



# Hinton Eco-Industrial Park

## Eco-Industrial District Zone & EIP Development Guidelines

Prepared for  
Town of Hinton, AB



December 2005



## Section 999

## ECO-INDUSTRIAL DISTRICT

### (1) General Purpose of District

This land use district is intended to establish an area that will allow for the development of an industrial park that will demonstrate innovation and high levels of environmental and economic performance.

A wide range of light industrial and medium industrial uses will be considered so long as they conform to the *EID Development Guidelines* and the regulations in this district and do not cause objectionable or dangerous conditions beyond the boundary of the land use district wherein the parcel is located.

### (2) EID Development Guidelines

Further to the requirements of Section 59 of this Bylaw, all proposed uses within this district shall be subject to, and comply with the *EID Development Guidelines*, as approved and amended by Council from time to time.

### (3) Uses

#### Permitted Uses, Discretionary Uses

##### *Permitted Uses:*

- a. Accessory industrial buildings and uses.
- b. Accessory use industrial office (but no more than 20 % of total floor space)
- c. Brewing or distilling
- d. Commercial warehouse
- e. Concrete batch plant
- f. Day care facility primarily for use of employees of businesses within the EID
- g. Lumber milling;
- h. Packaging plant
- i. Paper products manufacturing
- j. Public utility building
- k. Public utility infrastructure and equipment including energy, water (treatment and distribution) and

##### *Discretionary Uses*

- a. Asphalt plant
- a. Accessory use industrial office (greater than 20 % of total floor space)
- b. Auction facility
- c. Automotive service centre
- d. Aquaculture operations/facility
- e. Bulk storage and distribution of fuel, chemicals
- f. Card lock facility
- g. Composting of organic materials/ bio-solids
- h. Greenhouse or plant nursery
- i. Gas bar, service station or car wash establishment
- j. Industrial vehicle, construction equipment sales or materials service establishment

*Permitted Uses:*

- wastewater
- l. Shipping or receiving facilities
- m. Trade school associated with the other listed permitted or discretionary uses
- n. Truck wash facilities
- o. Wholesale or retail solely of products manufactured within the EID
- p. Wood products manufacturing but does not include Paper or Pulp Manufacturing.
- q. Wood sorting

*Discretionary Uses*

- k. Industrial warehouse
- l. Laboratory
- m. Manufacturing, processing, packaging or assembly of goods, chemicals or materials
- n. Mini-storage with or without outside storage
- o. Minor eating and drinking establishment intended for use by staff and visitors of existing businesses within the EID.
- p. Moving or cartage firm
- q. Printing or publishing
- r. Processing, assembly, fabricating operations, manufacturing, sales or storage of natural resources
- s. Power Plant
- t. Radio communications facility.
- u. Recycling depot
- v. Repair service establishment
- w. Research and development
- x. Salvage establishment or wrecking yard
- y. Surveillance suite, without basement
- z. Transportation service provider
- aa. Truck and equipment storage/repair shops
- bb. Workshops for construction and building trades
- cc. Those uses which in the opinion of the Municipal Planning Commission are similar to the permitted or discretionary uses, and which conform to the general purpose and intent of this district.

*Prohibited Uses*

The following uses are not permitted within this district:

- a. Animal Rendering
- b. Any facility/operation requiring a Provincial Environmental Assessment.
- c. Bulk storage, other than wholly within a completely enclosed building, of

- lime; fertilizer; toxic or corrosive chemicals or acids; flammable liquids or solids; scrap or junk; rags or cotton waste; fungicides, herbicides or pesticides; paint; varnish; oil shellac or turpentine; grain hops or sugar; fish, fish oil or meal (except as part of an approved aquaculture facility); animal oil or fat, or vegetable oil.
- d. Places of worship
  - e. Keeping of live animals, live poultry or other fowl.
  - f. Manufacturing or bulk storage of fireworks, ammunition, matches or flares; radioactive materials; coal tar products or derivatives;
  - g. Offices other than for the purposes of developing high technology products or software except as listed under permitted uses.
  - h. Processing of meat or meat products except fish processing may be allowed as part of an approved aquaculture facility;
  - i. Residential (except for surveillance residential building accessory to industrial uses).
  - j. Retail or wholesale sale of goods except as allowed as a permitted or discretionary use within this district.
  - k. Schools (other than those listed as a permitted or discretionary use)

#### **(4) Parcel Dimensions**

- a. Width:

Shall be no less than 20.0 m. Notwithstanding other provisions of this bylaw, the minimum lot width shall be measured at the front yard setback line.

- b. Depth:

Shall be no less than 25.0 m

- c. Area:

Shall be no less than 0.20 hectares

#### **(5) Parcel Coverage**

- a. The maximum coverage of the site with buildings and impermeable materials shall be 60% except that, where applicants can demonstrate compliance with the relevant EID Stormwater Management Plan as identified by the Development Authority, coverage greater than 60% may be allowed at the discretion of the Development Authority.
- b. Up to 50% of the required permeable area of the site (i.e. 20 % of site area) may be provided on the roof of a building as a rooftop garden. Rooftop gardens must be developed to a standard that is to the satisfaction of the Development Authority;

**(6) Setbacks**

- a. The minimum front yard setback is either 7.5% of the site depth or 7.5 metres, whichever is smaller.
- b. The minimum rear yard setback is 2.0 m
- c. There is no minimum side yard setback.
- d. The minimum setback from the top of bank of a creek is as specified in Section 44.1 of the Land Use Bylaw.
- e. Required setbacks in (7) a. – d. may be increased if required pursuant to the Alberta Safety Codes Act.

**(7) Height**

- a. The maximum height of buildings shall be 10 metres except that heights in excess of 10 metres may be approved at the discretion of the Development Authority who shall consider the design, siting and screening of the proposed development to minimize any objectionable aspects or incompatibilities as a result of an increased height of a building or structure beyond what would normally be found in the land use district or adjacent land use districts. In addition, the Development Authority or Municipal Planning Commission shall consider what the industry is proposing in terms of fire prevention and prepared to provide as far as fire fighting equipment is concerned, beyond what the Town can provide or is equipped to handle, in determining maximum height of buildings.

**(8) Parking and Loading Requirements**

- a. Parking shall be provided as required in Part VIII of this Bylaw.
- b. In addition, each business shall provide 1 preferential parking space for every 20 required parking spaces (minimum of 1 space) for use only by the vehicles displaying disabled parking placard and/or a disabled licence plate (*to be cross-checked with provincial regulations for final draft*); and
- c. Each business shall provide 1 preferential parking space for every 20 required parking spaces (minimum of 1 space) for use only by any of the following types of vehicle:
  - i. Car pool or van pool vehicles;
  - ii. Gas/electric hybrid vehicles; or
  - iii. Hydrogen fuelled vehicles; or
  - iv. Smart cars.
- d. Preferential parking spaces shall be in a convenient location and may be located within the front, side or rear yard of a building. Preferential parking spaces shall count towards the total required parking spaces.

- e. Parking areas shall be located, designed, landscaped and developed in accordance with the *EID Development Guidelines*.
- f. Loading bays/spaces shall be located and developed in accordance with the *EID Development Guidelines*.

### **(9) Landscape Buffers**

- a. Landscape buffers are intended to improve land use compatibility and environmental quality by reducing noise, lighting glare and other nuisances, or facilitating natural drainage and wildlife movement.
- b. A minimum depth of 3 metres of landscaping shall be provided to buffer parking, loading and outdoor storage areas from a public right-of-way and public trails while maintaining reasonable sight lines and visual permeability for Crime Prevention Through Environmental Design (CPTED) purposes to the satisfaction of the Development Authority.

### **(10) External Appearance**

- a. The external appearance of buildings shall be designed and maintained in accordance with the *EID Development Guidelines*.

### **(11) Management Plans**

Where warranted, the Development Authority may require proponents to prepare one or more management plans that describe how the facility will manage the following:

- a. Materials and solid waste
- b. Liquid waste and water efficiency
- c. Noxious odours
- d. Noise and vibration
- e. Energy efficiency
- f. Traffic

### **(12) District Energy System**

The Development Authority may require developers to connect buildings to a District Energy System or to make provision for future connection to this system.

### **(13) Other Provisions**

- a. Administrative Procedures and Regulations: refer to Parts I-V of this Bylaw.
- b. General Parcel Provisions: refer to Part VI of this Bylaw.
- c. Special Land Use Provisions: refer to Part VII of this Bylaw.

- d. Parking and Loading Regulations: refer to Part VIII of this Bylaw.
- e. Sign Regulations: refer to part IX of this Bylaw.
- f. EID Development Guidelines



Hinton Eco-Industrial Park Site Plan Concept November 21, 2003

## Hinton EIP Development Guidelines December 20, 2005



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## Introduction and Overview

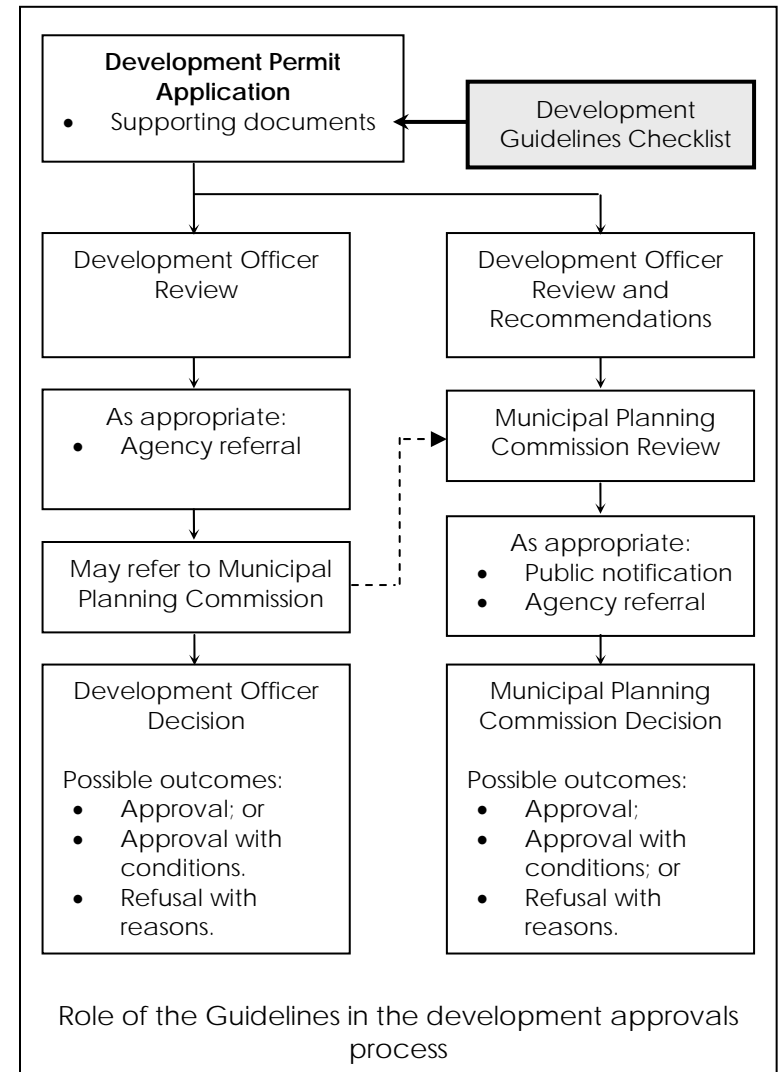
Building on its success with the Hinton Government Centre, an energy-efficient, environmentally friendly, award-winning development, Hinton is creating an Eco-Industrial Park (EIP) – a highly profitable, competitive, and eco-friendly industrial park. The Park’s strategy is based on three foundation principles – to be socially responsible, ecologically sensitive, and economically advantageous. The Town is committed to these principles, and to maximizing the sustainability performance of the Park<sup>1</sup>.

The EIP is located on Highway 16 at the eastern entrance to Hinton. It is a 103-acre site, incorporating 80 acres of developed land and 23 acres of parks and ecological reserves. It is a valuable and highly attractive location given its extraordinary environment and its well-exposed and convenient location on the highway.

Development in the EIP is guided by and controlled by the Land Use Bylaw, including a specific EIP zoning district, these development guidelines, and for a few parcels, restrictive covenants and easements. The Town will evaluate a proposed development first against the requirements of the Land Use Bylaw and then against requirements of these Development Guidelines. The approval process is shown in the diagram to the right, with the Development Guidelines highlighted.

For each parcel that is developed or redeveloped, a Development Permit will be required to ensure that building and site design address these Guidelines or are maintained in addition to zoning and other regulations. The EIP will be developed in three phases, beginning at the west end of the site. Parcels vary widely in size, and a wide range of uses are

<sup>1</sup> The Town’s commitment is evident through the creation of a Developers’ Resource Guide (highlighting green development principles and strategies); and a list of pre-qualified design professionals who, if enlisted by developers, will help to expedite approval processes. The Town will also support design teams in their efforts to maximize the sustainability performance of the Park.



considered via specific zoning district regulations (Eco-industrial Park District).

These **Development Guidelines, adopted by Town of Hinton Council**, are for the Town and all developers, planners, engineers and architects involved in the design, approval and construction of projects within the EIP. They provide guidance as to the design elements and strategies necessary to achieve the EIP goals. The Guidelines are not prescriptive. They encourage proponents to be innovative and enable them to use a variety of approaches<sup>2</sup>. They also provide strong design direction, encouraging a consistent look and feel, and integration of infrastructure and business systems where practical.

These Development Guidelines have been written to achieve an industrial park that:

- **Maximizes environmental and business performance** for the whole park;
- Creates a “**sense of place**” that is more than just a collection of buildings and parking lots;
- Includes a variety of safe and functional pedestrian, cycling, and vehicular **linkages throughout**;
- Provides **functional and attractive outdoor “living” space** and wildlife habitat;
- **Maximizes efficiency** of resource use through integrated design;
- **Minimizes energy use** through efficiency, sharing, and waste recovery;
- **Minimizes water demand, treatment and contamination** by using cascading and integrated water systems;
- **Integrates development with the environment** and with the Town’s image; and
- **Manages construction proactively** to reduce costs and environmental impacts.

In achieving these goals, such development is anticipated to be more competitive than in a conventional industrial park, and to be more ecologically sensitive at the same time.

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<sup>2</sup> Hinton strongly recommends an Integrated Design Process for developments in the EIP. Please see the Developer’s Resource Kit at [www.eip.hinton.ca](http://www.eip.hinton.ca) or in our office for more information regarding this process.

### What is an Eco-Industrial Park (EIP)?

An Eco-Industrial Park (EIP) represents the application of eco-industrial networking (EIN) within an industrial park. EIN supports collaborative partnerships, or networks, between businesses, local governments, and the wider community resulting in more efficient and ecological resource use. In an EIP, businesses and their local government and community partners work together to incorporate the following features:

- *Targeted economic development strategy:* Businesses are attracted to fill product or service niches.
- *By-product synergy:* Businesses cycle material and energy (waste of one = feed for another), increasing efficiency and reducing environmental impact.
- *Ecological design:* Green buildings and sites are designed to minimize resource use. Green spaces and ecologically sensitive areas are preserved and integrated with the site design.
- *Green infrastructure:* Traditional infrastructure is replaced i.e., natural stormwater management or alternative energy systems.
- *Networking around services:* Businesses share services, such as marketing, transportation, research, and monitoring services.

## **Structure of the Guidelines and How to Use this Document**

These Guidelines reflect the general flow of site and building design in the context of an EIP. The first section of the guidelines addresses integrated building design and eco-industrial networking, as these considerations are key to achieving high levels of efficiency. They then progress from large scale considerations such as site layout to more detailed design guidance such as design character.

Users can therefore move through the Guidelines as they progress through the design process from broad eco-industrial networking strategies to dealing with details of character and appearance. Within this overall progression, the guidelines interrelate frequently. As a result, it is essential to consider them together, and to look for synergies between different systems. At a conceptual level, this integration can occur when considering networking opportunities, and siting and orientation, while details are usually worked out through later stages of the design process.

The guidelines are intended to complement but not replace guidelines in the Land Use Bylaw, including those in Section 59 and elsewhere.

## **Performance Requirements and Demonstrating Compliance**

As noted above, compliance with these Guidelines will be evaluated in the course of approving a Development Permit application and in conjunction with Land Use Bylaw and other requirements. At a minimum, applicants must demonstrate that have met 55 of the 82 guidelines as follows:

- all 40 Guidelines marked 'R'; and
- 15 of the 42 optional Guidelines

For guidelines that require applicants to "Consider opportunities to...", applicants can demonstrate compliance by indicating the potential opportunities they identified, and either:

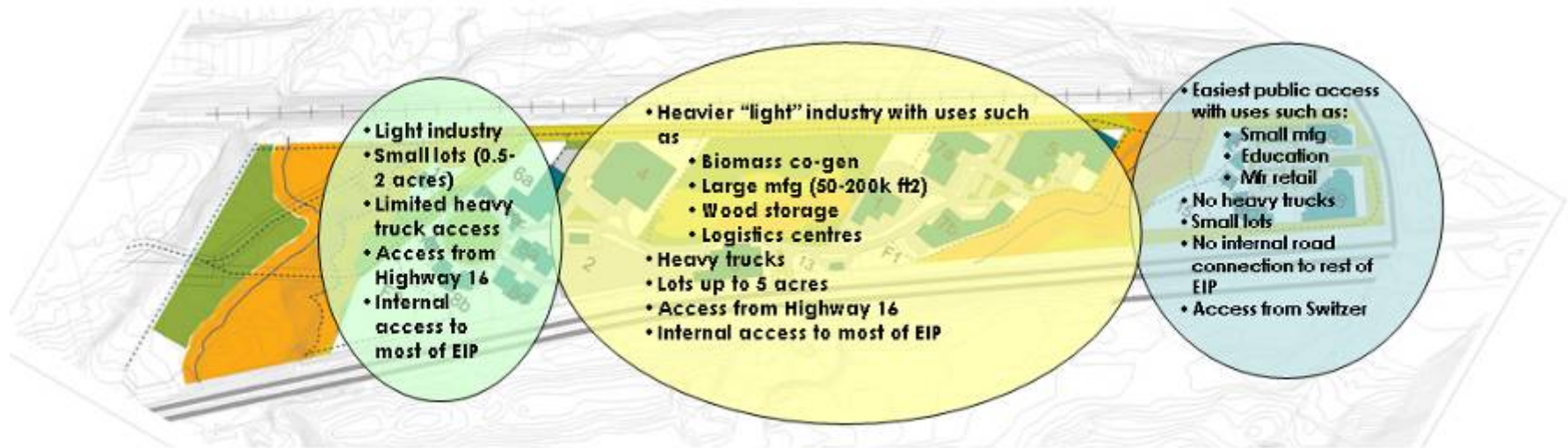
- indicating which ones they selected, if any, or

- explaining why they did not select any identified opportunities.

For other guidelines, applicants must demonstrate compliance by providing evidence to the satisfaction of the Development Authority. To facilitate compliance, the Town has pre-qualified various design professionals (see information about Hinton EIP Pre-Qualified Design Professionals, available from the Town). If these professionals are responsible for the building design, then the evidence should consist of a brief explanation and may include illustrative drawings or diagrams. If design is completed by professionals not on this list, then the Development Authority may require additional documentation to demonstrate compliance with these Guidelines. Alternatively, the Town will pre-qualify additional design professionals as proposed by developers active in the EIP. Information on the qualification process is available from the Development Authority.

### **Sub Areas**

The EIP is divided into 3 sub areas. Each sub area is designed to display a preferred character, level of performance or type of land uses. The diagram below indicates in a general way the preferred type of development within each sub area.



- Light industry
- Small lots (0.5-2 acres)
- Limited heavy truck access
- Access from Highway 16
- Internal access to most of EIP

- Heavier "light" industry with uses such as
  - Biomass co-gen
  - Large mfg (50-200k ft2)
  - Wood storage
  - Logistics centres
- Heavy trucks
- Lots up to 5 acres
- Access from Highway 16
- Internal access to most of EIP

- Easiest public access with uses such as:
  - Small mfg
  - Education
  - Mfr retail
- No heavy trucks
- Small lots
- No internal road connection to rest of EIP
- Access from Switzer

**Hinton EIP Sub-Areas**



## A. Pre-Development Planning

At the heart of an eco-industrial park's uniquely competitive nature is developing and maintaining efficiencies by sharing resources and wastes among its businesses. Identifying and evaluating opportunities for enhanced performance through joint efficiency initiatives is essential to successful eco-industrial networking. Therefore, proponents will be expected to demonstrate how they have considered these networking opportunities.

### Preparing Development Program

- R<sup>o</sup> Identify resource needs and waste production of the proposed operations and/or businesses anticipated on the site. Include energy, water, materials, human resources, training, logistics, transportation etc. Include approximate quantities where known.
- R<sup>o</sup> Obtain existing business resource needs and waste production of operations on nearby sites from the Development Authority. Include approximate quantities where known.
- R<sup>o</sup> Assess opportunities to reduce resource needs and waste generation through sharing and any other appropriate strategies. For example, recover waste heat and/or water e.g. from wastewater or industrial process, for reuse or sale to nearby businesses. Discuss opportunities with neighbouring businesses.

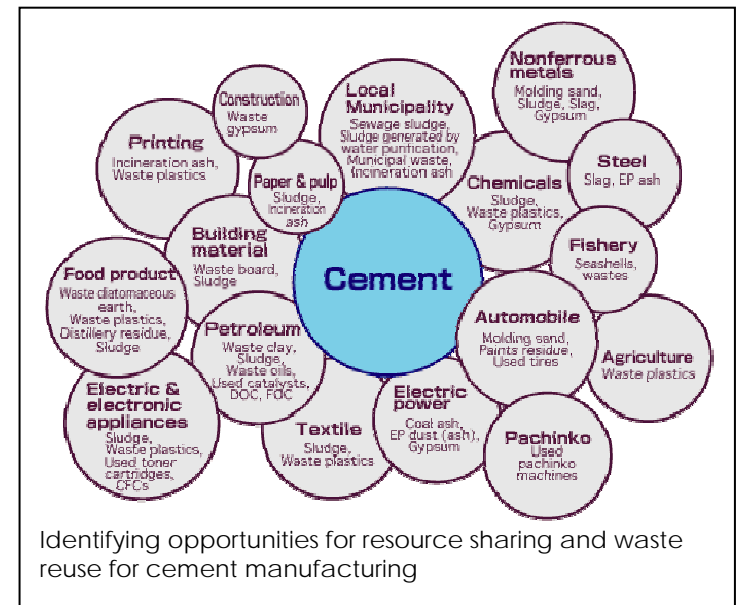
### Integrated Design Principles and Process

- o Use an "Integrated Design Process" (see text box) for site and facility design, to identify and take advantage of synergies between various building systems and industrial processes.

### What is an Integrated Design Process (IDP)?

An IDP involves collaboration between a wide range of people to design a building/facility. Usually participants include not only architects and engineers, but also owners, potential tenants, contractors, specifiers and estimators. The team engages in interactive workshops from pre-design right through design development to construction.

Throughout, the team considers the design from a whole systems perspective, identifying synergies and working out conflicts between building systems. This approach consistently achieves higher performance buildings, often with little or no cost premium. While it can be more expensive than a conventional design process, it offers excellent return on the investment.



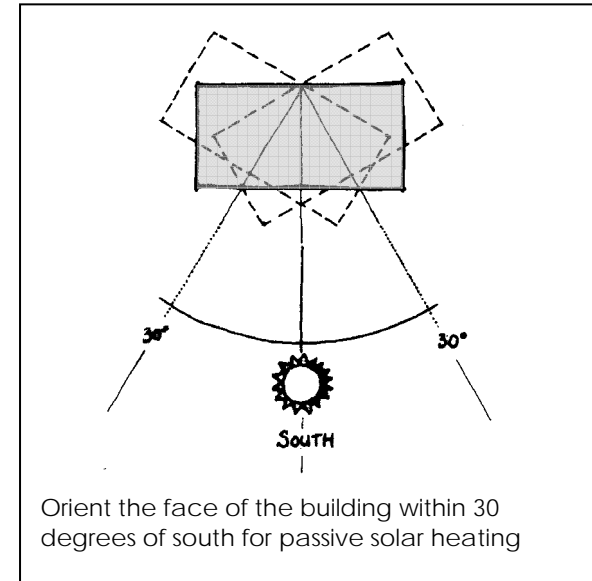
## B. Parcel Layout and Organization

The layout of the site, including the location and orientation of buildings, has the biggest impact on the site's appearance and economic and environmental performance, now and in the future

The EIP is intended to provide convenient access and linkages with adjoining businesses and to provide strong visual linkages with the public and vegetated areas that surround parcels.

### Siting and massing

- R<sup>o</sup> Orient the building to provide strong visual and pedestrian connections with the natural, vegetated areas of the site.
- R<sup>o</sup> Orient and mass buildings to maximize opportunities for passive solar heating and cooling, natural lighting and ventilation.
- R<sup>o</sup> Locate parking and loading at the front or side of buildings. Parking is not generally permitted at the rear of buildings to ensure a strong connection between the building and the natural landscape. However, exceptions may be discussed with the Development Authority if good connections to green space are maintained.
- o Minimize the overall development footprint (including building, warehousing, access roads and parking) by considering stackable or alternative warehousing techniques, use of joint logistics facilities, and building clustering.
  - o Facilitate shared service areas amongst buildings and with adjacent parcels. e.g., waste collection & sorting, shipping and



receiving, parking, outdoor lunch areas.

### Building Orientation and Layout

- R ° Provide a convenient exterior entrance close to or facing access to the site from the trail system.
- R ° Provide safe, comfortable social spaces for people in the interface between buildings and the forest (e.g. outdoor patio spaces). Alternatively, these may be provided on a landscaped, "green" roof area – which may also provide a good viewpoint.
- R ° Where possible, locate office and staff social spaces at the side or rear of the building to provide views of the forest or water features.
- R ° Incorporate recycling stations into employee areas to make recycling convenient.
- R ° Where possible, orient buildings and windows to maintain public views over Hardisty Creek to the mountains and foothills; provide these views to building occupants where possible.



Shared servicing areas in the conceptual plan



Views over Hardisty Creek

## C. Access and Movement

Safe and efficient movement of people and goods within and to/from the EIP is essential to its success. At the same time, transportation and related infrastructure can be costly to build and maintain, and can have significant environmental impacts. These guidelines are aimed at encouraging multi-modal transportation options for goods and people and identifying strategies to minimize costs and impacts of transportation infrastructure.

### General Access

- R<sup>o</sup> Design the parcel to accommodate a range of transportation modes safely and to minimize environmental impact.

### Pedestrian Movement<sup>3</sup>

- R<sup>o</sup> Design pedestrian access routes for comfort and safety. Provide pedestrians and cyclists with safe pathways separated from heavy traffic where possible.
- R<sup>o</sup> Maintain attractive connections between primary buildings on each parcel and the EIP trail system to encourage walking & cycling.
- <sup>o</sup> Provide bicycle end-of-trip facilities such as showers and lockers for staff and secure bicycle storage.

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<sup>3</sup> May include walking, cycling, cross-country skiing, rollerblading, and other similar activities



Accommodating a range of transportation modes. *Photo credit: US Dept. of Transportation*



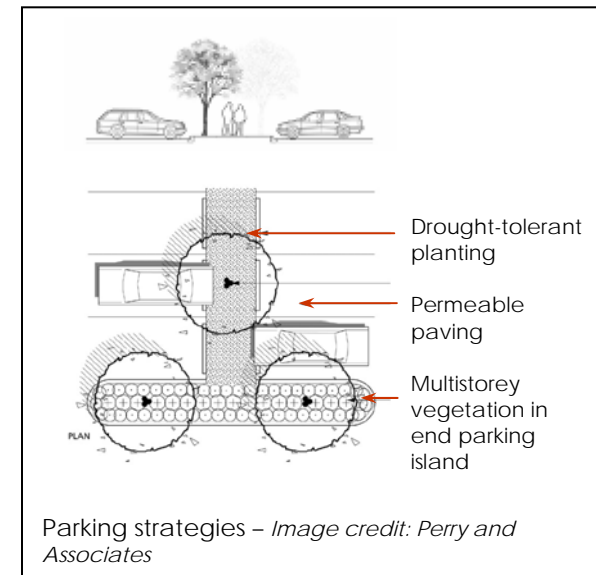
An attractive pedestrian connection. *Photo credit: www.lcrep.org*

## Internal Roads

- ° Minimize the width and area of paved surfaces required to accommodate traffic on the site.
- ° Where appropriate, consider travel lanes or paths for small, on-site, low-impact transportation modes such as small electric delivery vehicles or small landscape maintenance vehicles. These lanes / paths may be integrated with the pedestrian network where appropriate and safe.
- ° If applicable, facilitate ease of access from any parcel to a shared shipping and receiving centre in a manner that minimizes conflict between modal types.

## Parking & On-Site Movement

- R ° Minimize the size of parking areas and avoid large, barren parking areas.
- R ° Minimize light pollution of the night sky and forested areas by ensuring that lighting is shielded and directed towards the ground.
- R ° Plant trees and shrubs throughout the parking area to intercept precipitation, reduce surface heating, enhance appearance and protect pedestrians from the elements. The use of native plants is preferred – see Native Plant Landscaping Guide.
- R ° Provide parking for small / alternative / carpool vehicles in preferential locations.
- ° Share parking facilities with adjacent parcels where possible.



- ° Design parking spaces so that a portion of the vehicle hangs over into a landscape strip where possible.
- ° Concentrate planting in larger landscape spaces in select areas to create more functional green spaces that are not easily damaged by automobiles.

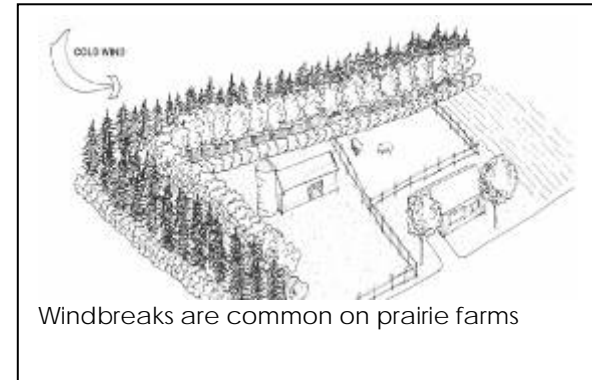


## D. Landscaping and Open Space Design

The EIP's natural environment and landscape is one of its defining attractions. Landscape design is an opportunity to create a pleasing business environment, maintain the natural character of the site, and protect its ecological integrity. Landscape design can also contribute to the efficiency of energy and water systems, and provide habitat for wildlife.

### Landscape Design

- R ° Optimize the development area to protect existing vegetation (especially mature trees).
- R ° Create continuity of landscaped areas as much as possible with those on adjacent parcels and park areas.
- ° Plant trees to the west and north of buildings to protect them from winter winds and summer afternoon sun. Use native plants where possible (see Native Plant Landscaping Guide)
- ° Design open spaces using Crime Prevention Through Environmental Design (CPTED) principles.
- ° Provide landscaping adjacent to pedestrian trails, and integrate it with adjacent natural vegetation where possible. Use native plants where possible (see Native Plant Landscaping Guide)
- ° Use landscaped roofs and walls that incorporate appropriate native vegetation.
- ° Mulch planting beds to a minimum depth of 50 mm to reduce evaporative losses.



## Plant selection

Choose plants, native where possible, for the landscape areas of the site to:

- R ° • Provide a complex multi-storey vegetative community through inclusion of a variety of groundcover, shrubs and trees;
- R ° • Reduce the need for maintenance, pesticide use, and irrigation by selecting hardy, drought-tolerant, perennial species;
- ° • Provide habitat for the Hermit Thrush and Tennessee Warbler; (e.g. trees, bushes, thickets)
- ° • Provide habitat to support other local native species.
- ° ▪ Allocate some landscape areas for "edible" landscaping.<sup>4</sup>



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<sup>4</sup> Edible landscaping is, as the name suggests, landscaping that consists of edible plants. These may include domestic herbs, vegetables, fruit, and native fruit-bearing shrubs and trees.



## **E. Energy Systems**

Energy is a significant and rising cost of doing business, and its use is related to greenhouse gas emissions and reduced air quality. In industrial settings, there are significant opportunities to reduce energy use both within individual sites and through sharing of heating and cooling loads between different operations.

### **Site-level and shared energy systems**

- R<sup>o</sup> Consider opportunities to share energy, heating and cooling between site areas and with other parcels.
- R<sup>o</sup> Consider opportunities to pool backup generation systems with other buildings and parcels, recognizing there may be regulatory challenges in doing so.
- R<sup>o</sup> Consider opportunities to produce energy on-site from renewable sources (solar, geo-exchange [earth energy], wind, biomass) or via co-generation.

Commit to purchasing a portion of the building's energy using Green Certificates.

### **Building process, heating and cooling systems**

- R<sup>o</sup> Improve energy efficiency by 25% over the Model National Energy Code for Buildings (MNECB) baseline. For build-to-suit applications, include 15% performance improvement from process changes and 10% from building system changes, in accordance with the Natural Resources Canada Industrial Building Incentive Program (IBIP) guidelines. For spec-built



applications, improve performance through building envelope only. Strategies may include:

- Use active solar energy systems such as photo-voltaics and solar water pre-heating.
- Use of envelope systems that facilitate the harvesting of energy, such as PV-integrated cladding, or systems that capture solar heat.
- Minimize the required size of Heating, Ventilation, and Air Conditioning (HVAC) systems by integrating them with architectural strategies such as passive heating/cooling and natural ventilation.
- Seek to maximize equipment energy efficiency, including HVAC and process equipment, for example through the use of "pinch analysis" of industrial process and shop floor layout.

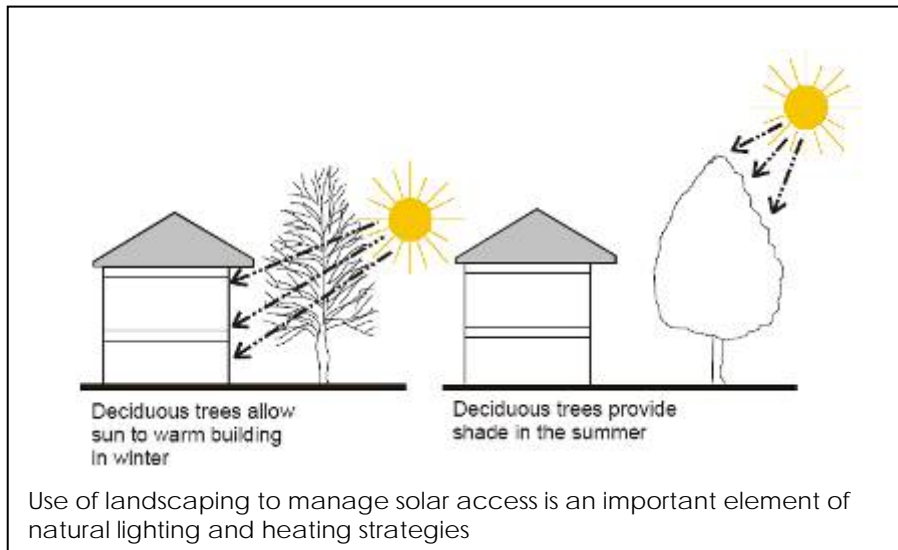
- R ° Specify HVAC equipment that is designated as non-Hydrochlorofluorocarbon (HCFC) or low-HCFC.
- R Plumb buildings such that they may be connected to a future hydronic district heating system.
  - ° Plumb buildings to be "retrofit ready" for solar hot water pre-heating systems.

### Building lighting systems

- R ° Use natural lighting strategies.
- ° Use seasonal and/or user-controlled shading techniques to take advantage of sunlight while minimizing unwanted heat gain in the summer.
- ° Minimize lighting energy demand by minimizing lighting, using high-efficiency luminaires and bulbs, and maximizing user control.



A sawtooth building in Arizona lets in north light and provides a south-facing surface for solar energy collection



In the daytime, natural daylight can effectively light large indoor spaces such as this warehouse.

## F. Water, Stormwater and Wastewater Systems

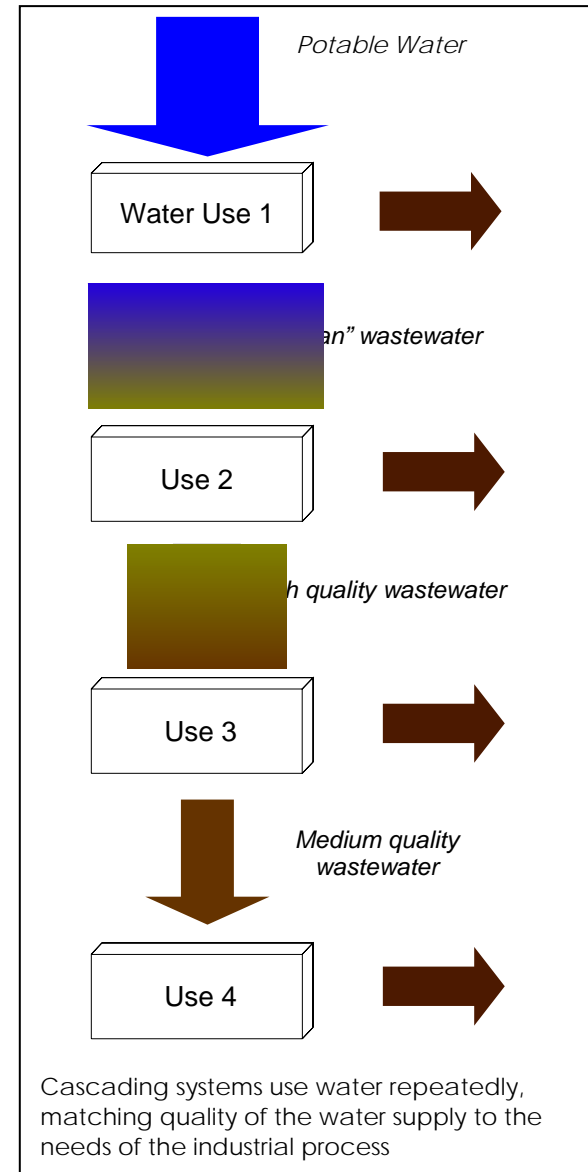
The intent of this section of the guidelines is to minimize consumption of potable water, and to facilitate the reclamation and re-use of stormwater and treated wastewater.

### Integrated water infrastructure systems

- R<sup>o</sup> Consider non-potable water sources, including treated wastewater from the EIP's own treatment plant, for use where appropriate in industrial processes, wetland flow stabilization and, irrigation.
  - Consider the provision of roof runoff storage and distribution to provide temporary water supplies. Where roof runoff is to be maximized for on-site use, use roofing materials that do not yield contaminants into runoff.
  - Consider designing water systems to use high quality clean and potable water only for drinking water and processes which require clean water sources (for example, to prevent scaling or contamination), and to use lower quality water for other purposes e.g., vehicle washing.
- o Double-plumb buildings to provide a cost-effective opportunity to retrofit later with non-potable systems. E.g., bringing cooling water from another operation to your building for use in process operations

### Stormwater

- R<sup>o</sup> Ensure that the required Site Drainage Plan manages runoff flow and volume and treats runoff in accordance with the Master Drainage Plan for the Industrial Park and the Alberta Stormwater Management Guidelines. In so doing, use Best Management



Practices applicable to cold climate sites.

- R<sup>o</sup> As an organizing principle, plan surface runoff management elements into landscape design. Consider the following strategies:
  - Direct roof runoff to infiltration basins.
  - Capture roof runoff for irrigation.
  - Develop green roofs.
  - Dry-wells and percolation swales.
- R<sup>o</sup> Design parking and other paved areas to minimize negative impacts on surface runoff volume and quality. Use an appropriate selection of strategies such as the following:
  - Install oil/water separators for high traffic areas.
  - Direct runoff to landscaped filter strips, bio-swales, and bio-filtration strips.
- o Where catchment and runoff conveyance in a pipe is necessary, minimize the length of pipe required and endeavour to return runoff to the soil through exfiltration or other means.

### Water Efficiency

- R<sup>o</sup> Consider opportunities to re-circulate water, including collected stormwater or high quality wastewater within industrial operations and between businesses.
- R<sup>o</sup> Use high-efficiency fixtures and fittings including for example:
  - Dual-flush or 6 L per flush toilets;
  - 3.8 lpm faucets;
  - 5.7 lpm showerheads;



A rain garden in Dakota County, MN allows rain to return to groundwater in a cold, relatively dry climate.



Landscaped filter strips are a good option for parking lots

- Waterless urinals.

- R ° For landscaping, either do not install an irrigation system OR use a temporary or high efficiency drip irrigation system OR use collected stormwater OR use treated wastewater.
- ° If applicable, use high-efficiency process equipment.

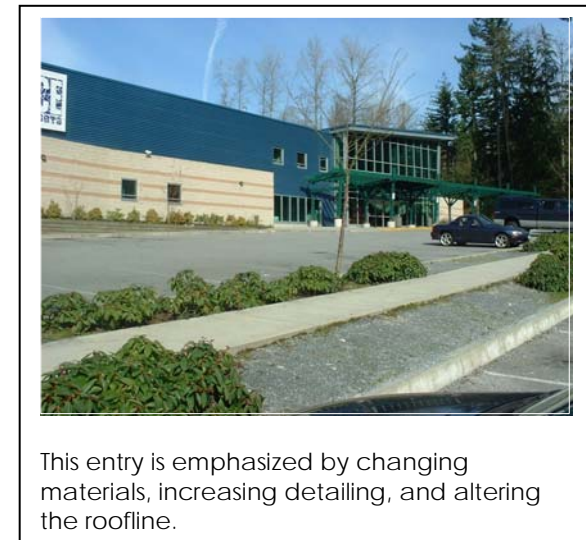
## G. Design Character and Materials

The character of the EIP and buildings within it should communicate its special nature to users and visitors, and create a high-quality environment that sets it apart from other industrial parks. These guidelines are intended to create a high performing, innovative, and leading edge industrial development, that also suits the beauty of the natural surroundings, serves as an appropriate entry to the Town, and feels comfortable for all occupants. Guidelines for material selection are intended to support these goals and minimize environmental impacts associated with all types of materials.

### Form and Character

- R<sup>0</sup> A building entrance should face a connection to the site's trail system. Distinguish this entry area from the rest of the building wall with human-scaled facade modulation; roof line variation; colour, texture, or material change; window placement; and/or other methods.
- R<sup>0</sup> Front Facade: Create visual interest by adding detailing to the front facade of the building. This may be achieved by:
- modulating the façade - stepping back or extending forward a portion of the façade;
  - changing the roofline to reinforce the façade modulation;
  - incorporating any merchandising display windows into the façade;
  - changing materials, colours, patterns, and textures within the building plane; and/or
  - designing buildings with visually distinct bases, middles, and upper storeys.

As an alternative to detailing the entire front facade, less architecturally significant portions of the front facades of buildings





may be set back and screened from public view by mature, dense landscaping.

- R ° Other Building Faces: Provide elements that create visual interest on building walls adjacent pedestrian/cyclist access routes, and/or landscape these substantially.
- ° Where possible, design the public face of buildings and parcel entrances to support the goals of community amenity and identity as an industrial park of “eco-leadership.” For example, choose building materials that reference activities occurring in the building and its role in the park.
- ° In multi-building complexes, maintain a consistent architectural concept through the use of complementary design, material and colors.
- ° To increase public and visitors’ interest and awareness, consider opportunities to prominently display objects and symbols of ongoing industrial activities.

### Design Theme

The character of development in the Eco-Industrial Park should reflect the image of the Town. Commercial development in the nearby Mountainview district is guided by the “Mountain Lodge” design theme described in the Mountainview/Hardisty Shopping Districts Architectural Theme Outline. Some elements of this theme are adapted here for use in an industrial context, producing a “Mountain Industrial” character. As this character supports the Mountain Lodge image, applicants should refer to the illustrations in the Theme Outline to clearly understand the desired image for the commercial area.





- o Generic Facade Components: Consider expressing the structural system (or implied structural system) of the building, and incorporating natural materials.
- o Sloped Roofs:
  - maintain a minimum pitch of 8:12 in a sloped roof;
  - express the structure framing, bracing, and supports and constructing them from large wood beams or metal (e.g. I-beams) elements; and
  - use standing seam metal, corrugated metal, shingles or wood shakes.
- o Flat Roofs: Distinguish the cornice from the wall by using suitable wood, metal, or stone materials, and/or by changing colour.
- o Exterior Wall: With the exception of windows and doors, consider using stucco (in natural colours), corrugated or raised seam metal, or wood (painted or stained) for exterior wall finishes, and express structural elements to provide visual rhythm and definition.
- o Side Walls: Extend the front facade theme down side walls that are visible from the street.
- o Entry: Use elements such as overhangs, columns, pilasters, window placements and/or signage to define the main entry. Additional options include extra-height lobby space, distinctive doorways, distinctive landscaped entry area, and changes in paving materials, textures or colour. Finally, consider the use of wood or stone planting boxes along the front wall.
- o Doors and Windows: For front entry doors, install doors with at least 25% glass. For larger window, consider designs that use muntin



bars or a visual equivalent that break them into smaller upper or lower panes to create rhythm and pattern.

- o Signage: Consider building signage that is one of the following four types:
  - Painted on wood;
  - Using individual letters as fascia;
  - Projecting/hanging signs; or
  - Free-standing signs, painted on wood, with a peaked roof and timber structure.
- o Sign lighting: Signs should be front-lit with wall lights incorporating shades to suit the architectural style.
- o Colours: Select colours to reflect the Mountainview colour palette described in the Mountainview/Hardisty Architectural Theme Outline.

### Structural design and material selection

- o Design buildings to be deconstructed and/or recycled easily.
- o Reflect Mountainview character and identity with natural wood design features, showcasing local species and products. Preferably, use metal as exterior siding only for minor architectural features and trims. Design entry elements of the front building facades to be reflective of materials indigenous to the region, (tamarack, black spruce, aspen).
- o Avoid the use of pressure-treated lumber and other products that may release contaminants into the soil.



Signage and lighting – from Mountainview Architectural Theme Outline



Drawing of mountain industrial character by architect

- o Choose materials that:
  - Can be easily recycled at the end of their life;
  - maintain a high level of indoor air quality in all rooms/covered areas, including low emission finishes;
  - are “rapidly renewable” ; and/or
  - are procured from local manufacturers and/or producers as much as possible.



Reuse of concrete blocks in landscaping, Vancouver, BC.

## H. Construction

### Construction management

Through careful planning and management, the negative impacts of construction can be minimized.

- R<sup>o</sup> Develop and implement a construction management plan that addresses each of the following goals:
- Minimize waste, e.g. by selecting products that conform to required material dimensions;
  - Separate waste materials for recycling where possible;
  - Effectively manage hazardous materials and wastes;
  - Minimize construction truck traffic;
  - Minimize health impacts of indoor air quality on construction personnel;
  - Minimize site areas to be disturbed, to retain natural vegetation;
  - Protect areas of natural vegetation from damage by fencing them; and
  - Maintain creek water quality by minimizing pollution, erosion and sedimentation.



Fencing forested areas prior to construction at the Sigma Xi research facility. *Photo credit:* [www.sigmaxi.org](http://www.sigmaxi.org)

## REQUIRED

### PRE-DEVELOPMENT PLANNING

- Identify resource needs and waste production of the proposed operations and/or businesses anticipated on the site. Include energy, water, materials, human resources, training, logistics, transportation etc. Include approximate quantities where known.
- Obtain existing business resource needs and waste production of operations on nearby sites from the Development Officer. Include approximate quantities where known.
- Assess opportunities to reduce resource needs and waste generation through sharing and any other appropriate strategies. For example, recover waste heat and/or water e.g. from wastewater or industrial process, for reuse or sale to nearby businesses. Discuss opportunities with neighboring businesses.

### PARCEL LAYOUT & ORGANIZATION

- Orient the building to provide strong visual and pedestrian connections with the natural, vegetated areas of the site.
- Orient and mass buildings to maximize opportunities for passive solar heating and cooling, natural lighting and ventilation.
- Locate parking and loading at the front or side of buildings. Parking is not generally permitted at the rear of buildings to ensure a strong connection between the building and the natural landscape. However, exceptions may be discussed with the Development Officer if good connections to green space are maintained.
- Provide a convenient exterior entrance close to or facing access to the site from the trail system.
- Provide safe, comfortable social spaces for people in the interface between buildings and the forest (e.g. outdoor patio spaces). Alternatively, these may be provided on a landscaped, "green" roof area – which may also provide a good viewpoint.
- Where possible, locate office and staff social spaces at the side or rear of the building with views of the forest or water features.
- Incorporate recycling stations into employee areas to make recycling convenient.
- Where possible, orient buildings and windows to maintain public views over Hardisty Creek to the mountains and foothills; provide these views to building occupants where possible.

### ACCESS & MOVEMENT

- Design the parcel to accommodate a range of transportation modes safely and to minimize environmental impact.
- Design pedestrian access routes for comfort and safety. Provide pedestrians and cyclists with safe pathways separated from heavy traffic where possible.
- Maintain attractive connections between primary buildings on each parcel and the EIP trail system to encourage walking & cycling.
- Minimize the size of parking areas and avoid large, barren parking areas.
- Minimize light pollution of the night sky and forested areas by ensuring that lighting is shielded and directed towards the ground.
- Plant trees and shrubs throughout the parking area to intercept precipitation, reduce surface heating, enhance appearance and protect pedestrians from the elements. The use of native plants is preferred - see Native Plant Landscaping Guide.
- Provide parking for small / alternative / carpool vehicles in preferential locations.

### LANDSCAPING & OPEN SPACE DESIGN

- Optimize the development area to protect existing vegetation (especially mature trees).
- Create continuity of landscaped areas as much as possible with those on adjacent parcels and park areas.  
  
Choose plants, native where possible, for the landscape areas of the site to:
- Provide a complex multi-storey vegetative community through inclusion of a variety of groundcover, shrubs and trees;
- Reduce the need for maintenance, pesticide use, and irrigation by selecting hardy, drought-tolerant, perennial species;

### ENERGY SYSTEMS

- Consider opportunities to share energy, heating and cooling between site areas and with other parcels.
- Consider opportunities to pool backup generation systems with other buildings and parcels, recognizing there may be regulatory challenges in doing so.

## REQUIRED cont'd

### Energy Systems *cont'd*

- Consider opportunities to produce energy on-site from renewable sources (solar, geo-exchange [earth energy], wind, biomass) or via co-generation.
- Improve energy efficiency by 25% over the Model National Energy Code for Buildings (MNECB) baseline. For build-to-suit applications, include 15% performance improvement from process changes and 10% from building system changes, in accordance with the Natural Resources Canada Industrial Building Incentive Program (IBIP) guidelines. For spec-built applications, improve performance through building envelope only.
- Specify HVAC equipment that is designated as non-Hydrochlorofluorocarbon (HCFC) or low-HCFC.
- Plumb buildings such that they may be connected to a future hydronic district heating system.
- Use natural lighting strategies.

### WATER, STORMWATER, & WASTEWATER SYSTEMS

- Consider non-potable water sources, including treated wastewater from the EIP's own treatment plant, for use where appropriate in industrial processes, wetland flow stabilization and, irrigation.
- Ensure that the required Site Drainage Plan manages runoff flow and volume and treats runoff in accordance with the Master Drainage Plan for the Industrial Park and the Alberta Stormwater Management Guidelines. In so doing, use Best Management Practices applicable to cold climate sites.
- As an organizing principle, plan surface runoff management elements into landscape design.
  - Direct roof runoff to infiltration basins.
  - Capture roof runoff for irrigation.
  - Develop green roofs.
  - Dry-wells and percolation swales.

Design parking and other paved areas to minimize negative impacts on surface runoff volume and quality. Use an appropriate selection of strategies such as the following:

  - Install oil/water separators for high traffic areas.
  - Direct runoff to landscaped filter strips, bio-swales, and bio-filtration strips
- Consider opportunities to re-circulate water, including collected stormwater or high quality wastewater within industrial operations and between businesses.

- Use high-efficiency fixtures and fittings including for example:
  - Dual-flush or 6 L per flush toilets;
  - 3.8 lpm faucets;
  - 5.7 lpm showerheads;
  - Waterless urinals.

- For landscaping, either do not install an irrigation system OR use a temporary or high efficiency drip irrigation system OR use collected stormwater OR use treated wastewater.

### DESIGN CHARACTER & MATERIALS

- A building entrance should face a connection to the site's trail system. Distinguish this entry area from the rest of the building wall with human-scaled facade modulation; roof line variation; colour, texture, or material change; window placement; and/or other methods.
- Front Facade: Create visual interest by adding detailing to the front facade of the building. This may be achieved by:
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As an alternative to detailing the entire front facade, less architecturally significant portions of the front facades of buildings may be set back and screened from public view by mature, dense landscaping.

- Other Building Faces: Provide elements that create visual interest on building walls adjacent pedestrian/cyclist access routes, and/or landscape these substantially.

### CONSTRUCTION

- Develop and implement a construction management plan that addresses each of the following goals:
  - Minimize waste, e.g. by selecting products that conform to required material dimensions;
  - Separate waste materials for recycling where possible;
  - Effectively manage hazardous materials and wastes;
  - Minimize construction truck traffic;
  - Minimize health impacts of indoor air quality on construction personnel;
  - Minimize site areas to be disturbed, to retain natural vegetation;
  - Protect areas of natural vegetation from damage by fencing them; and
  - Maintain creek water quality by minimizing pollution, erosion, sedimentation



## OPTIONAL

### PRE-DEVELOPMENT PLANNING

- Use an “Integrated Design Process” for site and facility design, to identify and take advantage of synergies between various building systems and industrial processes.

### PARCEL LAYOUT & ORGANIZATION

- Minimize the overall development footprint (including building, warehousing, access roads and parking) by considering stackable or alternative warehousing techniques, use of joint logistics facilities, and building clustering.
- Facilitate shared service areas amongst buildings and with adjacent parcels. e.g., waste collection & sorting, shipping and receiving, parking, outdoor lunch areas.

### ACCESS & MOVEMENT

- Provide bicycle end-of-trip facilities such as showers and lockers for staff and secure bicycle storage.
- Minimize the width and area of paved surfaces required to accommodate traffic on the site.
- Where appropriate, consider travel lanes or paths for small, on-site, low-impact transportation modes such as small electric delivery vehicles or small landscape maintenance vehicles. These lanes / paths may be integrated with the pedestrian network where appropriate and safe.
- If applicable, facilitate ease of access from any parcel to a shared shipping and receiving centre in a manner that minimizes conflict between modal types.
- Share parking facilities with adjacent parcels where possible.
- Design parking spaces so that a portion of the vehicle hangs over into a landscape strip where possible.
- Concentrate planting in larger landscape spaces in select areas to create more functional green spaces that are not easily damaged by automobiles.

### LANDSCAPING & OPEN SPACE DESIGN

- Plant trees to the west and north of buildings to protect them from winter winds and summer afternoon sun. Use native plants where possible (see Native Plant Landscaping Guide)

- Design open spaces using Crime Prevention Through Environmental Design (CPTED) principles.
- Provide landscaping adjacent to pedestrian trails, and integrate it with adjacent natural vegetation where possible. Use native plants where possible (see Native Plant Landscaping Guide)
- Use landscaped roofs and walls that incorporate appropriate native vegetation.
- Mulch planting beds to a minimum depth of 50 mm to reduce evaporative losses.  
Choose plants, native where possible, for the landscape areas of the site to:
  - Provide habitat for the Hermit Thrush and Tennessee Warbler; (e.g. trees, bushes, thickets)
  - Provide habitat to support other local native species.
  - Allocate some landscape areas for “edible” landscaping.

### ENERGY SYSTEMS

- Commit to purchasing a portion of the building’s energy using Green Certificates.
- Plumb buildings to be “retrofit ready” for solar hot water pre-heating systems.
- Use seasonal and/or user-controlled shading techniques to take advantage of sunlight while minimizing unwanted heat gain in the summer.
- Minimize lighting energy demand by minimizing lighting, using high-efficiency luminaires and bulbs, and maximizing user control.

### WATER, STORMWATER, & WASTEWATER SYSTEMS

- Double-plumb buildings to provide a cost-effective opportunity to retrofit later with non-potable systems. E.g., bringing cooling water from another operation to your building for use in process operations.
- Where catchment and runoff conveyance in a pipe is necessary, minimize the length of pipe required and endeavour to return runoff to the soil through exfiltration or other means.
- If applicable, use high-efficiency process equipment.

OPTIONAL *cont'd*

DESIGN CHARACTER & MATERIALS

- Where possible, design the public face of buildings and parcel entrances to support the goals of community amenity and identity as an industrial park of “eco-leadership.” For example, choose building materials that reference activities occurring in the building and its role in the park.
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  - use standing seam metal, corrugated metal, shingles or wood shakes.
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- Signage: Consider building signage that is one of the following four types:
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- Choose materials that:
  - Can be easily recycled at the end of their life;
  - maintain a high level of indoor air quality in all rooms/covered areas, including low emission finishes;
  - are “rapidly renewable” ; and/or
  - are procured from local manufacturers and/or producers as much as possible.