



Green Building & Site Design

A Commitment to Environmental and Community Stewardship



Developed in Cooperation with:

*Green Buildings BC
BCBC Technical Value Department*



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Green Building Plan Summary

As part of the New Economy's "footloose industry", technology companies are drawn to and motivated to stay in areas offering a higher quality of life. There is widespread evidence of the importance of a clean environment and other quality of life considerations in the location decisions of these firms.

Vancouver Island Technology Park (VITP) is being developed to showcase high performance (i.e., "green") building and site design and to further principles of environmental and community stewardship thereby enhancing the image of Greater Victoria and the Capital Region District (CRD) as a place where technology entrepreneurs and workers want to live, work and play.

An obvious environmental benefit of redeveloping the former Glendale Lodge building into a High Technology Research Park is the utilization of an existing abandoned building and site where existing road, sewer and water services currently exist. The Lodge was renovated at an economical retrofit and utilization of the existing infrastructure significantly reduced development costs for the development and community.

Other initiatives have proven to be cost effective from an initial capital outlay, from a life cycle costing perspective and will lower future site development costs.

The VITP Green Building Plan set out below describes initiatives underway at the Vancouver Island Technology Park. This Plan will be updated from time to time as new initiatives are undertaken.

Green Building Plan

- 1) Demonstrate green building and site design principles to building designers, owners, and users, as well as to other interested parties;
- 2) Develop partnerships to encourage environmental stewardship, and the adoption of green practices by others; and
- 3) Involve the community in project planning and development for the mutual benefit of local residents, businesses, BCBC, and the technology sector.



1.0 Objectives

1.1 Green Building Design

Incorporating environmental features that lower energy and water costs is not only good for the environment, but also helps “futureproof” a building for tomorrow. Utility costs are expected to rise with growing demand and more expensive supply. New buildings that do not address the inevitable increase in energy and water costs will find themselves at a competitive disadvantage in the future. The Green Building Plan for VITP sets out the initiatives incorporated in the design to lower water and energy costs and other environmental features that improves lease-ability and lower site development costs.

Further, Technology companies are becoming increasingly aware of the importance of working environments for their employees since their human capital costs far outweigh real estate costs on a per sq. ft. basis. Building characteristics impact worker productivity and retention, representing in many cases an untapped source of potential savings. It has been estimated that building-related illnesses cost \$60 billion annually in medical expenses and lost worker productivity in the United States.¹

There are well-measured case studies that show consistent gains in labour productivity of 6 to 16 percent in buildings with good overall environmental quality, including effective ventilation, natural or proper levels of lighting, indoor air quality, and good acoustics.² The average office spends 70 times as much money per square foot annually on employee salaries as on energy, so that an increase in labour productivity of just 1 percent can produce savings that exceed the entire energy bill.³ Improving air quality, lighting, and comfort through green building design at VITP will improve “leaseability” today and assist in future proofing for tomorrow.

New buildings at VITP will be planned utilizing integrated design principals to ensure initiatives are properly evaluated when incorporated into the design of buildings to increase building performance. For instance, the cost of daylighting, efficient lighting design, light shelves need to be evaluated along side with mechanical consultant to see what cost saving impact can be achieved on the mechanical design. Individually, initiatives may seem to be uneconomical but when looking at the total cost impact on the entire building system be deemed economical as a result of other capital savings.

IDP involves creating a design team with a wider range of technical experts, local stakeholders, and partners than is normal. It engages more of these participants at very early stages of the project, and uses their expertise to influence seminal design decisions.⁴

BCBC Environmental
Stewardship Plan

There are challenges and myths to overcome in understanding “green building design”. Green building and environmental site design features are often perceived to be more expensive than traditional development practices when, in fact, they are often economic from an initial cost and/or a longer-tem life cycle costing perspective. Furthermore, the building community itself lacks familiarity with environmental technologies and the associated costs and benefits relative to standard practices.

¹ Barbara Lippiatt and Gregory Norris (1995), “Selecting Environmentally and Economically Balanced Building Materials,” *National Institute of Standards and Technology Special Publication 888*, Second International Green Building Conference and Exposition (Gaithersburg, Md: NIST), p. 37.

² Joseph Romm and William Browning (1995), *Greening the Building and the Bottom Line* (Snowmass, CO: Rocky Mountain Institute). Cited in Rocky Mountain Institute, *Green Development*, p. 17.

³ *Ibid.*

⁴ *Ibid.*



1.2 Environmental Stewardship

Many people are still concerned about how higher-density land use will affect their communities, which may be manifested in a “NIMBY” view of further development. The public needs to see that the local community, business, and the natural environment can be successfully integrated. Saanich and other BC municipalities have already embarked on environmental stewardship through measures such as complete communities, greenways, and watershed planning.⁶

A sustainable economy is one that exhibits diverse and viable economic opportunities and is resilient and responsive to changing circumstances ... [It] also supports the achievement of environmental and social sustainability.⁵ CRD Regional Growth Strategy

VITP plans to showcase green building and site design technologies to demonstrate the possibilities to the building industry and the broader public using its web page, on-site signs, printed materials, and presentations and lectures. Relationships will be established with other organizations to work together on mutual goals concerning green building and site design.

1.3 Community Stewardship

To build local acceptance and interest in championing green development, communities must have an active role in planning, as well as a clear economic stake. It is recognized that the “promotion and implementation of green building practices within a community can generate new economic development opportunities, including new business development to meet the demand for green products and services; resource-efficiency improvement programs that enable existing businesses to lower operating costs; development of environmentally oriented business districts; and job training related to new green businesses and products.”⁷

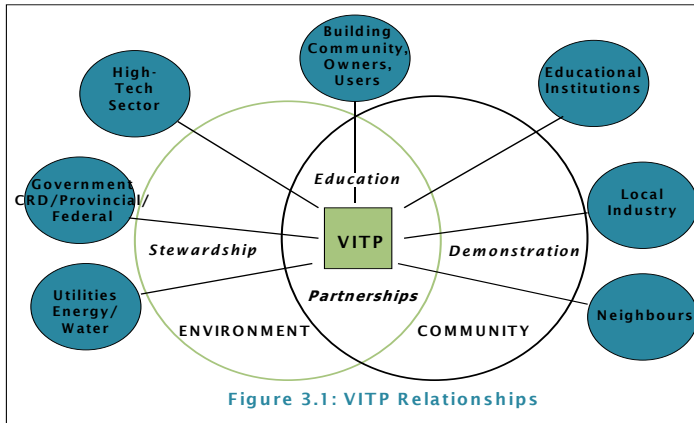


Figure 3.1: VITP Relationships

VITP is committed to demonstrating a model of development planning where community and development interests are addressed simultaneously while identifying opportunities to further mutual goals.

Community stewardship involves working with the municipality, community groups, local educational institutions, VIATec, and the private sector for collective gain. A number of

educational activities are underway with respect to student co-op programs and joint research programs to be located at VITP that will enable technology transfer. Private sector initiatives will include co-hosting lectures at the VITP business centre with VIATec and/or educational institutions on topics such as green building design, research news, venture capital funding, and patent/security law. VITP will also showcase on site the green technologies of local high-tech companies as a way to help them grow.

⁵ Capital Regional District (2001), *A Proposed Regional Growth Strategy for BC's Capital Region* (Victoria: CRD, March).
⁶ See Curran (1999), *Environmental Stewardship and Complete Communities: A Report on Municipal Environmental Initiatives in British Columbia* (Vancouver: SGBC), obtained from www.smartgrowth.bc.ca/pub/munisurvey.htm.
⁷ Public Technology Inc., US Green Building Council, U.S. Department of Energy, and U.S. Environmental Protection Agency (1996), *Sustainable Building Technical Manual: Green Building Design, Construction, and Operations* (Washington, DC: PTI), obtained from <http://www.sustainable.doe.gov/articles/ptipub.shtml>.





2.0 Assessment Criteria

The following criteria have been applied in developing the Green Building Plan and, specifically, in deciding which green building initiatives should be included in the building and site design:

2.1 Constructability

Durability, reliability, and performance will be addressed when evaluating whether to proceed with a green building initiative.

2.2 Leaseability

This characteristic relates to whether an initiative will affect the utility and desirability of the space from the tenant's perspective. Individual criteria include:

- Lower energy, water, and maintenance costs;
- Improvement in air and light quality and comfort;
- Image and appeal;
- Flexibility for a variety of uses;
- Ability to expand or shed space to meet tenant needs; and
- Quality of the working environment.

2.3 Responsibility

There are three primary considerations related to the impact of the initiative on the building owner and tenants, the environment, and the community:

Positive Impact on the Environment

- Reduce energy, water, and fossil fuel use;
- Increase materials efficiency in construction and operation;
- Improve air quality, ventilation, and comfort;
- Reduce the generation of wastes;

Positive Impact on the Community

- Involve the community in planning and implementation;
- Educate others on green building principles;
- Encourage the development of local industry and employment;

Financial Responsibility

- Be cost-effective from initial capital cost and lifecycle cost perspectives;
- Promote green building initiatives to gain a competitive and/or marketing advantage; and
- Track costs to demonstrate cost-effectiveness for building owner and others.



3.0 Description of Green Initiatives

3.1 Ecological Performance – Water



3.1.1 Water Use

Goal Reduce overall potable water use.

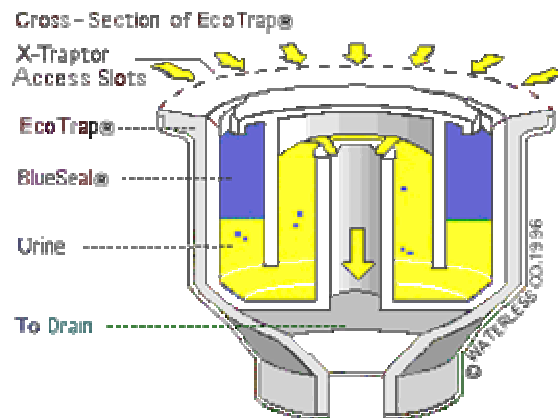
Target Achievement The renovated Lodge building will utilize 55% less water in the building than traditional building design with a saving of 6.2 million litres of water annually. The installation of water measures resulted in no net increase in capital costs.

Further, the reduction of water usage and resulting sewage output will, in all likelihood, mean that the main sewer and water mains servicing both the Camosun College and VITP site will not require upgrading for capacity at build out.

Implemented Initiatives

Waterless Urinals

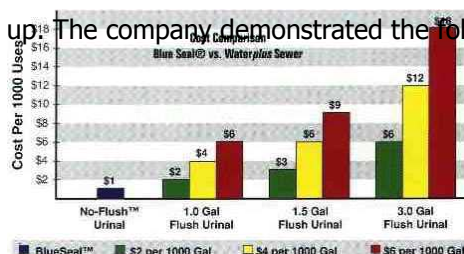
Waterless urinals have been installed in the building, resulting in a reduction in potable use and sewage output. A urinal is used 2.3 times a day per male. Assuming that 50% of the workers in the renovated building are men, the estimated water saved is 950.000 litres annually.



How it works

Urine Flows down the water repellent sides of the urinal into the ecotrap® drain insert (view above). In the trap the urine passes through a floating layer of BlueSeal® liquid, which is less dense than urine. This liquid provides a barrier preventing odours from the drain pipes escaping into the rest room. Urine under the barrier layer overflows into the central tube and runs down to the conventional drain line.

The cost savings do add up! The company demonstrated the following cost savings in US dollars.





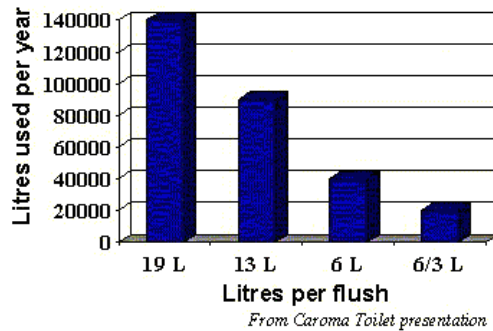
The urinals require no water line to the urinal, and the water line to the toilet could have been downsized. It is estimated that the net saving would have been a further \$22,000 to the project if the water lines had not been installed.

Dual Flush toilets

Dual flush toilets are being used in the building. The product allows for a dual flush system at 6 litre per flush or a 3 litre flush depending on use.



The water savings do add up. Below, the company demonstrated the following water savings.



Infrared Sensor Sinks & Shower Flow restrictors

Sinks will be equipped with infrared sensors and aerator taps with 30 second timeout settings (0.95 litres per use as compared to the standard 2.375 litres per use). Showers will have flow restrictors with a flow rate of 8 to 9.5 litres per use.



3.1.2 Human Waste

Goal

Reduce the generation of wastewater and therefore potable water demand.

Target Achievement

The amount of wastewater has been significantly reduced as a result of the use of waterless urinals and dual flush toilets. This will reduce operating costs with significant potential savings in not having to replace water & sewage mains for capacity.

Implemented Initiatives

See waterless urinals and dual flush toilet information under 3.1.1 above.





3.1.3 Water Efficient Landscaping

Goal

Limit the use of potable water for Landscaping Irrigation.

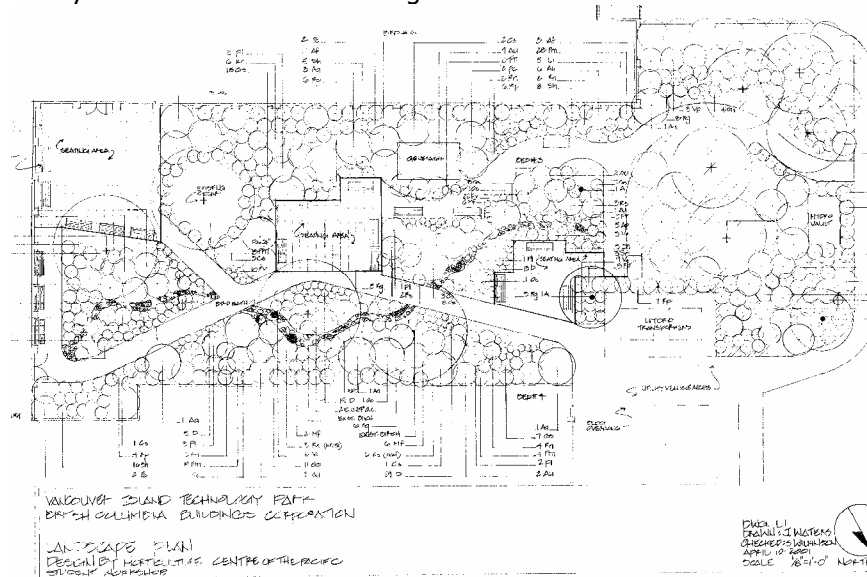
Target Achievement Implemented Initiatives

Potable water consumption has been significantly reduced and will be reduced further once the native plant species become established.

Native Plant Species

An agreement was reached with HCP to use their students in the design and planting of native plant species that require little irrigation and maintenance once established.

The following is one of the designs prepared by the HCP students in a courtyard area around the building.



Decommissioning of Previous Irrigation System

The previous irrigation system was decommissioned so that no irrigation occurs on lawn areas. The turfed areas are being replaced with native grass species.



3.1.4 Ground Water Recharge

Goal

Storm water recharges the water table.

Target Achievement

100% of all storm water will be recharged on site.

Implemented Initiatives

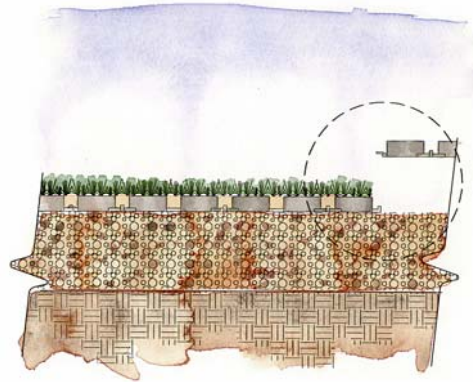
Grass & Gravel Pave Parking

This is a permeable system that allows the discharge of storm water directly into the ground, recharging the water table, but also oxidizes and biologically treats oil and gas drippings from cars. The cars park on the grass pave system and drive on the gravel pave system





The use of grass/gravel pave system reduces storm water management requirements by reducing runoff due to the permeability of the system. Further studies provided by the manufacturer indicate that maintenance costs for the product are substantially lower over time than for asphalt.



grass pave system for parking aisles



gravel pave for driving aisles

There is no need for the extensive drainage systems, manholes, catch basins, oil and gas separators, parking isle painting, concrete curb, and major tree planting required to minimize the impact of an asphalt parking lot.

In addition, overall storm water management can be downsized for storm water absorbed beneath the parking system rather than collected on the surface under traditional hard surfaces.

The US manufacturer was introduced to Scott Plastics in Victoria about manufacturing the product locally. The result was Scott Plastic will be producing the product in Victoria resulting in a benefit to the local economy.

VITP would also like to thank the Horticulture Centre of the Pacific for their excellent work in testing out various grass specie mixes for use in the grass pave system providing valuable information to the grass pave company.





3.1.5 Water Filtration

Goal

Polluting substances and sediments are filtered out of storm water runoff from vehicle parking and roads before it leaves the site.

Target Achievement

The innovative techniques being utilized at VITP in storm water management is being fully supported by the municipality of Saanich and is attracting significant attention as an affordable environmental solution for storm water treatment.

Implemented Initiatives

Storm Water Management Plan

Patrick Lucy of Aqua-Tex Scientific Consulting Inc. is the prime consultant for the storm water management plan (SWMP). He is well respected by the Municipality and government agencies in Canada and the United States.

The SWMP will meet the following objectives:

- Use on-site ecological treatment (flows, quality, temperature) before discharge into Viaduct Creek (salmon-bearing)
- Incorporate flood plain management, including 1 in 10 year and 1 in 200 year storm water runoff into the treatment facilities
- Incorporate aquatic habitat to achieve drainage, aesthetic, recreational, and environmental benefits
- Have no negative effect on aquatic life
- Cause no increase in storm water discharge (in fact, for VITP there will be a decrease, since current storm water is being addressed from the existing development)

A collaborative approach has been used with HCP for upstream waters and downstream for Quick's Bottom Park (Saanich).

Saanich has stringent requirements for storm water management and meeting them can be very expensive due to the land area normally required for detention ponds. However, when done properly, a SWMP can save money over traditional storm water management techniques.

Not only is the approach being used for VITP ecologically innovative but also the bioswales and ponds are located primarily in the property setback areas and in the site's low spots that are undevelopable. Further, a significant portion of stormwater runoff from Camosun is being treated in the VITP stormwater system at no additional cost.

Reduction in impervious surfaces

Reducing impervious surfaces reduces storm water and the cost of related systems. The grass and gravel parking system to be used will significantly reduce storm water runoff (see above under Ground Water Recharge).





3.2 Ecological Performance – Landscape



3.2.1 Green Space

Goal

Moderate microclimate with vegetative cover. Conserving existing natural areas and restoring damaged areas to provide habitat and promote biodiversity.

Target Achievement

17% of the land is treed area, with a further 40% of open green space comprised of fields, trees, and wetlands. New parking areas include a grass pave system that increases the total green space percentage for the development to 76%.

Implemented Initiatives

All clustered treed areas on the site have been retained. Over 99% of trees are being protected and future development is channeled on previously disturbed lands or on lands with minimal ecological significance.



3.2.2 Native Planting and Wildlife Habitat

Goal

Conserve and/or create native plantings and wildlife habitat through appropriate landscaping strategies.

Target Achievement

100% of all new landscaping is with native plant species. Sensitive ecological areas have been protected.

Implemented Initiatives

Removal of no-build covenants

The no-build covenants registered on title were the result of the original zoning on the site. As part of the Master Plan process, it was realized early on that the rationale for the no-build zones required revisiting because:

- The no-build zones have no ecological significance
- There were more sensitive ecological areas that were not protected and could not be developed (creek areas and flood plain)

Consultations were held with the community, Camosun College, HCP, and Saanich parks and environmental planning staff to gather support for removing one of the no-build covenants and to have the other amended to allow parking but protect the view corridor to the lake.

Two new no-build covenants will be registered: one around the creek (restricted from building by regulatory setback requirements) and the other to protect an ecologically bio-diverse tree stand between the renovated building and the existing parking lot. These new covenant areas are shown on the attached Master Plan. These changes were supported by Camosun College, HCP, Saanich and the community, ensuring protection of the ecologically sensitive areas on the site.





The result of this change is the protection of ecologically sensitive areas while providing a more efficient building layout for the development.

Additional Planting

Additional native species will be planted in the open green space areas and native fruit and nut bearing trees will be added along the trails as a food source for wildlife. The Horticulture Centre of the Pacific students prepared a phased landscape plan and planting is to be done by students utilizing only native plant species. This provides practical experience for the students to demonstrate the landscape sustainability, and fits in with the educational initiatives planned for the site.

Wildlife Corridor & Habitat enhancement

In addition, a wildlife corridor has been designed with HCP to provide a contiguous corridor for wildlife, and the new trails will be lined with fruit and nut bearing trees for birds in the area

Creek Restoration Plan

The salmon-bearing creek is not a proper functioning creek since it was trenched out historically for agricultural purposes. The creek has been significantly harmed because of traditional storm water management practices.

VITP has been working with the storm water consultant to raise funds to restore the creek to its proper functioning condition. Some funds have already been raised and it is expected the required remainder will be obtained. The new storm water management plan will ensure no further damage to the creek and will assist in the restoration process.



3.2.3 Integrated Pest Management

Goal

Minimize potentially harmful chemical pollution in the management of indoor and outdoor plant and structural pests.

Implemented Initiatives

Non-pesticide use on landscaping

As part of the HCP landscaping initiative, the Centre is providing information on maintaining the landscaping without the use of pesticides. HCP staff are well versed in these techniques as a result of demonstration gardens on their grounds. VITP has asked Property Management to ensure that landscape contractors who bid on the maintenance work are qualified in these techniques. HCP offers an educational program to certify horticulturists in these techniques.



3.2.4 Exterior Design for Heat Island Effect

Goal

Reduce heat islands (thermal gradient differences between developed and undeveloped areas) to minimize impacts on microclimate and human and wildlife habitat.

Implemented Initiatives

The grass and gravel pave system significantly reduces this impact over asphalt providing a cool parking area.





Additional tree planting is planned around hard surface areas.



3.2.5 Light Pollution

Goal

Eliminate light trespass from the building site, improve night sky access, and reduce development impact on nocturnal environments.

Implemented Initiatives

Zero direct-beam illumination will leave the site. Low foot candle levels will be implemented around the building and in the parking areas.

Pathway fixtures on pathways were retrofitted at minimal cost to ensure down cast lighting.

3.3 Ecological Performance – Waste



3.3.1 Recycling Facilities

Goal

Reduce the disposal of waste materials in landfills.

Implemented Initiatives

Recycling facilities are provided for in the building. Property Management is putting together a plan to ensure that they are in place and easily accessed by tenants.

A recycling brochure will be provided on site to tenants



3.3.2 Composting Facilities

Goal

Reduce the disposal of waste materials in landfills.

Implemented Initiatives

On-site composting will be done including landscaping pruning and cuttings. Property Management will be working out the details. The compost material will be used for on-site landscaping.



3.3.3 Construction Waste

Goal

Minimize the disposal of construction waste.

Implemented Initiatives

A waste management specification was provided to contractor. Over 99% of construction waste by weight was recycled/sold.

A list of reused materials will be provided. Excess wood is being stored for chipping for paths. River Rock in the balcony foundation was salvaged and stored for landscaping. Other materials such as concrete, drywall, and metal waste are being separated for recycling. Even old wiring was sorted and resold for a profit.





3.3.4 Reuse Topsoil

Goal Topsoil is protected and conserved.

Implemented Initiatives All topsoil is stored on site to be reused in landscaped areas.



3.3.5 Vegetation and Watercourse Protection

Goal Site vegetation and surrounding watercourses are protected.

Implemented Initiatives Road and parking construction was designed to contain sedimentation control during construction and thereby protect Viaduct creek.

A detailed tree survey was provided on the site and a directive was given to the contractor on tree protection and fencing installed.

3.4 Ecological Performance – Materials



3.4.1 Building Reuse

Goal Extend the life cycle of existing building, conserve resources, reduce waste and reduce environmental impacts of new buildings as they relate to materials manufacturing and transport.

Target Achievement The Reuse of the building generated a significant saving over building new. Approximately, 99.9% of the building structure was reused with approximately 91% of shell elements being reutilized. The 9% of shell not utilized was replaced with additional floor area by infilling balcony areas thereby increasing floor area without increasing the footprint of the building.



3.4.2 Recycled Materials

Goal Conserve natural resources while minimizing the generation of waste and pollution.

Target Achievement Approximately 33% of material costs value, excluding mechanical/electrical systems, was comprised of recycled material.

Implemented Initiatives Recycled materials
Examples of recycled materials include:

1. Fly ash component in concrete
2. Grass and gravel pave system
3. Gypsum board



4. Carpet tile made of recycled materials
5. Steel anchors
6. Building insulation
7. Aluminum panels
8. Roofing membrane



3.4.3 Efficient Materials

Goal

Conserve natural resources while minimizing the generation of waste and pollution.

Implemented Initiatives

Efficient Materials

Examples of this efficient material use include:

1. A significant portion of concrete walls and structural columns will be left exposed and not painted, thereby not needing drywall or paint finish.
2. Windows are pre-fabricated rain-screened sealed units.
3. Structural steel used was prefabricated.
4. Prefabricated/Movable walls and furniture systems are being installed in the business centre.



3.4.4 Salvaged Materials

Goal

Conserve natural resources while minimizing the generation of waste and pollution.

Target Achievement

Approximately 23% of material value was attributed to salvaged materials.

Implemented Initiatives

Salvaged/reclaimed materials

Examples of these materials include:

1. Steel cabinets and kitchen equipment were salvaged for reuse in the building.
2. Existing ductwork was salvaged for reuse in the air ventilation system.
3. The multi-zone system was retained for use on the third and part of the second floor of the centre wing (at a cost saving to the project).
4. River rock in the foundation was salvaged for reuse in landscaping.
5. Electrical alarm pull boxes were salvaged.
6. Roof insulation panels were reused.





3.4.5 Local Materials

Goal	Reduce the environmental impacts of transport and support the local economy by using local materials, products, services, and systems.
Target Achievement	Approximately 54% of material cost was purchased from manufacturers within a 500 mile radius.
Implemented Initiatives	<p><u>Grass and Gravel Parking</u> This product is now being manufactured by Scott’s Plastics in Victoria, creating jobs and a new product line for the firm. .</p>



3.4.6 Durable and Low Maintenance Materials

Goal	Conserve natural resources while minimizing the generation of waste and pollution.
Implemented Initiatives	<p><u>Floor areas – common</u> The majority of the common areas will be VST tiles. Some areas will contain carpet tile that can be easily maintained by the rotation and replacement of soiled tiles.</p> <p><u>Walls and Ceilings – common</u> The majority of concrete walls, columns, and ceilings will be left as bare concrete, which is durable and will require little maintenance as well as providing a high-tech/industrial design feel to the project.</p> <p><u>Grass & Gravel Parking</u> Promotional material and studies by the supplier of this product show that it requires less maintenance than traditional asphalt parking.</p>

3.5 Ecological Performance – Clean Energy Transport



3.5.1 Clean Energy Transport

Goal	Offer the option of clean energy transportation
Implemented Initiatives	<p><u>Transit</u> An agreement has been reached with BC Transit to provide bus service to VITP, including direct routes form downtown, Oak Bay, UVic, and Royal Roads. Two bus stops, a bus layby, and a transit loop will be provided on site. A transit shelter will be provided and existing walkways are well lit and connected to the bus stop.</p> <p><u>Carpooling</u> Carpool cars will be given preferred parking spaces to serve 5% of building occupants.</p>





Bicycle

Bicycle storage includes secured areas within the building and the amount of storage significantly exceeds the municipal requirement. The bicycle storage in the building is 80 stalls with outside storage under cover for another 100 stalls. The fitness centre includes showers for bicycle users.

Bicycle Trails

Part of the original MOU required widening Markham Road for bicycle lanes and walking trails. Saanich was approached to defer the road widening and to use the funds instead to create a pedestrian/biking trail along the VITP/ Camosun boundary to Mann Avenue. This would provide a safer, more logical route to access the Galloping Goose Trail not only for technology park employees, but also for Camosun College, Layritz Park, and HCP users. This trail will be extended through to the HCP lands to Interurban in order to connect into the east/west trail.

The Saanich bicycle committee and the Municipality have approved the construction of this trail. In addition, a bicycle/pedestrian trail will be built along side Markham Road.

Alternative Fuel Vehicles

No electrical outlets for electrical vehicles have been provided; however, they will be supplied as needed and appropriate conduit has been installed to service electrical vehicles.

Sustainable Transportation Study

Funding was arranged in cash and in kind from VITP, VIATeC, BC Transit and Camosun College to do a sustainable transportation study. VIATeC was asked to manage this study and submit application for federal matching funds. The federal government MOST program awarded the largest grant in Canada \$80,000 to contribute to this study. Saanich, HCP, and the local bicycle committee have been invited to participate in the process.

The study will look at innovative and financially responsible alternatives to single occupant vehicle transportation to VITP and Camosun College (bicycle, walking, public transit, etc.) and to the region.

Traffic Safety & Demand

Residents expressed concern over the amount of traffic, pedestrian safety on Markham road and the road's use as a connector to Interurban. To address these concerns, the Master Plan includes an upgrade to the existing road on the site to slow traffic:

- Diagonal parking off the road on one side
- Traffic calming measures to be implemented based on Traffic Consultant recommendations.
- Breaking up the pavement with strips of pavers
- Removal of speed bumps (hazard for bicycles)
- Having the entrances of the new buildings be flush to the street





to create a traditional streetscape look

- A path and bicycle trail along the other side of the road

Zoning amendments have been approved by Saanich to reduce traffic by allowing an on-site restaurant, 1,000 square meters of commercial space, and provisions for daycare.

Water purification stations are located on each floor to reduce traffic for bottled water deliveries.

3.6 Ecological Performance –Energy



3.6.1 Energy Use

Goal

Reduce annual source operating energy.

Target Achievement

Computer modeling has been done confirming the renovated building is approximately 31% better than the requirements of ASHRAE/IESNA standard 90.1 –1999. Energy performance in newer buildings planned for the site will be significantly improved beyond these levels by utilizing an integrated approach to design.

Implemented Initiatives

The following are some energy performance initiatives undertaken for the retrofit:

Thermal storage

Thermal storage has been integrated into the VITP water loop heat pump system at no premium cost. The benefit is that excess heat generated from the space or from computer rooms can be stored in the loop during winter. The heat is then available for early morning warm-up, as an alternative to heat supplied from the gas-fired boilers.

Variable volume pumping for water loop heat pumps

Variable volume pumping has been integrated into the water loop heat pump system at no premium cost. Conventionally designed water loop heat pumps have water flow through all the heat pumps even when they are not operating. At VITP, water flow control valves will allow flow through each heat pump only when it is operating. This will result in continual operating cost savings with the pumping system. The small premium cost of the control valves was offset by installing two pumps sized for 50% flow each, instead of two larger pumps sized at 100% flow each. It is expected that one pump should run for most of the year.

Digital controls for water loop heat pumps

A high-performance digital control system will control the water loop heat pumps in the tenant spaces at VITP. In this way, control of the central boiler plant, cooling tower, and heat pumps can be optimized as an entire system, which will generate both energy and maintenance savings. The control system will allow HVAC trouble-shooting to occur remotely, resulting in additional maintenance savings. It will also control the variable volume pumping system described above.





Other

The lighting system will only be fluorescent T8 lighting. A lighting plan in the base building uses indirect/task lighting and other measures to lower energy costs. Exterior lighting consists of high-pressure sodium lamps.

The existing ductwork was reused and is oversized in relation to the needs of the technology park. Lower air speeds in ducts reduce energy consumption, as less energy is required for fans.

A 3M film will be applied on the centre wing existing windows. The new windows have a .4 shading coefficient.

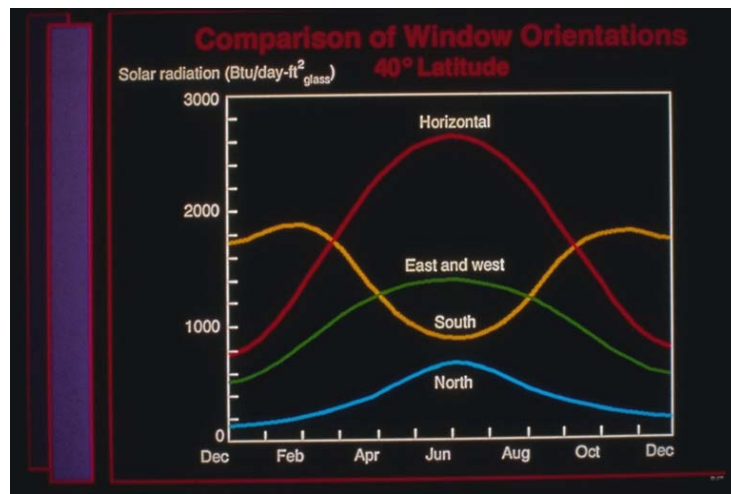
For the Future

Integrated design approach for new building

An integrated design approach will be undertaken in the new buildings planned for the site to significantly improve energy efficiency over traditional building design.

Location of new buildings

New buildings will be faced to the South to maximize heat gain during the winter months and minimize heat gain during the summer (see diagram below).



Source: Greg Franta - FAIA, Ensar Group, Inc. in Boulder Colorado.



3.6.2 Energy Source

Goal

Increase the use of renewable energy sources.

Target Achievement

No renewable energy sources were used in the building such as photovoltaics or ground source heat. These items were not budgeted as part of the scope of the project. However, the heat pump system employed can easily be adapted for ground source heat and the economics of this will be determined in planning the future building.





3.7 Human Health and Comfort – Indoor Air Quality



3.7.1 Air Pollutant Emissions

Goal

Indoor air is free of pollution.

Target Achievement

All low VOC limits were met or surpassed for adhesives, sealants, paints, composite wood products, and carpet systems with the exception of acrylic semi gloss varnish used in a very limited application (no equivalent low VOC product could be found to replace this product).



3.7.2 Mineral and Glass Fibre

Goal

Indoor air is free of pollution. Surfaces exposed to inhabited spaces and supply or return air should not trap or release dust, mineral, or glass fibre.

Implemented Initiatives

The acoustic duct linings are protected and sealed. Ceilings are being left exposed in most of the common area spaces.



3.7.3 Outdoor Air Intake

Goal

Indoor air is free of pollution. Ensure adequate separation of intakes from potential outdoor pollution.

Target Achievement

Intakes have been located on the roof of the building away from potential outdoor pollution.



3.7.4 Ventilation Effectiveness & Air Filtration

Goal

Indoor air is free of pollution.

Implemented Initiatives

Ventilation air effectiveness is performed for typical spaces and air filtration of at least 40% dust spot efficiency for typical spaces.



3.7.5 Systems Commissioning and Cleaning

Goal

Indoor air is free of pollution and Commissioning performed. Commissioning has been found to optimize energy performance and efficiency by 5 to 10%, resulting in significant environmental benefits and cost savings.

Implemented Initiatives

- Condensation and moisture in HAVC systems are drained safely and reliably.





- Duct systems were sealed during construction to prevent penetration of construction dust.
- Supply and return air duct systems are cleaned and verified prior to occupancy.
- HVAC systems and equipment are commissioned.

All practices will be implemented and the commissioning and cleaning will be performed and verified.



3.7.6 Daylighting

Goal

The building should provide visual access to outdoor conditions and should reduce lighting energy consumption.

Implemented Initiatives

Occupied floor space has direct line of sight to window on more than 90% of occupied space.

For the Future

The use of light shelves will be investigated in future buildings to act as shading and to introduce daylight to the interior. Daylighting will be reviewed in the next building to lower electrical loads and mechanical system costs as part of the integrated design approach.

