



STAFF REPORT ACTION REQUIRED

Toronto Green Standard Update: Performance Measures for Sustainable Development

Date:	October 30, 2008
To:	Planning and Growth Management Committee
From:	Chief Planner and Executive Director, City Planning Division
Wards:	All
Reference Number:	Pg080069

SUMMARY

The purpose of this report is to provide City Council with a comprehensive update on the results of a two-year review of the Toronto Green Standard (formerly referred to as the Toronto Green Development Standard), since adoption by Council in July, 2006. This report presents the new and revised, two-tiered Green Standard for new construction and the supporting results from an extensive legal review and the Toronto Green Standard Cost-Benefit Study undertaken by the University of Toronto Faculty of Architecture, Landscape and Design (a,l&d, Cost-Benefit Study).

In July 2007, City Council adopted the Climate Change, Clean Air and Sustainable Energy Action Plan. The plan included recommendations towards making the Toronto Green Standard mandatory, to account for the effects of proposed construction on Toronto's energy supply, consumption and greenhouse gas emissions. The Toronto Green Standard (TGS) is a first step in establishing better development practices. There has been substantial input into strengthening the standard from City staff and the private sector.

The Green Standard is a set of performance measures that promote sustainable development. They represent Toronto's approach to greening development practices in multi-unit highrise residential buildings, institutional, commercial and industrial buildings and low-rise residential and non-residential development. Tier 1 is mainly secured through the planning process and will be validated in-house; Tier 2 is achieved by way of incentives and will be validated by a third party review. A Development Charge Refund is proposed for Tier 2 to encourage high levels of energy efficiency and greenhouse gas reductions.

RECOMMENDATIONS

The Chief Planner and Executive Director of the City Planning Division recommends that:

1. City Council adopt the two-tiered set of performance measures associated with the Toronto Green Standard (revised Toronto Green Development Standard), as presented in Appendix A;
2. All divisions involved in the approval of development under the Planning Act, apply the performance measures found in Tier 1 of the Toronto Green Standard to all rezoning, site plan and plan of subdivision applications, commencing September, 2009;
3. All Agencies, Boards, Commissions, Divisions and Corporations apply Tier 1 of the Toronto Green Standard commencing at the next capital budget cycle;
4. City Council request the Province to amend the City of Toronto Act to provide the ability for the City to require energy efficiency measures that exceed the levels set out in the Ontario Building Code (OBC).
5. The Chief Planner and Executive Director, in consultation with other Divisions involved in development review, prepare an implementation protocol for the application of the Toronto Green Standard by September 2009;
6. The Chief Planner, Executive Director undertake the next review of the Toronto Green Standard in two years time, in anticipation of changes to the Ontario Building Code.

Implementation Points

Implementing the recommendations found in this report is dependent on an amendment to the Official Plan dealing with new powers under Site Plan Control coming into effect; the establishment of an implementation protocol among all divisions involved in development review under the Planning Act; and further communications with the development industry. All of this is expected to be complete by summer 2009 with a full launch of the two-tiered Toronto Green Standard in September 2009.

Financial Impact

The recommendations of this report have **no** financial impact beyond what has already been approved in the current year's budget.

Any further financial implications, if any, arising from implementation protocol will be reported through the 2010 Operating Budget process.

DECISION HISTORY

In November 2004, the Roundtable on a Beautiful City requested that City Planning report on the development and adoption of sustainable design principles and standards for Toronto. In 2006, the City Planning Division completed a discussion paper, Making a Sustainable City Happen: The Toronto Green Development Standard 2006, as a product of its work program and budget for 2005. The paper provided background and rationale for sustainable (green) design principles, and proposed a set of targets and strategies to enhance the environmental performance of development in Toronto. In July 2006, City Council adopted the Green Development Standard along with a set of staff recommendations concerning the implementation of the standard.

<http://www.toronto.ca/legdocs/2006/agendas/council/cc060725/cofa.pdf>

<http://www.toronto.ca/legdocs/2006/agendas/committees/pof/pof060718/agenda.pdf>

Several of the recommendations requested the Chief Planner and Executive Director, City Planning to conduct further work and report back to City Council. The major areas to investigate and report back on included:

- the City's legislative abilities in applying parts of the standard to private development or to making the standard mandatory for City-owned developments and those of its Agencies, Boards and Commissions (ABC's)
- the completion of a cost-benefit analysis of the standard,
- potential revisions to the standard considering questions, issues and suggestions from City Council, and,
- the development of a verification and labelling system for private property.

Further, in July 2007, Council endorsed the Climate Change, Clean Air and Sustainable Energy Action Plan including recommendations affecting City Planning related to: seeking amendments to the Ontario Building Code and using the City of Toronto Act to require sustainable design and energy labelling of low-rise residential buildings.

<http://www.toronto.ca/legdocs/mmis/2007/ex/decisions/2007-06-25-ex10-dd.pdf>

All of these matters are addressed in this report.

ISSUE BACKGROUND

The Toronto Green Development Standard, herein referred to as the Toronto Green Standard or TGS, was adopted by City Council in 2006. It was officially launched to staff in January 2007. Since then, planning staff were trained on green development and have been using the checklist during pre-consultation with developers on a voluntary basis.

The web site contains resources for staff, developers and the public:

<http://www.toronto.ca/planning/greendevlopment.htm>.

Community Council tracking provides one method to assess developer uptake. Staff reports now include references to green features being incorporated into developments. A database has been established to track the application of the standard. In 2008, 83% of all staff reports referenced some, but not all, of the performance measures being included in

new development. The intent is to have all of the performance measures addressed in new development in order to classify a site as “green”.

During 2007 and 2008, City Planning undertook a review of the TGS to determine changes and improvements that were needed and considering the specific requests made by City Council’s requests. Staff solicited feedback from the City’s agencies, boards, commissions and divisions (ABCD’s) and private developers on the TGS, hired a consultant to investigate the preferred methods of verification, and conducted an extensive legal review and cost-benefit study.

Within the same timeframe Council adopted greenhouse gas reduction targets of 6% by 2012, 30% by 2020 and 80% by 2050, from 1990 levels in the Climate Change Clean Air and Sustainable Energy Action Plan. The report reinforces the importance of sustainable design in new and existing buildings. Buildings account for the majority of Toronto’s emissions estimated at about 63% of our total emissions. The Toronto Green Standard continues to play a key role in improving Toronto’s built environment.

The TGS can be seen as part of an evolution taking place in the development industry toward high performance, sustainable design of sites and buildings. This evolution, like any major change in an industry, is both exciting and challenging. It requires considerable adjustments in the practices and skills of those involved in the planning, development and construction fields, new products and testing, training and development, and information support. Most important for the City of Toronto is fostering a ‘culture of sustainability’ at all levels and within all divisions of the organization. Building staff capacity to support green development is a continuous process to enable staff to both encourage and facilitate sustainable design in the buildings sector. The TGS supports a cultural shift within the City and fosters change within the private sector. The nature of this report and its recommendations is to merge these two objectives.

COMMENTS

Legislative Abilities to Implement the Toronto Green Standard

“Changes in technology alone require the TGS to remain a dynamic framework for ‘building better’ and to serve as a ratchet that does not allow the development industry to slip backward to lesser practices” (a,l&d Cost-Benefit Study, 2008).

The TGS has been applied on a voluntary basis to private development undergoing Official Plan and Zoning By-law Amendments and/or Site Plan Approvals since adoption by Council in 2006. It has also been applied, where feasible, to new construction by the City and its Agencies, Boards, Commissions and Corporations (ABCC’s).

The voluntary approach has allowed the development community, the City and its ABCC’s to become accustomed to the expectation that new development in Toronto needs to meet a higher level of environmental performance. The TGS took an important first step to begin to change behaviour and expectations of the development community and City staff.

During 2008, an extensive review of the City's legislative abilities to require the TGS was undertaken by City Planning and the City Solicitor's office in consultation with Toronto Building, Municipal Licensing and Standards and Toronto Water. This included a review of the City's authority under the Planning Act (PA), City of Toronto Act (COTA), and the Ontario Building Code (OBC). The review determined that the City has the ability to secure some environmental performance measures through the Official Plan and Zoning By-law amendment and Site Plan Approval processes as outlined below.

The Planning Act

The Planning Act lists several matters of Provincial interest to which Council must have regard in carrying out its responsibilities under the Act. These include:

- the protection of ecological systems, including natural areas, features and functions,
- the supply, efficient use and conservation of energy and water,
- the minimization of waste,
- the promotion of development that is designed to be sustainable, to support public transit and that is pedestrian-oriented.

The Planning Act also requires that municipal land use decisions be consistent with the 2005 Provincial Policy Statement (PPS). The PPS addresses several issues related to the Toronto Green Standard requirements including: energy from renewable sources and energy conservation, water efficiency, compact urban form and alternate forms of transportation. In considering Zoning By-law Amendments and Plans of Subdivision the City must address energy conservation as per the PPS.

Revisions to the Planning Act give the City authority to require additional information and material to properly evaluate Official Plan and Zoning By-law Amendment and Plan of Subdivision applications and submission requirements for Site Plan Control applications. In June 2008 City Council adopted a number of recommendations in this regard including that submission of the TGS checklist be considered part of a complete application.

<http://www.toronto.ca/legdocs/mmis/2008/pg/bgrd/backgroundfile-13989.pdf>

City of Toronto Act

COTA provides new additional Site Plan Control powers, as per the Planning Act, dealing with the sustainable design of the exterior of buildings and sustainable design elements in the adjacent right-of-way. The Act requires provisions in the Official Plan to use these powers, and the proposed Official Plan Amendment has been released for public consultation (see www.toronto.ca/legdocs/mmis/2008/pg/decisions/2008-07-02-pg17-dd.pdf). It is expected that this amendment will be considered by Council in the first Quarter of 2009. It is, of course, subject to appeal to the Ontario Municipal Board.

Once the this Official Plan amendment comes into force, these new powers will enable the City to secure a number of sustainable design elements related to the site and exterior building design found in the TGS such as: cool roofs and cool paving; rainwater harvesting and bio-retention swales; shade structures and trees; and native and drought

resistant plant material. The Planning Act continues to authorize the registration of agreements on title to ensure development proceeds in accordance with the approved plans.

Ontario Building Code (OBC)

The Province of Ontario, through administration of the Ontario Building Code, regulates the construction, demolition and renovation of buildings. The OBC establishes uniform minimum standards for building construction and the renovation requirements generally apply to the scope of work undertaken, which are enforced by the City through the building permit process. The Building Code Act prevents a municipality from requiring standards that exceed those contained in the OBC.

The 2006 OBC contains energy efficiency measures for houses and larger buildings that are to be phased in by 2012. This includes a level of approximately Energuide 80 for houses and 25% higher than the Model National Energy Code for Buildings (MNECB), a level which was endorsed by Council in 2006.

Acting on Council direction in 2007, the Deputy City Manager and Chief Building Official wrote to and met with representatives of the Ministry of Municipal Affairs and Housing and Ministry of Energy requesting that the province permit Toronto to fast track the 2012 energy and sustainability requirements of the OBC. This request was reinforced by the Mayor in a letter to the Minister of Municipal Affairs and Housing and in subsequent correspondence from the Deputy City Manager. The province has recognized the City's request on this matter, but provided no indication of intent to fast track the 2012 measures.

<http://www.toronto.ca/legdocs/mmis/2007/pe/bgrd/backgroundfile-4982.pdf>.

Nevertheless, energy efficient buildings remain extremely important for the City of Toronto to address our climate change plan and electrical transmission supply constraints to the downtown. The Toronto Sustainable Energy Plan, going forward to Executive Committee in November of this year, recommends steps designed to assist the Provincial government phase out coal-fired electricity generation through conservation and demand management programs and through renewable energy generation options. That report states that 63% of Toronto's greenhouse gas emissions are attributed to buildings.

Therefore, it is recommended that City Council should seek from the Province authority under the City of Toronto Act to obtain the ability to require energy efficiency measures that exceed the levels set out in the OBC. This would give the City the authority to fully implement the energy efficiency requirements of the Toronto Green Standard and implement the City's Climate Change, Clean Air and Sustainable Energy Action Plan.

Until the 2012 changes to the OBC take effect, a target of 25% better than the MNECB will be secured through agreements associated with Zoning By-law Amendments, Site Plan Approvals and through Plan of Subdivision. This action would be consistent with Provincial interests outlined in the Planning Act, the Provincial Policy Statement and policies of the City's Official Plan.

Sale of City Owned Land

Legal Services advises that in addition to being the type of condition likely to negatively affect the value of the land sold by the City, the terms of an agreement of purchase and sale requiring purchasers to comply with the Toronto Green Standard would be positive covenants relating not to the land itself but the activities on the land. The covenants would not “touch and concern the land”, and therefore would not “run with the land”. Accordingly, they would not be enforceable against subsequent owners of the land. Even when trying to enforce such obligations against the original contracting party (assuming it still exists), the City’s only remedy would be to bring an action in court. Court proceedings are slow and expensive, and the outcome of court proceedings cannot be easily predicted. It would also be difficult, if not impossible to reduce the general and flexible terms of the Toronto Green Standard to provisions that are sufficiently precise to be included in agreements of purchase and sale for land.

According to Legal Services incentive-based programs to secure compliance with the Toronto Green Standard, such as a development charge refund program, are preferable.

Moving Forward

Based on the review of the City’s enabling legislation, a new two-tiered system of the Toronto Green Standard is proposed, as contained in Appendix A of this report.

Tier 1: Identifies the minimum sustainable performance measures that will be secured during Planning Act application approval processes with the use of plans and agreements. The measures include exterior sustainable design, landscaping, site level infrastructure features (such as automobile, cycling and pedestrian infrastructure). The exception is energy efficiency of 25% better than the MNECB or Energuide 80 for low-rise development. This matter will be secured through agreements as explained above.

Tier 2: Identifies enhanced sustainable performance measures that raise the bar and encompass whole building performance such as 40% energy efficiency above MNECB or Energuide 85 for low-rise development. The enhanced standard includes matters that are outside of what can normally be secured under the Planning Act but will be achieved through a Development Charge Refund program. The details of this program are described in the Development Charges – Background Study and Proposed By-law report going to Executive Committee also in November.

Tier 1 will be secured for all private development through the development approvals process. City-owned developments and ABCC’s are expected to comply commencing in the next capital budget cycle. The voluntary, enhanced, Tier 2 standard will be encouraged for all new buildings through the use of incentives such as the proposed Development Charge Refund.

The proposed amendments to the Official Plan to use the new powers associated with COTA will come into effect following the statutory public meeting targeted for Planning and Growth Management Committee in January 2009. Provided there are no appeals, the OPA will come into effect in March 2009 at the earliest. Once the OPA is in place, the

Site Plan By-law will need to be amended, and the City will be able to exercise its authority to secure the sustainable design elements by the fall of 2009. If there are appeals to the OPA, the timing of these new powers will depend upon the timing and outcome of the OMB hearing.

Cost-Benefit Analysis

“If the green development path is not taken, these savings translate into the burdens that we place on the shoulders of successive generations.”

(a,l&d Cost-Benefit Study, 2008)

The City of Toronto, in partnership with Ontario Centres of Excellence, and with funding from the Federation of Canadian Municipalities Green Municipal Fund, undertook a cost-benefit analysis of the Toronto Green Standard in 2008. The Toronto Green Standard Cost-Benefit Study was prepared by the University of Toronto Faculty of Architecture, Landscape and Design (a,l&d) with continuous input from an expert Steering Committee that included private developers, consultants and experts.

The reason for undertaking the study was to address developers’ concerns about the costs versus savings of implementing green development and to help the City identify appropriate levels of incentives to achieve broader acceptance. The study provides an in-depth look at trends in green development across the region, opportunities and barriers. It considers to what extent green technologies are readily available to make green development achievable. The study considers avoided costs in future infrastructure expansion that result from efficient buildings.

The study recognizes that the Toronto Green Standard is among a number of instruments being developed by the City of Toronto to mitigate adverse environmental impacts related to growth and development. While the TGS is not intended to address all issues related to sustainable development, it has been based on a bio-regional approach to green development that recognizes the unique ecosystem that Toronto shares with the numerous communities bordering the Great Lakes. The TGS sets the municipal standard for new, green development in the City, leading the way for existing building standards to follow.

Economic assessment approaches including Return on Investment (ROI), Life Cycle Costing (LCC, over 75 years) and best “payback” are applied to sets of energy conservation measures for three major building types: multi-unit residential, office and retail/commercial.

- The results for a typical multi-unit residential building (MURB), such as an apartment building or condominium, showed that complying with the TGS represents less than a 2% capital cost premium yielding a payback period less than 7 years, and a return on investment exceeding 20%.
- According to the study, typical office buildings complying with the TGS have less than a 5% capital cost premium yielding a payback period averaging 6 years, and a return on investment averaging approximately 25%. Cost-benefit analyses for offices

demonstrate that energy savings alone afford generous margins for additional investments in durable and efficient building systems.

- For typical retail/commercial developments the cost of complying with the TGS is in the range of 2%, offering a payback period averaging less than 5 years and yielding a return on investment averaging slightly more than 30%. Additional benefits are available through the integration of landscape and stormwater management systems.

In summary, the central finding of the cost-benefit study is that the capital cost premium associated with applying the Toronto Green Standard ranges from between 2% to 5% of construction expenditures even without examining the full economic, social and environmental benefits associated with green development, particularly impacts on municipal infrastructure. This finding further reinforces the two-tiered approach to the TGS whereby Tier 1 is generally considered to be cost-effective with a low cost premium and therefore the City can expect compliance.

The study concludes by saying that over the next 25 year period, the economic benefit achieved from adopting the TGS is around \$1.2 billion for the City of Toronto. The savings from good development practices, avoided water and wastewater expansion, and avoided air quality related health costs exceed the premium on green development. The principle of avoided costs helps to support the establishment of the Development Charge Refund associated with the Tier 2 standard in order to strongly encourage greater efficiencies in building design. If the green development path is not taken these savings translate into burdens we place on future generations. The full Cost-Benefit Study and the executive summary is available from the City Planning website at:

<http://www.toronto.ca/planning/greendevlopment.htm>.

Revisions to the Toronto Green Standard

The Toronto Green Development Standard is “based on a bio-regional approach to green development that recognizes the unique ecosystem that Toronto shares with the numerous communities that border the Great Lakes.”

(a,l&d Cost-Benefit Study, 2008)

The revised Toronto Green Standard is presented in Appendix A. The proposed standard reflects the ongoing commitment by the City of Toronto to make green development business as usual for new development in Toronto. The green standard continues to be oriented towards addressing the City of Toronto’s unique urban characteristics and environmental pressures including:

- Improved air quality,
- Energy efficiency and climate change (greenhouse gas reductions),
- Water quality, quantity and efficiency,
- Ecological protection and enhancements,
- Solid waste diversion and reduction.

The TGS is a tool to implement the broader environmental policies of the Official Plan. The standard responds to the City’s overarching environmental objectives by adopting and incorporating performance targets from policy and guideline documents such as: the

Climate Change, Clean Air and Sustainable Energy Action Plan, the Wet Weather Flow Management Master Plan, Target 70 Waste Diversion Plan, Toronto's water efficiency and energy efficiency programs, the Eco-Roof Incentive Program and the Green Roof By-law under development, natural heritage studies, shade policy, tree canopy targets and Bird-Friendly Development Guidelines to name a few. The TGS acts as a bridge between high level policy and site level development, helping to define what we mean by sustainable development.

The revised standard reflects the results of a detailed review:

- Considering suggestions from City Council for overall improvements and enhancements to specific standards for local materials, minimum energy performance and storm water retention,
- Comparing to a variety of green development related reference documents such as LEED and other performance standards,
- Consulting with City divisions, academic institutions, developers, builders, architects and landscape architects on their experiences using the TGS and,
- Incorporating the results of the legal review and the Cost-Benefit Study described previously.

Summary of Major Revisions and Issues Considered

Restructured Standard

The revised TGS incorporates a new two-tiered structure emphasizing the priority performance measures that can be secured through the planning process in Tier 1, and those that raise the bar on green development in Tier 2. Tier 1, energy efficiency will be secured through rezoning applications involving Site Plan Approvals and through Plan of Subdivision and their associated agreements. Energy efficiency will also be strongly encouraged through the Better Buildings New Construction (BBNC) incentive program administered by the Energy Efficiency Office which provides grant money for energy modeling and kilowatts saved. The Tier 2 enhanced TGS offers a deeper level of green by setting higher performance targets and could be achieved through the Development Charge Refund. Tier 2 builds on Tier 1; to achieve Tier 2 all of the performance measures in both Tier 1 and 2 will have to be addressed.

Addition of a Low-Rise Non-Residential Standard

Low-rise non-residential buildings have very different site and building use characteristics than mid to high rise buildings and low-rise residential development. Therefore a new Low-Rise Non-Residential Development Standard has been added so that the TGS can better reflect the range of development occurring in the City of Toronto. In total there are now three standards for: Mid to High Rise Residential, Industrial, Commercial and Institutional; Low-rise Residential and Low-rise Non-residential (see Appendix A for all three standards).

Minimum Energy Performance

As noted in the legal ability section of this report, energy efficient buildings are extremely important for the City of Toronto to address our climate change plan and

electrical transmission supply constraints to the downtown. Energy efficiency is essential to any green building strategy.

The current target of 25% better than MNECB is consistent with the incentive program offered by City of Toronto's BBNC incentive program. The BBNC requires that applicants conduct and submit energy modelling which results in energy efficiency that is at least 10% better than the reference building that is designed to meet the basic requirements of the current Ontario Building Code, or 25% better than MNECB.

Unfortunately the Cost-Benefit Study did not examine the cost premium associated with higher levels of energy efficiency. However, the BBNC program has shown that 16 of 41 new developments that have been modelled through their program have achieved 40% or above the MNECB. Therefore Tier 2 energy targets were set at 40% because it is achievable yet not easy for proponents.

The TGS target for energy efficiency will be reviewed again in 2010, two years prior to the scheduled increase in the Ontario Building Code requirements with consideration given to raising the minimum energy performance requirements of the TGS to remain above that of the OBC.

Change to the Low-Rise Energy Requirement

A technical review was conducted by Toronto Building to identify potential conflicts with the new OBC. The review identified some significant revisions that were necessary for the Low Rise Residential Standard. Several sections have been replaced with a requirement to meet a minimum standard of EnerGuide 80 (Tier 1) and Energuide 85 (Tier 2) to be more consistent with the OBC.

Added On-site Energy Generation Requirements

The Cost-Benefit Study concluded that the cost-effectiveness of renewable energy technologies is improving at a rapid rate. Unfortunately renewable energy such as solar and wind remain expensive in Ontario and the most effective technologies are still emerging. There is a need for continued government support to accelerate the deployment of renewable energy technologies. After careful consideration, it was determined that including a requirement for on-site renewable energy for all new development is inappropriate at this time. On-site renewable energy generation is difficult for many building types and cost-effectiveness continues to be a challenge. However, the use of on-site renewable energy technologies has been explicitly added as a compliance option to meet Minimum Energy Performance targets for Tier 2 in the TGS for both mid to high rise and low-rise non-residential development.

Increase in Tree Canopy Requirements

A number of revisions were made to the TGS to support increasing the total tree canopy and soft surfaces in Toronto. New Tier 1 targets include: planting a tree for every 30m² of softscaped area and planting trees along street frontages and in surface parking lots; targets concerning tree planting conditions and maintenance to support tree survival and

mature growth; and targets under “Natural Heritage: Site” to encourage more landscaping with native plant species.

Stormwater Management

Requirements for stormwater retention on-site in Tier 1 targets emerge directly from the Wet Weather Flow Management Guidelines which identify source control techniques as a priority to reduce the quantity of stormwater runoff. Tier 2 enhances the targets in the TGS by requiring greater stormwater retention through infiltration and evapotranspiration and no storm runoff from mid to high rise building types.

Validation and Labelling

“There is a growing realization that a major jump in performance levels, at least in market economies, will depend on changes in market demand, and that such change cannot occur until building investors and tenants have access to a relatively simple method that allows them to identify buildings that perform to a higher standard.”
(a,l&d Cost-Benefit Study, 2008)

Methods of validation and labelling green buildings were investigated to determine the best approach. In 2007, a consultant conducted an independent review of issues and options related to providing adequate proof of compliance that the TGS has been met. The report entitled *Scoping a Validation Protocol for the City of Toronto Green Development Standard*, explores issues that need to be considered in developing a validation protocol such as risks and liabilities and key points in the building design and construction lifecycle to conduct validation, what and how to validate at each stage.

The preferred validation options considered were in-house, third party or self-attested declaration up to the Issue of Occupancy Permit stage (pre and post-construction validation). The legal review and decision to proceed with two levels of achievement, reinforces the Site Plan Approval process as the best process to implement an in-house validation procedure for the required, Tier 1 standard. Where features cannot be validated by staff, signed declaration forms or affidavits will be considered. The validation protocol for the Tier 2 enhanced standard may require a third party auditor to ensure that the higher performance standards are being met through more rigorous testing methods and to provide adequate proof to award the Development Charge Refund.

Site Plan Approval is an important means of encouraging well designed, functional and universally accessible development in Toronto. This involves the City reviewing plans that show the location and massing of buildings, structures, and spaces on a site and considering the exterior design and exterior architectural details and materials, which influence the building’s character and physical appearance. As part of the site plan review process, the City can consider the layout of parking and servicing areas, site landscaping and other aspects of the development. Sustainable design elements of the site and buildings found in the TGS will be taken into consideration. For areas and types of development where Site Plan Control is applied, Council or delegated staff may approve the plans and drawings and the owner may be required to enter into an agreement to secure the construction of the project as shown in the plans.

The proposed validation protocol for the Tier 1 Green Standard will work in concert with the Zoning By-law Amendment and Site Plan review and approvals process requirements. It will use a combination of new annotations on plan drawings and declaration forms (where additional documentation or professional sign-off is needed) and agreements to secure green development features. The use of financial securities may be expanded and a post-construction site audit will be undertaken by trained site plan technicians.

The validation protocol will be a central part of the overall implementation protocol developed with input from other divisions involved in development review and considering feasibility, cost recovery, staffing and training needs. Training needs will be addressed through a staff training program also under development and described below in the Implementation section of this report. Options are being explored for the validation of Tier 2, working with the Energy Efficiency Office using qualified third party reviewers.

The Cost-Benefit Study noted the importance of labelling buildings for consumer recognition and also to provide a standard performance testing protocol for buildings. City staff are working with Natural Resources Canada to pilot their energy labelling program on City-owned facilities. This program begins with a label for commercial and institutional buildings but plans are underway to expand the program to other building types. The City will continue to be involved in developing this program as a complementary approach to green buildings and the TGS.

Incentives

City Planning recognizes the important role that monetary incentives play in helping to implement higher expectations in development. Monetary incentives help to cover the premium or perceived financial barriers to new technologies and practices.

To date the City has provided some financial incentive programs that target specific objectives or technology implementation. These include: the Green Roof Pilot Incentive Program, Eco-Roof Program and the BBNC, providing critical support for energy efficient buildings in Toronto.

The Cost-Benefit Study showed that the 2006 TGS targets are cost-effective. That finding, combined with the results of the legal review, justifies the two-tier approach to the TGS as presented. The enhanced, Tier 2, voluntary standard requires a more substantive investment in new technologies and practices with a higher premium (e.g. beyond 2 to 7% of construction expenditures). Therefore, the financial incentives must be geared towards the higher targets set in the enhanced, deeper green standard.

Proposed Development Charge Refund

The City requires development charges to recover costs for supplying a number of services, including but not limited to: parks, sewers, water, transit and storm water management. Green development provides benefits in avoided costs to infrastructure expansion such as water and sanitary servicing and sewage treatment plants. The

development charge costs for sewers, water, and storm water management are approximately 20% for residential development and 40% for non-residential development. A Development Charge Refund, equivalent to 20% across the board, is proposed as an incentive for new development that meets or exceeds the Tier 2 TGS. The details of this proposal are cited in the Development Charges – Background Study and Proposed By-law report going to Executive Committee in November.

Implementation

Implementing the new Toronto Green Standard is a complex process that must be carefully worked through among the various divisions involved in development review, administration of incentive programs being applied and validation of the TGS. To do this, City Planning will establish a cross-divisional implementation team that includes representatives involved in development review: Toronto Building, Urban Forestry, Solid Waste, Toronto Water, Technical Services and City Planning. The team will establish a comprehensive implementation protocol described below. Other implementation work includes the development of a staff training program and website improvements.

Protocol for Development Review

Implementation of the restructured TGS involves embedding green development features into the site plan approvals process by making changes to the planning application forms, establishing new annotations on site plans and drawings and securing green performance measures by establishing new standard clauses in related agreements.

The TGS requirements will add to the workload, especially of City Planning staff and especially at the outset. Through standardized approaches to the review and approval of the measures, together with familiarity by the development community, the initial spike in workload will be lessened. Once established the additional workload resulting from expanded review and inspection requirements should be moderate.

A number of Divisions play a key role in development review by checking plans and drawings and visiting developments sites. These roles and responsibilities need to be assessed to establish an effective circulation and review process. The validation protocol is central in that “proof” of achievement at both the design and construction stages will be necessary to award the incentives outlined in this report, particularly the Development Charge Refund, which will require sign-off from the Chief Financial Officer. The coordination of these matters and others will be addressed by the implementation team.

Sustainable Design/Green Development Staff Training Course

The revised structure and requirements of the TGS warrants more in-depth training for staff involved in both the review of development applications, the design and construction of City-owned facilities as well as general information sessions for the broader staff body. To date, there have been several training sessions related to green development at the City, however understanding, promoting, and expediting green development can best be achieved through on-going staff training. The development of the staff training course is underway. The course will continue to advance green development. It will be designed to strengthen staff knowledge of sustainable design and building sciences, climate change and green development review and implementation

processes. The course will involve course modules, electronic materials, workshops and tours. The costs are being shared among several divisions with seed funds provided by the Federation of Canadian Municipalities.

Expanded Web-Site

To be effective, the components of TGS discussed in this report need to be consolidated and available in one place where staff, the public and the development and construction community can readily access new and leading edge information. A one-stop website is a necessary marketing and public outreach tool. Currently, information about the TGS can be found on the City Planning Division website at <http://www.toronto.ca/planning/greendevlopment.htm>.

The web portal contains the standard and checklists, educational materials, links and resources, incentive programs and applications, and email address and contact information for inquiries. The website will be expanded to include case studies of green buildings using a more interactive approach to educate users about sustainable design features and their impacts on City environmental priorities such as energy efficiency, GHG reductions, water quality and quantity, building materials, urban heat island reduction and urban ecology. The Cost-Benefit Study provided case studies of high performance buildings by building type that will be added to the site along with real green buildings in Toronto. In this way the website can function as both an education tool for the public around green buildings and provide more technical information aimed at developers and designers. It will provide an opportunity to showcase and recognize real green buildings in Toronto. A carbon calculator for different building types may be an added feature.

Next Toronto Green Standard Review

The Toronto Green Standard will be reviewed again in 2010 in anticipation of the scheduled increase in the Ontario Building Code requirements for energy efficiency. The intent of the review will be to fully utilize any new tools and powers available to secure the entire TGS if possible and to continue to push green development in Toronto. Consideration will also be given to raising the standard with special attention paid to raising the minimum energy performance requirements of the two-tier TGS above 25% and 40% respectively. The review will also address the City's most current environmental policy objectives, changes to enabling legislation, changes in the building and construction industry market and other new information.

CONTACT

Joe D' Abramo
Director (Acting)
Zoning Bylaw and Environmental Planning
City Planning Division
Telephone: (416) 397-0251
Fax: (416) 392-3821
Email: jdabramo@toronto.ca

SIGNATURE

Gary Wright
Chief Planner and Executive Director
City Planning Division

ATTACHMENTS

Appendix A: Toronto Green Standard - Mid to High Rise Residential, Commercial, Industrial and Institutional Development
Appendix A: Toronto Green Standard - Low-Rise Residential Development
Appendix A: Toronto Green Standard - Low-Rise Non-Residential Development

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AIR QUALITY

Development Feature	Tier 1	Tier 2
<p>Automobile Infrastructure Discourage single-occupancy automobile use and encourage the use of low emission vehicles.</p>	<ul style="list-style-type: none"> ▶ Residential: Provide no more than the minimum parking required under the Zoning By-law. Any additional spaces must provide or have direct access to electrical outlets for plug-in electric vehicles. ▶ Institutional/Commercial/Retail/: Provide no more than the minimum parking required under the Zoning By-law. Additional spaces may be provided <i>only</i> for dedicated priority parking spaces for carpooling and for publicly accessible spaces dedicated to car-sharing. All additional spaces must provide electrical outlets for plug-in electric vehicles. ▶ Design all parking spaces so that the dimensions do not exceed the minimum required by the Zoning By-law. ▶ In mixed use developments include shared parking among uses that have different peaking characteristics, where permitted under the Zoning By-law. <p>*See website for Tier 1 and Tier 2 specification details for all development features: http://www.toronto.ca/planning/greendevlopment.htm</p>	<ul style="list-style-type: none"> • Provide electrical outlets for plug-in electric vehicles (including electric bicycles) for 10% of the minimum required spaces in the zoning by-law • Provide a 1-year TTC metropass to all purchasers of residential units.



AIR QUALITY

Development Feature	Tier 1	Tier 2
<p>Cycling Infrastructure Encourage cycling as a clean air alternative</p>	<ul style="list-style-type: none"> ▶ Occupant bicycle parking should be provided at the following rates: <p>Residential: in the Downtown, Centres and Central Waterfront for buildings with more than 10 units, provide at least 1.0 bicycle parking space per unit; for buildings with more than 10 units in the rest of the City provide at least 0.75 bicycle parking spaces per unit; Locate at least 5% of residential bicycle occupant parking at grade</p> <p style="text-align: center;">OR</p> <p>Commercial/ retail/ institutional: in the Downtown, Central Waterfront and Centres, provide at least 0.2 bicycle parking spaces/100 m² of non-residential GFA; for buildings in the rest of the City provide at least 0.13 bicycle parking spaces/100 m² of non-residential GFA;</p> <p style="text-align: center;">OR</p> <p>Industrial: Provide at least 1 bicycle parking space per 15 regular building employees (No less than 1 space should ever be provided.)</p> ▶ Locate occupant bicycle parking in a weather protected, secure area with controlled access; or secure individual enclosures ▶ Visitor bicycle parking should be provided at the following rates: <p>Residential: provide visitor bicycle parking equal to 10% of the required minimum occupant' bicycle parking space requirements (Minimum of one space, maximum of 40 spaces)</p> <p style="text-align: center;">OR</p> <p>Commercial/ retail/ institutional: in the Downtown, Central Waterfront and Centres, provide the greater of 0.3 spaces/100 m² of non-residential GFA or 6 spaces, for sites with non-residential GFA > 1000 m²; for buildings in the rest of the City provide at least 0.25 spaces/100 m² of non-residential GFA or 6 spaces, for sites with non-residential GFA > 1000 m²</p> ▶ Provide visitor bicycle parking in a highly visible and easily accessible location at grade. ▶ In workplaces, provide 1 male and 1 female shower and change facility for every 30 bicycle parking spaces. (Minimum of 1 facility for each gender when 5 or more bicycle parking spaces are provided). 	<ul style="list-style-type: none"> • Residential: for buildings with more than 10 units in the Downtown, Centres and Central Waterfront, provide at least 1.2 bicycle parking space per unit;



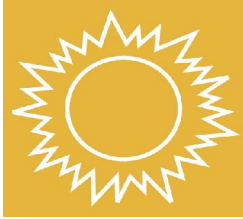
AIR QUALITY

Development Feature	Tier 1	Tier 2
<p>Public Transit Accessibility Encourage public transit as a clean air alternative</p>	<ul style="list-style-type: none"> ▶ Where site conditions allow, locate major building entrance within 200m of a transit stop. ▶ Provide signage indicating direction to and from transit to public facilities and service centres. 	
<p>Pedestrian Infrastructure Encourage walking as a clean air alternative for all ages and abilities</p>	<ul style="list-style-type: none"> ▶ Connect buildings on the site to off-site pedestrian paths, transit stops and parking areas (car and bike) ▶ Design sidewalks, crosswalks and walkways to be continuous, universally accessible, barrier free and clearly designated. ▶ Cover main entrances and outdoor waiting areas for protection from sun and inclement weather ▶ Use only energy efficient, pedestrian-specific lighting directed onto sidewalks, pathways, entrances and outdoor waiting areas ▶ Locate air exhaust systems away from pedestrian routes and amenity areas. ▶ No air intake grates along pedestrian routes 	



AIR QUALITY

Development Feature	Tier 1	Tier 2
<p>Urban Heat Island Reduction: At Grade Reduce ambient surface temperatures, and provide shade for human health and comfort</p>	<ul style="list-style-type: none"> ▶ Use high-albedo surface materials for at least 50% of the site’s non-roof hardscape. <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> Use open grid pavement for at least 50% of the site’s non-roof hardscape <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> Shade least 50% of hardscape, including surface parking areas, walkways and other hard surfaces. <ul style="list-style-type: none"> ▶ Plant large growing shade trees at the equivalent of 6-8m intervals starting from the property line along all street frontages, open space frontages and public walkways, excluding driveways and easements. ▶ If surface parking is permitted and provided, plant internal shade trees at a minimum ratio of one tree planted for every five parking spaces supplied, see the design specifications found in the Design Guidelines for “Greening” Surface Parking Lots 	<ul style="list-style-type: none"> • Complete at least one of the following: <ul style="list-style-type: none"> Use high-albedo surface materials for at least 75% of the site’s non-roof hardscape <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> Use open grid pavement for at least 75% of the site’s non-roof hardscape <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> Shade at least 75% of hardscape, including surface parking areas, walkways and other hard surfaces. <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> If surface parking is provided, plant internal shade trees at a minimum ratio of one tree planted for every three parking spaces supplied, in accordance with the Design Guidelines for “Greening” Surface Parking Lots <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> Install a Green wall on an exterior surface that is either free-standing or part of a building to a minimum height of one-storey.
<p>Urban Heat Island Reduction: Roof Reduce ambient surface temperatures on/from rooftops</p>	<ul style="list-style-type: none"> ▶ Do one of the following for available roof space: <ul style="list-style-type: none"> Install green roof with 50% minimum coverage <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> Use cool roofing materials for 100% of the roof <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> Use a combination of both for 75% of the roof. <ul style="list-style-type: none"> ▶ City buildings and all ABCCDs: provide a green roof with total area coverage equal to at least 50% of the ground floor area. Cover the remaining available roof space with cool roofing materials. 	



GREENHOUSE GAS EMISSIONS / ENERGY EFFICIENCY

Development Feature	Tier 1	Tier 2
<p>Minimum Energy Performance Minimize demand for energy through efficient building design and renewable energy production</p>	<p>► Design building (s) to achieve at least 25% efficiency improvement over the MNECB.</p> <p>*See website for Tier 1 and Tier 2 specification details for all development features: http://www.toronto.ca/planning/greendevlopment.htm</p>	<ul style="list-style-type: none"> • Design building (s) to achieve at least 40% efficiency improvement over the MNECB. <p>OR</p> <p>Design building (s) to achieve at least 35% efficiency improvement over the MNECB AND supply 5% of the buildings total energy use through on-site renewable energy generation.</p>
<p>Energy Efficient Fixtures and Appliances Minimize appliance and fixture energy demands</p>	<p>► Install occupancy sensors for all interior walkways and stairs.</p>	<ul style="list-style-type: none"> • Where supplied, ensure that at least 75% of appliances are Energy Star compliant. • In residential units, provide “all-off” switches to minimize “phantom load” energy losses • In commercial buildings, install occupancy sensors for lighting fixtures
<p>Systems Commissioning Ensure building systems function properly</p>		<ul style="list-style-type: none"> • Engage a 3rd party commissioning agent to commission the building



WATER QUALITY, QUANTITY AND EFFICIENCY

Development Feature	Tier 1	Tier 2
<p>Construction Activity Ensure protection of water quality during construction and demolition</p>	<p>▶ Follow the Erosion and Sediment Control Guidelines for Urban Construction (Greater Golden Horseshoe Conservation Authorities, December 2006) during construction and demolition activities.</p> <p>*See website for Tier 1 and Tier 2 specification details for all development features: http://www.toronto.ca/planning/greendevlopment.htm</p>	
<p>Stormwater Retention (Water balance) Minimize stormwater that leaves the site</p>	<p>▶ Retain stormwater on-site to the same level of annual volume of overland runoff allowable under pre-development conditions</p> <p>▶ Retain at least the first 5 mm from each rainfall through rainwater reuse, onsite infiltration, and evapotranspiration</p> <p style="text-align: center;">OR</p> <p>Ensure that the maximum allowable annual runoff volume from the development site is no more than 50% of the total average annual rainfall depth.</p>	<ul style="list-style-type: none"> • Retain storm run-off from up to the level of the 10 yr storm for 95% of site foot print.
<p>Water Quality - Stormwater Run-Off Manage and clean stormwater that leaves the site</p>	<p>▶ Remove 80% of total suspended solids (TSS) on an annual loading basis from all runoff leaving the site based on the post-development level of imperviousness.</p> <p>▶ Control amount of E. Coli directly entering Lake Ontario and waterfront areas as identified in the Wet Weather Flow Management Guidelines.</p>	
<p>Potable Water Reduce demand for potable water through greater efficiencies</p>	<p>▶ Use water efficient plant material for at least 50% of landscaped area (including vegetated roofs and walls).</p>	<ul style="list-style-type: none"> • Install only water efficient fixtures to meet the following standards: high efficiency (less than 6.0 L) or dual flush toilets, urinals (1L), faucets (5.7LPM) and showers (6.6 LPM). • Where provided, install only water efficient dishwashers (38L) and front-loading washing machines.



WATER QUALITY, QUANTITY AND EFFICIENCY

Development Feature	Tier 1	Tier 2
Non-Potable Water Reduce usage of potable water by harvesting non-potable water.		<ul style="list-style-type: none">• Capture rainwater for landscape irrigation



ECOLOGY

Development Feature	Tier 1	Tier 2
<p>Urban Forest: Tree Protection Preserve the urban forest</p>	<ul style="list-style-type: none"> ▶ Retain all trees that are 30cm or more DBH (diameter at breast height) ▶ Adhere to the standards for tree protection barriers during construction according to Specifications for Construction Near Trees <p>*See website for Tier 1 and Tier 2 specification details for all development features: http://www.toronto.ca/planning/greendevlopment.htm</p>	<ul style="list-style-type: none"> • Retain on-site, all trees that more than 15 cm DBH
<p>Urban Forest: Encourage Tree Growth Enhance the urban forest</p>	<ul style="list-style-type: none"> ▶ Trees in hardscaping: For street trees and other trees planted in groups of 2 or more in primarily hardscaped areas, provide a minimum volume of 15m³ of high quality soil per tree. A single tree planted in hardscape requires a minimum of 30 m³ of soil. ▶ Trees in softscaping: Provide trees planted in softscaping with a minimum volume of 30 m³ of high quality soil. ▶ Plant a minimum of one tree on site for every 30m² of site area covered by soft landscaping ▶ Provide a watering program for trees for the first 3 years after planting. 	
<p>Natural Heritage: Site Protect, restore and enhance the natural heritage system. Protect and increase biodiversity.</p>	<ul style="list-style-type: none"> ▶ Ensure that at least 50% of vegetation species planted are native. ▶ Do not plant any invasive species on properties or streets abutting ravines and natural area parks. ▶ Where a setback from the top-of bank is required, all plants must be native species. 	<ul style="list-style-type: none"> • Where a setback from top-of-bank is required, the setback must be planted and all plants must be native species. • Where site conditions allow, restore buried watercourses or altered drainage areas to a natural state
<p>Soil Quality and Planting Conditions: Provide growing conditions to support long-term plant survival and growth</p>	<ul style="list-style-type: none"> ▶ Retain and reuse all uncontaminated on-site soil in areas not covered by the building footprint or required hard surfaces; OR adjust or replace with soil of equal or better quality. 	



ECOLOGY

Development Feature	Tier 1	Tier 2
<p>Glass and other design features for Migratory Birds: Ensure that design features minimize the risk for migratory bird collisions.</p>	<ul style="list-style-type: none"> ▶ Treat glass with a density pattern between 10-28cm apart for a minimum of the first 12m of a building above grade <li style="text-align: center;">OR Mute reflections for a minimum of the first 12m of a building above grade ▶ Apply glass treatment to supplementary building and glass features on site (e.g. windbreaks, solariums, etc.) ▶ Ensure ground level ventilation grates have a porosity of less than 2cm X 2cm. 	<ul style="list-style-type: none"> • Treat glass with a density pattern between 10-28cm apart for a minimum of the first 20m of a building above grade <li style="text-align: center;">OR Mute reflections for a minimum of the first 20m of a building above grade
<p>Exterior Lighting and Light Pollution Reduce energy demand from exterior light fixtures and nighttime glare from lighting.</p>	<ul style="list-style-type: none"> ▶ Install energy efficient shield lighting for all exterior lighting fixtures. Lighting must focus downward, eliminating direct upward light and reducing spill light. ▶ Ensure at least 75% of exterior fixtures are Energy Star compliant or equivalent. ▶ Install occupancy sensors for exterior lighting fixtures and in parking structures and parking lots 	<ul style="list-style-type: none"> • Eliminate all spotlighting on the building and any rooftop lighting • Provide light switches and motion sensor lights in individual offices.



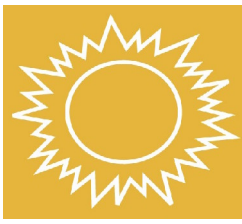
SOLID WASTE

Development Feature	Tier 1	Tier 2
<p>Storage and Collection of Recycling and Organic Waste Facilitate waste reduction and efficient processing</p>	<p>► Install user-friendly and accessible handling and storage facilities for organic waste</p> <p>*See website for Tier 1 and Tier 2 specification details for all development features: http://www.toronto.ca/planning/greendevlopment.htm</p>	<ul style="list-style-type: none"> • For residential buildings, provide recycling containers with the capacity of 8 cubic yards per 100 units per week
<p>Reuse of Building Materials Reduce demand for new materials and reduce waste going to landfill</p>		<ul style="list-style-type: none"> • Ensure that at least 5% of a project’s materials (based on value) comprise salvaged, refurbished or reused materials.
<p>Use of Recycled Materials Reduce demand for new materials and increase market for recycled materials</p>		<ul style="list-style-type: none"> • Ensure that at least 15% of a project’s construction materials (based on value) are comprised of recycled content¹
<p>Construction and Demolition Waste Management Reduce waste going to landfill</p>		<ul style="list-style-type: none"> • Recycle at least 75% of non-hazardous construction and demolition debris.



AIR QUALITY

Development Feature	Tier 1	Tier 2
<p>Pedestrian Infrastructure Encourage walking as a clean air alternative</p>	<p>► Provide grading and surface treatment, in accordance with the Toronto Accessibility Design Guidelines</p> <p>*See website for Tier 1 and Tier 2 specification details for all development features: http://www.toronto.ca/planning/greendevlopment.htm</p>	
<p>Urban Heat Island Reduction: At Grade Reduce ambient surface temperatures, and provide shade for human health and comfort.</p>	<p>► Use high-albedo surface materials for at least 50% of the site’s non-roof hardscape.</p> <p style="text-align: center;">OR</p> <p>Use open grid pavement for at least 50% of the site’s non-roof hardscape</p>	<p>• Use high-albedo surface materials for at least 75% of the site’s non-roof hardscape</p> <p style="text-align: center;">OR</p> <p>Use open grid pavement for at least 75% of the site’s non-roof hardscape</p> <p style="text-align: center;">OR</p> <p>Install a Green wall on an exterior surface that is either free-standing or part of a building to a minimum height of one-storey.</p>
<p>Urban Heat Island Reduction: Roof Reduce ambient surface temperatures on/from rooftops</p>	<p>► Use cool roofing materials for 100% of the available roof space.</p> <p style="text-align: center;">OR</p> <p>Use a combination of a green roof and cool roofing materials for 100% of the roof.</p>	



GREENHOUSE GAS EMISSIONS / ENERGY EFFICIENCY

Development Feature	Tier 1	Tier 2
<p>Minimum Energy Performance Minimize demand for energy through efficient building design</p>	<p>► Design building (s) to achieve at least EnerGuide 80 energy efficiency rating</p> <p>*See website for Tier 1 and Tier 2 specification details for all development features: http://www.toronto.ca/planning/greendevlopment.htm</p>	<p>• Design building(s) to achieve at least EnerGuide 85 energy efficiency rating</p>
<p>Renewable Energy Reduce demand for energy from the grid and encourage renewable energy production</p>		<p>• Use on-site renewable energy technologies to supply at least 5% of the building’s total energy use from any one source (i.e. natural gas or electricity)</p>
<p>Energy Efficient Fixtures and Appliances Minimize appliance and fixture energy demands</p>		<p>• Where supplied, ensure that at least 75% of appliances are Energy Star compliant.</p> <p>• Provide “all-off” switches to minimize “phantom load” energy losses</p>
<p>Water Heating Optimize performance of water heating system</p>		<p>• Install an ENERGY STAR compliant water heater</p> <p style="text-align: center;">OR</p> <p>• Tankless water heater.</p>



WATER QUALITY, QUANTITY AND EFFICIENCY

Development Feature	Tier 1	Tier 2
<p>Construction Activity Ensure protection of water quality during construction and demolition</p>	<p>▶ Follow the Erosion and Sediment Control Guidelines for Urban Construction (Greater Golden Horseshoe Conservation Authorities, December 2006) during construction and demolition activities.</p> <p>*See website for Tier 1 and Tier 2 specification details for all development features: http://www.toronto.ca/planning/greendevopment.htm</p>	
<p>Stormwater Run-Off Manage and clean stormwater that leaves the site</p>	<p>▶ Remove 80% of total suspended solids on an annual loading basis from all runoff leaving the site based on the post-development level of imperviousness.</p> <p>▶ Control amount of E. Coli directly entering Lake Ontario and waterfront areas.</p>	
<p>Stormwater Retention (Water balance) Minimize stormwater that leaves the site</p>	<p>▶ Where applicable, retain stormwater on-site to the same level of annual volume of overland runoff allowable under pre-development conditions</p> <p>▶ Where specified in the Wet Weather Flow Management Guidelines, retain at least the first 5 mm from each rainfall through rainwater reuse, onsite infiltration, and evapotranspiration</p> <p style="text-align: center;">OR</p> <p>Ensure that the maximum allowable annual runoff volume from the development site is no more than 50% of the total average annual rainfall depth.</p>	<ul style="list-style-type: none"> • Retain at least the first 5 mm from each rainfall through rainwater reuse, onsite infiltration, and evapotranspiration
<p>Potable Water Reduce demand for potable water through greater efficiencies</p>	<p>▶ Use water efficient plant material for at least 50% of landscaped area (including vegetated roofs and walls).</p>	<ul style="list-style-type: none"> • Install only water efficient fixtures to meet the following standards: high efficiency (less than 6.0 L) or dual flush toilets, urinals (1L), faucets (5.7LPM) and showers (6.6 LPM). • Where provided, install only water efficient dishwashers (38L) and front-loading washing machines.
<p>Non-Potable Water Reduce usage of potable water by harvesting and reusing non-potable water.</p>		<ul style="list-style-type: none"> • Capture rainwater for landscape irrigation



ECOLOGY

Development Feature	Tier 1	Tier 2
<p>Urban Forest: Tree Protection Preserve the urban forest</p>	<ul style="list-style-type: none"> ▶ Retain all trees that are 30cm or more DBH (diameter at breast height) ▶ Adhere to the standards for tree protection barriers during construction according to Specifications for Construction Near Trees <p>*See website for Tier 1 and Tier 2 specification details for all development features: http://www.toronto.ca/planning/greendevlopment.htm</p>	<ul style="list-style-type: none"> • Retain on-site, all trees that more than 15 cm DBH (diameter at breast height)
<p>Urban Forest: Encourage Tree Growth Enhance the urban forest</p>	<ul style="list-style-type: none"> ▶ Trees in hardscaping: For street trees and other trees planted in groups of 2 or more in primarily hardscaped areas, provide a minimum volume of 15m³ of high quality soil per tree. A single tree planted in hardscape requires a minimum of 30 m³ of soil. ▶ Trees in softscaping: Provide trees planted in softscaping with a minimum volume of 30 m³ of high quality soil. ▶ Plant at least 1 large growing shade tree per residential lot. ▶ Provide a watering program for trees for the first 3 years after planting. 	
<p>Natural Heritage: Site Protect and enhance natural habitat. Protect and increase biodiversity.</p>	<ul style="list-style-type: none"> ▶ Ensure that at least 50% of vegetation species planted are native. ▶ Do not plant any invasive species on properties or streets abutting ravines and natural area parks. ▶ Where a setback from top-of-bank is required, all plants must be native species 	<ul style="list-style-type: none"> • Where a setback from top-of-bank is required, the setback must be planted and all plants must be native species. • Where site conditions allow, restore buried watercourses or altered drainage areas to a natural state
<p>Soil Quality and Planting Conditions Provide growing conditions to support long-term plant survival and growth</p>	<ul style="list-style-type: none"> ▶ Protect soils from compaction during construction. ▶ Retain and reuse soil on-site in all areas not covered by the building footprint or required hard surfaces, or adjust or replace with soil of equal or better quality. 	



ECOLOGY

Development Feature	Tier 1	Tier 2
<p>Glass and other design features for Migratory Birds: Ensure that design features minimize the risk for migratory bird collisions.</p>	<ul style="list-style-type: none"> ▶ Treat glass with a density pattern between 10-28cm apart for a minimum of the first 12m of a building above grade or the mature height of adjacent vegetation:¹ OR Mute reflections for a minimum of the first 12m of a building above grade. ▶ Apply glass treatment to supplementary building and glass features on site (e.g. windbreaks, solariums, etc.) ▶ Ensure ground level ventilation grates have a porosity of less than 2cm X 2cm. 	<ul style="list-style-type: none"> • Treat glass with a density pattern between 10-28cm apart for the entire building OR Mute reflections for the entire building
<p>Light Pollution and Exterior Energy Efficient Fixtures Reduce night time glare from lighting and minimize energy demand exterior lighting</p>	<ul style="list-style-type: none"> ▶ Eliminate direct upward light 	<ul style="list-style-type: none"> • Eliminate all spotlighting on the building and any rooftop lighting. • Ensure all exterior fixtures are ENERGY STAR compliant • Install occupancy sensors for exterior lighting fixtures



SOLID WASTE

Development Feature	Tier 1	Tier 2
<p>Construction Waste Management Reduce waste going to landfill and reduce demand for new materials</p>	<p>*See website for Tier 1 and Tier 2 specification details for all development features: http://www.toronto.ca/planning/greendevlopment.htm</p>	<ul style="list-style-type: none"> Recycle at least 75% of non-hazardous construction and demolition debris
<p>Reuse of Building Materials Reduce waste going to landfill and reduce demand for new materials</p>		<ul style="list-style-type: none"> At least 5% of a project’s materials (based on value) shall comprise salvaged, refurbished or reused materials.
<p>Use of Recycled Materials Reduce demand for new materials and increase market for recycling</p>		<ul style="list-style-type: none"> At least 15% of a project’s construction materials (based on value) shall comprise recycled content.¹



AIR QUALITY

Development Feature	Tier 1	Tier 2
<p>Automobile Infrastructure Discourage single-occupancy automobile use and encourage the use of low emission vehicles.</p>	<ul style="list-style-type: none"> ▶ Provide no more than the minimum parking required under the Zoning By-law. Additional spaces may be provided only for publicly accessible spaces dedicated to car-sharing. Industrial uses may also provide additional spaces for dedicated priority parking spaces for carpooling. All additional spaces must provide or have access to electrical outlets for plug-in electric vehicles. ▶ Design all parking spaces so that the dimensions do not exceed the minimum required by the Zoning By-law. ▶ In mixed use developments include shared parking among uses that have different peaking characteristics, where permitted under the Zoning By-law. <p>*See website for Tier 1 and Tier 2 specification details for all development features: http://www.toronto.ca/planning/greendevlopment.htm</p>	<ul style="list-style-type: none"> • Provide electrical outlets for plug-in electric vehicles (including electric bicycles) for 10% of the minimum required spaces in the zoning by-law
<p>Cycling Infrastructure Encourage cycling as a clean air alternative</p>	<ul style="list-style-type: none"> ▶ Employee bicycle parking should be provided at the following rates: Commercial/ retail/ institutional: for buildings in the Downtown, Central Waterfront and Centres, provide at least 0.2 bicycle parking spaces/100 m² of non-residential GFA; for buildings in the rest of the City provide at least 0.13 bicycle parking spaces/100 m² of non-residential GFA; ▶ Locate employee bicycle parking in a weather protected, secure area with controlled access; or secure individual enclosures ▶ Visitor or patron bicycle parking should be provided at the following rates: Commercial/ retail/ institutional: for buildings in the Downtown, Central Waterfront and Centres, provide provide the greater of 0.3 spaces/100 m² of non-residential GFA or 6 spaces, for sites with non-residential GFA>1000 m²; for buildings in the rest of the City provide at least 0.25 spaces/100 m² of non-residential GFA or 6 spaces, for sites with non-residential GFA>1000 m² ▶ Provide visitor bicycle parking in a highly visible and easily accessible location at grade. ▶ In commercial, retail and institutional workplaces, provide 1 male and 1 female shower and change facility for every 30 bicycle parking spaces. (Minimum of 1 facility for each gender when 5 or more bicycle parking spaces are provided). 	



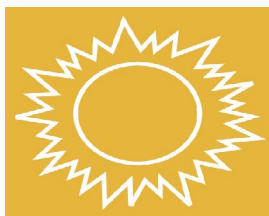
AIR QUALITY

Development Feature	Tier 1	Tier 2
<p>Public Transit Accessibility Encourage public transit as a clean air alternative</p>	<ul style="list-style-type: none"> ▶ Where site conditions allow, locate major building entrance within 200m of a transit stop. ▶ Provide signage indicating direction to and from transit to public facilities and service centres. 	
<p>Pedestrian Infrastructure Encourage walking as a clean air alternative for all ages and abilities</p>	<ul style="list-style-type: none"> ▶ Connect buildings on the site via pedestrian paths to off-site pedestrian walkways, transit stops and parking areas (car and bicycle). ▶ Design sidewalks, crosswalks and walkways to be continuous, universally accessible, barrier free and clearly designated. ▶ Cover main entrances and outdoor waiting areas for protection from sun and inclement weather ▶ Use only energy efficient, pedestrian-specific lighting directed onto sidewalks, pathways, entrances and outdoor waiting areas ▶ Locate air exhaust systems away from pedestrian routes and amenity areas. ▶ No air intake grates along pedestrian routes 	
<p>Urban Heat Island Reduction: At Grade Reduce ambient surface temperatures, and provide shade for human health and comfort</p>	<ul style="list-style-type: none"> ▶ Use high-albedo surface materials for at least 50% of the site’s non-roof hardscape. <p style="text-align: center;">OR</p> <p style="padding-left: 40px;">Use open grid pavement for at least 50% of the site’s non-roof hardscape</p> <p style="text-align: center;">OR</p> <p style="padding-left: 40px;">Shade least <u>50%</u> of hardscape, including surface parking areas, walkways and other hard surfaces.</p> <ul style="list-style-type: none"> ▶ Plant large growing shade trees at the equivalent of 6-8m intervals starting from the property line along all street frontages, open space frontages and public walkways, excluding driveways and easements. ▶ If surface parking is permitted and provided, plant internal shade trees at a minimum ratio of one tree planted for every five parking spaces supplied, in accordance with the specifications found in the <i>Design Guidelines for “Greening” Surface Parking Lots</i> 	<ul style="list-style-type: none"> • Complete at least one of the following: <ul style="list-style-type: none"> Use high-albedo surface materials for at least <u>75%</u> of the site’s non-roof hardscape <p style="text-align: center;">OR</p> <p style="padding-left: 40px;">Use open grid pavement for at least <u>75%</u> of the site’s non-roof hardscape</p> <p style="text-align: center;">OR</p> <p style="padding-left: 40px;">If surface parking is provided, plant internal shade trees at a minimum ratio of one tree planted for every <u>three</u> parking spaces supplied, in accordance with the <i>Design Guidelines for “Greening” Surface Parking Lots</i></p> <p style="text-align: center;">OR</p> <p style="padding-left: 40px;">Install a Green wall on an exterior surface that is either free-standing or part of a building</p>



AIR QUALITY

Development Feature	Tier 1	Tier 2
<p>Urban Heat Island Reduction: Roof Reduce ambient surface temperatures on/from rooftops</p>	<ul style="list-style-type: none"> ▶ Do one of the following for available roof space: <ul style="list-style-type: none"> Install green roof with 50% minimum coverage <li style="text-align: center;">OR Use cool roofing materials for 100% of the roof <li style="text-align: center;">OR Use a combination of both for 75% of the roof. ▶ City buildings and all ABCCDs: provide a green roof with total area coverage equal to at least 50% of the ground floor area. Cover the remaining available roof space with cool roofing materials. 	



GREENHOUSE GAS EMISSIONS / ENERGY EFFICIENCY

Development Feature	Tier 1	Tier 2
<p>Minimum Energy Performance Minimize demand for energy through efficient building design and renewable energy</p>	<p>► Design building to achieve at least 25% efficiency improvement over the MNECB.</p> <p>*See website for Tier 1 and Tier 2 specification details for all development features: http://www.toronto.ca/planning/greendevlopment.htm</p>	<ul style="list-style-type: none"> Design building (s) to achieve at least 40% efficiency improvement over the MNECB. <p style="text-align: center;">OR</p> <p>Design building (s) to achieve at least 35% efficiency improvement over the MNECB AND supply 5% of the buildings total energy use ²through on-site renewable energy generation.</p>
<p>Energy Efficient Fixtures and Appliances Minimize appliance and fixture energy demands</p>	<p>► Install occupancy sensors for all interior walkways and stairs.</p>	<ul style="list-style-type: none"> Where supplied, ensure that at least 75% of appliances are Energy Star compliant. In commercial buildings, install occupancy sensors for lighting fixtures
<p>Systems Commissioning Ensure building systems function properly</p>		<ul style="list-style-type: none"> Engage a 3rd party commissioning agent to commission the building



WATER QUALITY, QUANTITY AND EFFICIENCY

Development Feature	Tier 1	Tier 2
<p>Construction Activity Ensure protection of water quality during construction and demolition</p>	<p>► Follow the <i>Erosion and Sediment Control Guidelines for Urban Construction</i> (Greater Golden Horseshoe Conservation Authorities, December 2006) during construction and demolition activities.</p> <p>*See website for Tier 1 and Tier 2 specification details for all development features: http://www.toronto.ca/planning/greendevlopment.htm</p>	
<p>Stormwater Retention (Water balance) Minimize stormwater that leaves the site</p>	<p>► Retain stormwater on-site to the same level of annual volume of overland runoff allowable under pre-development conditions</p> <p>► Retain at least the first 5 mm from each rainfall through rainwater reuse, onsite infiltration, and evapotranspiration</p> <p style="text-align: center;">OR</p> <p>Ensure that the maximum allowable annual runoff volume from the development site is no more than 50% of the total average annual rainfall depth.</p>	<ul style="list-style-type: none"> • Retain at least the first 5 mm from each rainfall through onsite infiltration, and evapotranspiration for water balance purpose • Retain storm run-off from up to the level of the 2 yr storm for 95% of site foot print.
<p>Water Quality - Stormwater Run-Off Manage and clean stormwater that leaves the site</p>	<p>► Remove 80% of total suspended solids (TSS) on an annual loading basis from all runoff leaving the site based on the post-development level of imperviousness.</p> <p>► Control amount of E. Coli directly entering Lake Ontario and waterfront areas.</p>	
<p>Potable Water Reduce demand for potable water through greater efficiencies</p>	<p>► Use water efficient plant material for at least 50% of landscaped area (including vegetated roofs and walls).</p>	<ul style="list-style-type: none"> • Install only water efficient fixtures to meet the following standards: high efficiency (less than 6.0 L) or dual flush toilets, urinals (1L), faucets (5.7LPM) and showers (6.6 LPM). • Where provided, install only water efficient dishwashers (38L) and front-loading washing machines.
<p>Non-Potable Water Reduce usage of potable water by harvesting non-potable water.</p>		<ul style="list-style-type: none"> • Capture rainwater for landscape irrigation



ECOLOGY

Development Feature	Tier 1	Tier 2
<p>Urban Forest: Tree Protection Preserve the urban forest</p>	<ul style="list-style-type: none"> ▶ Retain all trees that are 30cm or more DBH (diameter at breast height) ▶ Adhere to the standards for tree protection barriers during construction according to Specifications for Construction Near Trees <p>*See website for Tier 1 and Tier 2 specification details for all development features: http://www.toronto.ca/planning/greendevlopment.htm</p>	<ul style="list-style-type: none"> • Retain on-site, all trees that more than 15 cm DBH (diameter at breast height)
<p>Urban Forest: Encourage Tree Growth Enhance the urban forest</p>	<ul style="list-style-type: none"> ▶ Trees in hardscaping: For street trees and other trees planted in groups of 2 or more in primarily hardscaped areas, provide a minimum volume of 15m³ of high quality soil per tree. A single tree planted in hardscape requires a minimum of 30 m³ of soil. ▶ Trees in softscaping: Provide trees planted in softscaping with a minimum volume of 30 m³ of high quality soil. ▶ Plant a minimum of one tree on site for every 30m² soft landscaping (e.g. for 60m² plant 2 trees) ▶ Provide a watering program for trees for the first 3 years after planting. 	
<p>Natural Heritage: Site Protect, restore and enhance the natural heritage system. Protect and increase biodiversity.</p>	<ul style="list-style-type: none"> ▶ Ensure that at least 50% of vegetation species planted are native. ▶ Do not plant any invasive species on properties or streets abutting ravines and natural area parks. ▶ Where a setback from top-of-bank is required, all plants must be native species. 	<ul style="list-style-type: none"> • Where a setback from top-of-bank is required, the setback must be planted and all plants must be native species. • Where site conditions allow, restore buried watercourses or altered drainage areas to a natural state
<p>Soil Quality and Planting Conditions: Provide growing conditions to support long-term plant survival and growth</p>	<ul style="list-style-type: none"> ▶ Retain and reuse all uncontaminated on-site soil in areas not covered by the building footprint or required hard surfaces; OR adjust or replace with soil of equal or better quality. 	



ECOLOGY

Development Feature	Tier 1	Tier 2
<p>Glass and other design features for Migratory Birds: Ensure that design features minimize the risk for migratory bird collisions.</p>	<ul style="list-style-type: none"> ▶ Treat glass with a density pattern between 10-28cm apart for a minimum of the first 12m of a building above grade <p style="text-align: center;">OR</p> <p>Mute reflections for a minimum of the first 12m of a building above grade</p> <ul style="list-style-type: none"> ▶ Apply glass treatment to supplementary building and glass features on site (e.g. windbreaks, solariums, etc.) ▶ Ensure ground level ventilation grates have a porosity of less than 2cm X 2cm. 	<ul style="list-style-type: none"> ▶ Treat glass with a density pattern between 10-28cm apart for the entire building <p style="text-align: center;">OR</p> <p>Mute reflections for the entire building</p>
<p>Exterior Lighting and Light Pollution Reduce energy demand from exterior light fixtures and night time glare from lighting.</p>	<ul style="list-style-type: none"> ▶ Install energy efficient shield lighting for all exterior lighting fixtures. Lighting must focus downward, eliminating direct upward light and reducing spill light. ▶ Ensure at least 75% of exterior fixtures are Energy Star compliant or equivalent. ▶ Install occupancy sensors for exterior lighting fixtures and in all interior walkways, stairs and parking structures and parking lots 	<ul style="list-style-type: none"> • Eliminate all spotlighting on the building and any rooftop lighting. • Provide light switches and motion sensor lights in individual offices.



SOLID WASTE

Development Feature	Tier 1	Tier 2
<p>Storage and Collection of Organic Waste Facilitate waste reduction and efficient processing</p>	<p>► Install user-friendly and accessible handling and storage facilities for organic waste</p> <p>*See website for Tier 1 and Tier 2 specification details for all development features: http://www.toronto.ca/planning/greendevlopment.htm</p>	
<p>Reuse of Building Materials Reduce demand for new materials and reduce waste going to landfill</p>		<ul style="list-style-type: none"> • Ensure that at least 5% of a project's materials (based on value) comprise salvaged, refurbished or reused materials.
<p>Use of Recycled Materials Reduce demand for new materials and increase market for recycled materials</p>		<ul style="list-style-type: none"> • Ensure that at least 15% of a project's construction materials (based on value) are comprised of recycled content
<p>Construction and Demolition Waste Management Reduce waste going to landfill</p>		<ul style="list-style-type: none"> • Recycle at least 75% of non-hazardous construction and demolition debris.