UNIVERSITY OF VICTORIA
CAMPUS SUSTAINABILITY GUIDELINES
REVISED VERSION
PREPARED BY CAMPUS PLANNING
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UVIC CAMPUS SUSTAINABILITY GUIDELINES

I INTENT OF THE GUIDELINES

These guidelines outline the University of Victoria's process for applying its sustainability objectives to major capital projects. It is intended to assist members of the campus planning committee, user & building committees, and project design teams understand and implement the Campus Plan's sustainability policies. The guide was developed and revised with input from the Campus Planning Committee (CPC) and the Facilities Development & Sustainability Sub-committee (FDSS).

These guidelines seek to achieve the following objectives:

- To ensure that campus building projects reflect the sustainability objectives of the Campus Plan
- To provide a decision-making process to determine the costs and benefits of developing a sustainable building project and certifying a pr

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II Sustainable Design

The concept of sustainability, green buildings, and smart growth are not new concepts at UVic. While the terminology has changed over time, the concept of developing a walkable, energy-efficient, human scale campus dates back to the initial creation of this campus in the early 1960's. What has changed is the level of interest shared among the campus community and members of the planning committees in sustainability issues and the recognition of the on-going effort and commitment required to develop a truly sustainable campus.

Green building practices are also becoming more "mainstream". As industry and consumer demand for sustainable developments and products increases, the financial premium that used to be associated with green building is diminishing and product availability is increasing. Technology improvements and advances in design are making green buildings much more accessible.

What Are Green Buildings?

Green buildings incorporate energy and resource efficient features designed to improve environmental performance and user comfort. Features may include:

- building site that takes advantage of existing infrastructure (including transit), microclimatic conditions, and redevelopment opportunities.
- Thermally efficient windows, walls & roofs
- Water efficient fixtures
- Designs that take advantage of solar access, natural ventilation and day lighting
- Flexible interior designs
- Use of environmentally-friendly paints, floor coverings, and building materials
- On-site stormwater management techniques such as ponds, green roofs and porous pavings designed to reduce rate of flow and improve water quality
- Landscaping which uses natural and durable plantings which require minimal irrigation and pesticides.

The development of green buildings and sustainable campus practices provide a broad range of benefits that go beyond environmental health. They include;

- Saving operation expenses, at little or no additional capital cost
- Building designs that are environmentally responsible and aesthetically pleasing
- Reduce sprawl development and encourage smart growth
- Create healthy indoor and outdoor campus environments
- Improve student learning
- Increase student, faculty and staff productivity
- Support markets for sustainable building materials and supplies
- Demonstrate to students, local governments and community members that the university can "walk the talk" on sustainability
- Educate students about green design, sustainability and responsible resource management
- Position the university as a leader in sustainable campus design

Building-specific Strategies

Pre-Design:

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- Make provision for electric bikes and vehicles on an as-needed basis
- Continue to monitor and audit traffic volumes and modal share
- Continue to implement, monitor and refine campus transportation demand management programs & initiatives

Building-specific strategies

Design:

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Design:

- Utilize energy modeling for new buildings to optimize energy performance and assess options

Water Efficiency & Stormwater Management

As a large institution, the University consumes significant volumes of potable water and contributes to the municipal stormwater and sewer systems. To reduce its servicing costs, and to reduce capacity constraints in the municipal systems, the university will support efforts to reduce flows into these systems. Approaches may include: low flow faucets and toilets, waterless

Construction

- Monitor sedimentation and erosion control systems, especially after storm events

Post-Construction

- Evaluate performance of water management systems, permeable paving materials and applications, new technologies, etc.
- Educate building users on water conservation and water re-use systems

Waste Management

Waste is generated through the life of a building, including demolition, renovation, construction and operations/occupant use. In addition to reducing its own operating costs and environmental impacts, the University also needs to consider the regional goals and regulations regarding landfill disposal and recycling.

Goal: Minimize waste generated on campus and facilitate the better management of waste through reuse and recycling

Campus-wide Strategies

- Minimize building-related waste through effective space and capital planning
- Assess opportunities for building and material reuse
- Maintain and expand campus-wide provisions for recycling materials
- Provide easily accessible recycling stations throughout the campus that allow for the collection and separation of materials, consistent with the requirements of the Capital Regional District (CRD)
- Provide recycling stations at convenient locations both inside and outside of buildings, including event gathering areas, parking lots, and plazas

Building-specific Strategies:

Design:

- Ensure that buildings are designed to be flexible, durable and long-lasting. Buildings should accommodate changes in space planning and academic programs and, where possible, be expandable to allow future space additions
- Plan for maximum standardization or repetition of building elements to accommodate future additions, alterations and program changes
- Require contractors to incorporate a construction waste management plan
- Design area (such as loading dock) for recycling handling
- Design facilities for recycling and waste handling that are convenient for maintenance and waste handlers, encourage appropriate use, and are aesthetically acceptable
- Provide space in food services spaces to collect food wastes

Construction Documentation & Specifications

- Include requirements for a construction waste management plan that addresses any demolition and salvaging requirements, as well as sorting, recycling and disposal specifications
- Specify supplier requirements for reusable, recyclable, and recycled content materials and/or packaging
- Detail recycling system requirements in construction documents for construction and occupant-use

Construction

- Reuse site materials, such as soil and land clearing debris which can be shredded for mulch
- Provide appropriate containers/facilities for construction material recycling & disposal
- Take steps to reduce amount of packaging material (e.g. vendor take-back requirements, recycling provisions, etc.)

Post-Construction
- Educate building users about recycling programs. Post signage to facilitate recycling.

Conserving Materials

Building materials choices are important in green building design because of the extensive network of extraction, processing, and transportation steps required and the ecological impacts of their eventual disposal. Activities associated with the production of building materials can contribute to air pollution, habitat destruction and resource depletion.

Goal: Minimize consumption and depletion of material resources; especially those from non-renewable resources

Campus-wide strategies
- Research and evaluate the environmental impacts of building materials
- Assess opportunities to reuse and recycle materials

Building-specific Strategies

Design:
- Develop design strategies that utilize materials with low environmental impact
- Assess life-cycle cost implications of materials. (Life cycle cost means the amortized annual cost of a product, including costs for capital, installations, maintenance, disposal discounted over the lifetime of the product.)
- Use products and materials that are durable, weather well and are appropriate to the demands of academic programs and student use
- Assess opportunities to use materials from renewable sources
- Assess opportunities to use locally manufactures materials
- Utilize low-toxic materials

Construction Documents & Specifications
- Specify material requirements

Post-Construction
- Evaluate materials and suppliers for future building projects

Indoor Environmental Quality

Goal: Provide interior environments that enhance user comfort, well-being, and productivity

Campus-wide Strategies:
- Provide smoke-free buildings and relocate designated smoking areas away from building entrances and air intakes
- Separate air intakes from loading areas and building exhausts
- Limit the use of mechanical air conditioning

Building-specific strategies

Design:

- Develop site plans to minimize potential pollutant sources in areas adjacent to the building. Consider the location of roads, parking lots, loading areas, and odour-generating facilities
- Develop design strategies to optimize natural ventilation
- Use no or low volatile organic compounds (VOC) paints for interior applications to the extent possible
- Incorporate occupant controls for airflow, temperature and lighting, where possible and practical. Include lighting controls, task lighting and operable windows
- Maximize interior daylighting, particularly in office areas
- Maximize view opportunities to provelightirable wMs(g,oc9htirabl)6.8(e)5.3]TJs tg,oc9h between(rior d)5.2(a)-

III SUSTAINABILITY ASSESSMENT PROCESS

The University embraces sustainable design principles in its construction and major renovation initiatives. As these guidelines explain, University projects may or may not seek certification under the LEED green building rating system, however, all University projects are expected to apply sustainability principles balancing the constraints of technology, funding, and material availability.

A thorough review by the University and the design team is required before arriving at a final decision to certify a building project using the LEED rating system criteria and these guidelines.

The intent of the sustainability assessment process is to evaluate the basic categories associated with the LEED rating system and these guidelines and provide transparent documentation of the initiatives considered and implemented. The categories to be assessed include:

- Site planning & site design
- Sustainable transportation
- Energy efficiency and renewable energy
- Water efficiency and stormwater management
- Conservation of materials and resources
- Indoor air quality
- Innovation

I Pre-design Phase

A sustainable design process recognizes that a building's systems and components are interrelated and thus, sustainability goals must be established at the project's initiation.

Involving the University and the consultant design team in the goal-setting and design process enables the resulting design to incorporate sustainability goals without significant initial cost premiums. This will also ensure that the resulting project is compatible with the expectations and culture of the University and supportive of the project's program.

Activities fundamental to making the campus more sustainable include:

Space Planning:
The role of Institutional Analysis and Capital Planning are critical at this stage to ensure that the existing inventory of space is optimized to meet user needs without over-building. Activities include

- verifying enrolment growth trends and projections
- verifying space needs
- optimizing space efficiencies
- confirming additional space requirements

Site Selection:
Appropriate site selection is critical to meeting the goal of a more sustainable campus. No amount of design can overcome a poor siting decision. Key activities include:

- ensuring all new developments are placed on the most suitable sites possible
- avoiding unnecessary impacts to environmentally-sensitive areas and key open spaces
- reflecting the principles of the campus plan
- promoting a compact, walkable campus

Project Development:
An important starting point in any major capital project is to incorporate appropriate sustainability and green design considerations in the project terms of reference (s), request for proposals, design team selection process, and project schedule and budget. Either at this stage, or prior to

the completion of the schematic design phase, the University will establish an obtainable sustainability target for the project, recognizing the opportunities and constraints within a given project such as site, functional requirements, budget, and broader university goals.

Programming:
The programming phase provides a good opportunity to educate users on the campus sustainability objectives and the importance of individual user commitments (e.g. responsible use of occupant controls, dressing for weather, using alternative transportation, recycling, responsible resource use, and the like). Activities at this stage may include:

- Examine preliminary opportunities and identify strategies
- Conduct workshop sessions with user group to inform them of campus plan & sustainability objectives. The workshop may also be used to establish, evaluate and prioritize sustainability goals for the new project. These goals will be reflected in the subsequent sustainability checklists
- Identify opportunities to share space or co-locate activities within new buildings to maximize academic opportunities while minimizing overall material and resource requirements

Sustainability Assessment Deliverable #1: Pre-Design Sustainability Assessment

The pre-design sustainability assessment should be undertaken at the initial stage of the project as soon as the design team has been hired. Initial work on the assessment may begin in the programming stage.

Using the categories listed above, the design team and University project staff should use these

Design Development: The design team and the University project team shall continue to refine the checklist as the project proceeds through the design process as priorities, costs and technologies are better known.

Sustainability Assessment Deliverable #3 Design Development Checklist :

An updated sustainability checklist should be calculated near the completion of design development. This checklist should be the basis of implementation through the development of contact documents, tender documents and construction standards and specifications.

If the project is formally registered under LEED, the checklist will reflect the documentation requirements of the Canada Green Building Council's LEED Canada-NC reference guide. If formal registration is not pursued, the sustainable building checklist may be used.

The checklist will be divided into categories, identifying whether the credit values are required (LEED prerequisites and University requirements), almost certain, possible (but may need more analysis), unlikely, and not applicable or recommended (e.g. too much cost for too little benefit). Cost effectiveness or the availability of additional funding sources may result in these possible credits being incorporated into the project, otherwise they are not considered further. The checklist shall be reviewed periodically and updated to reflect the status of the project budget, design opportunities and funding sources.

Depending on the nature and extent of the project, another facilitated sustainability workshop may be held prior to finalizing the design development checklist.

III Construction Phase

The objective of the construction phase is to build the project as represented in the contract document within the parameters approved by the Board of Governors. The design team and University personnel should clearly communicate the sustainability goals and green solutions with the construction manager/contractor to explore opportunities for innovation and efficiencies.

Activities may include:

- Identify and submit contract documents to include contractors with experience in sustainable design.
- Informing/educating contractors about sustainable design objectives.
- Verifying requirements and submittals for green products and systems.
- Developing/confirming the construction waste management plan
- Developing/confirming the construction indoor air quality management plan, when applicable
- Developing the commissioning plan

Sustainability Assessment Deliverable #4 Project Conclusion Report :

At the conclusion of all major projects, a final project report shall be prepared which indicates the following:

- Project summary information (net and gross figures, budget, etc.)
- Site plan, building design and elevations, landscape plan and plant list (as submitted for municipal approvals)
- Final sustainability checklist
- Summary report indicating the rationale for sustainability approaches used, as well as those not considered or included
- Any recommendations for future projects

APPENDIX ONE

2003 CAMPUS PLAN POLICY DIRECTION

The University adopted the Campus Plan in 2003 which contained principles and policies for a more socially, environmentally and fiscally sustainable campus. The plan clearly acknowledges that sustainability includes:

- Opportunities to enhance social interaction through human-scale designs
- Provision of sustainable transportation infrastructure and programs
- Protection & enhancement of environmentally-significant natural areas
- Commitment to “low-impact” development and green buildings
- Responsible stewardship of land through the use of smart growth/efficient development principles

The University recognizes that its buildings and facilities have an impact on those who use them. Additionally, it is recognized that water usage, site drainage, energy use, building materials, and construction practices have long-term environmental impacts beyond the borders of the campus.

Principle #6 of the plan, Sustainable Buildings and Facilities, states: The University commits to incorporate sustainable practices in the planning, construction and operation of buildings and facilities.

Relevant Campus Plan Policy Directions:

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Building Footprint: In the planning and design of new buildings, early consideration will be given to accommodating more floor-space within a smaller building “footprint” to enhance compactness

APPENDIX TWO

THE LEED RATING SYSTEM

The Leadership in Energy and Environmental

There are several goals within each category. Based on the number of goals that a project is able to successfully implement, the building is awarded a rating.
The four levels of certification under the LEED rating system are:

ƒ LEED Certified	26-32 points
ƒ LEED Silver Level	33-38 points
ƒ LEED Gold Level	39-51 points
ƒ LEED Platinum Level	52-69 points

Initial Costs

Although LEED buildings have been found to repay the extra costs of construction over the life of the building, the additional upfront costs of LEED participation can increase the capital budget. There is an application fee for the LEED certification process. In addition, it takes time and energy to complete and file documents at the appropriate stages. Architects, consultants and contractors may charge more if they are required to meet LEED standards. The average cost premiums for LEED certified buildings are less than 2% of construction and this is usually paid back early, and several times over the life of the building.

Specific Components of the LEED Rating System

1. Sustainable Sites:
   - Site selection
   - Urban redevelopment (e.g. use of parking lots)
   - Brownfield redevelopment
   - Alternative transportation
   - Reduced site disturbance
   - Storm water management
   - Landscape and exterior design to reduce heat islands
   - Light pollution reduction

2. Water Efficiency:
   - Water efficient landscape
   - Innovative wastewater technologies
   - Water use reduction

3. Energy and Atmosphere:
   - Fundamental building system commissioning
   - Minimum energy performance
   - Optimal energy performance
   - Renewable energy
   - Additional commissioning
   - Measurement and verification

4. Materials and Resources:
   - Storage and collection of recyclables
   - Building reuse
   - Construction waste management
   - Resource reuse
   - Recycled content
   - Local/regional materials
   - Rapidly renewable materials
   - Certified wood

5. Indoor Environmental Air Quality
   - Minimum IAQ performance
   - Environmental tobacco smoke control

- Carbon dioxide monitoring Increase ventilation effectiveness
- Construction IAQ management plans
- Low-emitting materials
- Indoor chemical and pollutant source control
- Controllability of systems
- Thermal comfort
- Daylight & views

6. Innovation and Design Process:
    - Maximize benefits of green planning by addressing issues at initial stages of a project

APPENDIX THREE

TERMINOLOGY

Charrette

A short and intensive design process that usually involves people from different backgrounds and disciplines in order to gain an integrated and broad perspective of issues at hand. The charrette process consists of focused workshop(s) which take place in the early phase of the design process. All project team members meet together to exchange ideas, encouraging generation of integrated design solutions.

Commissioning

Commissioning is a systematic process of ensuring that the performance of the building and its systems meet the design intent and the owner/occupants functional and operational needs. The process should: document the design intent; identify and perform tests that show the whole building and its systems meet the owner's functional requirements; provide a comprehensive and appropriate basis for training building operation and maintenance personnel.

Daylighting

A method of illuminating building interiors with natural light so that the use of artificial lighting is reduced in the day time. Common daylighting strategies include the proper orientation and placement of windows, use of light wells, light shafts or tubes, skylights, light shelves, reflective surfaces and shading, and the use of interior glazing to allow light into adjacent spaces.

Ecological Footprint

The ecological impact of human activities as measured in terms of the area of biologically productive land and water required to produce the goods consumed and to assimilate the wastes generated.

Embodied Energy

A representation of the energy used to grow, harvest, extract, manufacture, transport, and dispose of a material.

Energy modeling

A computer model that analyzes the building's energy-related features in order to project the energy consumption of a given design.

Greenhouse Gases

Chemical compounds in earth's atmosphere that allow sunlight to enter the atmosphere freely. When sunlight strikes the earth's surface, some of it is reflected back toward space as infrared radiation (heat). Greenhouse gases absorb this infrared radiation and trap the heat in the atmosphere. Many gases exhibit these "greenhouse" properties. Some of them are water vapour, carbon dioxide, methane, and nitrous oxide, and gases used for aerosols.

Harvested rainwater

The rain that falls on a roof and I channeled by gutters to a storage tank or cistern. The uses of this water depend on the quality and the type of pollutants picked up from the roof surface. Often it is used for irrigation.

Integrated Design

An approach where the design of each system takes into account and balances the design of other systems. Often an interdisciplinary approach, integrated design should begin at the earliest stage of a project with a guiding set of principles

Leadership in Energy and Environmental Design (LEED)

The LEED green building rating system is a set of performance standards where credits are earned for satisfying each criterion. The standards are based on accepted energy and environmental principles and aims to achieve a balance between known effective practices and emerging concepts. Four levels of LEED certification are possible; depending on the number of criteria met, and indicate increasingly high performance building practices:

- LEED Certified 26-32 points
- LEED Silver 33-38 points
- LEED Gold 29-51 points
- LEED Platinum 52+ points

Living Machine

An ecologically engineered waste water treatment system: It is a solar powered, accelerated version of the water treatment facilities found in mature natural systems. Incorporating helpful microbes, plants, snails and fish into diverse, self-organizing and responsive communities. Living machine systems are site-specific, biological solutions that re-route waste water streams into resources.

Life cycle assessment

The comprehensive examination of a product's environmental and economic aspects

APPENDIX FOUR

ONLINE RESOURCES

Sustainable Development Resources

Canada Green Building Council	www.cagbc.org
Center for a New American Dream	http://www.newdream.org
Center for Sustainable Systems	http:/css.snre.umich.edu/
Campus Ecology Project of the National Wildlife Federation	www.nuf.org/campusecology
Higher Education Climate Action Project (HECAP)	www.heclimateaction.org
Blueprint for a Green Campus	www.envirocitizen.org/blueprint/
Higher Education Network for Sustainability and the Environment	http://www.ulsf.org/hense/
Talloires declaration	www.ulsf.org/programs_talloires.html
Rocky Mountain Institute	http://www.rmi.org
Second Nature	http://secondnature.org
World Resources Institute	http://wri.org

Planning/Design Organizations

Canadian Institute of Planners www.cip-icu.ca