Cat tales

e-newsletter of the Institute for Catastrophic Loss Reduction

Volume 4, Issue 3
Third quarter 2010

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ICLR's submissions to change the Ontario Building Code reach crucial next step

Ontario government releases Building Code consultation paper, seeks feedback

By Grant Kelly, Director, Climate Change Adaptation Projects, ICLR

In early October, the Ontario Ministry of Municipal Affairs and Housing (OMMHA) released the first of two public consultation papers seeking public feedback on approximately 450 potential changes to the Ontario Building Code. The paper is available at: http://www.mah.gov.on.ca/AssetFactory.aspx?did=8454

All three of ICLR's proposals are included in the consultation paper. Two of the three are highlighted on page seven as examples of ideas that enhance the resilience of buildings in the face of more extreme weather events associated with climate change. Of the remaining changes, approximately 330 of the 450 changes outlined in the Ontario discussion paper seek to harmonize Ontario's Building Code with the National Building Code (NBC).

Having ICLR's three building code submissions documented in the Ontario consultation paper is a positive first step. However, our attempts to influence building code development can not yet be considered a success. We request the support of insurers and encourage Institute members to express their support for these changes to MMHA using the online comment form located at http://www.mah.gov.on.ca/AssetFactory.aspx?did=8447

OMMHA requests a separate form for each proposed Code amendment on which you are commenting, noting the change number in the appropriate box. The three submissions made by ICLR are:

Require backwater valves in every new home: proposed change: B-07-04-04

Members are requested to support this change with the following comment. While this is a step forward, the more significant issue is Ontario's interpretation of the existing code provision. Insurers believe that all new homes built in Ontario will be subject to backflow or surcharge from increasingly frequent and severe storms. ►

Inside this issue:

ICLR's Building Code submissions reach crucial next step *cont...*

Require hurricane tie down straps for roof framing over garages and carports: proposed change: B-09-23-03

Members are encouraged to comment that this low cost change in building practice could significantly reduce the potential for loss of the entire home in extreme wind events. Keeping the roof on buildings during increasingly frequent and severe storms will save lives and reduce insurance losses. When the roof lifts the entire home is lost.

Reduce maximum roof sheathing fastener spacing to 150 mm (6 inches) along intermediate supports: proposed change: B-09-23-06

Members are requested to support this change. A potential comment is that this low-cost change in building practice would significantly strengthen a home's roof. This small change would save lives and reduce insurance losses in the future.

Please remember to include the following on each Comment Form:

- your name
- your mailing address
- whether you are responding on behalf of yourself or an organization.

Completed Comment Forms and supporting documents may be submitted to the Ministry by fax or mail:

E-mail: James.ross@ontario.ca

Fax: (416) 585-7531 Subject Line: 2010 Next Edition Building Code Consultation

Mail: 2010 Next Edition Building Code Consultation
c/o Building and Development Branch
Ministry of Municipal Affairs and Housing
777 Bay Street – 2nd Floor
Toronto, ON
M5G 2E5

Next steps

OMMHA will release a second consultation paper that will provide even more changes aimed at energy and water conservation and energy efficiency. Over the past five years this has been the most dominant theme in discussions to improve Canada's Building Codes. These discussions are about to bear fruit with the release of the National Energy Code for Buildings.

After the second consultation paper, the public feedback received by OMMHA will be reviewed by the Building Code Technical Advisory Committee (TAC). Insurance Bureau of Canada has been asked to represent insurers on this Committee. The TAC will make recommendations to OMMAH. The Ministry will then make the final decisions and will publish a new Ontario Building Code in 2011.

Kovacs again chosen as lead author for IPCC

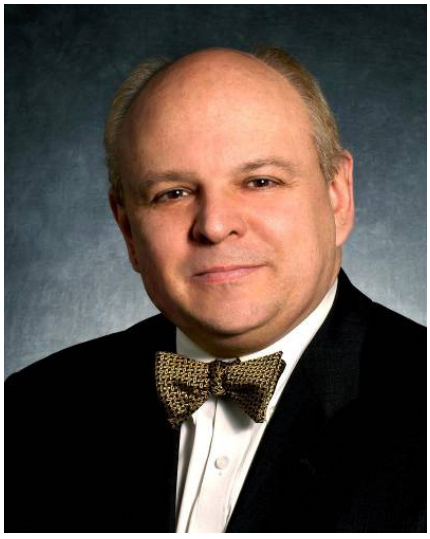
Paul Kovacs, executive director of the Institute for Catastrophic Loss Reduction, has been chosen as a lead author of an Intergovernmental Panel on Climate Change (IPCC) report.

Specifically, Kovacs will serve as lead author of Chapter 26, North America, of the Working Group II contribution to the IPCC's Fifth Assessment Report (AR5). The appointment is the first step in a four-year drafting process, scheduled for completion in 2014.

More than 1,200 people were nominated for the 311 available coordinating lead author, lead author and review editor positions. Candidates underwent a thorough review; input from observer organization representatives and senior leaders in climate science helped determine the final selections.

Kovacs has been involved with the IPCC for a number of years, and served as a lead author of Chapter 14 of the Fourth Assessment Report, published in 2007.

The work done by the IPCC also earned the group a Nobel Peace Prize -- along with former U.S. vice president Al Gore -- in 2007.



Paul Kovacs, Executive Director of ICLR.

Building affordable disaster-resilient housing in London, Ontario

Submissions by ICLR to improve the Ontario Building Code are showcased in a Habitat for Humanity home

By Greg Oulahen, Research Coordinator, ICLR

Habitat for Humanity has a long and respected history of working with families to build homes they could not otherwise afford. So it is with great excitement that the Institute for Catastrophic Loss Reduction has partnered with Habitat for Humanity in London, Ontario to make affordable housing more resilient to weather extremes. ICLR has teamed with Habitat for Humanity London on three homes currently being built in the city's east end.

The first home, called the CAW Hammer of Hope build, was constructed in the high profile parking lot of the John Labatt Centre in downtown London during a week-long blitz build in August, and then moved to its permanent location on the property of a former biker gang clubhouse. The two-bedroom bungalow will become home to a mother and daughter. This home and a duplex currently being built beside it for two other families are the most energy efficient homes ever built by Habitat London. Due to this new partnership with ICLR, they are also now the most disaster resilient. As reported in the Canadian Underwriter August 2010 issue, ICLR has made three submissions to the current Ontario Building Code update process – each of these changes to construction is showcased in the three new Habitat for Humanity London homes.

Habitat for Humanity

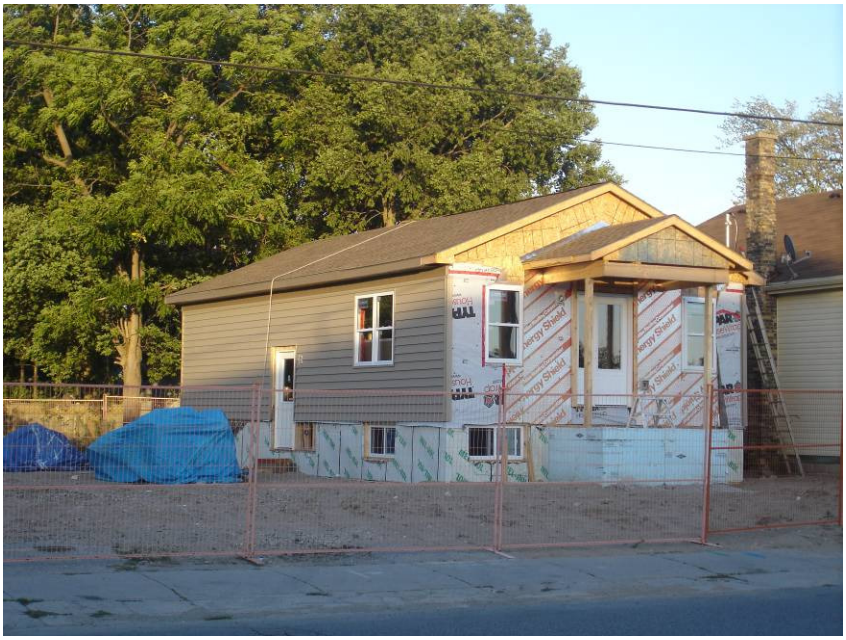
Habitat for Humanity's homeownership program helps families in financially vulnerable situations build and buy quality affordable homes by reducing the barriers to home ownership. Habitat sells the homes to the homeowner with no downpayment, an interest-free mortgage, and monthly payments set at a maximum of 30% of their gross income. The program gives families access to affordable housing while allowing them to build equity to help themselves escape the cycle of poverty.

Habitat keeps the costs of new homes down by using modest designs, donated materials, volunteer labour, and reinvesting mortgage payments from other homeowners back into the program. Homeowners put in at least 500 hours of "sweat equity" into the construction of the home and participate in homeownership preparation sessions. More than 50,000 people have volunteered with Habitat for Humanity Canada, including professional tradespeople donating their time and expertise, and first time homebuilders looking to contribute to their community while learning about residential construction.

The Habitat for Humanity London affiliate was established in 1993 and has since built 24 homes. In 2010, the organization will complete 10 housing projects, including local builds and renovations as well as two builds in Bolivia – the organization's most ambitious year to date. As ICLR is affiliated with the University of Western Ontario in London, working with Habitat London is a great opportunity for community partnership and a chance to advance the work of both organizations.

ICLR's submissions to improve the Ontario Building Code

All new construction and renovations in Canada must satisfy the requirements of the building code used in each province. Building codes exist to ensure that buildings are well constructed and safe for the occupants in everyday conditions as well as during more extreme conditions such as severe weather. Building codes are unique in different regions of the country due to local climate differences, as well as local ►



weather and soil conditions. For instance, building codes are more demanding of earthquake resilient construction measures in British Columbia and more demanding of wind resilience in Atlantic Canada.

In Ontario, the two hazards of primary concern are water and wind damage. A stronger building code that is focused on mitigating the effects of these hazards could reduce their human and economic costs. Thus, ICLR has made three submissions to the Ontario Building Code update process in order to make the new code stronger. Each submission is based on the research findings of engineering professors at the University of Western Ontario and recommendations of experts within Canada's p&c insurance industry. The submissions have been made to the Building Code update process and are currently subject to a detailed review process and comments from other construction industry groups before they are accepted or rejected.

ICLR's recommended changes to the building code include: Hurricane straps on wall-roof connections in garages; Nail spacing of 6" instead of 12" on roof sheathing; and, Backwater valves on sanitary sewer laterals.

The first submission made by ICLR is that the roof trusses in a garage that is attached to the front or side of a house be connected to the wall studs using hurricane straps. In the Habitat London homes, this was taken a step further by installing hurricane straps connecting roof trusses to wall studs throughout the entire home. Hurricane straps are designed to keep the roof connected to the walls in the event of wind loading and uplift on the roof. When windows or doors break, internal pressure in the house can change and dramatically increase the uplift on the roof. Keeping the roof securely down prevents rain from entering the house which can greatly increase damage costs, and prevents debris from entering the wind field which causes down wind damage. Much of the damage caused by the 2009 Vaughan tornadoes was due to roofs not being properly connected to the walls of homes.

The second building code submission is that nail spacing should be 6" instead of 12" on roof sheathing. Studies undertaken at the Insurance Research Lab for Better Homes at the University of Western Ontario have indicated that decreasing the spacing of nails that fasten the roof sheathing from 12" to 6" would increase the uplift capacity of each roof panel by 100%. The code currently requires maximum spacing of 6" along panel edges and 12" along intermediate supports. This spacing schedule results in 33 nails per typical sheet of 4'x8' roof panel. Decreasing spacing to 6" throughout the entire panel increases the number of nails used from 33 to 45 (only 12 nails), while doubling the uplift capacity of the sheathing.

The third submission is the installation of a mainline, open-port backwater valve directly into the sanitary sewer lateral. The backwater valve serves to reduce the risk of sewer backup entering the home through the basement floor drain or other plumbing fixtures. Backwater valves are increasingly being adopted by municipalities as one tool in the basement flood reduction tool kit. ICLR believes that the requirement of backwater valves on all new homes that are vulnerable to sewer backup will significantly reduce urban flood damages across Canada.

Decent, affordable housing in safe and resilient communities

Each of the three submissions made by ICLR to the Ontario building code update process is showcased in the three homes currently being built by Habitat for Humanity in London. In addition, hurricane straps were installed throughout the entire home rather than in just the garage. Steel braided hoses were also installed on all plumbing fixtures in order to reduce the risk of pipe-burst water damage. Based on insurance industry experience, steel-braided or armoured hoses are much more durable and less likely to crack or break than the standard rubber or plastic hoses.

The total cost of the four construction improvements is less than a few hundred dollars per house for all of the materials including hurricane straps, additional nails, backwater valve and plumbing hoses. Of course, the cost of the materials will decrease as the quantity purchased increases, making these improvements even more attractive on a larger scale.

By combining our expertise, ICLR and Habitat for Humanity have applied engineering research findings and insurance industry experience to make much-needed housing in London meet construction standards that will significantly reduce disaster losses. Habitat's mission to provide decent, affordable housing is well matched with ICLR's mission to create safe and resilient communities. Exciting possibilities lie ahead for these two organizations to continue to work together.

Brewing bigger storms

Climate change isn't increasing storm frequency so much as it is creating stronger, more intense storms

By Gordon McBean, ICLR Director of Policy

In late September 2003, Hurricane Juan hit Nova Scotia with sustained winds as high as 158 km/h, gusts up to 200 km/h and maximum wave heights of 20 metres. The result was eight deaths and major damage. According to the Canadian Hurricane Centre, it was the worst event of this type to hit the region in more than a century. Although Atlantic Canada receives most hurricane impacts, Hurricane Hazel in 1954 left a tragic and lasting impact in southern Ontario.

Hurricanes that affect North America begin as small atmospheric disturbances over the eastern tropical Atlantic Ocean where the sea surface temperature exceeds 26°C. They form at least a few degrees away from the equator to gain the effect of the earth's rotation, which also means that hurricanes do not cross the equator. The warm oceans provide much of the energy as the storm evolves from a "tropical depression" to a "tropical storm" and then, when the winds reach 118 km/h, to a "hurricane." As they develop they move west and then north before losing strength over land or colder waters and gradually change their characteristics. As in the case of Hazel, hurricanes affecting Canada are often in a state of transformation into mid-latitude storms. This process can sometimes re-energize the storm and concentrate the winds in narrower bands resulting in damages beyond what would have been expected from a decaying hurricane. Tropical cyclones or hurricanes strike Atlantic Canada about every one to three years (most often Newfoundland). The frequency is about one every six to seven years for Quebec and about once every 11 years for Ontario; hurricanes only very rarely affect British Columbia.

Hurricanes, also called typhoons outside the western hemisphere, are classified on a scale of one to five (the Saffir-Simpson Scale) based on their wind speed and destructive potential (which depends as well on precipitation). A category 4 storm has winds in the range of 211-249 km/h resulting in storm surges in excess of four metres. This category of storm typically results in damage to roofs and major flooding, leading to evacuations. The higher winds of category 5 storms cause major damage to buildings with some complete building failure and flooding leading to massive evacuations. Hurricane Juan was a category 2 hurricane. No category 4 or 5 hurricane has made landfall in Canada in the last 150 years.

Impact of climate change

What is the impact of climate change on hurricanes? Since climate change will result in warmer oceans, with more areas above 26°C and higher atmospheric water energy, a warmer climate would be expected to have more hurricanes. It is, however, more complicated because of other atmospheric factors such as wind shear and variations in El Niño-Southern Oscillation and monsoons. There is considerable scientific literature on this topic with analyses based on dynamical and modelling studies and detailed examinations of historical records from weather observations, satellite imagery and land-falling storms with human impacts. Each has its biases and sometimes the debate centres on these issues. This article will focus on the more intense category 4-5 hurricanes, which have the major impacts and where the scientific basis is stronger.

In the *2007 Fourth Assessment Report of the Intergovernmental Panel on Climate Change* the IPCC noted that although changes in hurricane frequency and intensity are masked by large natural variability, total global numbers of cyclones and cyclone days has generally decreased slightly since 1970, but there has been a large increase in numbers and proportion of strong hurricanes. The number of category 4 and 5 hurricanes increased by about 75% with the largest increases in the western North Pacific, Indian and Southwest Pacific Oceans. The numbers of hurricanes in the North Atlantic had also been above normal in nine of the last 11 years, culminating in the record-breaking 2005 season. Based on a range of climate models, the IPCC concluded it is likely that future tropical cyclones will become more intense, with larger peak wind speeds and heavier precipitation associated with ongoing increases of tropical sea surface temperatures.

In 2009, an international team of leading scientists prepared *The Copenhagen Diagnosis, 2009: Updating the World on the Latest Climate Science.* Several studies since the IPCC report have found more evidence for an increase in hurricane activity over the past decades. A complete reanalysis of satellite data since 1980 confirmed a global increase of the number of category 4 and 5 tropical cyclones. A 1°C global warming corresponded to a 30% increase in these storms. However, they concluded that there is not yet "robust capacity" in models to project future changes in tropical cyclone activity. ►

Educating about disaster risk reduction

From a disaster risk reduction point of view it seems very appropriate to assume that there will be increasing risk of more intense hurricanes, with stronger winds and heavier precipitation. Combined with rising sea levels, this will lead to more extreme storm surges and flooding. When Typhoon Nargis affected Myanmar in 2008, 113,000 people died -- most drowned in oceanic storm surges. On Aug. 19, 2005, a single heavy rain event in the Greater Toronto Area, not a hurricane, resulted in flooded basements and other damages. The event cost the insurance industry $500 million -- the costliest insurance event in Ontario's history. Heavier rain events, due to actual and transforming hurricanes do not portend well for the future. Hazards will continue to occur but they do not need to result in disasters. It is our vulnerabilities that allow these events to become disasters. Actions to reduce disaster risk and adapt to climate change have proven to be effective. Bangladesh and Myanmar are both densely populated countries with low-lying deltas vulnerable to typhoons. In 1970, Typhoon Bola struck Bangladesh causing 300,000 deaths; in 1991, Gorki killed 139,000 people. Bangladesh instituted a 48-hour early warning system and educational and construction programs leading to effective community-based disaster preparedness and mitigation. When Typhoon Sidr struck in 2007, only 3,000 people died -- tragic, but a much smaller death count than the previous events. Myanmar did not have disaster risk reduction systems in place when Nargis struck.

Here in Canada, the first-ever Safer Living Home was completed in Prince Edward Island in November 2006.The home, paid for byThe Co-operators and based on the Institute for Catastrophic Loss Reduction's Safer Living Program, was designed and constructed to withstand winds of 200 km/h. New ICLR guidelines on reducing losses due to intense precipitation are now available.

The United Nations International Strategy for Disaster Reduction has joined with the International Council for Science and the International Social Sciences Council to create a new international research program, Integrated Research on Disaster Risk (IRDR). The program will address the challenge of natural and human-induced environmental hazards. Methods to reduce risk and curb losses through knowledge-based actions need to be built on disaster risk reduction research integrated across the hazards, disciplines (including natural, socio-economic, engineering and health sciences), and geographical regions. Research will focus on the characterization of hazards, including how they will change with climate, vulnerability and risk and effective decision making in complex and changing risk contexts. The desired legacy is that when similar events happen in the future there are major reductions in the impacts and loss of lives.

Research and implementation of knowledge-based disaster risk reduction strategies can save lives and reduce losses, even as the intensity of hurricanes augments with a warming climate.

Dr. Gordon McBean, Director of Policy, ICLR.

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Mission
To reduce the loss of life and property caused by severe weather and earthquakes through the identification and support of sustained actions that improve society's capacity to adapt to, anticipate, mitigate, withstand and recover from natural disasters.

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