



AIR QUALITY

For **New** Mid to High Rise Residential and Industrial, Commercial and Institutional (ICI) Development

| Development Feature | Tier 1 | Tier 2 | Definitions, Specifications and Resources | Potential technologies and Strategies |
|---|---|--------|---|--|
| <p>Automobile Infrastructure Discourage single-occupancy automobile use and encourage the use of low emission vehicles</p> | <p><u>Residential</u>: If providing more than the minimum parking required under the Zoning By-law, any additional spaces must provide roughed-in conduits to allow for future electrical outlets for plug-in electric vehicles^{1,2}</p> <p><u>Institutional/Commercial</u>: If providing more than the minimum parking required under the Zoning By-law, any additional spaces must be provided <i>only</i> for dedicated priority parking spaces for carpooling and for publicly accessible spaces dedicated to car-sharing.^{1,2,3}</p> | | <ol style="list-style-type: none"> 1. This target can only apply where there is a minimum parking requirement. 2. The number of accessible parking spaces for disabled persons should be no less than 1 designated space for each 25 parking spaces up to the first 100 spaces, plus 1 space per additional 50 spaces above 100. No less than 1 accessible parking space should be provided where the number of parking spaces provided is less than 25. For details on accessible parking spaces, refer to the <i>Toronto Accessibility Design Guidelines</i>: (http://www.toronto.ca/diversity/pdf/accessibility_design_guidelines.pdf) 3. All dedicated priority parking spaces must be clearly identified with signage or symbol on the paved area. <ul style="list-style-type: none"> • Car-sharing refers to fee-based, shared automobile use that is intended to substitute for private vehicle ownership. It makes occasional use of a vehicle affordable, while providing an incentive to minimize driving and rely on alternative travel options as much as possible. • Car pooling is when 2 or more workers share a car ride to work locations. | <p>Designated carpool or car sharing parking spaces and signage</p> <p>Shared parking</p> <p>Rough-in conduits for electric plug-in infrastructure for cars, bicycles and scooters</p> |

1 Apply this standard to: All development 4-storeys or greater



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| <p>Cycling Infrastructure Encourage cycling as a clean air alternative</p> | <p>Bicycle parking rates:¹</p> <p>Residential: Downtown, Centres and Central Waterfront provide <u>0.8</u> occupant bicycle parking spaces/unit and <u>0.2</u> visitor bicycle parking spaces/unit; For the rest of the City provide at <u>0.6</u> occupant bicycle parking spaces/unit and <u>0.15</u> visitor bicycle parking spaces/ unit; Locate at least <u>5%</u> of occupant bicycle parking at grade^{2,3,4}</p> <p>Commercial/Institutional: Downtown, Central Waterfront and Centres, provide <u>0.2</u> occupant bicycle parking spaces per 100 m² of GFA and the greater of <u>0.2</u> visitor bicycle parking spaces/100 m² of GFA or 6 spaces; For the rest of the City provide <u>0.13</u> occupant bicycle parking spaces/100 m² of GFA and provide the greater of <u>0.15</u> visitor bicycle parking spaces /100 m² of GFA or 6 spaces</p> <p>Retail: Downtown, Central Waterfront and Centres, provide <u>0.2</u> occupant bicycle parking spaces per 100 m² of GFA and the greater of <u>0.3</u> spaces/100 m² of GFA or 6 spaces; For the rest of the City provide <u>0.13</u> occupant bicycle parking spaces/100 m² of GFA and the greater of <u>0.25</u> spaces/100 m² of GFA or 6 spaces⁴</p> <p>Industrial: Provide occupant bicycle parking spaces equal to <u>5%</u> of the number of required parking spaces⁵</p> <ul style="list-style-type: none"> ▶ Locate occupant bicycle parking in a weather protected, secure area with controlled access; or secure individual enclosures ▶ Provide visitor bicycle parking in a highly visible and easily accessible location at grade^{6,7} ▶ In workplaces, provide 1 male and 1 female shower and change facility for every 30 bicycle parking spaces | <ul style="list-style-type: none"> • <u>Residential</u>: Downtown, Centres and Central Waterfront, provide at least <u>1.2</u> bicycle parking space per unit | <ol style="list-style-type: none"> 1. All bicycle parking spaces should be designed in accordance with the City of Toronto <i>Guidelines for the Design and Management of Bicycle Facilities</i>. http://www.toronto.ca/planning/bicycle_parking_guide.htm 2. Residential bicycle parking rates apply to all residential apartment buildings with greater than 5 units 3. Minimum of one visitor parking space must be provided 4. At grade occupant parking is only required if less than 30% of visitor parking is provided at-grade 5. Retail visitor parking is required for all sites with a non-residential GFA greater than 1000 m² 6. No less than 1 bicycle parking space should ever be provided. 7. For residential buildings only, provide at least 10% of visitor bicycle parking spaces in an easily accessible location at grade <ul style="list-style-type: none"> • Occupant bicycle parking is also known as long-term or Type 1 bicycle parking for residents or employees of a building • Secure long-term bicycle parking is located in a separately accessed controlled area that is regularly monitored by security personnel or video surveillance. • Visitor bicycle parking is also known as short-term or Type 2 bicycle parking and includes bicycle racks in an easily accessible location, at grade, such as near major building entrances, and are available use by visitors to a building. | <p>Bicycle storage racks, lockers or cages</p> <p>Bicycle ramps on staircases</p> <p>Signage to local bicycle paths</p> <p>Dedicated entrances to indoor bicycle parking facilities</p> |



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| <p>Pedestrian Infrastructure Encourage walking as a clean air alternative for all ages and abilities</p> | <p>Connect buildings on the site to off-site pedestrian paths, surface transit stops and parking areas (car and bike)</p> <ul style="list-style-type: none"> ▶ Design onsite sidewalks, crosswalks and walkways to be continuous, universally accessible, barrier free and clearly designated. ▶ Outdoor waiting areas located on the site must offer protection from the weather <p>Use pedestrian-specific lighting directed onto sidewalks, pathways, entrances and outdoor waiting areas¹</p> <p>Where a transit stop is located within a walking distance of the project site boundary, the building main entrance should have a direct pedestrian linkage to that transit stop</p> | | <ol style="list-style-type: none"> 1. For details on exterior lighting design strategies to minimize light pollution refer to the Bird-friendly Development Guidelines: http://www.toronto.ca/lightsout/pdf/development_guidelines.pdf • For details on appropriate grading, walkway width, amenity strips and surface treatment, refer to the <i>Toronto Accessibility Design Guidelines</i> (http://www.toronto.ca/diversity/pdf/accessibility_design_guidelines.pdf), the <i>Design Guidelines for “Greening” Surface Parking Lots</i> (http://www.toronto.ca/planning/urbdesign/greening_parking_lots.htm) and the <i>Draft Toronto Streetscape Manual</i> • The Canadian Institute for Transportation Engineers’ (CITE) document, <i>Promoting Sustainable Transportation Through Site Design</i>, provides some useful design guidelines for sustainable transportation options for non-residential developments | <p>Pedestrian scale building design</p> <p>Pedestrian oriented landscaping, lighting and signage</p> <p>Free standing structures, attached canopies, awnings</p> <p>Building orientation to facilitate transit access</p> |



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| <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 materials¹ for at least <u>50%</u> of the site's non-roof hardscape²</p> <p style="text-align: center;">OR</p> <p>Use open grid pavement for at least <u>50%</u> of the site's non-roof hardscape³</p> <p style="text-align: center;">OR</p> <p>Shade within 5 years at least <u>50%</u> of hardscape, including surface parking areas, walkways and other hard surfaces⁴</p> <p style="text-align: center;">OR</p> <p>Use a combination of high-albedo surface materials, open grid pavement and shade for at least 50% of the site's non-roof hardscape</p> <p>Plant large growing shade trees at the equivalent of 6-8m intervals starting from the property line:</p> <ul style="list-style-type: none"> • along all street frontages, • along all open space frontages and • along all public walkways, excluding driveways and easements⁵ <p>► If surface parking is permitted and provided, plant shade trees at a minimum ratio of one tree planted for every five parking spaces supplied⁶</p> | <p>Use high-albedo surface materials¹ for at least <u>75%</u> of the site's non-roof hardscape²</p> <p style="text-align: center;">OR</p> <p>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>Shade at least <u>75%</u> of hardscape, including surface parking areas, walkways and other hard surfaces³</p> <p style="text-align: center;">OR</p> <p>If surface parking is provided, plant internal shade trees at a minimum ratio of one tree planted for every <u>three</u> parking spaces supplied⁶</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-storey⁷</p> <p style="text-align: center;">OR</p> <p>Use a combination of high-albedo surface materials, open grid pavement and shade for at least 75% of the site's non-roof hardscape.</p> | <ol style="list-style-type: none"> 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. 2. Non-roof hardscape (hard landscaping) includes: parking areas, walkways, plazas and other hard surfaces. 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. 4. Shade must be provided at solar noon at the summer solstice (Approximately June 21). For examples of native, large growing shade trees refer to: http://www.toronto.ca/trees/pdfs/Tree_List.pdf 5. Provide trees with sufficient soil volume to support crown growth diameter equivalent to proposed tree spacing. Refer to the Green Development Standard Ecology section for soil specifications. 6. For details on parking lot materials, landscaping and layout refer to the <i>Draft Design Guidelines for "Greening" Surface Parking Lots</i>: http://www.toronto.ca/planning/urbdesign/greening_parking_lots.htm 7. Green wall is defined as a wall, that is partially or completely covered with vegetation and, in some cases a growing medium | <p>High albedo materials include: grey or white concrete, light-coloured asphalt, selected interlocking concrete pavers and other light coloured pavers</p> <p>Soft landscaping</p> <p>High branching deciduous shade trees</p> <p>Bioswales</p> <p>Design site to reduce the size of hardscaped area (i.e. smaller parking lots, shorter driveways and below grade parking)</p> |

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| <p>Urban Heat Island Reduction: Roof Reduce ambient surface temperatures on/from rooftops</p> | <p>For buildings included in the City of Toronto Green Roof By-law install a green roof to meet the requirements of the By-law.¹</p> <p>For buildings not covered by the Green Roof By-law do one of the following for available roof space:²</p> <p>Install green roof with 50% minimum coverage³ OR Use cool roofing materials for 100% of the roof⁴ OR Use a combination of both for a minimum of 75% of the roof.</p> <p>► For all City owned buildings and all Agencies, Boards, Commissions, Corporations and Divisions, new buildings will provide a green roof with total area coverage equal to at least 50% of the building footprint. Cover the remaining available roof space with cool roofing materials.</p> | | <ol style="list-style-type: none"> Where a green roof is required under the City of Toronto Green Roof By-law, the By-law specifications apply. For more information see: http://www.toronto.ca/greenroofs/ Available roof space is defined 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. 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. 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. 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. <ul style="list-style-type: none"> Invasive species should not be planted 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 Where a green roof is constructed on a building that is adjacent to reflective glass;ensure that the glass is treated to a height of at least 12m above the level of the green roof to prevent potentially fatal window collisions. | <p>Specify Energy Star or Cool Roof Rating Council (CRRC) rated cool roof coatings and single ply membranes for low-sloped applications</p> <p>Green roof types include: complete and modular systems and pre-cultivated vegetation blankets.</p> |



GREENHOUSE GAS EMISSIONS/ ENERGY EFFICIENCY

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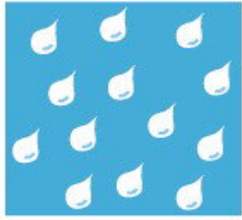
| Development Feature | Tier 1 | Tier 2 | Definitions, Specifications and Resources | Potential Technologies and Strategies |
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| <p>Minimum Energy Performance Minimize demand for energy through efficient building design and encourage renewable energy production</p> | <p>► Design building (s) to achieve at least 25% efficiency improvement over the Model National Energy Code for Buildings (MNECB) or 13% over the Ontario Building Code.^{1, 2}</p> | <p>Design and construct building (s) to achieve at least 35% efficiency improvement over the MNECB.^{1,2}</p> <ul style="list-style-type: none"> • Install certified in-suite smart meters in all residential units. | <ol style="list-style-type: none"> 1. Energy Modeling may be performed with EE4, DOE2 or EQuest or other models approved by the City of Toronto Energy Efficiency Office. See the Better Buildings Partnership New Construction Program (BBP-NC) for details on energy simulation and the Design Assistance Incentive: http://www.toronto.ca/energy/bbp-nc.htm 2. Buildings with a total Gross Floor Area under 2,000 m² may meet this target by designing the building in accordance with the specifications contained in the Small Buildings Checklists for the applicable buildings type. Checklists will be available in January 2010. <ul style="list-style-type: none"> • Model National Energy Code for Buildings: http://oee.nrcan.gc.ca/commercial/newbuildings/mnecb.cfm?attr=20 • Ontario Building Code (2006) requires that as of 2012, new buildings will be required to meet standards 25 per cent higher than the Model National Energy Code for Buildings • Window and glazing thermal performance can be determined by measured ratings (http://www.nfrc.org) or using a verified rating tool, such as FRAMETMplus Online (http://p10a.enermodal.com/WebFPlus/). • Buildings are encouraged to connect to existing district energy systems where the capacity exists to supply the heating and cooling demands of the building. | <p>BBP-NC Design Assistance Incentive</p> <p>Less than 50% glazing of the exterior wall area</p> <p>High efficiency fixtures, appliances and pumps</p> <p>Variable speed drives on fans and pumps</p> <p>Low-flow hot water fixtures and appliances</p> <p>Heat Recovery Ventilation</p> <p>Demand Control Ventilation</p> <p>Drain water heat recovery</p> <p>Passive solar day lighting</p> <p>Shade south- and west-facing windows with awnings or shade trees</p> <p>Connect to a District Energy System</p> |



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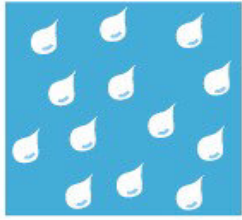
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| <p>Systems Commissioning Ensure building systems function properly</p> | | <p>Commission the project using best practice commissioning.¹</p> | <p>1. Refer to LEED-NC Energy & Atmosphere Credit 3 for building commissioning standard: http://www.cagbc.org/leed/systems/new_construction/documents.php</p> <ul style="list-style-type: none"> • Commissioning of a building is a systematic process that documents and verifies that all the facility's energy related systems perform interactively in accordance with the design documentation and intent, and according to the owner's operational requirements from the design phase through to at least one-year post construction. • For more information on commissioning, see <i>The Building Commissioning Guide</i>: http://www.wbdg.org/ccb/GSAMAN/buildingcommissioningguide.pdf • For strategies to implement, see the <i>International Performance Measurement and Verification Protocol Volume I</i>: www.evo-world.org | <p>Engage a 3rd party commissioning authority.</p> |



WATER QUALITY, QUANTITY AND EFFICIENCY

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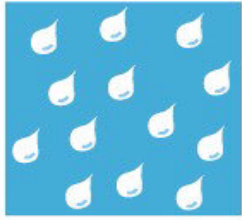
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| <p>Construction Activity Ensure protection of water quality during construction and demolition</p> | <p>► Follow the <i>Erosion and Sediment Control Guidelines for Urban Construction</i> (Greater Golden Horseshoe Conservation Authorities, December 2006) during construction and demolition activities.</p> | | <ul style="list-style-type: none"> Refer to the Greater Golden Horseshoe Area Conservation Authorities <i>Erosion and Sediment Control Guidelines for Urban Construction</i>: http://www.sustainabletechnologies.ca/Portals/Rainbow/Documents/ESC%20Guideline%20-%20December%202006.pdf | <p>Erosion and sediment control plan</p> <p>Silt fencing, sediment traps, sediment basins</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.¹</p> <p>► Retain at least the first 5 mm from each rainfall through rainwater reuse, onsite infiltration, and evapo-transpiration²</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 25mm from a 24 hour rainfall event for rainwater reuse, onsite infiltration and/or evapo-transpiration.³ | <ol style="list-style-type: none"> See Wet Weather Flow Management (WWFM) Guidelines Table 7 for summary of required stormwater management targets. http://www.toronto.ca/water/protecting_quality/wfmmmp/pdf/wwfm_guidelines_2006-11.pdf Use tree and shrub planting, green roofs and other landscaping, to increase evapo-transpiration from the site, and to increase the amount of permeable surfacing on site. The facility must be capable of retaining subsequent rainfalls event up to 5 mm within 72 hours without overflow. The maximum resident time of the retained run-off must not exceed 28 days. <p><i>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.</i></p> | <p>Green roofs</p> <p>Rain water harvesting</p> <p>Permeable pavers, permeable asphalt, permeable concrete for hard surfaces</p> <p>Greening of impervious areas such as alleyways, fire lanes and parking lots using permeable paving materials, trees and vegetation</p> <p>Downspout disconnection</p> <p>Infiltration trenches</p> <p>Rain gardens/absorbent landscaping</p> |



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| <p>Water Quality - Stormwater Run-Off Manage and clean stormwater that leaves the site</p> | <ul style="list-style-type: none"> ▶ 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.¹ ▶ Control amount of E. Coli directly entering Lake Ontario and waterfront areas as identified in the Wet Weather Flow Management Guidelines.² | | <ol style="list-style-type: none"> 1. Strategies for TSS removal include green streets, stormwater ponds, oil-grit separators, bioswales, filters and others. See: http://www.toronto.ca/water/protecting_quality/wfmmp/pdf/wwfm_guidelines_2006-11.pdf 2. Refer to the Water Quality Targets for E.Coli in the Wet Weather Flow Management Guidelines: http://www.toronto.ca/water/protecting_quality/wfmmp/pdf/wwfm_guidelines_2006-11.pdf - <p><i>These measures come from the Wet Weather Flow Management Guidelines. The 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.</i></p> | <p>Mechanical or natural treatment systems such as vegetated filter strips, bioswales, sediment traps, oil/grit separators</p> |



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| <p>Water Efficiency Reduce demand for potable water through greater efficiencies and by the use of non-potable water</p> | <p>► Use water efficient plant material for at least 50% of landscaped area (including vegetated roofs and walls).^{1,2}</p> | <p>Install water fixtures and appliances that achieve at least a 30% reduction in potable water consumption for the building (not including irrigation) over the baseline water fixtures and appliances.^{3,4}</p> <p>Where soft-landscaping exists on site, reduce potable water use for irrigation by 50 percent.⁵</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 the Native Tree list (http://www.toronto.ca/trees/pdfs/Tree_List.pdf). 2. If potable water is not used for landscape irrigation, this target is not applicable 3. Excluding commercial dishwashers, clothes washers and icemakers 4. Baseline fixtures and appliance include the following: toilets (6.0L), urinals (3.8L) faucets (8.3 LPM), shower heads (9.5LPM). 5. Reduction in potable water use must be calculated from a calculated mid-summer baseline case. 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 Water’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 more information on Energy Star refer to: http://www.oeenrcan.gc.ca/energystar/english/consumers/index.cfm | <p>Dual flush toilets</p> <p>Waterless Urinals</p> <p>Drought tolerant native species</p> <p>Water efficient plants/ landscaping</p> <p>Rain sensors for irrigation systems</p> <p>Rainwater harvested irrigation system</p> <p>Grey water irrigation</p> <p>Drip irrigation</p> |



ECOLOGY

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| <p>Urban Forest: Tree Protection Preserve the urban forest</p> | <ul style="list-style-type: none"> ▶ Adhere to the Tree Protection Policy and standards for tree protection barriers during construction according to Specifications for Construction Near Trees.¹ ▶ Retain all trees that are 30cm or more DBH (diameter at breast height) in accordance with the City of Toronto Private Tree Protection By-law.² <p>Where property is located within a Ravine Protected Area retain trees of all diameters.³</p> <ul style="list-style-type: none"> ▶ 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 By-laws.^{4, 5} | | <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 30 cm in diameter or larger on private property is prohibited, except where a permit is issued, in accordance with By-law 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 property is prohibited, except where a permit is issued, 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 by-law are required to be maintained substantially in conformity with the approved drawings. | <p>Establish tree protection zones during construction</p> <p>Include details on tree protection on site and/or landscape plans</p> |



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| <p>Urban Forest: Encourage Tree Growth Enhance the urban forest</p> | <p>► Plant a minimum of one tree on site for every 30m² of post development site area covered by soft landscaping.^{1,2}</p> <p>Trees in hardscaping (hard landscaping): For 2 or more trees planted in primarily hardscaped areas, provide a minimum of volume of 15m³ of high quality soil per tree. A single tree planted in hardscape requires a minimum volume of 30 m³ of soil.³</p> <p>Trees in softscaping (soft landscaping): Provide trees planted in softscaping with a minimum volume of 30 m³ of high quality soil.⁴</p> <p>► Provide a watering program for trees for the first 2 years after planting.⁵</p> | | <ol style="list-style-type: none"> Soft landscaping should contain well drained, uncompacted, permeable growing medium, 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. Areas dedicated for playing fields and sustainable local food production are exempt from the calculation of softscape area The soil volumes of 15 m³ and 30 m³ 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 to 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. 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> |



ECOLOGY

For **New** Mid to High Rise Residential and Industrial, Commercial and Institutional (ICI) Development

| Development Feature | Tier 1 | Tier 2 | Definitions, Specifications and Resources | Potential Technologies and Strategies |
|---|---|---|--|--|
| <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 used in landscaping are native.¹ ▶ Do not plant any invasive species on properties along streets abutting ravines and natural areas.² ▶ 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.³ | <ul style="list-style-type: none"> • 100% of tree species planted must be native species on properties or streets abutting ravines and natural areas³ • Where a setback from top-of-bank is required, the setback must be planted and all plants must be native species.^{4,5} | <ol style="list-style-type: none"> 1. Native plant species are defined as plants that live or grow naturally in a region without direct or indirect human intervention. Refer to the City of Toronto Native Plant Lists and fact sheets for lists of plant species native to the Toronto Region: http://www.toronto.ca/trees/ravines.htm 2. Invasive species are any alien (non-native) species whose introduction does or is likely to cause economic or environmental harm. For a list of invasive species in Southern Ontario see the Ontario Society for Ecological Restoration : http://www.serontario.org/pdfs/exotics.pdf 3. Ravine and natural areas are defined in accordance with the City of Toronto Ravine and Natural Feature Protection by-law: www.toronto.ca/legdocs/municode/1184_658.pdf 4. A development setback is defined in section 3.4.8 a) of the City's Official Plan as 10 metres from the top 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. 5. 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 Toronto Green Standard Water section for details on drought tolerant species. • Minimum buffer widths may be greater than 10 m for significant features such as Provincially Significant Wetlands, life science ANSIs and ESAs. | <p>Identify habitats that could be sustained on site</p> <p>Limit monocultures across large areas</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> |



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| <p>Soil Quality and Planting Conditions: Provide growing conditions to support long-term plant survival and growth</p> | <p>► Retain and reuse all uncontaminated on-site soil in areas not covered by the building and parking footprint or hard surfaces</p> <p style="text-align: center;">OR</p> <p>Adjust or replace with soil of equal or better quality.¹</p> | | <p>1. Refer to soil specifications from Forestry. Specifications for planting should indicate soils that are 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 and trees planted within hard and softscaping | <p>Develop a soil protection plan and specifications</p> <p>Limit areas impacted by construction</p> <p>Use compost to increase soil organic matter, increase water retention</p> <p>Mulch tree or planting beds</p> |



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| <p>Glass and other design features for Migratory Birds: Ensure that design features minimize the risk for migratory bird collisions.</p> | <p>► Treat glass with a density pattern between 10-28cm apart for a minimum of the first 10-12m of a building above grade^{1,2}</p> <p style="text-align: center;">OR</p> <p>Mute reflections for a minimum of the first 10-12m of a building above grade³</p> <p>► Ensure ground level ventilation grates have a porosity of less than 2cm X 2cm.</p> <p>Where a green roof is constructed that is adjacent to glass surfaces; ensure that the glass is treated to a height of at least 12m above the level of the green roof to prevent potentially fatal window collisions.</p> | <ul style="list-style-type: none"> Apply glass treatment to supplementary building and glass features on site (e.g. windbreaks, solariums, etc.) | <ol style="list-style-type: none"> Multiple pained glass provides the best visual markers for birds to reduce window collisions. The more dense the pattern the more visible. If the site is close to a natural area such as a ravine or woodlot or other natural feature where the majority of the vegetation is generally higher than 12m, glass treatments in these areas should be applied to the height of the top of the surrounding tree canopy or the anticipated height of the surrounding vegetation at maturity. Strategies to mute reflections include angled glass panes at a minimum angle of 20 degrees, internal screens, awnings and overhangs and external sunshades. <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>Decals</p> <p>Window frames</p> <p>Grilles and Louvres</p> <p>Angled glass</p> <p>Internal screens/blinds</p> <p>Awnings/Overhangs</p> <p>Sunshades</p> <p>Fritted glass</p> <p>Window films</p> <p>Fenestration patterns</p> <p>Non-reflective glass</p> |



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| <p>Light Pollution Reduce nighttime glare and light trespass from the building and the site</p> | <p>No up-lighting from exterior light fixtures unless otherwise permitted through a Heritage designation ^{1,2}</p> <p>Install exterior light fixtures that are shielded to prevent Glare and/or Light Trespass onto any neighbouring properties ^{3,4}</p> | <p>Eliminate all spotlighting and rooftop Vanity lighting on the building ⁵</p> <p>In Commercial/Institutional buildings, install an automatic device that reduces the outward spillage of internal light by:</p> <p>Reducing the input power to lighting fixtures by at least 50% between the hours of 11 PM and 5 AM. ⁶</p> <p>OR</p> <p>Shielding all openings in the envelope with a direct line of sight to any non-emergency light fixture between the hours of 11 PM and 5 AM.</p> | <ol style="list-style-type: none"> 1. A light fixture is an electrical device used to create artificial light or illumination. 2. All Light Fixtures shall be efficient while providing minimum illumination levels sufficient for personal safety and security. Safety and security lighting should minimize Glare and/or Light Trespass. 3. 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. 4. Glare is the physical sensation caused by artificial light that is brighter than one's adapted surroundings. Glare is produced by a bare light shining directly into the eyes of the observer. 5. Excessive rooftop lighting that contributes to light pollution is not permitted. Architectural illumination may be permitted in accordance with the following performance specifications: <ul style="list-style-type: none"> • Shield exterior light fixtures to prevent light trespass • Architectural illumination is turned off year round from 11pm - 5am using an automatic device 6. After hours override may be provided by a manual or occupant sensing device provided that the override last no more than 30 minutes. <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 Bird-Friendly Development Guidelines http://www.toronto.ca/lightout/guidelines.htm | <p>No vanity lighting</p> <p>Fixtures that effectively project light downwards</p> <p>Occupancy sensors in parking structures</p> <p>Building automation systems</p> <p>Use motion sensor lighting</p> |



SOLID WASTE

Toronto Green Standard For **New** Mid to High Rise Residential and Industrial, Commercial and Institutional (ICI) Development

| Development Feature | Tier 1 | Tier 2 | Definitions, Specifications and Resources | Potential Technologies and Strategies |
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| <p>Storage and Collection of Recycling and Organic Waste Facilitate waste reduction and efficient processing</p> | <p>► Provide a dedicated area or areas within or attached to the building for the collection and storage of recycling and organic waste.¹</p> <p>If a separate recycling room is required, provide an recycling room with an area of at least 10 m² for the first 40 residential units and 5 m² for each additional 40 residential units in the building</p> | <ul style="list-style-type: none"> For residential buildings, provide recycling containers with the capacity of 8 cubic yards per 100 residential units per week | <p>1. Dedicated areas are within a short walking distance of users and are equally as convenient as garbage storage areas. Provide well-lit access to storage areas.</p> | <p>Three chute system</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. | <ul style="list-style-type: none"> Material costs exclude installation expenses (e.g. labour and equipment) and transportation costs. This target may be met through the reuse of various building components, including (but not limited to) structural steel, timbers, a building façade and/or existing concrete structures. 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>Integrate existing structures into site design</p> <p>Use salvaged beams, posts, flooring, paneling, doors, frames, cabinetry, furniture, bricks and detailing.</p> <p>Reuse trees removed from the site as timber for terracing and erosion control</p> |



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| <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 ¹ | <p>1. Recycled content defined by CAN/CSA-ISO 14021-00 Environmental Labeling and Advertising Guidelines</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 (i.e. plastic lumber, recycled ceramic tiles)</p> <p>Identify recycled materials suppliers</p> <p>Require manufacturer documentation</p> <p>Recycled paints</p> |
| <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. | <ul style="list-style-type: none"> Recycling involves breaking down and reprocessing materials. This is different from reuse, in which whole components are reused. | <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> |