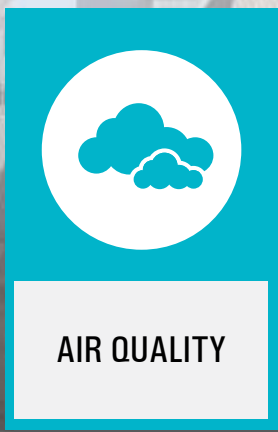


# TORONTO GREEN STANDARD v4 2022



SUSTAINABILITY REQUIREMENTS FOR  
NEW DEVELOPMENT IN TORONTO

City Agency, Corporation &  
Division-owned Facilities



## LOW EMISSIONS TRANSPORTATION

### AQ 1.1 Single-Occupant Auto Vehicle Trips

Reduce single occupancy auto vehicle trips generated by the proposed development by 25% through a variety of multimodal infrastructure strategies and Transportation Demand Management (TDM) measures.

### AQ 1.2 Electric Vehicle Infrastructure

Provide at least 25% of the parking spaces with Electric Vehicle Supply Equipment (EVSE). For multi-unit buildings, provide rough-in conduits to the remaining parking spaces to permit future EVSE installation. For non-residential uses, include at least 5% of the parking spaces with a dedicated Energized Outlet to support opportunity charging.

*Note: The requirements for AQ 1.2 may be implemented using any of the following strategies: dedicated electrical outlet, receptacle or EVSE supplied by a separate branch circuit or using Electric Vehicle Energy Management Systems (EVEMS) load sharing technologies, which allow multiple vehicles to charge on the same circuit reducing both power requirements and installation costs.*



## CYCLING INFRASTRUCTURE

### AQ 2.1 Bicycle Parking Rates

Provide bicycle parking spaces in accordance with Chapter 230 of Zoning By-law 569-2013.

### AQ 2.2 Long-term Bicycle Parking Location

Long-term bicycle parking must be provided in a secure controlled-access bicycle parking facility or purpose-built bicycle locker on the first or second storey of the building or on levels below ground commencing with the first level below ground.

### AQ 2.3 Short-term Bicycle Parking Location

Locate short-term bicycle parking in a highly visible and publicly accessible location at-grade or on the first parking level of the building below grade.

### AQ 2.4 Electric Bicycle Infrastructure

Residential: At least 15% of the required long-term bicycle parking spaces, or one parking space, whichever is greater, shall include an Energized Outlet (120 V) adjacent to the bicycle rack or parking space.

### AQ 2.5 Shower and Change Facilities

Provide shower and change facilities consistent with the rate identified in Chapter 230 of the City-wide Zoning By-law.

### AQ 2.6 Publicly Accessible Bicycle Parking

For all uses within 500m of transit station entrance, provide at least 10 additional publicly accessible, short-term bicycle parking spaces, at-grade on the site or within the public boulevard bicycle parking in addition to parking required under AQ 2.1.



## PEDESTRIAN INFRASTRUCTURE

### AQ 3.1 Connectivity

Provide safe, direct, universally accessible pedestrian routes, including crosswalks and midblock crossings that connect the buildings on-site to the off-site pedestrian network and priority destinations.

### AQ 3.2 Sidewalk Space

Provide a context-sensitive pedestrian clearway that is a minimum of 2.1m wide, to safely and comfortably accommodate pedestrian flow.

### AQ 3.3 Weather Protection

Provide covered outdoor waiting areas for pedestrian comfort and protection from inclement weather.

### AQ 3.4 Pedestrian Specific Lighting

Provide pedestrian-scale lighting that is evenly spaced, continuous and directed onto sidewalks, pathways, entrances, outdoor waiting areas and public spaces.



## OPERATIONAL EMISSIONS REDUCTIONS

### GHG 1.1 Energy Use and Greenhouse Gas Emissions Limits

Using whole-building energy modelling, design the buildings to demonstrate an annual Greenhouse Gas Intensity (GHGI) of 0, and meeting one of the following minimum energy performance options:

- 1) Minimum TEUI of 100 eKWh/m<sup>2</sup>/yr and TEDI of 30 eKWh/m<sup>2</sup>/yr;
- 2) Energy efficiency at a minimum 50% better than Ontario Building Code compliant building (Ontario Building Code, SB-10 Division 3 2017);
- 3) Passive House levels of energy performance including registration and certification;

OR

- 4) Follow the CaGBC Zero Carbon Building Standard v2 (Net Zero) design or performance standard including registration and certification.

*Note: A net-zero emissions building is one that is highly energy-efficient and produces on-site, or procures, carbon-free and or renewable energy in an amount sufficient to offset the annual carbon emissions associated with its operations or simply eliminates carbon emissions altogether. Net zero emissions is determined following the CaGBC Zero Carbon Building Standard methodology.*

### GHG 1.2 Refuge Area and Back-Up Power Generation

Provide 72 hours of back-up power to the refuge area and to essential building systems required during an extended power outage.



## EMBODIED EMISSIONS IN MATERIALS

### GHG 2.1 Material Emissions Assessment

Conduct a Material Emissions Assessment for the structure and envelope in accordance with the CaGBC Zero Carbon Building Standard v2 methodology for the Upfront Carbon lifecycle stage (A1-5). Identify low-carbon sustainable material alternatives to the proposed structure or envelope for use in the building project.

### Low Carbon Pathway Option

### GHG 2.2 Whole Building Life Cycle Assessment

Conduct a whole building life cycle assessment (LCA) of the building's structure and envelope in accordance with the CaGBC Zero Carbon Building Standard v2 methodology that demonstrates a minimum of 20% embodied carbon reduction, compared with a baseline building.

*Note: The City of Toronto is involved in two studies to benchmark embodied carbon in new construction. The results of the studies will refine and replace the targets above to ensure these Performance Measures can best be implemented in the Toronto context.*



## OPERATIONAL SYSTEMS VERIFICATION

### **GHG 5.1 Benchmarking & Reporting**

Enroll the project in ENERGYSTAR® Portfolio Manager to track energy and water consumption of the new development during operations in accordance with O. Reg. 397/11 for public buildings.

### **GHG 5.2 Enhanced Commissioning**

Complete the commissioning process (CxP) activities for mechanical, electrical, plumbing, and renewable energy systems and assemblies in accordance with ASHRAE Guideline 0–2013 and ASHRAE Guideline 1.1–2007 for HVAC&R systems, as they relate to energy, water, indoor environmental quality, and durability, to develop the owner's project requirements and basis of design.

### **GHG 5.3 Whole Building Air Leakage Testing (WBALT)**

Conduct a Whole-building Air Leakage Test to improve the quality and air tightness of the building envelope. The project must target equal to or less than 2 L/s/m<sup>2</sup> (at 75 Pa) through whole-building air infiltration testing, as conducted in accordance with the City of Toronto Air Tightness Testing Protocol & Process Guideline.



### WQ 1.1 Water Balance, Quality Control & Quantity Control

Design the site to achieve all Water Balance, Water Quality and Water Quantity control targets required by the Wet Weather Flow Management Guidelines:

- 1) Water Balance- Retain a minimum of 50% of the total average annual rainfall volume (or equivalent 5 mm from each rainfall event) generated from all site surfaces through infiltration, evapotranspiration, water harvesting and/or reuse, in accordance with the Wet Weather Flow Management Guidelines.
- 2) Water Quality- Provide an enhanced level of protection for water quality through the long-term average removal of 80% of Total Suspended Solids (TSS) on an annual loading basis from all runoff leaving the site, in accordance with the Wet Weather Flow Management Guidelines.

Provide E.coli control for direct discharges to Lake Ontario or for discharges generated from waterfront sites, where deemed necessary and in accordance with the Wet Weather Flow Management Guidelines.

- 3) Water Quantity- Provide peak flow control following applicable Wet Weather Flow Management Guideline requirements for flood flow management, erosion control and discharge to municipal sewers.

### WQ 1.2 Green Streets

Where new streets are proposed, capture and control stormwater runoff to the maximum extent possible, from all contributing drainage areas using Green Infrastructure in accordance with the City's green infrastructure standards and specifications for the Right-of-Way.

### WQ 1.3 On-site Green Infrastructure

Ensure that the total landscaped site area, located at and above grade, includes at least one of the following features:

- A Green Roof covering at least 80% of Available Roof Space;
- An Intensive Green Roof for 80% of the Green Roof Area provided;
- 25% of the Lot Area at or above-grade, planted with native flowering/pollinator species;
- At-grade bioretention facilities provided to capture and control 75% of runoff from on-site hardscape surfaces; or,
- Reforestation of a portion of the site (beyond the limit of a stewardship plan).





Development  
Feature

## WATER EFFICIENCY

### WQ 2.1 Water-Efficient Fixtures

Install water fixtures or use non-potable water sources that achieve at least a 40% cent reduction in potable water consumption for the building (not including irrigation) over the baseline water fixtures.

### WQ 2.2 Efficient Irrigation

Where soft landscaping exists on the site, reduce potable water use for irrigation by 60%.



## TREE CANOPY

### EC 1.1 Tree Planting Areas and Soil

1) Provide the total amount of soil required on the site and in the adjacent public boulevard to support tree canopy by using the following formula:

- $40\% \text{ of the site area} \div 66 \text{ m}^2 \times 30 \text{ m}^3 = \text{total soil volume required}$

2) Each separate new or retained tree planting area must have a minimum volume of  $30\text{m}^3$  of soil.

### EC 1.2 Trees Along Street Frontages

Plant large growing shade trees along street frontages that are spaced appropriately having regard to site conditions and have access to a minimum of  $30 \text{ m}^3$  of soil per tree. Ensure that space is provided to accommodate mature trunk and root flare growth of each tree.

### EC 1.3 Parking Lots

Plant large growing shade trees throughout the parking lot interior at a minimum ratio of 1:5 (one tree planted for every five surface parking spaces supplied).

### EC 1.4 Watering Program

Provide a watering program for trees for at least the first 2 years after planting. Provide a watering and maintenance program for trees for at least the first 4 years after planting.



### EC 2.1 Green & Cool Paving

Use one or a combination of the following strategies to treat at least 75% of the site's non-roof hardscape:

- High-albedo paving materials with an initial solar reflectance of at least 0.33 or SRI of 29;
- Open grid pavement with at least 50% perviousness;
- Shade from existing tree canopy or new tree canopy within 10 years of landscape installation;
- Shade from architectural structures that are vegetated or have an initial solar reflectance of at least 0.33 at installation or and SRI of 29; and
- Shade from structures with energy generation.

### EC 2.2 On-site Landscaping

Plant the at-grade landscaped site area using a minimum of 50% native plants (including trees, shrubs and herbaceous plants) comprising at least two native flowering species that provide continuous bloom throughout all periods over the growing season.

- Where potable water is used for irrigation, native and non-native plants must also be drought-tolerant.
- Do not plant any invasive species.

### EC 2.3 Green and Cool Roofs

For new buildings or building additions with a GFA greater than 100m<sup>2</sup> provide the following:

- Green roof equal to the greater than 50% of the Available Roof Space or the coverage requirement of the Green Roof By-law;
- Cool roof on areas of Available Roof Space not covered by green roof area; and
- Provide a minimum of 50% of the Green Roof Area located at or below the 8th storey as biodiverse green roof.



Development  
Feature

## NATURAL HERITAGE PROTECTION

### EC 3.1 Ravine and Natural Feature Protected Areas and Natural Heritage System

Plant the landscaped area within the Natural Heritage System and the Ravine Protected Area with 100% native plants, ensuring at least 50% of those come from a regionally appropriate seed source (including trees, shrubs and herbaceous plants).

### EC 3.2 Ravine and Protected Area Setbacks and Buffers

Where a setback or a buffer is required within or adjacent to the Natural Heritage System or Ravine and Natural Feature Protection Area, prepare and implement a stewardship plan for the setback, buffer and feature areas located within the property boundary.



Development  
**Feature**

## CLIMATE POSITIVE LANDSCAPES

### EC 4.1 Climate Positive Landscape Design

Enroll the project in the Climate Positive Design Challenge and use the Pathfinder tool calculate the years to carbon positive design. Incorporate low-carbon sustainable material alternatives to the proposed landscape design.

OR

Conduct a lifecycle assessment (LCA) for the landscape design at the Concept Design and Detailed Design stages. Demonstrate a reduction in the carbon impact of the project at Detailed Design milestone. Identify low-carbon sustainable material alternatives to the proposed landscape design.



## BIRD COLLISION DETERRENCE

### EC 5.1 Bird-Friendly Glazing Landscape Design

Use a combination of the following strategies to treat a minimum of 85% all exterior glazing within the greater of first 16 m of the building above grade or the height of the mature tree canopy:

- Visual markers applied to the 1st surface of glass with a maximum spacing of 50 mm x 50 mm;
- Building-integrated structures to mute reflections on glass surfaces or; and
- Non-reflective glass.

Areas where visual markers are required include:

- Fly-through conditions; and
- Elevations facing a High Hazard Area.

### EC 5.2 Rooftop Vegetation

Treat the first 4 m of glazing above the feature and a buffer width of at least 2.5 m on either side of the feature using strategies from EC 5.1.

### EC 5.3 Grate Porosity

Ensure ground level ventilation grates have a porosity of less than 20 mm X 20 mm (or 10 mm x 50 mm).

### EC 5.4 Exterior Lighting

All exterior fixtures must be Dark Sky compliant. Rooftop and exterior facade architectural illumination must be directed downward and turned off between the hours of 10 p.m. and 6 a.m.



## WASTE COLLECTION & STORAGE

### SW 1.1 Waste Collection

#### Residential Uses:

Provide a waste collection and sorting system for garbage, recycling and organics using one of the following:

- A single chute with a tri-sorter,
- Two separate chutes with one of the chutes equipped with a dual sorter,
- Three separate chutes for garbage, recycling, and organics collection on all floors,
- A central waste collection and waste diversion facility on the ground floor for garbage, recycling, and organics collection.

### SW 1.2 Waste Storage Space

#### Residential Uses:

Provide an easily accessible waste storage room with a minimum floor space of 25 m<sup>2</sup> for the first 50 units plus an additional 13 m<sup>2</sup> for each additional 50 units to accommodate containers and the compactor unit.

Provide a cabinet space in all kitchen suites for the segregated collection of: Recyclables, Organics and Garbage.

#### Non-residential Uses:

Provide dedicated areas accessible to waste haulers and building occupants for the collection and storage of garbage, recyclable materials and organics, household hazardous waste and electronic waste for the entire building. Collection and storage areas may be separate locations. Recyclable materials must include mixed paper, corrugated cardboard, glass, plastics, and metals. Take appropriate measures for the safe collection, storage, and disposal of two of the following: batteries, mercury-containing lamps, and electronic waste.

### SW 1.3 Bulky Waste

Residential Uses: Provide a minimum of 10m<sup>2</sup> for bulky items and items eligible for special collection services.

### SW 1.4 Compaction

Residential Uses: Developments with 31 units or above must ensure that all garbage is compacted by means of a compactor unit. The waste storage room must provide sufficient space to accommodate the compactor unit, to accommodate containers and the compactor unit.

### SW 1.5 Household Hazardous Waste

Multi-Unit Residential: Provide a minimum 1 m<sup>2</sup> for every 100 units, of dedicated space for the collection and storage for household hazardous waste and/or electronic waste.



### SW 2.1 Building and Material Reuse

1) Maintain existing structural elements (walls, floors, roofs, and envelopes):

Maintain the existing building structure (including floor and roof decking) and envelope (the exterior skin and framing, excluding window assemblies and non-structural roofing materials) for at least 30% of the project completed floor area.

AND/OR

2) Maintain interior non-structural elements:

Use existing interior non-structural elements (e.g. interior walls, doors, floor coverings and ceiling systems) for at least 30% of the project completed floor area, including additions.

Paths 1 & 2 above can be combined to maintain at least 30% of the project completed floor area.

OR

Whole-Building Life-Cycle Assessment

Conduct a whole building lifecycle assessment (LCA) for the structure and envelope in accordance with GHG 2.1 or 2.2.





## SOURCING OF RAW MATERIALS

### SW 3.1 Sourcing of Raw Materials

Ensure at least 25% (by cost) of the total value of permanently installed building products meet the requirements for at least two of the responsible extraction criteria identified below:

- Extended producer responsibility.
- Bio-based materials. Bio-based products must meet the Sustainable Agriculture Network's Sustainable Agriculture Standard.
- Wood products. Wood products must be certified by the Forest Stewardship Council or CaGBC-approved equivalent.
- Materials reuse. Reuse includes salvaged, refurbished, or reused products.
- Recycled content. Recycled content is the sum of post-consumer recycled content plus one-half the pre-consumer recycled content, based on weight.
- Products sourced (extracted, manufactured and purchased) within 800 km of the project site.



## CONSTRUCTION WASTE MANAGEMENT

### SW 4.1 Construction Waste Management

Manage construction and demolition waste in accordance with O. Reg. 103/94, as amended: Industrial, Commercial and Institutional Source Separation Programs.

### SW 4.2 Construction Waste Diversion

Waste Management Plan and Report

All projects must develop and implement a construction and demolition waste management plan and divert at least 75% of the total construction and demolition material from landfill: diverted materials must include at least four material streams.

OR

Generate less than 100 kg/m<sup>2</sup> of construction and demolition waste through reuse and source reduction design strategies. Salvage or recycle renovation and demolition debris and utilize waste minimizing design strategies for new construction elements. Track all materials generated by the project from start of construction through project completion to determine the project's total waste generation. Include all waste and diverted materials in the calculation of total project waste. Exclude hazardous materials and land-clearing debris from calculations.