



STAFF REPORT ACTION REQUIRED

Amendments to the Green Roof Bylaw for Industrial Buildings

Date:	October 19, 2011
To:	Planning and Growth Management Committee
From:	Chief Planner and Executive Director, City Planning
Wards:	All
Reference Number:	Pg11044

SUMMARY

This report recommends an amendment to the Toronto Green Roof Bylaw to permit new industrial buildings and major additions to provide an alternative roof surface that achieves a similar performance level to a green roof in response to a request from City Council. The alternative approach proposed would require new industrial buildings and building additions to install cool roofing material and adhere to a storm water management performance target. The approach reflects consultation with industry stakeholders and advice received through an external consultant.

The Green Roof Bylaw has been in force since January 31, 2010 and through the course of implementation, the need for amendments to the Toronto Green Roof Construction Standard has arisen. It is proposed that the Chief Building Official reconvene the Toronto Green Roof Technical Advisory group to review these changes and propose amendments to the Bylaw.

Recently, requests for Exemptions from the requirements of the Green Roof Bylaw by public school boards for new school buildings have given cause to consider that an alternative option also be explored with the public school boards. This report recommends a process similar to that developed for the review of industrial buildings be followed.

The General Manager, Economic Development, Culture and Tourism and the Chief Building Official and Executive Director, Toronto Building were consulted in the preparation of this report.

RECOMMENDATIONS

The Chief Planner and Executive Director, City Planning recommends that:

1. City Council authorize the City Solicitor to amend Chapter 492 of the Municipal Code – Green Roofs (known as the Toronto Green Roof Bylaw) to allow for an alternative option to green roofs with respect to industrial buildings that provides a roof surface that:
 - a. Uses cool roofing materials for 100% of Available Roof Space; and
 - b. Complies with the stormwater management performance measures required through the Site Plan Approval process, pursuant to Section 114 of the City of Toronto Act; or where Site Plan Approval is not required, retains or collects for re-use at least the first 5 mm from each rainfall or 50 % of annual rainfall volume falling on the roof through systems that incorporate roof surfaces.
2. City Council direct the Chief Building Official and Executive Director, Toronto Building and the Chief Planner and Executive Director, City Planning to report on revisions to the Green Roof Bylaw to reflect other changes including updates to the Toronto Green Roof Construction Standard before March 31, 2012.
3. City Council direct the Chief Planner and Executive Director, City Planning in consultation with the Chief Building Official and Executive Director, Toronto Building and other City Divisions as appropriate, to report on the provision of an alternative option for public school board buildings before March 31, 2012.

Implementation Points

Industrial buildings are not required to provide a green roof under the Green Roof Bylaw until May 1, 2012. The proposed revisions to the Bylaw will apply to Complete Site Plan and Complete Building Permit applications received on or after May 1, 2012.

The implementation of the amendment to the Green Roof Bylaw for industrial buildings, as recommended in this report, requires notification for applicants and implementation protocols in preparation for the amendments Bylaw coming into effect on May 1, 2012.

Financial Impact

The recommendations will have no financial impact on the approved 2011 budget.

DECISION HISTORY

At its meeting on May 25, 26 and 27, 2009, City Council enacted the Green Roof Bylaw under the authority of Section 108 of the City of Toronto Act (COTA), 2006. The City Planning Division and Economic Development Division were directed to report on an alternate option for industrial buildings that would address the benefits of green roofs including the reduction of the urban heat island effect and greenhouse gas emissions and enhanced stormwater management and biodiversity.

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2009.PG25.3>

At its meeting on February 7 and 8, 2011, City Council adopted an amendment to the Green Roof Bylaw to extend the exemption for industrial buildings from January 31, 2011 until April 30, 2012 to allow for further consultation with industrial building stakeholders.

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2011.PG1.6>

ISSUE BACKGROUND

During the development of the Green Roof Bylaw, stakeholders representing the industrial sector identified both technical and economic barriers to the installation of green roofs on low-rise industrial use buildings. Due to the City's established policies of protecting and encouraging employment uses (e.g. Official Plan policies, Development Charge By-law and incentive programs), early consultations included a proposal for alternatives to a green roof that included at-grade approaches to green industrial sites. However, the legislative authority in COTA only permitted the requirement of a vegetated roof.

When the Green Roof Bylaw was adopted, Council requested that the Province amend COTA to permit alternatives to a green roof to address the concerns of the industrial building sector. Council also recommended a delay in the implementation of the industrial requirement in order to explore an alternative option that would address the benefits of green roofs.

In December 2009, the Province (at the request of the City) amended Section 108 of COTA to permit the City to require and govern alternative roof surfaces with similar levels of performance to green roofs. At the same time, the Province also amended the regulation under the Building Code Act, 1992, to include as Applicable Law a bylaw made under section 108 of COTA. As a result of the amendment, all building permit applicants must prove that they comply with the Bylaw in order to receive their building permit. If an applicant is required to construct a green roof and does not provide for one in their building permit application, a permit cannot be issued.

COMMENTS

Alternative Option for Industrial Buildings

In March 2010, a working group made up of representatives from the Toronto Industry Network (TIN) and staff from City Planning Division, Economic Development Division and Toronto Building Division was formed to consider possible alternatives to green roofs for industrial buildings and the results of the Green Roof Alternatives Study.

A Green Roof Alternatives Study was completed in 2010 to compare the performance of a green roof built in accordance with the Toronto Green Roof Construction Standard (TGRCS) to the performance of alternative roof treatments and to identify alternatives that have similar performance levels to a green roof in accordance with the legislative requirements. The Study evaluated each alternative based on the City's green roof policy objectives.

The Alternatives Study estimated that among other benefits, a green roof designed to meet the TGRCS would: retain an average of 50% of annual stormwater volume that falls on the roof; and restrict the temperature rise directly above the roof to approximately 2-8°C, approximately 30°C cooler than a conventional roof during peak temperature periods.

The alternative technologies reviewed in the report included: Cool (White) Roof-membrane and ballast; Water Retention Board; Control Flow Device; Raised Drain; Vine Canopy; Biodiverse Roof; and De-pollution Membrane. The performance of the alternative roof treatments were compared to green roofs built in accordance with the TGRCS. Each alternative, as well as a select number of combinations of alternatives were evaluated as part of the research.

The Alternatives Study concluded that there is no single alternative that would meet the performance level of a green roof. However, combining alternatives may improve the overall performance of a roofing system and help achieve several of the objectives of a green roof.

The working group concluded that the most feasible option for industrial buildings would include a combination of strategies to address urban heat island and stormwater management objectives.

To address the urban heat island, the Alternatives Study concluded that a cool roof with a minimum Solar Reflective Index (SRI) of 79 can be used to achieve similar reductions in the ambient air temperature above a roof as a green roof. A cool roof is a roofing system with a highly reflective and emissive membrane or ballast that can restrict the temperature rise above the roof surface to 5-16°C. In comparison, a grey asphalt shingle roof surface would increase the ambient air temperature above the roof by 38°C. There are several rating systems for cool roofing products that assess the initial performance and performance over time of cool roofing products.

To address stormwater management, applications for new development must identify how stormwater is managed on-site for all hard surfaces, including the roof, through the Site Plan Control approval process. Where Site Plan Approval is not required, it is proposed that a roof surface be provided that retains or collects water for re-use to a level that meets or exceeds the performance of a green roof. This could be achieved through such strategies as: rooftop restrictors, infiltration of roof runoff and rainwater harvesting.

The working group assessed feasibility of the alternatives for industrial buildings and proposed that where a green roof is required under the Green Roof Bylaw, industrial use buildings be permitted an alternative to a green roof, provided that a roof surface:

- a) Uses cool roofing materials for 100% of Available Roof Space; and
- b) Complies with the stormwater management performance measures required through the Site Plan Approval process, pursuant to Section 114 of COTA; or where Site Plan Approval is not required, retains or collects for re-use at least the first 5 mm from each rainfall or 50 % of annual rainfall volume falling on the through systems that incorporate roof surfaces.

Toronto Green Roof Construction Standard

The Green Roof Bylaw has been in force since January 31, 2010 and through the course of implementation, the need for a number of small technical amendments has arisen. The Chief Building Official will meet with the Technical Advisory Group, (and Toronto Fire Services) to consider technical amendments to the Toronto Green Roof Construction Standard, (Article IV of the Bylaw) and the Chief Building Official will report to City Council with any recommended amendments. .

The TGRCS is a key component of the Toronto Green Roof Bylaw. The standard, applies to green roofs required under the Bylaw as well as those voluntarily built in the City. The City-developed construction standard provides certainty and clarity to designers, builders and the building officials where a green roof is being constructed even on a voluntary basis.

The TGRCS is an exception to provincial legislation that generally does not allow a municipality to regulate an aspect of building construction. The standard has been designed to dovetail with existing Ontario Building Code requirements and objectives, while also addressing the components of a green roof that make it “green.” The standard is clear in its design that it does not conflict, or exceed any code provisions. The standard is authorized by the *City of Toronto Act, 2006*.

In the absence of the standard, each application for a green roof would be reviewed as a distinct, "alternative solution" under the Building Code, which does not include specific requirements for green roof design. As a result, an applicant submitting a green roof design would be required to demonstrate that it meets the Building Code objectives and how it complies with the Building Code. Requiring applicants to apply for an alternative

solution would impose an additional fee of \$2,000 per application in addition to building permit fees. The standard, therefore, facilitates the construction of green roofs for applicants in a cost effective manner.

Technical Advisory Group

The TGRCS was developed through a public consultation and a review by the Toronto Green Roof Technical Advisory Group (TAG). The TAG is comprised of nominated representatives from various industry associations including, Ontario Architects Association, Consulting Engineers, Ontario Landscape Architects, and Green Roofs for Healthy Cities. The group is chaired by Ryerson Professor Hitesh Doshi. Professor Doshi's report to the Chief Building Official, leading up to the adoption of the Bylaw, contained a number of recommendations that were included in the proposed standard, ultimately adopted by Toronto City Council in May 2009.

The Bylaw prescribes that the Technical Advisory Group must be consulted in the development of amendments to the green roof construction standard. Article VII of the Bylaw, "Changes to the Technical Standards" directs that the Chief Building Official shall periodically review the standard and consult with the Technical Advisory Group to recommend amendments to City Council. These amendments are to reflect the City's experience with Green Roofs and new construction techniques and materials. Since the adoption of the TGRCS, the American National Standards Institute has adopted fire and wind uplift standards. These standards were under development at the time the Toronto Green Roof Construction Standard was adopted and should be considered for incorporation into the TGRCS.

The Chief Building Official will meet with the Technical Advisory Group and Toronto Fire Services to consider any technical updates to the Toronto Green Roof Construction Standard and report to City Council with recommendations for any amendments to this section of the Bylaw

Public School Board Buildings

During the consultations on the development of the Green Roof Bylaw in 2008 and 2009, public school boards raised concerns with the requirement for a green roof for school use buildings. Between February 1, 2010 and September 30, 2011, City Planning Division has received 6 applications for site plan approval for the construction of new public schools or additions to existing school buildings, three of which have requested an Exemption under the Bylaw. Only one other Exemption request has been received by the City Planning Division. It is proposed that consideration be given to providing public school board buildings with an alternative option under the Green Roof Bylaw and that City staff work with the public school boards to determine an appropriate option.

The Chief Building Official and Executive Director, Toronto Building, and the General Manager, Economic Development, Culture and Tourism were consulted in the preparation of this report.

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SIGNATURE

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