

# Toronto Green Standard v4 Sustainability Standards Crosswalk



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## Summary Comparison

**Version 4.0 Toronto Green Standard (TGS)**  
for new Mid to High-Rise Residential and  
Non-Residential Developments

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**LEED® Version 4.0/v4.1**  
Building Design and Construction  
(BD+C) Rating System

**Zero Carbon Building Design Standard 3.0**  
Framework for Designing and Retrofitting  
Buildings to Achieve Zero Carbon

**Passive House**  
Standard in Energy-Efficient Construction

2023

### Purpose

This document is designed to be used in conjunction with the LEED (Leadership in Energy and Environmental Design) v4 Building Design and Construction (BD+C) Rating System, Zero Carbon Building – Design (ZCB-Design) Standard v3 and Passive House (PH) Standard. It provides information on Toronto Green Standard (TGS) Version 4 (v4) requirements, policies, and practices that came into effect on May 1, 2022. The purpose of the Crosswalk is to:

- Identify those cases of selected sustainable design elements where the TGS minimum requirements contribute to LEED credits or achievement of ZCB or PH certification;
- Inform the design community who are familiar with LEED, ZCB or PH, or who are interested in pursuing certification, of the areas of similar intent between LEED v4 BD+C, ZCB-Design and PH, and the TGS v4;
- Help project teams pursuing certification to better understand how their projects may qualify for incentives from the TGS, and;
- Highlight where TGS performance can help projects meet or exceed LEED, ZCB or PH to help achieve certification.

This Crosswalk applies to new development and construction projects covered by the Toronto Green Standard v4 for new Mid to High-rise Residential and Non-Residential developments.

### Toronto Green Standard v4 for Mid-High Rise & Non-residential Development

The Toronto Green Standard is a set of performance measures for sustainable development that address the City of Toronto's environmental pressures and priorities in effect since 2010. The standard has been updated in 2014 (v2), in 2018 (v3), and again in 2022 (v4). The current Version 4 contains three (3) tiers of environmental performance including stepped energy performance and greenhouse gas targets. The basis for the TGS is the Climate Change Action Plan – an aggressive environmental framework aimed at reducing Toronto's greenhouse gas emissions and the Toronto Official Plan which guides land use planning decisions. In 2021 the TransformTO Net Zero Strategy was approved, with interim goals for 2025 and 2030, leading to net zero community-wide greenhouse gas (GHG) emissions by 2040. This updated strategy will reach net zero 10 years earlier than initial proposed, making it one of the most ambitious targets in North America.

There are three standards of the TGS, each relating to different building types:

- Low-Rise Residential (less than 4 storeys),
- Mid to High-Rise Residential & Non-Residential (4 storeys and higher), and,
- City Agency, Corporation and Division Owned Facilities (non-residential development).

Under the Low-Rise Residential and Mid to High-Rise Residential & Non-Residential standards, Tier 1 includes the minimum set of performance measures that are required by the City of Toronto. Tier 2 and 3 feature voluntary, higher-level environmental performance features with incentives. In August 2022, the City of Toronto announced an increase in the Development Charge Refund Initiative to accelerate greater uptake of the higher Tiers, to achieve net zero emissions sooner than 2030. Details of the TGS and how to apply for the development charge refund are available [here](#).

The Toronto Green Standard (TGS) is organized according to the City of Toronto's top five Environmental Drivers (pressures); then divided into a set of Performance Measures (e.g., Cycling

Infrastructure, Water Efficiency). The short form of each Environmental Driver is used in naming the performance measure. For example, *SW1.1 Waste Collection*. The Environmental Drivers are:

- Air Quality (AQ)
- Buildings Energy, Emissions & Resilience (GHG)
- Water Quality & Efficiency (WQ)
- Ecology & Biodiversity (EC)
- Waste and the Circular Economy (SW)

### LEED v4 Building Design and Construction Rating System

LEED v4 BD+C is an international, voluntary rating system for new construction and major renovations of commercial, industrial, and institutional buildings. It is an initiative of the US Green Building Council. Other LEED rating systems address other building sectors (such as homes, commercial interiors, and existing buildings). Details of the rating system are available [here](#).

The rating system is structured into a set of prerequisites and credits. Points are awarded for meeting the requirements of the credits, and the total of the points earned determines the overall certification level achieved (Certified, Silver, Gold, or Platinum). LEED credits are similar in function to TGS Performance Measures; however, the LEED rating system covers a wider range of possible credits. LEED credits and prerequisites are organized into 9 groups. The short form of each is used in naming the prerequisites (P) and credits (C). For example, *MRp1 Storage and Collection of Recyclables*. The groups are:

- Integrative Process (IP)
- Location and Transportation (LT)
- Sustainable Sites (SS)
- Water Efficiency (WE)
- Energy and Atmosphere (EA)
- Materials and Resources (MR)
- Indoor Environmental Quality (IEQ).

The remaining 2 groups provide the opportunity to achieve credits for exceptional performance above the requirements set by LEED, and help project teams focus on their environmental, social equity and public health priorities. These groups include:

- Innovation in Design (ID)
- Regional Priority (RP).

Note that for the purposes of this document LEED v4.0 and LEED v4.1 (as of the July 2022) have been considered.

### Zero Carbon Building Standard

The CAGBC's Zero Carbon Building – Design (ZCB-Design) Standard is a voluntary certification for new construction, major renovations, and existing buildings. The Zero Carbon Building – Design (ZCB-Design) Standard is a made-in-Canada framework for designing and retrofitting buildings to achieve zero carbon. The key components of the ZCB-Design Standard are:

- Zero Carbon Balance
- Low Embodied Carbon
- Limits On Combustion
- Energy Efficiency

New construction and major renovation projects can earn a ZCB-Design certification by modelling a zero carbon balance, demonstrating low embodied carbon, limiting or eliminating onsite combustion, and meeting requirements for highly energy efficient design including high-performance envelope and ventilation systems. Occupied buildings can achieve a ZCB-Performance certification by demonstrating a zero carbon balance over a 12-month operating period. Details of the ZCB-Performance program are available [here](#). The second iteration, Version 2 (v2) of the ZCB-Design Standard, introduces greater rigour while increasing flexibility, to support the goal of transforming all buildings to become zero carbon. ZCB-Design v3 was released in 2022, and represents a response to the changes in the Canadian design and construction market since the launch of ZCB-Design v2 in 2020, and includes for the first time a maximum embodied carbon target. Important updates include restrictions on onsite combustion and a maximum limit on embodied carbon.

ZCB-Design is reviewed in this Crosswalk for alignment between TGS v4 and ZCB-Design v3.

### Passive House Standard

Passive House high-performance building standard is the internationally recognized building certification system, providing third-party verification and a stamp of quality assurance that a building meets the high performance and comfort levels of the Passive House Standard.

Developed by the Passive House Institute, the Passive House concept follows five principles:

1. Super insulated envelopes
2. Airtight construction
3. High-performance glazing
4. Thermal-bridge-free detailing
5. Heat recovery ventilation.

Passive House buildings combine superior thermal comfort with minimum energy consumption. Passive Houses are classified as Classic, Plus or Premium depending on their renewable primary energy (PER) demand and renewable energy generation.

## OVERVIEW OF SIMILARITIES AND DIFFERENCES

The following sections detail the similarities and differences between TGS v4 and LEED, ZCB and PH. High-level tables have been prepared to indicate where requirements of the TGS v4 overlap with one of the certifications.

### LEED v4 BD+C Certification

The LEED v4 BD+C rating system and the TGS v4 are complementary and share many objectives. Several TGS performance measures and LEED v4 credits and prerequisites overlap in design intent.

This document includes three summary comparison tables, as described below.

**Table 1: Tier 1 vs. LEED v4** Comparison of all TGS Tier 1 performance measure requirements and corresponding LEED v4 BD+C credits and prerequisites.

**Table 2: Tier 2 vs. LEED v4** Comparison of all TGS Tier 2 performance measure requirements and corresponding LEED v4 BD+C credits and prerequisites.

**Table 3: Tier 3 vs. LEED v4** Comparison of all TGS Tier 3 performance measure requirements and corresponding LEED v4 BD+C credits and prerequisites.

### Terminology



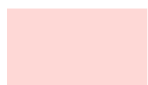
*LEED Additional Requirement.* The corresponding TGS performance measure feature does not entirely meet the requirements of the LEED v4 BD+C credit or prerequisite.



*TGS Additional Requirement.* The corresponding LEED v4 BD+C credit or prerequisite does not entirely meet the requirements of the TGS performance measure.



*Exclusive to TGS:* There is no corresponding LEED v4 BD+C credit or prerequisite.



*LEED Documentation Accepted for TGS Submission:* TGS performance measure and corresponding LEED v4 BD+C credit requirements and documentation are very similar, allowing an exchange of LEED submittals<sup>1</sup>. Cells that have been checked off indicate LEED Documentation is accepted for TGS submission, otherwise, it is not accepted.

<sup>1</sup> Refer to the City of Toronto TGS v4 website for further details on accepted LEED BD+C v4 documentation.

**TABLE 1: Comparison of LEED v4/v4.1 Credits and TGS Tier 1 Mid to High-Rise Residential & Non-Residential Performance Measures**

TGS v4 Tier 1 Performance Measure	LEED v4/v4.1 Credit	Exclusive to TGS	TGS Additional Requirement	LEED Additional Requirement
AQ 1.1 Single-Occupant Vehicle Trips	Various LT Credits		✓	✓
AQ 1.2 Electric Vehicle Infrastructure	LT Electric Vehicles		✓	✓
AQ 2.1 Bicycle Parking Rates	LT Bicycle Facilities		✓	✓
AQ 2.2 Long-term Bicycle Parking Location	LT Bicycle Facilities		✓	✓
AQ 2.3 Short-term Bicycle Parking Location	LT Bicycle Facilities		✓	✓
AQ 2.4 Electric Bicycle Infrastructure		✓		
AQ 2.5 Shower & Change Facilities	LT Bicycle Facilities		✓	✓
AQ 2.6 Publicly Accessible Bicycle Parking		✓		
AQ 3.1 Connectivity		✓		
AQ 3.2 Sidewalk Space		✓		

TGS v4 Tier 1 Performance Measure	LEED v4/v4.1 Credit	Exclusive to TGS	TGS Additional Requirement	LEED Additional Requirement
AQ 3.3 Weather Protection		✓		
AQ 3.4 Pedestrian Specific Lighting		✓		
GHG 1.1 Greenhouse Gas Emissions Limits		✓		
GHG 1.2 Building Energy Performance	EA Optimize Energy Performance: Option 1		✓	✓
WQ 1.1 Water Balance, Quality & Quantity Control	SS Rainwater Management		✓	✓
WQ 1.2 Green Streets	SS Rainwater Management		✓	✓
WQ 1.3 On-site Green Infrastructure	Various LEED Credits		✓	✓
EC 1.1 Tree Planting Areas and Soil Volume		✓		
EC 1.2 Trees Along Street Frontages		✓		
EC 1.3 Parking Lots		✓		
EC 1.4 Watering Program		✓		

TGS v4 Tier 1 Performance Measure	LEED v4/v4.1 Credit	Exclusive to TGS	TGS Additional Requirement	LEED Additional Requirement
EC 2.1 Green & Cool Paving	SS Heat Island Reduction: Option 1		✓	✓
EC 2.2 On-site Landscaping	Various LEED Credits		✓	✓
EC 2.3 Green & Cool Roofs	SS Heat Island Reduction: Option 1		✓	✓
EC 3.1 Ravine & Natural Feature Protected Area Stewardship		✓		
EC 3.2 Ravine & Natural Feature Protected Area and Natural Heritage System		✓		
EC 5.1 Bird Friendly Glazing	IN Bird Collision Deterrence		✓	✓
EC 5.2 Rooftop Vegetation	IN Bird Collision Deterrence		✓	✓
EC 5.3 Grate Porosity		✓		
EC 5.4 Exterior Lighting	SS Light Pollution Reduction		✓	✓
SW 1.1 Waste Collection & Sorting	MR Storage and Collection of Recyclables		✓	✓
SW 1.2 Waste Storage Space	MR Storage and Collection of Recyclables		✓	✓



TGS v4 Tier 1 Performance Measure	LEED v4/v4.1 Credit	Exclusive to TGS	TGS Additional Requirement	LEED Additional Requirement
SW 1.3 Bulky Waste		✓		
SW 1.4 Compaction		✓		
SW 1.5 Household Hazardous Waste	MR Storage and Collection of Recyclables		✓	
SW 4.1 Construction Waste Management	Construction and Demolition Waste Management: Option 1			✓

**TABLE 2: Comparison of LEED v4/v4.1 BD+C Credits and TGS Tier 2 Mid to High-Rise Residential & Non-Residential Performance Measures**

TGS v4 Tier 2 Performance Measure	LEED v4/v4.1 Credit	Exclusive to TGS	TGS Additional Requirement	LEED Additional Requirement	LEED Documentation Accepted for TGS Submission
GHG 1.1 Greenhouse Gas Emissions Limits	EA Optimize Energy Performance: Option 1		✓	✓	
GHG 1.2 Building Energy Performance	EA Optimize Energy Performance: Option 1		✓	✓	
GHG 2.1 Material Emissions Assessment	MR Building Life-cycle Impact Reduction: Option 2 (LEED v4.1), Pilot Credit: MR Procurement of Low Carbon <sup>2</sup>		✓	✓	

<sup>2</sup> Note: pilot credits are subject to change and being closed without notice. Please refer to the USGBC website.

TGS v4 Tier 2 Performance Measure	LEED v4/v4.1 Credit	Exclusive to TGS	TGS Additional Requirement	LEED Additional Requirement	LEED Documentation Accepted for TGS Submission
GHG 3.1 Refuge Area and Back-Up Power Generation	Pilot Credit: Passive Survivability and Back-up Power During Disruptions: Option 1 <sup>3</sup>		✓	✓	
GHG 4.1 Benchmarking & Reporting	EA Building-Level Energy Metering		✓	✓	
GHG 4.2 Enhanced Commissioning	EA Fundamental & Enhanced Commissioning and Verification (LEED v4.1)				✓
GHG 4.3 Whole Building Air Leakage Testing (WBALT)		✓			
WQ 2.1 Water-Efficient Fixtures	WE Indoor Water Use Reduction (40% reduction)				✓
WQ 2.2 Efficient Irrigation	WE Outdoor Water Use Reduction (Option 2, 100% reduction)		✓	✓	✓
EC 4.1 Climate Positive Landscape Design		✓			
SW 1.6 Additional Waste Storage and Sorting Space	MR Storage and Collection of Recyclables		✓	✓	
SW 2.1 Building and Material Reuse	MR Building Life Cycle Impact Reduction: Option 1 (LEED v4.1)				✓

<sup>3</sup> Note: pilot credits are subject to change and being closed without notice. Please refer to the USGBC website.

TGS v4 Tier 2 Performance Measure	LEED v4/v4.1 Credit	Exclusive to TGS	TGS Additional Requirement	LEED Additional Requirement	LEED Documentation Accepted for TGS Submission
SW 3.1 Sourcing of Raw Materials	MR Sourcing of Raw Materials		✓		✓
SW 4.2 Construction Waste Diversion	Construction and Demolition Waste Management: Option 1 & Option 2				✓

**TABLE 3: Comparison of LEED v4/v4.1 BD+C Credits and TGS Tier 3 Mid to High-Rise Residential & Non-Residential Performance Measures**

TGS v4 Tier 3 Performance Measure	LEED v4/v4.1 Credit	Exclusive to TGS	TGS Additional Requirement	LEED Additional Requirement	LEED Documentation Accepted for TGS Submission
GHG 1.1 Greenhouse Gas Emissions Limits	EA Optimize Energy Performance: Option 1		✓	✓	
GHG 1.2 Building Energy Performance	EA Optimize Energy Performance: Option 1		✓	✓	
GHG 2.2 Whole Building Life Cycle Assessment	MR Building Life-cycle Impact Reduction: Option 2 (LEED v4.1)		✓	✓	

## Zero Carbon Building - Design Certification

The TGS v4’s Buildings Energy, Emissions & Resilience development features have been aligned with the ZCB-Design requirements related to operational and embodied carbon. The complementary objectives are highlighted in Table 4 below, identifying where the performance requirements of the TGS Mid to High Rise Development projects achieve ZCB-Design certification. Refer to the [ZCB Design v3 Standard](#) for details, including a description on the Flexible, Renewable and Passive Design Approaches, and up to date requirements.

Additionally, the ZCB-Design certification is accepted as an alternative pathway to TGS v4 GHG1.1 Greenhouse Gas Emissions Limits and GHG 1.2 Building Energy Performance.

**TABLE 4: Comparison of ZCB-Design v3 Standard and TGS v4 Performance Measures**

Building Type	TGS Tier 1	TGS Tier 2	TGS Tier 3	ZCB Design v3
<b>Greenhouse Gas Intensity (kg CO2e/m<sup>2</sup>/yr) Limit</b>				
Multi-unit Residential	15	10	5	Net Zero <sup>4</sup>
Commercial Office	15	8	4	
Commercial Retail	10	5	3	
<b>Thermal Energy Demand Intensity (kWh/m<sup>2</sup>/yr) Limit</b>				
Multi-unit Residential (> 6 storeys)	50	30	15	No On-Site Combustion <sup>5</sup> (Report TEDI only) OR 32 kWh/m <sup>2</sup> /yr (Flexible or Renewable Energy Approach) OR 22 kWh/m <sup>2</sup> /yr (Passive Design Approach)
Multi-unit Residential (≤ 6 storeys)	40	25	15	
Commercial Office	30	22	15	
Commercial Retail	40	25	15	
<b>Total Energy Use Intensity (kWh/m<sup>2</sup>/yr) Limit</b>				
Multi-unit Residential (> 6 storeys)	135	100	75	≤ 110 <sup>6</sup>
Multi-unit Residential (≤ 6 storeys)	130	100	70	≤ 110 <sup>6</sup>
Commercial Office	130	100	65	≤ 100 <sup>6</sup>
Commercial Retail	120	90	70	≤ 90 <sup>6</sup>
<b>Embodied Carbon</b>				
All Building Types	NO	Material Emissions Assessment <sup>7</sup> OR 20% reduction	20% reduction	10% reduction OR ≤500 kg CO <sub>2</sub> e/m <sup>2</sup> AND 20-40% reduction OR ≤240-350 kg CO <sub>2</sub> e/m <sup>2</sup> (Optional Impact and Innovation)

<sup>4</sup> 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.

<sup>5</sup> And demonstrate an equipment seasonal coefficient of performance (COP) ≥2.

<sup>6</sup> ZCB-Design v3 projects can pursue 25% better than NECB 2017 over absolute energy use intensity targets

<sup>7</sup> Materials Emissions Assessment is only accepted if the project is pursuing Path 1 or 2 under SW2.1

### Passive House Certification

Passive House certification is focused on providing a high-performing building enclosure to reduce operational energy use in buildings. Higher certification categories (Passive House Plus, Passive House Premium) are available by further limiting energy use and encouraging renewable energy generation. The Passive House objectives align in intent with TGS v4’s Energy Use and Greenhouse Gas Emissions and Whole Building Air Leakage Testing. Refer to the [Passive House Standard](#) for details and up to date requirements.

Additionally, the Passive House certification is accepted as an alternative pathway to TGS v4 GHG1.1 Energy Use and Greenhouse Gas Emissions Limits.

**TABLE 5: Comparison of Passive House and TGS v4 Performance Measures**

Building Type	TGS Tier 1	TGS Tier 2	TGS Tier 3	Passive House
<b>Greenhouse Gas Intensity (kg CO2e/m<sup>2</sup>/yr)</b>				
Multi-unit Residential	15	10	5	No Carbon Balance Required
Commercial Office	15	8	4	
Commercial Retail	10	5	3	
<b>Thermal Energy Demand Intensity (kWh/m<sup>2</sup>/yr)<sup>8</sup></b>				
Multi-unit Residential (> 6 storeys)	50	30	15	Heating Demand 15 kWh/m <sup>2</sup> /yr
Multi-unit Residential (≤ 6 storeys)	40	25	15	
Commercial Office	30	22	15	
Commercial Retail	40	25	15	
<b>Total Energy Use Intensity (kWh/m<sup>2</sup>/yr)<sup>8</sup></b>				
Multi-unit Residential (> 6 storeys)	135	100	75	Renewable Primary Energy <sup>9</sup> 60 kWh/m <sup>2</sup> /yr
Multi-unit Residential (≤ 6 storeys)	130	100	70	
Commercial Office	130	100	65	
Commercial Retail	120	90	70	
<b>Air Tightness/Infiltration Testing</b>				
All Building Types	NO	2 L/s/m <sup>2</sup> (at 75 Pa)	2 L/s/m <sup>2</sup> (at 75 Pa)	0.6 ACH (at 50 Pa) ~0.89 L/s/m <sup>2</sup> (at 75 Pa)

<sup>8</sup> Applicable floor area in Passive House differs from TGS v4

<sup>9</sup> Renewable primary energy (PER) is the unit of energy generated from renewable resources (e.g. electricity produced by a photovoltaic system). PER-factors reflect the primary renewable resources needed to cover the final energy demand of a building, including distribution and storage losses. PER may have a higher project-specific target for residential and office/administrative buildings with a high occupancy density; buildings with high required ventilation rates, such as hospitals or laboratories; or buildings with a high energy intensity, such as indoor pools or data centers.

**Created By**

WSP Canada Inc. developed this document in consultation with the City Planning Division at the City of Toronto and the Canada Green Building Council, with input from the CaGBC and Passive House Canada.

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