

City of Mississauga

# Green Development Standard



Process and Green Development  
Standard Overview

# Land Acknowledgement

We acknowledge the lands which constitute the present-day City of Mississauga as being part of the Treaty and Traditional Territory of the Mississaugas of the Credit First Nation, The Haudenosaunee Confederacy, and The Huron-Wendat and Wyandot Nations. We recognize these peoples and their ancestors as peoples who inhabited these lands since time immemorial. The City of Mississauga is home to many global Indigenous Peoples.

As a municipality, the City of Mississauga is actively working towards Reconciliation by confronting our past and our present, providing space for Indigenous peoples within their territory, to recognize and uphold their Treaty Rights and to support Indigenous peoples. We formally recognize the Anishinaabe origins of our name and continue to make Mississauga a safe space for all Indigenous peoples.

## Prepared for:

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City of Mississauga

## Prepared by:

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Sustainability Solutions Group (SSG)

## Prepared:

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## Revised:

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# Introduction

In October 2018, the Intergovernmental Panel on Climate Change (IPCC) urged governments to take action to limit global warming to 1.5°C above pre-industrial levels to limit the most harmful impacts of climate change. If global warming continues at the current rate, the IPCC estimates that warming is likely to reach 1.5°C between 2030 and 2052.<sup>1</sup> Achieving the IPCC's goal to limit warming to 1.5°C will require decarbonization of global energy and economic systems, including land use, transportation, energy systems, and buildings, in order to reach net-zero greenhouse gas (GHG) emissions by 2050.

On June 19, 2019, the City of Mississauga responded to the IPCC's call to action by passing a motion declaring a climate emergency. The motion strengthened the City's commitment to climate action and established the framework for the City's Climate Change Action Plan (CCAP) to reduce GHG emissions by 40% by 2030 and by 80% by 2050, compared to 1990 levels. Adopted in 2019, the CCAP outlines 89 actions grouped into the following five action pathways:

1. Buildings and clean energy
2. Resilient and green infrastructure
3. Accelerating discovery and innovation
4. Low emissions mobility
5. Engagement and partnerships

Updating the 2012 Green Development Standard (GDS) was identified as the first action under the "Improve the Energy Efficiency and Climate Resilience of New Buildings" pathway. As identified in Action 3.1, the GDS update project was undertaken to include energy and resilience considerations within building and site features.

In 2023, the City began to update the CCAP to align with the IPCC's recommendations for limiting global warming to 1.5°C. As such, the GDS was developed to align with the IPCC's 1.5°C goal and set Mississauga on the path to achieving this target. This document outlines the City's updated GDS. Its purpose is to help developers and development project teams understand the process and requirements for new development projects in Mississauga.

## About Green Development Standards

GDSs are sets of mandatory or voluntary measures related to environmentally, socially, and economically sustainable design. As described by the Clean Air Partnership, "A GDS Framework encompasses healthy, well-designed communities with integrated green spaces, pedestrian and transit networks, and offers a variety of options for housing, transportation, and employment."<sup>2</sup> Using the site planning authority under the Planning Act, municipalities can use GDSs to set

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<sup>1</sup> IPCC. 2022. Summary for Policymakers [H.-O. Pörtner, et al. (eds.)]. Dans: Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 3–33, oi:10.1017/9781009325844.001.

<sup>2</sup> Clean Air Partnership. 2021. Municipal Green Development Standards: Briefing Note. <https://www.cleanairpartnership.org/wp-content/uploads/2021/10/Municipal-Green-Development-Standards-Final.pdf>

measures for the form and features of new developments to help achieve municipal climate objectives, improve community health and well-being, promote climate resilience, and use municipal infrastructure more efficiently. Since 2010, GDSs have become a common tool applied by Ontario municipalities to new buildings and developments in the residential, institutional, commercial, and industrial (ICI) sectors.

## CORPORATE LEADERSHIP

Mississauga's 2019 Corporate Green Building Standard (CGB) is a comprehensive set of environmental performance requirements designed to complement existing policies and address the gap in the Leadership in Energy and Environmental Design (LEED) Silver standard's energy and emissions requirements. The CGB includes three tiers with targets in 13 key performance areas that have been designed to encourage applicants to achieve the highest level of performance while remaining in the project's given budget and schedule.

In addition to achieving the targets set out in the key performance areas, applicants are encouraged to achieve the following design principles:

1. Ensure specific spatial programming and psychological needs of building occupants and visitors are addressed.
2. Design building systems, materials, and technologies to be mutually supportive.
3. Meet environmental performance targets in a financially sustainable manner.
4. Make use of "simple" systems that are designed for long operational life and lower maintenance costs.

## Mississauga's Green Development Standard and Municipal Growth

Mississauga is undergoing substantial growth—between 2023 and 2051, the city's population is expected to increase by nearly 250,000 new residents.<sup>3</sup> The Official Plan (2022) anticipated that the city will need to accommodate 100,000 new dwelling units over the next 30 years, or approximately 3,300 units per year, and add approximately 113,000 new jobs.<sup>4</sup> Further, the provincial government's housing supply target will rapidly accelerate new growth. To meet the provincial target of 1.5 million new units, Mississauga is expected to deliver 120,000 new dwelling units in the next 10 years.<sup>5</sup>

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<sup>3</sup> City of Mississauga Planning and Building. 2021. City of Mississauga Corporate Report—Population and Employment Forecasts. <https://pubmississauga.escrimemeetings.com/filestream.ashx?DocumentId=10910>

<sup>4</sup> City of Mississauga Draft Official Plan: Appendix 1. 2022. Technical Memo: Mississauga's City Structure and Residential GrowthAccommodation. <https://pub-mississauga.escrimemeetings.com/filestream.ashx?DocumentId=23036>

<sup>5</sup> City of Mississauga. 2023. Growing Mississauga: An Action Plan for New Housing. [https://www.mississauga.ca/wp-content/uploads/2023/03/Growing-Mississauga\\_AnActionPlanforNewHousing\\_web-3.pdf](https://www.mississauga.ca/wp-content/uploads/2023/03/Growing-Mississauga_AnActionPlanforNewHousing_web-3.pdf)

With the absence of remaining greenfield lands in the city limits, development patterns are shifting from low-density, single-detached homes to mixed-use communities and transit-supportive communities. These new community forms will primarily be realized through mid-rise and high-rise residential infill development, as well as neighbourhoods featuring townhouses, singles, duplexes, triplexes, multiplexes, and lower-rise residential buildings. The majority of these new developments will be concentrated in the City's strategic growth areas, known as the Urban Growth Centres, Major Nodes, Community Nodes, and Major Transit Station Areas. These areas are integral to achieving the goal of mixed-use, transit-supportive communities and will allow Mississauga to accommodate the influx of residents and significantly reduce GHG emissions.<sup>6</sup>

The GDS is a pivotal document that will impact the nature and form of the city's new developments. This will impact the lives of those living and working within these buildings, the energy and GHG implications associated with each building, and the operations and characteristics of the city as a whole. Mississauga's GDS presents an opportunity to put the City on track towards reaching its climate targets and achieving its vision for vibrant, safe, and connected communities where all can live, work, and prosper.<sup>7</sup> The updated GDS will replace the 2010 Green Development Strategy and will allow the City to reduce GHG emissions and integrate climate resilience into new residential and ICI buildings.

## Updating the Green Development Standards

The GDS is the City's opportunity to embed climate change, climate resilience, and environmental priorities into how the city grows. The update was undertaken with the aim to:

- Ensure Mississauga meets its GHG targets of a 40% reduction below 1990 levels by 2030 and an 80% reduction by 2050;
- Develop a low-energy, low-carbon, climate-resilient, and sustainable approach for new private developments that is also financially feasible;
- Support implementation of climate-resilient design and technological innovations;
- Support implementation of simple and passive systems that are designed for long operational life, lower maintenance costs, and reduced infrastructure impacts; and
- Ensure site features, building systems, and technologies are designed to be mutually supportive of one another.

As new development affects all members of the community, a comprehensive Engagement Plan was created to ensure all interested and affected parties<sup>8</sup> were given the opportunity to inform and provide feedback in the creation of the GDS. Interested and affected parties were made up of representatives from Mississauga's community, and during the development of the GDS, these parties were engaged through the following techniques:

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<sup>6</sup> City of Mississauga. 2023. Growing Mississauga: An Action Plan for New Housing. [https://www.mississauga.ca/wp-content/uploads/2023/03/Growing-Mississauga\\_AnActionPlanforNewHousing\\_web-3.pdf](https://www.mississauga.ca/wp-content/uploads/2023/03/Growing-Mississauga_AnActionPlanforNewHousing_web-3.pdf)

<sup>7</sup> City of Mississauga. Our Future Mississauga Strategic Plan. [https://www.mississauga.ca/file/COM/StrategicPlan\\_Web\\_04\\_22\\_2009.pdf](https://www.mississauga.ca/file/COM/StrategicPlan_Web_04_22_2009.pdf)

<sup>8</sup> Any person, group of individuals, or organization interested in or affected by the Project.

## PROGRAM OVERVIEW

- Workshops with the City of Mississauga's internal departments;
- Workshops and interviews with regional and utility partners, residential developers, institutional, commercial and industrial (ICI) developers, and youth representatives;
- A forum with representatives from Indigenous communities hosted in collaboration with the Town of Caledon; and
- A community survey and release of the GDS draft, which was open for comments from all interested and affected parties.



Figure 1. Summary of interested and affected parties engaged throughout the GDS project.

In addition to addressing feedback from the interested and affected parties, the GDS was developed to meet the following priorities:

- Ease the process for city staff and applicants by being direct, simple, and verifiable;
- Advance climate change resilience and establish a pathway to net zero;
- Align with existing standards, including the City's Corporate Green Building Standards, Toronto Green Standard, and GTA municipalities' GDSs;
- Avoid conflict with existing City standards or programs; and
- Provide the City with the authority to implement it through the Planning Act, the Official Plan, and Site Plan approval.

# Mississauga's Vision and Guiding Principles

The vision statement is the "compass" that provides a clear image of where the City of Mississauga wants to be in the medium to long term. It captures the City's aspirations and spirit, not what it will do to get there or how. Guiding principles establish a framework for decisionmaking. They steer decisions, planning, and practices in organizations or endeavours.

Mississauga's GDS vision statement and guiding principles were developed to align with the City's Strategic Plan, Climate Change Action Plan, and Official Plan.

## VISION STATEMENT

Mississauga will be a low-carbon and resilient<sup>9</sup> community. We will find innovative and creative ways to create vibrant, safe, and connected communities that respect and celebrate the rich diversity of our cultures and natural environment.

## GUIDING PRINCIPLES

1. Provide a pathway to achieve net-zero building emissions by 2030.
2. Build climate-resilient communities and infrastructure.
3. Promote clean air and healthy lifestyles.
4. Support a prosperous and sustainable local economy.
5. Reduce impacts on the natural environment and enhance ecosystem services.
6. Enhance social equity and improve quality of life.

## THEMES AND METRICS

Mississauga's GDS has been designed as three tiers of performance across five themes: energy and building performance, climate impacts, resilience, ecology, and natural systems. **Mandatory Metrics** (Appendix A) provide the mandatory minimum criteria needed to be met across all themes and measures for the project to be approved. All metrics are mandatory unless a metric exemption is discussed during the application process. The subsequent tiers include increased performance criteria, all of which need to be achieved to meet the next tier. **High-Performance Metrics** (Appendix B) provide additional criteria for Tier 2 and Tier 3 across all themes and measures.

### Theme 1: Energy and Building Performance



The energy and building performance theme is designed to ensure energy-efficient design, construction, and operational practices. Energy-efficient buildings reduce emissions, enhance the building envelope and mechanical system performance, decrease operating costs, and improve occupant health and comfort. This theme, driven by Mississauga's GDS guiding principles and vision statement, provides a pathway to achieve net-zero-ready buildings by 2030.

### Theme 2: Climate Impact



The climate change theme is designed to reduce climate impacts through the duration of the building's life cycle and occupancy. Establishing performance requirements for low embodied carbon and construction waste reduction can reduce the building's climate impact by reducing GHG emissions generated upstream of building occupancy. In addition, performance measures such as cycling amenities, interior waste facilities, and electric vehicle charging stations can all support occupants in developing behaviour changes to reduce GHG emissions.

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<sup>9</sup> Mississauga's CCAP identifies climate-resilient communities as those that are safeguarded against climate change impacts so that there is greater protection from the economic, social, and psychological costs of property damage from severe weather events. Climate resilience in Mississauga's GDS involves social, economic, or environmental systems and their capacity to cope with hazardous events or disturbances.

## Theme 3: Resilience



The resilience theme has been designed to enhance the climate resilience of new development and ensure new buildings maintain minimum functions during extreme weather and climate events. In addition, these measures are designed to support developments in achieving the EB1: Energy Performance targets for GHGI, TEUI, and TEDI. These performance measures include emissions-free energy and storage (R1), refuge, and back-up power generation (R2).

## Theme 4: Ecology



The ecology theme has been designed to reduce negative impacts on local wildlife and bird populations. It uses mandatory measures for bird-friendly design and exterior lighting to protect local bird populations and reduce the negative impacts on local wildlife. However, there is considerable overlap between the ecology theme and the natural systems theme, as implementing these measures will have complementary effects on the entire natural environment in Mississauga.

## Theme 5: Natural Systems



The natural systems theme is designed to mitigate the impacts of development on the natural environment and foster resilient natural ecosystems. The integration of these measures will enhance biodiversity, improve water quality, and alleviate the burden on existing infrastructure, ultimately creating a more ecologically balanced and sustainable environment. On a social level, these measures are designed to elevate the well-being and quality of life for residents. This is accomplished by providing accessible green spaces, fostering community cohesion, and promoting physical and mental health. From an economic perspective, incorporating natural systems measures yields long-term cost savings. This is achieved by reducing maintenance expenses and curbing energy consumption, primarily through the optimization of passive cooling and heating systems.



# Appendix A: Mandatory Performance Requirements

## Theme 1: Energy and Building Performance



METRIC	DEVELOPMENT TYPE	TIER 1 MANDATORY REQUIREMENTS
<b>EB1: ENERGY PERFORMANCE</b>	Low-Rise Residential	Design, construct and label the building(s) to achieve at least ENERGY STAR® for New Homes, version 17.1 or R-2000 requirements.
	Mid-Rise and High-Rise Multi-Unit Residential	GHGI: 15 kgCO <sub>2</sub> e/m <sup>2</sup> /yr TEUI: 135 kWh/m <sup>2</sup> TEDI: 50 kWh/m <sup>2</sup>
	Institutional and Commercial	Commercial office and institutional: GHGI: 15 kgCO <sub>2</sub> e/m <sup>2</sup> /yr TEUI: 130 kWh/m <sup>2</sup> TEDI: 30 kWh/m <sup>2</sup>  Commercial retail: GHGI: 10 kgCO <sub>2</sub> e/m <sup>2</sup> /yr TEUI: 120 kWh/m <sup>2</sup> TEDI: 40 kWh/m <sup>2</sup>
	Industrial	GHGI: 15 CO <sub>2</sub> e/m <sup>2</sup> /yr TEUI: 130 kWh/m <sup>2</sup> TEDI: 60 kWh/m <sup>2</sup>

## Theme 2: Climate Impact



METRIC	DEVELOPMENT TYPE	TIER 1 MANDATORY REQUIREMENTS
<b>C11: EMBODIED CARBON</b>	Low-Rise Residential	Conduct an Upfront Embodied Emissions Assessment to measure A1-A3 life cycle stage emissions for all structural, enclosure and major finishes.
	Mid-Rise and High-Rise Multi-Unit Residential	Conduct an Upfront Embodied Emissions Assessment for A1-A5 life cycle stage emissions in accordance with the CAGBC Zero Carbon Building Standard.
	Institutional and Commercial	
	Industrial	

METRIC	DEVELOPMENT TYPE	TIER 1 MANDATORY REQUIREMENTS
CI2: EMBODIED CARBON	Institutional and Commercial	Equip 10% of all parking spaces with an energized outlet Level 2 charging or higher installed adjacent to the space for the purpose of EV charging .
	Industrial	Provide signage indicating that the spaces with chargers are for customers and/or employees.

## Theme 3: Resilience



METRIC	DEVELOPMENT TYPE	TIER 1 MANDATORY REQUIREMENTS
R1: EMISSIONS FREE ENERGY AND STORAGE	Low-Rise Residential	Provide a minimum of 5% of building's annual energy consumption from one or a combination of acceptable renewable energy sources.  OR  Meet the NRCan Solar Ready Guidelines for solar domestic hot water and photovoltaic systems.
	Mid-Rise and High-Rise Multi-Unit Residential	
	Institutional and Commercial	Provide a minimum of 5% of building's annual energy consumption from one or a combination of acceptable renewable energy sources.
	Industrial	

METRIC	DEVELOPMENT TYPE	TIER 1 MANDATORY REQUIREMENTS
<b>R2: REFUGE AND BACK-UP POWER GENERATION</b>	Low-Rise Residential	Submit Resilience Planning Checklist.
		Submit Resilience Planning Checklist.
	Mid-Rise and High-Rise Multi-Unit Residential	Provide a refuge area with heating, cooling, lighting, potable water, and power available.
		Provide 24 hours of back-up power.
	Institutional and Commercial	Commercial office and institutional buildings: provide a refuge area with heating, cooling, lighting, potable water, and back-up power available, and
		Provide 24 hours of back-up power.
		Commercial office, retail, and institutional buildings: Submit Resilience Planning Checklist.
	Industrial	Submit Resilience Planning Checklist.
		Provide a refuge area with heating, cooling, lighting, potable water, and back-up power available.
		Provide 24 hours of back-up power.

## Theme 4: Ecology



METRIC	DEVELOPMENT TYPE	TIER 1 MANDATORY REQUIREMENTS
<b>E1: BIRD FRIENDLY GLAZING AND DESIGN</b>	Low-Rise Residential	Align bird-friendly designs with Canadian Standards Association A460: 19: Bird Friendly Design standards for treatment of glazing materials, building integrated permanent structures, and overall building and site design.
	Mid-Rise and High-Rise Multi-Unit Residential	
	Institutional and Commercial	
	Industrial	
<b>E2: EXTERIOR LIGHTING</b>	Low-Rise Residential	All exterior fixtures must be Dark Sky compliant and all rooftop and exterior facade architectural illumination must be directed downward.
	Mid-Rise and High-Rise Multi-Unit Residential	
	Institutional and Commercial	
	Industrial	

## Theme 5: Natural Systems



METRIC	DEVELOPMENT TYPE	TIER 1 MANDATORY REQUIREMENTS
<b>NS1: HEAT ISLAND EFFECT</b>	Low-Rise Residential	Use combination of the following strategies to treat at least 75% of the site's (non-roof) hardscape: <ul style="list-style-type: none"> <li>• High-albedo paving materials.</li> <li>• Open grid pavement and/or permeable surfaces.</li> <li>• Shade from existing or new tree canopy.</li> <li>• Shade from energy generation structures.</li> </ul>
	Mid-Rise and High-Rise Mult-Unit Residential	Use combination of the following strategies to treat at least 50% of the site's (non-roof) hardscape: <ul style="list-style-type: none"> <li>• High-albedo paving materials.</li> <li>• Open grid pavement and/or permeable surfaces.</li> <li>• Shade from existing or new tree canopy.</li> <li>• Shade from energy generation structures.</li> </ul>
	Institutional and Commercial	Use combination of the following strategies to treat at least 50% of the site's (non-roof) hardscape: <ul style="list-style-type: none"> <li>• High-albedo paving materials.</li> <li>• Open grid pavement and/or permeable surfaces.</li> <li>• Shade from existing or new tree canopy.</li> <li>• Shade from energy generation structures.</li> </ul>
	Industrial	Use combination of the following strategies to treat at least 50% of the site's (non-roof) hardscape: <ul style="list-style-type: none"> <li>• High-albedo paving materials.</li> <li>• Open grid pavement and/or permeable surfaces.</li> <li>• Shade from existing or new tree canopy.</li> <li>• Shade from energy generation structures.</li> </ul>
<b>NS2: TREE GROWTH</b>	Low-Rise Residential	Plant 'shade trees' 6-8 m (20- 27 ft.) apart along the street frontages, and should be drought tolerant and non-invasive.
	Mid-Rise and High-Rise Mult-Unit Residential	Plant 'shade trees' 6-8 m (20- 27 ft.) apart along the street frontages, and should be drought tolerant and non-invasive.
	Institutional and Commercial	Provide adequate rooting space to support tree health and growth, through the minimum soil volume of 30m <sup>3</sup> for each new tree.
	Industrial	Provide adequate rooting space to support tree health and growth, through the minimum soil volume of 30m <sup>3</sup> for each new tree.

METRIC	DEVELOPMENT TYPE	TIER 1 MANDATORY REQUIREMENTS
<b>NS3: CLIMATE-RESILIENT LANDSCAPES</b>	Low-Rise Residential	In all landscaped areas, including green roofs, plant a minimum of 50% native plants and comply with Ontario Invasive Plant Council Guidelines, including:
	Mid-Rise and High-Rise Multi-Unit Residential	<ul style="list-style-type: none"> <li>Minimum of 2 native flowering species to provide continuous bloom throughout the growing season to support pollinators.</li> <li>Preference for drought tolerant native species.</li> </ul>
	Institutional and Commercial	For vegetated buffer areas, adjacent significant natural features, plant 100% native plants.
	Industrial	Provide a natural heritage restoration and/or enhancement plan with the proposed locations of natural heritage restoration, design specifications, and ecological function.
<b>NS4: SUSTAINABLE ROOFS</b>	Low-Rise Residential	Buildings with an available roof area larger than 500m <sup>2</sup> must include one or a combination of green roof, cool roof, blue roof and/or solar PV:
	Mid-Rise and High-Rise Multi-Unit Residential	<ul style="list-style-type: none"> <li>Green roof and/or blue roof for at least 50% of Available Roof Space.</li> <li>Cool roof installed for 100% of Available Roof Space.</li> <li>Use a combination of a green, blue, cool roof or solar PV for at least 75% of Available Roof Space.</li> </ul>
	Institutional and Commercial	
	Industrial	

# Appendix B: High Performance Requirements

## Theme 1: Energy and Building Performance



METRIC	DEVELOPMENT TYPE	TIER 2 REQUIREMENTS	TIER 3 REQUIREMENTS
<b>EB1: ENERGY PERFORMANCE</b>	Low-Rise Residential	Design and construct the building in accordance with the CHBA Net Zero-Ready Home Labelling Program.	Design and construct the building in accordance with the CHBA Net Zero Home Labelling Program or Passive House Standards.
	Mid-Rise and High-Rise Mult-Unit Residential	GHGI: 10 kgCO <sub>2</sub> e/m <sup>2</sup> /yr TEUI: 100 kWh/m <sup>2</sup> TEDl: 30 kWh/m <sup>2</sup>	GHGI: 5 kgCO <sub>2</sub> e/m <sup>2</sup> /yr TEUI: 75 kWh/m <sup>2</sup> TEDl: 15 kWh/m <sup>2</sup>
	Institutional and Commercial	Office and institutional: GHGI: 8 kgCO <sub>2</sub> e/m <sup>2</sup> /yr TEUI: 100 kWh/m <sup>2</sup> TEDl: 22 kWh/m <sup>2</sup>	Office and institutional: GHGI: 5 kgCO <sub>2</sub> e/m <sup>2</sup> /yr TEUI: 65 kWh/m <sup>2</sup> TEDl: 15 kWh/m <sup>2</sup>
		Retail: GHGI: 5 kgCO <sub>2</sub> e/m <sup>2</sup> /yr TEUI: 90 kWh/m <sup>2</sup> TEDl: 25 kWh/m <sup>2</sup>	Retail: GHGI: 5 kgCO <sub>2</sub> e/m <sup>2</sup> /yr TEUI: 70 kWh/m <sup>2</sup> TEDl: 15 kWh/m <sup>2</sup>
	Industrial	GHGI: 10 kgCO <sub>2</sub> e/m <sup>2</sup> /yr TEUI: 100 kWh/m <sup>2</sup> TEDl: 50 kWh/m <sup>2</sup>	GHGI: 5 kgCO <sub>2</sub> e/m <sup>2</sup> /yr TEUI: 70 kWh/m <sup>2</sup> TEDl: 37 kWh/m <sup>2</sup>

METRIC	DEVELOPMENT TYPE	TIER 2 REQUIREMENTS	TIER 3 REQUIREMENTS
<b>EB2: AIR TIGHTNESS TESTING</b>	Low-Rise Residential	Conduct a whole-building air leakage test to improve the quality and airtightness of the building envelope.	Achieve Tier 2 requirements, plus:
	Mid-Rise and High-Rise Multi-Unit Residential	Target equal to or less than 2.0 L/s/m <sup>2</sup> (at 75 Pa) through whole-building air infiltration testing.	Target equal to or less than 1.0 L/s/m <sup>2</sup> (at 75 Pa) through whole-building air infiltration testing.
	Institutional and Commercial	Conduct a whole-building air leakage test to improve the quality and airtightness of the building envelope.	Achieve Tier 2 requirements, plus:  Target equal to or less than through whole-building air infiltration testing: <ul style="list-style-type: none"> <li>• Retail and institutional: 2.5 L/s/m<sup>2</sup> (at 75 Pa).</li> <li>• Office: 2.0 L/s/m<sup>2</sup> (at 75 Pa).</li> </ul>
	Industrial	Conduct a whole-building air leakage test to improve the quality and airtightness of the building envelope.	Achieve Tier 2 requirements, plus:  Target equal to or less than 3.0 L/s/m <sup>2</sup> (at 75 Pa) through whole-building air infiltration testing.
<b>EB3: BENCHMARKING AND COMMISSIONING</b>	Low-Rise Residential	Enrol the project in ENERGY STAR® Portfolio Manager to benchmark and report on operational energy performance.	Achieve Tier 2 requirements.
	Mid-Rise and High-Rise Multi-Unit Residential	Complete the following commissioning (Cx) process activities for mechanical, electrical, plumbing, and renewable energy systems and assemblies, in accordance with ASHRAE Guideline 0-2005 and ASHRAE Guideline 1.1-2007 for HVAC&R Systems, as they relate to energy, water, indoor environmental quality, and durability.	
	Institutional and Commercial		
	Industrial		

## Theme 2: Climate Impact



METRIC	DEVELOPMENT TYPE	TIER 2 REQUIREMENTS	TIER 3 REQUIREMENTS
<b>C11: EMBODIED CARBON</b>	Low-Rise Residential	Conduct an Upfront Embodied Emissions Assessment to measure A1-A3 life cycle stage emissions for all structural, enclosure and major finishes- demonstrate an emissions intensity of less than 133 kg CO <sub>2</sub> /m <sup>2</sup> .	Achieve Tier 2 requirements, plus:  Demonstrate an emissions intensity of less than 100 kg CO <sub>2</sub> /m <sup>2</sup> .
	Mid-Rise and High-Rise Mult-Unit Residential	Conduct an Upfront Embodied Emissions Assessment for A1-A5 life cycle stage emissions in accordance with the CAGBC Zero Carbon Building Standard - demonstrate an emissions intensity of less than 330 kg CO <sub>2</sub> /m <sup>2</sup> .	Achieve Tier 2 requirements, plus:  Demonstrate an emissions intensity of less than 250 kg CO <sub>2</sub> /m <sup>2</sup> .
	Institutional and Commercial	Conduct an Upfront Embodied Emissions Assessment for A1-A5 life cycle stage emissions in accordance with the CAGBC Zero Carbon Building Standard - demonstrate an emissions intensity of less than 270 kg CO <sub>2</sub> /m <sup>2</sup> (commercial) and 370 kg CO <sub>2</sub> /m <sup>2</sup> (institutional).	Achieve Tier 2 requirements, plus:  Demonstrate an emissions intensity of less than 200 kg CO <sub>2</sub> /m <sup>2</sup> (commercial) and 275 kg CO <sub>2</sub> /m <sup>2</sup> (institutional).
	Industrial	Conduct an Upfront Embodied Emissions Assessment for A1-A5 life cycle stage emissions in accordance with the CAGBC Zero Carbon Building Standard- demonstrate an emissions intensity of less than 370 kg CO <sub>2</sub> /m <sup>2</sup> .	Achieve Tier 2 requirements, plus:  Demonstrate an emissions intensity of less than 275 kg CO <sub>2</sub> /m <sup>2</sup> .



METRIC	DEVELOPMENT TYPE	TIER 2 REQUIREMENTS	TIER 3 REQUIREMENTS
<b>CI2: EV CHARGING INFRASTRUCTURE</b>	Low-Rise Residential	MURBs with garages, driveways, or adjacent parking spaces: provide electrical infrastructure capable of supplying Level 2 charging or higher.	MURBs with garages, driveways, or adjacent parking spaces: provide electrical infrastructure capable of supplying Level 2 charging or higher.
	Mid-Rise and High-Rise Mult-Unit Residential	<p>MURBs with above or below ground parking structures:</p> <ul style="list-style-type: none"> <li>Equip 25% of resident parking spaces (including car share) with Level 2 or higher EVSE, and remaining spaces with an energized outlet adjacent to the space for purpose of EV charging (EV-Ready), and</li> <li>Equip a minimum of 1 visitor parking space with Level 2 or higher EVSE.</li> </ul>	<p>MURBs with above or below ground parking structures:</p> <ul style="list-style-type: none"> <li>Equip 30% of resident parking spaces (including car share) with Level 2 or higher EVSE, and remaining spaces with an energized outlet adjacent to the space for purpose of EV charging (EV-Ready), and</li> <li>Equip a minimum of 1 visitor parking space with Level 2 or higher EVSE.</li> </ul>
	Institutional and Commercial	<p>Equip 20% of all parking spaces with an energized outlet Level 2 charging or higher installed adjacent to the space for the purpose of EV charging, and provide signage indicating that spaces with chargers are for customers and/or employees</p> <p>OR</p> <p>Achieve the following requirements:</p> <ul style="list-style-type: none"> <li>Equip 5% of parking spaces with an energized outlet installed adjacent to the space for the purpose of EV charging.</li> <li>Equip 10% of parking spaces (minimum one space) Level 2 or higher EVSE.</li> <li>Equip 5% of spaces (minimum one space) Level 3 EVSE, and</li> <li>Provide signage indicating that spaces with chargers are for customers and/or employees.</li> </ul>	<p>Equip 30% of all parking spaces with an energized outlet Level 2 charging or higher installed adjacent to the space for the purpose of EV charging, and provide signage indicating that spaces with chargers are for customers and/or employees</p> <p>OR</p> <p>Achieve the following requirements:</p> <ul style="list-style-type: none"> <li>Equip 10% of parking spaces with an energized outlet installed adjacent to the space for the purpose of EV charging.</li> <li>Equip 15% of parking spaces (minimum one space) Level 2 or higher EVSE.</li> <li>Equip 5% of spaces (minimum one space) Level 3 EVSE, and</li> <li>Provide signage indicating that spaces with chargers are for customers and/or employees.</li> </ul>
	Industrial	<p>Achieve the following requirements:</p> <ul style="list-style-type: none"> <li>Equip 5% of parking spaces with an energized outlet installed adjacent to the space for the purpose of EV charging.</li> <li>Equip 10% of parking spaces (minimum one space) Level 2 or higher EVSE.</li> <li>Equip 5% of spaces (minimum one space) Level 3 EVSE, and</li> <li>Provide signage indicating that spaces with chargers are for customers and/or employees.</li> </ul>	<p>Achieve the following requirements:</p> <ul style="list-style-type: none"> <li>Equip 10% of parking spaces with an energized outlet installed adjacent to the space for the purpose of EV charging.</li> <li>Equip 15% of parking spaces (minimum one space) Level 2 or higher EVSE.</li> <li>Equip 5% of spaces (minimum one space) Level 3 EVSE, and</li> <li>Provide signage indicating that spaces with chargers are for customers and/or employees.</li> </ul>

METRIC	DEVELOPMENT TYPE	TIER 2 REQUIREMENTS	TIER 3 REQUIREMENTS
<b>CI3: CONSTRUCTION WASTE MANAGEMENT</b>	Low-Rise Residential	Develop and implement a construction and demolition waste management plan, and divert at least 75% of total construction and demolition material from landfill	Develop and implement a construction and demolition waste management plan, and divert at least 90% of total construction and demolition material from landfill
	Mid-Rise and High-Rise Mult-Unit Residential	OR Produce 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.	OR Produce less than 75 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.
	Institutional and Commercial		
	Industrial		
<b>CI4: WASTE INFRASTRUCTURE</b>	Low-Rise Residential	Provide a shared access to central waste collection and waste diversion, and a minimum of three waste streams are required at each collection station: garbage, recycling, and composting.	Achieve Tier 2, plus: Provide a minimum of 1m <sup>2</sup> for every 100 units of dedicated household hazardous waste and electronic waste collection space.
	Mid-Rise and High-Rise Mult-Unit Residential	The room must be accessible with a minimum floor space of 25m <sup>2</sup> for the first 50 units plus an additional 13m <sup>2</sup> for each additional 50 units.	Provide in-cabinet space in all kitchen sets for three waste stream sorting: garbage, recycling, and composting.

METRIC	DEVELOPMENT TYPE	TIER 2 REQUIREMENTS	TIER 3 REQUIREMENTS
<b>C15: BICYCLE PARKING AND AMENITIES</b>	Low-Rise Residential	Bike repair station: provide at least 1 bike repair station in a publicly accessible location at grade or on the first parking level of the build below grade.	Achieve Tier 2 requirements.
	Mid-Rise and High-Rise Mult-Unit Residential	Electric bicycle charging infrastructure: equip the greater of 15% of the long-term bike parking, or a total of 1 space, with an Energized Outlet (120V) adjacent to the bicycle rack or parking spaces.	
	Institutional and Commercial	Bike repair station: provide at least 1 bike repair station in a publicly accessible location at grade or on the first parking level of the build below grade.	Achieve Tier 2 requirements.
		Electric bicycle charging infrastructure: equip the greater of 15% of the long-term bike parking, or a total of 1 space, with an Energized Outlet (120V) adjacent to the bicycle rack or parking spaces.	
	Industrial	Shower and changing facilities: provide 1 on-site shower with changing facility for the first 100 regular building occupants, and 1 additional shower for every 150 regular building occupants thereafter (commercial office and institutional only).	Achieve Tier 2 requirements.
		Bike repair station: provide at least 1 bike repair station in a publicly accessible location at grade or on the first parking level of the build below grade.	
		Electric bicycle charging infrastructure: equip the greater of 15% of the long-term bike parking, or a total of 1 space, with an Energized Outlet (120V) adjacent to the bicycle rack or parking spaces.	

## Theme 3: Resilience



METRIC	DEVELOPMENT TYPE	TIER 2 REQUIREMENTS	TIER 3 REQUIREMENTS
<b>R1: EMISSIONS FREE ENERGY AND STORAGE</b>	Low-Rise Residential		
	Mid-Rise and High-Rise Multi-Unit Residential	Provide a minimum of 15% of building's annual energy consumption from one or a combination of acceptable renewable energy sources.	Provide a minimum of 50% of building's annual energy consumption from one or a combination of acceptable renewable energy sources.
	Institutional and Commercial		
	Industrial		
<b>R2: REFUGE AND BACK-UP POWER GENERATION</b>	Low-Rise Residential	Submit Resilience Planning Checklist.	Achieve Tier 2 requirements.
		Submit Resilience Planning Checklist.	
	Mid-Rise and High-Rise Multi-Unit Residential	Provide a refuge area with heating, cooling, lighting, potable water, and power available.	Achieve Tier 2 requirements, plus: Provide 72 hours of back-up power.
		Provide 48 hours of back-up power.	
	Institutional and Commercial	Office and institutional: provide refuge area with heating, cooling, lighting, potable water, and back-up power available. Provide 48 hours of back-up power.	Office and institutional: provide refuge area with heating, cooling, lighting, potable water, and back-up power available Provide 72 hours of back-up power.
		All commercial and institutional: Submit Resilience Planning Checklist.	All commercial and institutional: Submit Resilience Planning Checklist.
		Submit Resilience Planning Checklist.	
	Industrial	Provide refuge area with heating, cooling, lighting, potable water, and back-up power available.	Achieve Tier 2 requirements, plus: Provide 72 hours of back-up power.
		Provide 48 hours of back-up power.	

## Theme 4: Ecology



METRIC	DEVELOPMENT TYPE	TIER 2 REQUIREMENTS	TIER 3 REQUIREMENTS
<b>E1: BIRD FRIENDLY GLAZING AND DESIGN</b>	Low-Rise Residential	Align bird-friendly designs with Canadian Standards Association A460: 19: Bird Friendly Design standards for treatment of glazing materials, building integrated permanent structures, and overall building and site design.	Achieve Tier 2 requirements.
	Mid-Rise and High-Rise Multi-Unit Residential		
	Institutional and Commercial		
	Industrial		
<b>E2: EXTERIOR LIGHTING</b>	Low-Rise Residential	All exterior fixtures must be Dark Sky compliant and all rooftop and exterior facade architectural illumination must be directed downward.	Achieve Tier 2 requirements.
	Mid-Rise and High-Rise Multi-Unit Residential		
	Institutional and Commercial		
	Industrial		

## Theme 5: Natural Systems



METRIC	DEVELOPMENT TYPE	TIER 2 REQUIREMENTS	TIER 3 REQUIREMENTS	
NS1: HEAT ISLAND EFFECT	Low-Rise Residential	Use combination of the following strategies to treat at least 90% of the site’s (non-roof) hardscape: <ul style="list-style-type: none"><li>• High-albedo paving materials.</li><li>• Open grid pavement and/ or permeable surfaces.</li></ul>	Achieve Tier 2 requirements.	
	Mid-Rise and High-Rise Mult-Unit Residential	<ul style="list-style-type: none"><li>• Shade from existing or new tree canopy.</li><li>• Shade from energy generation structures.</li></ul>		
	Institutional and Commercial	Use combination of the following strategies to treat at least 75% of the site’s (non-roof) hardscape: <ul style="list-style-type: none"><li>• High-albedo paving materials.</li><li>• Open grid pavement and/ or permeable surfaces.</li></ul>	Achieve Tier 2 requirements.	
	Industrial	<ul style="list-style-type: none"><li>• Shade from existing or new tree canopy.</li><li>• Shade from energy generation structures.</li></ul>		
	NS2: TREE GROWTH	Low-Rise Residential	Plant ‘shade trees’ 6-8 m (20- 27 ft.) apart along the street frontages, and should be drought tolerant and non-invasive.	Achieve Tier 2 requirements.
		Mid-Rise and High-Rise Mult-Unit Residential		
Institutional and Commercial		Provide adequate rooting space to support tree health and growth, through the minimum soil volume of 30m³ for each new tree.		
Industrial				

METRIC	DEVELOPMENT TYPE	TIER 2 REQUIREMENTS	TIER 3 REQUIREMENTS
<b>NS3: CLIMATE RESILIENT LANDSCAPES</b>	Low-Rise Residential	In all landscaped areas, including green roofs, plant a minimum of 75% native plants and comply with Ontario Invasive Plant Council Guidelines, including: <ul style="list-style-type: none"> <li>Minimum of 2 native flowering species to provide continuous bloom throughout the growing season to support pollinators.</li> <li>Preference for drought tolerant native species.</li> </ul>	In all landscaped areas, including green roofs, plant a minimum of 90% native plants and comply with Ontario Invasive Plant Council Guidelines, including: <ul style="list-style-type: none"> <li>Minimum of 2 native flowering species to provide continuous bloom throughout the growing season to support pollinators.</li> <li>Preference for drought tolerant native species.</li> </ul>
	Mid-Rise and High-Rise Multi-Unit Residential		
	Institutional and Commercial	For vegetated buffer areas, adjacent significant natural features, plant 100% native plants.	For vegetated buffer areas, adjacent significant natural features, plant 100% native plants.
	Industrial	Provide a natural heritage restoration and/or enhancement plan with the proposed locations of natural heritage restoration, design specifications, and ecological function.	Provide a natural heritage restoration and/or enhancement plan with the proposed locations of natural heritage restoration, design specifications, and ecological function.
<b>NS4: SUSTAINABLE ROOFS</b>	Low-Rise Residential	Buildings with an available roof area larger than 500m <sup>2</sup> must include one or a combination of green roof, cool roof, blue roof and/or solar PV:	Achieve Tier 2 requirements.
	Mid-Rise and High-Rise Multi-Unit Residential	<ul style="list-style-type: none"> <li>Green roof and/or blue roof for at least 50% of available roof space</li> </ul>	
	Institutional and Commercial	<ul style="list-style-type: none"> <li>Cool roof installed for 100% of available roof space.</li> </ul>	
	Industrial	<ul style="list-style-type: none"> <li>Use a combination of a green, blue, cool roof or solar PV for at least 75% of available roof space.</li> </ul>	

METRIC	DEVELOPMENT TYPE	TIER 2 REQUIREMENTS	TIER 3 REQUIREMENTS
<b>NS5: STORMWATER MANAGEMENT</b>	Low-Rise Residential	Retain 80% runoff generated from a minimum of 27 mm depth of rainfall from all site surfaces using rain barrels integrated to supplement non-potable water uses (required), and a combination of the Stormwater Management Practices outlined in the Stormwater Management Planning and Design Manual Infill Development.	Retain 100% runoff generated from a minimum of 27 mm depth of rainfall from all site surfaces using rain barrels integrated to supplement non-potable water uses (required), and a combination of the Stormwater Management Practices outlined in the Stormwater Management Planning and Design Manual Infill Development.
	Mid-Rise and High-Rise Mult-Unit Residential		
	Institutional and Commercial		
	Industrial		
<b>NS6: WATER CONSUMPTION</b>	Low-Rise Residential	Reduce irrigation water consumption by 60% using a combination of treatment measures for reuse of greywater and blackwater (e.g., rain barrels, cisterns, green roofs, filtration ponds).	Reduce irrigation water consumption by 80% using a combination of treatment measures for reuse of greywater and blackwater (e.g., rain barrels, cisterns, green roofs, filtration ponds).
	Mid-Rise and High-Rise Mult-Unit Residential		
	Institutional and Commercial	Reduce building water consumption (not including irrigation) by 20% using water fixtures or non-potable water sources.	Reduce building water consumption (not including irrigation) by 40% using water fixtures or non-potable water sources.
	Industrial		