

High Performance Development Standard Metrics Site Plan

How To Use This Document

This document is split into three sections,

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The introduction gives principal information about the standard and how it is applied. The metrics lay out the requirements for site plan applications. Project applicants are encouraged to familiarize themselves with the Tier 2 measures in addition to Tier 1 measures and implement where possible. Tier 2 measures are not currently required for Site Plan application. Proponents will use the document to review the measures and documentation. Where applicable, links to supporting resources have been provided. This document is to be used in conjunction with the High Performance Development Standard Checklist which the project proponent will be required to fill out for new site plan applications.

Introduction

This standard applies to projects pursuing Site Plan Control approval within the City of Ottawa.

The High Performance Development Standard (HPDS) shall apply only to the parts of a site undergoing new, or modification to existing development. All projects are encouraged to advance the sustainability objectives of the HPDS to the fullest extent possible. Development on sites that are designated under Part IV or Part V of the Ontario Heritage Act shall be exempt from applicable standards if it can be demonstrated that they will negatively impact the defined cultural heritage attributes of the property. Projects that have completed a Pre-consultation Meeting prior to adoption of the standard will not be required to comply with the measures outlined herein.

Authority to implement this standard comes from Section 41 of the Planning Act which gives authority to require drawings or plans as it relates to sustainable design for exterior measures. This standard may point to other city requirements imposed through authorities such as zoning, where they relate back to sustainable design.

What is a standard?

A standard is a set of specific measures to which a proponent must demonstrate compliance. Where compliance cannot be achieved, justification must be provided. The intention is to

implement the HPDS to the fullest extent; deviations may be permitted under extenuating circumstances. Proponents should submit a letter outlining the circumstances that may justify deviation. This makes the standard more prescriptive than municipal guidelines, but less stringent and rigorous with respect to non conformity than regulations established through Zoning and other By-laws.

Other Jurisdictions

Similar standards have been put in place in municipalities across Ontario including Toronto, Mississauga, Vaughan, Brampton, Whitby, and East Gwillimbury, with others undertaking similar reviews. Ottawa has developed its own standard to align with the priorities in the new Official Plan and Energy Evolution: Ottawa's Community Energy Transition Strategy. Many elements of this standard are aligned with the requirements in place in other municipalities; this is done where possible for consistency.

HPDS Document List

New

- Metrics for each tier
- Checklist
- Energy model Terms of Reference
- Community Energy Plan Terms of Reference
- Legislative Table
- Deviation guidance
- Planning Primer Training

To be modified

- Planning Application Form
- Procedures Manual

Site Plan Tier 1

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1.1. Building Energy Efficiency

Rationale and Objective	When it is required	
<p>To address climate change by reducing the greenhouse gas emissions associated with the operations of new buildings. The focus is on exterior measures and early design decisions to enable sustainable design solutions while minimizing incremental cost. Energy priorities evaluated and set early in design enable innovative solutions and design trade-offs that are not available later in the building design.</p>	Application	Site Plan Applications over 2,000 m ² gross floor area
	Exemptions	Buildings that don't have energy requirements under the Ontario Building Code as per SB 10 section 1.2.1.1 do not have to demonstrate energy performance under this standard.
	Phasing	<p>Phase 1: For the first 12 months the HPDS is in effect, proponents must submit the energy model but are not required to comply with the thresholds outlined in this metric.</p> <p>Phase 2: 12 months after the adoption of the HPDS, proponents will be held to the thresholds outlined in this metric.</p>
Requirement		
<p>Using exterior elements, buildings shall be designed to meet or exceed one of the following (Projects may opt to factor in interior measures into the proposed design):</p> <ul style="list-style-type: none"> • Total Energy Use Intensity (TEUI), Thermal Energy Demand Intensity (TEDI) and GHG Emission Intensity (GHGI) targets by building type per Table 1 below. Multi Unit Residential Buildings are referred to as MURB in the table; <p>OR</p> <ul style="list-style-type: none"> • 25% carbon emission reduction beyond the Ontario Building Code, SB-10, Division 3 (2017)*; <p>OR</p> <ul style="list-style-type: none"> • Commitment to pursue certification program such as Energy Star for MURBS; LEED, or BOMA Best with a minimum number of energy points, or equivalent. 		

Table 1 Energy Intensities Buildings

	TEUI (kWh/m ² /yr)	TEDI (kWh/m ² /yr)	GHGI (kg CO ₂ ^e /m ² /yr)
MURB (≥ 4 Storeys)	142	52	19
MURB (≤ 6 Storeys)	147	62	19
Commercial Office	142	42	19
Commercial Retail	132	52	12
All Other Building Types	25% over OBC		
Mixed Use Buildings	Mixed-use buildings will use an area-weighted average, by occupancy type		

Documentation

Compliance with this metric is proven through a preliminary energy model report submitted prior to approval; (not required at submission). Project proponents are encouraged to engage an energy modeller as early as possible to maximize energy efficiency design opportunities.

Energy Modeling is performed [as per the guidelines in the Energy Modelling Report Terms of Reference](#).

It is understood that as this is a preliminary energy model there will be a number of assumptions required, and energy estimates will not exactly reflect future models if completed for future phases of the project.

Review Process

City staff will complete a review of the energy model report to ensure submission elements are there, and targets are met and sign off by design professionals has been completed. An audit process may be used to complete a more thorough review of energy model on select planning applications to ensure modelling protocol is being followed correctly. Similar to existing requirements such as noise attenuation requirements, Site Plan control by-law may be used to secure energy efficient design features such as window treatments, cladding, energy efficient form, and balconies. With respect to the Tier 1 energy efficiency requirements, an applicant may choose how to address the minimum performance

	requirements and may include interior measures, exterior measures or a combination therein. Where the applicant does not advance designs sufficiently to address the energy efficiency strategies proposed in the energy model, the plans and drawing will provide for contingent obligations to the extent necessary to meet the Standard after the interior measures are accounted for.
Other Jurisdictions	<ul style="list-style-type: none"> • The City of Toronto has energy modeling requirement under the Toronto Green Standard. • Whitby requires energy analysis and minimum target under their green standard. • Brampton, Vaughan, Richmond Hill Sustainable Assessment Tool includes energy in their recommended minimum target.
References	<ul style="list-style-type: none"> • Energy Modeling Report Terms of Reference • SB-10 of Ontario Building Code

1.2. Site Plan Accessibility

Rationale and Objective	When it is required	
<p>To ensure sites are contributing to an inclusive community with equivalent access to all users.</p> <p>Ensure features such as fresh air grates do not create accessibility issues to those with mobility devices, or challenges.</p>	Application	All site plan applications
	Exemptions	Projects only required to comply as applicable. Projects with no public entrances and exterior horizontal grates have no requirements under this metric.
	Phasing	Phase 1- initial requirement
Requirement		
<p>Projects to ensure accessibility is addressed through the following requirements:</p> <p>a) For Public entrances to the site's building projects must provide the same means of entrance for all users whenever possible, provide equivalent access when access by the same means is not possible, and identify on the site plan accessible building entrance(s).</p>		

AND

- b) Projects are encouraged to minimize interruptions along paths of travel through site planning. Design of grates embedded in the ground must meet the following requirements:
- Grates along a path of travel must ensure openings do not allow passage of an object that has a diameter greater than 13 mm, ensure that elongated openings are oriented perpendicular to the pedestrian path of travel. (Figure 1)

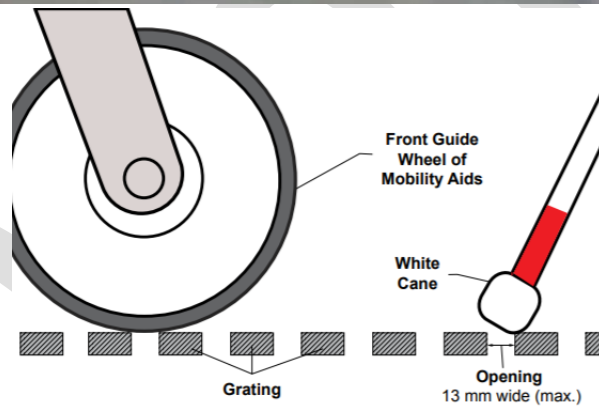
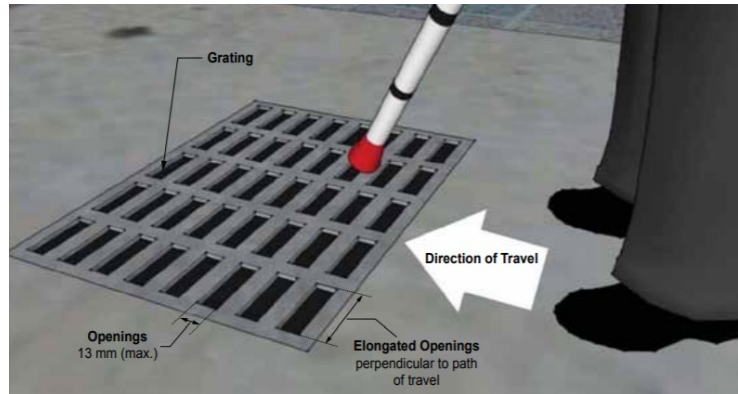


Figure 1 Grate Design Path of travel

AND

- Grates that are outside a path of travel must have a maximum porosity of 20 x 20 mm (or 40 x 10 mm) or may be screened.

<p>Documentation</p>	<p>Provide a brief description of Site Accessibility considerations in the HPDS checklist. At a minimum, note how the Metric requirements are met.</p> <p>Site Plan and/or elevations will identify the public entrances noting any accessibility features.</p>
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	The Site Plan will also identify preferred locations for grates. Locations will note the maximum porosity based on relation to paths of travel.
Review Process	Information to be provided on drawings as early as possible (prior to site plan approval at the latest) with clear identification and a brief description provided on the checklist. The Development Review planner will review for inclusion. Changing locations of grates due to evolving designs are not considered a substantial Site Plan change so long as minimum requirements are maintained.
References	This requirement comes from the City's Accessibility Design Standards

1.3. Fresh Air Intake

Rationale and Objective	When it is required	
<p>To minimize the health impact of air pollutants emitted by vehicle exhaust on building occupants and visitors, through a focus on interior fresh air systems and outdoor amenity areas.</p> <p>While mechanical design details are determined at a later stage in design, the opportunity to incorporate buffers from neighbouring air pollutant sources is determined through the siting and landscaping of the building. This is why it is important to incorporate considerations at this early point in design.</p>	Application	Site plan applications with nearby or onsite car exhaust pollution.
	Exemptions	Residential buildings with dedicated fresh air system for each residential unit.
	Phasing	Phase 1- initial requirement
Requirement		

Site plans must demonstrate how on-site outdoor amenities, and fresh air ventilation intakes, are protected from air pollutants resulting from adjacent sources, and how neighbouring outdoor site amenities and fresh air intakes are protected from air pollutant sources generated on site. Adjacent sources of air pollutants include traffic or idling vehicle areas such as drive-throughs, and loading zones, it does not include parking spaces.

Protection from sources of air pollutants can be achieved through setbacks, vegetation, or other technologies, that provide absorbent and protective buffering, or a combination of these measures. **Sources of air pollutants are defined as areas within:**

- **150 metres of a road with an average of 50,000 vehicles or more per day,**
- **100 metres of road with an average of 15,000 vehicles or more per day, and**
- **100 metres of idling areas.**

Protection options include:

- Natural air pollutant buffering made up of rows of Red Maple, Red Oak, Little Leaf Linden or Honey Locust trees with a row of shrubs underneath the full length of the exposure zone.

OR

- Physical buffer either by the building, or other structures such as walls 1.5m high.

OR

- 3.5 metres, or more, above road level.

<p>Documentation</p>	<p>Plans will identify air pollutant sources, exterior amenity areas, and possible safe areas for fresh air intakes. The means of protection from air pollutant sources is to be provided in a write up in the checklist.</p> <p>The guidance on safe areas will inform more detailed design that comes after site plan approval. Exact locates will be determined in detailed design as dictated by Building Code and other applicable manufacturer requirements.</p>
<p>Review Process</p>	<p>Planner to review the site plan reflects the elements required as described in the checklist write-up.</p>
<p>Other Jurisdictions</p>	<p>This metric is new and the mitigation practices are founded in the city’s Urban Design Guidelines for Drive-Through Facilities currently in place.</p>

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1.4. Tree Planting

Rationale and Objective		When it is required	
To contribute to the City's urban tree canopy target by ensuring new trees are planted with sufficient soil volume to support the long term growth of the tree.	Application	Site Plan	
	Exemptions	None	
	Phasing	Requirement to come in effect with the release of tree planting guidelines.	
Requirement			
<p>Volume of high-quality soil sufficient to support canopy cover on the site, as recommended in the City's Tree Planting Guidelines.</p> <p>Projects must demonstrate 30 m³ high quality soil for street trees. Soil calculation can include continuous soil on private or public property. High quality soil excludes compacted soil, further details are provided in the Landscape Plan Terms of Reference.</p> <p>Trees to be maintained and warrantied for a minimum of 2 years.</p>			
Documentation	<p>Landscape plans to mark soil volumes, including a marked off horizontal area of soil and expected depth on uncompacted soil used to calculate volume</p> <p>warrantee period for the trees</p> <p>HPDS checklist to include soil volume calculation summaries.</p>		
Review Process	Planner to review for inclusion. Support from forestry and planning team for complete review.		
Other Jurisdictions	Markham, Toronto Vaughan, and Oakville have similar targets for tree soil volumes.		
References	Landscape Plan Terms of Reference- <i>currently under development</i>		

1.5. Plant Species

Rationale and Objective		When it is required	
Build on landscaping guidelines, contribute to local ecosystems and reduce impact of invasive species.	Application	Site Plan Application	
	Exemptions	None	
	Phasing	Phase 1- initial requirement	
Requirement			
Landscape plan to include no invasive species and target a minimum 50% native plant species . Drought tolerant and pollinator friendly plant species preferred. Vegetated buffers to be 100% native vegetation.			
Documentation	Landscape plans to include the list of plant species with identification of native, local, and drought tolerant species.		
Review Process	Planner to review planting list includes required information and meets requirement.		
Other Jurisdictions	No invasive species is an existing target in the City of Ottawa. Toronto Green Standard has the same requirement under Tier 1.		
References	Landscape Plan Terms of Reference- <i>currently under development</i>		

1.6. Exterior Lighting

Rationale and Objective		When it is required	
Light pollution contributes to adverse impacts on humans, wildlife and local ecosystems. By updating requirements to prefer certified fixture(s) we improved the rigor behind the light pollution reduction efforts already in place.	Application	Site Plan Application	
	Exemptions	Specialized buildings which may have a requirement for a small amount of up lighting such as heritage buildings in order to preserve the existing character of the building.	
	Phasing	Phase 1- initial requirement	
Requirement			
<p>All exterior lighting fixtures will be Dark Sky compliant (full cut-off). No uplighting.</p> <p>Dark Sky Compliant fixture(s) must have the Dark Sky Fixture Seal of Approval which provides objective, third-party certification for lighting that minimizes glare, reduces light trespass and doesn't pollute the night sky. If a Dark Sky Fixture Seal of Approval is not available, fixtures must be full-cutoff and with a colour temperature rating of 3000K or less.</p>			
Documentation	Compliance is demonstrated through <ul style="list-style-type: none"> • a checkmark on the HPDS checklist • and by providing the certification by way of a letter stating that the lighting is full cutoff prior to registration of the site plan agreement. 		
Review Process	Planner to review the letter and ensures sign off has been provided		
Other Jurisdictions	Full cut off exterior lighting is an existing requirement in the City of Ottawa Toronto Green Standard includes same measures in Tier 1.		
References	Dark Sky Fixture Seal of Approval		

1.7. Bird-Safe Design

Rationale and Objective	When it is required	
Birds perform many critical roles in our local ecosystems. Window collisions are the second leading cause of bird mortality. Including this metric in the standard helps to ensure that the bird-safe design guidelines are appropriately considered and implemented.	Application	Site Plan Application
	Exemptions	Low rise residential and small scale commercial/industrial/institutional.
	Phasing	Phase 1- initial requirement
Requirement		
<p>Mid to high-rise residential and medium to large scale commercial / industrial / institutional:</p> <ul style="list-style-type: none"> • Use specified bird-safe glass or integrated protection measures to treat at least 90% of exterior glazing within the first 16 m of height or to the height of the adjacent mature tree canopy. AND • Use specified bird-safe glass or integrated protection measures to treat any glazing adjacent to a green roof, rooftop garden or garden terrace to a height of 4 m or to the height of the adjacent mature vegetation. AND • Eliminate all fly-through effects (e.g., glass corners, parallel glass) and other traps from building design or use specified bird-safe glass or integrated protection measures. 		
Documentation	Elevations to identify bird-safe glazing with area information. HPDS checklist to provide a summary of the area calculation.	
Review Process	Planner to review that information is included on the HPDS checklist and that the plan meets the parameters listed in the metric	
Other Jurisdictions	<ul style="list-style-type: none"> • Toronto includes these measures in the Toronto Green Standard. • Whitby includes this in their Tier 2 measures. 	
References	Ottawa Bird-Safe Design Guidelines	

1.8. Sustainable Roofing

Rationale and Objective	When it is required	
<p>Heat islands contribute to significantly higher localized overnight and daytime temperatures. Extreme heat can pose a significant health risk to people in the community which is only expected to increase with the changing climate. This metric is intended to reduce the contribution of new building flat roof areas onto the urban heat island while balancing out opportunities for local renewable energy generation.</p> <p>Solar ready infrastructure helps to avoid costly future retrofits associated with solar installation. National Renewable Energy Laboratory estimates by incorporating solar ready measures at design and construction that the building related costs associated with solar can be reduced by 60-75%¹.</p> <p>The focus will be on large roof sizes that have a strong business case for solar installation.</p> <p>Projects are encouraged to consider location of strategies to maximize benefit and minimize cost.</p> <p>Considerations include:</p> <ul style="list-style-type: none"> • Green roof on podium to improve view from towers. • Very tall buildings may face additional challenges with wind loads for future solar PV. An alternate pathway may be preferred. • Location of solar ready area should take into account shading from neighbouring structures. 	Application	Site Plan
	Exemptions	Sloped roofs and roofs under 500m ² .
	Phasing	Phase 1- initial requirement
Requirement		

¹ <https://www.nrel.gov/docs/fy12osti/51296.pdf>

For flat roofs (**low slope \leq 2:12**) over 500m² projects must provide:

- a) Green roof for at least 50% of available roof space¹;
- Where possible, green roof area should be incorporated into visible or accessible locations, such as podiums.
 - Where green roof is accessible, the green area may be reduced by 20%
 - Where green roof is edible landscaping, the whole garden area, including pathways and adjacent terraces, may be counted as “green area”.

OR

- b) Cool roof installed for 90% of available roof space¹ and if the roof is over 2,500m² a minimum of 1,000 m² will be designated solar ready^{2,3};

OR

- c) A combination of a green roof, and cool roof and solar PV installed for at least 75 per cent of available roof space.

Specification details

¹Available roof space is considered roof space that is not otherwise occupied by mechanical and electrical equipment.

²Proponents may seek an exemption from the solar ready component where:

- i. Accommodation of a solar energy system and/or a solar hot water heater would be impractical due to poor solar resources at project site;
- ii. A substitute renewable energy system will be installed at the time of construction; or
- iii. Where proponent can justify that a solar installation does not make sense such as buildings with low electrical loads making solar net metering an unfeasible option.

³Solar Ready Requirements

At a minimum, the project shall include requirements for:

- i. Static load roof strength, with a requirement that roofing where solar equipment could be placed be capable of supporting a minimum of 29 kg/m², where alternate solution for dealing with the loading requirements of solar is recommended by a professional engineer this may be used in lieu of the 29kg/m² threshold, a letter from engineer stating alternate solution to be submitted.;
- ii. Placement of non-solar related rooftop equipment, taking into account positioning that avoids shading of solar equipment (i.e., north of solar ready zone) and maximization of continuous roof space;

	<p>iii. Provision of space for a solar energy system DC-AC inverter on an outside wall in the utility room in accordance with ESA requirements (within 4.5m of future array location).</p> <p>iv. Placement of solar ready area located in a space with high solar potential.</p> <p>Recommended to also consider:</p> <p>v. Sizing and/or provision of extra electrical panels to accommodate addition of an appropriately sized future solar energy system.</p> <p>vi. A conduit for wiring from roof to electric panel.</p> <p>vii. Solar Ready Guidelines in resources for further considerations</p>
<p>Documentation</p>	<p>Identify green, solar, and reflective roof zones on the roof top plan. Include area information for the roof overall and for each individual zone. Rooftop plan should include notations such as additional loading that may need to be factored into the detailed structural designs.</p> <p>HPDS checklist to include the area summaries and a brief description of the strategy chosen. If any exemptions are requested, the rationale will be provided in the write-up.</p>
<p>Review Process</p>	<p>Planner to review and make sure the site plan matches the HPDS checklist and that sufficient urban heat island mitigation measures have been incorporated to meet the metric.</p>
<p>Other Jurisdictions</p>	<ul style="list-style-type: none"> • Marin County California solar ready required on new commercial buildings over 5,000ft² (464m²). • Colorado Solar ready required as base option on all new single family homes and duplexes. • Seattle solar ready for floor areas over 5,000ft² (464m²). • Toronto requires a Solar Readiness under Tier 2. • Whitby requires feasibility review for renewable energy • Brampton, Vaughan, Richmond Hill Sustainable Assessment Tool includes Solar Ready for an option 1 point. • Toronto has a green roof bylaw which requires green roofs on 20-60% of available roof space on new buildings or additions greater than 2,000 m². The authority to create this bylaw is unique to Toronto in Ontario. In addition, where the Green Roof Bylaw does not apply the Toronto Green Standard requires green roof, cool roof, or green, cool or solar PV.

	<ul style="list-style-type: none"> • Whitby has cool roof requirements under Tier 2 of their standard • Brampton, Vaughan Richmond Hill Sustainable Assessment Tool includes cool roof measures under the recommended minimum point measures. • Gatineau put in place green roof requirements in 2019 these are currently under review. • Measures included in the Town of Newmarket Development Standard Checklist.
References	<ul style="list-style-type: none"> • Ottawa Urban Heat Island Maps <ul style="list-style-type: none"> ○ City-wide ○ Urban Area • National Renewable Energy Laboratory Solar Ready Buildings Planning Guide • National Renewable Energy Laboratory Solar Ready: An Overview of Implementation Practices • Solar Ready Building Design Guidelines • Solar generation potential North America • NRCan Solar Ready Guidelines

1.9. Cool Landscape and Paving

Rationale and Objective	When it is required	
<p>Heat islands contribute to significantly higher localized overnight and daytime temperatures. Extreme heat can pose a significant health risk to people in the community which is expected to increase with the changing climate. This metric is intended to reduce the contribution of hardscaped areas of new sites on urban heat island.</p> <p>Projects are encouraged to consider embodied carbon in material choices in addition to the material reflectance. In general, natural shading and soft landscape will have a lower embodied carbon impact than paved or stone areas.</p>	Application	Site Plan Applications
	Exemptions	Industrial work yards or similar areas that limit the available options for shading or reflective surfaces may be excluded from the hard surface area calculation.
	Phasing	Phase 1- initial requirement
Requirement		
<p>Soft landscaping area requirements are addressed in the zoning By-law the project is exempt from cool paving requirements where soft landscaping area exceeds the Zoning By-law by 20%,</p> <p>OR</p> <p>Use a combination of the following strategies to treat at least 50% of the site’s non-roof hardscape:</p> <ul style="list-style-type: none"> • High-reflectivity 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 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 an SRI of 29. • Shade from structures with energy generation. • For parking areas projects may plant one tree for every five parking spaces distributed within or along the border of the parking area, in lieu of reflective paving or completing a shade study. <p>Non-roof hardscape includes driveways, walkways, courtyards, surface parking areas, artificial turf and other on-site hard surfaces.</p>		

Documentation	Identify material type and reflectivity target in landscape or site plans. Include area information for material types. If shade is the targeted strategy, include documentation to demonstrate shading over the area. On HPDS checklist include the area count for various strategies and any write up if applicable.																												
Review Process	Planner to review and make sure site plan matches HPDS checklist and that sufficient urban heat island mitigation measures have been incorporated to meet the metric.																												
Other Jurisdictions	<ul style="list-style-type: none"> • Toronto has cool hardscaping requirements under Tier 1 of the Toronto Green Standard. • Brampton, Vaughan Richmond Hill Sustainable Assessment Tool includes cool non-roof measures under the recommended minimum point measures. 																												
References	<p>Transportation Association of Canada Solar Reflectance of Typical Paving Materials</p> <table border="1" data-bbox="488 982 1430 1724"> <thead> <tr> <th>Material</th> <th>Emissivity</th> <th>Solar Reflectance</th> <th>SRI Solar Reflectance Index (SRI)</th> </tr> </thead> <tbody> <tr> <td>Typical New Grey Concrete</td> <td>0.9</td> <td>0.35</td> <td>35</td> </tr> <tr> <td>Typical Weathered Grey Concrete</td> <td>0.9</td> <td>0.2</td> <td>19</td> </tr> <tr> <td>Typical New White Concrete</td> <td>0.9</td> <td>0.7</td> <td>86</td> </tr> <tr> <td>Typical Weathered White Concrete</td> <td>0.9</td> <td>.4</td> <td>45</td> </tr> <tr> <td>New Asphalt</td> <td>0.9</td> <td>.05</td> <td>0</td> </tr> <tr> <td>Weathered Asphalt</td> <td>0.9</td> <td>.1</td> <td>6</td> </tr> </tbody> </table> <p>https://www.tac-atc.ca/sites/default/files/conf_papers/uzarowskil_-_reducing_urban_heat_island_effect_using_lcap.pdf</p>	Material	Emissivity	Solar Reflectance	SRI Solar Reflectance Index (SRI)	Typical New Grey Concrete	0.9	0.35	35	Typical Weathered Grey Concrete	0.9	0.2	19	Typical New White Concrete	0.9	0.7	86	Typical Weathered White Concrete	0.9	.4	45	New Asphalt	0.9	.05	0	Weathered Asphalt	0.9	.1	6
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Weathered Asphalt	0.9	.1	6																										

	<ul style="list-style-type: none">• Solar Reflectance is the fraction of the incident solar energy which is reflected by the surface in question. The best standard technique for its determination uses spectrophotometric measurements with an integrating sphere to determine the reflectance at each different wavelength. The average reflectance is then determined by an averaging process, using a standard solar spectrum. This method is documented by ASTM (Amer. Soc. for Testing and Materials) as Standards E903 and E892. When this data is not available, other, or less detailed measurements are utilized.• The Solar Reflectance Index (SRI.) is a measure of the material's ability to reject solar heat, as shown by a small temperature rise. It is defined so that a standard black (reflectance 0.05, emittance 0.90) is 0 and a standard white (reflectance 0.80, emittance 0.90) is 100.<ul style="list-style-type: none">• Cool roof rating council• Berkeley Lab Heat Island Resources
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1.10. Common Area Waste Storage

Rationale and Objective		When it is required	
Enabling all residents with adequate access to sorted waste storage facilities helps the City achieve higher levels of waste diversion from landfill. Diverting waste from landfill supports the reduction of greenhouse gas emissions and promotes a circular economy by reusing existing and valuable resources	Application	Site Plan Residential	
	Exemptions	Non-residential buildings	
	Phasing	Phase 1- initial requirement	
Requirement			
Design and construct property with adequate space for City-allocated garbage, recycling, and organic waste containers. As required by Zoning, and the Solid Waste Collection Design Guidelines for Multi-Unit Residential Development .			
Documentation	Site Plan to identify waste storage areas and truck access.		
Review Process	Development Review Planner to complete review to ensure it's included. Solid Waste team to review for consistency with Solid Waste Guidelines.		
Other Jurisdictions	As this requirement is not changing an in-depth review of other municipalities was not part of this project. The City of Toronto requires multi-residential developments to have adequate storage space for bulky items and other special waste.		
References	Solid Waste Collection Design Guidelines for Multi-Unit Residential Development		

1.11. Electric Vehicle Parking

Rationale and Objective	
To ensure infrastructure is available for electric vehicle charging build out as demand increases. The cost for including infrastructure rough in and capacity at initial construction is a fraction of the cost of adding it on post construction. This helps to minimize the costs associated with the transition to electric vehicles. In addition to the infrastructure rigid condo rules can place a significant barrier to future condo owners looking to install electric vehicle chargers for the parking space. By setting out parameters to deal with common element issues related to electric vehicle chargers in condos at the outset the process is simplified and will minimize potential for additional legal fees to amend or revise agreements.	
Requirement	
Provide electric vehicle parking infrastructure as required by zoning.	
Documentation	Parking Plan
References	EV Readiness Requirements Framework

1.12. Bicycle Access and Storage

Rationale and Objective	
Enable cycling through access to safe flexible storage facilities	
Requirement	
Provide bike parking infrastructure as required by zoning.	
Documentation	Parking Plan

Draft

Site Plan Tier 2

This section lays out the draft requirements for Tier 2 site plan applications. Tier 2 is the voluntary component of the High-Performance Development Standard.

An incentive program is proposed to be developed to encourage these metrics. The metrics may evolve based on the parameters of the incentive program once developed. It is intended that projects pursuing Tier 2 incentive would have an incentive agreement with an additional layer of approval beyond the standard site plan application. The details of this additional approval and review to be defined as part of the incentive program.

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2.1. Building Energy Efficiency

Rationale and Objective

To address climate change by reducing the greenhouse gas emissions associated with the operations of new buildings.

Requirement

Buildings shall be designed to meet or exceed one of the following:

- Total Energy Use Intensity (TEUI), Thermal Energy Demand Intensity (TEDI) and GHG Emission Intensity (GHGI) targets by building type per Table 2 below. Multi Unit Residential Buildings are referred to as MURB in the table.

OR

- 50% carbon emission efficiency improvement above the Ontario Building Code, SB-10, Division 3 (2017)*;

OR

- Commitment to pursue certification program such as Energy Star for MURBS; LEED or BOMA Best with a minimum number of energy points, or equivalent

Table 2 Tier 2 Energy Intensities Buildings

	TEUI (kWh/m ² /yr)	TEDI (kWh/m ² /yr)	GHGI (kg CO ₂ ^e /m ² /yr)
MURB (≥ 4 Storeys)	108	33	13
MURB (≤ 6 Storeys)	108	38	13
Commercial Office	108	30	11
Commercial Retail	98	33	7
All Other Building Types	50% over OBC		
Mixed Use Buildings	Mixed-use buildings will use an area-weighted average, by occupancy type		

Documentation

Compliance with this metric is demonstrated through a preliminary energy model report submitted prior to approval; (not required at submission). In addition an as built final energy model is to be provided by third party

	<p>reviewer. Project proponents are encouraged to engage an energy modeller as early as possible to maximize energy efficiency design opportunities.</p> <p>Energy Modeling is performed as per the guidelines in the Energy Modelling Report Terms of Reference</p>
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2.2. Airtightness Testing

Rationale and Objective	
<p>Air leakage accounts for significant portion of heat loss in buildings. Air tightness testing is one of the best ways to ensure that projects minimize air leakage there by improving the energy performance of the building.</p> <p>Beyond just energy air leakage plays a role in other key building performance criteria including indoor air quality, and water vapor management.</p>	
Requirement	
<p>Conduct a whole-building Air Tightness Test to improve the quality and air tightness of the building envelope.</p> <p>Follow ASTM E-3158-18 Standard Test Method for Measuring the Air Leakage Rate of a Large or Multizone Building. Additional guidance, including space type exemptions can be found in US Army Corps of Engineers (USACE) Air Leakage Test Protocol.</p>	
Documentation	Post Construction: Report on the result from the air tightness test of the building.
References	US Army Corps of Engineers (USACE) Air Leakage Test Protocol .

2.3. Operational Energy

Rationale and Objective	
<p>Ongoing operations and management is an important part of energy efficient buildings. Particularly as it relates to the more active components of the building such as mechanical systems and responding to occupant behaviour. Portfolio Manager</p>	

<p>helps to track and benchmark the performance of buildings on an ongoing basis. Benchmarking is also important to help evaluate that design intents are being realized as expected, helping to inform continuous improvement for the industry.</p>	
<p>Requirement</p>	
<p>Projects must commit to benchmarking their building in addition to installing metering equipment for ongoing monitoring</p> <p>Benchmarking</p> <p>Register the building on ENERGystar® Portfolio Manager.</p> <p>Submetering</p> <p>RESIDENTIAL</p> <p>Install thermal energy meters for each heating/cooling appliance in all residential units.</p> <p>NON-RESIDENTIAL</p> <p>Install thermal energy meters for each individual tenant in multi-tenant commercial/retail buildings</p>	
<p>Documentation</p>	<p>Proof of registration</p> <p>Metering single line diagram</p>
<p>References</p>	<p>Energy Star Portfolio Manager</p>

2.4. Renewable Energy

Rationale and Objective	
Increase the amount of local renewable energy and decrease carbon impact related to site energy demands.	
Requirement	
<p>Design on-site renewable energy systems to supply one of the following:</p> <p>Minimum of 5 per cent¹ of the building's annual energy consumption from one or a combination of acceptable renewable energy sources;</p> <p>OR</p> <p>Minimum of 20 per cent¹ of the building's annual energy consumption from geo-exchange.</p> <p>Where it can be demonstrated that solar installation is not reasonable or feasible, this requirement may be waived.</p> <p>Acceptable renewable energy sources include energy generated by:</p> <ul style="list-style-type: none"> • Solar photovoltaics (PV) – use of building-integrated (including window or wall) or mounted, composite panels to convert solar energy into electricity, to be used within in the building or exported to the grid • Solar thermal – use of solar thermal collectors to directly convert solar energy into heating air or water for use in the building • Biogas systems – Fuel cells that use biogas to convert hydrogen and oxygen into electricity. • Biofuel systems – Fuels produced directly or indirectly from organic material and combusted for the production of thermal energy or electricity. • Wind systems – Building or site-integrated wind turbines that convert wind energy to electricity • Geoexchange – Use of electric ground source heat pumps coupled with horizontal or vertical ground loop piping systems to provide heating and cooling energy; or use or direct ground contact systems <p>¹ Alternate percentages may be allowed for in specialty use buildings such as industrial uses, or laboratories with high energy density due to operational loads.</p>	
Documentation	Energy Modeling Report

2.5. District Energy

Rationale and Objective	
Enable establishment and expansion of low carbon district energy systems through encouraging connections.	
Requirement	
<p>Where site is located:</p> <p>In an area with high thermal energy density,</p> <ul style="list-style-type: none"> • adjacent to a district energy system that is targeting new or future connection, <p>or</p> <ul style="list-style-type: none"> • when a site plan includes 2 or more buildings <p>The project must demonstrate at least one of the following:</p> <ul style="list-style-type: none"> • plan to connect to an existing district energy system; • be district energy-ready (as per guidelines); • demonstrate less greenhouse emissions in proposed design than district connected reference case. • demonstrate it is not feasible to connect to the district energy system in the area <p>TERMS</p> <p>District Energy refers to systems that distribute thermal energy to multiple buildings in an area or neighbourhood. These systems typically consist of a heating and cooling centre, and a thermal network of pipes connected to a group of buildings.</p> <p>High Thermal Density- neighbourhoods with 113 MJ/ha thermal energy demand per year.</p>	
Documentation	Energy Model Report
References	District Energy Ready Guidelines will be developed with the incentive program.

2.6. Embodied Carbon

Rationale and Objective	
To advance the industry understanding of embodied carbon	
OPTIONAL Item	
Project will demonstrate embodied carbon target and commit to tracking and reporting on the target through construction of the project.	
Documentation	HPDS Checklist
References	Achieving Real Net-Zero Emission Homes: Embodied carbon scenario analysis of the upper tiers of performance in the 2020 Canadian National Building Code

2.7. Thermal Imaging

Rationale and Objective	
To advance the industry understanding of performance of envelope systems	
OPTIONAL Item	
Project will complete thermal imaging of the building to prior to finishing stage to demonstrate wall performance.	
Documentation	HPDS Checklist
References	N/A

2.8. Health Supportive Amenities

Rationale and Objective			
Design amenities such that they improve social connection for all ages, facilitate active lifestyles, and enable access to healthy food sources.			
Requirement			
Select one amenity measure from each category, the applicable project may choose an interior amenity in lieu of an exterior solution. For details on parameters follow the link outlining the specifics of each space type.			
Active Living		All Ages/ Community Connection	Food Access
<input type="checkbox"/>	Large open exterior naturalized space*	<input type="checkbox"/>	Place Making (POP designed for community connection)
<input type="checkbox"/>	Outdoor Walking Trail	<input type="checkbox"/>	Public Art
<input type="checkbox"/>	Outdoor Fitness	<input type="checkbox"/>	Children’s play space
<input type="checkbox"/>	Indoor Fitness	<input type="checkbox"/>	Shaded Outdoor seating
<input type="checkbox"/>	Restorative Garden	<input type="checkbox"/>	Stroller Parking
<input type="checkbox"/>	Outdoor public water refill station	<input type="checkbox"/>	Automated external defibrillator (AED) in building
<input type="checkbox"/>		<input type="checkbox"/>	Outdoor Amenity (Commercial Only)
<input type="checkbox"/>		<input type="checkbox"/>	Food Garden
<input type="checkbox"/>		<input type="checkbox"/>	Grocery Food Delivery
<input type="checkbox"/>		<input type="checkbox"/>	Farmers Market
<input type="checkbox"/>		<input type="checkbox"/>	On-site or nearby Healthy Food Retail
<input type="checkbox"/>		<input type="checkbox"/>	Free healthy onsite catering
<input type="checkbox"/>		<input type="checkbox"/>	Kitchen area with access to views (non-residential)
*preference for public park, publicly accessible spaces preferred to be ground oriented			
Documentation			

References	
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2.9. Exterior Lighting

Rationale and Objective	
Light pollution contributes to adverse impacts on humans, wildlife and local ecosystems. By updating requirements to preference for certified fixture we improved the rigor behind the light pollution reduction efforts already in place.	
Requirement	
Exterior lighting controlled by motion detectors or timers to reduce or extinguish non-essential lights between 11 pm and 6 am. Interior lighting controlled by motion detectors or timers to reduce or extinguish lights from unoccupied areas of non-residential buildings outside of business hours.	
Documentation	Exterior lighting plan Interior lighting plan

2.10. Operable Windows

Rationale and Objective	
Extreme heat poses a significant health risk to the community which may only increase as the frequency of local extreme heat days increases. Operable windows are one of the key ways for residents to help manage their indoor temperature when air conditioning is unavailable either due to not being installed, a breakdown or, power outage.	
Requirement	
Include operable windows*, in all regularly occupied spaces in dwelling units. operable windows are windows that have accessible operator to open the window enabling ventilation and passive cooling. Exterior doors that open to a secure area, such as patio doors to balconies, may be counted as operable windows.	
Documentation	Elevations and Floor Plans showing operable windows.

2.11. Interior Room Temperature

Rationale and Objective	
Extreme heat poses a significant health risk to the community which may only increase as the frequency of local extreme heat days increases. Spaces designed to not exceed maximum interior temperatures through mechanical or passive design solutions helps to ensure the spaces remain safe for occupants.	
Requirement	
Demonstrate through passive or mechanical design solutions that the interior temperature is designed to stay below 26°C in summer conditions	
Documentation	Sign off by a mechanical engineer.

2.12. Refuge Area

Rationale and Objective	
Local climate projections suggest we can expect more extreme weather events more regularly. These events can often lead to power outages potentially for extended periods of time. Planning for refuge areas that provide a place for occupants to gather in these events is a simple way to ensure access to critical infrastructure in these events.	
Requirement	
Provide a refuge area with heating, cooling, lighting, potable water, and power available; AND Provide 72 hours of back-up power to the refuge area and essential building systems.	
Documentation	HPDS Checklist
References	Resilience Planning for New Construction

2.13. Resiliency Plan

Rationale and Objective	
Improving the ability of the buildings to withstand the impacts of climate change and extreme weather is an important step towards creating a more resilient city and to protecting the health, safety and economic wellbeing of the city's residents and businesses	
Requirement	
Complete resiliency planning checklist	
Documentation	Resiliency Planning Checklist
References	Resilience Planning for New Construction

2.14. Common Area Waste Storage

Rationale and Objective	
Providing occupants with the tools necessary to conveniently sort and store waste from all streams is an important means of minimizing waste going to landfill. Methane associated with landfill gas has a global warming potential 25 times that of Carbon Dioxide.	
Requirement	
Ensure residents garbage, recycling, and organics waste receptacles are equally accessible. In residential buildings over 5 storeys these facilities shall be inside the building. Where facilities are located outdoors, they must be well lit and easily accessible.	
Documentation	Site Plan

2.15. In Suite Waste Sorting

Rationale and Objective	
<p>Providing occupants with the tools necessary to conveniently sort and store waste from all streams is an important means of minimizing waste going to landfill. Divertible waste in the landfill (specifically organic and paper products) produce methane gas, a GHG that is 25 times more potent than Carbon Dioxide. It is important to take proactive measures to encourage diverting this material from landfill. Methane associated with landfill gas has a global warming potential 25 times that of Carbon Dioxide.</p>	
Requirement	
<p>Provide dedicated space in-unit for residents to store containers for the following waste streams, either by using an under-the-counter solution, closet solution, or other acceptable solution:</p> <ul style="list-style-type: none"> • Garbage • Paper recycling • Glass, Metal, Plastic recycling • Food and Organic Waste 	
Documentation	Suite Floor Plan

2.16. Construction Waste Management Plan

Rationale and Objective	
<p>Benchmarking of construction waste management is a challenge in the industry. While many builders seek to reduce wasted material in order to minimize cost, without an industry benchmark it is difficult to evaluate if strategies are improving on the industry standard or just maintaining the status quo. By committing to share this information, this will help to build a reference data base which the City may seek academic partnerships to report on in aggregate.</p>	
Requirement	

<p>Commit to reporting on construction waste tracking. Tracking includes measurement of total weights of waste, from recycled and non recycled streams relative to constructed area using the downloadable excel template. Include a summary of strategies used to minimize waste and report of significant events that may have contributed to abnormal volumes. Significant events could include fires or flooding leading to significant material damage, or partially complete spaces.</p>	
Documentation	<p>Completed Construction waste tracking sheet and management plan report.</p>
References	<p>A Guide to Waste Audits and Waste Reduction Work Plans for Construction & Demolition Projects</p>

2.17. Parking

Rationale and Objective	
<p>To encourage a shift away from higher emission modes of transportation, a shift away from private vehicles is necessary and reducing the supply of parking spaces helps to achieve this goal. Reducing parking and ensuring users pay the costs associated with parking is encouraged.</p>	
Requirement	
<p>Provide at least 10% less parking than the maximum allowed under the zoning by-law. And Unbundle the parking spaces from the unit. Unbundled parking is the practice of selling or leasing parking spaces separate from the purchase or lease of the commercial or residential use</p>	
Documentation	<p>Site Plan</p>

2.18. Micro-Mobility

Rationale and Objective	
To move the community away from higher emission modes of transportation a number of different solutions are necessary. Micro-mobility solutions help to address short trips, and access to transit networks. To enable safe use of these solutions space for storage is encouraged.	
Requirement	
Provide space for micro-mobility devices located close to entrance, marked on site plan. Micro-mobility includes vehicles such as scooters, bikeshare and their accessories.	
Documentation	Site Plan
References	

2.19. Electric Vehicle Parking

Residential

Rationale and Objective	
To ensure occupants are able to access on site electric vehicle charging buildings need to include infrastructure and legal framework to enable installation of charging stations in shared parking spaces. The cost for including infrastructure rough-in and electrical capacity at initial construction is a fraction of the cost of adding it on post construction. This helps to minimize the costs associated with the transition to electric vehicles. In addition to the infrastructure, condo rules can place a significant barrier to future condo owners looking to install EV chargers for parking spaces. By setting out parameters to deal with common element issues related to EV chargers in condos at the outset, the process is simplified and will not require additional legal fees to amend or revise agreements.	
Requirement	

All parking spaces for use by residential occupancies including car-share spaces, (excluding visitor parking spaces), shall have an energized outlet installed adjacent to the space for the purpose of electric vehicle charging.

level 2 charging capability must be provided for each parking space.

OR

Level 1 charging capability is accepted but, must also demonstrate local access to Level 3 charging station(s); either through public network or provided onsite.

The electrical infrastructure shall include revenue metering capability so that meters may be installed to apportioning energy costs to persons when electric vehicle supply equipment is installed.

For designs where an electric vehicle energy management system (EVEMS) is intended, the electrical infrastructure shall include all communications equipment, control systems installation, licensing, and permitting required to operate.

See EV infrastructure guidelines for more details.

Local access is defined as within 5-minute driving distance.

In addition, the infrastructure condo agreements shall lay out requirements, process and allowance for installation of electric vehicle charging stations.

Documentation	Site Plan
References	EV Readiness Requirements Framework

COMMERCIAL BUILDINGS

Rationale and Objective
To ensure occupants are able to access on-site electric vehicle charging, buildings need to include infrastructure to enable installation of charging stations in shared parking spaces. The cost for including infrastructure rough-in and capacity at initial construction is a fraction of the cost of adding it on post construction. This helps to minimize the costs associated with the transition to electric vehicles.
Requirement
10% of all new parking spaces serving commercial, industrial, and institutional occupancies shall have an energized outlet installed adjacent to the space for the

<p>purpose of electric vehicle charging.</p> <p>The electrical infrastructure shall include cold jaw revenue metering that provides for apportioning of energy costs to persons when electric vehicle charging equipment is installed.</p> <p>For designs where an electric vehicle energy management system (EVEMS) is intended, the electrical infrastructure shall include all communications equipment, control systems installation, licensing, and permitting required to operate.</p>	
Documentation	Parking Plan
References	EV Readiness Requirements Framework

2.20. BICYCLE ACCESS AND STORAGE

Rationale and Objective		
Enable cycling through access to safe and flexible storage facilities		
Requirement		
<p>As part of the Transportation Impact Assessment submission, provide a cycling plan illustrating the route from the boundary street(s) to the on-site occupant and visitor bicycle parking locations. The route must operate at no more than 30 km/hr for mixed traffic or provide a separate facility for cyclists. Identify the number of spaces and location of secure occupant and visitor bicycle parking required by zoning bylaw and any additional spaces provided. The plan must illustrate that bicycle parking is accessible (5% grade maximum). Short term visitor bicycle parking must be located in a space with passive supervision to reduce theft and vandalism risks.</p> <p>Provide sufficient bicycle parking to accommodate all tenants or commuters in a secure accessible location.</p> <p>Number of Spaces Required</p>		
Development Type	Long-Term	Short-Term
Multi-unit residential, no garages or carports (applies to high rise, low-rise and stacked townhouses)	1.5 spaces for studio and one-bedroom units 2.5 spaces for two-bedroom units	2 spaces for development with at least 20 units, and one additional space for every additional 20 dwelling units

	3.5 spaces for three-bedroom units	
Offices	A minimum of one space for each 170 square metres of gross floor area.	Minimum of 6 spaces for any development with a minimum of 2,000 square metres of gross floor area
Elementary schools	1 space for every 17 employees	1 space for every 5 students
High School and Post-Secondary Schools	1 space for every 17 employees plus 0.4 space for every 10 students on a maximum attendance period	0.6 space for every 10 students on a maximum attendance period
Restaurants, Bars, Retail, Personal; Service	One space for each 340 square metres of gross floor area	Minimum of 6 spaces for any development containing a minimum of 1,000 square metres of gross floor area
Rooming unit or dwelling unit within a post secondary educational facility	0.75 per unit - TBC	0.25 per unit
Airport; bus station; hospital; hotel; light industrial use; medical facility; technology industry; train station	TBD	1 per 1000 m ² of gross floor area
(h) animal hospital; storage yard; truck transport terminal; warehouse	TBD	1 per 2000 m ² of gross floor area
(i) all other non-residential uses	TBD	1 per 1500 m ² of gross floor area

Passive supervision is defined as areas visible from high traffic or often occupied spaces.

Documentation	Site Plan
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2.21. ENHANCED BICYCLE FACILITIES

Rationale and Objective	
Enable cycling through access to safe and flexible storage facilities.	
Requirement	
Flexibility in size/type of parking facility - cargo, trailer. Provide secure purpose-built larger spaces for 20% to accommodate these vehicles	
Supply electrical outlets in secure bicycle parking area for e-bikes. Sufficient outlets to service 20% of bike parking. Strategies to add multi-outlets are allowed.	
Documentation	Site Plan

2.22. TRANSIT ACCESS

Rationale and Objective	
Help to encourage transit use through improved access to transit facilities.	
Requirement	
Ensure quality linkages from building entrances to nearby transit stations. <i>This speaks to providing missing links of sidewalk outside the frontage limits.</i>	
Provide wayfinding signage on larger sites with multiple buildings for all transportation related amenities. Include bike parking locations, transit, ride hail information.	
Documentation	Site Plan

2.23. ENHANCED TRANSIT FACILITIES

Rationale and Objective	
Help to encourage transit use through improved transit facilities.	
Requirement	
When the building is next to a transit stop or requires that a new transit stop is added, project must install a shelter space for transit users with size based on mode share	

target. This space is preferred in the right-of-way but can be provided in the building if insufficient right-of-way is available.

Shelter space refers to transit waiting area that provides protection from sun and rain. Where existing transit stop is already equipped with shelter space requirement is not

Documentation	Site Plan
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Site Plan Tier 3

Tier 3 is provided for context as to the expected direction by 2030 but will not be tied to any specific incentive criteria.

		Tier 3		
		TEUI (KWh/m ² /yr)	TEDI (KWh/m ² /yr)	GHGI (kg CO ₂ /m ² /yr)
E1.2	MURB (≥4 Storeys)	75	15	5
E1.3	MURB (≤ 6 Storeys)	70	15	5
	Commercial Office	65	15	4
E1.4	Commercial Retail	70	15	3
	Mixed Use Buildings (90% residential, 5% retail, 5% commercial)	74	15	5
E1.5	All Other Building Types		TBD	