



**STAFF REPORT
ACTION REQUIRED**

Eco-Roof Incentive Program: Progress Report #2

Date:	March 7, 2012
To:	Planning and Growth Management Committee
From:	John Livey, Deputy City Manager
Wards:	All
Reference Number:	P:\2012\Cluster B\TEO\PG12005

SUMMARY

Green and cool roofs – known together as 'eco-roofs' – help the City of Toronto reach its sustainability goals. Green roofs create green space and help reduce stormwater run-off. Cool roofs reflect sunlight (known as 'high solar reflectance - the ability to reflect visible, infrared and ultraviolet wavelengths of the sun) and do not retain heat (known as 'high thermal emittance' - the ability to radiate absorbed or non-reflected solar energy). Therefore, cool roofs reduce air conditioning and help reduce the "urban heat island effect" in Toronto. The use of eco-roofs also helps to support green jobs and businesses.

In order to support the uptake of eco-roofs by building owners, the City of Toronto established in 2008 the Eco-Roof Incentive Program, which is administered by the Toronto Environment Office. The program applies to existing industrial, commercial and institutional buildings and new buildings not subject to the City's Green Roof Bylaw (Toronto Municipal Code Chapter 492) that mandates green roofs for new building construction over a certain size threshold.

This report provides an update on the Eco-Roof Incentive Program.

RECOMMENDATIONS

John Livey, Deputy City Manager, recommends that:

1. Planning and Growth Management Committee receive this report for information.

Financial Impact

There are no immediate financial implications arising from this report.

Before the committee is another report from the Deputy City Manager, entitled "*Eco-Roof Incentive Program: Creation of a Reserve Fund*", which proposes the creation of a reserve fund to receive money paid to the City of Toronto by developers who make a cash-in-lieu payment when they opt not to construct a green roof, as required by the Green Roof Bylaw (Toronto Municipal Code Chapter 492).

Creation of a reserve fund will enable the City to maintain the Eco-Roof Incentive Program, as 2012 is the final year of scheduled financial support for the Strategic Infrastructure Reserve.

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

DECISION HISTORY

At its meeting of July 16 – 19, 2007 City Council unanimously adopted the *Climate Change, Clean Air and Sustainable Energy Action Plan: Moving from Framework to Action* (the "Climate Change Action Plan"). At that time City Council directed the Director of the Toronto Environment Office to establish a program to support property owners in making their roof space more environmentally friendly. See item EX10.3 on page 25 of the Council minutes:

<http://www.toronto.ca/legdocs/mmis/2007/cc/minutes/2007-07-16-cc11-mn.pdf>.

In March 2008, City Council considered a report entitled, "Climate Change Action Plan – Implementation of Key Program Initiatives" (see item BU21.1h), which included requested funding of \$2.4 million over five years (2008-12) to establish an Eco-Roof Incentive Program. That request was approved and in December 2008 City Council endorsed the terms of reference for the Eco-Roof Incentive Program (<http://www.toronto.ca/legdocs/mmis/2008/pg/bgrd/backgroundfile-16869.pdf>), which was officially launched in March 2009.

At its meeting of May 26, 2009 City Council adopted the Green Roof Bylaw which provides an option for developers who do not wish to construct a green roof as required, to seek approval to provide cash in-lieu of constructing the green roof. The Green Roof Bylaw came into effect in January 2010. The Green Roof Bylaw can be viewed at:

http://www.toronto.ca/legdocs/municode/1184_492.pdf.

The Director of the Toronto Environment Office is required to provide regular progress reports to City Council on the status and outcomes of the program and identify any changes required in the delivery of the program. The first progress report was presented in February 2010. The decision document can be viewed here:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2010.EX40.7>.

At that time City Council adopted some minor modifications to the program and adopted a motion that \$100,000 of the program funding be allocated for research to demonstrate that air conditioning can operate more efficiently when located on a green roof and to explore the ability of green roofs and solar photo voltaic systems to be paired on a roof. Progress on implementing this direction is reported on in this report.

In March 2011 City Council adopted the recommendations of the Auditor-General resulting from his review of the administration of environmental grants in the Toronto Environment Office. This report outlines how the Toronto Environment Office has addressed those recommendations that relate to the Eco-Roof Incentive Program.

ISSUE BACKGROUND

The Eco-Roof Incentive Program built upon the Green Roof Strategy adopted by City Council in 2006 and the Green Roof pilot incentive program, delivered in 2006 and 2007.

The Eco-Roof Incentive Program, launched in 2009, encourages the installation of green or cool roofs on existing buildings, and new buildings not subject to the Green Roof Bylaw. The program makes buildings more sustainable, promotes the creation of green jobs, and helps reduce barriers to the adoption of eco-roof technology in Toronto.

For green roofs, the program offers a \$50 per square meter incentive, to a maximum of \$100,000 on:

- existing industrial, commercial and institutional buildings;
- new industrial building with a gross floor area of 2,000 square meters or greater; or
- new institutional or commercial building with a gross floor area of less than 2,000 square meters.

For cool roofs on existing buildings only, the program offers the following incentives to a maximum of \$50,000:

- \$2 per square meter incentive for a coating over an existing roof; or
- \$5 per square meter for a new roof membrane.

Applicants must submit detailed plans of their proposed roof including the percentage of roof coverage, and plant material and type of growing medium if the proposal is a green roof, as well as a five-year maintenance plan and construction details. The proposal is reviewed by a technical committee made up of representatives from City Planning, Toronto Water and Toronto Building, which makes recommendations to the Director of the Toronto Environment Office.

If accepted, the applicant is required to construct the green or cool roof and provide evidence of its completion prior to receiving any part of the grant. Evidence of completion includes the submission of a letter of declaration from the eco-roof installer, and photos of the installed eco-roof. Random site inspections by City staff are also part of

the verification process. City staff may also inspect a green roof at anytime during its lifetime to ensure that it is being maintained properly. More information about the application process can be found at: www.toronto.ca/livegreen/ecoroofs.

COMMENTS

Eco-Roof Incentive Program: Environmental & Economic Benefits

Between March 2009 and February 2012, 104 funding applications were received, 94 applications were approved, and 85 projects were ultimately pursued by building owners (26 green roofs and 59 cool roofs) with 73 projects completed and 12 in progress.

A total of 192,816 square metres (equivalent to 33 football fields) of green and cool roofs have been approved under the Eco-Roof Incentive Program, with a combined funding allocation of \$1.32 million.

Map One shows the funded projects across all major employment areas in Toronto. Table One summarizes the outcomes associated with the projects supported by the Eco-Roof Incentive Program. Appendix I provides a detailed list of all funded projects.

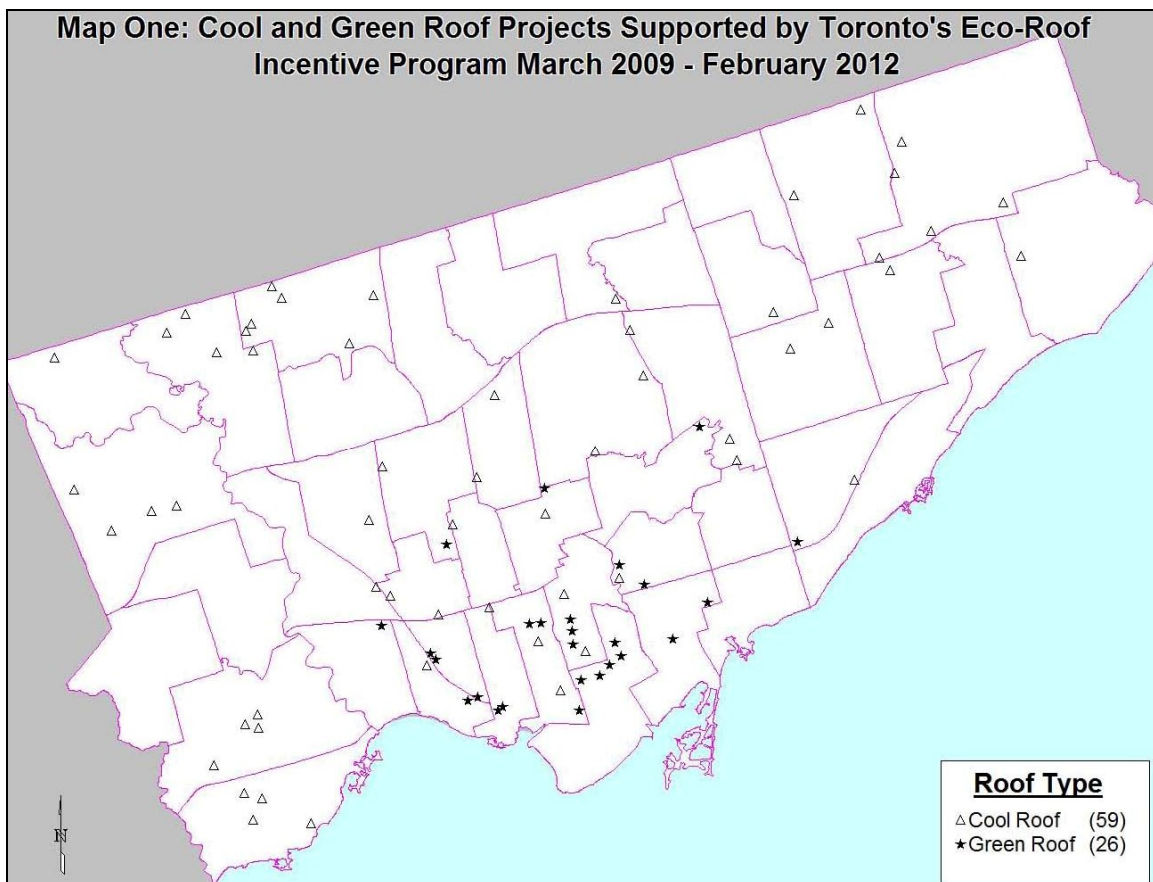


Table One: Measureable Outcomes of Toronto's Eco-Roof Incentive Program March 2009 to February 2012*	
Area of Concern	Outcomes
Stormwater Management	Approximately 7.2 million litres of storm water diverted from sewers annually due to approved green-roofs.
Energy Efficiency	Average of 158,000 kilowatt hours per year in energy savings due to approved green roofs. Average of 308,000 kilowatt hours per year in energy savings due to approved cool roofs. Total electricity savings: \$57,200 per year (based on Toronto Hydro's average rate of 12.275 cents per kWh)
Greenhouse Gas Emission Reductions	Average of 30 tonnes of greenhouse gases avoided annually due to approved green roofs. Average of 58 tonnes of greenhouse gases avoided annually due to approved cool roofs.
Economic Development	Minimum of 23 person-years of new employment generated. 27 person-years of existing employment through this program.
Green Space Enhancement	More than 13,600 square meters of green roofs will help increase biodiversity in Toronto.
*Based on 85 projects, of which 73 are complete.	

Urban Heat Island Reduction

Green and cool roofs reduce the urban heat island effect, which is defined as the observed increase in air and surface temperatures in an urban area caused by concrete and non porous surfaces locking in heat.

Wide spread implementation of green roofs can reduce local ambient air temperature by 0.1 to 2°C and wide spread implementation of cool roofs can reduce local ambient air temperature by 0.6 to 1.7 °C.

Administrative Improvements

In 2010 and 2011, the efficiency and effectiveness of the Eco-Roof Incentive Program was improved by:

- eliminating application deadlines to better accommodate the needs of applicants who often have an urgent need to replace their roofs;
- instituting a six-month project completion deadline; and
- allocating additional staff resources to administer the program, as recommended by the Auditor General in the review of all environmental grant programs.

Auditor General's Recommendation for Lifetime Monitoring of Green Roofs

At its meeting in March 2011, City Council adopted the recommendations of the Auditor-General resulting from his review of the administration of environmental grants in the Toronto Environment Office. The report recommended that,

"the Director, Toronto Environment Office, in consultation with the City Solicitor, amend the standard agreement for the Eco-Roof Incentive Program to allow City staff to periodically inspect green roofs in accordance with the roofs specific design service life. Such amendment also allow for the repayment of grants, if green roof inspections determine that a roof has not been satisfactorily maintained."

The decision document can be viewed here (item AU1.11):

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2011.AU1.11>).

The Terms and Conditions for the Eco-Roof Incentive Program were amended on Oct 28, 2011. Updates were made to the Eligibility Criteria (section 4 and 4.1 d), Applicant's Responsibility with respect to Work (section 7), and Information and Access Rights of City (section 12 d). A new section was added:

*"Conditions after Payment
10. The City may inspect a Green Roof during its lifetime to ensure that it is being maintained properly and continues to function for its design service life, and if the Green Roof has not been maintained, may recover payment in accordance with section 11."*

The Terms and Conditions are posted online at:

<http://wx.toronto.ca/inter/livegreen/ecorooft.nsf/Terms%20and%20Conditions?OpenForm>

Research Project: Co-Benefits of Green Roofs, Air Conditioning and Solar

When the Eco-Roof Incentive Program's first progress report was presented to Council on February 22 and 23, 2010, it was amended to include a direction that \$100,000 be set aside from the Eco-Roof Incentive Program budget to fund a research and demonstration

project on a new or existing industrial building. The purpose of the research is to demonstrate that air conditioning units can operate more efficiently by drawing in cooler air generated by a green roof. An additional component of this research was to explore the ability of green roofs to be paired with solar photo voltaic panels for increased efficiency of energy production and optimum designs for maximum power.

A research agreement was signed in November 2010 with the University of Toronto to implement a 3-year project, and \$99,720 of the 2010 Eco-Roof Incentive Program budget was contributed to support the study. The study will provide an analysis of the energy-efficiency and environmental performance associated with the integration of Green Roof/Green Wall/Cool Roof with Photovoltaic and Air Conditioning roof-units.

The study is expected to be completed by the end of 2013. The results will be published by the University of Toronto. The City of Toronto will own the study copyright.

Stakeholder Consultation

The Toronto Environment Office conducted a stakeholder consultation via an e-mail survey in February 2012. The respondents included building owners, property managers, architects, green roof designers, installers, roofing contractors and manufacturers.

Highlights of the 23 responses from Eco-Roof Incentive Grant recipients (property managers and building owners) include:

- 81% identified cost as a barrier to installing an eco-roof on their property.
- 77% agreed that the Eco-Roof Incentive Program grant influenced their decision to install an eco-roof over a traditional roof.
- Other key factors that influenced their decision included a desire to reduce urban heat (77%), lower energy costs (73%) and social responsibility/leadership (73%).

Highlights of the 17 responses received from roofing contractors, architects and others in the green design industry include:

- 94% cited cost as the main barrier to their clients installing a green roof.
- 67% cited cost as the main barrier to installing a cool roof.

Recommendations for improving or changing the program include:

- increasing the incentive amount per square metre,
- providing case studies on completed projects for education purposes,
- continuing to offer incentives for cool roofs, and
- targeted promotions to roofing contractors to raise awareness of the program.

TEO staff will utilize the recommendations received through the stakeholder consultation process to improve the program and provide an update in the next Eco-Roof Incentive Program progress report.

Conclusion

In the three years of operation, the program has provided environmental and economic benefits to the community and to the businesses that undertake eco-roof projects. To date, 104 funding applications have been received by the Toronto Environment Office from owners of industrial, commercial and institutional buildings seeking financial assistance to support their construction of eco-roofs. Of that number 94 have been approved and 85 projects have been initiated (26 green roofs and 59 cool roofs) with 73 projects completed and 12 in progress.

A total of 192,816 square metres (equivalent to 33 football fields) of green and cool roofs have been approved, with a combined funding allocation of \$1.32 million.

2012 is the final year of dedicated funding from the Strategic Infrastructure Reserve for the Eco-Roof Incentive Program. Going forward, it is proposed that all funding for green roof installation projects would come from cash-in-lieu contributions associated with the Green Roof Bylaw, which is the subject of another report to the Committee.

CONTACTS

Lawson Oates, Director, Toronto Environment Office
Tel: 416-392-9744, Email: Loates@toronto.ca

Mark Bekkering, Manager Implementation and Support, Toronto Environment Office
Tel: 416-392-8556, Email: mbekker@toronto.ca

SIGNATURES

John Livey
Deputy City Manager

APPENDIX I: Approved Eco-Roof Applications, March 2009 to February 2012

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Approved Eco-Roof Applications,
March 2009 to February 2012

TABLE A: APPROVED <u>GREEN ROOF</u> PROJECTS					
Ward	Organization	Address	Eco-Roof Area (m²)	Approved Grant	Status as of February 2012
29	Carrot Commons Corporation	348 Danforth Ave	471.00	\$23,550.00	Completed and verified
26	Building Owner: Crown Property Management. Tenant: ESRI Canada	12 Concorde Place	704.00	\$35,200.00	Completed and verified
27	Metro Central YMCA	20 Grosvenor St	486.00	\$24,300.00	Completed and verified
20	Brookfield Properties	207 Queen's Quay West	607.20	\$30,360.00	Completed and verified
18	Jane Zeidler	1214 Queen Street West	540.00	\$27,000.00	Completed and verified
27	Native Child and Family Services	30 College Street	531.00	\$26,550.00	Completed and verified
13	128 Vine Inc	128 Vine Ave	290.00	\$14,500.00	Completed and verified
27	Seeds of Hope Foundation	6 St. Joseph Street	130.00	\$6,500.00	Completed and verified
28	Robert Carroll, Sanghun Oh	380 Queen St East	67.10	\$3,355.00	Completed and verified
35	Crescent Town Community Health Centre and Social Services Hub (Access Alliance)	3079 Danforth Ave	411.50	\$20,575.00	Completed and verified
22	Toronto District School Board	17 Broadway Ave	2105.00	\$100,000.00	Completed and verified
30	6884709 Canada Limited (Shoppers Drugmart)	970 Queen Street East	493.00	\$24,650.00	Completed and verified
15	HM Investments Inc	518-520 Oakwood Ave	180.00	\$9,000.00	Completed and verified
30	Riverdale Immigrant Women's Enterprises	1326 Gerrard St. East	150.00	\$7,500.00	Completed and verified
18	Kent Monkman	240 Sterling Road	280.00	\$14,000.00	Completed and verified
19	Monarch Group (ZIP)	132 East Liberty St	415.00	\$235.00	Completed and verified

TABLE A: APPROVED <u>GREEN ROOF</u> PROJECTS					
Ward	Organization	Address	Eco-Roof Area (m²)	Approved Grant	Status as of February 2012
19	Monarch Group (Vibe)	100 Western Battery Rd.	12.97	\$648.50	Completed and verified
28	Dundas and Parliament Development Corporation	25 Cole Street	1314.00	\$8,475.50	Completed and verified
20	750 Spadina Ave Association	750 Spadina Ave	372.00	\$18,600.00	Completed and verified
18	Michael Banasiak	276 Sterling Rd.	206.20	\$10,310.00	Completed and verified
14	Henry Gooderham	17 Noble St.	383.67	\$19,183.50	Completed and verified
29	Evergreen Brick Works	550 Bayview Ave	311.00	\$15,550.00	Completed and verified
28	Metropolitan Toronto Condominium Corporation	80 Front Street	1421.00	\$71,050.00	Completed and verified
20	University of Toronto	105 St. George St	485.80	\$24,290.00	Completed and verified
28	260 Richmond Holdings Inc.	260 Richmond Street East	228.00	\$11,400.00	In Progress
28	TD Bank Group	55 King Street West	1026.00	\$51,300.00	In Progress
TOTALS			13,621.44 m²	\$546,782.50	

Green Roof Projects Summary

- Total Approved Green Roof Projects: 26 (24 complete, 2 in progress)
- Total Approved Green Roof Area: 13,621.44 square metres
- Total Approved Green Roof Grants: \$546,782.50

TABLE B: APPROVED COOL ROOF PROJECTS

Ward	Organization	Address	Eco-Roof Area (m ²)	Approved Grant Amount	Status as of February 2012
42	MI Developments Inc	20 Pullman Court	3623.00	\$18,115.00	Completed and verified
16	Toronto Cricket Skating and Curling Club	141 Wilson Ave	5008.00	\$25,040.00	Completed and verified
44	University of Toronto Scarborough Campus	1265 Military Trail	2611.00	\$13,055.00	Completed and verified
34	Don Valley Volkswagen	1695 Eglinton Ave East	1579.00	\$7,895.00	Completed and verified
27	TCHC	931 Yonge St	581.00	\$2,905.00	Completed and verified
2	Bayer Inc	77 Belfield Rd	600.00	\$1,200.00	Completed and verified
8	Toronto and Region Conservation Authority	5 Shoreham Drive	1765.00	\$8,825.00	Completed and verified
35	Hudson Movers Ltd.	347 Kennedy Rd.	2232.00	\$11,160.00	Completed and verified
8	Friesland and Zeeland Investments Inc.	61/63 Brisbane Road	1015.00	\$5,075.00	Completed and verified
6	Butterick Holdings Ltd.	40 Butterick Road	4452.00	\$22,760.00	Completed and verified
8	Toronto and Region Conservation Authority (Black Creek Pioneer Village)	1000 Murray Ross Parkway	2871.00	\$14,355.00	Completed and verified
15	1632937 Ont. Inc	1180 Caledonia Rd	557.00	\$2,785.00	Completed and verified
1	MTCC 659 - c/o Zoran Properties	32 Goodmark Place	3419.00	\$17,095.00	Completed and verified
29	Evergreen Brick Works	550 Bayview Ave	7290.51	\$36,452.55	Completed and verified
7	YCC 484	2300 Finch Ave West	10000.00	\$20,000.00	Completed and verified
7	Avi Gottlieb	25 Scarsdale Road	4564.00	\$22,820.00	Completed and verified
16	Shaarei Shomayim Congregation	470 Glencairn Ave	2090.00	\$10,450.00	Completed and verified
42	Hedley Thomas	2275 Markham Rd	2511.00	\$12,555.00	Completed and verified
42	York Condominium No. 463	525 Milner Avenue	2249.00	\$11,245.00	Completed and verified
37	OPTIK K & R	425 Midwest Rd	2004.00	\$10,020.00	Completed and verified
20	Toronto Hydro-Electric System Limited	253 Wellington Street	790.00	\$3,950.00	Completed and verified
2	1186890 Ontario Limited	34 Greensboro Drive	2575.00	\$12,875.00	Completed and verified
2	Woodbine	555 Rexdale	790.00	\$3,950.00	Completed and

TABLE B: APPROVED COOL ROOF PROJECTS

Ward	Organization	Address	Eco-Roof Area (m ²)	Approved Grant Amount	Status as of February 2012
	Entertainment Group	Boulevard			verified
7	Atlas Container	85 Millwick Drive	2031.51	\$10,157.55	Completed and verified
8	Myriad Group	125 Norfinch Drive	4687.05	\$23,435.26	Completed and verified
21	Beth Sholom Synagogue	1445 Eglinton Avenue West	2039.00	\$10,194.25	Completed and verified
8	York Manufacturing Services (YMS)	65 St. Regis Crescent North	4148.77	\$20,743.86	Completed and verified
38	Con-Tech Restoration	755 Progress Ave	2232.00	\$11,159.98	Completed and verified
5	Coleman Containers Limited	54 Atomic Avenue	5584.00	\$27,920.00	Completed and verified
8	Mr G. Investments	114 Norfinch Drive	3404.00	\$17,020.00	Completed and verified
2	Bayer	77 Belfield Rd.	1578.00	\$7,890.00	Completed and verified
34	Medipac International Inc	180 Lesmill Road	2901.00	\$14,505.00	Completed and verified
27	Ryerson University	122 Bond Street	2790.00	\$13,950.00	Completed and verified
42	Alfa Laval Inc. Canada	101 Milner Ave	2876.00	\$14,380.00	Completed and verified
19	Elgin Picture & Frame Inc.	665 Dupont St.	420.00	\$2,100.00	Completed and verified
6	1223817 Ontario Inc	2786-2800 Lakeshore Blvd West	210.40	\$1,052.00	Completed and verified
22	George Tomev	2019 Yonge St	102.00	\$510.00	Completed and verified
14	Stucture Corp.	35 Golden Avenue	2120.50	\$10,602.50	Completed and verified
42	Annamen Inc.	35 Grand Marshall Drive	2518.09	\$12,590.45	Completed and verified
6	1629810 Ontario Inc.	43 Fima Crescent	468.23	\$2,341.15	Completed and verified
5	Dimpflmeier Bakery Ltd	26-36 Advance Road - SIX POINT, ROOF NG, ROOF 128	1965.91	\$9,829.55	Completed and verified
40	Peter and Pei Kong Tommy Chia Liang	50 Rolark Drive	1506.40	\$7,532.00	Completed and verified
7	Garyray Properties Inc.	700-730 Garyray Drive	2568.60	\$12,843.00	Completed and verified
41	Asha Patel	115 Select Avenue	1542.19	\$7,710.95	Completed and verified
37	MeMeMe LC	1470	2346.73	\$11,733.65	Completed and

TABLE B: APPROVED COOL ROOF PROJECTS					
Ward	Organization	Address	Eco-Roof Area (m²)	Approved Grant Amount	Status as of February 2012
		Birchmount Road			verified
17	Consolidated Bottle Company	77 Union Street	2843.00	\$14,215.00	Completed and verified
5	Dimpflmeier Bakery Ltd	26-36 Advance Road - 3 Roofs A, B, C	1170.11	\$5,850.55	Completed and verified
5	Dimpflmeier Bakery Ltd	29 Chauncey Avenue	524.62	\$2,623.10	Completed and verified
20	University of Toronto	105 St. George St	1038.70	\$5,193.50	Completed and verified
25	Sunnybrook Health Sciences Centre	2075 Bayview Avenue	543.00	\$2,715.00	In progress
2	John Rossetti	271 Attwell Drive	6503.21	\$32,516.05	In progress
24	Institute of Naturopathic Education and Research	1255 Sheppard Ave East	1992.20	\$9,961.00	In progress
12	Speedy Self Storage	7 Ingram Drive	5778.60	\$28,893.00	In progress
7	Humber River Regional Hospital	2111 Finch Avenue West	1950.00	\$9,750.00	In progress
41	Torgan Construction Limited	4186 & 4188 Finch Avenue East	4473.50	\$22,367.50	In progress
11	207 Weston Storage Inc.	207 Weston Road	9690.00	\$19,380.00	In progress
17	Ted Redelmeier & Associates Ltd.	91 Brandon Avenue	464.50	\$1,548.50	In progress
34	Conros Corporation	125 Bermondsey Road	14000.00	\$50,000.00	In progress
6	1654154 Ontario Limited	500 Kipling Avenue	13006.00	\$26,012.00	In progress
TOTALS			179,194.30 m²	\$775,808.89	

Cool Roof Projects Summary

- Total Approved Cool Roof Projects: 59 (49 complete, 10 in progress)
- Total Approved Cool Roof Area: 179,194.30 square metres
- Total Approved Cool Roof Grants: \$775,808.89