



Sustainable Building and Development Guidelines

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Purpose

The purpose of the Sustainable Building and Development Guidelines is to encourage sustainable design approaches through Planning Act applications, in keeping with the City's declaration as a sustainable community, and in alignment with Burlington's Strategic Plan 2015-2040. Burlington's Strategic Plan encourages energy efficient buildings and other on-site sustainable features, and sets a net carbon neutral goal for the community. Sustainable design is an integrated design process that helps to reduce infrastructure demands and costs, environmental impacts, greenhouse gas emissions, long term building operating costs, and contributes to the City's goal of being a prosperous, livable and healthy community. The guidelines address sustainability approaches related to site design, transportation, the natural environment, water, energy and emissions, waste and building materials, and maintenance, monitoring, and communication.

The guidelines serve as a comprehensive checklist of various sustainable design, construction and operation approaches, and will be used as a tool to assess the sustainable features of development applications. The checklist is enabled by the Sustainable Design policies of the Official Plan, and is meant to be a tool to encourage voluntary sustainable development practices and to highlight required sustainability measures as identified in the Official Plan, Zoning By-law and other city by-laws. The attached Sustainable Building and Development Guidelines table identifies all guidelines and identifies which items are required, and which items are voluntary.

Of the voluntary items, the city would specifically encourage measures to achieve water conservation, waste reduction, carbon neutrality, implement energy conservation and generation, increase and improve the urban forest tree canopy, implement innovative stormwater management and other measures that align with the Strategic Plan 2015-2040 and the Community Energy Plan.

Implementation

Applications and Development Types Subject to the Guidelines

The guidelines apply city-wide to development applications proposing the following uses:

- Mixed use,
- Institutional and Public Service Facilities,
- Commercial,
- Industrial/Employment, and
- High and medium density residential buildings.

Applications involving single detached dwellings and other low density residential buildings are not subject to the guidelines.

While the guidelines are administered primarily through major Site Plan applications, a review of the guidelines is also required as part of Official Plan and Zoning By-law amendment applications to ensure items can be implemented at Site Plan. Committee of Adjustment, minor Site Plan and building permit applications are not subject to the guidelines.

The guidelines apply to all new development applications submitted after the approval of the Sustainable Design policies in the Official Plan.

Compliance

Application Submission: The applicant must comply with the items identified as required, and is encouraged to consider the voluntary items. If voluntary measures are selected, they must also be shown on development application submission documents.

After Construction: Implementation compliance is required for all elements that are a component of Site Plan approval. Compliance for additional voluntary building measures is only required if the owner is seeking recognition through a sustainable building award, or if the development is subject to Community Benefits/Section 37 of the *Planning Act*.

Incentives

- The City of Burlington will develop an Urban Design Awards program that will include sustainable building awards and recognition to incentivize applicants to pursue additional voluntary guidelines. Developers who implement the highest number of voluntary guidelines and demonstrate compliance of these items will be eligible for an award.
- Other levels of government and utilities run financial incentive programs for which applicants may be eligible. These programs are highlighted in the Sustainable Building and Development Guidelines table.
- The voluntary guidelines may also be used in Section 37 Community Benefits negotiations, under the *Planning Act*.



Incorporation into the Development Process

The table below illustrates key steps in the implementation process:

Pre-consultation Meeting	The applicant will be made aware of the guidelines and checklist at the pre-consultation meeting. The checklist will be identified on the Pre-consultation Form and any required supporting documentation will be identified.
Submit Application	A completed checklist and supporting documentation will be submitted as part of a complete application.
OPA/ZBLA Approval	Sustainability measures that impact site layout and design will be identified through the Official Plan Amendment (OPA) and Zoning By-Law Amendment (ZBLA) process. The voluntary guidelines may also be used in Section 37 negotiations, under <i>the Planning Act</i> .
Site Plan Approval	Conditions related to any required or voluntarily selected technical sustainability measures (e.g. Low Impact Development Measures (LID)) will be included in Site Plan Approval.
Site Plan Agreement	Agreement will include requirements for meeting any required or voluntarily selected sustainability measures.
Building Permit Application	Measures related to the building permit process (e.g. internal to the building, structural elements) are only selected on a voluntary basis. If any voluntary sustainability measures related to the Ontario Building Code are selected, a copy of the completed checklist and supporting information/drawings will be submitted with the Building Permit application.
Compliance Verification	Implementation compliance will be required for all required building elements that are included in Site Plan approval. The applicant may choose to voluntarily confirm the implementation of voluntary sustainability measures. Compliance of all measures will be required for consideration of a sustainable building award.



The Benefits and Costs of Sustainable Buildings

Sustainable building practices are well known for their environmental benefits, however less attention is given to the social and economic benefits of “building green”. The common misconception that sustainable building practices are cost prohibitive is often an obstacle to implementation.

Canadian research has demonstrated that sustainable building activity is being driven by the market, and by the benefits that accrue from good sustainable building practicesⁱ. These benefits are not only environmental and include reduced operating costs, demonstration of a public commitment to corporate sustainability, effective asset management, improved rental and occupancy rates and creating higher quality buildings that provide enhanced occupant comfort, productivity, health and well-beingⁱⁱ. Doing the right thing and client demand are the top two triggers for increased green building activity in the Canadian marketⁱⁱⁱ. Research has identified the following performance of green buildings in the Canadian market:

- A median reduction in operating costs of 17% over 5 years;
- A median payback of eight years; and
- A median increased building value of 4%^{iv}.

Further studies have demonstrated that additional costs in green buildings are generally attributed to the design and modeling time necessary to incorporate sustainability features midway through a project. Incorporating sustainable design features from the outset or early stage of a project can help avoid higher costs^v. The investment of an additional 3% of project costs in the design phase can reduce construction costs by 10%, and the inclusion of a multi-disciplinary design team and involving contractors in the design process can also contribute to reduced costs^{vi}.

Third Party Standards and Guidelines

There are numerous third party certification programs and standards which applicants may also choose to pursue, such as:

- LEED (Leadership in Energy and Environmental Design), www.cagbc.org
- Energy Star and R-2000 Home Certification, www.nrcan.gc.ca/energy/efficiency/housing/new-homes/5057
- BOMA BEST, www.bomabest.com
- Quality Assured Passive House Certification (also available for non-residential buildings), www.passivehouse.ca
- Sustainable Sites Initiative, www.sustainablesites.org

The City’s Sustainable Building and Development Guidelines incorporate many similar standards to those found in the programs above. The city supports and encourages the use of recognized and accredited third-party green building certification programs for all new development.

ⁱ McGraw Hill Construction. “Canada Green Building Trends: Benefits Driving the New and Retrofit Market”. 2014 Available at: www.cagbc.org/CAGBC/Resources/GreenBuildMarketRes2014/CAGBC/Resources/Green_Building_Marke.aspx?hkey=36b22df4-d4f7-4bc2-80da-fd8767ff42d6

ⁱⁱ *Ibid*, ⁱⁱⁱ *Ibid*, ^{iv} *Ibid*

^v Kats, Gregory. “Green Building Costs and Financial Benefits.” A report for the Massachusetts Technology Collaborative. 2003 1-10. Available at: www.dnr.sc.gov/marine/NERR/present/highperf/Green%20Building%20Costs_Kats.pdf

^{vi} Syphers, Geof, et al. “Managing the Cost of Green Building,” KEMA, 2003. Available at: www.calrecycle.ca.gov/greenbuilding/design/ManagingCost.pdf

Sustainable Building and Development Guidelines - Section 1: SITE DESIGN

#	Required or Voluntary	Guideline	Rationale, Incentives and Resources	Implementation
1.1	Required	Augment Topsoil: Maintain a minimum 15 cm/6" quality topsoil.	Rationale: Appropriate topsoil levels absorbs runoff and helps to ensure plants survive and thrive. Resources: N/A	Site Plan
1.2	Required	Snow Management: For sites with surface parking, identify a designated snow storage area in an area that will reduce salt and contaminant impacts to vegetation, groundwater and surface water. Appropriate on site snow storage is preferable to off-site snow removal.	Rationale: Road salt poses risk to plants, animals, birds, fish, lake and stream ecosystems and groundwater. Appropriate snow storage areas can help manage and mitigate the risks associated with road salt. Resources: City of Burlington Site Plan Guidelines [PDF]: www.burlington.ca/siteplanguidelines Guidelines for Snow Disposal and De-icing Operations in Ontario: www.ontario.ca/document/guidelines-snow-disposal-and-de-icing-operations-ontario	Site Plan
1.3	Voluntary	Augment Topsoil, Enhanced: Maintain a minimum 30 cm/12" quality topsoil, protect areas from disturbance and/or decompact subsoil in landscaped areas/non hardscape areas.	Rationale: Enhanced topsoil levels absorbs runoff and helps to ensure plants survive and thrive. Protecting areas from disturbance and decompacting soil in disturbed areas further ensures the health of planted material. Resource: Preserving and Restoring Healthy Soil: Best Practices for Urban Construction. TRCA June 2012 Incentive: Sustainable Building Award	Site Plan
1.4	Voluntary	Snow Management, Enhanced: Achieve the Smart About Salt Site Certification.	Rationale: The Smart About Salt Site Certification ensures that design and management best practices are in place to mitigate the impacts of road salt. Resource: www.smartaboutsalt.com Incentive: Sustainable Building Award	Site Plan
1.5	Voluntary	Reuse Topsoil: Retain and reuse uncontaminated on-site topsoil in areas not covered by the building and parking/hard surface areas. Proper storage of topsoil to retain soil health and quality.	Rationale: Reusing soil promotes responsible use of a natural resource and minimizes the need to truck soil to and from the site. Resource: Preserving and Restoring Healthy Soil: Best Practices for Urban Construction. TRCA June 2012 Incentive: Sustainable Building Award	Site Plan

Sustainable Building and Development Guidelines - Section 1: SITE DESIGN

#	Required or Voluntary	Guideline	Rationale, Incentives and Resources	Implementation
1.6	Voluntary	<p>Site Disturbance: On greenfield sites, limit site disturbance including earthwork and clearing of vegetation to 12 metres beyond the building perimeter, 1.5 m beyond primary roadway curbs, walkways, and main utility branch trenches, and 7.5 m beyond constructed areas with permeable surfaces (such as pervious paving areas) that require additional staging areas in order to limit compaction in the constructed area. Or on previously developed sites, restore a minimum of 50% of the site area (excluding the building footprint) by replacing impervious surfaces with native or adapted vegetation.</p>	<p>Rationale: Maintains the local landscape and helps to ensure soils and vegetation remain undisturbed.</p> <p>Resource: LEED ND</p> <p>Incentive: Sustainable Building Award</p>	OPA/ZBLA and Site Plan
1.7	Voluntary	<p>Adaptive Reuse: Development includes adaptive reuse or rehabilitation of any non designated heritage buildings with cultural heritage value or potential.</p>	<p>Rationale: The City's Official Plan contains policy to encourage adaptive re-use of built heritage resources where appropriate. Adaptive reuse integrates cultural heritage resources or their key attributes into a new development and makes use of existing building stock.</p> <p>Resource: N/A</p> <p>Incentive: Sustainable Building Award</p>	OPA/ZBLA and Site Plan

Sustainable Building and Development Guidelines - Section 1: SITE DESIGN

#	Required or Voluntary	Guideline	Rationale, Incentives and Resources	Implementation
1.8	Voluntary (see exception)	<p>Accessible Units: In ground oriented residential developments such as townhomes, 15% of units are constructed as visitable housing. Features include: one zero-step entrance, wider doorways and clear passage on the main floor, a main floor bathroom or powder room.</p> <p>NOTE: Currently required for multi-unit apartment and condo buildings under the Ontario Building Code.</p>	<p>Rationale: Visitable housing is the concept of designing and building homes with basic accessibility. Visitable homes provide a welcoming environment for visitors of all ages and mobility. It also helps a person of any age who develops a temporary or permanent mobility disability stay in their home without having to undergo extensive renovations.</p> <p>Resources: Visitable Housing Canada: www.visitablehousingcanada.com</p> <p>CMHC Accessible Housing by Design: www.cmhc-schl.gc.ca/en/co/acho/acho_002.cfm</p> <p>Incentives: Sustainable Building Award; Burlington Accessibility Award; David C. Onley Award for Leadership in Accessibility</p>	Building Permit

Sustainable Building and Development Guidelines - Section 2: TRANSPORTATION

#	Required or Voluntary	Guideline	Rationale, Incentives and Resources	Implementation
2.1	Required	<p>Site Connections: Provide pedestrian and cycling connections from on-site buildings to off-site public sidewalks, pedestrian paths, trails, open space, active transportation pathways, transit stops and adjacent buildings and sites in accordance with Official Plan policies.</p>	<p>Rationale: Encourages active transportation and transit use to reduce the dependence on the automobile.</p> <p>Resource: N/A</p>	OPA/ZBLA and Site Plan
2.2	Required	<p>Accessibility: Design on-site sidewalks, crosswalks and walkways to be continuous, universally accessible, barrier-free and clearly delineated in accordance with Official Plan Policies, Accessibility for Ontarians with Disabilities Act & City of Burlington Accessibility Design Standards.</p>	<p>Rationale: Promotes walking by all age groups and abilities and provides access for those with limited mobility.</p> <p>Resources: The City of Burlington Accessibility Design Standards [PDF]: www.burlington.ca/accessibilitydesignstandards</p> <p>The Illustrated Technical Guide to the Accessibility Standard for the Design of Public Spaces: www.gaates.org/documents/DOPS_Illustrated_Guide_140527_FINAL.pdf</p>	Site Plan

Sustainable Building and Development Guidelines - Section 2: TRANSPORTATION

#	Required or Voluntary	Guideline	Rationale, Incentives and Resources	Implementation
2.3	Required	Bicycle Storage: Provide bicycle parking spaces in accordance with the Zoning By-law and Official Plan Policies.	<p>Rationale: Cycling reduces greenhouse gas emissions, reduces traffic congestion and improves health. Convenient bicycle parking encourages the use of active transportation.</p> <p>Resource: The City's Zoning Bylaw contains minimum bicycle parking space requirements for various zones</p>	OPA/ZBLA and Site Plan
2.4	Voluntary (see exception)	Transportation Demand Management: Provision and implementation of a Transportation Demand Management Plan. Required for parking reductions and required in Primary, Secondary and Employment Growth areas as per Official Plan policy.	<p>Rationale: Transportation Demand Management Plans are plans that encourage sustainable modes of transportation. TDM plans evaluate building transportation needs comprehensively and may consider measures such as the provision of transit passes, flexible work hours, unbundled parking, on site transit facilities, priority parking for carpooling and autoshare programs, etc.</p> <p>Resource: Smart Commute Halton</p> <p>Incentive: Sustainable Building Award</p>	OPA/ZBLA and Site Plan
2.5	Voluntary	Bicycle Storage (Occupants): Locate occupant/employee bicycle parking near the main entrance or easy to identify area, in a weather protected area with controlled access or secure enclosures, at no extra charge to the occupant/employee.	<p>Rationale: Applicants are encouraged improve upon the required bicycle parking requirements in the Zoning By-law to further encourage cycling as a viable transportation option.</p> <p>Resource: Toronto's Guidelines for the Design and Management of Bicycle Parking Facilities</p> <p>Incentive: Sustainable Building Award</p>	OPA/ZBLA and Site Plan
2.6	Voluntary	Bicycle Storage (Visitor): Provision of bicycle parking spaces in a weather protected area at grade near the main entrance or easy to identify area.	<p>Rationale: Applicants are encouraged improve upon the required bicycle parking requirements in the Zoning By-law to further encourage cycling as a viable transportation option.</p> <p>Resource: Toronto's Guidelines for the Design and Management of Bicycle Parking Facilities</p> <p>Incentive: Sustainable Building Award</p>	OPA/ZBLA and Site Plan

Sustainable Building and Development Guidelines - Section 2: TRANSPORTATION

#	Required or Voluntary	Guideline	Rationale, Incentives and Resources	Implementation
2.7	Voluntary	End of Trip Facilities: In workplaces provide a minimum of 1 shower and change facility with lockers. Provide an additional shower and change facility for every 30 bicycle parking spaces.	Rationale: In order to facilitate growth in bicycle commute trips, end of trip infrastructure is essential to ensure that cycling is a viable transportation option. Resource: Toronto's Guidelines for the Design and Management of Bicycle Parking Facilities Incentive: Sustainable Building Award	Site Plan
2.8	Voluntary (see exception)	Electric Vehicles: A minimum of 3% of parking spaces provide charging stations to accommodate electric vehicles and design additional areas to be EV conversion ready. NOTE: Effective January 2019, the Building Code requires EV charging in 20 per cent of parking spaces and "rough-ins" in the remaining spaces in new multi-unit residential buildings where parking is provided within the building.	Rationale: The demand for electric vehicles and related infrastructure is growing in Canada, and encouraging electric vehicles reduces greenhouse gas emissions and air pollution. Resource: www.plugndrive.ca - Level 1 charging stations are appropriate for most residential and employment/office buildings. Level 2 charging stations are recommended for commercial/public use. Incentives: Sustainable Building Award, MTO provides incentives to offset the cost of electric vehicles and Level 2 charging stations: www.mto.gov.on.ca/english/vehicles/electric/charging-incentive-program.shtml	Site Plan
2.9	Voluntary	Transit Pass: For residential developments, each unit receives a one-year Burlington Transit pass at no cost to resident.	Rationale: Growth in Burlington is directed towards intensification areas, all serviced by local transit. The City encourages transit-supportive development and measures to encourage transit ridership. Resource: N/A Incentive: Sustainable Building Award	Site Plan
2.10	Voluntary	Bike Share: Provision of an on-site bike share available for owners/tenants to use.	Rationale: Encourages cycling as a transportation choice. Resource: N/A Incentive: Sustainable Building Award	Site Plan
2.11	Voluntary	Car Share: Provision of an on-site car share service available to owners/tenants and the public.	Rationale: Providing space for a car share service reduces the need for private automobile ownership. Resource: N/A Incentive: Sustainable Building Award	Site Plan

Sustainable Building and Development Guidelines - Section 3: NATURAL ENVIRONMENT

#	Required or Voluntary	Guideline	Rationale, Incentives and Resources	Implementation
3.1	Required	Light Pollution: Minimization of light pollution in accordance with the city's Guidelines for Outdoor Lighting and Official Plan Policies.	<p>Rationale: Reducing light pollution reduces night sky glow which is beneficial for wildlife and improves nighttime visibility. All exterior lights must include cut-off shields in accordance with the City's guidelines.</p> <p>Resource: Council Approved Guidelines for Outdoor Lighting. www.burlington.ca/uploads/92/635575154693976963.pdf</p>	Site Plan
3.2	Required	Native Species (NHS): As per Official Plan policy, use native, non-invasive species within the Natural Heritage System and related buffers, and use non-invasive species in all other areas.	<p>Rationale: Planting native and non-invasive species protects and enhances the Natural Heritage System and biodiversity, and are resilient to the local climate.</p> <p>Resource: For a list of native species, please refer to Conservation Halton's Landscaping and Tree Preservation Guidelines. www.conservationhalton.ca/planning-permits</p>	Site Plan
3.3	Voluntary	Native Species (Enhanced, outside NHS and buffers): Use native, non-invasive species that are suitable to site conditions for a minimum of 75% of all landscaped areas.	<p>Rationale: Additional native plantings outside of natural areas are encouraged to promote biodiversity and resiliency.</p> <p>Resource: See above</p> <p>Incentive: Sustainable Building Award</p>	Site Plan

Sustainable Building and Development Guidelines - Section 3: NATURAL ENVIRONMENT

#	Required or Voluntary	Guideline	Rationale, Incentives and Resources	Implementation
3.4	Voluntary (See exception)	Bird Friendly Design: Incorporate bird friendly design measures. Required for glass buildings and buildings adjacent to the Natural Heritage System and the Lake Ontario shoreline, as per Official Plan Policy.	<p>Rationale: Bird Collisions with windows is a leading cause of bird death across North America.</p> <p>Resource: For assistance identifying bird friendly design measures please consult with FLAP Canada (www.flap.org) or the following Bird Friendly Design Guidelines:</p> <p>City of Toronto: www1.toronto.ca/city_of_toronto/city_planning/zoning_environment/files/pdf/development_guidelines.pdf</p> <p>City of Toronto (for glass buildings): www1.toronto.ca/City%20of%20Toronto/City%20Planning/Environment/Files/pdf/B/BF%20Best%20Practices%20Glass_FinalAODA_Bookmarked.pdf</p> <p>Markham: www2.markham.ca/markham/ccbs/indexfile/Agendas/2014/Development%20Services/pl140204/Bird%20Friendly%20-%20Appendix%20A%20-%20Guidelines.pdf</p>	Site Plan
3.5	Voluntary	Low Maintenance Landscaping: All landscaping is low maintenance and drought resistant (i.e. Xeriscaping) that does not require a permanent potable water based irrigation system (except for initial watering to establish plants).	<p>Rationale: The use of low maintenance and drought-resistant planting reduces the amount of watering needed and produces a resilient landscape.</p> <p>Resource: N/A</p> <p>Incentive: Sustainable Building Award</p>	Site Plan
3.6	Voluntary	Tree Planting (quantity): Submit a Canopy Cover Plan that demonstrates 20% canopy cover of non-building hard surfaces at two thirds mature size.	<p>Rationale: Planting trees provides numerous benefits and services, including the reduction of air pollution, water attenuation, moderation of the urban heat island effect, carbon sequestration, shade, habitat for urban adapted wildlife, neighbourhood character and mental health benefits.</p> <p>Resource: For assistance preparing a Canopy Cover Plan, please see the Town of Oakville's Guideline and Calculator: www.oakville.ca/assets/2011%20planning/canopycoverplanjan13.pdf</p> <p>Incentive: Sustainable Building Award</p>	Site Plan

Sustainable Building and Development Guidelines - Section 3: NATURAL ENVIRONMENT

#	Required or Voluntary	Guideline	Rationale, Incentives and Resources	Implementation
3.7	Voluntary	Tree Planting (soil): Provide a soil volume of 30 m3 per tree and a minimum depth of 1 metre of high quality soil OR in hard surface situations install a soil cell product with high quality soil and provide the required soil volume.	<p>Rationale: The use of high quality soil at an appropriate quantity helps ensure trees survive and thrive. A soil cell type product helps ensure trees survive in urban hardscape environments. High quality soil is well drained, un-compacted soil comprised of 5 to 15% organic material with a pH level of 6.0 to 8.0.</p> <p>Resource: N/A</p> <p>Incentive: Sustainable Building Award</p>	Site Plan
3.8	Voluntary (See exception)	<p>Enhanced Tree Preservation: Maintain existing on-site trees that are 30 cm or more DBH (diameter at breast height) OR Maintain 75% of healthy mature trees greater than 20 cm DBH.</p> <p>Note: Tree preservation requirements will be determined by Official Plan urban forestry policies.</p>	<p>Rationale: Preserving trees provides numerous benefits and services, including the reduction of air pollution, water attenuation, moderation of the urban heat island effect, carbon sequestration, shade, habitat for urban adapted wildlife, neighbourhood character and mental health benefits.</p> <p>Resource: N/A</p> <p>Incentive: Sustainable Building Award</p>	OPA/ZBLA and Site Plan
3.9	Voluntary (See Exception)	Restoration and Enhancement: Complete and implement a restoration and/or enhancement plan that demonstrates net gain for Natural Heritage System areas, including a management and monitoring plan. May be required as a result of Environmental Impact Assessment recommendations.	<p>Rationale: The restoration and enhancement of Natural Heritage System areas can aid in the improvement of degraded areas, and can enhance ecosystem function. Long term management and monitoring ensures the success of the restoration project over the long term.</p> <p>Resource: N/A</p> <p>Incentive: Sustainable Building Award</p>	OPA/ZBLA and Site Plan
3.10	Voluntary	Community Gardens: For development containing residential units, provide community garden plots for residents in a common amenity area.	<p>Rationale: Community gardens encourage sustainable local food production, increase access to healthy food, provide opportunities for community building and create local green space.</p> <p>Resource: N/A</p> <p>Incentive: Sustainable Building Award</p>	Site Plan

Sustainable Building and Development Guidelines - Section 4: WATER CONSERVATION AND QUALITY

#	Required or Voluntary	Guideline	Rationale, Incentives and Resources	Implementation
4.1	Required	Stormwater Quality: Achievement of a level one/enhanced stormwater treatment for all stormwater runoff.	Rationale: Stormwater quality treatment reduces the total suspended solids in runoff to ensure the protection of receiving watercourses and Lake Ontario.	OPA/ZBLA and Site Plan
4.2	Voluntary	Water Conservation Systems: implementation of systems to retain and reuse water, such as grey water recycling, rainwater harvesting systems, cisterns and rain barrels.	Rationale: Cisterns, rain barrels and rainwater harvesting systems allow rainwater to be captured and reused on site. Grey water systems allow the reuse of water internal to the building, for example allowing the reuse of water from bathing and/or laundry to be used for flushing toilets or irrigation. Resources: N/A Incentives: Sustainable Building Award	Site Plan and Building Permit
4.3	Voluntary	Pervious Surfaces: minimization of impervious surfaces and stormwater runoff through the use of Low Impact Development (LID) measures, such as: <ul style="list-style-type: none"> • permeable pavement; • bioswales; • infiltration trenches/bioretention areas; • rain gardens; • draining roofs to pervious areas, and; • other innovative stormwater management strategies 	Rationale: Low Impact Development strategies mitigate the impacts of increased urban runoff and stormwater pollution by managing it as close to its source as possible. It comprises a set of site design approaches and small scale stormwater management practices that promote the use of natural systems for infiltration and evapotranspiration, and rainwater harvesting. Resources: Guidance, case studies and other tools to help design and construct LID approaches can be found on Credit Valley Conservation's website: www.creditvalleyca.ca/low-impact-development/ Incentives: Sustainable Building Award	OPA/ZBLA and Site Plan
4.4	Voluntary	Efficient Fixtures: All newly installed toilets, urinals, private lavatory faucets, and showerheads that are eligible for labeling must be WaterSense labeled.	Rationale: Efficient water fixtures reduce the use of potable water. Resources: EPA Watersense - www.epa.gov/watersense/watersense-label Incentives: Sustainable Building Award	Building Permit

Sustainable Building and Development Guidelines - Section 5: ENERGY AND EMISSIONS

#	Required or Voluntary	Guideline	Rationale, Incentives and Resources	Implementation
5.1	Required	Urban Heat Island: Provide vegetated landscape areas in hard surface areas as per the Zoning By-law.	<p>Rationale: Vegetation can reduce the urban heat island effect to improve human comfort and energy efficiency in the surrounding areas.</p> <p>Resource: City's Zoning By-law</p>	OPA/ZBLA and Site Plan
5.2	Voluntary	Urban Heat Island (non-roof): efforts to reduce urban heat island effect using light coloured materials/white paving and/or enhanced landscaped parking for at least 50% of non-roof hardscape.	<p>Rationale: Light coloured materials and vegetation can reduce the urban heat island effect to improve human comfort and health and improve energy efficiency in the surrounding area. High albedo materials include white or grey concrete, light coloured asphalt, selected interlocking concrete paver and other light coloured pavers and must have an initial reflectance of at least 0.33.</p> <p>Resources: LEED standards provide additional guidance for calculating reflectance: www.cagbc.org</p> <p>Incentive: Sustainable Building Award</p>	Site Plan
5.3	Voluntary	Urban Heat Island (roof): Use Cool roofing materials for 75% of the roof area OR Install a Green Roof with 50% minimum coverage OR use a combination of green roof and cool roof material for a minimum of 75% of the roof.	<p>Rationale: Light coloured roofing materials reduces the heat island effect and contributes to building energy efficiency. Light coloured roofs should generally have a Solar Reflectance Index of 82 for a low sloped roof, and 39 for a high sloped roof. In addition to reducing the heat island effect, green roofs can be used to manage stormwater, improve local air quality, provide amenity space and grow produce.</p> <p>Resources: LEED standards provide additional guidance for calculating reflectance. www.cagbc.org</p> <p>Incentive: Sustainable Building Award</p>	Site Plan

Sustainable Building and Development Guidelines - Section 5: ENERGY AND EMISSIONS

#	Required or Voluntary	Guideline	Rationale, Incentives and Resources	Implementation
5.4	Voluntary	Energy Efficiency: Achieve 10% or better energy efficiency improvements over ASHRAE 90.1-2010 as demonstrated by third party certification/energy modelling.	<p>Rationale: By some estimates, 40% of energy use in North America can be attributed to the heating, cooling and maintenance of buildings. Building more energy efficient buildings reduces greenhouse gas emissions and air pollution and are more cost effective to operate. Efficiencies can be achieved through a combination of measures including HVAC, insulation, building materials, windows, lighting, appliances, automation/controls, building orientation and other passive energy measures to achieve a low carbon building.</p> <p>Resources: N/A</p> <p>Incentives: Various incentives may be available for eligible projects. Applicants are encouraged to investigate these incentives by contacting Burlington Hydro, Union Gas and the Independent Electricity System Operator. Information is available at www.saveonenergy.ca</p> <p>CMHC Green Home Program (for buyers of condo units)</p>	Building Permit
5.5	Voluntary	On-site Renewable Energy: Generate a portion building energy needs using an on-site renewable energy supply (e.g. solar, wind, geothermal).	<p>Rationale: Renewable energy can reduce pollution and greenhouse gas emissions and provide energy security.</p> <p>Resources: City of Burlington Renewable Energy Protocol</p> <p>Incentives: Buildings that generate renewable energy may participate in the IESO's Feed-in-Tariff programs: www.ieso.ca/sector-participants/feed-in-tariff-program/overview</p>	Site Plan and Building Permit
5.6	Voluntary	Net-Zero: Demonstration via energy modelling of net-zero energy footprint.	<p>Rationale: A combination of energy efficiency and on-site renewable measures can achieve a net-zero energy footprint.</p> <p>Resources: LEED Zero Carbon Building Standard and the Toronto Zero Emissions Building Framework</p> <p>Incentives: Sustainable Building Award</p>	Site Plan and Building Permit

Sustainable Building and Development Guidelines - Section 5: ENERGY AND EMISSIONS

#	Required or Voluntary	Guideline	Rationale, Incentives and Resources	Implementation
5.7	Voluntary	District Energy: Incorporate a district heating and/or cooling system, or ensure the building is retrofit ready for a future DE connection.	<p>Rationale: District energy is technology for providing heating and/or cooling from a central plant to multiple users in a district. District energy can save money for users, conserve resources, reduce air emissions, and provide energy security.</p> <p>Resources: www.districtenergy.org • www.questcanada.org</p> <p>Incentives: Sustainable Building Award</p>	Site Plan and Building Permit
5.8	Voluntary	Continuous Metering: Provision of continuous metering of energy usage for each unit.	<p>Rationale: Continuous energy metering is critical for accurate energy monitoring and management.</p> <p>Resources: N/A</p> <p>Incentives: Sustainable Building Award</p>	Building Permit
5.9	Voluntary	Commissioning: Third-party commissioning of building systems to ensure they function properly. Commissioning team should be part of an integrated design and construction team at project start.	<p>Rationale: Commissioning of a building a process that documents and verifies that all of the facility's energy related systems perform interactively as per the design specifications and operational requirements for at least one year following construction.</p> <p>Resources: Please see the LEED-NC Energy & Atmosphere Prerequisite for Fundamental Building Systems Commissioning (www.cagbc.org) or The Building Commissioning Guide: www.wbdg.org/ccb/GSAMAN/buildingcommissioningguide.pdf</p> <p>Incentives: Sustainable Building Award</p>	Building Permit

Sustainable Building and Development Guidelines - Section 6: WASTE AND BUILDING MATERIALS

#	Required or Voluntary	Guideline	Rationale, Incentives and Resources	Implementation
6.1	Required	Waste Management Plan: Provide and implement a waste management plan in accordance with Regional requirements.	Rationale: Recycling and composting treats waste as a resource and reduces the need for landfill expansion. Resource: Halton Region's Development Design Guidelines for Source Separation of Solid Waste: www.halton.ca/cms/One.aspx?portalId=8310&pageId=73736	OPA/ZBLA and Site Plan
6.2	Voluntary	Waste Management Facilities: Provision of recycling, garbage and composting facilities (beyond those required by Halton Region) which are easily accessible for all occupants (in an attached building);	Rationale: Recycling and composting treats waste as a resource and reduces the need for landfill expansion.	Site Plan
6.3	Voluntary	Recycled Materials: Ensure that at least 15% of a project's construction materials (based on value) are comprised of refurbished/reused or recycled content;	Rationale: Reduces the demand for new materials and their associated environmental impacts. Resources: N/A Incentives: Sustainable Building Award	Building Permit
6.4	Voluntary	Locally Manufactured: Ensure that at least 15% of a project's construction materials (based on value) are comprised of materials with locally manufactured content;	Rationale: Local materials support the local economy and reduce the environmental impacts associated with transportation. Products should be sourced within 160 km of development site. Resource: N/A Incentives: Sustainable Building Award	Building Permit
6.5	Voluntary	Sustainable Wood: Where wood based materials are used, utilize a minimum of 25% that are certified in accordance with the Forest Stewardship Council's principles and criteria for wood building components.	Rationale: The Forest Stewardship Council (FSC) is an international certification and labeling system dedicated to promoting responsible forest management, which includes sustainable harvesting and replanting practices. Resources: Forestry Stewardship Council - ca.fsc.org/en-ca Incentive: Sustainable Building Award	Building Permit

Sustainable Building and Development Guidelines - Section 6: WASTE AND BUILDING MATERIALS

#	Required or Voluntary	Guideline	Rationale, Incentives and Resources	Implementation
6.6	Voluntary	Air Pollutants in Materials: Minimization of air pollutants in interior materials by using low or no VOC paints, carpets, adhesives and other finishes.	Rationale: The use of low VOC (volatile organic compounds) paint and finishes improve indoor air quality. Resource: N/A Incentives: Sustainable Building Award	Building Permit
6.7	Voluntary	Construction Waste Management: Develop and implement a waste management plan to recycle and/or salvage construction, demolition and land clearing waste.	Rationale: Reduces construction and demolition waste disposed of in landfills, and to treat recycled and salvaged materials as a resource. Resource: N/A Incentive: Sustainable Building Award	Building Permit

Sustainable Building and Development Guidelines - Section 7: MAINTENANCE, MONITORING AND COMMUNICATION

#	Required or Voluntary	Guideline	Rationale, Incentives and Resources	Implementation
7.1	Voluntary	Maintenance Plan: provision of a building maintenance plan that provides instructions, training requirements and schedules for maintaining sustainability features of the site/building/landscaping. Includes requirements for recommissioning plan of the facility every 5 years.	Rationale: A maintenance plan will ensure sustainability features remain implemented on the site and continue to function at optimal levels. Resource: N/A Incentives: Sustainable Building Award	Building Permit
7.2	Voluntary	Education: provision of instructions for homeowners and occupants that explain the intent, benefits, use, and maintenance of green building features as part of the lease/sale agreement or condo declaration. Signage and other education materials are posted to educate building visitors of sustainability features.	Rationale: Communicating the building's green development features and familiarizing the owner(s) or occupants with these features will help to ensure their proper use and maintenance. Resource: N/A Incentives: Sustainable Building Award	Building Permit

Sustainable Building and Development Guidelines - Section 7: MAINTENANCE, MONITORING AND COMMUNICATION

#	Required or Voluntary	Guideline	Rationale, Incentives and Resources	Implementation
7.3	Voluntary (note exception)	<p>Monitoring: collection and monitoring of project performance data on energy, water and healthy living environments.</p> <p>Note: Ontario's Energy and Water Reporting and Benchmarking (EWRB) program has reporting requirements for commercial, multi unit residential and some industrial buildings over 50,000 square feet.</p>	<p>Rationale: Monitoring is critical to understand project performance and to undertake adaptive management measures, maintenance and training as required.</p> <p>Resource: EWRB - www.energy.gov.on.ca/en/ontarios-ewrb/</p> <p>Incentives: Sustainable Building Award</p>	Building Permit

Sustainable Building and Development Guidelines - Section 8: INNOVATION

#	Required or Voluntary	Guideline	Rationale, Incentives and Resources	Implementation
8.1	Voluntary	Innovative design or performance features not listed that receive approval from the City.	<p>Rationale: The intent of this category is to encourage and recognize additional innovative approaches in design or performance that are not specifically addressed above.</p> <p>Incentive: Sustainable Building Award</p>	Various

NOTE: Highlighted items are required based on Official Plan Policies, Zoning Bylaws or other City Bylaws.

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