the house;
- To illustrate the importance of detailed duct design in retrofit installation projects.

Prepared by R. Clarke Designs Ltd. CMHC Project Officer: Don Fugler. Ottawa: Canada Mortgage and Housing Corporation, 2004. 31 pages

AVAILABILITY : Canadian Housing Information Centre

HEATING AND VENTILATION

DISTRIBUTION RETROFIT: PROPER RETROFIT FURNACE SIZING

The Building Performance Section of the Saskatchewan Research Council (SRC) was contracted by Canada Mortgage and Housing Corporation (CMHC) to examine simple methods for determining the required retrofit furnace size for Canadian residences.

This project was intended to test simple procedures for furnace sizing in retrofit situations and quantify the advantages of proper furnace sizing when replacing heating systems.

During the course of this project the SRC found twenty-six residences willing to participate in the project. Ten of these homes had actual meter readings for the month of January in at least one year, while all twenty-six homes had long term utility records.

Three methods of determining the required retrofit furnace size were employed during this project. The most detailed of the three methods consisted of plotting the natural gas consumption per day versus the heating degree days per day for the same period. In all cases this provided a linear relationship. By extrapolating this linear relationship out to fifty three heating degree days per day (corresponding to the 2.5% design temperature for Saskatoon (-35°C)), the peak heat loss of the home could be determined. The other two methods also determined the peak heat loss using a linear relationship of the natural gas consumption per day versus the heating degree days per day but only used two meter readings. The second method used the meter readings taken by the utility company every three months, while the third method used meter readings that were taken at the start and end of January.

When estimating the predicted retrofit furnace sizes the peak heat loss for each home (found using each of the methods) was increased by forty percent (the maximum suggested by F280). All of the homes were still dramatically over sized (from 1.22 to 3.86 times larger than forty percent over peak heat loss).

Modelling of the effects of furnace over sizing using the HOT2000 residential modelling software package indicated that there are no energy costs or savings associated with over sizing of mid- and high-efficiency furnaces. This does not agree with some of the information that is published. In fact the published information about mid- and high-efficiency furnaces almost always indicates that proper furnace sizing will reduce the energy consumption of the heating system. There are also publications that indicate high-efficiency (condensing) furnaces operate better if they are oversized and have shorter run times.

Prepared by Tom MacDermott, Rob Dumont, Jerry Makohon, Saskatchewan Research Council. CMHC Project Officer: Don Fuger. Ottawa: Canada Mortgage and Housing Corporation, 2003. 20 pages

Note: No. 03-109 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre

HEATING AND VENTILATION

FIELD TESTING OF AN INTEGRATED VENTILATION - SPACE CONDITIONING SYSTEM FOR APARTMENTS: FINAL REPORT

An evaluation was undertaken of the performance of an innovative ventilation and space conditioning (VSC) system developed for application in multi-unit residential buildings. The system is comprised of a forced air vertical fan coil with an integrated heat recovery ventilation system. Testing was conducted in suites of a newly constructed apartment building in Toronto, Ontario where prototypes of the VSC system were installed. The evaluation included the assessment of supply and exhaust air flow rates, air leakage characteristics of the apartments and a common corridor, an evaluation of the ability of the VSC to work under different indoor-outdoor pressure regimes, and the impact of the operation of unbalanced exhaust appliances within the apartments on the performance of the VSC and the need for make-up air. The testing found that the VSC is capable of meeting the ventilation requirements of apartments but that additional consideration will have to be given to reducing its sensitivity to adverse air pressure regimes and the need to consider make-up air strategies for unbalanced exhaust appliances.

Prepared by Enermodal Engineering Limited. Prepared by Canada Mortgage and Housing Corporation, Housing Technology Group, Policy and Research Division and MinoUrban Communities. CMHC Project Officer: Duncan Hill. Ottawa: Canada Mortgage and Housing Corporation, 2003. 58 pages

AVAILABILITY : Canadian Housing Information Centre

IMPACT OF REQUIRING RESIDENTIAL HVAC SYSTEM DESIGN SUBMITTAL ON SYSTEM PERFORMANCE

In Canada, there are variations in the methods that authorities use to ensure that heating, ventilating and air conditioning systems are designed and installed properly in new residences. In particular, some authorities require submission of heat loss/gain calculations and duct designs prior to issuing building permits, while others do not. Also, some jurisdictions have more stringent inspection procedures in place than others. The purpose of this study is to compare the installed HVAC systems resulting from two different permit and inspection processes in two different cities in Canada.

City A: Requires the submission of heat loss calculations and duct sizes.

City B: Does not require the submission of heat loss calculations and duct sizes.

Significant deviations from code requirements were identified in each city. One could argue that the more rigorous inspection procedure in City B in part made up for the less stringent approval process. However, the study shows that City A does not necessarily enforce its own permit requirements and that the building inspection process in both cities missed flaws in some installations. The design requirements in City A appear to result in larger installed main ducts than in City B. Despite the inability of builders, contractors and inspectors to ensure code compliance, homeowners had few complaints about the quality of their installations. From the limited number of houses that were included in this study, it appears that there is little difference in the performance and perceived comfort levels of installed HVAC systems in the two cities with the current permit and inspection processes in place.

Prepared by William Crist, Sol-Tech Housing, Calgary, Ltd. Prepared for Canada Mortgage and Housing Corporation. CMHC Project Officer: Don Fugler. Ottawa: CMHC, 2003. 22 pages.

AVAILABILITY : Canadian Housing Information Centre

HEATING AND VENTILATION

INVESTIGATION OF A GROUND-SOURCE HEAT PUMP RETROFIT TO AN ELECTRICALLY HEATED MULTI-FAMILY BUILDING

During the 1960s and 1970s, electric baseboard heating systems were a common space heating approach in multi-unit residential buildings due to low installation costs, minimal use of interior space and the relatively low price of electricity. As a result, approximately 50% of apartment buildings in Canada have electric baseboard heating. However, rapidly increasing costs of electricity, concerns over environmental damage associated with conventional generating stations and the very age of most electric baseboards in apartment buildings will necessitate the development of alternative space heating strategies. This is a report of research to investigate the technical potential and economic benefits of retrofitting electrically heated apartment buildings with ground-source heat pumps. The report presents results of a literature and web search and review of available components and equipment suitable for the application, and analyses the most promising combination using an example building complex in the Greater Toronto area. Both the cases of no benefit and full benefit for central air conditioning are considered. Comparisons are drawn with retrofitting natural gas heating systems under the same circumstances. Conclusions and recommendations for new component development are identified and the economic results are as attractive under some circumstances as natural gas heating system retrofits.

Prepared by Caneta Research Inc. CMHC Project Officer: Duncan Hill. Ottawa: Canada Mortgage and Housing Corporation, 2002. (CMHC External Research Program Report) 34 pages

Note: No. 03-118 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-ccd/h/Research_Reports-Rapports_de_recherche/eng_unilingual/RR%20Investigation_FINAL\(w\).pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccd/h/Research_Reports-Rapports_de_recherche/eng_unilingual/RR%20Investigation_FINAL(w).pdf)

SURVEY OF IN-SUITE SPACE AND DOMESTIC HOT WATER HEATING SYSTEMS IN MULTI-UNIT RESIDENTIAL BUILDINGS

A project to survey the operation and maintenance performance of in-suite space and domestic hot water heating systems in multi-unit residential buildings has been completed. Previously, there has been little research conducted on the performance of in-suite systems as they are a relatively new approach to meet the space conditioning and water heating needs of apartment buildings. Nine buildings were surveyed to establish system type, annual operating and maintenance costs, capital costs, architectural considerations, owner and occupant satisfaction with system performance and other parameters. The project concluded that in-suite systems represent a viable alternative to central approaches and that residents and property managers are satisfied with their performance. However, operation and maintenance can be problematic for residents and the longterm performance of the systems is unknown. Interior space use, building envelope penetrations can also represent challenges. The project provides insight regarding how well in-suite space and domestic hot water systems meet the needs of building owners and occupants.

Prepared by Finn Projects (Synchronicity Projects Inc.). CMHC Project Officer: Duncan Hill. Ottawa: Canada Mortgage and Housing Corporation, 2003. 45 pages

HEATING AND VENTILATION

Note: No. 04-107 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site

AVAILABILITY : Canadian Housing Information Centre and
ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilin_gual/FINISHEDSURVEY-WEB.pdf

VENTILATION SYSTEMS FOR MULTI-UNIT RESIDENTIAL BUILDINGS: PERFORMANCE REQUIREMENTS AND ALTERNATIVE APPROACHES

The goal of this project was to assist CMHC in developing performance requirements and alternative approaches for innovative ventilation systems that overcome problems with conventional ventilation systems in multi-unit apartment buildings.

A review of conventional ventilation systems reveals that current designs for ventilation systems in MURBs do not work well for ensuring adequate indoor air quality. They suffer from a litany of complaints from occupants and building operators and owners about noisy systems, ineffective supply of ventilation air and removal of contaminants, and high-energy consumption.

To characterize improved ventilation system performance, practical performance parameters and targets were developed. Based on an evaluation of ventilation needs for residents of multi-unit residential apartments in Canada, it is recommended that ventilation rates from the current ASHRAE Standard 62-01 be used as a basis for performance, with those rates provided fully by mechanical systems rather than relying on infiltration for part or all of ventilation supply rates.

Four alternative ventilation systems that better meet these performance targets were developed and evaluated in terms of capital cost, energy use, and operating costs. The four systems are:

1. Passive inlet vents with suite based mechanical exhaust,
2. Balanced individual suite HRV units,
3. Balanced floor by floor system with heat recovery,
4. Balanced central system with heat recovery.

These alternative systems may not necessarily meet current building codes.

Based on analysis of these systems, the following observations can be made:

- System 1 provides some improvement in performance over conventional systems for a marginal cost of approximately \$700 per suite.
- Systems 2 through 4 provide substantially improved performance in most or all areas at a marginal cost of between \$1300 and \$2300 per suite.
- Advanced ventilation systems with HRV's can exhibit more than a ten-fold reduction in operating cost over conventional ventilation systems and a five-fold reduction over similar ventilation systems without heat recovery.
- Energy cost savings of as much as \$130 per suite per year are possible from advanced systems with heat recovery in new buildings.

Prepared by Craig Edwards, Innes Hood, The Sheltair Group Resource Consultants Inc. in association with Mario Kani, Allen Kani and Associates; Leslie Jones, Leslie Jones & Associates; Rob Dumont, Saskatchewan Research Council. CMHC Project Officer: Duncan Hill. Ottawa: Canada Mortgage and Housing Corporation, 2003. 104 pages

Note: No. 03-121 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilin_gual/RR_Ventilation_Systems\(W\).pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilin_gual/RR_Ventilation_Systems(W).pdf)

HIGH-RISE AND MULTIPLE UNIT CONSTRUCTION

BETTER BUILDINGS CASE STUDIES

This project documents and illustrates repairs and upgrades to multi-unit residential buildings across Canada. It is estimated that, in this country, \$300 M are spent every year in premature building failures. CMHC is collecting and publishing easy to read case studies to present to owners, architects, builders and property managers on what can go wrong and why, how to fix it and how much it will cost. Most cases will focus on the building envelope since the vast majority of documented problems occur there, in addition to examples of energy and acoustical upgrades.

This project adds to CMHC's current documentation and publication of case studies on repair and retrofit of multiple-unit residential buildings. Ultimately, a repair guide will be developed based on this work. Case studies from across Canada are obtained from those directly involved in the repairs and involve buildings of all types of construction ranging in height from 3 to 50 storeys. Every year the Corporation publishes 10 Better Buildings Case Studies on CMHC's website.

AVAILABILITY : http://www.cmhc.ca/en/imquaf/himu/bebufa_021.cfm

EXTERIOR INSULATION AND FINISH SYSTEMS. BEST PRACTICE GUIDE BUILDING TECHNOLOGY

This guide covers the use of exterior insulation and finish systems (EIFS) in new construction, both high-rise and low-rise. EIFS are products that integrate insulation and a "stucco" like covering, for cladding exterior walls. This sixty-five page technical guide, and extensive appendices, is intended to assist building professionals in proper design and application of EIFS. Following these best practice recommendations promotes satisfactory performance and durability of the products. Includes a CD-ROM version of the guide.

Ottawa: Canada Mortgage and Housing Corporation, 2004.

Order number 63567 **Price: \$89.00 + GST and handling charges

Nota : Aussi disponible en français sous le titre : Systèmes d'isolation des façades avec enduit

AVAILABILITY : CMHC Information Products

FIRE AND SOUND CONTROL IN WOOD-FRAME, MULTI-FAMILY BUILDINGS. BEST PRACTICE GUIDE, BUILDING TECHNOLOGY

This guide shows how to control the spread of fire and the transmission of sound between dwelling units in wood-frame, multi-family buildings. It focuses on the design and construction of the interior walls and floors that separate one dwelling unit from another. It highlights the results of research performed by the National Research Council of Canada for Canada Mortgage and Housing Corporation (CMHC) and others, and uses it as a basis for the best practices that can be applied to design and construction.

Prepared by Michael Lio, Lio & Associates with the assistance of the Institute for Research in Construction, National Research Council of Canada. CMHC Project Officer: Ken Ruest. Ottawa: Canada Mortgage and Housing Corporation, 2002. 140 pages + CD-ROM

HIGH-RISE AND MULTIPLE UNIT CONSTRUCTION

Order number: 62942 **Price: \$89.00 + GST and handling charges

Nota : Aussi disponible en français sous le titre : Protection contre le feu et isolement acoustique des collectifs d'habitation à ossature de bois

AVAILABILITY : CMHC Information Products

MONITORED PERFORMANCE OF AN INNOVATIVE MULTI-UNIT RESIDENTIAL BUILDING: FINAL REPORT

A research project was undertaken to investigate a wide variety of aspects in an innovative condominium building in Dundas, Ontario. The 48 unit, 6 storey building was designed to use 35% less energy than a similar building designed to just meet the MNECB. To better understand the operation of the building a comprehensive monitoring and evaluation program was undertaken. The monitoring program consisted of one-time measurements of envelope airtightness, indoor air quality, ventilation system performance and air movement. A PC-based data acquisition system was installed. Performance monitoring included the heating systems, building envelope, and ventilation systems. Monitoring was undertaken to understand long-term system performance, indoor air quality and overall energy performance. Short-term testing was also undertaken to investigate building air tightness and indoor air quality issues. A quantitative analysis of the performance of these areas is presented. The benefits and shortcomings in each area are examined.

Prepared by Enermodal Engineering Limited. CMHC Project Officer: Duncan Hill. Ottawa: Canada Mortgage and Housing Corporation, 2002. 134 pages

Note: No. 02-135 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre

PERFORMANCE MONITORING OF A BRICK VENEER/STEEL STUD WALL SYSTEM: PHASE 5 RESULTS

The brick veneer/steel stud (BV/SS) wall system has become very popular over the last 20 years, however, the rapid adoption of this wall system has preceded the development of adequate design and construction standards. In order to address concerns about the long term safety, serviceability and durability of BV/SS wall systems, Canada Mortgage and Housing Corporation (CMHC) has undertaken a program to evaluate this popular wall system.

A relatively new system, called the Dynamic Buffer Zone (DBZ), has been developed which injects warm, dry air into the space between the exterior masonry and interior walls. The intent of this system is to keep moisture out of the masonry system to reduce the detrimental effects of condensation and freeze-thaw cycles.

As part of the CMHC evaluation program, Keller Engineering Associates Inc. (KEA) carried out in-situ performance monitoring of a BV/SS wall system. The performance monitoring focused on building science issues such as temperature gradients, moisture movements and pressure differences across the wall system. This report evaluates the practical efficacy of the DBZ system in a BV/SS wall system.

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The performance of a test wall was monitored using various temperature, moisture and air pressure sensors that were connected to an automatic data logging system. The results of this study indicate that the installation of a DBZ is beneficial to the performance of the BV/SS system during winter months. Moisture vapour from the interior of the building is prevented from entering the wall system. However, a DBZ system may lead to distress over the long term since moisture from precipitation still enters the wall system, and once behind the brick veneer cannot readily escape.

Prepared by Keller Engineering Associates Inc. CMHC Project Officer: Luis de Miguel. Ottawa: Canada Mortgage and Housing Corporation, 2003. 117 pages

AVAILABILITY : On a loan basis only from Canadian Housing Information Centre

TECHNOLOGY ROADMAP FOR INTELLIGENT BUILDINGS

In the fall of 1999, the Federal Interdepartmental Forum on Construction Technology, which has representatives from the department of the Government of Canada with a major interest in construction innovation issues, identified the lack of understanding of the challenges and opportunities in the general areas of intelligent building technologies as a significant national issue. This led to the proposal to create the Technology Roadmap for intelligent building technologies. The Continental Automated Building Association (CABA) was approached to determine if private industry would participate actively in the initiative.

For the purposes of this report intelligent building technologies have been defined as: “The use of integrated technological building systems, communications and controls to create a building and its infrastructure which provides the owner, operator and occupant with an environment which is flexible, effective, comfortable and secure”.

This Technology Roadmap explores and explains the current status and imminent opportunities offered by the accelerating evolution and use of intelligent building technologies. The focus is on commercial, institutional and high-rise residential buildings, both new projects and retrofits, in a five year time horizon.

Prepared by IBI Group. Managed by CABA staff under the guidance of the Technology Roadmap Steering Committee. Financial support provided by Industry Canada, National Research Council Canada, Public Works and Government Services Canada, Natural Resources Canada, and Canada Mortgage and Housing Corporation. Ottawa: Continental Automated Building Association, 2002. 60 pages

Nota : Aussi disponible en français sous le titre : Carte routière technologique du bâtiment intelligent

Note: No. 03-114 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Product is available on the web: www.caba.org/trm/

HOME OWNERSHIP

ASK CMHC ABOUT YOUR HOME'S POSSIBILITIES

This catalogue provides an overview of the life cycle of homeownership using a phase by phase approach and highlights useful information for each stage. Combining helpful tips and full colour illustrations with snapshot summaries of what each of the products have to offer, this catalogue is ideal for homeowners who would like to learn about the life cycle of homeownership and how CMHC can help in each stage.

Ottawa: Canada Mortgage and Housing Corporation, 2003. 23 pages

Note: Aussi disponible en français sous le titre : Consultez la SCHL—Pour découvrir le potentiel de votre maison

AVAILABILITY : CMHC Information Products (Order number 63027)

ASSESSMENT OF THE OUTCOMES FOR HABITAT FOR HUMANITY HOME BUYERS

Habitat for Humanity Canada (HFHC) provides homes in partnership with low income families. Participants must contribute sweat equity, either in the construction of their own home or through other tasks required by the organization. They are also responsible for making monthly payments on an interest free mortgage used to finance the cost of the property; their payment is based on 25% of their income. The intention of using this process is for homeowners to feel they have earned their new accommodation, rather than being given it (a hand up, not a handout) as well as providing funds for the construction of more homes as the mortgage loans are repaid. There are currently approximately 600 households who have moved into homes built or renovated by HFHC in Canada.

While some research has been done regarding outcomes for families in the US who have moved into Habitat housing, there has been no rigorous analysis of impacts of stable affordable housing for Canadian Habitat families. As well, HFHC is interested in evaluating and improving the process used to prepare prospective homeowners for the responsibilities involved in owning a home.

The goals for this study were: 1. To examine how access to a stable home ownership environment has changed outcomes for families who have been participants in the HFHC program in Canada. 2. To assess and suggest improvements to the partnership aspects of the HFHC program; how well does the partnership process between the affiliate and the applicant prepare families for home ownership? 3. To assess how the financial well being of a Habitat household changes over time after occupation of their home.

Interviewees were asked about two main issues: how their lives had changed since moving into their new homes and how the counselling/partnering process worked for them in moving into their homes. A significant portion of homeowners reported improvements in their children's grades and/or behaviour since moving. In some cases this was attributed to improved housing conditions such as greater space and more private space for each child. Some adults had returned to school since moving (30% of these to university or college) in order to improve their future job prospects; some already had better jobs since moving.

The counselling/partnering process was considered very valuable by the interviewees and most Habitat partners received very high ratings. Positive responses were linked to providing good

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information in a timely manner and being friendly. A good partner, who responded quickly to questions and concerns raised by the homeowner during the process, greatly helped to relieve the stress involved in taking on homeownership responsibilities.

The findings indicate that, while there is some room for improvement in certain areas, the Habitat program is generally working extremely well. Households are chosen for the program with the expectation that they can succeed at homeownership. While respondents said that they have to budget very carefully for the costs involved, most are able to manage and are excited about the fact that they are investing in an asset.

Prepared by Maureen Crawford and Jane Londerville. CMHC Project Officer: Bruno Duhamel. Ottawa: Canada Mortgage and Housing Corporation, 2004 (External Research Program Report)

Note: No. 04-024 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre and
[http://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilingual/assessment%20pages\(W\).pdf](http://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilingual/assessment%20pages(W).pdf)

CONDOMINIUM BUYER'S GUIDE

This guide was developed to assist buyers in choosing a condominium which meets their personal and financial needs. The guide provides buyers with an overview of the operation of different condominiums and important questions to address when choosing a condominium to meet the lifestyle and financial needs of the buyer. In addition, the guide provides instructions on evaluating the financial and physical status of an existing condominium. Information on evaluating the physical condition of the individual unit, the condominium building and grounds, and the financial status of the condominium is also covered. Contact information for acquiring additional information and assistance is included.

CMHC Project Officer: Duncan Hill. Ottawa: Canada Mortgage and Housing Corporation, c2002. 37p.

Note : Aussi disponible en français sous le titre : Logements en copropriété - guide de l'acheteur

AVAILABILITY : CMHC Information Products (Order no. 63100)

IMPACT OF THE HOME BUYERS' PLAN ON HOUSING DEMAND

The Home Buyers' Plan (HBP) was introduced in February 1992. The HBP is aimed at facilitating access to homeownership by allowing households to withdraw up to \$20,000 tax free from their Registered Retirement Saving Plans (RRSPs) to cover the down payment for the home. Such withdrawals must be repaid through a series of annual payments equal to 1/15 of the amount withdrawn over a maximum period of 15 years. Should households fail to make the required repayment, they must add the amount in default to their taxable income.

This tax measure is very popular. Between its introduction and 1998, the HBP has enabled over 777,000 individuals to withdraw close to \$7.5 billion from their RRSPs to finance the purchase of their first home and, in 1998, just over 111,000 households withdrew an average amount of \$9,400. However, no one has yet developed a stringent analysis or an adequate modelling of the

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advantages and drawbacks of the HBP. This issue is all the more important in that the behaviour of the participants in the plan is quite varied. In fact, despite the growing popularity of the HBP, it can be seen that a significant proportion of participants do not make the full repayment required into their RRSPs according to the terms of the HBP. The purpose of this study is to analyze the impact of the HBP.

First, the study explains the popularity of this program, showing the potential financial gain. This analysis identifies those households who gain the most from this program. Then, the research studies how saving and consumption decisions are modified by the HBP. The analysis is theoretical and makes use of a housing demand model based on a continuous-time life-cycle analysis. This model was initially applied to housing demand by Artle and Varaiya (1978) and subsequently used by Wheaton (1985) in the United States and Fortin (1988) in Canada, among others.

Prepared by Frédéric Chartrand and Mario Fortin, Economics Department, Université de Sherbrooke. CMHC Project Officer: Ian Melzer. Ottawa: Canada Mortgage and Housing Corporation, 2003. (External Research Program Research Report) 37 pages

Nota : Aussi disponible en français sous le titre : L'impact sur régime d'accession à la propriété sur la demande de logement

Note: No. 03-009 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre and [ftp://ftp.cmhc-schl.gc.ca/chic-ccd/h/Research_Reports-Rapports_de_recherche/eng_bilingual/RR_Impact_Homebuyers\(W\).pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccd/h/Research_Reports-Rapports_de_recherche/eng_bilingual/RR_Impact_Homebuyers(W).pdf)

HOMELESSNESS

APPLICABILITY OF A CONTINUUM OF CARE MODEL TO ADDRESS HOMELESSNESS: FINAL REPORT

This report presents the results of a study that examined the Continuum of Care (CoC) model of addressing homelessness in the United States (US). The model requires communities to develop coordinated action plans in order to receive funding by the US Department of Housing and Urban Development (HUD) for local homelessness initiatives. Four sites were studied to explore the model's benefits, limitations, similarities and differences. The selected sites for the case studies were:

1. Broward County, Florida
2. King County, Seattle, Washington
3. City of Memphis, Tennessee
4. Philadelphia, Pennsylvania

The case studies were conducted using secondary data collection methods including interviews, document reviews and self-administered questionnaires. The final phase of the research involved a survey of Canadian stakeholders to examine the applicability of the CoC homelessness model for Canada based on the findings of the case studies and their knowledge of the Canadian environment.

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Prepared by: Social Data Research Ltd. CMHC Project Officer: Anna Lenk. Ottawa: Canada Mortgage and Housing Corporation, 2002. ca. 68 pages

Note: No. 03-115 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre

DEVELOPING A METHODOLOGY FOR TRACKING PERSONS WHO ARE HOMELESS OVER TIME: FINAL REPORT

The Panel Study on Homelessness in Ottawa is the first Canadian attempt to follow a cohort of homeless persons over time. The research objective for the first wave of the study was to interview a representative sample of current residents of Ottawa emergency shelters in order to gather descriptive data on demographic characteristics, housing history, health status, and health and social service utilization. The ultimate goal of the study is to identify and explain factors that distinguish individuals who escape homelessness from those who remain homeless or who experience multiple episodes of homelessness. This research project is using the panel study to develop and empirically validate a methodology for locating as many participants as possible over time. Based on a review of the relevant literature, a tracking protocol was developed for the project.

The tracking process began at the time of the initial interview. Participants were asked to provide consent to contact individuals and/or agencies with whom they were likely to be in contact in one year's time. As much information as possible was gathered to facilitate finding these contacts, which included friends, family members, service providers, hospitals and shelters. Participants were also asked to provide consent for the researchers to contact the City of Ottawa Employment and Financial Assistance (EFA) data base, through which all social benefits are distributed, to search for addresses and phone numbers of participants.

A total of 1,961 individual contacts were made to locate the 416 original study participants during the course of the project and 63% of the study participants were located. The success rate ranged from 73% for the male youth to 52% for the male adults. Family and friends were the most effective contacts in our efforts to reach female youth, and family and shelter contacts were the most effective means of reaching male youth. For all the other subgroups, the EFA data base at the City of Ottawa yielded significantly more accurate information than any of the other contacts.

Based on the lessons learned during the course of the project, a number of recommendations are provided relating to consent forms, soliciting participants' assistance, centralized administration of tracking and the necessity of adopting different strategies for different populations.

Prepared by: Tim Aubry, Fran Klodawsky, Elizabeth Hay, Rebecca Nemiroff, and Sophie Hyman, Faculty of Social Sciences, University of Ottawa. CMHC Project Officer: Anna Lenk. Ottawa: Canada Mortgage and Housing Corporation, 2004. 33 pages

Note: No. 04-035 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilin_gual/Developing_Methodology\(W\).pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilin_gual/Developing_Methodology(W).pdf)

HOMELESSNESS

FAMILY HOMELESSNESS: CAUSES AND SOLUTIONS: FINAL REPORT

This report describes recent trends in family homelessness, causes and conditions that contribute to family homelessness, the impact of homelessness on children, and ways and means of addressing family homelessness.

Information for this report was obtained from three different sources: a literature review, structured telephone interviews with 74 key informants who were involved in providing services to families who are homeless or at risk of homelessness, and face-to-face qualitative interviews with 59 families who were homeless or formerly homeless. These families were referred or recruited by several different agencies in the cities included in the study.

Interviews with both agencies and families were conducted in Victoria, Vancouver, Calgary, Winnipeg, Peel Region, Toronto, Montreal, Quebec, Saint John, and Halifax.

When considering the information obtained from all the sources used in this study, including the literature review, interviews with agency key informants, and interviews with families, the high degree of consistency in much of the data provides clear direction on many of the factors contributing to family homelessness and ways to address this problem.

Prepared by Social Planning and Research Council of BC, Deborah Kraus, Paul Dowling. CMHC Project Officer: Jim Zamprelli. Ottawa: Canada Mortgage and Housing Corporation, 2003. ca. 208 pages

Note: No. 03-006 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre

GOVERNANCE IN ORGANIZATIONS ADDRESSING HOMELESSNESS

Across the country, the homeless situation is becoming more severe as the number of homeless persons steadily increases in most major Canadian cities. In order to address the needs of a more diverse and growing number of homeless people, organizations and agencies have had to adjust their methods of program delivery and management. Effective governance has become a critical aspect of meeting the needs of the homeless population.

Although there is a considerable body of literature and research on the homeless population there is less information available on the governance characteristics of agencies that are attempting to address the needs of the homeless. This report attempts to address this deficiency by examining governance characteristics of a number of agencies working with homeless people. A series of case studies identify the partnerships, board structures and strategies these agencies are using in their work with the homeless population.

The report begins with a brief examination of the changing characteristics of the homeless population, noting the trends exhibited in large Canadian cities. This is followed by an overview of the current program and funding framework within which agencies working to address the needs of the homeless operate. Then there is a review of the applicable literature on governance. This initial material sets the context for a detailed discussion on aspects of governance within organizations dealing with the homeless, focusing specifically on their ability to govern their affairs and the development and use of partnerships in the delivery of services in an ever changing and complex environment. This is accomplished through detailed case studies of agencies distributed

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across the nation and chosen to reflect a range of different organizational characteristics. A synthesis of the case study material is provided in the main body of the report and the detailed case studies themselves are contained in the Appendices. The report concludes with a summary of best practice applications and lessons learned.

Prepared by Institute of Urban Studies & Urban Aspects Consulting Group Ltd. with assistance from Sylvia Novac, Centre for Urban and Community Studies, Luba Serge, Research Associate, Janet McClain, Research Associate. Submitted to Canada Mortgage and Housing Corporation and National Secretariat on Homelessness. CMHC Project Officer: Anna Lenk. Ottawa: Canada Mortgage and Housing Corporation, 2003. 274 pages

Note: No. 03-114 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-ccd/h/Research_Reports-Rapports_de_recherche/eng_unilin_gual/RR_Governance_EN_\(w\).pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccd/h/Research_Reports-Rapports_de_recherche/eng_unilin_gual/RR_Governance_EN_(w).pdf)

HOUSING OPTIONS FOR ELDERLY OR CHRONICALLY ILL SHELTER USERS

This national study for Canada Mortgage and Housing Corporation is an exploration of problems and solutions related to elderly and chronically ill shelter users. The central research questions to guide the study were:

- Why are elderly people and chronically ill persons living in shelters for homeless people?
- What are their residential long-term care needs?
- What are the barriers to their accessing long-term care, and how can these barriers be reduced or removed?
- What strategies have been developed in Canada to address the needs of this population?

The study was undertaken in three phases. First, an international literature review and an exploratory survey of professional networks were conducted to identify fundamental issues. Second, key informant interviews were carried out with long-term care providers, placement co-ordination service providers, emergency shelter providers, and long-term care providers within the emergency shelter system. Third, 13 case studies that respond to the needs of elderly and chronically ill shelter users were completed.

The findings of this exploratory study echo much of what is found in literature on homelessness from other countries: there is a paucity of studies on elderly homelessness; elderly homeless persons are quite vulnerable, especially from younger homeless persons; while many elderly homeless persons are homeless only once and for a short duration, others are chronically homeless and maintaining permanent housing may be of considerable difficulty for this group. The literature on health care and homelessness underlines the difficulty in providing adequate and constant care as well as the consequences of this problem: premature ageing among homeless persons and a greater likelihood of dying from preventable causes.

Interviews with key informants from the long-term care and homelessness sectors reveal that they experience similar challenges: the supply does not meet the need – whether it is the need for shelters, transitional housing or residential long-term care. The interviews also made it clear that information on elderly, homeless women in particular is scarce or undocumented. Furthermore, while many shelters are barrier-free, some remain inaccessible to persons with

mobility problems and, if personal care is required, most shelters cannot accommodate the need. Finally, it is clear that lack of co-ordination and integration of health services and shelters is an

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issue of considerable concern, especially discharge planning for homeless patients leaving hospitals: such integration is still in its infancy in many cities.

Findings from the 13 case studies confirm what was learned from key informant interviews. For example, the integration of health and shelter services is nascent in Canada. As well, few examples of an integrated approach between shelters and mainstream long-term care facilities were found. Most residential projects documented in this study were developed by shelter providers. This approach raises a number of questions including how to protect the more vulnerable elderly homeless persons from younger, possibly predatory shelter users and what the ideal settings for residential projects for elderly homeless persons should be: the city core with its close proximity to services or outlying areas, away from dangerous situations.

Despite the development and delivery of the solutions reported in this document, the needs of elderly and chronically ill homeless people in Canada are still largely unmet. Most of the facilities documented in this study have waiting lists. Service providers stated that even if the number of places they can offer were doubled or tripled, the need would still be unmet.

Prepared by Luba Serge and Nancy Gnaedinger. CMHC Project Officer: Anna Lenk. Ottawa: Canada Mortgage and Housing Corporation, 2003. 109 pages

Note: No. 03-119 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre and
ftp://ftp.cmhc-schl.gc.ca/chic-ccd/h/Research_Reports-Rapports_de_recherche/eng_bilingual/Housing%20Options%20for%20the%20Elderly.pdf

HOUSING, LONG TERM CARE FACILITIES AND SERVICES FOR HOMELESS AND LOW-INCOME URBAN ABORIGINAL PEOPLES LIVING WITH HIV/AIDS: ISSUES IDENTIFICATION PAPER

The objectives of this research study of limited scope were: a) to examine housing issues and residential facilities and services available to homeless and low-income Aboriginal people with HIV/AIDS in urban centres, and gaps in services; b) to identify appropriate services for homeless and low-income urban Aboriginal people with HIV/AIDS.

This research report is a synthesis of secondary research; a review of the existing literature, and primary research conducted utilizing survey questionnaires with 29 respondents that included a range of Aboriginal and non-Aboriginal service providers as well as Aboriginal people living with HIV/AIDS in Vancouver, Edmonton, Regina, Winnipeg, Toronto, Ottawa, Montreal and Halifax. Two of these respondents spoke to the specific issues affecting Aboriginal people with HIV/AIDS in the Far North (Inuit) and Labrador. In addition, three (3) Native American HIV/AIDS organizations in New York, in Minneapolis-St. Paul and in Oakland were contacted for relevant information regarding housing options and culturally appropriate models of long-term care for Native Americans living with HIV/AIDS.

The profile of Aboriginal people with HIV/AIDS in urban centres that emerged from this limited research study indicates they are a heterogeneous low-income population whose housing and

care needs may differ. At the same time, a majority of this population is living on the “hem of life” in unstable housing conditions and in destabilizing lifestyles. Additional supports, services and transitional housing are required to meet their housing and care needs which differ from those of

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Aboriginal people with HIV/AIDS in a stable lifestyle. There is also a need to ensure that the specific housing and care needs of Aboriginal families living with HIV/AIDS, particularly those of single-parent, female-headed families, are met.

Service providers and Aboriginal people with HIV/AIDS (PHAs) identified a number of important gaps in housing, long-term residential care facilities and services for homeless and low-income Aboriginal people living with HIV/AIDS in urban centres.

Prepared by Susan Judith Ship and Laura Norton for Sweetgrass Consulting. CMHC Project Officer: Anna Lenk. Ottawa: Canada Mortgage and Housing Corporation, 2003. 62 pages.

AVAILABILITY : Canadian Housing Information Centre

HOUSING STABILITY VALIDITY STUDY: FINAL REPORT

The Housing Stability Validity Study is the third project of a series conducted by the Community Research, Planning and Evaluation Team at the Centre for Addiction and Mental Health. The purpose of this work has been to develop concepts, tools and methods for the planning and improvement of supportive housing programs for people with serious mental illness. This report describes the validation process of the Housing Stability Model, and benchmark evaluation procedure, developed in Toronto, Ontario through application to two other local housing systems in Canada: Ottawa and Halifax.

The Community Research, Planning and Evaluation Team formed partnerships with two agencies in each city. Each partner and local steering committee participated in a benchmark evaluation procedure. Following this process, participants were asked to describe the usefulness and applicability of the model, benchmarking evaluation procedure, and recommended practices. Through this collaborative process, the study team and participants were able to learn about the local mental health housing systems from a myriad of perspectives, and assess the extent to which the concepts and methodologies developed in one housing system in Canada are applicable to two other jurisdictions. Steering Committees also discussed the implications that noted gaps and overlaps in housing and support service delivery have on strategic directions and next steps.

Prepared by the Community Research, Planning and Evaluation Team, Community Support and Research Unit, Centre for Addiction and Mental Health. CMHC Project Officer: Anna Lenk. Ottawa: Canada Mortgage and Housing Corporation, 2004 (External Research Program Research Report). 54 pages

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-ccdhd/Research_Reports-Rapports_de_recherche/eng_unilingual/Housing_Stability\(w\).pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccdhd/Research_Reports-Rapports_de_recherche/eng_unilingual/Housing_Stability(w).pdf)

HOMELESSNESS

TRANSITIONAL HOUSING: OBJECTIVES, INDICATORS OF SUCCESS, AND OUTCOMES: FINAL REPORT

Some homeless adults, youth, and families require support as well as housing to stabilize their lives, perhaps due to histories of abusive treatment, addictions, mental health problems, or lack of employment skills. Transitional housing is intended to offer a supportive living environment and tools and opportunities for social and skills development. The overall objective of transitional housing is to provide people with the structure and support they need to address critical issues necessary to maintain permanent housing and maximize self-sufficiency. At a minimum, it is hoped that program 'graduates' will not use the emergency shelter system or become homeless again. Several federal government programs are funding the development of new transitional housing projects to address homelessness, but there is little research that assesses the effectiveness of this model.

This report is based on a review of the literature focused on the program objectives, indicators of success, and outcomes of transitional housing, as well as nine case studies. Appended to the report is a partial inventory of more than 75 transitional housing projects across Canada.

Prepared by Sylvia Novac, Joyce Brown, and Carmen Bourbonnais. CMHC Project Office: Anna Lenk. Ottawa: Canada Mortgage and Housing Corporation, 2004. 111 pages

Note: No. 04-017 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-ccd/h/Research_Reports-Rapports_de_recherche/eng_unilingual/Transitional%20HousingEN2\(w\).pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccd/h/Research_Reports-Rapports_de_recherche/eng_unilingual/Transitional%20HousingEN2(w).pdf)

WHERE DO THEY COME FROM? WHY DO THEY LEAVE? WHERE DO THEY GO? A STUDY OF TENANT EXITS FROM HOUSING FOR HOMELESS PEOPLE

Using a multi-method research approach that included in-depth interviews, focus groups and a cross-sectional survey, this study focused on the housing stability of formerly homeless persons who live in two alternative housing programs for the "hard-to-house" in Toronto. A central theme from the in-depth interviews was the challenges that participants experienced in the shared housing model. Multivariate logistic regression analysis of data from the cross-sectional survey identified that social support and quality of life (satisfaction with living situation) were significant predictors of housing stability.

Prepared by Uzo Anucha with the assistance of J. David Hulchanski. CMHC Project Officer: Anna Lenk. Ottawa: Canada Mortgage and Housing Corporation, 2003. (CMHC External Research Program Report) 131 pages.

NOTE: No. 03-005 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre and
ftp://ftp.cmhc-schl.gc.ca/chic-ccd/h/Research_Reports-Rapports_de_recherche/eng_unilingual/RR_Homeless.pdf

HOUSE CONSTRUCTION

BUILDING CANADA: PHASE I FINAL REPORT

The purpose of this project was to examine the feasibility of developing a Building Canada program similar to the Building America model. To be effective, the Canadian program had to be of interest to Canadian builders and recognize the different environment by responding to their real needs, i.e., reducing construction costs, customer callbacks, warranty claims, construction time, and construction waste, while at the same time improving the energy efficiency of their new houses. There should be little or no additional cost for the builder and where ever possible a reduction in costs. This study was a necessary first step to determine if a Building Canada program was viable and could be established in Canada. It drew from the experience of the Building America program as well as the results achieved in a pilot with large Canadian builders. This project was managed by EnerQuality Corporation on behalf of a consortium of partners including: CMHC, Enbridge Consumers Gas, Union Gas, Owens Corning, and Natural Resources Canada. Building Canada was deemed a success for large builders and is presently going to be expanded to other areas of Canada.

Prepared by EnerQuality Corporation. CMHC Project Manager: Darrel Smith. Ottawa: Canada Mortgage and Housing Corporation, 2003. 122 pages

Note: No. 04-115 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site

AVAILABILITY : Canadian Housing Information Centre and
ftp://ftp.cmhc-schl.gc.ca/chic-ccdh/Research_Reports-Rapports_de_recherche/eng_unilin_gual/FINISHEDBC-WEB.pdf

INSTALLATION GUIDE FOR RESIDENTIAL WOOD I-JOIST FLOOR SYSTEMS: A GUIDE TO HELP BUILDERS USE WOOD I-JOISTS SAFELY AND EFFECTIVELY

Wood-I-joists have become a common material for framing residential floors. While these products have been available for many years, they are new to some builders. Canada Mortgage and Housing Corporation and the Canadian Home Builders' Association have commissioned the development of this Guide to help builders use wood I-joists safely and effectively.

The Guide presents information that is common to all wood I-joist manufacturers. It is intended to help builders understand basics and to supplement the excellent technical literature and expertise provided by I-joist manufacturers.

Wood I-joists are proprietary products. This means the design values are not standard and the capabilities of I-joists (spans, loads, etc.) and some installation details (nailing patterns, etc.) vary from one manufacturer to another. Good installation and the resulting good performance of a wood I-joist floor system can be provided by understanding and implementing these key basic requirements: storage and handling; installation; span charts; holes in wood I-joists; bearing length; offset walls; rim framing; squash blocks and blocking; web stiffeners.

In addition, the Guide provides information about other topics that will concern builders from time to time including: floor performance, fire safety, and cantilevers.

Prepared by J.F. Burrows Consulting and Accurate Design and Communications Inc. CMHC Project Officer: Darrel Smith. Ottawa: Canada Mortgage and Housing Corporation, 2004. 34 pages

HOUSE CONSTRUCTION

Order number: 63559 **Price: \$10.95 + GST and handling charges

Nota : Aussi disponible en français sous le titre : Guide de pose des solives de bois en I pour les bâtiments résidentiels

Note: No. 04-113 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site

AVAILABILITY : CMHC Information Products

UPDATE OF ROOF TRUSS DESIGNS WITH NAILING SCHEDULES

The purpose of this project was to research standard, simple roof truss designs (Fink W) covering a limited range of loading conditions and spans. The research report includes illustrations and tables providing details on the top and bottom chords, webs, plywood gusset plates and nailing patterns. This information will be useful, especially in certain atypical circumstances, such as remote locations where manufactured trusses are not available, as an alternative to engineered roof trusses or conventionally framed roof systems. The information from this research will be incorporated into the 2005 edition of the Canadian Wood-Frame House Construction publication and CD ROM.

Prepared by Oaktree Engineering Ltd. CMHC Project Officer: Joe Cottitto. Ottawa: Canada Mortgage and Housing Corporation, 2004. 28 pages

Note: No. 04-126 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre

WOOD-FRAME CONSTRUCTION, FIRE RESISTANCE AND SOUND TRANSMISSION

For many years, wood-frame construction has been providing Canadians with high-quality, affordable housing. This goes from town houses to multi-storey apartment buildings, and from single-family bungalows to large luxury houses. The intent of this brochure is to provide some background on fire safe construction concepts, as well as examples of wood-based light-frame building systems designed to maximize fire safety and the reduction of sound transmission between dwelling units.

Forintek Canada Corp., Société d'habitation du Québec and Canada Mortgage and Housing Corporation, c2002. 12 pages.

Nota : Aussi disponible en français et en espagnol. Le titre en français : Construction à ossature en bois, résistance au feu et transmission du son.

AVAILABILITY : Canadian Housing Information Centre

HOUSE CONSTRUCTION INDUSTRY

COMPARISON AND ANALYSIS OF PROVINCIAL BUILDER AND RENOVATOR INDUSTRY PROGRAMS: FINAL REPORT

The purpose of this research project was to investigate the current situation of the provincial builder and renovator training/certification programs in Canada and in other countries, and to conduct a comparative analysis of the programs.

Training/certification programs for builders and renovators have been developed for most regions/provinces in Canada. Each believes, to some degree, that they are unique and thus require regional customization. It is not known how these programs compare to one another and to the National Occupational Analysis for New Home Builder and Residential Renovation Contractor (OA). There is a need to clearly identify the underlying rationale for why and how training programs, delivery, and management systems were developed and implemented.

The objectives of this study were:

1. To analyze the existing programs and compare the individual elements of the required training courses using the tasks and subtasks of the existing National Occupational Analysis for New Home Builder and Residential Renovation Contractor as the reference point.
2. To identify training gaps in the awareness, knowledge acquisition and skill development elements of the courses through comparison to the awareness, knowledge acquisition and skill development elements of the Occupational Analysis.
3. To identify the operational differences and commonalities of the training/certification programs across the country by comparing the delivery processes and management of the programs.
4. To compare training/certification programs in other countries, which have implemented similar industry programs, with those in Canada.
5. To propose a harmonized pan-Canadian model for builders and renovators.

The research involved a series of steps: collection of course materials for analysis; development of a standard course analysis matrix; analysis of course materials; assembly and summary of program requirements/delivery process information; development of a pan-Canadian model; validation of the pan-Canadian model in British Columbia; and presentation of the results at the National Education and Training Advisory Committee.

Prepared by Sun Ridge Group. CMHC Project Officer: Darrel Smith. Ottawa: Canada Mortgage and Housing Corporation, 2004. ca 218 pages

Note: No. 04-122 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site

AVAILABILITY : Canadian Housing Information Centre and
ftp://ftp.cmhc-schl.gc.ca/chic-ccdhd/Research_Reports-Rapports_de_recherche/eng_unilingual/FINAL%20WEB2.pdf

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HOUSING CONSTRUCTION INDUSTRY: CHALLENGES AND OPPORTUNITIES FOR THE 21ST CENTURY

This study examines the evolution of the new house building and renovation construction industry in Canada during the 1990s, the industry's current and future challenges in the period to 2010 and the opportunities for the industry to respond to those challenges. Within this context it looks at the industry and the influences of a variety of external factors.

The focus is the private sector. Public sector activity, namely federal, provincial/territorial and municipal government involvement in social housing construction and delivery, is not covered in the paper.

Topics discussed include:

- the structure of the industry: understanding how the industry is organized and how it functions is a major element in comprehending how external factors affect the industry and how the industry will meet future challenges; and
- external factors that have both short- and long-term effects on the industry: identifying the major trends in areas such as demographics, the economy, regulation, technology; these are important when considering what the future may be like for the industry.

The final section of the paper assesses the challenges and opportunities the industry will face over the next decade.

The study's methodology included a literature review, data gathering and analysis, and a consultation process involving housing industry stakeholders. The report's findings on existing and emerging trends include such aspects as: economic factors, regulatory factors, mortgage financing, trade and labour mobility, development cost charges, taxes, fees and construction costs and technology.

Prepared by Urban Aspects Consulting Group Ltd. & Langlais et associés. CMHC Project Officer: Ian Melzer. Ottawa: Canada Mortgage and Housing Corporation, 2002. 124 pages

Note: No. 03-004 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre

INDUCED MACROECONOMIC IMPACTS OF THE HOUSING SECTOR

This study presents a series of simulations investigating the macroeconomic impacts of a two-year, temporary increase in housing construction activity. The simulations were conducted with the FOCUS macroeconomic model, built and maintained at the Institute for Policy Analysis, University of Toronto.

The central section of the study presents simulation results for 16 separate simulations. These simulations consider all the possible combinations of four basic two-way choices of assumptions:

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new construction versus alterations, high versus low growth in the underlying economy, historically observed versus observed-times-two import propensities in the construction sector and monetary policy aimed at stabilizing interest rates versus monetary policy aimed at stabilizing exchange rates.

The simulations show that a temporary increase in housing activity can have important induced effects on the economy, and that stimulus of this sort could be used as a tool of countercyclical policy during a slump or recession. Stimulus takes up to a year to gather momentum and can persist for a year or more after the stimulus is removed. The simulations also indicate that temporary housing stimulus of this kind develops its own contractionary aftershock within 3 to 4 years (or somewhat longer under interest-rate targeting).

The simulations indicate small differences in impact when new construction is compared to alterations. Doubling import propensities in construction naturally scales down the expansionary impact of construction activity, since expenditure leakages in the form of imported building materials are greater. The choice of interest rate and exchange rate control has little effect on impacts of the case, but do produce more pronounced differences over the longer term. Assumptions about the state of economy have little impact on the simulation results.

Prepared by DRI/McGraw Hill. Ottawa: Canada Mortgage and Housing Corporation, 2003? 36 pages

AVAILABILITY : On a loan basis only from Canadian Housing Information Centre

INDUSTRY PROFILE: CANADIAN LIGHTWEIGHT STEEL FRAME RESIDENTIAL BUILDING INDUSTRY

“Lightweight steel framing” is a name used to define a class of products manufactured from sheet steel that is formed to shape at room temperature (cold formed). The most common LSF shapes are C-sections used as wall studs, floor joists and roof rafters. As structural framing members, LSF sections are manufactured from sheet steel with specific properties and are engineered products.

Presented in this report is an overview of the Canadian light steel framing industry. This includes a description of the products currently in use, the common applications for these products, advantages, training requirements and a list of the current manufacturers. The intention is to give the reader a general understanding of the current Canadian industry, and identify companies that may be possible exporters.

Prepared by L. Xu, Canadian Cold Formed Steel Research Group, University of Waterloo. CMHC Project Officers: Murray Rasmussen and Jorge A. Malisani. Ottawa: Canada Mortgage and Housing Corporation, CMHC International, 2002. 39 pages

AVAILABILITY : On a loan basis from Canadian Housing Information Centre

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INSURANCE IN RESIDENTIAL CONSTRUCTION: AN ENVIRONMENTAL SCAN: EXECUTIVE SUMMARY FINDINGS REPORT

In Canada, home builders acquire protection via various forms of insurance, including, among others, builders risk insurance, wrap-up general liability insurance and contractors comprehensive general liability insurance. Together, these types of coverage, whether purchased on a project-by-project or continuous basis, not only provide builders with protection for loss and liability throughout and following construction projects but also act as a means of securing the interests of financial stakeholders associated with the project(s).

This study was designed to satisfy the following key objectives:

- Develop an understanding of the issues surrounding builders risk insurance; and
- Develop an understanding of the issues surrounding post-construction liability insurance.

Primary research for this study consisted of conducting nationwide interviews of residential construction companies, insurance underwriters and brokers, and associations and lending organizations, while secondary research consisted of documentation and literature reviews of previously published articles, research and proprietary association and company materials.

According to the research conducted, the insurance market for all types of commercial coverage has hardened over the last three years. A “hard” market designates an environment characterized by rising prices and reductions in capacity to underwrite insurance. The market has reacted to the events of September 11, reductions in reinsurance capacity, poor underwriting results and a difficult investment climate. The insurance industry’s appetite for insuring residential construction projects has been particularly weak in response to widely publicized catastrophic fires at construction sites at several different locations across Canada and the emergence of new risks such as mold and terrorism. The insurance market for residential construction is contracting, with lower risk tolerance and fewer companies participating in the market.

Over the last three years, home builders have identified construction insurance as a critical problem area with reports of higher premiums and deductibles, reduced levels of coverage, new warranties and conditions attached to the policies, as well as refusals of coverage. These recent developments are a cause of concern in the housing industry with respect to the cost and availability of insurance. The cost of insurance ultimately affects housing affordability and the profitability of the home builders’ business.

Prepared by Deloitte & Touche. CMHC Project Officer: Eric Tsang. Ottawa: Canada Mortgage and Housing Corporation, 2004 (Housing Affordability and Finance Series) 51 pages

Order number 63425

Nota : Aussi disponible en français sous le titre : L’assurance dans le secteur de la construction résidentielle : une analyse de l’environnement : rapport sommaire sur les constatations

Note: No. 04-013 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site

AVAILABILITY : CMHC Information Products and
<https://www.cmhc-schl.gc.ca:50104/b2c/b2c/mimes/pdf/63425.pdf>

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CANADIAN HOUSING OBSERVER

Illustrated with extensive, colourful charts, the *Canadian Housing Observer*, offers readers a comprehensive review of housing in Canada, identifying and commenting on the most important trends and issues. It brings together national coverage with details on provinces and major metropolitan areas.

As a stand-alone print publication, the *Observer* is a concise, valuable resource. The chapter headings reveal the scope of the publication:

1. Introduction: Why Housing Matters
2. The State of Canada's Housing: An Overview
3. A Portrait of Canada's Housing
4. Demographic and Socio-economic Influences on Housing Demand
5. Current Housing Market Developments
6. Trends in Housing Finance
7. Housing Affordability

The web version of the *Observer* -- available at www.cmhc.gc.ca -- provides links to more detailed housing data relating to the trends reviewed in the print publication, covering all major housing markets across Canada, including provinces and metropolitan areas. The *Observer* data tables will be refined and expanded over time, as additional information becomes available.

Ottawa: *Canada Mortgage and Housing Corporation, 2003 - 2004. 2 volumes Bilingual*

Issue 2003 (75 pages): Order number: 63125

Issue 2004 (84 pages): Order number: 63610

AVAILABILITY : On the CMHC web site and from CMHC Information Products

ENVIRONMENTAL SCAN ON THE USE AND EFFECTIVENESS OF GEOGRAPHIC INFORMATION IN THE HOUSING SECTOR IN CANADA: FINAL REPORT

Hickling Arthurs Low (HAL) Corporation was engaged by CMHC to investigate the use and effectiveness of geographic information (GI) in Canada's housing sector, and to undertake comparisons of this use with that in Australia, Germany, and the United States. This study went beyond a narrow consideration of geographical information systems (GIS) to include all GI and tools, including such disciplines as cartography, photogrammetry, surveying, remote sensing, etc.

Information was collected through a literature and web review, interviews, an electronic survey and a workshop. The study team conducted over 70 in-depth confidential interviews, 40 in Canada, 32 in Australia, Germany, and the USA. An electronic survey was conducted of housing sector stakeholders across Canada. A workshop was held to consider further uses of GI for the real estate segment of the housing sector.

The organizations consulted fell into two broad categories: those which had a primary interest in geographic information and secondary interests in thematic data, of which one application involved housing; and those which had a primary interest in the housing sector and peripheral interests in GI as a component of their total information needs. The results of the consultations

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revealed that there are very few personnel with a primary interest in both areas, reflecting the minor role GI and geospatial tools play in the housing sector.

This study reviewed the use of GI in a number of housing sub-sectors, both in Canada and abroad. Consideration of the status of GI use in each housing sub-sector, and the potential for benefits, led to recommendations of where effort should be focused in promoting GI use in the future. These recommendations balance considerations of which sub-sectors already have made significant progress in GI use (and thus require less assistance) and which sub-sectors have little potential to benefit from GI (and, thus, there is little to gain from assistance).

Most housing sub-sectors have achieved a reasonable balance between current GI use and potential benefits. However, there are three housing sub-sectors where GI promotions and efforts could provide increased benefits. These are, in order of priority, real estate, appraisal and assessment, and safety and security.

Prepared by Hickling Arthurs Low. CMHC Project Officer: Pierre Lanciault. Ottawa: Canada Mortgage and Housing Corporation, 2003. 157 pages

Nota : Aussi disponible en français sous le titre : Analyse de l'environnement : utilisation et efficacité de l'information géographique dans le secteur de l'habitation canadien

AVAILABILITY : Canadian Housing Information Centre and
ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_bilingual/geographic%20information.pdf

HOUSING NEEDS OF LOW-INCOME PEOPLE LIVING IN RURAL AREAS

This research report summarizes the housing situations of low income persons living in rural areas of Canada. It also identifies the barriers to addressing their housing needs, and the opportunities that exist in rural communities and small towns to address these situations.

Three approaches were employed to develop an understanding of the housing needs of low income people living in rural areas. A literature review and a statistical review were conducted concurrently. This was followed by 12 case studies conducted in 12 diverse rural communities and small towns across Canada. This included key informant interviews and a review of relevant local documents. The case study sites were:

Brooks, Alberta	Preeceville, Saskatchewan	Coral Harbour, Nunavut
Russell, Manitoba	Kingston-Greenwood, N.S.	Saint-Fabien-de-Panet, Québec
Maniwaki, Québec	St. Stephen, N.B.	Marystown, Newfoundland and Labrador
Wawa, Ontario	Mississippi Mills, Ontario	Port Elgin, Ontario

Statistical Review prepared by Paddy Fuller with David Bruce, Tom Carter, and Ed Starr. Literature Review prepared by David Bruce with Tom Carter and Glenda Quinn. Case Study Report prepared by David Bruce with contributions from Tom Carter, Ed Starr, Jino Distasio, Austra Burns. CMHC Project Officer: Anna Lenk. Ottawa: Canada Mortgage and Housing Corporation, 2002. 3 volumes (Distinct Housing Needs Series)

Nota : Aussi disponible en français sous le titre : Les besoins en matière de logement des personnes à faible revenu habitant en milieu rural

Note: No. 116 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre

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PARTICIPATION DES RÉSIDENTS ET STRATÉGIES DE RESPONSABILISATION DES COLLECTIVITÉS

This study deals with the viability of housing-related enablement strategies in a multiethnic context. It attempts to evaluate if cultural diversity can hinder collective action and identifies possible solutions promoting involvement and enablement initiatives in an ethnic context like that of Parc Extension in Montréal (targeted neighbourhood). The quantitative section of the study includes a survey among the residents of the neighbourhood, aimed at studying the relation between certain key factors, such as cultural diversity, the feeling of belonging, the property management approach and social behaviour and the willingness to get involved in the typical enablement project. Through statistical tests and a series of logistic regressions, certain conclusions were reached, including: that the factors that generally favour involvement are operational, even in a multiethnic context like that of Parc Extension; that the application of enablement approaches poses some particular obstacles, related especially to language barriers; that housing has a role to play, more specifically the property management approach; and that the residents seem ready to take up the challenge of involvement but not necessarily that of leadership.

Prepared by Marguerite Montfort with the assistance of Renée Lachapelle. Ottawa: Canada Mortgage and Housing Corporation, 2002. (CMHC External Research Program Report) ca. 152 pages

AVAILABILITY : Canadian Housing Information Centre

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ADDRESSING HOUSING NEED THROUGH ACQUISITION OF EXISTING DWELLINGS: SECHELT, BC = RÉPONDRE AUX BESOINS DE LOGEMENT PAR L'ACQUISITION D'UNITÉS D'HABITATION EXISTANTES : SECHELT (C.-B.)

This project aimed to acquire and operate 15 existing units as affordable housing, primarily for low-income single women (with or without dependents) in the Town of Gibsons, BC. The primary purposes were to improve access to affordable housing for the target group and to demonstrate the feasibility of using existing housing stock, selected from a market that is either depressed or conventionally low in cost, to acquire a scattered portfolio of dwellings in order to meet social housing needs.

The initiative failed to achieve its objectives for a number of reasons, but inability to secure funding support from BC Housing Management Commission was the main difficulty.

When the original project objective was foreclosed due to absence of provincial funding, volunteers fashioned an idea of a housing registry, generated at community workshops, into a workable and affordable alternative for improving access to affordable market housing.

The final report was produced by the Coast Housing Society to document this initiative in order to share information with those wanting to address the need for affordable housing in their community.

Final report submitted to Homegrown Solutions by Coast Housing Society. Ottawa: Canada Mortgage and Housing Corporation, 2002. 42 pages

AVAILABILITY : Canadian Housing Information Centre

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AFFORDABLE HOUSING IN CANADA'S URBAN COMMUNITIES: A LITERATURE REVIEW

The Privy Council Office created an internal task force on urban communities in 2002 to compile and present a strategically useful profile of federal programs and services in Canada's urban communities, to develop a targeted research agenda for assessing the impact of federal policies and programs on urban communities and to guide the development of a strategy in support of the government's agenda. Affordable housing is an identified priority issue in the context of targeted research on social cohesion, inclusion and diversity, and sustainable environment and urban infrastructure. This literature review is intended to identify issues with respect to urban affordable housing and will complement research into other topic areas and facilitate discussion on linkages between housing and other social, economic and environmental issues of concern to Canada's urban centres. This review is the first phase of a broader planned study on affordable housing. The goals of the overall study are to: identify and analyze current key issues and challenges facing Canadian urban communities in the field of affordable housing; provide an overview of the Government of Canada's current and historic role in the affordable housing sector; and identify best practices and successful models of affordable housing policy and provision in Canada's urban communities.

Prepared by Sharon Chisholm. CMHC Project Officer: Brian Davidson. Ottawa: Canada Mortgage and Housing Corporation, 2003. 60 pages.

Note : Aussi disponible en français sous le titre : Le logement abordable dans les collectivités urbaines du Canada : étude documentaire

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_biling_ual/RR%20Affordable%20Housing_FINAL\(w\).pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_biling_ual/RR%20Affordable%20Housing_FINAL(w).pdf)

ASSESSMENT OF THE DIRECT AND INDIRECT IMPACTS OF THE ACT PROGRAM

The purpose of this project was to assess the impact of the ACT Program both directly from ACT-funded projects and indirectly through initiatives that have replicated ACT solutions without funding from the program.

Interviews were conducted with up to 2 project leaders and partners for 26 ACT funded projects, to assess direct impacts. Interviews were conducted with 43 municipal officials (drawn from the ACT mailing list, the ACT Forum participant list, and from referrals from direct interviewees) to determine if their municipality had replicated or used ACT ideas or solutions to implement regulatory reforms to address housing affordability and choice issues, without ACT funding.

Prepared by David Bruce, Rural and Small Town Programme, Mount Allison University. CMHC Project Officer: Susan Fisher. Ottawa: Canada Mortgage and Housing Corporation, 2003. 88 pages

AVAILABILITY : Available on a loan basis only from the Canadian Housing Information Centre

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FINAL REPORT ON THE TERRASSE GREENFIELD PROJECT “FROM TENANCY TO COMMUNITY OWNERSHIP” = RAPPORT FINAL SUR LE PROJET DES TERRASSES GREENFIELD "DE LA LOCATION À LA COPROPIÉTÉ"

Services d'Animation Teninform Inc. sought to facilitate a process of tenant acquisition in order to rehabilitate and to preserve ongoing affordability of a large 200-unit private rental project on the South Shore of Montreal, originally developed as a limited dividend project. The attempt to organize residents, and to undertake a feasibility assessment was funded in part by Homegrown solutions and by the pro-bono contribution of coordination and legal services of Services d'Animation Teninform Inc.

The initiative has not been successful due to a number of factors:

- A very litigious environment in which the existing owner is engaged in legal action against individual tenants, the residents association and the municipality;
- Reluctance on the part of the Municipality or tenants' association to approve conversion of the property to facilitate sale of individual units;
- Very limited interest on the part of existing residents in participating in a tenant-led acquisition -- underpinned by fears that rents will increase, even though this would likely be combined with extensive physical repairs;
- Inability to retain a well qualified consultant to animate and coordinate the process;
- Lack of local funding to facilitate the acquisition and rehabilitation process; and
- A large scale metropolitan amalgamation process that has preoccupied the energy of municipal officials.

Although very little progress has been made to date, the proponents believe that there may be an opportunity in the future due to the more extensive resources of the amalgamated municipality as well as the possibility of additional funding under the new federal-provincial affordable rental program.

Prepared by Arnold Bennett, President, Services d'Animation Teninform Inc. Submitted to Homegrown Solutions. Ottawa: Canada Mortgage and Housing Corporation, 2002. 33 pages

AVAILABILITY : Canadian Housing Information Centre

IDEAS THAT WORK: BEST PRACTICES IN AFFORDABLE HOUSING MANAGEMENT

The Canadian Housing and Renewal Association (CHRA) has documented this sample of best management practices in Canadian social housing to help providers address their pressures and promote improvement across the sector.

This manual contains six best practice case studies, a synopsis of 27 good management practices across Canada, a section on future trends -- creative new initiatives that have not yet been fully implemented or had time for a thorough evaluation -- and an overview of two best practice initiatives currently underway in B.C. and Ontario. Best and good practices in affordable housing management were selected in six key areas for this manual: financial management; maintenance; governance and accountability; housing management; development planning; and human resources management. In addition, the “Resources” section identifies other information sources for achieving best practices.

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Non-profit societies and housing cooperatives can adopt or adapt the examples in this manual to streamline administrative processes, use resources more efficiently and effectively, improve fiscal accountability, accountably, enhance self-sufficiency and encourage innovation

The research work and development of the manual was undertaken by a research team led by Jim Woodward of Jim Woodward & Associates Inc. CMHC Project Officer: Bill Lortie. Produced with the assistance of Canada Mortgage and Housing Corporation and Peel Non-Profit Housing Corporation. Ottawa: Canadian Housing and Renewal Association, 2002. 48 pages

Nota : Aussi disponible en français sous le titre : Des idées qui fonctionnent : pratiques exemplaires en gestion de logements à prix abordable

AVAILABILITY : Canadian Housing and Renewal Association

SCIP WEB SITE FOR PUBLIC RELEASE

The purpose of this research is to revise the content of the prototype dynamic SCIP web site and complete preparation of the changed nature of the SCIP web site to be more of a static as opposed to dynamic web site with SCIP serving as a comprehensive reference site on indicator development, documentation and use on Environment Canada's web site to assist municipalities establishing, developing and monitoring their own sustainable communities indicators programs.

AVAILABILITY : Product is available on the web

ST. CLARE'S MULTIFAITH HOUSING SOCIETY: 25 LEONARD AFFORDABLE HOUSING PROJECT = ST. CLARE'S MULTIFAITH HOUSING SOCIETY : ENSEMBLE DOMICILIAIRE ABORDABLE, 25, AVENUE LEONARD

This report documents the construction of 50 units of affordable apartments targeted to low income singles exiting the shelter system. It is the culmination of 5 years of effort by an advocacy organization - Toronto Action for Social Change (TASC) - combining advocacy with a pragmatic "just do it" approach.

TASC became involved with a group of street youth that had been arrested for squatting in the square fronting Toronto City Hall after they were evicted from a squat. After helping the youth secure bail and dealing with the justice system, a partnership emerged with a focus on finding a way to build affordable housing where youth like these could live. In the absence of ongoing social housing programs, the task was to find a way to secure a property, funding and financing.

TASC incorporated a legal entity so that the group would be eligible for charitable status and could make offers on property. The group focused its efforts on trying to acquire existing properties suitable for conversion to apartments. After making offers on various properties, an agreement for purchase was successfully negotiated on a former medical office building at 25 Leonard, in downtown Toronto. The property was converted to create 50 small one-bedroom units.

25 Leonard is one of the first projects to be built in Ontario outside of a formal program, and based on bundling together various sources of funding and using a creative financing approach - including the line of credit approach as a way to secure property. This final report was produced

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by the St. Clare's Multifaith Housing Society to document this initiative in order to share with those wanting to address the need for affordable housing in their community.

Prepared by St. Clare's Multifaith Housing Society. Final report to Homegrown Solutions. Ottawa: Canada Mortgage and Housing Corporation, 2002, 47 pages

AVAILABILITY : Canadian Housing Information Centre

THINK BIG: ACT SMALL: AN OVERVIEW OF THE PETERBOROUGH COMMUNITY HOUSING DEVELOPMENT CORPORATION

Peterborough Community Housing Development Corporation (PCHDC) was created in 1998 to address the void in meeting the need for affordable housing. Established with a broad base of support from the community, business and political sectors, this corporation has quickly evolved as a leading example of innovation and resourcefulness. Initially funded by Homegrown Solutions to develop a community land trust as a vehicle to hold acquired properties, work on the community land trust is still ongoing. The PCHDC relieves a serious affordable housing shortage in Peterborough by rescuing old homes (some slated for demolition), renovating them, and renting them to low-income families. In order to operate effectively, the PCHDC forms partnerships with other agencies and community organizations in the public, private and non-profit sectors. The PCHDC acts as a developer, builder, landlord, and property manager.

This final report provides an overview of the PCHDC experience in Peterborough and provides insights into methods of community organizing, broadening community support, cost effective ways to acquire and develop housing, effective fund raising techniques and creativity in leveraging new assets.

Prepared by the Peterborough Community Housing Development Corporation. Final report to Homegrown Solutions. Ottawa: Canada Mortgage and Housing Corporation, December 2002, 20 pages

AVAILABILITY : Canadian Housing Information Centre

HOUSING AND IMMIGRATION

INSERTION RÉSIDENTIELLE DES JEUNES ISSUS DE L'IMMIGRATION À MONTRÉAL : RAPPORT FINAL, VERSION DÉFINITIVE

This research is the result of cooperation between CMHC and the Immigration et métropoles inter-university research centre as part of the Metropolis Project with which CMHC is associated as a federal partner.

Back in 1996 in the Montreal metropolitan area, more than one resident in six (17.8 %) was born outside Canada. The immigrant population is growing in both absolute and relative terms. Since

1986, the household formation rate is higher among immigrants than among non-immigrants. There is thus reason to believe that young immigrants are accounting for an ever-increasing share of the residential market in the Montreal area.

HOUSING AND IMMIGRATION

The objective of this study is to paint a descriptive picture of the residential situation of young persons who are the products of immigration in Montreal in 1996 between 15 and 29. The research is based on a special compilation of census data from 1996 for the Metropolitan Montreal area (according to a 28-zone division) obtained from Statistics Canada. In this report, the authors deal with the following dimensions:

- the type of occupation (owner or tenant);
- the type of housing lived in;
- its location within the metropolitan area; and
- the affordability ration (i.e. the percentage of income earmarked to housing expenses).

The report also contains financial status indicators of the households concerned -- median income and the frequency with which income is less than \$20,000.

Prepared by Anne-Marie Séguin, Damaris Rose, Jaël Mongeau, INRS-Urbanisation, Culture et Société. CMHC project officer: Kim Anh-Lâm. Report produced as part of the Metropolis Project and submitted to Canada Mortgage and Housing Corporation. Ottawa: CMHC, 2003. 96 pages

AVAILABILITY : Canadian Housing Information Centre

METROPOLIS - CENTRES OF EXCELLENCE FOR RESEARCH ON IMMIGRATION ISSUES

CMHC and other federal departments provide ongoing financial support to stimulate and support policy-relevant research on immigration issues through a network of research centres in Canadian universities (Centres of Excellence). The results of the research will be used for the assessment of and development of policies and programs affecting immigrants and new Canadians. As an example, CMHC should benefit from research to be undertaken by the Centres in such areas as:

1. the effect of immigration on housing markets, demand and supply;
2. the effect of immigration on urban development, including issues of renewal of the urban core;
3. the impact of immigration on housing need, affordability, homelessness and the demand for social housing;
4. the social and spatial mobility of immigrants as compared with the profiles of the Canadian-born;
5. the relationship between immigration and the formation of ethnic, cultural or religious enclaves; the dynamics of enclaves - their role in integration (bridging or isolating), their economic role, their effect on city life, on urban renewal, on public safety, and so forth;
6. the relationship between metropolitan infrastructure (the quantity, quality and distribution of housing and public space) and immigrant integration.

AVAILABILITY : Information on Metropolis and on close to 200 funded research projects can be found at www.canada.metropolis.net

HOUSING AND IMMIGRATION

REFUGEE HOUSING INFORMATION NEEDS: RESEARCH CONDUCTED IN THE REGION OF NIAGARA

The Peace Bridge between Canada and the United States at Fort Erie, Ont. is Canada's highest volume entry point for refugees seeking asylum in Canada. Since 2000, an average of more than 5,000 refugees per year have entered the country at Fort Erie, with a peak in 2001 of 7,070, the largest number at any point of entry in Canada. Since 1998, the number of refugees entering Canada at Fort Erie has climbed by approximately 400 per cent, compared to a Canada-wide increase of about 60 per cent.

The increase has put tremendous pressure on the demand for low-cost rental housing in the region. The four objectives of this research were: to identify the current housing situation of refugees who choose to stay in the Niagara region (Fort Erie, Welland, St. Catharines and Niagara Falls), the housing options available to them, their housing information needs, and how these needs can be met.

Prepared by David Redmond and Associates. CMHC Project Officer: Judith L. Binder. Ottawa: Canada Mortgage and Housing Corporation, 2004. 60 pages

Note: No. 04-025 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-ccd/h/Research_Reports-Rapports_de_recherche/eng_unilingual/CHIC-refugee\(W\).pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccd/h/Research_Reports-Rapports_de_recherche/eng_unilingual/CHIC-refugee(W).pdf)

HOUSING DESIGN

FLEXHOUSING CONSUMER DEMAND AND INFORMATION NEEDS IN B.C.

This report examines the new approach to home design, building and renovation called FlexHousing. FlexHousing is a concept in housing that incorporates, at the design and construction stage, the ability to make future changes easily and with minimum expense, to meet the evolving needs of its occupants. This approach means that people are able to reside in the same dwelling for longer periods of time by more easily making affordable alterations to the home, including a wide range of possible adaptations that suit changing life stage needs.

The objectives of this research project were:

- to assess overall awareness and attitudes toward FlexHousing by home buyers and home renovators (i.e. consumers) in British Columbia;
- to segment consumer demand and awareness of FlexHousing into first-time and repeat buyers as well as home renovators;

- to identify the key 'influences' of consumer preferences in purchasing or renovating a home; and
- to identify any gaps in knowledge that consumers might have with regard to FlexHousing.

The findings of the project included the following:

HOUSING DESIGN

- While few have heard of the concept, when provided with a brief description, interest levels were high regarding FlexHousing. Approximately two thirds (65%) of those surveyed were 'very' or 'somewhat' interested in the concept;
- When projected over the entire population, 21% would be potential FlexHousing consumers over the next five years. A total of 17% would potentially purchase a Flex home, while another 5% would initiate a major renovation that includes FlexHousing features;
- The reasons for interest in FlexHousing were varied and included: (a) ease of future renovations or improvements; (b) the ability to adapt to changing household circumstances; (c) improved access for the elderly among those 55+; (d) eliminate the need to move and associated costs; and, (e) positive impact on resale value of the home.
- The highest priority appears to be given to those features than can serve a useful purpose regardless of the life stage of the homeowner, and which appear to entail relatively little cost
- Although the benefits were apparent and considered desirable, there was widespread agreement that Flex features should not leave a home looking like it has been built for a handicapped person (due to perceptions that this would negatively affect resale value).
- Those planning on purchasing a home within the next five years said they would pay on average \$15,655 above the cost of a conventional home for one with Flex features (representing a 6% increase over the anticipated cost of their future home).
- Renovators would pay an additional \$6,115 for Flex features, representing a 42% increase over the expected average cost of their next renovation.
- Information consumers would like to have about FlexHousing included: (a) types of features that can be incorporated to meet a person's specific needs; (b) cost implications of Flex features; (c) construction and installation tips; (d) building code and zoning bylaw restrictions; and, (e) a list of reputable contractors that are knowledgeable and experienced in FlexHousing concepts.

Prepared by McIntyre & Mustel Research Ltd. CMHC Project Officer: Norm Connolly. Ottawa: Canada Mortgage and Housing Corporation, 2003. 2 volumes

AVAILABILITY : Available on a loan basis only from the Canadian Housing Information Centre

HOUSING EXPORT OPPORTUNITIES

BUILDING REGULATIONS IN ICELAND

Iceland represents a small but promising niche market for Canadian housing exporters. The Icelandic housing market, currently at 1400 starts per year, is expanding due to a strong economy and new industrial developments in the east. Virtually all building materials in Iceland must be imported and housing costs are high, making Canadian products quite competitive. Interest in wood frame construction is growing. Although the regulatory environment is quite conservative, most Canadian systems and products can be accepted. This bulletin summarizes the regulatory requirements related to imported housing.

Ottawa: CMHC International, 2003. 7 pages

Nota : Aussi disponible en français sous le titre : Règlement de construction en Islande

AVAILABILITY : CMHC Web site at:

http://www.cmhc-schl.gc.ca/en/homadoin/excaprex/suexin/suexin_021.cfm

HOUSING EXPORT OPPORTUNITIES

CANADIAN EXPORTERS GUIDE TO U.S. RESIDENTIAL BUILDING CODES

For those Canadian firms that are contemplating the export of housing or housing components, the United States is a compelling market. It is close, it is familiar, it is big and it is rich.

It is also different. The United States has a wider range of climate zones and endures more extreme weather than does Canada - from the cold of the north, to the humidity and hurricanes of the south, to the heat and deserts of the southwest. In addition to the environmental challenges, there are code and regulatory issues for Canadians. There are five, major, building code models in active use across the U.S. at this time. In addition, there are a number of codes developed by individual states or by major cities. Also, each state and municipality may apply additional regulations and approval requirements to the adopted model code. So an exporter who wishes to market to more than a single state may have to meet the requirements of more than one code and each state's individual regulations and approvals may differ in detail even if they use the same code.

Further, each building code of itself is a large and complex document and a considerable effort is required to investigate and determine how the design and assembly of a house or a housing component may be required to adapt for compliance. For many Canadian housing manufacturers this neighbour to the south remains an uncertain and an unrealized market.

The purpose of this study is to help Canadian manufacturers of housing products gain an understanding of U.S. building codes and regulations for housing. The main focus is the International Residential Code (IRC), which is emerging as the prevailing standard for residential construction in the U.S. This study is also intended to provide a summary of the standards and approvals that may be required for code compliance of individual housing products in the United States.

This Guide is divided into six sections:

- Section 2 provides an overview of the different U.S. building codes and develops a rationale for focusing this work on the International Residential Code. Section 2 also provides a brief overview of some of the statistical characteristics of the U.S. housing market.
- Section 3 summarizes the key differences between the International Residential Code and the National Building Code of Canada. Section 3 also provides a brief summary of some of the differences between the IRC and the Uniform Building Code.
- Section 4 provides a review of U.S. Energy Codes (Model Energy Code and International Energy Conservation Code) and the ENERGY STAR Program. It also provides a summary of several state code requirements of efficiency and ventilation.
- Section 5 provides a review of the Requirements for Manufactured Housing.
- Section 6 provides a summary of the standards and approvals that are required for selected housing products in the U.S.
- Section 7 provides a brief set of conclusions and lists the next steps a new exporter might take.

*Prepared by Bruce Gough, Energy Building Group Ltd. CMHC Project Manager: Terry Robinson.
Ottawa: CMHC International, 2003. 112 pages*

Nota : Aussi disponible en français sous le titre : Guide des codes de construction résidentiels des États-Unis à l'intention des exportateurs canadiens

AVAILABILITY : CMHC web site at:

<http://www.cmhc-schl.gc.ca/en/homadoin/excaprex/suexin/upload/A-Guide-for-Canadian-Exporters-to-US-Residential-Building-Codes.pdf>

HOUSING EXPORT OPPORTUNITIES

EXPORTING TO MEXICO: LESSONS LEARNED FROM THE CANADIAN HOUSING INDUSTRY

This report includes a presentation of the Mexican housing situation, an analysis of Canadian company experience in Mexico, and, an analysis of CMHC's role vis-à-vis the Mexican market.

Prepared by Mercadex International Inc. CMHC Project Officer: Tulio Conejeros. Ottawa: CMHC International, Canada Mortgage and Housing Corporation, 2003. 89 pages.

Nota : Aussi disponible en français sous le titre : Exporter au Mexique : Leçons tirées de l'industrie canadienne de l'habitation

AVAILABILITY : CMHC International and

<http://www.cmhc.ca/en/homadoin/excaprex/repu/loader.cfm?url=/commonspot/security/getfile.cfm&PageID=59190>

GERMAN HOLIDAY FUND SCHEME

Are you planning to export or provide Canadian labour services in Germany? The unique German holiday fund scheme may impact your company. This document reflects on the function of the German "Holiday Fund Scheme". It analyzes particularly the possibilities for Canadian producers of prefabricated houses and log homes to be exempted from the compulsory membership in the fund.

Prepared by Andreas Saggau. Ottawa: CMHC International, Canada Mortgage and Housing Corporation, 2003. 32 pages

Nota : Aussi disponible en français sous le titre : La Caisse de vacances allemande

AVAILABILITY : CMHC International and

<http://www.cmhc-schl.gc.ca/en/homadoin/excaprex/suexin/upload/German-Holiday-Fund-Scheme.pdf>

GETTING STARTED! GUIDE TO BUILDING REGULATIONS IN THE UNITED KINGDOM

This guide will help Canadian exporters of housing systems and components, to better understand the UK regulatory framework, to obtain the necessary approvals and to identify potential trade obstacles as well as regulatory issues.

It focuses on the market that will be of most interest to Canadian exporters: new-build, low-rise residential buildings up to three storeys above ground; principally detached, semi-detached and row (terraced) housing. This guide covers wood-frame house construction known as timber frame housing in the UK. It also considers all the related components such as finishes (linings), claddings, insulation, vapour control layers and joinery.

“Getting Started” is organized into a number of sections:

HOUSING EXPORT OPPORTUNITIES

- Section 1 describes The Building Regulations 2000 for England and Wales that apply to housing up to three storeys. This section describes the Canadian export potential.
- Section 2 gives some essential information which needs to be considered even before an exporter can begin getting started.
- Section 3 describes the way that UK timber frame houses are built to meet these standards, gives an overview of the similarities and differences of Canadian housing design and where necessary, identifies additional measures needed to meet the requirements
- Section 4 provides guidance on the UK procedures for approvals and certification for housing products and systems.
- Section 5 gives an overview of the UK housing warranty schemes.
- Section 6 provides references and information sources for exporters.

Appendices provide additional information including: the Housing Corporation “Scheme Development Standards” for social housing; an overview of building regulations for Scotland and Northern Ireland, and a glossary of building and construction terms.

Prepared by Geoffrey C. Pitts in association with Jeff Armstrong, Bill Boles, Bruce Gough, Julie Levi and Simon Palmer. CMHC Project Officer: Terry Robinson. Ottawa: CMHC International, Canada Mortgage and Housing Corporation, 2003.

Nota : Aussi disponible en français sous le titre : Pour commencer! Guide aux réglementations du bâtiment au Royaume-Uni

AVAILABILITY : CMHC International and
<http://www.cmhc-schl.gc.ca/en/homadoin/excaprex/suexin/upload/Getting-Started-Guide-to-Building-Regulations-in-the-United-Kingdom.pdf>

GUIDE TO THE U.S. ENERGY STAR PROGRAM FOR CANADIAN HOUSING EXPORTERS

ENERGY STAR is a US national voluntary program for the labeling of energy efficient products. The purpose of this guide is to introduce exporters to the ENERGY STAR Program and to help guide those who may wish to apply the ENERGY STAR label to their export products. The major focus is upon the application of ENERGY STAR to new houses in the US. Other sections of the report review the requirements for other ENERGY STAR eligible housing products that may be exported to the US including windows and doors, heating and cooling equipment, and, reflective roof products. With the exception of houses, these products may also be labeled and marketed with the ENERGY STAR in Canada.

A major sub-objective of this work was to compare ENERGY STAR for Homes with Canadian building code requirements and with the R-2000 Standard which is the Canadian voluntary labeling program for efficient new houses. While ENERGY STAR for Homes differs from R-2000 there is an opportunity for exporters to transfer skills and knowledge from the Canadian experience to the US through ENERGY STAR.

A study was undertaken which compares the energy performance of a number of house plans built to the Canadian standards and using the ENERGY STAR rating software. The results of this

study are attached to this report as Appendix A: Comparisons with Canadian Standards and an “ENERGY STAR Ready” Package. An “ENERGY STAR Ready” Package is recommended for exporters and the sensitivity of the performance rating of the package is examined in different locations across the US and through a series of changes to the specification.

HOUSING EXPORT OPPORTUNITIES

Prepared by Bruce Gough, Energy Building Group Ltd. CMHC Project Manager: Terry Robinson. Ottawa: CMHC International, c2004. 61 pages

Nota : Aussi disponible en français sous le titre : Guide sur le programme Energy Star des États-Unis à l'intention des exportateurs canadiens du secteur de l'habitation

AVAILABILITY : CMHC Information Products (Order number: 62398) and <http://www.cmhc-schl.gc.ca/en/homadoin/excaprex/suexin/loader.cfm?url=/commonspot/security/getfile.cfm&PageID=68932>

HOUSING MARKET IN ICELAND

Canada Mortgage and Housing Corporation conducted a study on the Icelandic housing market and its opportunities for the Canadian housing industry. The project was done in partnership with the Canadian Embassy in Iceland. A local consulting firm was hired to undertake the research.

The study presents an overview of the country, some economic trends, key characteristics of the housing market, such as stock and demand, opportunities in the new housing sector, regulations and certification for buildings, and some business considerations for Canadian companies. Contact information is also listed for some key players in the industry, such as architects, contractors, consultants, and government agencies.

Overall, Iceland presents some small scale opportunities for Canadian wood frame housing. Climatic similarities with the east coast, high incomes and a tradition of imports among Icelanders play in favour of these opportunities. However, the market poses many challenges to Canadian exporters, among which are, for each house, a unique design and engineering testing for approval and strict fire resistance requirements.

Prepared for CMHC by: Linuhönnun HF Consulting Engineers. CMHC Project Officer: Marie-Hélène Pastor. Ottawa: CMHC International, 2003. 123 pages

AVAILABILITY : CMHC International and http://www.cmhc-schl.gc.ca/en/homadoin/excaprex/suexin/suexin_037.cfm

KEY U.S. HOUSING MARKETS: OPPORTUNITIES AND CONTACTS

Key U.S. Housing Markets: Opportunities and Contacts are guides for the Boston, Chicago, Dallas and Seattle housing markets in the United States.

The market guides are designed to help Canadian producers of residential building products and services understand and penetrate the local market. Each guide is a reference tool that includes economic, demographic and housing overviews, as well as trends and detailed information on housing projects, renovation activity and demand for five building products which are: cabinetry, doors and windows, flooring, siding (roofing in the case of Seattle) and pre-engineered or

panelized building systems. The guides provide local contact information, key trade regulations and processes, and identify associations and government agencies that may provide further information.

HOUSING EXPORT OPPORTUNITIES

The guides were prepared by The Starr Group Inc. and F.W. Dodge Canada and commissioned by CMHC in partnership with Department of Foreign Affairs and International Trade. Ottawa: Canada Mortgage and Housing Corporation, 2002. 1 CD-ROM

Nota : Aussi disponible en français sous le titre : Les principaux marchés de l'habitation aux États-Unis : Occasions et contacts

AVAILABILITY : CD-ROM is available and product is available on the CMHC web site at: http://www.cmhc-schl.gc.ca/en/homadoin/excaprex/suexin/suexin_033.cfm

MARKET FOR CANADIAN BUILDING PRODUCTS IN THE GREATER CHICAGOLAND AREA 2003

This study covers recent changes, trends and opportunities for Canadian building products in the greater Chicagoland Area. The greater Chicagoland area is defined by 9 counties with a population of around 8.2 million people.

Prepared by Susan Roberts, Executive Supports Inc. CMHC Project Manager: Tulio Conejeros. Ottawa: CMHC International, 2003. 21 pages

Nota : Aussi disponible en français sous le titre : Le marché des matériaux de construction canadiens dans la grande région de Chicago 2003

AVAILABILITY : CMHC International and <http://www.cmhc-schl.gc.ca/en/homadoin/excaprex/suexin/upload/The-market-for-Canadian-Building-Products-in-the-greater-Chicagoland-Area-2003.pdf>

PRELIMINARY ASSESSMENT OF JAPANESE HOMEBUYER SEGMENTS SURVEY

This study identifies market segments among Japanese residential homebuyers, according to their preferences for different performance characteristics of a house. It also reviews major forces shaping the Japanese residential housing market.

Prepared by David H. Cohen, Natalia Vidal, Wellington Spetic, Rafael Ide, and Robert A. Kozak. Ottawa: CMHC International, Canada Mortgage and Housing Corporation, c2003. 45 pages

segments Nota : Aussi disponible en français sous le titre : Évaluation préliminaire de l'enquête visant les d'acheteurs de maison japonais

AVAILABILITY : CMHC International and <http://www.cmhc-schl.gc.ca/en/homadoin/excaprex/repu/loader.cfm?url=/commonspot/security/getfile.cfm&PageID=60018>

HOUSING EXPORT OPPORTUNITIES

UK HOUSING MARKET 2003

Canada Mortgage and Housing Corporation completed this study on the United Kingdom housing market, in partnership with the Canadian High Commission in London and a local consulting firm.

The study explores many key aspects of the UK housing market and its opportunities for wood frame construction and for specific building products. It provides an in-depth understanding of the market and recommends export strategies for the Canadian housing industry. The report should be read by those interested in learning about the possibilities and challenges of the UK housing market for manufactured homes and housing components, windows, doors, heating and ventilation systems, wood flooring, kitchen cabinets, roofing, cladding, and engineered wood products.

The report first presents a brief economic and demographic overview of the country and key characteristics of the housing market, such as stock, demand, and supply. It is followed by a detailed analysis for wood frame construction and for the specific eight products listed above. For each of these products, the study examines market size, prices, regulatory issues, design issues, distribution, training issues, trade barriers, export opportunities, and entry strategies for Canadian suppliers. Contact information for key players in the industry is also provided, for example, builders, housing associations, homes and building product manufacturers and associations.

Prepared by Lychgate Projects Ltd. CMHC Project Officer: Roger Leger. Ottawa: CMHC International, 2003. 82 pages

Nota : Aussi disponible en français sous le titre : Le marché de l'habitation au Royaume-Uni 2003

AVAILABILITY : CMHC International and on the Internet at:
<http://www.cmhc-schl.gc.ca/en/homadoin/excaprex/repu/index.cfm>

HOUSING FINANCE

CONSUMER SUPPORT AND PROTECTION IN MORTGAGE AND HOME EQUITY BASED BORROWING: THE U.S. EXPERIENCE AND CANADIAN COMPARISONS: FINAL REPORT

In the U.S. in recent years, there has been a widespread perception that “predatory lending practices” have multiplied dramatically in the residential mortgage market. The report assesses whether the surge in predatory lending practices in the U.S. is an indicator of what is to come in Canada or a uniquely U.S. phenomenon - occurring because of the particular institutional, regulatory social and market framework in the U.S.

First, the U.S. experience was reviewed, including the legislation and political responses. Canadian legislation was then examined and compared with that in the U.S. Differences in the institutional and social framework that might impact the spread of predatory practices in Canada were considered. Options to protect the borrower were then explored.

HOUSING FINANCE

A background paper drawing together the above elements, and a questionnaire soliciting views on the key issues and options was distributed to selected people in lending, regulation, credit counseling, brokerage and real estate.

Based on the analysis carried out, and drawing from the insights of the respondents, the study concluded that predatory lending is not a serious problem in Canada at the moment, but that certain factors indicate an increased risk of predatory lending in the future. The report suggests initiatives that could be undertaken now to assist borrowers in making choices, and provides a set of recommendations implementation should future monitoring suggest that predatory lending is becoming a serious problem in Canada.

Prepared by Tony Wellman. CMHC Project Officer: Kamal Gupta. Ottawa: Canada Mortgage and Housing Corporation, 2003. (CMHC External Program Research Report) 97 pages

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-ccdh/Research_Reports-Rapports_de_recherche/eng_unilin_gual/RR%20Consume_FINAL\(w\).pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccdh/Research_Reports-Rapports_de_recherche/eng_unilin_gual/RR%20Consume_FINAL(w).pdf)

EVOLVING IMPACT OF E-COMMERCE ON CANADIAN HOME OWNERSHIP FINANCE ACCESS AND AFFORDABILITY

The objective of this research was to examine the significant changes arising in the housing finance market place resulting from e-commerce and their impact on housing finance access and housing affordability.

E-commerce describes the process of conducting trade via Internet-enabled technologies. E-commerce makes the computer and the Internet network central to the processes of communication and collaboration between trading parties. In relation to mortgages, e-commerce describes the hardware, software and network applications that allow stakeholders in the mortgage process to share and collaborate electronically to originate, close and service a consumer mortgage online. The focus of this study was to understand how the processes and stakeholders within a mortgage offering may be affected by e-commerce technologies and to examine the impact of these changes on Canadian home ownership finance affordability and accessibility in the period to 2006.

To date, the mortgage industries in Canada and the United States have emphasized e-commerce development differently. Therefore with the intent of understanding broader trends in the Canadian mortgage market, the report compares and contrasts U.S. and Canadian mortgage provision models and stakeholder roles in order to understand the effects of e-commerce technology on the mortgage industry structure and ultimately on the Canadian consumer.

The research project entailed a literature review, Internet searches, interviews and discussions with knowledgeable US and Canadian industry participants, government regulatory agencies, housing sector stakeholders and other key informants.

Prepared by Scott Wilkinson. CMHC Project Officer: Ian Melzer. Ottawa: Canada Mortgage and Housing Corporation, 2002. 173 pages

Note: No. 110 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilingual/RR%20Evolving%20Impact\(w\)REV.pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilingual/RR%20Evolving%20Impact(w)REV.pdf)

HOUSING FINANCE

HOUSE PRICES, BORROWING AGAINST HOME EQUITY, AND CONSUMER EXPENDITURES

This paper examines the link between house prices, borrowing against home equity, and consumer spending in Canada in recent years. Borrowing against home equity, or home equity withdrawal, means turning home equity into financial capital through borrowing, without selling the home.

The main objectives of this research project were to investigate the different sources of data on refinancing in Canada and examine the effect of changes in house prices on consumer expenditures through borrowing against home equity and in total, through the wealth effect. The study concludes that borrowing against home equity is more common than it used to be, both through refinancing of mortgages with a cash-out and through home equity loans and lines of credit. The paper presents two estimates of borrowing against home equity that have been produced in Canada. However, it found that they do not agree.

The paper highlights the lack of data and inconclusive econometric work to date to measure the size and significance of home equity borrowing in Canada. It considers how home equity withdrawal can be monitored and analyzed and underlines that further analysis of the link between house prices and consumer expenditures through borrowing against home equity is not possible without more information through surveys and enhanced reporting by financial institutions.

Prepared by Informetrica Limited. CMHC Project Officer: Bruno Duhamel. Ottawa: Canada Mortgage and Housing Corporation, 2003. 35 pages

Note: No. 04-006 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilingual/RR_House_Prices\(w\).pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilingual/RR_House_Prices(w).pdf)

IMPACT OF THE 1988 BASEL CAPITAL ACCORD AND PROGNOSIS FOR THE FUTURE

The research consists of a comprehensive review of over two hundred papers focusing on the impact of Basel 1988. Of the twenty-three potential impacts which served as the basis for conducting the review, it is possible to address ten through the available literature. These are segmented into general market and mortgage market impacts.

This literature review will help establish a baseline for understanding the potential impacts of the proposed revisions to Basel 1988 (thereafter called Basel II) on the capital market in general, and on the housing finance sector in particular.

AVAILABILITY : No. 04-020 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site

HOUSING FORECASTING AND DEMAND

ESTIMATION OF CORE HOUSING NEED USING THE 1999 SURVEY OF HOUSEHOLD SPENDING MICRO DATA FILE

The objective of the project was to test the feasibility of implementing the core housing need methodology on the 1999 Survey of Household Spending (SHS) micro data file. The Household Facilities and Equipment micro data file that CMHC had used in the past for developing inter-censal estimates of core housing need was no longer available and CMHC wanted to explore other sources of inter-censal information on housing need. The Survey of Household Spending contains much of the same data content as HIFE as well as the expenditure items that had been previously collected by the Family Expenditure Survey. However, the SHS sample is considerably smaller than HIFE. This limited both the ability to develop norm rent incomes for sub-provincial areas and to produce detailed cross-tabulations of core housing need by socio-economic characteristics at lower levels of geography. The project used two versions of the file – the publicly released version and a non-released working version held within Statistics Canada. As a result of this project, the publicly released version will in future contain a revised size of area of residence breakdown that distinguishes metropolitan areas and makes the file more suitable for housing need analysis. While SHS contains the necessary content for the application of the core housing need methodology, the sample size constrains the use of the file in both deriving norm rents and detailed analysis of households in core housing need. It does contain detailed expenditures and income for the same time period, which makes it a good platform for expenditure analysis.

Prepared by Paddy Fuller, Fuller Information. CMHC Project Officer: John Engeland. Ottawa: Canada Mortgage and Housing Corporation, 2003. (CMHC External Research Program Report) 53 pages

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-ccdh/Research_Reports-Rapports_de_recherche/eng_unilingual/RR%20Estimation_FINAL\(w\).pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccdh/Research_Reports-Rapports_de_recherche/eng_unilingual/RR%20Estimation_FINAL(w).pdf)

HOUSING MARKET

IMPACT OF INVESTORS ON THE MARKET FOR APARTMENT CONDOMINIUMS IN SELECTED MARKETS IN THE VANCOUVER CMA

Canada Mortgage and Housing Corporation is interested in the role that apartment condominiums play in the supply of rental housing in the Vancouver CMA, specifically in a study area consisting of the cities of Vancouver (Downtown, Westside and Eastside), Burnaby and Richmond. Anecdotal information suggests that investors have purchased a significant share of the many new apartment condominiums developed in the study area since 1990, and then leased them as rental apartments. However, information about these rental condominiums, including the number of them, is sketchy due partially to the difficulty of distinguishing between

owner-occupied and rental condominiums. In contrast, developers have built very few new purpose-built rental-only apartment buildings since then.

CMHC retained PricewaterhouseCoopers LLP ("PwC") to investigate the rental market for apartment condominiums in the study area over the 1990 to 2001 period. PwC obtained information for this investigation from various sources including CMHC, the PwC Condominium Database, the British Columbia Assessment Authority (BCAA), published literature, and

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interviews with condominium developers, property managers and real estate agents familiar with this market.

Prepared by PricewaterhouseCoopers LLP. CMHC Project Officers: Cameron Muir and Charles King. Ottawa: Canada Mortgage and Housing Corporation, 2003.

AVAILABILITY : Canadian Housing Information Centre

INCIDENCES DES TRANSFORMATIONS ETHNIQUES SUR LE MARCHÉ RÉSIDENTIEL DU QUARTIER RIVIÈRE-DES-PRAIRIES À MONTRÉAL

Like other Montreal districts, Rivière-des-Prairies has undergone significant ethno-demographic changes in recent decades. For this research, the Rivière-des-Prairies district was retained as a preferred area to observe and analyze the conditions in which persons of Haitian origin access the real estate market. The main objective of this research was to understand the conditions that may give rise to differential treatment and their impact on the extent to which buyers of Haitian origin access the real estate market. Assumptions regarding the increase/decrease in property values in Rivière-des-Prairies as advanced by real estate agents, the geographical confinement to the district, differential treatment that could result in discrimination, and alternative financing options required by financial institutions were tested. The data showed that none of the assumptions could be verified completely. Slight variations, in both the practices and their effects, had to be made during the research to explain the different perceptions among the players. In a district where pluri-ethnic cohabitation has become the norm, the market segmentation of the real estate market certainly depends on factors such as cost and the ethno-cultural mix within many micro-spaces. Finally, certain types of testing, like the experiences in the United States, would precisely provide a better measurement of discrimination based on identity markers such as ethnic group, family status, gender or skin colour.

Prepared by Sylvie Paré. CMHC Project Officer: Kevin Hughes. Ottawa: Canada Mortgage and Housing Corporation, 2004 (External Research Program Research Report) 165 pages

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/fr_unilingue/Incidences_FINAL\(w\)2.pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/fr_unilingue/Incidences_FINAL(w)2.pdf)

LITERATURE REVIEW OF SOCIO-ECONOMIC TRENDS AFFECTING CONSUMERS AND HOUSING MARKETS: FINAL REPORT

The purpose of this report is to review and consolidate existing research regarding the impact of socio-economic trends on consumers and housing markets, discuss current thinking, identify research gaps and prioritize future research. The terms of reference for this report called for

the inclusion of such topics as: the cost of housing and factors contributing to costs; tenure choice and consumer housing preferences; economic factors (such as employment, income, interest rates, inflation and taxation); demographic factors (such as aging, changes in households composition, immigration and migration); sustainable development and infrastructure needs; evidence of market failure; consumer environmental awareness; and land use planning (such as smart growth and growth management).

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Because of the significant amounts of research already done on affordable housing, the scope of the study excludes information gaps and trends in relation to the need for and availability of affordable housing. It also excludes financial product and public policy development, since these topics are more thoroughly addressed through other CMHC research reports.

The report outlines the recent and future aspects of various trends, drawing on major findings in Australia, New Zealand, United Kingdom and United States where appropriate. A discussion of the regional and submarket variations within Canada of the various issues and trends is provided and the report identifies potential research priorities in Canada. The report also contains a full bibliography of all sources consulted.

Prepared by Rural and Small Town Programme, Mount Allison University and Institute of Urban Studies, University of Winnipeg. Principal Investigators: David Bruce and Tom Carter. Research Team: Ausra Burns, Jino Distasio, Jillian Golby. Ottawa: Canada Mortgage and Housing Corporation, 2003 (Housing Affordability and Finance Series) 115 pages

Nota : Aussi disponible en français sous le titre : Analyse documentaire des tendances socioéconomiques influant sur les marchés de l'habitation et de la consommation

Note: No. 03-011 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site

AVAILABILITY : CMHC Information Products (Order number 63411)

HOUSING RESEARCH

HOME\$AVE: BUILDING INVESTMENTS IN HOUSING ASSETS: STUDY OF INDIVIDUAL DEVELOPMENT ACCOUNTS FOR HOUSING - A NATIONAL DEMONSTRATION PROJECT

The research undertakes a national consultation to evaluate Home\$ave, an asset-based approach to antipoverty using housing as a catalyst. The main objective of this research is to determine if an asset-based strategy through housing is a viable solution to poverty reduction.

A common assumption is that lower income households cannot save. In 1991, Dr. Michael Sherraden of Washington University in St. Louis illustrated the concept of Individual Development Account (IDA). IDA rewards the monthly savings of lower-income households who are trying to buy their first home, pay for post-secondary education, or start a small business. This reward or incentive is provided through the use of matching funds that typically come from a variety of private and public sources. The hypothesis is that individuals who have

an incentive to accumulate assets will do so. Asset accumulation should alter savings behaviours that lead to self-sufficiency, thereby allowing individuals to exit poverty.

This consultation is to validate the assumption that low-income individuals will respond to financial incentives to engage in a range of activities related to housing.

Study prepared for Canada Mortgage and Housing Corporation and the National Secretariat on Homelessness by Social and Enterprise Development Innovations (SEDI). CMHC Project Officer: Eric Tsang. Ottawa: Canada Mortgage and Housing Corporation, 2003. 2 volumes + research highlight
Volume 1 Final Report (59 pages) Volume 2 Background Report (94 pages)

HOUSING RESEARCH

Note: No. 03-001 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

Nota : Aussi disponible en français sous le titre : *Mai\$on en banque : accumuler des actifs pour mieux se loger : étude sur les comptes individuels de développement axés sur le logement - projet national de démonstration*

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-ccd/h/Research_Reports-Rapports_de_recherche/eng_bilingual/HomeSave_Final_EN.pdf](http://ftp.cmhc-schl.gc.ca/chic-ccd/h/Research_Reports-Rapports_de_recherche/eng_bilingual/HomeSave_Final_EN.pdf) and
[ftp://ftp.cmhc-schl.gc.ca/chic-ccd/h/Research_Reports-Rapports_de_recherche/eng_bilingual/HomeSave_Background_EN.pdf](http://ftp.cmhc-schl.gc.ca/chic-ccd/h/Research_Reports-Rapports_de_recherche/eng_bilingual/HomeSave_Background_EN.pdf)

INTERNATIONAL COMPARISON OF HOUSING CONDITIONS INDICATORS

The underlying intent of the work is to describe the housing conditions indicators currently used for planning and policy purposes by the national governments of the United States, England, and Australia, and to compare these with the Canadian core housing need approach. It focuses primarily on the measures and norms used to assess housing conditions, but also compares the results of applying the indicators for a recent year, and discusses the strengths, weaknesses, and limitations of such a comparison. The results update and extend the 1992 work "A Comparison of Housing Needs Measures Used in Canada, the United States, and England" (CMHC Socio-Economic Research Highlight Issue 7). The results will be of interest to housing researchers at the federal, provincial, and municipal level, along with academics and any private / non-profit companies involved in measuring housing conditions.

Prepared by Steve Pomeroy, Focus Consulting Inc. in association with Tony Dalton, Michael Stegman, and Steve Wilcox. CMHC Project Officer: Lance Jakubec. Ottawa: Canada Mortgage and Housing Corporation, 2004. 82 pages

Note: No. 04-032 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-ccd/h/Research_Reports-Rapports_de_recherche/eng_unilingual/CHIC-Comparison\(w\).pdf](http://ftp.cmhc-schl.gc.ca/chic-ccd/h/Research_Reports-Rapports_de_recherche/eng_unilingual/CHIC-Comparison(w).pdf)

INDOOR ENVIRONMENT

GARAGE PERFORMANCE TESTING: FINAL REPORT

The focus of this study was to:

- 1) Establish the range and profile of airtightness in the garage-to-house interfaces in regions across Canada.
- 2) Determine the implications of garage-to-house air leakage on house indoor air quality.
- 3) Propose and test solutions for reducing contaminant transfer between garages and houses.

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Forty-two houses with attached garages were tested to assess the leakage characteristics of the house to garage interface. On average 10 to 13% of house leakage occurs through the interface. Based on CONTAM modelling using a cold start and a hot soak test, it was found that ten of the 42 houses had elevated pollutant levels indoors resulting from garage-to house air leakage.

Three remediation strategies were tested and modelled, including

1. Tightening the garage-to-house interface,
2. Installation of a passive air grille from the garage to the exterior, and
3. Installation of an exhaust fan in the garage.

All strategies were found to reduce peak concentrations of pollutants in the house.

Prepared by Sheltair Group Resource Consultants Inc. CMHC Project Officer: Don Fugler. Ottawa: Canada Mortgage and Housing Corporation, 2004. 47 pages

Note: No. 04-108 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site

AVAILABILITY : Canadian Housing Information Centre and
ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilin_gual/Garage-web.pdf

INDOOR PARTICULATE AND FLOOR CLEANING

The objective of this study was to evaluate several cleaning methods on several surfaces with respect to their relative effect on the particle matter (PM) exposure of an individual living in the home. Secondly, the study sought to demonstrate a new approach to evaluation of floor cleaning methods by using a "standard activity" to quantify PM resuspension from the floor on the premise that more effective cleaning would result in less resuspension after cleaning.

All of the experiments were based on five homes in Brantford Ontario and the test conditions replicate typical southern Ontario Canadian spring, fall and winter conditions. The cleaning devices were employed in a manner which is representative of normal cleaning practice. Over 1300 experiments involving six electrically powered and four non-powered cleaning devices were carried out. The experiments consisted of a "simulated activity" prior to cleaning, cleaning of the floor and a simulated activity immediately following cleaning. Cleaning was carried out weekly in one room of each house by the same operator using a different device each week. At a pre-determined point in the sequence, the carpeted floor was replaced by a smooth floor and the cleaning program was repeated.

Results show that carpeted floors exhibit higher levels of PM resuspension than smooth floors in all size ranges except that this tendency is not so pronounced for very fine (PM₁) particles. The tendency for a floor to accumulate particles over time appears to be much more pronounced for

carpeted floors than for smooth floors and it also varies greatly from house to house. Based on limited data, it appears that new carpet exhibits lower PM resuspension rates than old carpet and slightly higher PM resuspension rates than smooth floors. It is possible that the higher accumulation rate for carpets is responsible for their higher resuspension rates with aging.

The ordinary house broom was found to have high PM resuspension rates during use, but the cleaning effectiveness was similar to other devices. Dry or wet pad smooth floor sweeping devices were not found to have better effectiveness than a conventional dust-mop.

INDOOR ENVIRONMENT

Prepared by Bowser Technical Inc. Principal Investigators: Dara Bowser and Sandra Vos. Prepared for Policy and Research Division. CMHC Project Officer: Don Fugler. Ottawa: Canada Mortgage and Housing Corporation, 2003. 2 volumes

Volume 1 Main Report (27 pages) Volume 2 Appendices (12 pages)

Note: No. 03-104 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre

INFLUENCE OF AN ELECTRONIC AIR CLEANER ON INDOOR OZONE

Plate and wire type Electronic Air Cleaners (EAC) are frequently found in the central forced air systems of Canadian houses. They are often sold on the basis of their potential to relieve the symptoms of those who suffer from allergy-related and respiratory conditions. It is known that these devices produce ozone during operation, and ozone is a known respiratory irritant. Recent findings lead to the possibility that EAC devices may contribute to raising indoor ozone levels which could have a negative health impact.

Experiments were carried out to determine the degree to which ozone levels are influenced in a home due to the operation of an EAC and whether or not the ozone levels are affected by changes in house ventilation rate and changes in airflow through the device. All of the experiments were based on one air-handler and EAC arrangement in one home in Brantford, Ontario, Canada, during November and December 2000. A total of 185 hours of data were obtained under varying conditions of house ventilation, EAC airflow and EAC operation. The air-handling system was operated continuously and all of the windows were kept closed.

Samples were obtained using a real-time data acquisition system using a UV Photometric ozone monitor sampling from outside, upstream of the EAC, office area (basement), downstream of EAC, bedroom (upstairs). Continuous weather data was used to predict air exchange rates.

Data was analyzed using a model which accounted for air-change, internal removal, source strength, and filtration of incoming air. Using house characteristics and source-strength values obtained from the experiments, inside ozone levels were predicted for a variety of air-change rates and outdoor ozone levels.

It was concluded that the continuous operation of an EAC could result in a rise of inside ozone concentration by 7 to 10 ppb higher than that which would normally be expected without EAC operation, or with intermittent EAC operation. Ozone concentration increase can be expected to be higher than this for smaller homes and homes with more smooth surfaces (e.g. smooth floors in place of carpeted.) Conversely, the increase will be lower for larger homes with less smooth surfaces.

Changes in airflow through the EAC had a minor effect on ozone levels. Reducing the airflow by 50% resulted in an increase of ozone production and interior levels of less than 10%.

No conclusions were able to be reached concerning the effect of ventilation and filtration by the building envelope due to the lack of difference between indoor and outdoor ozone levels experienced during the experimental period.

As a consequence of these findings, winter-time indoor/outdoor ratios used for predictive population studies may require revision upwards from current estimates for houses equipped

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with continuously operating EACs. Summer-time I/O ratios for air-conditioned houses may also require revision if the house also contains an EAC.

In homes equipped with an EAC and a continuously operating air-handling system, it is possible that the indoor air will exceed the 1 hour health-based Reference Level values for outdoor air proposed by the Canadian Federal-Provincial Working Group on Air Quality Objectives and Guidelines. EAC devices appear to be capable of elevating the ozone level inside a home to levels which are continuously at or above 10 ppb.

Prepared by Bowser Technical Inc. Principal Investigator: Dara Bowser. Prepared for Policy and Research Division. CMHC Project Officer: Don Fugler. Ottawa: Canada Mortgage and Housing Corporation, 2003.

Volume 1 Main Report (23 pages) Volume 2 Appendices (14 pages)

Note: No. 03-117 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre

LEAD IN YOUR HOME. REVISED EDITION

This booklet was prepared by CMHC and Health Canada to inform homeowners about the effects of lead in the home. Lead can be harmful to your family's health. Infants, young children and pregnant women are especially at risk. You'll learn about the most common sources of household lead, lead testing, minimizing lead in the home and how to safely diagnose and remove lead. Includes a handy resource contact list.

Ottawa: Canada Mortgage and Housing Corporation, 2003. 25 pages

Note: Aussi disponible en français sous le titre : Le plomb dans votre maison

AVAILABILITY : CMHC Information Products (Order number 61941) and the web site

PENETRATION OF OUTDOOR PARTICLES INTO A RESIDENCE

The objectives of this study were to determine how ventilation and operational configurations can affect the indoor-outdoor relationship of fine particle concentrations in a home and to determine the filtration effect of the house envelope for incoming ventilation or infiltrating air.

The study was limited to one, southern Ontario Canadian home with moderate airtightness. The house was operated with normal occupancy of 2 adults and with 5 distinct ventilation modes as follows:

- 1) Supply Only, No Filtration
- 2) Exhaust Only, No Filtration
- 3) Balanced, No Filtration
- 4) Balanced, with HEPA Intake Filter
- 5) Supply Only, with HEPA Intake Filter

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Ventilation rates ranged between 1.20 and 0.71 ACPH and were selected to ensure that in the Supply Only arrangements, all of the incoming air passed through the ventilation system and in the case of the Exhaust Only arrangement all of the incoming air passed through the building envelope. Continuous real-time measurement of indoor and outdoor particulate levels were made in 5 locations. Air temperature, air pressure, wind speed and ventilation flows were also measured continuously. A total of 428 data-hours were used for data-analysis.

The non-filtered ventilation arrangements resulted in higher indoor-outdoor ratios in both the PM1 (Particulate Matter less than 1Fm) and PM10 (Particulate Matter less than 10Fm) size ranges. Filtered ventilation arrangements resulted in significantly lower indoor-outdoor ratios. Exhaust only ventilation arrangements (incoming air filtered by the house envelope) resulted in ratios in the mid-range between the filtered and unfiltered ventilation cases.

Comparison of the data with a mass-balance model showed that, for a fixed rate of indoor particle generation/resuspension, there was poor correlation of measured and predicted particle levels for the filtered ventilation modes, but good correlation for the unfiltered ventilation modes. This probably occurs because the indoor particles in the filtered ventilation modes are dominated by indoor generation/re-suspension which is in fact quite variable. In the unfiltered cases however, the improved correlation of measured with predicted levels demonstrates that indoor levels are primarily a function of outdoor levels.

Further analysis of the data using the mass-balance model predicted filtration factors (removal rate of incoming particles) for the building envelope of 0.43 and 0.37 for the PM1 and PM10 size ranges respectively.

In general, it was found that there are substantial benefits to filtering the incoming ventilation air. The benefits of filtering appear to be only slightly reduced for balanced ventilation systems when compared to supply-only ventilation systems. Ventilation air which enters via the building envelope appears to experience a significant degree of filtration.

Prepared by Bowser Technical Inc. Principal Investigator: Dara Bowser. Prepared for Policy and Research Division. CMHC Project Officer: Don Fugler. Ottawa: Canada Mortgage and Housing Corporation, 2003.

Volume 1 Main Report (18 pages) Volume 2 Appendices (8 pages)

Note: No. 03-105 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre

REDUCTION OF AIR INTAKE CONTAMINATION IN HIGH-RISE RESIDENTIAL BUILDINGS: FINAL REPORT

The purpose of this project was to evaluate the dispersion of pollutants from rooftop sources on high-rise buildings so that guidelines on the placement of stacks and air intake grilles for HVAC systems could be developed. The reingestion of building exhaust into fresh air intakes has been shown to adversely affect indoor air quality. Often the source of the contaminants is an adjacent building, which may or may not be a residential structure. Although a number of experimental studies have investigated the dispersion of exhaust from low-rise buildings, relatively little work has been conducted concerning high-rise buildings. This study provides some guidelines to building designers concerning the placement of fresh-air intakes on such buildings.

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The placement evaluation was based on water flume tests and modeling of air movement around high-rise buildings given confounding factors such as the height and proximity of neighboring buildings. A literature survey of relevant research on air intake grille location and contamination potential was also undertaken.

Prepared by T. Stathopoulos, P. Saathoff and H. Yan. CMHC Project Officer: Duncan Hill. Ottawa: Canada Mortgage and Housing Corporation, 2002. (CMHC External Research Program Report) 61 pages

Note: No. 03-119 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre

MANUFACTURED HOUSING

DEBUNKING THE MYTHS: LAND LEASE COMMUNITY DEVELOPMENT: A MUNICIPAL COST BENEFIT ANALYSIS

This study was undertaken by an industry association with the objective of identifying the potential of manufactured housing as a viable source of affordable housing. To date this option has not been widely adopted, in large part due to a combination of consumer reluctance and more particularly exclusionary planning and zoning policies that have limited the opportunity to utilize this relatively affordable housing form in many cities.

The goal of this study is to provide documented research which can be used by the industry, and various levels of government to build public confidence in the decisions made by public officials and professionals. The focus is to:

- dispel the myths that are often used by the public and government officials to prevent the development of manufactured home communities in Canada and
- provide a document that can help address ways to meet the increasing demand for affordable housing through revealing many of the advantages of this type of development.

The purpose of this research was to undertake a study of land lease housing communities that evaluates and documents the impact that this form of development has on municipal costs in order to promote the development of affordable housing through the use of manufactured homes. This is the final report on a socioeconomic analysis of the impact of manufactured home parks on the residents of the communities in which they are located.

Final report to Homegrown Solutions. Prepared by Ron Corbett and J. Frank Strain. For the Manufactured Housing Association of Alberta and Saskatchewan. Ottawa: Canada Mortgage and Housing Corporation, 2002. 22 pages.

AVAILABILITY : Canadian Housing Information Centre

MOISTURE AND MOLD

CLEAN-UP PROCEDURES FOR MOLD IN HOUSES. REVISED EDITION

Since biblical times, indoor mold growth has been thought to affect the health of those living in a moldy dwelling. Today we are increasingly aware of the link between our environment and our health and well-being. Working with the provinces and territories, Health Canada first provided guidelines stating the need to minimize exposure to fungi and molds in residences in 1987. More specific guidelines for the non-industrial workplace were published in 1993, 1995 and most recently, in 2004. The purpose of this guide is to help homeowners to respond to advice from Health Canada and other health departments in Canada to prevent and, if detected, remove mold growth indoors. It describes a process for dealing with mold in houses and provides detailed guidance both on how to eliminate indoor mold safely and on how to prevent the conditions that allow it to grow.

Prepared by James Scott. CMHC Project Officer: Virginia Salares. Ottawa: Canada Mortgage and Housing Corporation, 2004. 90 pages

Order number 61091 **Price \$3.95 + GST and handling changes

Nota : Aussi disponible en français sous le titre : Méthodes d'élimination de la moisissure dans les maisons

AVAILABILITY : CMHC Information Products

ICE DAMMING FIELD RESEARCH: ICE DAMMING SOLUTIONS

Ice damming is a problem that annually affects a large number of houses in Canada. It can cause water leakage inside the house and can present a danger of falling ice. It may also affect the service life of roofing materials and components.

Ice damming arises from differential melting and freezing of snow on a roof. The root causes of the melting, such as air leakage from the interior into the attic, are frequently far from the roof deck. As a consequence, methods to alleviate ice damming (e.g. electric cables, membranes) often treat the leakage without addressing the fundamental cause. Such methods can reduce or eliminate the leakage in the short term but, because they do not address the cause of the melting and freezing, they often do not provide a long-term solution. In addition, they frequently do not address the durability issues caused by ice build-up on the roofs. The best solution is to change attic conditions to prevent ice damming from occurring.

This report describes the factors that contributed to ice damming in detailed case studies of four low rise condominium complexes and one single family house in Ottawa, Ontario. Each site has suffered severe ice damming in the past. The repair strategy at each site primarily focused on reducing air leakage into the attic from the house. The success of these trial repairs were

monitored by attic temperatures and visual indicators. The suggested repairs had benefits on some sites and little benefit on others.

Prepared by Mark Lucuik, Morrison Hershfield Limited. CMHC Project Officer: Don Fugler. Ottawa: Canada Mortgage and Housing Corporation, 2004.

Note: No. 04-119 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-cedh/Research_Reports-Rapports_de_recherche/eng_unilin_gual/Ice%20Damming%20\(WEB\).pdf](ftp://ftp.cmhc-schl.gc.ca/chic-cedh/Research_Reports-Rapports_de_recherche/eng_unilin_gual/Ice%20Damming%20(WEB).pdf)

MOISTURE AND MOLD

MONITORING THE PERFORMANCE OF A RETROFITTED PRESERVED WOOD FOUNDATION

Homeowners in a house in the Ottawa area were experiencing sensitivity to moulds growing inside the wall cavities of their preserved or permanent wood foundation (PWF). CMHC became involved when the homeowners sought to resolve the moisture problems underlying that growth.

Based on the site description, the site inspection, and description of the problem, investigators felt that the main moisture source to the PWF was due to moisture movement through the bottom plate and the lower wall area. The proposed remedial solution was to continuously vent the bottom area of the wall cavity to the outside. The remaining, upper part of the wall cavity was re-insulated with cellulose fill. Two interior wall finishes were tried: unpainted drywall (with no polyethylene) and polyethylene with no drywall.

Ten monitoring stations were established around the perimeter of the foundation to monitor relative humidity moisture content in the lumber framing, temperatures at various positions in the wall, and the moisture content in the plywood in the upper portion of the wall. Mapping of the pressures in the wall cavities was undertaken to assess the source of make-up air. Flow measurements in the ventilated cavity and the exhaust stream were also made.

This report describes the basis for the renovation solution that was installed and the monitoring that was done to confirm the effectiveness of the recommended solution.

Prepared by Donald Onysko, Dan Gates, Gerard Van Rijn. CMHC Project Officer: Don Fugler. Ottawa: Canada Mortgage and Housing Corporation, 2003. 51 pages

AVAILABILITY : Canadian Housing Information Centre

RAIN PENETRATION CONTROL: APPLYING CURRENT KNOWLEDGE = CONTRÔLE DE LA PÉNÉTRATION DE LA PLUIE : APPLICATION DES CONNAISSANCES COURANTES

Water is the most significant factor in the premature deterioration of buildings. It can damage some materials directly and reduce the effectiveness of insulation. It is the major factor in the corrosion of metals, the chemical breakdown of many organic materials and the growth of mold and rot. Controlling water penetration, as well as its location, duration and phase (vapour, liquid or solid), is often the most critical factor in achieving long-term performance of a building envelope assembly.

This CD-ROM focuses primarily on rain penetration control in walls and windows. Other wetting mechanisms include condensation and exposure to ground water. Moisture can be removed from a building assembly through drainage, by diffusion or venting (convective air change) to a drier indoor or outdoor environment. Most building assemblies and materials have some tolerance for infrequent and short duration wetting. Some infrequent passage of water to the inside is a minor inconvenience rather than a disaster. Determining how much effort and expense can be justified to minimize water penetration or evaluating what assembly types are appropriate for a particular building application and location is an exercise in judgment and risk management.

MOISTURE AND MOLD

Following a discussion of several approaches to water penetration control in walls, including architectural design, there is a detailed explanation of the rain-screen principle and its application to contemporary buildings. Designers are further challenged to incorporate the Pressure Equalized Rain-screen (PER) principles. The PER system uses compartment seals to divide the cavity into a series of chambers in addition to the elements of a simple rainscreen. This limits lateral air flow in the cavity and increases pressure equalization, ultimately reducing the amount of water entering the interior wall. Remarkably, in pressure equalized rainscreen walls or joints, leakage is reduced by making bigger holes in the outside surface. This is counterintuitive.

To help design rainscreen curtain walls CMHC developed the **RainScreen** software. It allows designers to vary the parameters of their rain screen system and graphically see the resulting dynamic pressure distribution on cladding and air barrier (backpan) layers. Its mathematical engine is based on the CMHC report *Rainscreen* by Jacques Rousseau. **RainScreen 2.1** adds many new features and an easy GUI interface, using either Windows (**3.1 or 95**) or Macintosh systems. The RainScreen v2.1 and Emptied software are included on the CD-ROM.

Prepared by Morrison Hershfield with review and input from CMHC staff and members of the American Architectural Manufacturers Association Task Group on Rainscreen Principle and Pressure-Equalized Wall Design. Illustrations prepared by David G. Anderson. Ottawa: Canada Mortgage and Housing Corporation, 1999 [i.e. 2003] | CD-ROM Bilingual

AVAILABILITY : Canadian Housing Information Centre

REVIEW OF HYGROTHERMAL MODELS FOR BUILDING ENVELOPE RETROFIT ANALYSIS

A research project was undertaken to review and assess commercially available computerized hygrothermal modeling tools that could be used to model heat, air and moisture conditions in 5 pre-selected wall assembly types and a number of given insulation retrofit possibilities. The models were evaluated based on their commercial availability, ability to model the wall types of concern, the degree to which their algorithms were transparent and documented, user-friendliness, technical support, and material property data. Of the models reviewed, two were deemed to be applicable for the analysis of the wall assemblies and insulation retrofits of interest. The selected models will be used in a subsequent research project to assess the hygrothermal response of the selected wall types when subjected to insulation retrofits.

Prepared by Alex McGowan and Martin Gevers, Levelton Engineering Ltd. CMHC Project Officer: Duncan Hill. Ottawa: Canada Mortgage and Housing Corporation, 2003. 31 pages

Note: No. 03-128 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site

AVAILABILITY : Canadian Housing Information Centre

PERSONS WITH DISABILITIES

ENTRETIEN MAJEUR ET RÉNOVATION RÉSIDENIELLE, ÉTUDE D'UNE AVENUE POUR AMÉLIORER L'ACCESSIBILITÉ ARCHITECTURALE DES BÂTIMENTS EXISTANTS

This study explores the possibility of improving architectural accessibility performance for existing residential buildings in which major maintenance or renovation work is being done. There is a host of products and materials available on the market which meet universal accessibility criteria and the needs of persons with functional limitations very effectively. These products and materials, which are commonly used, are often attractive and affordable. The authors explored various ways of encouraging public and private homeowners to use products and materials which provide better universal accessibility when they do maintenance or renovate. In 23 instances, products, materials and methods which provide greater accessibility than those generally in use were proposed to three owners/managers of rental housing to find out their reactions and their interest in using them.

The final report includes:

- descriptions of products or materials generally used for maintenance or renovation (including the manufacturer's suggested price);
- an evaluation of their performance in terms of universal accessibility;
- a description of replacement products or materials, which perform better (also including the manufacturer's suggested price); and
- arguments and situations put forward by owners to justify their retaining or rejecting the proposed products or materials.

Prepared by Société Logique under the supervision of Sophie Lanctôt. Ottawa: Canada Mortgage and Housing Corporation, 2002. (CMHC External Research Program Report) 92 pages

AVAILABILITY : Canadian Housing Information Centre

PROJET P.A.L. : MONOGRAPHIE D'UNE RESSOURCE ALTERNATIVE EN SANTÉ MENTALE

The Projet P.A.L., a non-profit organization, is defined as an alternative mental health resource. Since its founding in 1975 in Verdun, in the underprivileged neighbourhood downtown, P.A.L. has been advocating an overall intervention approach both individually and collectively. P.A.L. has developed services ranging from defending the rights of its members and non-members to psycho-social rehabilitation, while drawing from the potential and capacities of people living with mental illness. As for housing, P.A.L., from the time it began operation, has been concerned with helping people living with mental illness live autonomously in the community. P.A.L. has been offering an accommodation program since 1983, which includes a transition house (6 units) and

shared apartments (8 units) over the latter. P.A.L. also established Logi-P.A.L. in 1989, a non-profit organization which offers five social housing units to persons with mental health problems.

The main objective in developing this monograph was to determine the practices and characteristics of P.A.L., one of the first alternative mental health resources to be created in Quebec, and the conditions under which it emerged. A second objective of the research was to specify the intersectorial practices in operation in P.A.L. and in Verdun in the area of housing. The basic instrument used to collect data was the methodological guide developed by Yvan Comeau (2000) and issued by the Centre de recherche sur les innovations sociales (CRISES) to study social economics companies and organizations.

PERSONS WITH DISABILITIES

Prepared by Paul Morin under the direction of Yves Vaillancourt, Laboratoire de recherche sur les pratiques et politiques sociales, École de travail social, Université du Québec à Montréal. Ottawa: Canada Mortgage and Housing Corporation, 2003. (CMHC External Research Program Report) 92 pages

AVAILABILITY : Canadian Housing Information Centre

POPULATION HEALTH

POPULATION HEALTH APPROACH TO HOUSING: A FRAMEWORK FOR RESEARCH

This report presents a framework for analyzing the relationship between housing and health from a population health perspective. The population health perspective is an influential research and policy framework that is motivated by the question “What makes some people healthy and others not?” It suggests that the strongest determinants of health are socio-economic factors in everyday life.

The primary purpose of this report is to propose a conceptual framework intended to guide research on housing and health from a population perspective. The report reviews the primary underpinnings of the population health perspective, emphasizing its importance in the Canadian social policy discourse and the primary evidence base for the population health perspective. A brief overview of previous research on housing and health is presented, the framework for housing and population health is presented and explained, and a number of emergent research questions are identified. Opportunities in children’s housing and health research are emphasized and several key issues for housing and health relationships amongst seniors are also identified. The report also identifies some of the unique questions and issues that must be addressed in the study of housing and population health among people from groups that experience marginality and disempowerment: First Nations’ Peoples, people with mental illness and addictions, people with disabilities and chronic illnesses, women and visible minorities. The final section of the report emphasizes some of the methodological challenges that must be addressed by researchers studying the socio-economic dimensions of housing.

Prepared for National Housing Research Committee by James R. Dunn. CMHC Project Manager: Phil Deacon. Ottawa: Canada Mortgage and Housing Corporation, Policy and Research Division, 2002. (Distinct Housing Needs Series) 75 pages

Nota : Aussi disponible en français sous le titre : L'approche de la santé de la population en fonction du logement : cadre de recherche

AVAILABILITY : CMHC Information Products (Order no. 62980) and ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_biling_ual/Population%20health%20approach%20to%20housing.pdf

PROPERTY MANAGEMENT

HOME CARE: A GUIDE TO REPAIR AND MAINTENANCE. REVISED EDITION

This updated homeowner's companion guide will help you keep your home in top condition for years to come. Performing minor repairs as soon as a problem appears will often prevent further damage and more costly repair at a later date. The guide therefore helps homeowner's save money with a wide range of tips that include how to replace a light switch; control wall condensation; repair wooden steps; prepare a landscaping plan; or put together the right tool kit. Easy-to-understand instructions come complete with detailed illustrations.

Ottawa: Canada Mortgage and Housing Corporation, 2003. 113 pages

Nota : Aussi disponible en français sous le titre : Votre maison : l'entretien et la réparation

Order number 61019 **Price \$6.95 + GST and handling charges

AVAILABILITY : CMHC Information Products

OPERATIONS MANUAL FOR MAINTENANCE AND CUSTODIAL STAFF OF MULTI-UNIT RESIDENTIAL BUILDINGS

Canada Mortgage and Housing Corporation developed this manual as a service to property owners and managers of multi-unit residential buildings, in cooperation with the Canadian Condominium Institute, and the Association of Condominium Managers of Ontario.

The information contained in this manual provides helpful direction for maintenance and custodial staff to improve the overall performance of apartment buildings in terms of durability and occupant health and safety. The purpose of this manual is to provide the maintenance and custodial staff of multi-unit residential buildings with the following information:

1. Guidance to perform daily, weekly, monthly, and annual tasks.
2. Information to help diagnose problems within the building.
3. Guidance to perform minor repairs and preventative maintenance.
4. Guidelines indicating when outside contractors and engineers are required.
5. Dealing with tenant concerns.

The information is organized in the following sections: housekeeping; grounds keeping; building envelope; electrical, lighting, motors, and appliances; fire protection; plumbing and drainage; heating, cooling and other mechanical systems; and security and communication.

By adopting the operating practices recommended by this manual, the maintenance and custodial staff of multi-unit residential buildings will ensure the buildings under their care will operate efficiently and cost effectively.

Prepared by Efficiency Engineering Incorporated. Ottawa: Canada Mortgage and Housing Corporation, 2003. 196 pages

Order no. 63085 **Price: \$24.95 + GST and handling charges

Nota : Aussi disponible en français sous le titre : Manuel d'entretien à l'intention du personnel d'entretien et de garde : collectifs d'habitation

AVAILABILITY : CMHC Information Products

PROPERTY MANAGEMENT

OPERATIONS MANUAL FOR OWNERS AND MANAGERS OF MULTI-UNIT RESIDENTIAL BUILDINGS

Canada Mortgage and Housing Corporation developed this manual in cooperation with the Canadian Condominium Institute, and the Association of Condominium Managers and Operators to assist property owners and managers of multi-unit residential buildings. Its purpose is to reduce the cost of operating multi-unit residential buildings, improve the overall affordability and to sustain the stock of apartment buildings in Canada.

While much of the information contained within this manual is directed at reducing costs, it also provides helpful direction for improving the overall performance of apartment buildings in terms of durability and occupant health and safety. This Manual provides owners and managers with the tools to tailor a cost-effective and successful management system for any multi-residential building. The process described in this manual will guide the owner/manager in:

1. Creating an operation and energy management plan. A building-specific set of documents to guide staffing, manpower and task planning, contracting, tenant management, budgeting, fire and life safety essentials, and utility management.
2. Making resource decisions concerning on-site staff or outside contractors.
3. Creating an organized filing system.

By adopting the operating practices recommended by this manual, the property owners and managers of multi-unit residential buildings will ensure that their buildings operate as long-term financial assets rather than liabilities.

Prepared by Efficiency Engineering Incorporated. Ottawa: Canada Mortgage and Housing Corporation, 2003. 211 pages

Order no. 63078 **Price: \$24.95 + GST and handling charges

Nota : Aussi disponible en français sous le titre : Manuel des opérations à l'intention des propriétaires et des gestionnaires : collectifs d'habitation

AVAILABILITY : CMHC Information Products

REGULATORY REFORM

MODIFYING MUNICIPAL REGULATIONS TO ACCOMMODATE TWO-GENERATIONAL HOUSES IN QUEBEC CITY = MODIFICATION DE LA

RÉGLEMENTATION MUNICIPALE PERMETTANT LES RÉSIDENCES DEUX GÉNÉRATIONS À QUÉBEC

In fall 1999, the City of Quebec was awarded an ACT grant to review the current regulatory context and propose changes to municipal regulations in order to encourage the development of two-generational housing in two post-war single-family suburbs in Quebec City.

To this end, the project team carried out the following:

- An inventory of regulatory approaches to secondary suites and two-generational housing in Quebec and elsewhere;
- The identification of incentives and obstacles to these housing types in the pilot neighbourhoods;

REGULATORY REFORM

- The creation of a regulatory framework for secondary suites;
- The evaluation of the impact of the regulatory changes on the physical, financial and regulatory environments.

The ACT project team drew on the expertise and experience of representatives from the following groups: City of Quebec Planning and Development Assistance Departments; la Société d'habitation du Québec; Laval University School of Architecture; and Germon Construction Inc.

The City made the following key changes to the zoning bylaw in the pilot neighbourhood:

- Permit the conversion of a single-family dwelling into a two-family dwelling by adding a secondary suite;
- Revise site development standards to permit (1) the encroachment into the side setback of a garage transformed into a secondary unit (2) the retention of a parking area in front of a garage which existed before the conversion, and (3) a reduction in the side setback to 1.5 metres on one side, allowing a total of at least 4 metres for both side-yards.

The zoning changes adopted by the City of Quebec provide a regulatory framework for two-generational housing. By rezoning single-family neighbourhoods to permit the addition of secondary suites in conjunction with updating site development standards, municipalities can encourage secondary suite additions while ensuring that their construction complements the lifestyle and architectural character of suburban neighbourhoods. In addition, the public consultation process undertaken for this ACT project has been instrumental in introducing and sensitizing citizens to the concept of two-generational housing. Establishing a regulatory framework for secondary suites helps municipalities ensure an acceptable level of quality for a housing form that is often built illegally.

The case study report discusses the regulatory reform initiative, its goals and the lessons learned.

Case study written by Julie Tasker-Brown, Consultant in Housing Planning. Prepared for: Federation of Canadian Municipalities; Canadian Home Builders' Association; Canadian Housing and Renewal Association; Canada Mortgage and Housing Corporation. Ottawa: CMHC, November 2002. 35 pages (Affordability and Choice Today (ACT) Demonstration Project Case Study) Bilingual

AVAILABILITY : CMHC Information Products (Order number: 63259)

NEW PARKING STANDARDS TO PROMOTE DOWNTOWN DENSIFICATION = NOUVELLES NORMES DE STATIONNEMENT FAVORISANT LA DENSIFICATION DU CENTRE-VILLE

A small city just north of Calgary, Airdrie faced the possibility of simply being a bedroom community for its large urban neighbour. In the late 1990s, the City experienced rapid single family residential growth, but commercial and mixed use developments were not keeping pace. Development of a successful pedestrian-oriented downtown had been identified as a key planning goal. However, Airdrie's existing parking space standards were seen as one of the key obstacles to successful downtown redevelopment and densification.

In 1999, the City of Airdrie decided it needed to :

- survey existing parking supply and future needs in the City's downtown core;
- analyze the need for and impact of current parking requirements in the area;
- look at experience in other jurisdictions;
- develop a long-term densification and parking strategy for the downtown;

REGULATORY REFORM

- draft and adopt necessary bylaw amendments; and
- promote results to stakeholders.

The City submitted an ACT grant application in October 1999. Airdrie's goal was to make future developments more pedestrian oriented, attracting people likely to walk to stores, services and work. A September 2000 parking study found that peak usage was only 52 per cent for on-street parking and 34 per cent for off-street parking. If the City applied its existing parking requirements to new development in the downtown it would undermine downtown revitalization objectives.

A survey of other municipalities found that Airdrie's requirements were usually towards the more stringent end of the range. By-law amendments were suggested for the downtown area. The new downtown parking bylaw was passed in May 2001. It incorporated new ratios as of right, and allowed for variances based on shared parking, some off-site spaces and cash-in lieu of payments.

The new parking standards represent a substantial reduction in the site area which must be used for stalls -- up to 40 per cent in the case of two bedroom and larger units and 50 per cent for one-bedroom units. This allows for more units per acre, resulting in lower land costs per unit. In some projects, it may allow all at-grade parking, avoiding the much higher costs of garage construction. In Airdrie's competitive housing market, these savings are being passed on to home buyers, allowing more households to qualify for the units. By reducing parking requirements for almost all land uses, and allowing shared parking and cash-in lieu, Airdrie's new parking policies for its downtown core encourage mixed use development.

The case study report discusses the regulatory reform initiative, its goals and the lessons learned.

Case study written by Rowena E. Moyes and Carol L. Hancock. Prepared for: Federation of Canadian Municipalities; Canadian Home Builders' Association; Canadian Housing and Renewal Association; Canada Mortgage and Housing Corporation. Ottawa: CMHC, March 2003. 29 pages (Affordability and Choice Today (ACT) Demonstration Project Case Study) Bilingual

AVAILABILITY : CMHC Information Products (Order number: 63196)

RENOVATION AND INSPECTION

CONSULTATION ON HOUSING RENOVATION PROGRAMS: SUMMARY REPORT: CMHC EMPLOYEE CONSULTATION

In the summer of 2002, Canada Mortgage and Housing Corporation, in co-operation with the provinces and territories, undertook a public consultation on the future of the federal government's housing renovation programs. The consultation involved discussions with Canadians on their views on the effectiveness of the renovation programs and their ideas on how the programs could be improved.

CMHC employees were also invited to share their views on the issues raised in the consultation document. This paper provides a summary of the input received from CMHC employees. Separate consultation processes were held in each Region and at National Office. Input was

RENOVATION AND INSPECTION

received through individual responses, focus groups and meetings of functional and business teams.

Ottawa: Canada Mortgage and Housing Corporation, December 2002. (Renovation Consultation Report) 35 pages

Nota : Aussi disponible en français sous le titre : Consultation sur les programmes de rénovation : rapport sommaire : Consultation des employés de la SCHL

AVAILABILITY : Canadian Housing Information Centre

INVESTIGATING CLAIMS AGAINST HOME AND PROPERTY INSPECTORS

One of the fastest growing sectors in the housing market is the home and property inspectors sector. A home and property inspector (HPI) mainly inspects existing homes and commercial buildings. The home/property inspection sector includes sole-operators, firms, and franchised businesses. Although many HPIs are professionals with satisfied clients, from time to time they are involved in legal action with a client. Recently, some insurance companies have challenged the sector by refusing some HPIs errors and omission insurance.

The purpose of this study is to focus on the nature of complaints filed against HPI. The data on insurance claims from 1997 to 2003 reveals that most of the claims appear to be focused on structural issues such as cracks in the foundation (30 claims filed). The next claims most often made against home inspectors are water in the basement (29 claims filed) followed by structural general including walls and some foundations (19 claims filed).

The majority of the claims are from Quebec followed by Ontario, British Columbia, Alberta, Nova Scotia, New Brunswick, Newfoundland, Prince Edward Island and Saskatchewan. No claims were filed in Manitoba. This only represents claims filed and not complaints against home inspectors. The data showed that the insurance companies were paying out more in claims than they were receiving in insurance fees.

The interviews and review of documents, including jurisprudence, show that some HPI are involved in legal challenges because they failed to adhere to the standard of practice or carried out their activities beyond the scope of the national occupational standards. In addition, some HPI are not properly trained in specific areas such as building sciences. Many of the courses available to HPI through industry associations may need to be reexamined to ensure that proper information is being provided.

Recommendations on how to reduce insurance claims and complaints against HPIs are included in the report.

Prepared by John Kiedrowski, Claude Lawrenson, Kiedrowski & Associates. CMHC Project Officer: Darrel Smith. Ottawa: Canada Mortgage and Housing Corporation, 2004. 59 pages

Note: No. 04-114 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilingual/CHIC-Investigating%20Claims\(w\).pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilingual/CHIC-Investigating%20Claims(w).pdf)

RENOVATION AND INSPECTION

MANDATORY HOME INSPECTIONS ON RESALE HOMES IN ONTARIO

A CMHC External Research Program (ERP) grant was awarded to research the issue of mandatory home inspections for resale homes in Ontario with a number of housing industry interest groups such as Ontario Government stakeholders, the inspection industry (public and private), the real estate industry, financial lending institutions, and consumer associations. The research investigated was to determine why this requirement was never imposed in the past, the pros and cons of enacting such a requirement in the future, and how could such a requirement be enacted and by whom. The study also investigated if the existing home inspection industry could handle the increased capacity of such a requirement. The research indicates that all industry interest groups agree that home inspections are a worthwhile part of the resale home process. They also believe that a voluntary inspection service is adequate, provided the industry self-regulates and establishes uniform acceptable standards of practice to provide a better service for homeowners.

Prepared by Terry A. Marshall. CMHC Project Officer: Darrel Smith. Ottawa: Canada Mortgage and Housing Corporation, 2002 (CMHC External Research Program Report) 84 pages

Note : No. 03-101 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre

PUBLIC CONSULTATION ON HOUSING RENOVATION PROGRAMS: SUMMARY

In the summer of 2002, Canada Mortgage and Housing Corporation, in co-operation with the provinces and territories, undertook a public consultation on the future of the federal government's housing renovation programs. The consultation involved discussions with Canadians on their views on the effectiveness of the renovation programs and their ideas on how the programs could be improved.

This document provides a summary of the input received from over 150 national, provincial, territorial and local stakeholder groups and individuals, including urban and rural municipalities and regional municipalities, First Nation provincial associations and Tribal and Band Councils, Métis and Innu groups, off-reserve Aboriginal associations, native inspection services, organizations representing non-profit and co-operative housing groups, seniors, transition homes, independent living centres, the homeless, persons with disabilities, occupational

therapists, landlords, tenants, builders, and real estate agents, as well as advisory committees, housing partnerships, program beneficiaries, private citizens, agents responsible for the delivery of the renovation programs, and federal and provincial departments and agencies.

Ottawa: *Canada Mortgage and Housing Corporation, December 2002. (Renovation Consultation Report) 57 pages*

Nota : Aussi disponible en français sous le titre : Consultation publique sur les programmes de rénovation : rapport sommaire

AVAILABILITY : Canadian Housing Information Centre

RENOVATION AND INSPECTION

RECYCLE: LIFECYCLE - HOW TO RENOVATE FOR CHANGE

This project's purpose was to develop a set of design strategies for adaptable renovations involving a variety of common, detached housing types. The objective of these strategies was to inform homeowners, or prospective homeowners about how they could, through alterations or additions to their homes, achieve the greatest flexibility while meeting their changing needs. It is intended for use by homeowners, architects and home designers, contractors and others in positions of jurisdictional authority.

Prepared by Elizabeth MacKenzie, James Boldt, Linda Brock. CMHC Project Officer: Tom Parker. Ottawa: Canada Mortgage and Housing Corporation, 2002. (CMHC External Research Program Report) 49 pages

Note: No. 03-007 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre

RENOVATING DISTINCTIVE HOMES: THE CENTURY HOME

This book focuses specifically on the century-old two storey house. With the century-old two storey house, the layout, the construction methods and systems of the period, and the usable attic all pose particular renovation opportunities. This book provides the homeowner with information to plan and carry out successful renovation, and recognizes the typical problems houses of this vintage face. It includes technical information as well as what to ask your contractor and how to incorporate Healthy Housing™ and FlexHousing™ features into renovation plans. It includes the following:

- background information on why the century-old two storey house is built the way it is
- typical problems century-old houses face and what needs attention as part of any renovation
- an overview of what a renovation project involves
- tools to help plan and carry out a renovation: worksheets, checklists and a sample renovation contract
- renovation ideas and tips on proper construction details of typical renovation projects

- a directory of further information sources.

*Prepared by Canada Mortgage and Housing Corporation. Ottawa: CMHC, 2003. 123 pages
Order number 63106 Price: \$14.95 + GST + Handling Charges*

Nota : Aussi disponible en français sous le titre : La maison réinventée : La maison centenaire

AVAILABILITY : CMHC Information Products

RENOVATION AND INSPECTION

RESIDENTIAL REHABILITATION ASSISTANCE PROGRAM (RRAP) EVALUATION = ÉVALUATION DU PROGRAMME D'AIDE À LA REMISE EN ÉTAT DES LOGEMENTS (PAREL)

The Residential Rehabilitation Assistance Program (RRAP) was introduced in 1973, with the On-reserve RRAP being introduced in 1978. Since then, the Program has provided \$3.0 billion to help rehabilitate over 650,000 substandard housing units and beds. While RRAP has undergone numerous changes throughout its history, its prime intent to bring the housing conditions of low-income Canadians up to basic health and safety standards has remained unchanged.

This evaluation covers the period from 1995, when major program changes were last introduced, to 2001. Previous changes introduced in 1985 ensured that RRAP was targeted to households in core housing need, that is, households living in substandard housing who cannot afford adequate and suitable accommodation without paying more than 30% of their income on shelter. The 1995 changes were intended to improve the program's ability to address repair needs by increasing program assistance and improved targeting to households with greatest need.

In December 1999, the federal government announced a \$311 million expansion to the RRAP and other federal renovation assistance programs as part of the \$753 million National Homelessness Initiative.

This evaluation covers activity for the following program components: Homeowner RRAP, Rental RRAP, Rooming House RRAP, Conversion RRAP, RRAP for Persons with Disabilities and the Emergency Repair Program, as well as provincial and territorial programs cost-shared under RRAP. The evaluation also covers activity for the two components of the On-reserve RRAP, namely Homeowner RRAP and RRAP-D for Persons with Disabilities. In the case of Quebec, the evaluation relies on existing evaluations of Quebec programs carried out by la Société d'habitation du Québec. Two other renovation assistance programs, the Home Adaptations for Seniors' Independence program and the Shelter Enhancement Program have recently been evaluated and hence are not part of the current evaluation.

This evaluation addresses the following key questions: Is there a continuing rationale for federal government renovation assistance? Who benefits from renovation assistance? What are the housing impacts? What are the impacts on neighbourhoods and on employment? The evaluation also examines program design and delivery issues.

Prepared by Audit and Evaluation Services, Canada Mortgage and Housing Corporation, R. A. Malatest & Associates Limited, and Auguste Solutions and Associates Inc. Ottawa: CMHC, 2003. 1 CD-ROM
Bilingual

AVAILABILITY : Canadian Housing Information Centre and
ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_bilingual/Residential%20Rehabilitation%20Assistance%20Program%20Evaluation%20-%202003.pdf

RENTAL HOUSING

NON-PAIEMENT DE LOYER ET LA SANTÉ DU SECTEUR LOCATIF AU QUÉBEC

Every year, the Régie du logement du Québec (Quebec Rental Board) receives some 70,000 cases, the vast majority of which involve the non-payment of rents by tenants. This situation means that landlords sustain losses of income that may be substantial but whose significance remains to be determined. This study is primarily aimed at measuring the significance of the phenomenon of the non-payment of rents in Quebec, its spatial distribution and its economic impact on the rental housing sector. The approach used rests mainly on a systematic analysis of the information contained in the computerized central file of the decisions delivered by the commissioners of the Régie du logement. The study covers a sample of 1,610 decisions rendered during the period from 1998 to 2000 for recovery-termination, recoveries other and abandonment. The 24 areas considered in the study correspond to the administrative delimitation of the agency's regional offices and cover all of Quebec. The sampling error is 3.92%.

Prepared by François Des Rosiers. CMHC Project Officer: Charles Fortin. Ottawa: Canada Mortgage and Housing Corporation, 2003. (CMHC External Research Program Report) 224 pages

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/fr_unilingue/LE%20NON-PAIEMENT%20DE%20LOYER\(W\).pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/fr_unilingue/LE%20NON-PAIEMENT%20DE%20LOYER(W).pdf)

STRATEGIES TO PRESERVE THE EXISTING RENTAL HOUSING STOCK IN GREATER VANCOUVER: FINAL REPORT

There is growing recognition of the need to preserve the existing rental housing stock in Greater Vancouver as this stock has a critical role to play in addressing the need for affordable housing.

This study identifies and considers a variety of tools that could be used to preserve the existing rental housing stock, and which of these would have the most potential for preserving the rental housing stock in Greater Vancouver. The range of tools includes:

- Planning and policy
- Conversion control
- Standards of maintenance bylaws
- Demolition policies

- Zoning: regulations and incentives
- Tax incentives
- Acquisition and rehabilitation by municipalities and non-profit housing organizations
- Education and information
- Direct expenditure government programs
- Financing tools

The method involved a focused literature search to identify tools and initiatives in the United States and Canada that are used to preserve the existing rental housing stock. In addition, a limited number of key informant interviews were conducted with local government staff in the U.S., (San Diego, Seattle and Portland), and with municipal planners, inspectors and landlords in Greater Vancouver. A workshop was also held with key stakeholders in Greater Vancouver.

In order to preserve rental housing in Greater Vancouver, this report recommends that all the tools identified in this study be considered as part of a comprehensive strategy to promote maintenance and the preservation of this housing. It is further recommended that all levels of

RENTAL HOUSING

government, the private sector and community agencies work together to implement a coordinated strategy to preserve this stock.

Prepared for the Tenants Rights Action Coalition by Deborah Kraus, Jim Woodward, Margaret Eberle and Dianna Hurford. CMHC Project Officer: Tan M. Crombie. Ottawa: Canada Mortgage and Housing Corporation, 2004 (External Research Program Report) 87 pages

Note: No. 04-026 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre

YOUR GUIDE TO RENTING A HOME

This project's objective was to undertake research and produce content for an online residential rental guide. This guide provides comprehensive advice to tenants, landlords and rental property managers regarding rights, responsibilities and best practices. It includes checklists, worksheets, and sample forms and letters, and appropriate information for each province and territory. It also provides links to other web sites and contact information.

AVAILABILITY : Product is available on the CMHC web site at <http://www.cmhc.ca/en/bureho/reho/index.cfm>

RESIDENTIAL DEVELOPMENT

LEVIES, FEES, CHARGES AND TAXES ON NEW HOUSING: 2002

This research identified, tabulated and compared the separate and cumulative costs of the various development charges, levies fees and other charges for various housing forms and tenure. The study encompassed 30 municipalities including those examined in a similar 1997 CMHC study. The research also identified the changes that have occurred with regard to these charges in the intervening period and assessed the burden these charges represent on new

housing prices and on new rental property. The study found that these charges vary widely among municipalities and range from 5.2% to 19.7% of the house price and, correspondingly, from 7.6% to 21.2% of the development costs of rental property. In absolute terms, the range of total charges was from \$8,662 to \$48,327 for detached houses and from \$5,170 to 22,280 for rental units. The comparison with the 1997 results show that total charges increased slightly from 13.5% to 13.7% of the house price.

Prepared by Greg Lampert. Ottawa: Canada Mortgage and Housing Corporation, 2003 (Housing Affordability and Finance Series) 165 pages

Nota : Aussi disponible en français sous le titre : Impôts, droits, frais et taxes sur les logements neufs 2002

Note: No. 115 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site

AVAILABILITY : CMHC Information Products (Order number: 63184)

RESIDENTIAL DEVELOPMENT

RESIDENTIAL DEVELOPMENT IN COASTAL COMMUNITIES: ADDRESSING CLIMATE CHANGE THROUGH SUSTAINABLE COASTAL PLANNING

The Beaubassin coastal area of southeastern New Brunswick has a long coastal development history. It has become one of the premier places to live and play in New Brunswick. In recent years, a number of storm surges have impacted dramatically on people's coastal homes, cottages and properties. Scientists have determined that sea-level rise is occurring due to climate change and the impacts are being felt all along the coasts of not only New Brunswick but all of Canada. This project looks at the issue of sea-level rise and coastal residential development.

The study reviews residential development patterns and explores unsustainable land use practices of coastal communities. It looks at ways in which property owners are currently adapting to sea-level rise, storm surges and coastal flooding. The project recommends ways in which both communities and property owners can adapt to sea-level rise and storm surges in a sustainable way.

Prepared by Paul Jordan, Research Associate, Rural and Small Town Programme, Mount Allison University. CMHC Project Officer: Brian Eames. Ottawa: Canada Mortgage and Housing Corporation, 2002 (CMHC External Research Program Report) 38 pages

AVAILABILITY : Canadian Housing Information Centre and
ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilingual/RR_Coastal_Communities_w.pdf

WAVERLEY WEST KENASTON BOULEVARD ALIGNMENT OPTIONS STUDY

The purpose of this research was to assist the Manitoba Housing and Renewal Corporation and the City of Winnipeg in examining and implementing the fused grid planning model. A main goal of this work was to engage the industry in applying planning and design ideas that are intended to have positive impacts on the community and the environment. A subsidiary goal was to obtain sound research results which can demonstrate the validity of these ideas and their benefits to industry and community.

This report assesses the traffic performance of a number of options for route 90 (Kenaston Blvd) as it passes through a planned town centre in a new community in the southwest boundary

of the city of Winnipeg. The first component of this research looked at a central element of the Fused Grid model, the twined arterial, as it applies to the planned new community. The traffic analysis shows that the twined option provides a better level of service than the conventional 6-lane express arterial road. Moreover, it would be more economical to build and would create a much friendlier pedestrian environment at the community, business and retail centre than the alternative.

Prepared by Stantec Consulting Ltd. Prepared for Manitoba Housing and Renewal Corporation. CMHC Project Officer: Fanis Grammenos. Ottawa: Canada Mortgage and Housing Corporation, 2004. 28 pages

AVAILABILITY : On a loan basis from Canadian Housing Information Centre

SENIORS

EVALUATION OF OPTIMAL BATH GRAB BAR PLACEMENT FOR SENIORS: FINAL REPORT

The purpose of the proposed study was to evaluate the patterns of use as well as the perceived usefulness and perceived safety of five different configurations of bathtub grab bars for community-living seniors. Current bathing activities, fall history, socio-demographic characteristics, balance measures as well as details about the home bathing environment were recorded for 103 participants. Participants also evaluated five different configurations of bathtub grab bars to get in/out and sit down/get up from a standard bathtub. The five configurations evaluated corresponded to the standards published by the Canadian Standards Association, the US Uniform Accessibility Standards, a modification of the Ontario Building code, a “common configuration” and a composite configuration. A series of recommendations and suggestions for future research are made based on the data from the study.

Prepared by: Heidi Sveistrup ... et al. CMHC Project Officer: Luis Rodriguez. Ottawa: Canada Mortgage and Housing Corporation, 2002. (CMHC External Research Program Report) 75 pages

Note: No. 03-110 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre and
ftp://ftp.cmhc-schl.gc.ca/chic-ccd/h/Research_Reports-Rapports_de_recherche/eng_unilin_gual/DC-20070738%20filescollected.pdf

INTERGENERATIONAL HOME SHARING AND SECONDARY SUITES IN QUÉBEC CITY SUBURBS

This research studied the addition of secondary suites—self-contained housing units adjacent to a single-family dwelling or constructed within it—for inter-generational home sharing in suburbs.

The research included a qualitative survey of urban planning managers in five suburban Québec municipalities to obtain information about municipal regulations and perceived benefits and drawbacks of secondary suite home sharing. Researchers also interviewed 36 people in 26 households, representing 15 families who are home sharing. The interviews collected information about attitudes, motivation, the steps taken toward home sharing, the difficulties faced and perceptions of benefits and drawbacks before and after deciding to home share.

The research shows that municipal zoning and architectural integration regulations are an important part of decision-making for households that wish to home share. Adding a secondary suite for relatives seems to be a choice for families with strong emotional bonds. Inter-generational home sharing is a joint decision and generally meets the expectations of the people involved. They see many benefits in terms of security, finances, sociability, daily life, the quality of the built environment, space and health. The most significant drawback is a potential loss of privacy and this can lead to friction if space for each household is not clearly defined. The research also notes that there are no public programs to finance secondary suites for inter-generational home sharing. The households involved pay the entire conversion costs.

Prepared by Manon Boulianne. CMHC Project Officer: Luis Rodriguez. Ottawa: Canada Mortgage and Housing Corporation, 2004. 91 pages

SENIORS

Note: No. 04-028 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

Nota : Aussi disponible en français sous le titre : Cohabitation intergénérationnelle et logement supplémentaire dans les banlieues de Québec

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-ccdh/Research_Reports-Rapports_de_recherche/eng_bilingual/Intergrational_feb28\(web\).pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccdh/Research_Reports-Rapports_de_recherche/eng_bilingual/Intergrational_feb28(web).pdf)

LIFE LEASE HOUSING IN CANADA: A PRELIMINARY EXPLORATION OF SOME CONSUMER PROTECTION ISSUES

This 70 page research report describes life lease housing and how it operates in Canada; discusses the regulatory perspectives, policies, and plans of the five provinces (Ontario, Manitoba, Saskatchewan, Alberta and British Columbia) where life lease housing is currently available; describes the views of some development consultants about consumer protection issues; and identifies consumer protection issues that are of interest to governments and consumers and suggests how these might be addressed in a legislative framework. The discussions in the report are based on surveys of sponsors, development consultants, and the governments of provinces where life lease housing is currently active.

Prepared by Lumina Services Inc. Principal Investigator: Kate Mancer. CMHC Project Officer: Luis Rodriguez. Ottawa: Canada Mortgage and Housing Corporation, 2003 (CMHC External Program Research Report) 70 pages

Nota : Aussi disponible en français sous le titre : La location viagère au Canada : étude préliminaire de certains enjeux relatifs à la protection des consommateurs

Note: No. 03-113 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre

VILLAGEOIS DE LAFONTAINE HOUSING PROJECT FOR RETIREES = LE VILLAGEOIS DE LAFONTAINE PROJET DE LOGEMENTS POUR PERSONNES À LA RETRAITE

The development of a housing project for retirees began in the fall of 1998 under the direction of the Club de l'âge d'or and its partner CALDEC, a non-profit community economic development corporation. The Club set up a housing committee, which became a non-profit corporation and adopted the name "Le Villageois de Lafontaine".

This report documents the objective of this organization to develop a three-part housing project for retirees, consisting of:

- 30 units intended for retirees;
- 10-20 units for semi-autonomous persons; and
- a community centre integrated with the residential components, which provides the residents and the public with various services.

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The organization hopes to serve on a priority basis the French-speaking population in the Township of Tilly, in Simcoe County, in north-central Ontario. The aim is to put a stop to the exodus of young people and retirees. Its plans call for accommodation for the elderly and employment for younger residents. Le Villageois wishes to be innovative in the area of affordable housing by offering a life lease. This report outlines the plans of the organization and its success to date.

Prepared by Le Club de l'âge d'or de Lafontaine, Le Villageois de Lafontaine and CALDECH. Final report as part of the Homegrown Solutions Project. Ottawa: Canada Mortgage and Housing Corporation, 2002. 41 pages

AVAILABILITY : Canadian Housing Information Centre

SOCIAL HOUSING

SEARCH FOR MORAL MONEY: USING SELF-DIRECTED RRSP'S TO FINANCE SOCIAL HOUSING = À LA RECHERCHE D'UN FINANCEMENT ÉTHIQUE : UTILISER LES REER AUTOGÉRÉS POUR FINANCER LE LOGEMENT SOCIAL

This report examines the opportunity and feasibility of using self-directed RRSP investments to assist in financing development of affordable housing by non-profit housing groups.

Two options are explored and discussed. The first option considered using money in a self-directed RRSP to buy shares in a small business corporation that is created to develop and invest in affordable housing. The second option is using a self-directed RRSP to invest in a mortgage fund, which in turn can be used to provide mortgage financing for a social housing project. Both options require the investor to have a self-administered RRSP, and a flexible trustee willing to make the investment in the housing project.

This paper discusses how providers can use RRSP's and outlines some of the challenges facing a group that wants to access RRSP funds. The review of opportunities has identified some serious regulatory issues -- which while not insurmountable require a sophisticated institution to assemble and manage the investment funds. This study is not a guide or a 'how-to' manual. Rather, the intention is to outline the pitfalls and challenges facing a housing provider that wants to use self-directed RRSP's to finance social housing.

Prepared by Pareval Non-Profit Residential Corporation. Submitted to Homegrown Solutions. Ottawa: Canada Mortgage and Housing Corporation, 2002. 64 pages

AVAILABILITY : Canadian Housing Information Centre

SHELTER ENHANCEMENT PROGRAM EVALUATION = ÉVALUATION DU PROGRAMME D'AMÉLIORATION DES MAISONS D'HÉBERGEMENT

The Shelter Enhancement Program (SEP) was initiated in 1995/96 with funding from the Federal Family Violence Initiative (FVI). The objective of the SEP is to assist in repairing and improving existing shelters for women and children in areas such as security, access for persons with

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disabilities, and improvements in child play areas. SEP also assists in the acquisition or construction of new shelters and second stage housing where needed.

SEP provides interest-free, fully forgivable loans to sponsors of first-stage shelters and second-stage housing for women and their children experiencing family violence. Sponsors who are eligible include non-profit organizations and Indian Band Councils. In December 1999, additional funding for SEP from the National Homelessness Initiative (NHI) was announced for the four years 1999/00 to 2002/03, and the scope of the program was expanded to include youth who are victims of family violence.

An evaluation of SEP was undertaken in 2001 and this report addresses the impacts of this program for Canadian family violence shelters. A separate report on the youth component of the SEP examines the youth shelters funded in the two years 1999/00 and 2000/01. The evaluation addressed four key questions: Have SEP expenditures improved shelter conditions and had positive impacts for shelter clients? Is there a continuing need for a program to fund mandatory repairs and enhancements of shelters (security, access for persons with disabilities, etc.)? What impact have SEP expenditures had on the need for shelters and shelter utilization? Is there a continuing need for a program to fund additional shelter units?

Submitted to Audit & Evaluation Services, Canada Mortgage and Housing Corporation by SPR Associates Inc. Ottawa: CMHC, 2002. 81 pages

AVAILABILITY : Canadian Housing Information Centre

SHELTER ENHANCEMENT PROGRAM EVALUATION - YOUTH COMPONENT = ÉVALUATION DU PROGRAMME D'AMÉLIORATION DES MAISONS D'HÉBERGEMENT - VOLET JEUNESSE

The evaluation of the Youth Component of SEP addresses the same questions as were considered in the SEP evaluation of family violence shelters. The Youth Component of the SEP Evaluation also attempts to estimate what percentage of youth shelter clients seek emergency housing because of family violence and examines the linkages between women's family violence shelters and youth shelters. It also considers the different sources of funding for these youth shelters, including fund-raising and partnering issues.

This evaluation of the youth component of SEP is based on only two years of SEP funding to-date for youth shelters which is the mid-term in the four years of SEP funding under the NHI. A total of 15 youth shelter organizations have received SEP funding, four of these for new shelter

facilities and eleven for repairs of existing shelter facilities. Each of the youth shelters funded is unique in some respects including the client groups served and the services provided. Two are located in First Nations and the rest are located in metropolitan areas. The small number of youth shelters funded to-date and their variability make it difficult to generalize about the impacts of SEP funding at this time. Therefore, the objective of this evaluation was to provide an overview of the youth shelters funded and illustrate the impacts of SEP funding on the shelters and their programs for their clients.

Submitted to Audit & Evaluation Services, Canada Mortgage and Housing Corporation by SPR Associates Inc. Ottawa: CMHC, 2002. 54 pages

AVAILABILITY : Canadian Housing Information Centre

SUSTAINABLE DEVELOPMENT & HEALTHY HOUSING

INTEGRATED COMMUNITY SOLUTIONS: REGINA'S AFFORDABLE, SUSTAINABLE HOUSING DESIGN CHARRETTE

A design charrette sponsored by Canada Mortgage and Housing Corporation (CMHC) and hosted by the City of Regina took place on January 10, 2003. The purpose was to solicit ideas and explore the opportunities for a pilot project that would demonstrate affordable, sustainable housing development on a vacant school site located in Regina's inner city based on initial design and feasibility work for the site.

Design charrettes are becoming more common in design practice and are an excellent way to bring a range of expertise and interests together to collaborate and create effective solutions to multifaceted projects. The Regina Affordable Sustainable Housing Charrette was very successful in presenting a vision and potential path towards creating healthy affordable housing and a community asset for the City of Regina.

The project goal was to create design strategies that can reduce operating costs while providing comfortable housing that protects the health of the occupants and the environment. Thirty-five key individuals contributed their expertise and time over an intensive day of presentations and discussion. They included technical experts, representatives from the local neighbourhood, and participants from various partner organizations.

The degree of enthusiasm and positive ideas as well as the degree of consensus achieved during the charrette reflect the shared realization of the participants for the extensive benefits that such a well-planned healthy housing project could bring to the housing occupants, as well as the surrounding neighbourhood.

Prepared by Ken Coutu, Integrated Controls Ltd. Prepared for: Community Services Department, City of Regina and Policy and Research Division, Canada Mortgage and Housing Corporation. City of Regina Project Manager: Robert Bjerke. CMHC Project Manager: Thomas Green. Ottawa: CMHC, 2003. 81 pages

AVAILABILITY : Canadian Housing Information Centre and [ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilin_gual/RR%20Integrated\(w\).pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilin_gual/RR%20Integrated(w).pdf)

INTEGRATED DESIGN CHARRETTE FOR A SUSTAINABLE UNIVERCITY COMMUNITY: CHARRETTE RESULTS, BURNABY, B.C.

In order to support the development teams in the design of a new, more sustainable residential development at Simon Fraser University, known as the UniverCity Community, an integrated design charrette was initiated in September 2002. The charrette took place over two days at Simon Fraser University in Burnaby on September 9 and 10, 2002. The intention of the Charrette was to use the integrated design process (IDP) to push the boundaries of building performance towards more sustainable practices.

The objective of the Charrette was to provide participants with the tools and information required to make it easier to implement the Green Building Guidelines established for the UniverCity Community. The sessions were intended to take development teams working on the first stage of the UniverCity Highlands project through an integrated design process. Experts

with experience in the integrated design process acted as facilitators and provided support to the

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design teams. Resource persons were selected to provide specific areas of expertise that would complement the composition of the design teams and enable the integrated design process in each team to become more specific and less theoretical. The charrette helped development teams attain meaningful progress towards the UniverCity development's sustainability goals. This report describes the integrated design process, the work of the charrette teams, the break out sessions, and the conclusions reached.

Prepared by Richard Kadulski, Architect. CMHC Project Officer: Sandra Marshall. Ottawa: Canada Mortgage and Housing Corporation, 2003. 43 pages

Note: No. 03-110 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Available on a loan basis only from the Canadian Housing Information Centre

INTEGRATED DESIGN CHARRETTE FOR SUSTAINABLE AFFORDABLE HOUSING: CHARRETTE RESULTS, CALGARY, AB

The 2-day Integrated Design Charrette for Sustainable Affordable Housing was held in Calgary on January 21st - 22nd, at the Carriage House Inn, near by the proposed development site. The goal of the charrette was to examine possible design solutions for the creation of a sustainable, affordable housing community for those who cannot afford the higher prices that have become the norm for the City of Calgary.

Dome Britannia Properties wanted to have a flagship model of sustainable and affordable residential development. As such, the specific objectives for the design charrette were as follows:

- Ensure that any design concepts take into consideration green/environmental stewardship. The development should utilize the best in sustainable development technology and applications.
- Succeed in encouraging its occupants to adopt environmentally friendly practices in their day-to-day lives.
- Create a project that can integrate people from different walks of life with the objective of creating a framework for a vibrant sustainable community. The project may include a combination of market, near market, affordable and seniors' housing. Recreational facilities and programs, interaction between children and seniors, green spaces and the possible inclusion of medical or commercial amenities are all examples of what could be included in the overall concept.
- Determine the pros and cons of rental versus ownership. The development could allow for rental units or owner occupied units.
- Create affordable housing. The rent of a two bedroom unit to be around \$600/month.
- Provide the balance between the provision of affordable housing and the costs of sustainable development.

The costs for the sustainable development should be the same as for conventional development, or, at the very least, the payback on ongoing cost saving measures must have a reasonable time frame attached. If the costs of going green are incrementally higher, determine the possibility of subsidies, grants, private donations or discounted interest rates from green or socially conscious lenders, which may be available to defray those additional costs.

This report describes the Integrated Design Process used, the teams, the resources, results, analysis and conclusions of the charrette.

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Prepared by Shari Imada and Scott Pickles. CMHC Project Officer: Sandra Marshall. Ottawa: Canada Mortgage and Housing Corporation, 2004. 22 pages

Note: No. 04-102 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : On a loan basis from the Canadian Housing Information Centre

INTEGRATED DESIGN PROCESS (IDP) DESCRIPTION AND EVALUATION FINAL REPORT: SEVILLE THEATER REDEVELOPMENT PROJECT

This report describes the results of an integrated design process carried out for the Seville Theatre Redevelopment Project in Montreal. The purpose of the charrette was to validate the economic potential in creating and building an innovative concept that is predominantly environmentally sound. This charrette distinguished itself from previous ones by its inclusion of a wider range of concerns beyond energy efficiency: urban integration, commercial operation requirements and the questioning of the program itself, recycling of existing buildings and heritage issues, embodied energy and greenhouse gas emissions as well as urban ecology. With respect to building energy performance, the discussion was similarly widened to include a number of technologies which have not yet been widely applied in the Canadian context yet, such as underground earth pipes and double-skin ventilated walls/facades. This final report provides the context for the charrette, describes the integrated design process that took place, and outlines results and comments from the post-charrette evaluation. Appendices include pre- and post-charrette designs, and participant papers and reports.

Written and edited by Daniel Pearl and Bernard Olivier of L'OEUF. Montreal: L'OEUF (Pearl Poddubiuk architectes), 2002. ca. 153 pages

AVAILABILITY : Available from: L'OEUF (Pearl Poddubiuk architectes) 995 Girouard, Montréal, (Québec) H4A 3B9 www.loeuf.com

LANDSCAPE GUIDE FOR CANADIAN HOMES

This guide will help you meet your home landscape needs while respecting the natural environment, and saving time and money, whether you want a radical makeover, are starting from scratch or want to spruce up an old garden. The guide shows how to go from ideas, to plan, to real life, by describing the design process and providing many tips on materials and technical solutions as well as maintenance tips. These tips relate to a wide range of landscape elements like plants, soil, ponds, slopes, stormwater and hard surfaces, such as decks and patios. These tips can be used by do-it-yourselfers or even those that are hiring a professional to design, prepare technical documents or install the design.

Prepared by Daniel Lefebvre, Landscape Architect, Rousseau Lefebvre Architecture de paysage and Susan Fisher, Landscape Architect, Senior Researcher, Canada Mortgage and Housing Corporation. Ottawa: CMHC, c2004. 175 pages

Order number: 63523 **Price: \$19.95 + GST and handling charges

Nota : Aussi disponible en français sous le titre : L'aménagement paysager chez soi – Guide canadien

AVAILABILITY : CMHC Information Products

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ON THE LIVING EDGE: YOUR HANDBOOK FOR WATERFRONT LIVING

Learn how to protect your investment and have more time to enjoy your waterfront setting. The authors share their personal experiences of living by water in B.C. in this user-friendly handbook. It includes informative tips, advice, helpful B.C. references, illustrations and stories to assist with the unique challenges of waterfront living. This handbook for waterfront living includes the following topics:

- shoreline erosion
- protecting your water quality
- tips for purchasers
- docks
- recreation and boating
- native plants on the shoreline
- septic and water systems
- building by water
- caring for yards and gardens
- co-existing with wildlife

“On the Living Edge” has been written for both permanent shoreline residents and seasonal cottagers along all types of shorelines: marine and freshwater, urban and rural. This includes property bordering on the ocean, an estuary, lake, reservoir, or river. It also includes properties which contain a stream, pond, canal, wetland, or drainage ditch.

British Columbia Edition. Prepared by Sarah Kipp and Clive Callaway. CMHC Project Officer: Susan Fisher. Vancouver: Federation of British Columbia Naturalists, 2002. 142 pages.

AVAILABILITY : Living by Water Project at shorelines@jetstream.net, 250-832-7405 or 604-737-3057, www.livingbywater.ca

PROTOTYPE INTERNET TOOL FOR NEGOTIATED URBAN DESIGN

The purpose of the study was to create a prototype Negotiated Urban Design (NUD) Tool that provides an interactive forum for stakeholder engagement in Planning-Design-Development projects. Part 1 consists of an examination of various methods of density specification, analysis of the relationship between achieved density and specified density and a survey of practitioners' opinions on various methods of density specification. Part 2 dealt with the development of the Negotiated Urban Design (NUD) Tool. The tool is simulated on a CD-ROM. It was beyond the scope of this research to create a fully functioning tool. It is intended that the tool would ultimately be web based for easy access and to promote stakeholder interactivity and engagement in the Planning-Design-Development process. The tool is primarily image based and seeks to determine and advise on participant preferences to streetscape and form with density specifications secondary.

Prepared by William T. Perks, Faculty of Environmental Design, University of Calgary and Terry Brooke, Brooke Associates. Website design: Rosita Kwan and Ed Reddy. Prepared for Canada Mortgage and Housing Corporation. Ottawa: CMHC, 2003. (External Research Program Research Report). 1 volume (67 pages) + CD-ROM

AVAILABILITY : Canadian Housing Information Centre

RESIDENTIAL INTENSIFICATION CASE STUDIES: BUILT PROJECTS

This project profiles examples of residential projects that have overcome the barriers to intensification and are generally considered to be successful by the developers, residents and municipal officials. The report profiles 23 completed intensification projects. The selection of case studies attempts to strike a balance between regional representation, different urban

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contexts (e.g. downtown, waterfront, suburban, brownfield), and different types of intensification (e.g. redevelopment, infill, adaptive re-use). For each case study, the research team interviewed the developer, the municipal official most familiar with the project and a number of residents.

Each residential intensification case study provides the following information: the address of the project, the name of the developer, the date a project was completed, the site area, the number and type of residential units, the floor area, gross residential density, landscaped open space, maximum height of the buildings, parking, non-residential units, pre-development usage and the selling or renting price per unit. Each case study also gives an overview of the project, the success factors, obstacles and the lessons learned from the perspectives of developers, municipal officials or residents.

Prepared by Robert Barrs, Holland Barrs Planning Group Inc. CMHC Project Officer: Susan Fisher. Ottawa: Canada Mortgage and Housing Corporation, 2004. 1 volume in various pagings

Nota : Aussi disponible en français sous le titre : Études de cas sur la densification résidentielle : projets réalisés

Note: No. 04-014 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site

AVAILABILITY : CMHC Information Products (Order number 63520)

RESIDENTIAL INTENSIFICATION CASE STUDIES: MUNICIPAL INITIATIVES

For the last 50 years, development patterns in Canada have emphasized building out onto greenfield lands at the urban edge at a rate that has outstripped the rate of population growth. This development pattern has resulted in the loss of farmland and natural areas, rising car dependency and traffic congestion. Moreover, many municipalities lack the resources to pay for the infrastructure needed to support expansion into greenfield areas.

One of the ways municipalities have sought to address these issues is through residential intensification, i.e., encouraging housing development in existing urban areas where infrastructure and transit services are already in place. Infill development, adaptive reuse, brownfield development, lot splitting and secondary suites are examples of intensification that can result in the following:

- Reduce infrastructure costs;
- Use land more efficiently;
- Preserve rural and natural areas outside existing urban boundaries;
- Revitalize urban areas in decline; and
- Create more transportation choice through easier access to daily destinations like work, shopping and entertainment (e.g., mixed-use, pedestrian- and transit-oriented neighbourhoods).

Despite the considerable potential benefits, intensification faces a series of practical challenges:

- Higher development costs;
- Neighbourhood opposition;
- Regulatory issues.

This study aims to profile successful examples of municipal initiatives that have helped to overcome obstacles such as these, either by removing barriers or providing positive incentives.

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Most importantly, they have resulted in concrete results “on the ground,” in that they have helped trigger or facilitate projects that may not have otherwise gone ahead. The report profiles 12 case studies of local initiatives that support intensification. This document is intended to be of use to municipal officials and other stakeholders across the country who may be looking for mechanisms with which to encourage intensification.

Prepared by Ray Tomalty, Co-operative Research and Policy Services. CMHC Project Officer: Susan Fisher. Ottawa: Canada Mortgage and Housing Corporation, 2003. (Healthy Housing and Communities Series)

Nota : Aussi disponible en français sous le titre : Études de cas sur la densification résidentielle : initiatives municipales

Note: No. 04-002 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site

AVAILABILITY : CMHC Information Products (Order number 63421)

SETTING PRIORITIES FOR MORE SUSTAINABLE COMMUNITIES: A GUIDE

Every day, municipal councils, businesses and individuals in Canadian cities, towns, and villages make a variety of conscious and implicit choices with environmental impacts, small or large. These include individual and community-scale purchases, construction and renovation, waste disposal, driving patterns, types of appliances and equipment used, etc.

Over time, whole communities move either toward or away from becoming more "sustainable". That is, they determine whether they will pass on to future generations natural and built environments in equal or measurably better condition than the ones they inherited.

To stay on track in shaping better environments, communities need to set explicit priorities based on combined consideration of evidence, values, and resources. Strategies to set priorities include:

- Tackle the biggest problems first.
- Align priorities with dominant community values.
- Choose the most effective solutions.
- Pick the lowest-cost solutions.
- Find the quickest solutions.

The most productive and successful priorities are likely to be those combining the above strategies in a single package. Setting day-to-day priorities is also much easier if communities are also guided by a shared vision of where they would like to be in five, ten, or twenty-five years.

This Guide offers help with how to make the best case for "environmental" decisions when many other competing possibilities are tugging at policy-makers. It also suggests how to select which kinds of decisions are likely to pay off most for the environment, based on the best available evidence.

Prepared by The Bayswater Consulting Group Inc. CMHC Project Officer: Douglas Pollard. Ottawa: Canada Mortgage and Housing Corporation, 2003 (External Research Program Research Report) 124 pages

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilin_gual/RR%20Setting_FINAL\(w\).pdf](http://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilin_gual/RR%20Setting_FINAL(w).pdf)

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SUSTAINABLE PLANNING WORKSHOP WORKBOOK: SUSTAINABLE PLANNING AND DEVELOPMENT FOR SMALL COMMUNITIES

Sustainable Planning and Development for Small Communities was developed for CMHC in the Winter of 2002 as a tool to help small communities plan for sustainable future growth and development. This Workbook was part of a one-day Workshop designed to provide an overview of the principles of sustainability and to highlight sustainable development practices in smaller communities. The information presented was based on current research available to CMHC.

The Workbook was also designed to act as a resource for participants to use in their communities. Not only does it summarize the Workshop presentation, it also includes additional reading materials and references to a selection of sustainable development case studies and topics. Examples from small communities across Canada are included.

The Workshop objectives were:

- to build awareness of what sustainable planning and development is and why it is important;
- to share information on current sustainable planning and development practices in small municipalities; and
- to provide tools that will help communities plan for long term sustainability.

The focus of the Workshop was on sustainability as it relates to the physical infrastructure of communities. Although economic and social developments are two other dimensions of sustainable development, it was beyond the scope of this Workshop.

Ottawa: Canada Mortgage and Housing Corporation, 2004.

AVAILABILITY : On a loan basis from Canadian Housing Information Centre

TOOLS FOR PLANNING FOR LONG-TERM SUSTAINABILITY: THE CITIES^{PLUS} DESIGN CHARRETTES

This document addresses the concept of planning for long-term urban sustainability, and focuses on one important tool that was successfully used in preparing the cities^{PLUS} 100-year plan for urban sustainability in Greater Vancouver: the design charrette. The first section in this publication elaborates on the key concepts and approaches underlying long-term planning, while the second section provides a case study of some of the results of applying the charrette tool during the cities^{PLUS} project.

Prepared by Lourette Swanepoel, Elisa Campbell and Sebastian Moffatt. A cities^{PLUS} publication produced by the Sheltair Group Inc. CMHC Project Officer: Norm Connolly. Ottawa: Canada Mortgage and Housing Corporation, c2003. 75 pages

Note: No. 04-003 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilin_gual/Final%20charrette%20manual\(w\).pdf](http://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilin_gual/Final%20charrette%20manual(w).pdf)

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TOWN OF MILTON ECO-TECH VILLAGE PILOT PROJECT URBAN DESIGN CHARRETTE: MAKING CHOICES TOWARDS SUSTAINABILITY: RESEARCH REPORT

The purpose of this project was to create a compelling and sustainable vision for an urban village that serves as a model for growth in the Town of Milton. CMHC provided financial support and participated in an urban design charrette led by the Town of Milton, Ontario to create visual and narrative images of the concepts and potential of the Eco-Tech Village Pilot Project. This design charrette was a link between the initial visioning exercises held during 2002 and the creation of development options for the site later in 2003 and 2004.

Prepared by Ruth Victor, Bill Mann. Ottawa : Canada Mortgage and Housing Corporation, 2003. 107 pages

Note: No. 04-011 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : Canadian Housing Information Centre and
http://www.milton.ca/exceserv/ecotech_final_report.pdf

UNIVERCITY: ASSESSING CONSUMER DEMAND FOR SUSTAINABLE DEVELOPMENT IN GREATER VANCOUVER

UniverCity is a new community that is being developed at Simon Fraser University (SFU) in Burnaby, B.C. It is intended to be a sustainable community that will eventually house 10,000 residents in 4,500 homes and contain approximately 250,000 ft² of commercial and office space. Simon Fraser UniverCity Community Corporation is a wholly owned subsidiary of SFU and is the land developer for this project.

Canada Mortgage and Housing Corporation (CMHC) frequently works with local stakeholders and other public or private partners to encourage greater housing choice, improve affordability, or support housing innovation. To encourage market adoption of Healthy Housing™, and to encourage developers to “push the envelope” in terms of greater energy efficiency, improved indoor air quality, and water conservation, CMHC, Greater Vancouver Regional District (GVRD), Natural Resources Canada and UniverCity participated in an Integrated Design Charrette in September 2002. This charrette provided the opportunity for developers and their design teams, to explore ways of incorporating UniverCity’s Green Building Guidelines into three development proposals. An online version of the Development Guidelines can be found at www.univercity.ca

Experts with experience in the integrated design process acted as facilitators and provided support to the design teams. Resource people complemented the developers’ teams, bringing expertise as quantity surveyors, landscape specialists, sustainability consultants, solar energy advisors, municipal planners and utility representatives.

As the two-day charrette progressed, several participants noted a distinct lack of information on market demand for “greener,” healthier and more sustainable housing. Since some “green” building design elements may incur additional up-front construction costs, it is critical to understand the level of consumer interest and willingness to pay for such features. As one of the

sponsors for this event, CMHC agreed to conduct a study to quantify consumer demand for Healthy Housing in order to demystify and bring clarity to the local debate on “where home buyers are at” in terms of sustainable development. This study was designed to identify the

SUSTAINABLE DEVELOPMENT & HEALTHY HOUSING

features that appeal to consumers and how much extra they would be willing to pay for these features.

A POLLARA Report for Canada Mortgage and Housing Corporation. CMHC Project Officer: Norm Connolly. Ottawa: Canada Mortgage and Housing Corporation, 2003. 60 pages

Note: No. 04-022 in the Research Highlights Socio-economic Series summarizes the results of this research and is available on the CMHC web site

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-ccdh/Research_Reports-Rapports_de_recherche/eng_unilin_gual/UniverCity%20FINAL\(w\).pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccdh/Research_Reports-Rapports_de_recherche/eng_unilin_gual/UniverCity%20FINAL(w).pdf)

WATER CONSERVATION, REUSE & MANAGEMENT

CASE STUDIES OF ON-SITE STORMWATER MANAGEMENT ALTERNATIVES: FINAL REPORT

This report provides practical information to developers, landscape architects, and municipalities to promote stormwater best management practices (BMPs) at the level of the individual lot or a cluster of buildings. It examines the costs and benefits of practical solutions as well as any barriers to implementation through a series of case studies.

Specifically, the study:

- documents case studies of lot- and cluster- level stormwater BMPs, including documentation of their key economic, technical, and implementation issues; and
- lists the key economic, technical, and implementation issues of other potential BMPs where relevant case studies are unavailable in Canada.

Other topics covered within the report include:

- an overview of key stormwater management issues.
- traditional stormwater management financing options.
- alternative lot- and cluster- level stormwater best management practices.
- a high-level overview of BMP functions, and
- descriptions of the ten stormwater best management practices, as well as effectiveness and economic analyses, and a discussion of implementation issues.

Prepared by Hagler Bailly Canada with Marshall Macklin Monaghan. CMHC Project Officer: Cate Soroczan. Ottawa: Canada Mortgage and Housing Corporation, 2000. 57 pages

AVAILABILITY : Canadian Housing Information Centre

WATER CONSERVATION, REUSE & MANAGEMENT

DUAL-FLUSH TOILET PROJECT

CMHC, in partnership with 12 municipalities across Canada, conducted a pilot program to test dual-flush toilet technology in residential, commercial and institutional settings. Dual-flush toilet technology allows the user to select a short flush (three litres) or long flush (six litres).

This study monitored water consumption, toilet performance and customer satisfaction with the dual-flush system. Moreover, a small number of single-flush 6-litre toilets were assessed as a comparison. The project had three objectives:

1. to determine public perception, acceptance and satisfaction with dual-flush toilets
2. to field-test the performance of dual-flush toilets compared to 6-litre and 13-litre toilets in terms of consumption rates and equipment performance
3. to determine the cost-effectiveness of dual-flush toilets compared to 6-litre and 13-litre toilets.

Prepared by Veritec Consulting Inc. in association with Canada Mortgage and Housing Corporation ... et al. Ottawa: Canada Mortgage and Housing Corporation, 2002. 39 pages

Nota : Aussi disponible en français sous le titre : Étude sur les toilettes à double chasse

Note: No. 02-124 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site.

AVAILABILITY : CMHC Information Products (Order no. 63042)

MAXIMUM PERFORMANCE TESTING OF POPULAR WATER-EFFICIENT TOILET MODELS: FINAL REPORT

In this project led by the Canadian Water and Wastewater Association (CWWA), CMHC, in partnership with 15 other Canadian and American agencies, assessed the performance of approximately 40 ULF toilets in order to:

- 1) develop a performance assessment and relative ranking of each of the models based on "realistic" test media;
- 2) perform a water exchange test to determine each fixture's ability to evacuate all of the waste, and
- 3) determine the proper flush volume setting for each fixture when fitted with different brands of adjustable replacement flappers.

The results indicate that approximately 1/3 of toilets meeting the CSA standard failed to flush the designated minimum amount of media. The findings from this work have generated much interest from water agencies, manufacturers and regulators. Some jurisdictions are using these results to help determine which toilets to include within their rebate programs.

Prepared by William Gauley and John Koeller. CMHC Project Officer: Cate Soroczan. Ottawa: Canada Mortgage and Housing Corporation, 2003 (Housing Technology Series). 26 pages

Nota : Aussi disponible en français sous le titre : Test du niveau maximal de rendement de toilettes offertes sur le marché

Note: No. 04-109 in the Research Highlights Technical Series summarizes the results of this research and is available on the CMHC web site

AVAILABILITY : CMHC Information Products (Order number 63505)

WATER CONSERVATION, REUSE & MANAGEMENT

REMOTE MONITORING AND CONTROL OF ON-SITE WASTEWATER TREATMENT, RECYCLING AND RE-USE SYSTEMS

Current and potential applications of remote monitoring and control include:

- conventional on-site systems, which have no mechanical or electrical components, provide treatment in a septic tank, possibly in a sand filter, and in native soil, discharge treated effluent to groundwater, and require minimal maintenance and no control;
- on-site systems for more difficult lot conditions, which can also include pumps and additional treatment components, may include more sophisticated systems for subsurface disposal, or use surface disposal, and require additional maintenance and control;
- recycling and reuse systems, which are being developed and applied in situations where the water demand, and the quantity and quality of effluent for on-site disposal, are important issues, and include treatment components that require performance monitoring and control.

Even the simplest of these systems, if not properly used and maintained, can fail, and more complex systems cannot be expected to operate reliably and effectively without periodic or continuous monitoring and control.

Examples of a variety of sensing, recording, monitoring, and communication technologies that have been applied to such systems have been described in papers, reports, and commercial publications. But no single non-commercial document exists to guide planners, designers, managers, and regulators as to the capabilities, limitations, opportunities, and benefits associated with options for remote monitoring and control of systems for on-site wastewater treatment, recycling, and reuse. This report is intended to address that need.

This report includes consideration of:

- Systems and system components currently in use, and alternatives presented by new and emerging technologies.
- Systems appropriate to a single on-site wastewater system, and those suitable for a network of many on-site units.
- Systems appropriate for a range of systems from simple passive conventional on-site systems to complex recycling and reuse systems.

The report begins with an overview of the role of remote monitoring and control in the management of on-site treatment, recycling, and reuse systems. It continues with an introduction to the fundamentals of remote monitoring and control and a review of system operating and water quality parameters that are, or could be, the subject of remote monitoring and control. This discussion is followed by case studies developed in consultation with individuals and organizations with responsibilities related to the case study systems. Appendices provide additional information about products and product sources.

Prepared by D.H. Waller, C. MacInnis, J. London, G.M. Bauer, Centre for Water Resources Studies, Faculty of Engineering, Dalhousie University. CMHC Project Officer: Cate Soroczan. Ottawa: Canada Mortgage and Housing Corporation, 2003. (CMHC External Research Program Report) 96 pages

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilin_gual/RR%20Remote_FINAL\(w\).pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilin_gual/RR%20Remote_FINAL(w).pdf)

WATER CONSERVATION, REUSE & MANAGEMENT

WATER REUSE STANDARDS AND VERIFICATION PROTOCOL

This report summarizes water reuse standards and treatment technology verification protocols, used by various countries, states and provinces worldwide. Effluent quality standards were examined with respect to biological, biochemical and physical water quality parameters. The assessment focused on municipal and residential water reuse applications, including toilet flushing, bathing, showering, laundry, washing, landscape & garden irrigation. The report also identified treatment technology verification protocols in use for both lab and field testing appropriate for reuse applications.

Although monitoring protocols exist for treatment plants that had been installed for reuse applications, few of those identified were intended to test and verify system performance prior to field installation. Nine testing protocols were identified. These protocols test a wide range of wastewater technologies, from domestic, onsite wastewater treatment systems for water reuse, to ship-board treatment systems, potable wastewater treatment systems and disinfection systems. This document provides a summary of resource requirements for protocol laboratory and field testing equipment along with associated testing cost estimates.

A workshop was held with government and industry representatives to discuss appropriate water quality standards and verification protocols for water reuse applications in Canada. A comparison is presented between the reuse standard recommendations arising from the workshop and comparable international standards.

Prepared by Troy Vassos, NovaTec Consultants Inc. CMHC Project Officer: Cate Soroczan. Ottawa: Canada Mortgage and Housing Corporation, 2004. ix, 65 pages

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilin_gual/CHIC-Water\(w\).pdf](ftp://ftp.cmhc-schl.gc.ca/chic-ccd/Research_Reports-Rapports_de_recherche/eng_unilin_gual/CHIC-Water(w).pdf)

WOMEN AND HOUSING

WOMEN OFFENDERS: CHARACTERISTICS, NEEDS AND IMPACTS OF TRANSITIONAL HOUSING: FINAL RESEARCH REPORT

This document presents the findings of a research project that examined the personal characteristics, housing and housing-related needs of women offenders and the importance of post-prison transitional housing in helping women offenders successfully reintegrate into the community.

There were three parts to this research project. A longitudinal study component compared criminal justice, housing, health and other outcomes of a small group of women who had received transitional post-prison housing with women who had not received this type of housing

support. The second component was a literature review which reviewed the characteristics of women offenders, their housing and housing-related needs, and the impacts of being involved in post-prison transitional housing. A survey of seventeen key respondents working with women offenders in the Vancouver region was also undertaken to identify the housing related needs of women offenders and housing services that are available.

WOMEN AND HOUSING

The longitudinal comparison study involved women who resided at Pathways, a nine unit transitional housing program for women who have left the custodial environment (prison and parole facilities) and who require assistance with reintegration in order to successfully function in the community. Pathways is managed and staffed by the Elizabeth Fry Society of Greater Vancouver. The goal of Pathways is to provide stable transitional safe, secure and flexible housing, supportive programs and counseling for high risk women offenders in order to increase their ability to live independently and to assist in their social integration into the community so that they do not commit further crimes or return to prison. The comparison group was drawn from Columbia House residents. Columbia House is a community residential facility for women on parole that offers some support, counseling and assistance as well as housing with 24 hour staffing.

The most significant improvements in the Pathways group in comparison to the Columbia House group were related to the lack of subsequent criminal charges or returns to custody, the increase in stable, non-transient, safe and secure housing, improvements in health and nutritional status, the increased ability of women to prepare food at home and reduced levels of self-described drug/alcohol misuse. Pathways participants were slightly more involved in specific job training programs and had experienced fewer problems finding a place to sleep at night. Pathways women also reported fewer mental health disorders at the final interview.

Levels of income decreased for both groups during the study (possibly due to less reliance on illegal forms of income), but there was a significant improvement in the number and frequency of personal and family contacts in both groups. There were also improvements in feelings of self-worth and a sense of hopefulness in both groups. However, at the final interview, three out of seven of the Pathways participants still felt that they had problems making decisions or lacked sufficient skills to handle life well.

The burden of issues and problems experienced by most women offenders suggests that program support and counseling needs to be delivered in conjunction with transitional housing. Without the provision of stable and safe housing, it is doubtful whether issues related to health, addictions, mental health, relationships and other, can be addressed.

Prepared by Janet Currie, Focus Consultants. CMHC Project Officer: Anna Lenk. Ottawa: Canada Mortgage and Housing Corporation, 2004 (External Research Program Research Report) 118 pages

AVAILABILITY : Canadian Housing Information Centre and
[ftp://ftp.cmhc-schl.gc.ca/chic-cedh/Research_Reports-Rapports_de_recherche/eng_unilin_gual/CHIC%20Women%20Offenders\(w\).pdf](ftp://ftp.cmhc-schl.gc.ca/chic-cedh/Research_Reports-Rapports_de_recherche/eng_unilin_gual/CHIC%20Women%20Offenders(w).pdf)

YOUTH AND HOUSING

INSERTION RÉSIDENIELLE DES JEUNES MIGRANTS AU QUÉBEC

This research report examines the housing integration of youth who migrate from city to city or region to region within Quebec. It identifies not only the problems encountered by young people, but also the strategies and support available to help them get settled in housing. The study of residential integration in a migration context is particularly justified because youth who leave their parents' homes to live elsewhere find themselves distanced from those people most likely to assist and support them during a period of life now marked by low income and difficulty in settling into the labour market. It is also relevant due to the number of youth who migrate from one administrative region to another. Affecting close to one in two young people, this experience is now part of the process of attaining adulthood, of which residential integration is a cornerstone.

Based on a study of texts, semi-structured interviews carried out in 1997 and, in particular, the results of a survey of 5,518 respondents between 18 and 34 years old conducted in the winter of 1998-1999, this analysis provides a profile of Quebec youth migration, and describes the circumstances of the departure and settlement into new housing and the priority given to housing in decisions, and projects regarding future mobility.

Prepared by Marc Molgat with the collaboration of Frédéric Deschenaux and Nathalie St-Laurent. CMHC Project Officers: Fran Harding and Leanne Elliott. Ottawa: Canada Mortgage and Housing Corporation, 2003 (CMHC External Program Research Report) 107 pages

AVAILABILITY : Canadian Housing Information Centre and
ftp://ftp.cmhc-schl.gc.ca/chic-ccdh/Research_Reports-Rapports_de_recherche/fr_unilingue/Insertion%20des%20jeunes.pdf

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-schl.gc.ca/en/burema/gesein/abhose/abhose_060.cfm

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

Order no.	Series no.	Title
62027	CE 1	<p>Measuring Humidity in Your Home</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>Combustion Gases in Your Home</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>Asbestos</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>Hydronic Radiant Floor Heating</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>Understanding Window Terminology</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>

ABOUT YOUR HOUSE SERIES

Order no.	Series no.	Title
62032	CE 6	<p>Urea-Formaldehyde Foam Insulation (UFFI)</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>
60515	CE 7	<p>After the Flood</p> <p>Protect your health and prevent further damage to your home by following this step-by-step guide to restoring your home after a flood.</p> <p>Aussi disponible en français sous le titre : Après une inondation</p>
60516	CE 8	<p>Fighting Mold: The Homeowner's Guide</p> <p>Mold can cause allergies or respiratory disease. Learn how to identify and eliminate mold from your home.</p> <p>Aussi disponible en français sous le titre : Combattre la moisissure -- Guide pour les propriétaires-occupants</p>
62043	CE 9	<p>Maintaining Your HRV</p> <p>For a clean and healthy living environment, review the seven steps to maintaining the Heat Recovery Ventilator (HRV).</p> <p>Aussi disponible en français sous le titre : L'entretien du VRC</p>
60339	CE 10	<p>Wood Heat Safety in an Emergency</p> <p>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.</p> <p>Aussi disponible en français sous le titre : Le chauffage au bois en toute sécurité lors d'une situation d'urgence</p>
60356	CE 11	<p>When You Reoccupy Your House After a Prolonged Winter Power Outage</p> <p>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.</p> <p>Aussi disponible en français sous le titre : À votre retour à la maison après une longue interruption de courant en hiver</p>

ABOUT YOUR HOUSE SERIES

Order no.	Series no.	Title
60360	CE 12	<p>Tips for Post-storm Tree Care</p> <p>Practical pruning advice to restore the health and shape of trees damaged by ice or wind storms.</p> <p>Aussi disponible en français sous le titre : Le soin des arbres après la tempête</p>
62034	CE 13	<p>Attic Venting, Attic Moisture, and Ice Dams</p> <p>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.</p> <p>Aussi disponible en français sous le titre : Ventilation du vide sous toit, humidité dans le vide sous toit et formation de barrières de glace</p>
62035	CE 14	<p>Carpet Streaking</p> <p>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.</p> <p>Aussi disponible en français sous le titre : Taches en traînée sur les moquettes</p>
62036	CE 15	<p>Removing Ice on Roofs</p> <p>Whether you have a sloped or flat roof, learn techniques that will help you deal with extensive roof icing or ice dam problems.</p> <p>Aussi disponible en français sous le titre : L'enlèvement de la glace sur les toitures</p>
62037	CE 17	<p>The Importance of Bathroom and Kitchen Fans</p> <p>Choosing the proper kitchen and bathroom fans is important for improving indoor air quality and maintaining ideal humidity levels.</p> <p>Aussi disponible en français sous le titre : Importance des ventilateurs de cuisine et de salle de bains</p>
62038	CE 18	<p>How to Read a Material Safety Data Sheet (MSDS)</p> <p>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.</p> <p>Aussi disponible en français sous le titre : Comment déchiffrer une fiche technique sur la sécurité des substances (FTSS)</p>

ABOUT YOUR HOUSE SERIES

Order no.	Series no.	Title
62039	CE 19	<p>Insulating Your House</p> <p>Choose the right insulation to reduce the amount of energy you use and to make your home more comfortable.</p> <p>Aussi disponible en français sous le titre : L'isolation de votre maison</p>
62040	CE 21	<p>Log Homes: Frequently Asked Questions</p> <p>A list of questions and answers concerning the unique design and building considerations for log homes.</p> <p>Aussi disponible en français sous le titre : Foire aux questions - maisons en rondins</p>
62041	CE 22	<p>Your Furnace Filter</p> <p>To reduce exposure to airborne particles, choose the furnace filter that best suits your needs.</p> <p>Aussi disponible en français sous le titre : Le filtre de votre générateur d'air chaud</p>
62042	CE 23	<p>Water-Saving Tips for Your Lawn and Garden</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>Backup Power for Your Home</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>Carbon Monoxide</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>

ABOUT YOUR HOUSE SERIES

Order no.	Series no.	Title
62277	CE 26a	<p>Hiring a Contractor</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>Sample Renovation Contract</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>Choosing a Dehumidifier</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>The Renovation Project (12 parts)</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>
62246	CE 28a	<p>Assessing the Renovation Project</p> <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 du projet de rénovation</p>

ABOUT YOUR HOUSE SERIES

62248	CE 28b	<p>Renovating your Basement - Structural Issues and Soil Conditions</p> <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 structureaux et conditions du sol</p>
62250	CE 28c	<p>Renovating Your Basement - Moisture Problems</p> <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 : Rénovation du sous-sol - Problèmes d'humidité</p>
62252	CE 28d	<p>Renovating Your Kitchen</p> <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 : Rénovation de la cuisine</p>
62254	CE 28e	<p>Renovating Your Bathroom</p> <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	<p>Window and Door Renovations</p> <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>Repairing or Replacing Roof Finishes</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 : Réparation ou remplacement de la couverture</p>
62260	CE 28h	<p>Repairing or Replacing Exterior Wall Materials</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 : Réparation ou remplacement du revêtement des murs extérieurs</p>
62262	CE 28i	<p>Energy Efficient Upgrade - Mechanical Systems</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 : Améliorations éconergétiques - installations mécaniques</p>
62264	CE 28j	<p>Energy Efficient Upgrade - The Building Envelope</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>Assessing the Comfort and Safety of Mechanical Systems</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>

ABOUT YOUR HOUSE SERIES

Order no.	Series no.	Title
62268	CE 28L	<p>A New Addition</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 : Une nouvelle annexe</p>
62044	CE 29	<p>Should you get your Heating Ducts Cleaned?</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>Water Damage, Mold and House Insurance</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>Understanding and Dealing with Interactions Between Trees, Sensitive Clay Soils and Foundations</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>
62288	CE 33	<p>CMHC Garbage Bag Airflow Test</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>Your Septic System</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>

ABOUT YOUR HOUSE SERIES

Order no.	Series no.	Title
62839	CE 35	<p>Hiring a Home Inspector</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>
62341	CE 36	<p>The Condominium Owners' Guide to Mold</p> <p>Special advice for identifying and removing mold in a condo, and solving the problems that cause it.</p> <p>Aussi disponible en français sous le titre : Guide sur la moisissure à l'intention des copropriétaires</p>
62935	CE 39	<p>Buying a Toilet</p> <p>Advice and tips on what to look for when buying a toilet.</p> <p>Aussi disponible en français sous le titre : L'achat de toilettes</p>
63319	CE 40	<p>Buying a House with a Well and Septic System</p> <p>Information on what to inspect and test if a property has a well and/or septic system. Includes checklists for potential buyers.</p> <p>Aussi disponible en français sous le titre : L'achat d'une maison avec un puits et une installation septique</p>
62953	CE 41A	<p>UV Water Treatment</p> <p>Describes the ultra-violet light water treatment process, and the pros and cons of using such a system.</p> <p>Aussi disponible en français sous le titre : Traitement de l'eau aux rayons ultraviolets (UV)</p>
62898	CE 41B	<p>Water Distillers</p> <p>Everything you ever wanted to know about water distillers from how they work to how to install and maintain them.</p> <p>Aussi disponible en français sous le titre : La distillation de l'eau</p>
62896	CE41C	<p>Water Filters</p> <p>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.</p> <p>Aussi disponible en français sous le titre : Filtres à eau</p>

ABOUT YOUR HOUSE SERIES

Order no.	Series no.	Title
62946	CE 41D	<p>Water Softeners</p> <p>Find out how a water softener works and obtain information on whether you should consider installing one.</p> <p>Aussi disponible en français sous le titre : Les adoucisseurs d'eau</p>
62962	CE 41E	<p>Reverse Osmosis Water Treatment</p> <p>Describes the reverse osmosis water treatment process, and provides the pros and cons of using such a system.</p> <p>Aussi disponible en français sous le titre : Filtration de l'eau par osmose inverse</p>
62966	CE 42	<p>Canada's Construction System</p> <p>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.</p> <p>Aussi disponible en français sous le titre : Système de construction canadien</p>
63134	CE 44	<p>Painting: Walls, Ceilings and Floors</p> <p>This factsheet 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.</p> <p>Aussi disponible en français sous le titre : La peinture : murs, plafonds et Planchers.</p>
63144	CE 45	<p>Flooring Choices</p> <p>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.</p> <p>Aussi disponible en français sous le titre : Les revêtements de sol</p>
63349	CE 46	<p>Fighting Asthma in Your Home</p> <p>Practical tips to help people with asthma improve the indoor air quality of their home.</p> <p>Aussi disponible en français sous le titre : Combattre l'asthme à la maison</p>

ABOUT YOUR HOUSE SERIES

Order no.	Series no.	Title
63218	CE47	<p>Home Maintenance Schedule</p> <p>This factsheet 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.</p> <p>Aussi disponible en français sous le titre : Calendrier d'entretien de votre maison</p>
63227	CE48	<p>Replacing Your Furnace</p> <p>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.</p> <p>Aussi disponible en français sous le titre : Le remplacement d'un générateur de chaleur</p>
63235	CE 49	<p>Getting Your House Ready to Sell</p> <p>Tips for homeowners who wish to get their house ready to sell.</p> <p>Aussi disponible en français sous le titre : Ce qu'il faut faire avant de mettre votre maison en vente</p>
63436	CE50	<p>Avoiding Basement Flooding</p> <p>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.</p> <p>Aussi disponible en français sous le titre : Comment prévenir les inondations de sous-sol</p>
63486	CE51	<p>Get to Know Your Soil</p> <p>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.</p> <p>Aussi disponible en français sous le titre : Apprenez à connaître votre sol</p>
63488	CE52	<p>Low-Maintenance Lawns</p> <p>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.</p> <p>Aussi disponible en français sous le titre : Les pelouses à faible entretien</p>

ABOUT YOUR HOUSE SERIES

Order no.	Series no.	Title
63490	CE53	<p>Rain Gardens: Improve Stormwater Management in Your Yard</p> <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	<p>Understanding Your New Home Sales Contract</p> <p>This factsheet 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	<p>Selecting A New Home Builder</p> <p>This factsheet 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	<p>Preventing Falls on Stairs</p> <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	<p>Efficient, Convenient Wood Heating</p> <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	<p>The ABC's of Windows</p> <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 APARTMENT SERIES

63419	AEI	<p>Solving Odour Transfer Problems in Your Apartment</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>
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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

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

Order no.	Series no.	TITLE
63735	04-129	Durable Wood-Frame Construction for all Climatic Zones: A Companion to Canadian Wood-Frame House Construction
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
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

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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
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

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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?
63194	03-107	Design of Durable Joints Between Windows and Walls

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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
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62892	02-115	Energy Use in Straw Bale Houses
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

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63685	04-035	Developing a Methodology for Tracking Homeless People over the Long Term
63645	04-034	Title Insurance and the Canadian Land Conveyancing System
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
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
63545	04-023	Land Title Conveyance Practices and Fraud
63526	04-022	UniverCity: Assessing Consumer Demand for Sustainable Development

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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
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63372	04-013	Insurance In Residential Construction: An Environmental Scan
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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 CitiesPLUS Design Charrettes

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63306	04-001	2001 Census Housing Series: Issue 2 - 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
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63138	03-003	Crisis Situations in Cooperatives: Better Interventions Hinge on a Better Understanding
63142	03-002	Ethical and Social Fund Investments in Lower-to-Moderate Income Affordable Rental Housing in Canada: An Assessment
63140	03-001	Home\$ave: Building Investments in Housing Assets
63119	116	Housing Needs of Low-Income People Living in Rural Areas
63078	115	Levies, Fees, Charges and Taxes on New Housing (2002)
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62773	100	Evaluating Housing Stability for People with Serious Mental Illness at Risk of Homelessness
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