City of Hamilton
Airport Employment Growth District

Eco-Industrial Design Guidelines

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Table of Contents
Eco-Industrial Design Guidelines

1.0 Introduction

The City of Hamilton is committed to developing the Airport Employment Growth District (AEGD) as a model of sustainable development – i.e. to build a business park that is economically viable and contributes significantly to providing local jobs for Hamilton residents while showcasing sustainable design principles including protection of local natural systems and features.

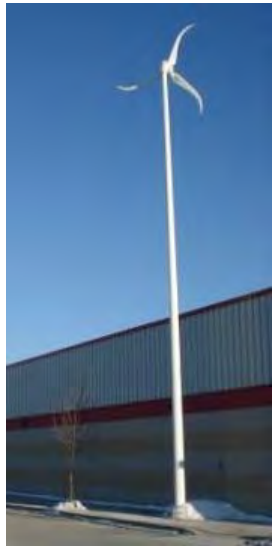
In order to ensure that a sustainable design is achieved in the AEGD, the planning process was framed around a sustainable development vision and objectives that guided the design of the urban structure and related policies. Specific principles of sustainability are embedded in the AEGD's Secondary Plan to ensure that sustainable objectives underpin planning policies and subsequent related implementation tools. Sustainability has also been incorporated into the Transportation Master Plan, Stormwater Master Plan and Water/ Wastewater Master Plan for the AEGD.

The Eco-Industrial Design Guidelines (EIG) presented in this document are part of the AEGD's Eco-Industrial Initiative. This initiative is described through the following documents: the Eco-Industrial Initiative: Incentives and Funding Options – Technical Memo; Eco-Industrial Directions – Technical Memo; and, Eco-Industrial Park Best Practices and Standards review (conducted as part of the AEGD Phase 1 project).

1.1. The Role of Eco-Industrial Design Guidelines (EIG)

The Eco-Industrial Design Guidelines provide an integrated set of principles and measures to guide the development of the AEGD area. The Guidelines are an important tool that developers will follow when planning a site and City staff will follow when evaluating planning applications. Staff will be able to test and document that each new development in the AEGD has fully considered innovation in sustainable design. The EIG provide "guard rails" to ensure that the plans and projects are fully considering a wide range of innovative sustainable design solutions.

Through the use of the Eco-Industrial Design Guidelines for the AEGD, the City of Hamilton aims to improve individual and social well-being, enhance and protect the environment, reduce developments' carbon footprint, and improve economic vitality. Sustainability by definition refers a perspective that considers all aspects of a community together - the social (e.g. character, safety, convenience), economic (e.g. number and character of local jobs and health of the local economy) and environmental (e.g. terrestrial and aquatic systems health).



Wind Power in an ICI building, Mississauga

The Eco-Industrial Design Guidelines are intended to be used in combination with the Hamilton Airport Employment Growth District Urban Design Guidelines. The elements of eco-industrial and urban design are intended to work together to create development that reduces its negative impact and optimizes its positive impact, in the physical context of an urban form and built from that can be characterized as a high quality place and space. Both Guidelines have been prepared following the Eco-Industrial and Urban Design Principles outlined in the Hamilton Airport Employment Growth District Secondary Plan, Section 8.13. Section 8.13.1 states the basis of the EIG:

> *Eco-Industrial Design Guidelines and Urban Design Guidelines for the Airport Employment Growth District shall be prepared and adopted by Council that provide specific guidance for development in accordance with the eco-industrial and urban design policies of this Secondary Plan.*

1.2. Sustainable Design in the AEGD Vision

The Secondary Plan and Infrastructure Master Plans are based upon the following vision:

AEGD VISION

The Hamilton Airport Employment Growth District is vibrant and visually appealing and the natural and cultural heritage resources in the area have been preserved and used to establish a distinct character for the area. It is a working community that attracts a range of airport related and other businesses providing both conventional and knowledge-based services. The environmental footprint of the area has been managed through a range of sustainable design techniques and the character of the surrounding land uses have been protected through appropriate land use transitions and transportation planning.

1.3. Structure of the Guidelines

Eco-industrial design elements have been grouped around nine principles in the guidelines, as follows:

- Transportation
- Energy, Renewables, Air Quality and GHG Reduction
- Water and Wastewater, and Water Conservation/ Efficiency

Solar Wall, Ford Plant in Oakville, ON

- Stormwater Management Guidelines
- Materials, Resources, and Solid Waste
- Economic Sustainability and Business Synergy
- Social Sustainability
- Site Development, Disturbance, Natural Corridors and Greenways
- Food Production and Community Gardening

A short description has been provided for each design element (first column) along with a list of associated measures to be implemented (second column). The EIG includes a check list to be filled in during the application process (third and fourth columns). The evaluation system shall be used to provide a basis under which the City will evaluate and prioritize development approvals, possibly including assignment of servicing allocations and the issuance of site plan approval or other incentives.

As part of the City's commitment to promote sustainability, a summary of funding or grants available to both the municipalities and developers for implementing sustainable developments is included in a separate document titled Eco-Industrial Initiative: Incentives and Funding Options – Technical Memo. In addition, the document includes a sample of incentives and programs implemented in other geographies in North America.

1.4. Who Should Use these Guidelines

The EIG are intended to provide guidance to the City, developers, planners, engineers and architects involved in the design, approval and construction projects within the Hamilton Airport Employment Growth District as to how to achieve the City's sustainability goals for this area. The Guidelines are intended to apply to all new development or redevelopment in the AEGD area. The Guidelines are flexible, as they encourage proponents to be innovative and enable them to use a variety of technologies and designs to achieve each principle.

The EIG are designed to be comprehensive and apply to different types of development applications. Therefore, there are a variety of elements in the EIG that may not apply to all development forms.

It is equally important that the planning, design, construction and maintenance of municipal infrastructure be approached in a similar eco-industrial, sustainable fashion. It is key that all components and areas of this employment area embrace the principles inherent in "AEGD Vision". As such, the approaches and guidelines for eco-industrial and sustainable design of municipal infrastructure are outlined in the Master Plans for Water and Wastewater, Stormwater and Transportation. Likewise, the Urban Design Guidelines for the AEGD inherently promote the philosophy of sustainability and eco-industrial design.

1.5. How to Use the Guidelines

Development in the AEGD is guided by the AEGD Secondary Plan and Zoning by-Law, the Transportation, Stormwater and Water/Wastewater Master Plans, these Eco-Industrial Design Guidelines and the Urban Design Guidelines. The City will evaluate a proposed

development against the requirements of the Zoning by-Law. The EIG will also be considered as part of the evaluation.

According to Sections 8.14.1 8.14.2, 8.14.3 and 8.15.5 of the Secondary Plan, the EIG will be part of the Plan of Subdivision or Site Plan approval process for the Airport Employment Growth District. The EIG will be completed as parte of the "Energy and Environmental Assessment Report as follows:

8.14 Energy and Environmental Assessment Report

8.14.1 Notwithstanding Section F.3.2.9 of Volume 1, the sustainability of development shall be evaluated at the time of development approval for a Plan of Subdivision or Site Plan and an Energy and Environmental Assessment Report demonstrating how the development meets or exceeds the sustainability provisions of the Eco-industrial Design Guidelines and Urban Design Guidelines shall be required prior to development approval.

8.14.2 The degree to which a development meets or exceeds the sustainability provisions of the Eco-industrial Design Guidelines and Urban Design Guidelines as described by the Energy and Environmental Assessment Report may be used as a basis by the City to prioritize development applications, including the assignment of servicing allocation and the issuance of draft plan approval under the Planning Act.

8.14.3 The Eco-industrial Design Guidelines and Urban Design Guidelines may incorporate an evaluation system which would provide specific criteria for the assessment of development applications through the Energy and Environmental Assessment Report. The evaluation system may be revised from time to time to respond to technology advancement and design innovation without an amendment to this Secondary Plan. The evaluation system may include criteria including but not limited to:

a. *Green building materials;*
b. *Energy efficient building design;*
c. *Vehicle trip generation, access to public transit, cycling, and walkability;*
d. *Water conservation;*
e. *Diversity of use and availability of community services and public amenities;*
f. *Waste reduction, reuse and recycling (during construction and during operation);*
g. *On-site storm water management;*
h. *Grey water reuse;*
i. *Light pollution management;*
j. *"Urban heat island" effect management; and,*
k. *On-site renewable energy generation; and,*
l. *Use of a district energy system.*

Complete Application Requirements

8.15.3 Notwithstanding the complete application requirements of Section F.1.19 of the Urban Hamilton Official Plan, an Energy and Environmental Assessment Report shall be required as other information and materials required to

deem Planning Act applications for draft plan of subdivision and site plan complete.

The development application process will be as follows:

a) The applicant will be required to provide staff with a completed copy of the EIG checklist and as part of the Energy and Environmental Assessment Report with an explanation of how the development meets or exceeds sustainability provisions of the eco-industrial guidelines. The report will also address how the various elements of the EIG will be implemented and achieved (i.e. development agreements, third party verification).

b) City Staff will evaluate the submission and provide an assessment of the application to the applicant.

c) Development review will consider an application's ability to satisfy all Required Elements applicable to the development. The series of Optional Elements are provided to allow for innovation and provide the ability for development to achieve a higher standard of sustainability which in turn may give the application priority in the approval process.

d) The applicant may then be encouraged to amend the application and submit additional information and/or to modify their plans to integrate the appropriate changes and comments into a revised application.

e) Following the consultation with the applicant, the developer will submit an updated checklist, which will be included as part of Staff's overall development application review and approval process including a report to Council.

1.6. Performance Requirements

The EIG are intended to complement but not replace regulations in the Zoning By-Law.

2.0 Eco-Industrial Design Guidelines

ECO-INDUSTRIAL DESIGN PRINCIPLE/ RATIONALE		MEASURE	✓	N/A
2.1. Transportation				
Public Transit Amenities  *Hamilton Transit System* Use of transit reduces automobile usage and congestion. The provision of transit service enhances access to the employment area to those that do not own a car. The provision of transit amenities (i.e. weather protected bus shelters) can increase transit ridership.	Optional	• For transit-serviced roads, development includes transit amenities, such as bus shelters with weather protection, signage, benches and trash receptacles.	☐	☐
	Required	• Plan integrates transit facilities directly into the development or locates building's entrances within 400 metres walking distance of a bus stop or within 800 metres of a Rapid Transit station, when feasible and where transit is available.	☐	☐
	Required	• For transit-serviced roads and where feasible, plan accommodates transit stops at intersections or major destinations (e.g. adjacent to Employment Supportive Centres) spaced within 300 to 500 metres to achieve a 400-metre walking distance between building entrances and transit stops (or within 800 metres of a Rapid Transit Station) for 90% of the buildings.	☐	☐
	Required	• For transit-serviced roads and where feasible, "Enhanced Transit Stops" as defined in the Transportation Master Plan, should be located adjacent to Employment Supportive Centres. They may include the amenities such as signage, transit shelters, drinking fountains, benches, trash receptacles, bike racks, lighting, decorative paving; and trees, shrubs and groundcovers.	☐	☐
		• Development incorporates or becomes part of the AEGD transportation management association which partners with businesses to promote a variety of transportation services that reduce single-occupant vehicle trips.	☐	☐

ECO-INDUSTRIAL DESIGN PRINCIPLE/ RATIONALE		MEASURE	✓	N/A
2.1. Transportation				
Pedestrian and Cycling Infrastructure Inclusion of pedestrian and cycling networks expands transportation options, and reduces reliance on automobiles.  *Meadowvale Business Park, Mississauga* Sidewalks have an important role for those working along main routes. Well designed sidewalks encourage walking and provide safety for pedestrians of all ages. The addition of walkways and trails enhances the network and provides additional connectivity. Transit users are also pedestrians at the beginning and end of their trips, as such they are also users of pedestrian networks. Pedestrian comfort and security should also be considered when designing employment areas. For example, benches, streets trees, pedestrian-scaled lights, and transit amenities provide comfort to pedestrians and a high quality environment. The creation of a cycling network using on and off-road cycling facilities offers people a viable alternative to automobile travel and promotes a healthy lifestyle.	Required Required Required Required	• Plan establishes a year-round connected pedestrian and bicycle network composed of trails, walkways, cycling lanes and sidewalks as specified in the Transportation Master Plan. • Development accommodates streetscape amenities that encourage pedestrian movement, such as: benches, street trees, waste receptacles, pedestrian-scaled street lighting, shelter at public areas and curb cuts for accessibility for arterial and collector roads or all roads. Water fountains and bike racks and/or lockers should be considered at high-ridership transit facilities. • Plan includes roads with bike lanes and/or off-road cycling and/or multi-use trails that are integrated with the City's trail system, when feasible, according to the AEGD Transportation Master Plan. • Plan provides a secure, weather-protected bike storage with convenient changing/ shower facilities (i.e. within 200 metres of the building) for 5% or more of regular building occupants.	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐
Parking	Required	• Plan minimizes the size of parking areas and avoids large,	☐	☐

ECO-INDUSTRIAL DESIGN PRINCIPLE/ RATIONALE		MEASURE	✓	N/A
2.1. Transportation				
Reduction of parking requirements promotes more efficient land use, compact form, reduction of stormwater run-off and heat island effect. In addition, reduction of surface parking areas creates enhanced walkable streescapes. Parking located at interior of built areas helps to mitigate the detrimental affect of parking on streetscapes and promotes more walkable streets.  *Seneca College - use of permeable paving*	Required	barren parking areas. • Surface parking lots include sustainable features, such as permeable pavement, pedestrian connections, landscaping and applicable stormwater retention systems.	☐	☐
	Required	• Development includes preferential parking for carpools, vanpools, car co-ops, among others, located closest to the building entrance, when feasible.	☐	☐
	Optional	• Plan locates parking at the interior or rear/side of built areas to minimize impact on streetscape and maximize the opportunity to locate front doors in proximity to transit facilities.	☐	☐
	Optional	• Plan provides preferred parking for high efficiency hybrid or alternative fuel vehicles for 3% or building occupants, when feasible.	☐	☐
Logistic Facilities Loading docks, outside storage, and service areas should be located in areas of low visibility and screened from public view. Shared driveways between two properties and consolidated logistic facilities should be provided to minimize the development footprint and minimize disruption of the public sidewalks.  *Alcon, Mississauga - use of landscaping to screen logistic area*	Required	• Plan locates loading docks, outside storage (where permitted in the Zoning Bylaw) and service areas in areas of low visibility such as at the side or at the rear.	☐	☐
	Optional	• Plan includes consolidated logistics facilities, including cargo distribution centres, loading areas and warehousing, with shared access roads.	☐	☐

ECO-INDUSTRIAL DESIGN PRINCIPLE/ RATIONALE		MEASURE	✓	N/A
2.2. Energy, Renewables, Air Quality and GHG Reduction				
Energy Conservation and Efficient Buildings Energy efficiency and conservation reduces the needs of costly generation, transmission and distribution of power as well as reduces the development's carbon footprint. Energy reduction also generate savings to businesses and municipalities.  *Energy Star® Symbol* Energy Star® and Energuide are publicly accepted measures of energy performance. Energy efficient lighting reduces light pollution and energy consumption. The threshold of 25% efficiency improvement over the MNECB is a comon target in the marketplace, and a prerequisite for both LEED™ certification and Commercial Building Incentive Program (CBIP) funding. This target can be achieved for most of building types.	Optional	• Plan includes opportunities for energy, heating and cooling sharing among businesses in different parcel.	☐	☐
	Optional	• Plan uses high-efficiency products and participates in Natural Resources Canada voluntary programs, such as EnerGuide for Industry and ENERGY STAR®.	☐	☐
	Optional	• Buildings achieve at least 25% efficiency improvement over the Model National Energy Code for Buildings (MNECB).	☐	☐
	Optional	• Where supplied, plan ensures that 75% of appliances and fixtures are Energy Star compliant.	☐	☐
	Optional	• Plan requires installation of motion sensors for all interior walkways and stairs; for exterior lighting fixtures; and, in exterior walkways, stairs, parking structures and parking lots.	☐	☐
	Optional	• Plan includes LED lighting or other alternative that is energy efficient in all public lighting, such as streetlights and traffic lights.	☐	☐
	Optional	• Plan uses energy efficient fixtures and/or alternative energy sources (e.g. solar power) for outdoor lighting in private and public spaces.	☐	☐
	Optional	• Plan includes the use of high-efficient heating, ventilation and air conditioning equipment.	☐	☐

ECO-INDUSTRIAL DESIGN PRINCIPLE/ RATIONALE		MEASURE	✓	N/A
2.2. Energy, Renewables, Air Quality and GHG Reduction				
	Optional	• Plan pursues LEED™ or other green building certification. The plan will include documentation of, the intention to complete, or the completion of, a green building certification process.	☐	☐
Renewable Power Generation On-site renewable power generation and local energy production have many benefits for the environment as they increase the flexibility of the electrical grid; increase user's awareness of where their power comes from, and reduce carbon emissions.  *Clarkson Wastewater Plant – Photovoltaic Solar Flairs* Use of on-site renewable energy generation can also result in savings for the user, principally if the generation coincides with high peak demand. Grid-sources renewable energy are those that meet the Environment Canada Environmental Choice program's EcoLogo requirements for green power supplies.	Optional Optional Optional	• Plan incorporates on-site renewable sources of power generation (wind, solar, biomass) to meet 10% of the energy needs of buildings, outdoor features and commonly owned infrastructure in the project. • Where feasible, plan incorporates connection to the District Energy System for heating and/or cooling. • Plan proposes the purchase of 50% of energy needs through grid-source renewable energy, where feasible.	☐ ☐ ☐	☐ ☐ ☐
Building Orientation Passive solar gain reduces the heating and lighting requirements for buildings at no cost to the developer or owner. Solar gain can be obtained through street and building	Optional	• Plan orients and designs buildings and infrastructure to take advantage of passive solar heating, natural lighting, ventilation and shading for cooling (See Urban Design Guidelines).	☐	☐

ECO-INDUSTRIAL DESIGN PRINCIPLE/ RATIONALE		MEASURE	✓	N/A
2.2. Energy, Renewables, Air Quality and GHG Reduction				
orientation, fenestration and building height/separation. The level of benefit will relate to the number of lots and facades fronting an east-west road versus the number fronting on a north-south road. Orienting buildings south will bring benefits from the highest winter heat gains. During the summer, this strategy will provide more natural light while rejecting heat.				
Air Quality Jurisdiction for ensuring healthy air quality lies primarily with the Provincial government. Nevertheless, municipalities and developers can contribute significantly to ensure healthy air quality during construction and building operation. A healthy indoor air quality decreases health risks associated with respiratory diseases, asthmas and allergies, increases productivity and increases resale value of the building.	Required Optional Optional	• Plan ensures minimum air and dust emissions during construction and demolition. • Plan contemplates use of low-emitting building materials (at least 45% of the material cost), including adhesives and sealants, paints and coatings, carpet systems, composite wood and agrifiber products. • Design includes a permanent indoor carbon dioxide (CO_2) monitoring system that provides feedback on space ventilation performance.	☐ ☐ ☐	☐ ☐ ☐

ECO-INDUSTRIAL DESIGN PRINCIPLE/ RATIONALE		MEASURE	✓	N/A
2.3. Water and Wastewater Conservation/Efficiency				
 *City of Hamilton's Wise Water Use Program* **Water Conservation and Efficiency** Efficient and wise use of water can help reduce businesses water and energy bills while helping to preserve Hamilton's local water resources and helping to reduce businesses' carbon footprint. It may also help to reduce run-off pollution through grey water use and can potentially defer infrastructure costs. Through the use of gutters and downspouts, businesses can catch rainwater and channel it to landscape elements or store it in a rain barrel to use during dry periods. Low water use landscaping requires the selection of native, drought-resistant species that require little to no watering, minimal planting practices and only basic maintenance. Efficient equipment and fixtures can help reduce water consumption	Required	• Plan implements water consumption reduction strategies related to both employee and business operations/industrial processes, such as low-water landscaping, use of water efficient manufactory processes and use of captured rainwater, among others.	☐	☐
	Required	• Plan includes water efficient fixtures, including low-flow toilets, urinals, faucets and showers as well as water efficient appliances (e.g. dishwashers in employees' kitchens) and water efficient equipments.	☐	☐
	Optional	• Plan incorporates a rain and/or moisture sensor into the irrigation systems to ensure the system will not water during or immediately after rainfall.	☐	☐
	Optional	• Plan includes a programmed irrigation systems to water in the mornings before 5:30 a.m., to allow water infiltrate the soil before the sun rises, reducing the risk of evaporation.	☐	☐
	Optional	• Plan incorporates the use of rain barrels or other method to capture, store and reuse rain water for irrigation.	☐	☐
	Optional	• Plan considers infrastructure needs and uses for adjacent businesses that could develop innovative means of water use, reuse and discharge.	☐	☐

ECO-INDUSTRIAL DESIGN PRINCIPLE/ RATIONALE		MEASURE	✓	N/A
2.3. Water and Wastewater Conservation/Efficiency				
Waste Water Management Greywater reuse reduces the loading on infrastructure (both potable water systems and storm sewers) and generates savings for businesses and municipalities. Greywater from sinks, showers and other sources can be used to flush toilets and urinals. Some wastewater flows that are not discharged to the sanitary or combined sewer system can be used by the business' processes or products.	Optional	• Plan includes a system that recovers and uses greywater for use in businesses process, flushing, irrigation, cooling and car washing (Greywater is wastewater generated from activities such as laundry, dishwashing, and bathing which can be recycled on-site for uses such as landscape irrigation).	☐	☐
Low-Water Landscaping Water efficient or xeriscape landscaping requires little to no irrigation, minimal planting practices and basic maintenance. Also, adding organic material to the soil help to retain water, decreases soil compaction and water runoff.  *Downspout Disconnection* Use of rainwater collection for irrigation and high-efficiency irrigation technology can reduce the need for potable water and consequently reduce water costs.	Required Required	• Project uses drought resistant low-maintenance landscaping for at least 50% of publicly landscaped area that requires little irrigation. • Plan uses high-efficiency irrigation technology and/or other techniques to reduce potable water consumption for irrigation by 50% over conventional means (i.e. uses native species, reduce or eliminate irrigation requirements, uses stormwater and/or greywater for irrigation).	☐ ☐	☐ ☐

ECO-INDUSTRIAL DESIGN PRINCIPLE/ RATIONALE		**MEASURE**	✓	N/A
2.4. Stormwater Guidelines				
Stormwater Management Use of stormwater management measures ensures ground infiltration, minimizes run-off and diverts water from the building. By slowing the flow of water and allowing settling, filtration and percolation, water quality and quantity can be regulated.  *LID Conveyance Control* Low Impact Development (LID) source and conveyance controls provide aquatic habitat protection, water quality, erosion, and water balance control, while dry-ponds provide flood protection and allow for multipurpose use of dedicated lands. Stream restoration provides the additional benefits of improved stream corridor functions, moderating stream temperatures and improving aquatic and terrestrial habitat conditions.	Required	• Plan uses a Treatment Train Approach to managing Stormwater, by implementing a series of measures, working down-gradient, beginning with Source Control measures, followed by Conveyance Control Measures, End of Pipe Measures and Stream Corridor Protection in order to meet the predevelopment water balance/flow management criteria, as outlined in the Stormwater Management Master Plan for: - Flood control - Erosion control - Water quality control - Infiltration - Natural features protection	☐	☐
	Required	• Plan selects measures from each of the following in order to meet the predevelopment water balance criteria (as specified in the Stormwater Management Master Plan) established for erosion, water quality and infiltration on an individual catchment basis: I. LID source controls can include rainwater harvesting, green roofs, downspout disconnection, soakaway pits, bioretention, compost amendments, tree clusters, filter strips, permeable pavement, grass channels and dry swales. (Practitioner selection of suitable LID Source control techniques for the specific land use as per the stormwater master plan)	☐	☐
	Required	II. LID conveyance control measures can include bio-swales, grassed channels and subsurface perforated pipe systems. (Practitioner selection of suitable LID	☐	☐

ECO-INDUSTRIAL DESIGN PRINCIPLE/ RATIONALE		MEASURE	✓	N/A
		conveyance technique as per guidance provided in the stormwater master plan)		
	Required	• Plan includes dry ponds that meet the flood control design flows and volumes at the end of the flow conveyance system as recommended in the Stormwater Master Plan.	☐	☐
	Required	• Plan protects and enhance, as necessary, Stream Corridors, meeting the fish habitat protection and flood conveyance requirements: - Stream corridor buffer requirements, as per the Sub-watershed master plan. - Riparian plantings to achieve density/cover targets for the specified stream corridor widths as per the Stormwater Master Plan. - 250m of stream restoration/outlet modification at each dry pond location as per the Stormwater Master Plan.	☐	☐
	Required	• Plan includes a maintenance program for the stormwater management measures as per recommendations in the Stormwater Management Master Plan.	☐	☐

ECO-INDUSTRIAL DESIGN PRINCIPLE/ RATIONALE		MEASURE	✓	N/A
2.5. Materials, Resources, and Solid Waste				
 *www.fsccanada.o* **Materials and Resources** Construction materials require an extensive network of extraction, processing and transportation; as such, the use of green materials generates fewer impacts on the environment than the use of regular construction materials. Repairing, reusing and remanufacturing building materials extend the life of all materials. One step further is to design buildings that can be easily converted, repaired or disassembled and their parts reused. Using salvaged materials can reduce the need for new materials and save on construction costs. Materials with recycled content reuse waste products that otherwise would have been disposed in landfills. Use of local materials reduces the impacts of transportation and supports the regional economy. Paper and wood products certified by the Forest Stewardship Council (FSC) are guaranteed that come from an environmentally and socially responsible source.	Optional	• Plan contemplates the construction of buildings and infrastructure using green building materials.	☐	☐
	Optional	• Plan uses a minimum of 75% of all building materials (based on cost) that are harvested/recovered, manufactured or extracted within an 800 kilometres radius of the project site.	☐	☐
	Optional	• Plan uses at least 10% of total building material cost, material with recycled content or comprises salvaged, refurbished or reused materials, when applicable.	☐	☐
	Optional	• Plan includes the use of durable building materials and techniques to be implemented that will enhance building durability.	☐	☐
	Optional	• Plan utilizes aggregate base and sub-base that has at least 25% of recycled aggregate materials for roadways, surface parking lots, sidewalks and curbs.	☐	☐
	Optional	• Plan uses a minimum of 25% of wood-based materials and products, certified in accordance with the Forest Stewardship Council's (FSC) principles and Criteria, for wood building components.	☐	☐

ECO-INDUSTRIAL DESIGN PRINCIPLE/ RATIONALE		MEASURE	✓	N/A
2.5. Materials, Resources, and Solid Waste				
Construction Waste Management  *bcwaste.ca, Kiln-dried wood recycling* Reducing construction waste results in lowered costs from landfill tipping fees and reduces the need for landfill space. Construction waste can be a resource for some industries; as such, increasingly private operations are collecting and recycling construction and demolition waste. Recycling of construction waste and use of recycled materials reduces the demand for virgin materials and the environmental impacts associated with extraction, processing and transportation of resources.	Required	• Plan includes waste management plan using best practices of construction and demolition waste management. As a reference on Best Practices, see the following resources: - Public Works and Government Services Canada (2000). *The Environmentally Responsible Construction and Renovation Handbook*, Chapter 8 - Construction, Renovation and Demolition Waste http://www.tpsgc-pwgsc.gc.ca/biens-property/gd-env-cnstrctn/index-eng.html - Best Management Practices Resource Guide, Chapter 4 – Construction and Demolition Waste Management and Building Design http://www.p2pays.org/ref/19/18363.pdf	☐	☐
	Optional	• Development proposes to recycle at least 75% of non-hazardous construction and demolition debris, when applicable.	☐	☐
	Optional	• Plan proposes the use of non-hazardous construction waste material for the construction of roadways, parking lots, sidewalks, and curbs, whenever possible.	☐	☐
	Optional	• Plan includes the provision of cardboard balers.	☐	☐
Comprehensive Waste Management Waste management is the process of collecting, processing and disposing of waste. There are many economic, environmental and social benefits from diverting waste away from landfills	Optional	• Plan incorporates recycling and composting stations into employee areas.	☐	☐
	Optional	• Plan includes the implementation of site scale waste diversion initiatives.	☐	☐
	Optional	• Plan includes on-site composting system for yard waste,	☐	☐

ECO-INDUSTRIAL DESIGN PRINCIPLE/ RATIONALE		MEASURE	✓	N/A
2.5. Materials, Resources, and Solid Waste				
or incinerators, through reuse, recycling or composting.  Among the economic benefits are the revenues generated from selling waste, savings from additional landfill creation and operations, and savings from reduced transportation of waste. There are also important environmental benefits: recycled materials use less energy than producing with virgin materials; recycling reduces greenhouse gases emitted by landfill and incinerators; and, conserves resources. Social benefits can also be achieved through recycling and reusing waste, such as the reduction of pollutants and improvement of health, and the promotion and encouragement of an environmental sustainable behaviour.		when feasible, that is compatible with the airport operations.		

ECO-INDUSTRIAL DESIGN PRINCIPLE/ RATIONALE		MEASURE	✓	N/A
2.6. Economic Sustainability and Business Synergy				
Economic Sustainability and Business Synergy Organizations that work together to create business synergies and make use of by-products and/or energy can obtain numerous benefits, such as: reduction in the use of virgin materials as resource input; increase energy efficiency and reduced energy use; reduction in volume of waste products; increase in the amount and types of process outputs that have market value; and, reduction in pollution.	Optional	• Plan contemplates the creation of synergies between waste producers and waste users (i.e. recycling companies or companies that use waste as input), whenever possible.	☐	☐
	Optional	• Plan contemplates the exchange energy and water among businesses, shares utilities, and connects material flows on production processes, whenever possible.	☐	☐
	Optional	• Design considers combining logistics/truck delivery facilities and/or combining parking, public transportation and car pooling facilities, whenever possible.	☐	☐
	Optional	• Plan contemplates sharing of facilities between businesses such as restaurants, sport facilities and recreation.	☐	☐

ECO-INDUSTRIAL DESIGN PRINCIPLE/ RATIONALE		MEASURE	✓	N/A
2.7. Social Sustainability				
Access to Amenities Proximity to amenities (e.g. convenience commercial and health/fitness clubs) promotes walking, reduces dependency on the automovile, increases employee satisfaction and contributes to good workplace relationships. The creation of well connected community can help to foster a strong sense of community, improve road network efficiency and safety.  *Kellogg's, Mississauga – Public Space* Parks, plazas and other public and private open spaces are meeting and gathering places that increase the sense of place, offer opportunities for recreation, and contributes to employees' wellbeing.	Optional	• Plan locates small scale accessory uses which primarily support the employees in accordance with the Secondary Plan, such as private health and fitness club, financial establishments, restaurants, personal services and medical or professional offices. The location, design and operations of these amenities must comply with Hamilton Airport Influence Area regulations.	☐	☐
	Optional	• Plan contemplates the use of shared facilities such as fitness clubs, sport facilities (as accessory to the main use) restaurants, and outdoor lunch areas, whenever possible.	☐	☐
	Optional	• Development connects the internal pedestrian infrastructure with the overall Airport Employment Growth District pedestrian routes.	☐	☐
	Optional	• Design includes easy access to open spaces, such park, plaza or square, when feasible.	☐	☐
	Optional	• Plan provides public spaces for employees that are comfortable in terms of sun, shade, wind and weather protection.	☐	☐
	Optional	• Plan locates offices and staff social and lunch spaces providing views to main landmarks, landscaped areas and natural environment, where applicable.	☐	☐

ECO-INDUSTRIAL DESIGN PRINCIPLE/ RATIONALE		MEASURE	✓	N/A
2.8. Site Development, Disturbance, Natural Corridors and Greenways				
Site Development  *GE Headquarters, Mississauga – LEED™ Certified* Incorporating innovative design and approaches in sustainability can reduce the carbon footprint of businesses, increase energy and other efficiencies, create more comfortable and healty places to work, and generate long term savings for businesses, employees and municipalities. Sustainable design strategies are constantly evolving and new technologies are introduced to the market in a regular basis. Higher development densities make a better use of the land, create compact communities, create opportunities for transit use, reduce dependance on automobile and reduce the impact on the enviroment, among other benefits.	Required Required Optional	• Site development protects and enhances the local ecology and avoids building on ecologically sensitive lands. • Development incorporates higher employment densities and a compact form, with buildings containing employment uses and ancillary/accessory uses to support the main operations and to support the employees. • Plan includes innovative design and approaches in sustainability, smart growth, or new development ideas not specifically addressed in this Guidelines.	☐ ☐ ☐	☐ ☐ ☐
Site Disturbance & Natural Environment The ecological value of the site should be respected because many Canadian ecosystems are fragile and lack the biodiversity	Required	• Development includes frequently monitored erosion and sediment control program throughout the construction with reports provided to either the City or the Conservation Authority (or both).	☐	☐

ECO-INDUSTRIAL DESIGN PRINCIPLE/ RATIONALE		MEASURE	✓	N/A
2.8. Site Development, Disturbance, Natural Corridors and Greenways				
of more southerly eco-types. Undisturbed slopes greater than 15% must be left undeveloped as these lands often represent areas of significant landform features such as ravines and ridges.  *Woodlot in the AEGD*	Required	• Plan includes edge management plan if the site includes key natural heritage features.	☐	☐
	Required	• Plan includes building setbacks for development adjacent to the boundary of natural features under the jurisdiction of the Niagara Peninsula Conservation Authority, Hamilton Conservation Authority, and Grand River Conservation Authority.	☐	☐
	Required	• Plan includes 100% native species in all stormwater facilities planting.	☐	☐
	Required	• Plan ensures construction work staging to minimize time that soil is exposed and unstabilized.	☐	☐
	Optional	• Plan provides replanting plan to compensate for removals, and to provide shade and cooling for streets and buildings.	☐	☐
	Optional	• Project uses native species for at least 75% of the landscaped area and avoids use of invasive species.	☐	☐
	Optional	• Design preserves and enhance existing tree canopy, native vegetation and pervious surfaces, wherever possible.	☐	☐
	Optional	• Plan includes buffer naturalization through planting to increase the natural heritage on the site.	☐	☐
	Optional	• Plan aligns passive land uses with protected natural areas.	☐	☐
	Optional	• Development includes lights out program during business' non-operational hours to reduce bird strikes during the migratory season.	☐	☐
		• Plan includes interpretative signs where sites have	☐	☐

ECO-INDUSTRIAL DESIGN PRINCIPLE/ RATIONALE		MEASURE	✓	N/A
2.8. Site Development, Disturbance, Natural Corridors and Greenways				
	Optional	protected natural heritage features on site.		
Natural Corridors and Greenways Green spaces serve as recreational areas for employees. Linked space systems have numerous benefits including encouraging healthy habits, habitat continuity, aesthetic improvement and encouraging non-auto modes of travel. When the green spaces are linked to natural areas, they also provide wildlife habitats and migration pathways for a diversity of species.  *AEGD has many natural features*	Required	• Plan ensures connectivity between natural heritage areas and enhances its access as follows: - Plan protects and enhances stream corridors according to fish habitat and flood conveyance requirements as outlined in the Subwatershed/ Stormwater Master Plan - Plan ensures protection of natural core areas as outlined in the Subwatershed/ Stormwater Master Plan - Plan ensures protection of local natural features through scoped EIS studies	☐ ☐ ☐	☐ ☐ ☐
	Optional	• Site plan design contemplates all-year round connections from the development to sidewalks, green corridors and pathways throughout the AEGD.	☐	☐
	Optional	• Plan provides direction on roadway design promoting naturalized areas and green corridors.	☐	☐

ECO-INDUSTRIAL DESIGN PRINCIPLE/ RATIONALE		MEASURE	✓	N/A
2.8. Site Development, Disturbance, Natural Corridors and Greenways				
Heat Island Reduction  *Greenroofs.org (2009). Green roof in Ford Plant, Michigan* Use of dark, non-reflective surfaces for roofs, parking areas and walkways contributes to heat island effect by absorbing more solar radiation and emitting it back to surrounding areas as heat, raising ambient temperatures and increasing building cooling loads. Light coloured, reflective surfaces mitiage this effect. Using hightly reflective and emissive materials or installing green roofs cand also reduce heat island effects.	Optional Optional	• Development uses a combination of tree shading, open-grid pavement and light coloured materials in non-roof impervious surfaces, including surface parking areas, walkways and other hard surfaces. • Development uses cool roofing materials or incorporates green roofs or uses a combination of techniques that help to reduce heat islands on roofs.	☐ ☐	☐ ☐

ECO-INDUSTRIAL DESIGN PRINCIPLE/ RATIONALE		MEASURE	✓	N/A
2.9. Food Production and Community Gardening				
Food Production and Community Gardening The AEGD is located nearby extensive agricultural areas, most of it inside the Greenbelt Natural Heritage area, which make them permanently protected from urban development. Employers and employees can take advantage of the proximity of these agricultural operations and incorporate their products into the business operations and for consumption in the local cafes and restaurants. Proximity to community gardens provides access to open space and increases food self-sufficiency. Community gardens also help to reduce the carbon footprint of the development, providing food products to be used at employees' cafés and restaurants, as well as reducing the heat island effects in developed areas. Community gardens also allow individuals to have access to traditional produce or nutritionally rich foods close to their workplace. They offer opportunities for exercising, interactions and stress relief.	Optional Optional Optional Optional	• Plan proposes to create synergies between agricultural operations within and outside the AEGD and employment uses. • Development proposes the support of local food production through the use of local food products in business operations and restaurant facilities for employees, among other activities. • Development includes the location of community gardens for their employees and for business operations (e.g., restaurant or cafeteria), where feasible. • Plan maintains or enhances the agricultural food productivity of the land, when feasible.	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐