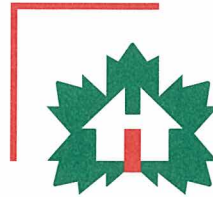


150 Laurier Avenue W.
Suite 500
Ottawa, Ontario
K1P 5J4

T. 613 230 3060
F. 613 232 8214
E. chba@chba.ca
W. www.chba.ca

**Canadian
Home Builders'
Association**



**Association canadienne
des constructeurs
d'habitations**

May 19, 2009

Bruce Clemmensen, Chair
Canadian Commission on Building and Fire Codes
c/o Anne Gribbon, Secretary
Canadian Codes Centre / National Research Council
Building M-23A
1200 Montreal Road
Ottawa, Ontario K1A 0R6

Re: Recent information underpinning the importance of a disciplined approach to building standards and codes

Dear Bruce:

The CHBA received recently the two attached documents on the issue of mandated "green roofs", and I wish to bring them to your attention.

The CHBA is a strong advocate of the importance of ensuring that a disciplined, science-based approach underpins the code development process.

Our position recognizes the considerable risks if such an approach is not taken. The commitment of Canadian Commission on Building and Fire Codes (CCBFC) to proper and full process is, for this reason, of considerable importance.

The attached letters, addressing the issue of mandatory "green roofs", offer valuable insight into the significant dangers of "ad hoc" building requirements, ones that are enacted without the benefit of a proper, disciplined process. In particular, the letter from Marshall Leslie to the Mayor of Toronto and members of Toronto Council offers rather stark testimony in this regard.

I trust these documents will be of interest to you and members of the CCBFC Executive Committee.

Yours truly,


John Kenward
Chief Operating Officer

cc: CHBA Executive Board

30 Elora Road,
Toronto, ON
M6P 3H6

May 12th, 2009

The Mayor and Members of Council,
City of Toronto,
City Hall,
2nd Floor, 100 Queen St. West,
Toronto ON M5H 2N2

Dear Members of Council:

RE: PG25.3 By-law to Require and Govern the Construction of Green Roofs in Toronto

On May 25th, Council will be asked to mandate green, vegetative roofs on most new non-residential buildings, additions and major alterations; and many residential occupancies. I urge you to reject the by-law: *Requiring and Governing Construction of Green Roofs (PG25.3)*, and instead make green roofing a voluntary feature of the *Toronto Green Development Standard*.

The proposed by-law fails for several reasons:

1. The by-law fails to critically examine the benefits of green roofs
2. The by-law does not have regard to the brief experience of green roofs in Toronto
3. The Technical Advisory Group (TAG) that presented the report: "Toronto Green Roof Construction Standard" (sic) did not receive a proper charge; was neither balanced or representative; did not consider adequately the work of other standards development organizations; and failed to make recommendations on important aspects of construction, design and maintenance
4. The by-law does not meet the requirements of Section 108 of the City of Toronto Act, 2006 because it skirts Ontario's Building Code Act
5. The by-law exposes the City of Toronto's Chief Building Official (CBO) to liability for failure through negligence
6. The "Green Roof Declaration Form" (sic) described in the by-law would conflict with both Tarion's Bulletin 19 (Design and Field Review Reporting) and the recommendations of Ontario's professional licensing bodies
7. Passage of a defective Toronto green roofing by-law effectively rolls the dice on the future use and employment of the City of Toronto Act, 2006 and will diminish respect and regard for the *Toronto Green Development Standard*.

1) The benefits of Green Roofs are over-stated

Many benefits are claimed for green roofs – among them energy saving and a reduction of urban heat island effects. However little or no proof of this assertion has been advanced that has been documented in Canadian research. On the contrary, recent research performed by the National Research Council (NRC) of Canada contrasts starkly with claims made by green roofing proponents.

To quantify the engineering performance of green roofs, the NRC instrumented and monitored the field performance of a generic green roof at its Ottawa campus (see “*Engineering Performance of Garden Roofs in North (Canadian) Climate - 5 Years of Field Data*”, by Bas. A. Baskaran, David van Reenen, Judy Overton and Karen Liu, the National Research Council Canada). They instrumented a building; divided it into two equal sections; planted a generic green roof; and gathered five years of field monitored data. The NRC concluded that green and conventional roofs perform similarly in cold months from November to February. The NRC recommended that: “there should not be change in the space-heating requirement of the building due to the type of roofing system in place”. The NRC found that between April and September the conventional roof had a heat flow into the building that increased. The NRC recommended for that period that: “When designing the air conditioning systems of buildings with GRS (a.k.a. green roofing systems), with given climatic conditions, provisions can be made to reduce the cooling load requirement. Alternatively, an insulation thickness trade off could be considered to achieve the same energy performance”. In other words, the only energy saving provided by a green roof occurs during the summer; and increased insulation would achieve the same level of performance as the installation of a green roof.

In short, Canadian building scientists have demonstrated convincingly that the single most significant rationale for installing a green roof – energy savings – can be accomplished more easily, effectively and at less cost simply by adding insulation.

2) The experience of Green Roofs in the region has not been measured

It was with great interest that I first found myself on the City of Toronto web page “Green roofs around Toronto” that profiles seven projects, see <http://www.toronto.ca/greenroofs/experience.htm>. The largest of these – York University’s Computer Science Building – is described as “an inaccessible extensive green roof The Toronto and Region Conservation Authority has been monitoring this green roof since construction, taking climate, soil and runoff quantity data to better understand green roof performance“ This is a roof that I have been on. This is a roof that York University has spent a great deal more time and money monitoring than the MTRCA. And York University’s conclusion is that it will not install more green roofs. (I have served as an

alumni representative on the advisory board of the York University Development Corporation since 1986).

Elsewhere on the City web site (see http://www.toronto.ca/greenroofs/incentive_applicants07.htm) a green roof is featured at a single family residence on Ellis Park Road that was partially funded in 2007 by Toronto. This +\$3 million custom built, single family home belongs to one of my neighbours and is a concrete and steel structure built into a hillside overlooking Grenadier Pond. The house has no backyard, no sideyard and no frontyard. While the project's building program, site and views merit a rooftop, vegetative or green roof these same qualities make it exceptional and unique.

The choice of these projects - and others on the City web site – as examples that should be followed is meretricious. None of these projects have been monitored properly; and all are lacking documentation.

3) The Technical Advisory Group failed its charge

In a March 27th Staff Report to the Planning and Growth Management Committee there is an account of how the green roofing Technical Advisory Group (TAG) was formed “The authority to develop provisions regulating construction in Ontario generally lies with the province. Green roofs are the only aspect of construction for which the City has the authority to set standards. In developing the TGRCS, Toronto Building has therefore undertaken a process normally under the purview of the province or by the federal government. It has been essential to subject the TGRCS to a level of analysis and due diligence consistent with other code setting organizations. In order to provide this analysis, the Chief Building Official established a Technical Advisory Group to review the proposed standard and consider the consultation comments” (page 13)

Please have regard to the phrase – “a level of analysis and due diligence consistent with other code setting organizations” – for if this was its charge then the TAG failed. The principles of Canada's codes and standards system include: rigorous scientific assessment and peer review; full consultation with affected parties; and cost benefit analysis. The TAG failed in the following ways -

- The TAG's membership was neither balanced or representative. Excluded from membership were roofing contractors; roofing manufacturers, suppliers and distributors; roofing consultants; building envelope consultants; representatives of any standard development organization; general contractor; building trades unions; school boards (the TDSB is the largest building owner in Toronto); Tarion; the Construction Safety Association; or a surety and bonding organization

- In the TAG report there is a single reference to ASTM E2397.05 “Standard Practice for Determination of Dead Loads and Live Loads associated with Green Roof Systems” – but no mention is made of any other green roofing standard. Totally ignored are:
 - ASTM E2396-05 Standard test method for saturated water permeability of granulated drainage media (falling-head method) for Green Roof Systems
 - ASTM E2398-05 Standard Test Method for Water Capture and Media Retention of Geocomposite Drain Layers for Green Roof Systems
 - ASTM E2399-05 Standard Test Method for Maximum Media Density for Dead Load Analysis of Green Roof Systems
 - ASTM E2400-06 Standard Guide for Selection, Installation, and Maintenance of Plants for Green Roof Systems
 - ASTM Standard Guide for Green Roof Systems WK14283 (in development)

- In the TAG report there is an observation that: “The Ontario Building Code contains a Canadian Standards Association (CSA) standard reference to durability. The TAG discussed how the CSA durability standard would apply to the TGRCS. As such, the group discussed whether it was appropriate to recommend a minimum service life for membranes. Durability was agreed to be a matter that could be addressed through a maintenance plan requirement” (page 9)The CSA Durability Guide S478-95(R-2001) is a 108 page document that addresses the service life of buildings, components and assemblies. The passing reference to it in the TAG never addresses its content

- The TAG report fails to make any recommendations on wind uplift and fire. Into this gaping hole it inserted a statement that at some future date: “The Chief Building Official should reconvene the Technical Advisory Group (TAG) following completion of the SPRI/ANSI wind uplift standard”

- The TAG performed no cost-benefit analysis; it did not enquire whether or not green roof insurance/surety coverage was available or at issue; it did not invite the views of the Ontario School Board's Insurance Exchange (OSBIE) or Factory Mutual members; and it did not consult Tarion about condominium warranty coverage.

Clearly, the TAG did not perform any analysis with the diligence that is required of a codes and standards development organization; and the word “standard” as it is employed in the TAG report is inappropriate and undeserved.

4) The By-law skirts the (Ontario) Building Code Act

The wording and intent of the relevant section of the City of Toronto Act, 2006 only allows the municipality to pass a by-law that does *not* conflict with, limit or skirt Ontario’s Building Code Act (OBC). Please refer to the text of the Act:

Construction of green roofs

108. (1) Without limiting sections 7 and 8, those sections authorize the City to pass a by-law requiring and governing the construction of green roofs if the provisions of the by-law do not conflict with the provisions of a regulation made under the Building Code Act, 1992 respecting public health and safety, fire protection, structural sufficiency, conservation and environmental protection and the requirements respecting barrier-free access. 2006, c. 11, Sched. A, s. 108 (1); 2006, c. 32, Sched. B, s. 22 (1).

Same

(2) A by-law under subsection (1) prevails over a regulation made under the Building Code Act, 1992, despite section 35 of that Act. 2006, c. 11, Sched. A, s. 108 (2); 2006, c. 32, Sched. B, s. 22 (2).

Definition

(3) For the purposes of subsection (1),

“green roof” means a roof surface that supports the growth of vegetation over a substantial portion of its area for the purpose of water conservation or energy conservation. 2006, c. 11, Sched. A, s. 108 (3).

Repeal

(4) This section is repealed on a day to be named by proclamation of the Lieutenant Governor. 2006, c. 11, Sched. A, s. 108 (4).

However, as Douglas Fishburn points out in his recently published paper: “*How Green is Green*” which was presented several weeks ago and appears in the new [Proceedings of the Canadian Symposium on Roofing Technology](#) ; there are several features of the by-law that conflict with and/or skirt the OBC including

- Membrane testing for water tightness
- Flashing requirements that are not specific
- Wind uplift resistance
- Roof coverings that are classified in accordance with *CAN/ULC S107-M-Fire Testing of Roof Coverings*

.... So, if the language of the by-law fails the intent of Section 108 of the Act and conflicts with the OBC, then the by-law fails on not just one point, but completely and in total. Therefore, the City of Toronto – if it mandates green roofs – must research, explore, verify and test every single construction detail, flashing, reference, and performance requirement in its legislation. So far, this has not happened.

5) The By-law exposes the CBO to liability

It is abundantly clear that the policy intent of both Section 108 of the City of Toronto Act, 2006 and the by-law that you have under consideration are to promote and encourage green roofing. It is also apparent to the even mildly curious that the intent of the “Green Roofing Declaration” included in the by-law is to safeguard the municipality and its employees from any exposure to charges of negligence should a green roof that is “beyond code” fail at any time in the future (see below).

However, roof failures do occur. Members of Council should keep in mind that there is no wording, in any form of declaration, that will prevent or protect the CBO from being pursued for negligence when: the policy intent is clear; legislative enactment is married to administrative enforcement; an innovative “green roofing permit” is issued; the intent stands outside of and apart from the TGDS; a defective green roofing technical standard (sic) was commissioned by the municipality; and the drafters of the by-law had reference to conflicting declarations from all of the recognized design professions and Ontario’s mandatory home warranty corporation. Finally, members of Council should note the advice that British Columbia municipalities have been given by a provincial agency – British Columbia municipalities have been permitted for several years to expand the provincial building code – to “Advise local governments against mandating extensive green roofs in residential construction at this time” (see attached letter)

6) The “Green Roofing Declaration” poses a risk

Article III of the by-law states that: “An application for a permit for construction of a Green Roof shall be made to the Chief Building Official on forms, including a ‘Green Roof Declaration Form’, that may be prescribed by the Chief Building Official from time to time. The ‘Green Roof Declaration Form’ may require information including, but not limited to: structural design; intended use of the Roof and whether or not it will be accessible to the public; and fire safety provisions”

The contemplated Declaration has no purpose other than to protect the CBO from legal action - it fails in its purpose and is an illegal delegation. There is no description in the by-law of the parties and individuals who might authorize the Declaration with respect to: insurance, bonding, certification, license or professional designation. There is an inference – “from time to time” – that the Declaration could be waived (under circumstances that are not defined). The Declaration certainly conflicts with Tarion's (the Ontario new home warranty corporation) “Bulletin 19 for Design and Field Review Reporting”. There is no evidence that the by-law’s drafters consulted with the Canadian Construction Documents Committee (CCDC) - the national joint committee responsible for the development, production and review of standard Canadian construction contracts, forms and guides – in the creation of the Declaration.

7) A defective By-law subverts Toronto’s sustainability agenda

Toronto and Canada are leaders in green building. The Toronto Better Buildings Partnership established in 1993 has registered more than 600 buildings since its inception; and was the inspiration of the Government of Canada’s Commercial Building Incentive Program. The Energy Efficiency Office, Toronto Atmospheric Fund, TGDS and the Mayor’s Tower Renewal Project are more current expansions on this effort. “Build Green” was the first (albeit short lived) green

building program in North America, a partnership in 1991 between the Toronto Home Builders Association and the Ontario Research Foundation. And the LEED® building rating system is based upon BREEAM-Canada written and developed in Toronto by the Canadian Standards Association, in 1995.

One of the more recent projects that I have led is to track the market size and rate of growth of the Canadian green building market. In my first report to Natural Resources Canada (NRCan) last year, I concluded that Toronto - at the end of 2007 – led all municipalities in the number of green building projects that were planned or underway. I am now in the midst of analyzing project data from 2008, but am able to report that Toronto is still in the lead; and that the Canadian market is both bigger and faster growing than green building in the United States. Obviously, this can only have occurred because over the medium to long term Canadians have done the right things well.

It is in this context that I must caution Council that a hastily conceived green roofing by-law will take Toronto down a path that is untried, unproven, unverified and unfortunately makes use of resources that could be used in far better ways – like recovery of roofing (and other construction) materials, an expanded Better Buildings Partnership and proven energy savings methods. In a single sweep, with this by-law the City effectively rolls the dice on the future use and employment of the City of Toronto Act, 2006 and diminishes respect and regard for the newly launched Toronto Green Development Standard.

Yours, truly,

A handwritten signature in black ink that reads "Marshall Leslie". The signature is written in a cursive, flowing style.

Marshall Leslie

e-mail: marshall@mleslie.com

phone: 416-766-7873

for more information about the author see: www.greenstandard.ca www.buildgreenschools.ca
www.mleslie.com

/attach - *"Green Roofs and Homeowner Protection in British Columbia"*, a letter from the CEO of the Homeowner Protection Office (a British Columbia Crown Corporation) addressed to Mayors and Municipal Councils, June 25th, 2007



June 25, 2007

Dear Mayor and Members of Council:

Re: Green Roofs and Homeowner Protection in British Columbia

As you will be aware from our earlier correspondence on this subject, the Homeowner Protection Office (HPO) is engaged in helping industry to resolve the issues surrounding green roof technology and the province's system of consumer protection for new homebuyers. To this end, the HPO organized a day-long conference on the subject on May 29, 2007, and it appointed a task group representative of the various interests involved to attend the conference and make recommendations to the HPO Board of Directors. I write to inform you of the outcome of this process.

The task group concluded that the conference had confirmed that it is technically feasible to design, install and maintain a green roof such that it performs as well as, or better than, a conventional roof system. The group noted, however, that it had not been demonstrated that a green roof would be cost-beneficial from a "triple bottom line" perspective (considering social, economic and environmental aspects) in every case. A decision to implement a green roof would depend on the particulars of the site, climatic conditions, municipal infrastructure and other factors.

The task group noted that, while it is technically feasible to design, install and maintain a green roof properly, the probability that this would be done is considerably less than certain at this time. This is due to factors such as the lack of experience with these systems in British Columbia, the limited supply of skilled labour, the absence of accepted standards and minimum levels of quality control and the inability to ensure that strata corporations discharge their responsibilities for maintenance properly. Although there are proprietary green roof systems available in British Columbia, the market penetration of these systems is quite limited at present.

Consequently, the task group identified a number of risks that would arise from failure to design, install and maintain green roofs properly. These include the failure of the membrane leading to water penetration, the destruction of plant material through drought or other influence, economic losses for homeowners if failures are not covered by home warranty insurance, liability claims for local governments and catastrophic failures for home warranty insurance providers if green roof failures were widespread.

The task group therefore concluded that we should manage the evolution of building technology to incorporate green roofs as and when knowledge and experience can support them. In their report, which can be found at www.hpo.bc.ca, the task group recommended that the HPO Board of Directors:

1. Advise local governments against mandating extensive green roofs in residential construction at this time.
2. Request home warranty insurance providers to specify the conditions, if any, under which they would accept for initial consideration a request for home warranty insurance coverage for a residential building with a green roof.
3. Review the Homeowner Protection Act to clarify the provision and coverage of mandatory home warranty insurance with respect to extensive green roof installation and maintenance.
4. Recommend to the provincial Office of Housing and Construction Standards that consideration is given to the issues surrounding extensive green roofs, including regional climatic variations within the province, in the Green Building Code which is currently under development.
5. Continue to support research and education activities that will expand the knowledge base about the design, installation, maintenance, durability and life expectancy of extensive green roofs in the different climatic zones in British Columbia.
6. Recommend that the Minister of Finance consider the need to ensure that strata corporations' obligations for maintenance of green roof systems are strengthened in the Strata Property Act.

In the report's conclusion, the task group further noted that other jurisdictions have used various tools such as incentives to introduce extensive green roofs on a more gradual basis, with implementation keeping pace with the state of knowledge, experience and capacity of their industry. Local governments or other interested parties may wish to explore such approaches.

At its meeting on June 14, 2007, the HPO Board of Directors received the task group's recommendations and referred them to interested parties for comment before the Board considers them further this fall. The board was aware, however, that a number of local governments are awaiting the outcome of the HPO's work before giving further consideration to mandating green roofs. It therefore decided to approve the Recommendation 1 at this time and to direct me to communicate it to you immediately.

If you have any questions or comments about the Board's recommendation or other aspects of the HPO's work on this matter, please contact me at (604) 646-7056, email: kcameron@hpo.bc.ca, or toll-free at 1-800-407-7757. We would also welcome your comments on the task group's recommendations by September 1, 2007; these comments can be registered directly on our website.

Yours truly,

Ken Cameron
Chief Executive Officer