



February 15, 2013
For immediate release

**ICLR releases new study:
'Urban flooding in Canada: Lot-side risk reduction through voluntary
retrofit programs, code interpretation and by-laws'**

(Toronto) - The Institute for Catastrophic Loss Reduction (ICLR) today released a study on urban flooding in Canada which looks at, among other topics, interpretation of building and plumbing code wordings that relate to installation of backwater valves to protect homes from sewer backup. While a significant amount of research by ICLR and others has concluded that resolution of building code *enforcement* issues may result in reduced vulnerability to extreme natural hazards, issues surrounding code *interpretation* have not previously been studied.

Urban flood damages are a recurrent and growing issue for municipalities, insurers and homeowners across Canada. Damages from urban flood events often total in the \$10s- and \$100s of millions of dollars. In May, 2012, a storm system that affected Thunder Bay and moved through to Montréal resulted in \$260 million in insured damages. In July, 2012, a storm moved through southern Ontario affecting several neighbourhoods in Hamilton and Ottawa, resulting in \$90 million in insured damages. An extreme rainfall event that affected a large region of southern Ontario from Hamilton to Durham Region in August, 2005 resulted in over \$500 million in insured damages, \$247 million of which was associated with sewer backup. Also in 2005, heavy rainfall and associated flooding resulted in \$300 million in insured damages in southern Alberta. A severe storm in Edmonton, Alberta in 2004 resulted in approximately \$166 million in insured damages, \$143 million of which were associated with sewer backup.

Previous research conducted by ICLR revealed that a mainline, full port, normally open backwater valve, when properly installed and maintained, in tandem with the severance of foundation drains (i.e. weeping tile) from the sanitary sewer, is one of the best measures a homeowner can take to reduce the risk of stormwater and/or sewage backing up into a basement. But building code/plumbing code and/or local by-law requirements to install such valves in new homes is spotty across the country, largely owing to code interpretation.

The study revealed that backwater valve building/plumbing code wordings are interpreted differently across the country, though there is greater interpretation consistency in some regions than in others. Specifically, the survey revealed that 19% of British Columbia respondents, 81% of Alberta respondents, 86% of Saskatchewan respondents, 72% of Manitoba respondents, 26% of Ontario respondents and 58% of respondents from New Brunswick and Nova Scotia interpreted code wordings in a manner that required backwater valves to be installed in all or most new homes. The study further revealed that interpreting code wordings in this manner was strongly correlated with a higher frequency of installation of backwater valves in new homes, indicating the importance of code interpretation for backwater valve installation.

According to Dan Sandink, study author, "Despite the fact that the National Building Code of Canada and virtually all provinces use near identical code wordings in the backwater valve sections of their respective building and/or plumbing codes, this study found that there are differing interpretations of code wordings, resulting in differing frequencies of installation of backwater valves. So, while building and plumbing officials in many jurisdictions in Canada interpret the code as meaning that all new homes should have backwater valves, some officials in

some jurisdictions interpret the code as meaning that backwater valves shall be used only in certain circumstances.”

The primary recommendation of this report is that sentences in the National Plumbing Code and provincial building and/or plumbing codes that relate to installation of backwater valves to protect against sewer backflow be reworded or clarified to ensure they are clearly and consistently interpreted and applied.

According to the study, there are many advantages of installing backwater valves in new homes. Due to the unpredictable nature of extreme rainfall events and the unpredictability of infiltration and inflow (I/I) in relatively new, separated sewer systems, it is often impossible to identify which regions of an urban municipality are exposed to sewer backup risk until widespread or regional sewer backup events have occurred. It is also more economical to install backwater valves in new homes when compared to retrofitting valves into existing homes. For example, several Canadian municipalities provide partial retrofit subsidies of several thousand dollars for the retrofit of backwater valves, while installation of valves in new homes costs approximately \$250. Requiring installation of valves in new homes would also help offset relatively low uptake frequencies for municipal subsidy programs aimed at encouraging homeowners to adopt urban flood risk reduction measures.

* * * *

Established in 1998 by Canada's property and casualty insurers, ICLR is an independent, not-for-profit research institute based in Toronto and at Western University in London, Canada. ICLR is a centre of excellence for disaster loss prevention research and education. ICLR's research staff is internationally recognized for pioneering work in a number of fields including wind and seismic engineering, atmospheric sciences, water resources engineering and economics. Multi-disciplined research is a foundation for ICLR's work to build communities more resilient to disasters.

Media contacts:

Dan Sandink, Manager, Resilient Communities & Research, ICLR
tel. 416-364-8677, ext. 3212
cell 416-278-1096
dsandink@iclr.org

- 30 -