

Toronto Green Standard

Making a Sustainable City Happen



For

New Low-Rise Residential Development
(5 dwelling units or greater)



TORONTO GREEN STANDARD



For New Low-Rise Residential Development

The Toronto Green Standard (TGS) is a two-tier set of performance measures, with supporting guidelines, for sustainable site and building design for new development. Its purpose is to promote site and building designs that address air quality, greenhouse gas emissions, energy efficiency, water quality and efficiency, solid waste and ecology.

The Toronto Green Standard is a key strategy of the City's Climate Change Action Plan, an aggressive environmental framework aimed at reducing Toronto's greenhouse gas emissions by 80 per cent by 2050. Achieving the TGS performance measures will help meet this goal, while improving air and water quality, and enhancing the natural environment.

There are three versions of the Toronto Green Standard, each relating to different building types:

- "Low-Rise Non-Residential" applies to non-residential buildings up to three storeys in height.
- "Low-Rise Residential" applies to detached, semi-detached and town homes, in projects containing a minimum of 5 dwellings or units, up to three storeys in height.
- "Mid to High-Rise" applies to all residential apartment buildings and non-residential buildings that are 4 storeys and higher.

Each version contains the Tier 1 (required) and Tier 2 (voluntary) TGS performance measures; detailed specifications and definitions that provide additional information on how to comply with the TGS; and examples of possible strategies to implement the proposed standard.

Applying the Toronto Green Standard

New planning applications, including zoning bylaw amendments, site plan approval and draft plan of subdivision, are required to meet Tier 1 of the environmental performance measures. Developers may also choose to meet Tier 2, a voluntary higher level of environmental performance. Site Plan applications that meet both Tier 1 and 2 of the TGS are eligible for a refund of 20% of the development charges paid to the City.

There are a number of materials that have been produced to support implementation of the TGS:

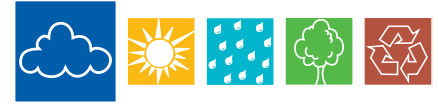
1. **TGS Checklist:** The Checklist should be submitted and completed in full with all development applications. The Checklist should provide adequate detail on how the design meets the Toronto Green Standard. The Checklist must also indicate the appropriate plans, drawings and reports that document the achievement of the TGS performance measures. In order to complete the TGS Checklist, review the appropriate standard that applies to the development type, including the Specifications, Definitions and Resources column that provide more information on how to comply with the standard.
2. **TGS Statistics Template:** For Site Plan Control applications, complete the full Statistics Template and copy it directly onto the site plan submitted with the development application.
3. **Energy Report:** The TGS includes energy performance measures for new development. In order to meet these targets, an Energy Report is required following the City's terms of reference available from the website www.toronto.ca/greendevlopment and in the *Building Toronto Together Development Guide* www.toronto.ca/developing-toronto/darp_guide.htm.



For New Low-Rise Residential Development

| Development Feature | Required Tier 1 | Voluntary Tier 2 | Specifications, Definitions and Resources | Potential Strategies |
|--|--|--|--|--|
| <p>Pedestrian Infrastructure</p> <p>Encourage walking as a clean air alternative</p> | <p>AQ 1.1 Provide grading and surface treatment, in accordance with the <i>Toronto Accessibility Design Guidelines</i>.¹</p> | | <p>1. For details on grading, walkway width, and surface treatment, refer to the <i>Toronto Accessibility Design Guidelines</i>: www.toronto.ca/diversity/pdf/accessibility_design_guidelines.pdf.</p> | <p>Pedestrian oriented landscaping, lighting and signage</p> |
| <p>Urban Heat Island Reduction: At Grade</p> <p>Reduce ambient surface temperatures, and provide shade for human health and comfort</p> | <p>AQ 2.1 Use high-albedo surface materials¹ for at least <u>50%</u> of the site's non-roof hardscape²</p> <p>OR</p> <p>Use open grid pavement for at least <u>50%</u> of the site's non-roof hardscape³</p> <p>OR</p> <p>Shade within 5 years at least <u>50%</u> of the site's non-roof hardscape, including surface parking areas, walkways and other hard surfaces⁴</p> <p>OR</p> <p>Use a combination of high-albedo surface materials, open grid pavement and shade for at least <u>50%</u> of the site's non-roof hardscape.</p> | <p>AQ 2.2 Use high-albedo surface materials¹ for at least <u>75%</u> of the site's non-roof hardscape²</p> <p>OR</p> <p>Use open grid pavement for at least <u>75%</u> of the site's non-roof hardscape³</p> <p>OR</p> <p>Shade at least <u>75%</u> of hardscape, including driveways, walkways and other hard surfaces⁴</p> <p>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-storey⁵</p> <p>OR</p> <p>Use a combination of high-albedo surface materials, open grid pavement and shade for at least <u>75%</u> of the site's non-roof hardscape.</p> | <p>1. High albedo surface materials must have an initial reflectance of at least 0.3 or SRI of 29. Solar Reflectance Index (SRI) combines the reflectivity and emittance values as a measure of a coating's overall ability to reject solar heat. Black asphalt has an SRI of 0, while new white Portland cement concrete has an SRI of 86. Other pavement types range between these values, with a 35 SRI for new gray concrete.</p> <p>2. Non-roof hardscape (hard landscaping) includes: driveways, walkways and other hard surfaces.</p> <p>3. Open grid pavement consists of concrete or hard plastic grid systems with large pore spaces filled with a planted growing medium or light coloured aggregate (e.g. gravel).</p> <p>4. Shade must be measured at solar noon at the summer solstice (Approximately June 21) and may be provided by trees and shade structures. For examples of native, large growing shade trees refer to: http://www.toronto.ca/trees/pdfs/Tree_List.pdf.</p> <p>5. Green wall is defined as a wall, that is partially or completely covered with vegetation and, in some cases a growing medium</p> <ul style="list-style-type: none"> For details on parking lot materials, landscaping and layout refer to the <i>Design Guidelines for 'Greening' Surface Parking Lots</i>: http://www.toronto.ca/planning/urbdesign/greening_parking_lots.htm. | <p>Grass paving systems</p> <p>Soft landscaping</p> <p>Design site to reduce the size of the hardscaped area</p> <p>High-albedo surface materials include: grey or white concrete, light-coloured asphalt, selected interlocking concrete pavers and other light coloured pavers</p> <p>High-branching deciduous shade trees</p> |

¹ Apply this standard to: Residential development under Part 9 of the Ontario Building Code where the project contains 5 dwelling units or more



For New Low-Rise Residential Development

| Development Feature | Required Tier 1 | Voluntary Tier 2 | Specifications, Definitions and Resources | Potential Strategies |
|--|---|------------------|--|--|
| <p>Urban Heat Island Reduction: Roof</p> <p>Reduce ambient surface temperatures on or from rooftops</p> | <p>AQ 3.1 Use cool roofing¹ materials for 100% of the Available Roof Space.²</p> <p style="text-align: center;">OR</p> <p>Use a combination of a Green Roof³ and cool roofing materials for 100% of the Available Roof Space.</p> | | <ol style="list-style-type: none"> 1. Cool roofing materials are defined as having high thermal emittance and high solar reflectance properties. Cool roof materials must have a minimum initial reflectance of 0.65 and minimum emittance of 0.90; or an SRI value of 78 for a low-sloped roof and 29 for a steep-sloped roof. Low sloped roofs have a surface slope less than 16.7% (9.5 degrees) and steep sloped roofs have a surface slope greater than 16.7% (9.5 degrees) and less than 41.7% (22.6 degrees). Ballasted roofs with a minimum stone ballast of 83 kg/m² (17 lb/ft²) or 117 kg/m² (23 lb/ft²) pavers will also be accepted. 2. Available Roof Space is defined as the total roof area of the building excluding areas designated for renewable energy devices, private terraces and residential outdoor amenity space to a maximum of 2m² per residential unit. 3. A Green Roof is a roof surface that supports the growth of vegetation over a substantial portion of its area for the purpose of water conservation or energy conservation. A green roof system typically includes: vegetation, growing medium, filter layer, drainage layer, root resistance layer, and waterproof membrane. <ul style="list-style-type: none"> • Where a green roof is to be constructed in or abutting the Natural Heritage System (Map 9, Official Plan), consider providing a minimum growing medium depth of 150mm (6 inches) to accommodate a greater variety of plant species, to promote biodiversity. • Invasive species are discouraged on green roofs. For a list of invasive species in Southern Ontario see the Ontario Society for Ecological Restoration: http://www.serontario.org/pdfs/exotics.pdf. Planting of native or adaptive species from the Southern Ontario area is encouraged. Refer to the Toronto and Region Conservation Authority list of native plants for a green roof environment in Toronto: http://www.toronto.ca/greenroofs/pdf/plant_suggestions2007.pdf. | <p>Cool Roof Rating Council (CRRC) rated cool roofing such as reflective tiles and metal roofs for steep-sloped applications</p> <p>Green roof types include: complete systems, modular systems and pre-cultivated vegetation blankets</p> |

GREENHOUSE GAS EMISSIONS/ENERGY EFFICIENCY



For New Low-Rise Residential Development

| Development Feature | Required Tier 1 | Voluntary Tier 2 | Specifications, Definitions and Resources | Potential Strategies |
|--|--|---|---|--|
| <p>Minimum Energy Performance</p> <p>Minimize demand for energy through efficient building design</p> | <p>GHG 1.1 Design building(s) to achieve at least EnerGuide 80 energy efficiency rating.^{1,2,3,4}</p> | <p>GHG 1.2 Design and construct building(s) to achieve at least EnerGuide 85 energy efficiency rating.^{1,2,3,4}</p> <p>GHG 1.3 Where supplied, for each unit, provide ENERGY STAR[®] compliant refrigerators and dishwashers.</p> | <ol style="list-style-type: none"> 1. Proof of Registration with a NRCAN Authorized Service Organization is required for Tier 1 compliance. Service Organizations are licensed by NRCAN to deliver EnerGuide energy efficiency ratings. For a list of authorized service organizations see: http://www2.nrcan.gc.ca/oe/nh-mn/f-t/index.cfm. 2. The EnerGuide label with an EGNH80 or better rating or ENERGY STAR for new homes label is also accepted as proof of compliance. 3. EnerGuide Rating System evaluations are conducted by Certified Energy Advisors using the OBC equivalent version of the HOT2000 software. ENERGY STAR evaluations are conducted using the BOP (Builder Option Package). Certified Energy Advisors are independent contractors who contract directly with builders to perform the testing and final inspection and report. They submit their report to the NRCAN Authorized Service Organization. For more information regarding EnerGuide or ENERGY STAR see: http://oe.nrcan.gc.ca/residential/business/builders-renovators-trades.cfm?attr=4. 4. The efficiency improvement may include energy savings from ENERGY STAR and water efficient fixtures. For more information on ENERGY STAR refer to: http://www.oe.nrcan.gc.ca/energystar/english/consumers/index.cfm. <ul style="list-style-type: none"> • Ontario Building Code (2006) requires that as of 2012, new houses must meet standards that are substantially in accordance with EnerGuide 80. • Trees may be used to provide shade. Deciduous trees are particularly useful for shading in the summer, and allowing solar heating in the winter. • EnerGuide is an official trade mark of Natural Resources Canada and is used with permission. • The ENERGY STAR[®] trade mark is administered and promoted in Canada by Natural Resources Canada and is used with permission. | <p>Lower window to wall ratios</p> <p>Drain water heat recovery</p> <p>Improved quality of frames and glazing</p> <p>Low-flow hot water fixtures and appliances</p> <p>Heat Recovery Ventilation</p> <p>Reduce vaulted to flat roof ratio</p> <p>Improve foundation insulation</p> <p>Use exterior insulated sheathing</p> <p>Increase r-value of wall and ceiling assemblies</p> <p>ENERGY STAR HVAC and appliances</p> <p>Improved building envelope performance (air tightness)</p> |

GREENHOUSE GAS EMISSIONS/ENERGY EFFICIENCY



For New Low-Rise Residential Development

| Development Feature | Required Tier 1 | Voluntary Tier 2 | Specifications, Definitions and Resources | Potential Strategies |
|--|-----------------|--|--|--|
| <p>Renewable Energy</p> <p>Reduce demand for energy from the grid and encourage renewable energy production</p> | | <p>GHG 2.1 Use on-site renewable energy technologies to supply at least 5% of the building's total energy use from any one source (e.g. natural gas or electricity).¹</p> | <p>1. The percent renewable energy is defined as the energy produced from renewable energy divided by the building annual energy consumption for any one source of energy (e.g. offset 5% of natural gas consumption using solar hot water heating).</p> <ul style="list-style-type: none"> As defined by the City of Toronto Renewable Energy Bylaw, renewable energy and other green energy sources include solar, wind, geoenery and cogeneration energy technologies. | <p>Solar Photovoltaic</p> <p>Solar thermal water and space heating</p> <p>Solar air collection system for ventilation</p> <p>ENERGY STAR qualified Geo-thermal heat pump</p> |
| <p>Water Heating</p> <p>Optimize performance of water heating system</p> | | <p>GHG 3.1 Install an ENERGY STAR compliant water heater</p> <p>OR</p> <p>Tankless water heater.</p> | | <p>ENERGY STAR qualified tankless water heater</p> <p>Solar hot water heaters</p> |

WATER QUALITY, QUANTITY AND EFFICIENCY



For New Low-Rise Residential Development

| Development Feature | Required Tier 1 | Voluntary Tier 2 | Specifications, Definitions and Resources | Potential Strategies |
|---|---|---|---|--|
| Construction Activity Ensure protection of water quality during construction and demolition | WQ 1.1 Follow the <i>Erosion and Sediment Control Guidelines for Urban Construction</i> (Greater Golden Horseshoe Conservation Authorities, December 2006) during construction and demolition activities. ¹ | | 1. Refer to the Greater Toronto Area Conservation Authorities (GTACA) on-site <i>Erosion and Sediment Control Guidelines for Urban Construction</i> : http://www.sustainabletechnologies.ca/Portals/_Rainbow/Documents/ESC%20Guideline%20-%20December%202006.pdf . | Erosion and sediment control plan Silt fencing, sediment traps, sediment basins |
| Stormwater Retention (Water balance) Minimize stormwater that leaves the site | WQ 2.1 For sites greater than 0.1 hectares, retain storm-water on-site to the same level of annual volume of overland runoff allowable under pre-development conditions. ¹ WQ 2.2 For sites greater than 0.1 hectares retain at least the first 5 mm from each rainfall through rainwater reuse, on-site infiltration, and evapotranspiration OR Ensure that the maximum allowable annual runoff volume from the development site is no more than 50% of the total average annual rainfall depth. ^{1,2} | WQ 2.3 Retain at least the first 5 mm from each rainfall through rainwater reuse, on-site infiltration, and evapotranspiration. | 1. See <i>Wet Weather Flow Management (WWFM) Guidelines</i> for applicability thresholds. Refer in particular to Water Balance targets. 2. Use tree and shrub planting, green roofs and other landscaping, to increase evapotranspiration from the site, and to increase the amount of permeable surfacing on site. • These measures come from the WWFM Guidelines which provide stormwater practices so that source control is undertaken as a priority to the extent physical factors allow. When source control practices are exhausted, the WWFM Guidelines provide conveyance and end of pipe practices. | Green roofs Rain barrels Permeable pavers, permeable asphalt, permeable concrete Greening of impervious areas Infiltration trenches Rain gardens/ absorbent landscaping Soil amendments Protect soils from compaction |
| Stormwater Run-Off Manage and clean stormwater that leaves the site | WQ 3.1 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. WQ 3.2 Control the amount of E. Coli directly entering Lake Ontario and waterfront areas. ¹ | | 1. Refer to the water quality targets for E.Coli in the <i>Wet Weather Flow Management Guidelines</i> . • These measures come from the <i>Wet Weather Flow Management Guidelines</i> . The WWFM guidelines provide stormwater practices so that source control is undertaken as a priority to the extent physical factors allow. When source control practices are exhausted, the WWFM guidelines provide conveyance and end of pipe practices. | Mechanical or natural treatment systems such as vegetated filter strips, bio-swales |

WATER QUALITY, QUANTITY AND EFFICIENCY



For New Low-Rise Residential Development

| Development Feature | Required Tier 1 | Voluntary Tier 2 | Specifications, Definitions and Resources | Potential Strategies |
|--|---|--|--|---|
| <p>Water Efficiency</p> <p>Reduce demand for potable water through greater efficiencies and by the use of non-potable water</p> | <p>WQ 4.1 Use water efficient plant material for at least 50% of landscaped area (including vegetated roofs and walls).^{1,2}</p> | <p>WQ 4.2 Ensure that 75% of water fixtures and appliances installed meet or exceed the following standards:</p> <ul style="list-style-type: none"> • toilets less than 6.0L or dual flush toilets; • faucets (5.7LPM); • showers (6.6LPM); • dishwashers (ENERGY STAR models only); • front-loading washing machines. <p>WQ 4.3 Where soft landscaping exists on site, reduce potable water use for irrigation by 50%.³</p> | <ol style="list-style-type: none"> 1. Refer to the City of Toronto preferred plant list : http://www.toronto.ca/planning/pdf/water_efficient_plant_list.pdf and Native Tree list: www.toronto.ca/trees/pdfs/Tree_List.pdf. 2. If potable water is not used for soft landscape irrigation, this target is not applicable. 3. Methods to reduce potable water use for irrigation include: plant species appropriate to local conditions, high efficiency irrigation, use of captured rainwater and use of recycled wastewater. <ul style="list-style-type: none"> • Toronto’s Water Saver program assists major ICI sector water users to reduce water use http://www.toronto.ca/watereff/ici_water_saver.htm. • High efficiency hot water fixtures and appliances reduce the amount of energy consumed for hot water heating. For information on ENERGY STAR see: http://www.oee.nrcan.gc.ca/energystar/index.html. | <p>Dual flush toilets</p> <p>Drought tolerant native species</p> <p>Water efficient plants/ landscaping</p> <p>Rain sensors for irrigation systems</p> <p>Rainwater reuse</p> <p>Below ground rainwater collection system</p> <p>Grey water recycling</p> |



For New Low-Rise Residential Development

| Development Feature | Required Tier 1 | Voluntary Tier 2 | Specifications, Definitions and Resources | Potential Strategies |
|--|--|------------------|--|---|
| <p>Urban Forest: Tree Protection</p> <p>Preserve the urban forest</p> | <p>EC 1.1 Adhere to the Tree Protection Policy and standards for tree protection barriers during construction according to Specifications for Construction Near Trees.¹</p> <p>EC 1.2 Retain all trees that are 30cm or more DBH (diameter at breast height) in accordance with the City of Toronto Private Tree Protection Bylaw.²</p> <p>EC 1.3 Where property is located within a Ravine Protected Area retain trees of all diameters.³</p> <p>EC 1.4 Where applicable, protect and retain trees of all diameters adjacent to City of Toronto streets and roadways and City-owned Parkland in accordance with the Trees on City Streets and Parkland Bylaws.^{4,5}</p> | | <ol style="list-style-type: none"> 1. Refer to the City of Toronto Tree Protection Policy and Specifications for Construction Near Trees: http://www.toronto.ca/trees/pdfs/TreeProtSpecs.pdf. 2. Tree injury or removal of trees measuring 30cm in diameter or larger on private property may be permitted in accordance with Bylaw City of Toronto Municipal Code Chapter 813, Private Tree Protection: www.toronto.ca/legdocs/municode/1184_813.pdf. 3. Tree injury or removal of trees of all diameters within a Ravine Protection Area may be permitted in accordance with the City of Toronto Municipal Code Chapter 658, Ravine and Natural Feature Protection: www.toronto.ca/legdocs/municode/1184_658.pdf. 4. Trees of all diameters on City property adjacent to City of Toronto streets and roadways, are protected under the City of Toronto Municipal Code Chapter 813, Trees on City Streets: www.toronto.ca/legdocs/municode/1184_813.pdf. 5. Trees of all diameters on City-owned Parkland are protected under the City of Toronto Municipal Code Chapter 608, Parks: www.toronto.ca/legdocs/municode/1184_608.pdf. <ul style="list-style-type: none"> • Privately-owned trees that were planted as a condition of site plan approval and incorporated into a site plan agreement registered on title, that do not qualify for protection under the Private Tree or the Ravine and Natural Feature Protection Bylaw are required to be maintained substantially in conformity with the approved drawings. | <p>Construction management plan to avoid site disturbance</p> <p>Relocate trees on-site</p> |



For New Low-Rise Residential Development

| Development Feature | Required Tier 1 | Voluntary Tier 2 | Specifications, Definitions and Resources | Potential Strategies |
|---|---|------------------|--|---|
| <p>Urban Forest: Encourage Tree Growth</p> <p>Enhance the urban forest</p> | <p>EC 2.1 Plant at least 1 large growing shade tree per residential lot.¹</p> <p>EC 2.2 Trees in hardscaping (hard landscaping): For 2 or more trees planted 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 volume of 30m³ of soil.²</p> <p>EC 2.3 Trees in softscaping (soft landscaping): Provide trees planted in soft landscaping with a minimum volume of 30m³ of high quality soil.^{3,4}</p> <p>EC 2.4 Provide a watering program for trees for the first 2 years after planting.⁵</p> | | <ol style="list-style-type: none"> For developments with more than one unit on each lot provide one tree for each grade related unit to be planted on the site. The soil volumes of 15m³ and 30m³ respectively, should be based on a soil depth of a minimum of 0.8m and a maximum of 1.2m of high quality soil above a well drained sub soil or drainage layer. Ensure that groups of trees planted in hardscape can share soil volume, for example, through the use of continuous soil planters. If trees can share soil, providing at least 15m³ per tree ensures that each tree actually has access to closer than 30m³. The use of soil cells is also encouraged. The soil volume of 30m³ should be based on a soil depth of a minimum of 0.8m and a maximum of 1.2m of high quality soil above a well drained sub soil or drainage layer. The objective for trees in softscaping is to achieve species maturity; a higher soil volume is specified. The lower volume for hardscaped areas recognizes species maturity may not be possible in confined conditions, but still allows reasonable growth. Soft landscaping should contain well drained, uncompacted, permeable growing medium at-grade, with a minimum depth of 50cm, that can support plants and trees and that may be covered by planted ground cover. It may also be covered by decorative stones on an uncompacted sub surface. Soft landscaping does not include decorative stonework, retaining walls, walkways, or similar landscape architectural elements over a compacted surface. Non-potable water for the tree watering program is preferred. <ul style="list-style-type: none"> Large growing, native trees are preferred: www.toronto.ca/trees/pdfs/Tree_List.pdf. | <p>Soil cells</p> <p>Continuous soil planters</p> <p>Rainwater harvesting irrigation system</p> |



For New Low-Rise Residential Development

| Development Feature | Required Tier 1 | Voluntary Tier 2 | Specifications, Definitions and Resources | Potential Strategies |
|---|---|---|---|--|
| <p>Natural Heritage: Site</p> <p>Protect and enhance natural habitat and increase biodiversity</p> | <p>EC 3.1 Ensure that at least 50% of vegetation species used in landscaping are native.^{1,2,3}</p> <p>EC 3.2 Do not plant any invasive species on properties along streets abutting ravines and natural areas.⁴</p> <p>EC 3.3 Where a development setback from the top-of-bank of a valley, ravine or bluff or a buffer area is required by the City, all plants must be native species.^{5,6}</p> | <p>EC 3.4 100% of tree species planted must be native species on properties or streets abutting ravines and natural areas.⁵</p> <p>EC 3.5 Where a setback from top-of-bank is required, the setback must be planted and all plants must be native species.^{6,7}</p> | <ol style="list-style-type: none"> Landscaping is defined as at-grade trees, plants, decorative stonework, retaining walls, walkways, or other landscape-architectural elements. Native species are species whose presence in an area is the result of natural processes with no human intervention. They are adapted to the local climate, soil and moisture conditions, and have evolved with other native species, such as animals and insects to create functional natural ecosystems. For examples of species native to the Toronto area see: http://city-dev.city.toronto.on.ca/trees/ravines.htm. In choosing tree species, preference should always be given to those native to the area. Where it can be clearly demonstrated that the planting of native tree species would not be appropriate due to site constraints often encountered in urban settings, Urban Forestry may accept non-native, non-invasive species better suited to the particular site. Invasive species are species that reproduce aggressively and become established in a natural area by displacing native species. Invasive species are predominantly non-native species that do not naturally occur in an area. They are introduced through a number of means, most often through intentional or accidental human activity. The proliferation of invasive species is often facilitated by site and environmental disturbances that disrupt natural forest systems, including compaction, trampling, drought, pollution, poor soils, heat, and disease. For examples of invasive species in Southern Ontario see the Ontario Society for Ecological Restoration: www.serontario.org/pdfs/exotics.pdf. Ravine and natural areas are defined in accordance with the City of Toronto Ravine and Natural Feature Protection Bylaw: www.toronto.ca/legdocs/municode/1184_658.pdf. A development setback is defined in section 3.4.8 a) of the City's Official Plan as 10 metres from the top-of-bank of a valley, ravine or bluff. Buffer areas are addressed under section 3.4.12 d). Where the top-of-bank is unstable, minimum setbacks may be greater than 10m. Naturalized setbacks and buffers should provide species and structural diversity with native trees (both small and large growing trees), shrubs and ground layer species. <ul style="list-style-type: none"> Refer to the Green Standard Water section for details on drought tolerant species. Minimum buffer widths may be greater than 10m for significant features such as Provincially Significant Wetlands, life science ANSIs and ESAs. | <p>Identify habitats that could be sustained on-site</p> <p>Plant a diversity of native species</p> <p>Locate constructed features to leave as much contiguous vegetated area as possible to minimize habitat fragmentation</p> <p>Limit monocultures across large areas</p> |



For New Low-Rise Residential Development

| Development Feature | Required Tier 1 | Voluntary Tier 2 | Specifications, Definitions and Resources | Potential Strategies |
|---|---|------------------|--|---|
| <p>Soil Quality and Planting Conditions</p> <p>Provide growing conditions to support long-term plant survival and growth</p> | <p>EC 4.1 Protect soils from compaction during construction.</p> <p>EC 4.2 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.¹</p> | | <p>1. Refer to soil specifications from Forestry. In general, soils should be fertile and friable, obtained from well-drained, arable land. They should be free of calcium carbonate, subsoil, refuse, heavy clay, noxious weed seeds, large debris, and other deleterious substances.</p> <ul style="list-style-type: none"> For planting details refer to: http://www.toronto.ca/trees/pdfs/DetailPD101bbinturf.pdf. For information on soil compaction during construction refer to the tree protection policy and specifications for construction near trees: http://www.toronto.ca/trees/pdfs/TreeProtSpecs.pdf. Continuous soil trenches are encouraged for shrub beds within hard and softscaping. | <p>Soil protection plan and specifications</p> <p>Compost to increase soil organic matter, increase water retention</p> <p>Mulched tree or planting beds</p> <p>Testing soils for fertility and supplemented as required to ensure adequate growth potential.</p> |



For New Low-Rise Residential Development

| Development Feature | Required Tier 1 | Voluntary Tier 2 | Specifications, Definitions and Resources | Potential Strategies |
|--|--|---|--|--|
| <p>Glass and Other Design Features for Migratory Birds:</p> <p>Ensure that design features minimize the risk for migratory bird collisions.</p> | <p>EC 5.1 Where abutting ravines or natural areas:¹ Treat glass with a density pattern between 10-28cm apart for a minimum of the first 10-12m of a building above grade or the mature height of adjacent vegetation,^{2,3}</p> <p style="text-align: center;">OR</p> <p>Mute reflections for a minimum of the first 12m of a building above grade.⁴</p> <p>EC 5.2 Ensure ground level ventilation grates have a porosity of less than 2cm X 2cm.</p> | <p>EC 5.3 Apply glass treatment to supplementary building and glass features on-site.</p> | <ol style="list-style-type: none"> 1. If the site is adjacent to a natural area such as a ravine or woodlot or other natural feature, glass must be treated with a density pattern to the first 12m of the building or to the height of the top of the surrounding tree canopy at maturity. 2. Density patterns and multiple paned glass provides the best visual markers for birds to reduce collisions with windows. Visual markers must be applied to the exterior surface of the glass. The denser the pattern the more visible and the more effective. 3. Visual markers consist of points (or alternative pattern) etched into or applied onto the exterior surface of the glass and must have a minimum diameter of 5mm. 4. Strategies to mute reflections include angled glass panes at a minimum angle of 20 degrees, awnings and overhangs and external sunshades. Awnings should provide muted reflection to the base of the window. <ul style="list-style-type: none"> • As birds migrate, they are disoriented by and drawn towards light pollution escaping from urban areas, which often leads to their collision with buildings resulting in injury or death. • For details on ways to make buildings better for birds including glass treatments, lighting, building operations and site management, refer to the Bird-Friendly Development Guidelines http://www.toronto.ca/lightsout/guidelines.htm. | <p>Window frames</p> <p>Grilles and Louvres</p> <p>Sunshades</p> <p>Fritted glass</p> <p>Window films</p> <p>Fenestration patterns</p> |



For New Low-Rise Residential Development

| Development Feature | Required Tier 1 | Voluntary Tier 2 | Specifications, Definitions and Resources | Potential Strategies |
|--|--|------------------|--|---|
| <p>Light Pollution Reduce nighttime glare and light trespass from the building and the site</p> | <p>EC 6.1 No up-lighting from exterior light fixtures.¹ EC 6.2 Install exterior light fixtures that are shielded to prevent glare and/or light trespass onto any neighbouring properties.^{2,3}</p> | | <ol style="list-style-type: none"> 1. All exterior light fixtures should be efficient while providing minimum illumination levels sufficient for personal safety and security in the area. Safety and security lighting should minimize Glare and/or Light Trespass. Refer to the <i>Illuminating Engineering Society of North America (IESNA) Recommended Practice Manual: Lighting for Exterior Environments</i> for requirements to partially of fully shield exterior lighting: www.iesna.org. 2. Light Trespass is unwanted stray light shining across property boundaries. Any light fixture installed on a property must direct and shield light coming from the fixture so that the light source is not directly visible from any adjacent property. Lighting must focus downward, eliminating direct upward light and reducing spill light. 3. Glare is the physical sensation caused by an artificial light that is brighter than one's adapted surroundings. Glare is usually produced by a bare light source shining directly into the eyes of the observer. <ul style="list-style-type: none"> • For details on ways to make buildings better for birds including lighting, building operations and site management, refer to the <i>Bird-Friendly Development Guidelines</i> http://www.toronto.ca/lightout/guidelines.htm. | <p>No vanity lighting Use motion sensor lighting Occupancy sensors/timers for exterior lighting</p> |

SOLID WASTE



For New Low-Rise Residential Development

| Development Feature | Required Tier 1 | Voluntary Tier 2 | Specifications, Definitions and Resources | Potential Strategies |
|---|-----------------|--|---|---|
| <p>Construction Waste Management</p> <p>Reduce waste going to landfill</p> | | <p>SW 1.1 Recycle at least 75% of non-hazardous construction and demolition debris.¹</p> | <p>1. Recycling involves breaking down and reprocessing materials. This is different from reuse, in which whole components are reused. For this target, materials salvaged for reuse can be included.</p> | <p>Construction waste management plan</p> <p>Designated area on site for recyclable materials</p> <p>Recycle trees removed from the site through tree salvage companies</p> |
| <p>Reuse of Building Materials</p> <p>Reduce waste going to landfill and reduce demand for new materials</p> | | <p>SW 2.1 At least 5% of a project's materials (based on value) shall comprise salvaged, refurbished or reused materials.</p> | | <p>Integrate existing structures into site design</p> <p>Use salvaged beams, posts, flooring, paneling, doors, frames, cabinetry, furniture, bricks and detailing</p> |
| <p>Use of Recycled Materials</p> <p>Reduce demand for new materials and increase market for recycling</p> | | <p>SW 3.1 At least 15% of a project's construction materials (based on value) shall comprise recycled content.^{1,2}</p> | <p>1. Recycled content is defined by CAN/CSA-ISO 14021-00 Environmental Labeling and Advertising Guidelines.</p> <p>2. Recycled materials include both post-industrial (pre-consumer) and post-consumer materials. However, post-industrial materials are assigned half the value of post-consumer materials in the calculation of the percentage of recycled construction materials.</p> <ul style="list-style-type: none"> Material costs exclude installation expenses (e.g. labour and equipment) and transportation costs. Materials must also satisfy the requirements of the Ontario Building Code, or any other applicable standard (such as CSA certification), as well as the requirements of TARION Home Warranty Program. | <p>Specify recycled content for outdoor structures and landscaping, building envelope and interior finishing materials</p> <p>Identify recycled materials suppliers</p> <p>Require manufacturer documentation</p> |