

Eco-Roof Incentive Program

Date:	October 30, 2008
To:	Planning and Growth Management Committee
From:	Director, Toronto Environment Office
Wards:	All
Reference Number:	P:\2008\Cluster B\TEO\PGO8009

SUMMARY

The purpose of the Eco-Roof program is to provide incentives to commercial, industrial and institutional (ICI) property owners so that Toronto's building stock becomes more sustainable and better adapted to climate change. The program is intended to complement the proposed Toronto Green Roof Bylaw and the Green Standard (formerly the "Toronto Green Development Standard") by encouraging owners to take advantage of their roof space. An "eco-roof" would include green roofs that support vegetation and cool roofs that reflect the sun's thermal energy.

Direction to establish the program comes from the 2007 Climate Change, Clean Air and Sustainable Energy Action Plan. The program builds on Toronto's Green Roof Strategy adopted in 2006 and the 2008 Climate Change Adaptation Strategy by taking increased action on storm water management and urban heat island mitigation.

The Eco-roof program would provide incentives for the retrofit of ICI buildings in Toronto's designated employment areas. On a one year pilot basis, the program would also provide incentives for new large ICI buildings citywide that are subject to the proposed Green Roof Bylaw requirements. The program would provide incentives of \$50 / square metre of green roof up to \$100,000 per award and \$2-\$5 / square metre of cool roof up to \$50,000 per award. Initial funding for Eco-Roofs was approved in 2007, totalling \$2.4 million over 5 years. Additional funding of \$200,000 per year would be provided by Toronto Water to be specifically allocated to green roof projects.

This report recommends terms of reference for the incentive program, including environmental performance, eligibility criteria and administration details. The incentive amounts and program terms would be reviewed annually.

RECOMMENDATIONS

The Director of the Toronto Environment Office recommends that:

1. The terms of reference set out in Appendix I to this report be adopted as the selection criteria for the Eco-Roof Incentive Program;
2. The Director of the Toronto Environment Office be authorized to award funds under the Eco-Roofs Incentive program according to the terms of reference set out in Appendix I;
3. For the purposes of the Eco-Roof Incentive Program, a financial incentive of:
 - a. \$50.00 per square metre of green roof installed, be paid to eligible industrial, commercial and institutional property owners as per the terms of reference set out in Attachment I to this report, to a maximum of \$100,000 per award; and
 - b. \$2.00 - \$5.00 per square metre of cool roof installed, be paid to eligible industrial, commercial and institutional property owners as per the terms of reference set out in Attachment I to this report, to a maximum of \$50,000 per award; and
4. The Director of the Toronto Environment Office provide an annual report to the Executive Committee on the status of the Eco-Roof Incentive Program and any proposed refinements to the incentives and program terms of reference.

Financial Impact

Initial funding was approved in the 2008 Climate Change Capital Budget for the Toronto Environment Office in CCL001-02 for the amount of \$200,000 for 2008 and \$800,000 has been included as part of the 2009 Toronto Environment Office Operating Budget Submission. Additional funding of \$200,000 has been included in Toronto Water's 2009 Capital Budget Submission to continue with the incentive program for green roofs, in Capital Account CWW475-01. Toronto Water may identify additional funds for the program in its Capital Budget submissions for 2010-2012. Funding from the Toronto Environment Office for 2010-2012 will be submitted as part of future year Operating Submissions. A total of \$2.4 million for 2009-2012 has been committed for the Eco-Roof Program in the Environment Protection Reserve.

From the program budget, \$70,000 will be drawn per year to fund a project administrator position (Research Analyst 2 level) for the years 2009-2012.

The Acting Deputy City Manager and Chief Financial Officer has reviewed this report and agrees with the financial impact information.

DECISION HISTORY

City Council adopted a Green Roof Strategy at its meeting on February 1, 2006. The strategy built upon extensive stakeholder consultation and a cost-benefit study that identified significant savings in stormwater infrastructure costs and urban heat island reduction as potential benefits of widespread green roof implementation. The strategy contained recommendations to encourage the construction of green roofs on City facilities and through the development approval process, recommendations for publicity and education and recommendations to establish a financial incentive program.
<http://www.toronto.ca/legdocs/2006/agendas/council/cc060131/pof1rpt/cl020.pdf>

A Green Roof Pilot Incentive Program was approved by Council at its meeting on April 25, 26 and 27, 2006 and funding of \$200,000 was allocated by Toronto Water in 2006 and 2007.
<http://www.toronto.ca/legdocs/2006/agendas/committees/wks/wks060307/it022.pdf>
<http://www.toronto.ca/legdocs/mmis/2007/pg/bgrd/backgroundfile-3302.pdf>

City Council also adopted the Toronto Green Standard (formerly the “Green Development Standard”) at its meeting on July 25, 2006. The Green Standard integrates various performance measures for sustainable site development including green roofs and cool roofs.
<http://www.toronto.ca/legdocs/2006/agendas/council/cc060725/pof6rpt/cl001.pdf>

In July 2007, City Council unanimously adopted the Climate Change, Clean Air and Sustainable Energy Action Plan, the “*Climate Change Action Plan*”. Included in the Climate Change Action Plan was a direction to establish a program under the name of Eco-Roofs. The purpose of the program is to provide support for owners and operators of industrial, commercial and institutional buildings in making their roof spaces more environmentally friendly. A target was set for a minimum of 10% of the total industrial, commercial and institutional roof space located in Toronto to be made more environmentally friendly by 2020. In addition, a direction was provided to establish a permanent program for encouraging the installation of green roofs.
<http://www.toronto.ca/legdocs/mmis/2007/ex/reports/2007-06-25-ex10-cr.pdf> (page 14)

In December 2007, City Council considered as part of the Capital Budget process a report entitled “*Climate Change Action Plan – Implementation of Key Program Initiatives*”, which requested capital funding of \$2.4 million over five years for an Eco-Roof Incentive program, including \$200,000 in 2008. This request was approved and at that time it was identified that the Toronto Environment Office would report to Council on the criteria for allocating and granting these funds and how the funds would be administered. This report responds to that directive of City Council and the directive on establishing a permanent program for encouraging the development of green roofs.
<http://www.toronto.ca/legdocs/mmis/2007/ex/reports/2007-11-26-ex15-cr.pdf> (page 24)

The proposed objectives, criteria and selection process have been developed with the support of staff in Toronto Water, City Planning and Toronto Building. In conjunction

with this report, the Planning and Growth Management Committee is also considering reports on the development of a Green Roof Bylaw and refinements to the Toronto Green Standard.

ISSUE BACKGROUND

The City of Toronto is a recognized global leader in sustainability and reducing greenhouse gas emissions because the City and its residents and businesses have been willing to undertake the actions required to address climate change. Included in the Climate Change Action Plan is a recognition that for Toronto to achieve its stated emission reduction targets there must be a continued effort to help residents and businesses make changes in how they operate their homes and businesses.

The Eco-roof program will create a financial incentive program for the next four years to support local businesses in making our building stock more sustainable through the addition of green roofs (roofs that support vegetation) or cool roofs (roofs that reflect the sun's thermal energy). The intention is to catalyze the ICI sector in critical areas of the City where urban heat island and stormwater management are a concern so that we begin working towards the target of greening 10% of Toronto's ICI roofs by 2020.

The program builds upon the Green Roof Strategy adopted by City Council in 2006 and the successful Green-Roof pilot program, delivered by Toronto Water in 2006 and 2007. The Green Roof Incentive Pilot Program demonstrated growing public interest in green roof technology. In 2006 and 2007, a total of 46 green roof projects received funding from the City.

Green roofs and cool roofs have also been encouraged through the development approval process by the Toronto Green Standard, adopted in June of 2006. The Eco-Roof program has been designed to complement the refined Green Standard and Green Roof Bylaw and to assist in the implementation of Toronto's Climate Change Action Plan and Adaptation Strategy.

COMMENTS

Purpose

The purpose of the Eco-Roof Incentive Program is to help improve Toronto's building stock so that it contributes positively to urban heat island mitigation, stormwater management, climate change adaptation, energy efficiency, biodiversity enhancement and air quality improvement. The program will provide a financial incentive to owners or operators of industrial, commercial and institutional (ICI) buildings to install a green roof, cool roof or a combination of the two. The program will target building retrofits in designated employment areas and new large ICI buildings citywide to complement the Green Standard and proposed Green Roof Bylaw.

Definition of an Eco-Roof

An Eco-Roof includes both green roofs and cool roofs. A green roof contributes to stormwater management and urban heat island mitigation and is comprised of a waterproofing membrane, drainage layer, organic growing medium (soil) and vegetation. A cool roof contributes to urban heat island mitigation and has an exterior surface with high “solar reflectivity” and “thermal emissivity.” In short, a cool roof reflects the sun’s rays and reduces heat build-up from the sun’s thermal energy. To be eligible for the program, green roofs and cool roofs must meet the performance specifications in the program terms of reference (see Appendix I).

A cool roof can be either a coating applied over an existing roof system or a new single-ply waterproofing membrane. The definition of an Eco-Roof does not include roof materials made from recycled materials, such as rubber and plastics or metal roofing and wood products unless these materials meet the environmental performance specifications of the Eco-Roof program.

Program Target Area

The Eco-Roof program will prioritize applications in the City’s designated employment districts (see Map 2 of the Toronto Official Plan or Map ONE in Appendix I of this report). On a one year pilot basis the program will also accept applications for new large ICI buildings citywide that are captured by the proposed Green Roof By-law.

The Toronto Green Roof Cost-Benefit study undertaken by Ryerson University in 2005 identified that concentrations of large roofs provide a significant opportunity for environmental benefits including urban heat island mitigation and stormwater management. Subsequent research by the City Planning Division in partnership with Natural Resources Canada has also demonstrated a clear spatial relationship between the large roofs of the employment districts and various “hotspots” where urban heat island is a concern. Both cool roofs and green roofs can help to address this issue. Green roofs can also help with stormwater management, which is of particular concern where there are large impermeable surfaces.

Targeting the employment districts would contribute to a more sustainable and resilient building stock while supporting the objectives of the Green Economic Development Strategy. Incentives for green roofs on large ICI buildings are particularly important because roof construction is often a higher overall percentage of the total building costs. For retrofits, the roofs on these buildings typically have long clear spans and the spaces below are often not heated or cooled. Structurally reinforcing the roof deck to support the weight of a green roof can be expensive and the energy efficiency benefits from greater insulation do not create the same kind of paybacks as for other buildings.

The program would differ from the pilot program in that residential buildings would not be eligible. The roof areas and environmental benefits in greening single family residences are generally smaller and the program will be most effective if it is targeting large employment areas and catalyzing businesses to make our buildings more sustainable.

Financial Incentives

For green roofs, the financial incentive that was developed through the 2006 – 2007 pilot program will be maintained. Successful proposals can receive a financial incentive of \$50 per square meter up to a maximum of \$100,000 towards the installation of a green roof. A minimum of \$200,000 in the program budget will be allocated for green roof construction.

For cool roofs, the financial incentive will range from \$2 - \$5 per square metre up to a maximum of \$50,000. These values are based on a review of cool roof incentive programs in other major North American jurisdictions and feedback from the local roofing industry. \$2 per square metre would be offered for coating applications over existing roofs. This approach is typically lower cost and requires reapplication after about 5 years. \$5 per square metre would be offered for new cool roof membranes and is comparable to the grants offered by the City of Chicago. The incentive values will be monitored during the first year with recommendations on potential revisions in 2009.

Financial and Environmental Benefits

The financial and environmental benefits of green roofs have been well documented in the cost/benefit study by Ryerson University titled, “*Environmental Benefits and Costs of Green Roof Technology for the City of Toronto*”. This provided the background to the City’s green roof strategy, *Making Green Roofs Happen*. If widely implemented, green roofs will help to cool the city, offset stormwater infrastructure costs, enhance local biodiversity and improve energy efficiency and air quality. The installation of cool roofs will help to address the urban heat island issue which is expected to become more intense in the future as a result of climate change.

As directed by Council, the Eco-Roof program will focus on ICI buildings because these largely flat roofs have been identified as a major contributor to the urban heat island effect and they add significantly to storm water management issues. It is estimated that there are 65,000 ICI buildings in Toronto with a combined roof space area of almost 40 million square metres. The incremental costs of green and cool roofs can pose a barrier for some building owners and the incentives offered by this program will help to share the financial burden, leveraging private investment for a public environmental benefit.

Performance Criteria

Program participants will be required to provide detailed information about the installation of their Eco-Roof in compliance with the performance criteria outlined in

detail in Appendix I. The green roof performance criteria were developed as part of the Green Roof Pilot Program while the cool roof criteria have been developed through a review of other jurisdictions and feedback from the local roofing industry.

The criteria have been developed with regard to the Toronto Green Standard and the Toronto Green Roof Standard. The Green Roof Standard is currently in draft format and will undergo further amendments following the public consultation and Technical Advisory Group review. The performance criteria for the Eco-roof program will be further refined as needed to ensure consistency with these standards.

Program Administration

The Eco-Roof Incentive Program, while funded by both Toronto Water and the Toronto Environment Office, will be administered by the Toronto Environment Office. Staff from the Toronto Environment Office will assist potential applicants in preparing their applications, conducting preliminary evaluations, conducting site inspections and ensuring all appropriate City policies, standards and guidelines are followed in the delivery of the program. Evaluation of project proposals will be done by a staff committee consisting of representatives from City Planning, Toronto Building, Toronto Environment Office and Toronto Water.

Other Environmental Technologies

The Eco-Roof Incentive Program will not provide any financial incentives for energy conservation through insulation, renewable energy systems (e.g. solar or wind) or rainwater harvesting. Policies, programs and grants for these strategies already exist through the Energy Efficiency Office, Live Green Toronto and Toronto Water. The Project Administrator will be knowledgeable about these opportunities and will encourage project proponents to consider alternatives when developing plans for their roof space.

Communication Strategy

The Eco-roof program will be marketed in partnership with other city divisions including City Planning, Economic Development, Toronto Water and the Energy Efficiency Office. Opportunities include issuing a press release, promoting the program with the international Cities Alive! Green Roof Conference to be held in Toronto in 2009, updating the City's Green Roof and Live Green websites, Live Green Toronto community animators, the development approval front counter staff, the Better Buildings Partnership program, Economic Development's Business Development and Retention unit, Toronto Water's Water Efficiency Program for the ICI sector and the Water Watch newsletter and direct notification to the roofing industry and local business networks.

SUMMARY

The Eco-Roof program would build upon the City's successful Green Roof and Green Development strategies, while responding to the long-term challenges of Climate Change. Climate change is a long-lasting alteration of weather patterns. This change will mean that our infrastructure and buildings will have to be adapted to weather patterns that are different from what they were designed to accommodate. By providing financial incentives through the Eco-Roof Program, Toronto's industrial, commercial and institutional buildings will be more resilient to climate change and contribute to broader sustainability.

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ATTACHMENTS

Appendix I: Terms of Reference for the City of Toronto Eco-Roof Incentive Program

APPENDIX I

TERMS OF REFERENCE FOR THE CITY OF TORONTO ECO ROOF INCENTIVE PROGRAM

Administration

1. The Eco Roof Incentive Program ("the Program") will be administered by the Toronto Environment Office of the City of Toronto ("the City") with the support of the following City Divisions during the review of applications Toronto Water, City Planning and Toronto Building.

Program Application

2. An Eco-Roof is defined as a cool roof or a green roof as per the eligibility criteria described in section 4. The Eco-Roof Incentive Program applies to:
 - any above grade green or cool roof. Parking garages and at-grade roofs are ineligible;
 - any green or cool roof on an existing industrial, commercial or institutional building within an employment district in Map 2 of the Toronto Official Plan (see Map One of this appendix)
 - any green roof on a new commercial or institutional building with a GFA of greater than 10,000 m² (107,600 sq ft) or greater
 - any green roof on a new industrial building with a GFA of 10,000 m² (107,600 sq ft) or greater

Selection of Participants

3. The City wishes to make financial incentives available under this Program on a fair basis to a broad range of eligible applicants and, for this purpose, the City reserves the absolute right to limit the approval of applications and/or funds granted in such a manner so as to ensure no single applicant or property owner receives a disproportionate share of Program funds, notwithstanding there may be available Program funds or that all funding eligibility requirements have been met by the Applicant.

By signing this Application, the Applicant acknowledges and agrees that the selection and approval of an application for a Program grant is in the absolute discretion of the City, and that the City has reserved rights to limit the number of grants approved and the manner of grant approval on such grounds and conditions as it deems in the best interests of the public. Without limiting the foregoing, where the number of eligible grant applications received exceeds available program funding, the Director of the Toronto Environment Office shall have the absolute discretion in the selection and approval of applications subject to such selection criteria as may be established by City Council.

Eligibility Criteria

4. To be eligible for consideration for participation in the Eco-Roof Incentive Program, a building must be located in the City of Toronto and meet the Green Roof or Cool

Roof specifications of section 4.1, Requirements of Participation and other terms and conditions of this Program:

4.1 Green Roof Specifications

(a) “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. (City of Toronto Act, 2006, c. 11, Sched. A, s. 108 (3)). It is comprised of a waterproofing membrane, drainage layer, organic growing medium (soil) and vegetation.

(b) To be eligible for consideration for participation in this Program each applicant must demonstrate that the proposed Green Roof:

- (i) shall have a continuous coverage of growing media measuring at least 50% of the ground floor area of the building;
- (ii) shall have a vegetation mix (as opposed to a monoculture) and a sustainable organic growing medium that replenishes nutrients and retains moisture;
- (iii) shall have in place anti-shear measures when the slope is in excess of 20% (11 degrees);
- (iv) shall be designed and constructed in conformance to the requirements of the Toronto Green Roof Standard.

(c) The City reserves the right to request additional supporting documentation demonstrating that the materials meet the above specifications.

4.2 Cool Roof Specifications

(a) “Cool Roof” means a roofing system with high solar reflectivity and thermal emissivity to reduce the urban heat island effect and can be either a coating applied over an existing roof system or a new single-ply waterproofing membrane that meets the performance specifications outlined below.

(b) To be eligible for participation in this Program and the Cool Roof incentive, each applicant must demonstrate that the proposed Cool Roof:

- (i) shall have an area that covers 100% of the roof area of the building, excluding mechanical equipment or other environmental technologies.
- (ii) shall have a roof material or coating system that has a minimum Solar Reflectance Index (SRI) rating of :
 - a. 78 for low sloped roofs. Low sloped roofs have a surface slope less than 16.7% (9.5 degrees).
 - b. 29 for steep slope roofs. Steep sloped roofs have a surface slope greater than 16.7% (9.5 degrees) and less than 41.7% (22.6 degrees).
 - c. shall have an emissivity greater than 0.9 and an initial solar reflectance of 0.65 (equivalent to an SRI of 78)
- (iii) shall be comprised of material that is asbestos and mercury-free and emits zero volatile organic compounds (VOCs) and ozone depleting substances (ODSs).

(c) The City reserves the right to request additional supporting documentation demonstrating that the materials meet the above specifications.

Requirements of Participation

5. (a) Application and Supporting Documentation - No application will be accepted or approved unless the applicant has submitted the following:

5.1 Green Roof Applications:

- i. detailed plans of the proposal showing percentage coverage, plant material and type of growing medium and construction details;
- ii. a storm-water runoff calculation report for the proposed design for projects over 500 square metres;
- iii. a maintenance contract or equivalent assurance for 5 years on projects over 500 sq m; and
- iv. the completed and compliant Application form.

5.2 Cool Roof Applications:

- i. detailed plans of the proposal showing percentage coverage, cool roof materials and manufacturer documentation and construction details;
- ii. a 5 year maintenance plan and contract or equivalent assurance including:
 - o an annual roof condition assessment and resulting maintenance; all subsequent roof maintenance must meet the cool roof specifications as outlined in the terms and conditions;
 - o at minimum, an annual roof cleaning;
 - o if applicable, re-coating of cool roof spray as per the life expectancy of the material or site conditions;
 - o the inclusion of all maintenance recommendations provided by the manufacturer or materials supplier; and
- iii. the completed and compliant Application form.

(b) Compliance with Specifications and other Program Requirements – All applicants participating in this Program shall comply with all specifications and other requirements set out in this Application to be eligible for payment of any funds by the City.

(c) Compliance with Laws - All applicants shall comply with all applicable laws, by-laws, regulations, orders, directives, requirements and policies of the federal, provincial and municipal governments, including the City, and all applicable court orders, judgments and declarations of a court or tribunal of competent jurisdiction, including, without limitation, those laws and regulations applying to building methods, health and safety (collectively referred to as “Laws”).

(e) Stormwater Management Report - On new projects with more than 500 square metres of roof area, an engineering report showing source controls (including runoff coefficients for green roofs) should be included as per the requirements of the stormwater management report for the development site.

Application Deadline and Review

6. The Program is undertaken annually and applications will be reviewed two (2) times per year: in the Spring and Fall. Notwithstanding such application deadline, upon commencement of the Program, if the City determines, at any time and in its sole discretion, that:

(a) it has received a sufficient number of acceptable applications to achieve its purposes and objectives of the Program, it may cease accepting any further applications, subject to clause (b) hereof; and

(b) it has received an insufficient number of acceptable applications to achieve its purposes and objectives of the Program, or an initial determination of sufficiency subsequently becomes insufficient for whatever reason.

City Council may suspend or further extend the deadline date of the program as it in its unfettered discretion deems appropriate.

Applicant's Responsibility with respect to Work

7. Each selected Applicant shall, and by signing this application agrees to, assume all financial and other responsibility for all work whatsoever in respect to and related to installation, performance, maintenance, repair and use of the Eco-Roof including, without limitation, the selection of the installers (where applicable) the proper installation of the Eco-Roof and any consequence arising from the installation of the Eco-Roof and the compliance with all Laws in respect to such work.

Waiver and Release

8. The City makes no representation or warranty, express or implied, relating to any Eco-Roof or the availability, competence, quality or financial status of any installer or their work, and by submitting an application, including acceptance of same by the City and any agreement arising thereunder or in consequence thereof, each Applicant fully and completely, without qualification, agrees hereby to waive and release and shall be deemed to have waived and released the City, its officials, officers, employees, agents and representatives from and against any claims or liabilities whatsoever including, without limitation, any damages, costs and liability for any and all loss, injury or damage to any property or person, whether direct, special, consequential, indirect or of any other nature, in connection with or related to the installation of a Eco-Roof or related to the participation in this Program.

Conditions of Payment

9. No payment of a grant or financial incentive under this Program shall be made unless and until the following conditions are met:

(a) a complete and compliant Program application has been approved and the installation is fully completed in accordance with all terms and conditions of this Program set out herein; and

(b) documentation provided by the manufacturer or materials supplier has been received by the City verifying the installed Eco-Roof has been completed in accordance with the terms and conditions of this Program; or

(c) an inspection by the City or its agent verifying the installed Eco-Roof has been completed in accordance with the terms and conditions of this Program.

Terms of Payment

10. Upon successful completion of the installation of the Eco-Roof in accordance with the terms and conditions of this Program set out herein, those grant monies for which an approved applicant may be entitled under this Program will be awarded and paid over to such applicant.

Information and Access Rights of City

11. Each Applicant selected and approved by the City for this Program hereby consents to and shall provide and authorize the City and its personnel:

(a) access during installation period and/or after the installation for a period up to six (6) months from completion to verify compliance of the work with this Program and to photograph the installation;

(b) the right to use or take, including the right to make reproductions of, any information, photographs and digital images and other data concerning any building selected and approved under this Program in any report and/or promotional and educational materials produced by and/or for the City; and

(c) to have access to, and the right to make reproductions of, utility records of any building selected and approved under this Program, for the two (2) year period preceding and following the Eco-Roof installation (four years in total), for Program evaluation purposes.

Privacy Notification:

12. Personal information, on this form, and in relation to the Eco Roof Incentive Program is collected under the authority of *City of Toronto Act, 2006*. The information will be collected and used for the proper administration of the Eco Roof Incentive Program, which will include, but is not limited to: processing of applications for the program; evaluation and verification of compliance with the Eco Roof Incentive Program; evaluation of the Eco Roof Incentive Program; use in governance, educational, promotional materials concerning the Eco Roof Incentive Program; the issuing of payments in relation to the affected properties; updating the information concerning the affected properties, and collection of any unpaid amounts resulting under the Eco Roof Incentive Program. Questions about this collection can be directed to the Eco-Roof Co-ordinator, Toronto Environment Office, 100 Queen Street West, 21st Floor, East Tower, Toronto ON M5H 2N2, Telephone (416) 338-5373

