

sustainability

The aspirations for the New SUB Project with respect to sustainability are extremely high. The thinking that informs the design is long-term with respect to the building's impact on occupants, users and the environment. The New SUB will be flexible, adaptable, energy efficient, have low water use and be a healthy place in which to work, hang out, study and have a meal.

Uses within the SUB constantly change and therefore **a building with a potential life span of 100 years needs to be able to adapt** to those changes to remain useful. Structural, mechanical, electrical and other systems within the building are being designed with adaptability in mind in areas where change is anticipated. Certain parts of the building (for instance the exterior envelope, stairs and service cores) will not change in the near term, and in these and other areas, strategies of durability will be pursued.

Anticipated to be a LEED Platinum building, incorporating elements of the Living Building Challenge, the New SUB will be extremely energy efficient. Design **strategies place a priority on minimizing consumption. A high performance envelope, natural ventilation and daylight harvesting** are amongst the long list of strategies that are integral to this low energy building.

Rainwater harvesting will be used as one of the means to reduce water use significantly on the project.

As the SUB has the provision of food to people on campus as a primary service, sustainability and health with respect to food, from original production to delivery in prepared form to the disposal of food waste, forms a unique focus for this project.

The AMS and design team recognize that **human behavior has a significant impact on the environment and therefore the building design aims to make sustainable behavior informed, easy and pleasurable.** Information monitors provide feedback to staff and users regarding consumption. The SUB will be a significant node for cyclists containing, as it does, a Bike Kitchen, end of trip facilities and secure and sheltered bike parking.

In all, it is expected that the New SUB will be a model project with respect to sustainability.

fixed parts + loose parts

Fixed elements give the building character, quality and endurance; loose elements allow it to change and adapt over time - to grow/expand/flux. The thoughtful and strategic combinations of these allow the building to have living **'layers of change'**

flexibility / adaptability / future-proofing

Moveable, reconfigurable, de/reconstructable systems allow flexibility to respond to short term changes (hours, days, months, etc). Durable materials and non prescriptive elements allow for adaptation to occur over longer timescales.

The skillful combination of the two provides a robust + nimble capacity to respond to the challenges of designing for unknowable futures.

flowscales

The New SUB Building is conceived of as a means of shaping flows through space - flows of peoples, of materials, ecologies, energies...and ideas. 4d sustainability depends on both:

- a deep understanding of and sensitivity towards the nested scales of flows and flow exchanges through and across the site +
- the exchange of ideas, aspirations and everyday actions towards more sustainable possible futures

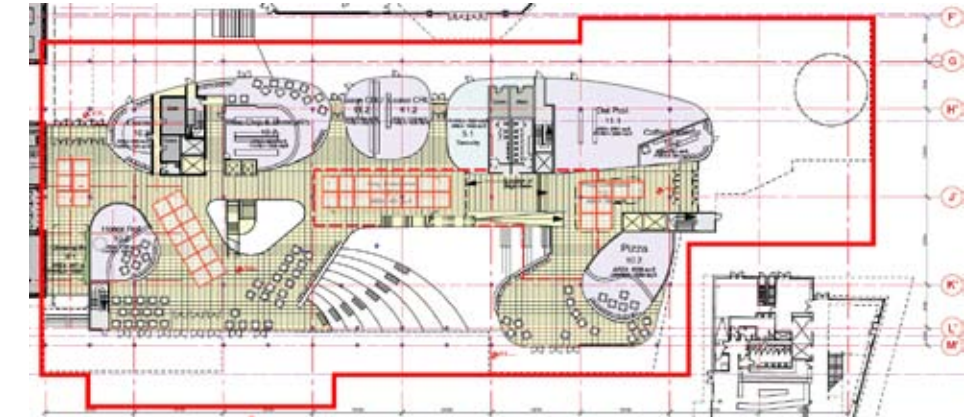
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LEED Canada-NC 1.1 Project Checklist

UBC SUB

Vancouver, BC December 23, 2010



Yes ? No

10 1 3

Sustainable Sites

14 Points

Schematic Design: Why is this a Yes/ Maybe/ No?

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- Prereq 1 Erosion & Sedimentation Control
- Credit 1 Site Selection
- Credit 2 Development Density
- Credit 3 Redevelopment of Contaminated Site
- Credit 4.1 Alternative Transportation, Public Transportation Access
- Credit 4.2 Alternative Transportation, Bicycle Storage & Changing Rooms
- Credit 4.3 Alternative Transportation, Alternative Fuel Vehicles
- Credit 4.4 Alternative Transportation, Parking Capacity
- Credit 5.1 Reduced Site Disturbance, Protect or Restore Open Space
- Credit 5.2 Reduced Site Disturbance, Development Footprint
- Credit 6.1 Stormwater Management, Rate and Quantity
- Credit 6.2 Stormwater Management, Treatment
- Credit 7.1 Heat Island Effect, Non-Roof
- Credit 7.2 Heat Island Effect, Roof
- Credit 8 Light Pollution Reduction

Required

- Specification manuals will include measures to prevent soil from leaving the site.
- 1 The new SUB building is not located on land that violates any of the above conditions.
- 1 The SUB exceeds the minimum development density requirement & is central to UBC's main campus, in close proximity to a number of faculty buildings & facilities.
- 1 The site was not previously contaminated.
- 1 The SUB will be within a few hundred metres of the campus's main, 11-bay bus depot that provides frequent service to every part of Vancouver's Lower Mainland.
- 1 The UBC Trek program requires long & short-term bike storage and end-of-trip facilities that will be met by the SUB. The functional program for the project also requires showering facilities that will be provided in the new space.
- 1 UBC has a fleet of vehicles; further investigation is required to determine the number of fuel-efficient vehicles. If the number satisfies the credit requirements, the possibilities will be investigated.
- 1 No parking is being added. If parking in the nearby parkade is claimed for building occupants, then enough spaces shall be added for car/vanpools as per the credit requirement, with signage.
- 1 Building footprint is much greater than 50% of site.
- 1 Team has committed to credit; strategy details to be provided as the design progresses. This will include on-site water storage for irrigation and toilet flushing.
- 1 Team has committed to credit; strategy details to be provided as the design progresses.
- 1 Both: extensive green roofs with local plantings, and urban agriculture areas growing food for use/consumption by the new SUB food services facilities will account for at least 50% of the total roof area.
- 1 Lighting levels will be designed to meet or exceed the IESNA requirements. The design will not include up-lights or other light directed off of the site.

Yes ? No

4 1

Water Efficiency

5 Points

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- Credit 1.1 Water Efficient Landscaping, Reduce by 50%
- Credit 1.2 Water Efficient Landscaping, No Potable Use or No Irrigation
- Credit 2 Innovative Wastewater Technologies
- Credit 3.1 Water Use Reduction, 20% Reduction
- Credit 3.2 Water Use Reduction, 30% Reduction

- 1 Drip/micro irrigation systems will be specified for planted areas, including extensive green roof areas.
- 1 Landscaping will be designed using drought-resistant plants requiring minimal irrigation, using water from the rainwater capture cistern. As the urban agriculture space requires potable water, 100% reduction likely won't be available.
- 1 Project will consider: dual flush water closets, low or ultra low-flow urinals, low flow faucets & shower heads and on-site stormwater retention will be used to flush water closets & urinals.
- 1 Project will consider: dual flush water closets, low or ultra low-flow urinals, low flow faucets & shower heads.

Yes ? No

14 3

Energy & Atmosphere

17 Points

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- Prereq 1 Fundamental Building Systems Commissioning
- Prereq 2 Minimum Energy Performance
- Prereq 3 CFC Reduction in HVAC&R Equipment
- Credit 1 Optimize Energy Performance
- Credit 2.1 Renewable Energy, 5%
- Credit 2.2 Renewable Energy, 10%
- Credit 2.3 Renewable Energy, 20%
- Credit 3 Best Practice Commissioning
- Credit 4 Ozone Protection
- Credit 5 Measurement & Verification
- Credit 6 Green Power

- Required UBC has agreed to engage a commissioning authority.
- Required See Executive Summary narrative for energy efficiency strategies.
- Required It is illegal to install CFC-based refrigerants in Canada.
- 1 to 10 See Executive Summary narrative for energy efficiency strategies.
- 1 If a PV panels were used, the system has been estimated at:
 - 1 - 100kW system for 5% energy cost savings, using 12,000ft2 roof area
 - 1 A balance will be determined to meet the green roof requirements of SSc7.2, and balance PV & SDHW opportunities.
- 1 UBC has agreed to engage a commissioning authority.
- 1 HCFC refrigerant will not be specified for any base building equipment.
- 1 A M&V plan will be created by the team and integrated into the designs, particularly the electrical, mechanical & control systems.
- 1 UBC has agreed to purchase green power as required by this credit.

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Yes ? No

8 3 3 Materials & Resources 14 Points

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- Prereq 1 **Storage & Collection of Recyclables**
- Credit 1.1 **Building Reuse: Maintain 75% of Existing Walls, Floors, and Roof**
- Credit 1.2 **Building Reuse: Maintain 95% of Existing Walls, Floors, and Roof**
- Credit 1.3 **Building Reuse: Maintain 50% of Interior Non-Structural Elements**
- Credit 2.1 **Construction Waste Management: Divert 50% from Landfill**
- Credit 2.2 **Construction Waste Management: Divert 75% from Landfill**
- Credit 3.1 **Resource Reuse: 5%**
- Credit 3.2 **Resource Reuse: 10%**
- Credit 4.1 **Recycled Content: 7.5% (post-consumer + 1/2 post-industrial)**
- Credit 4.2 **Recycled Content: 15% (post-consumer + 1/2 post-industrial)**
- Credit 5.1 **Regional Materials: 10% Extracted and Manufactured Regionally**
- Credit 5.2 **Regional Materials: 20% Extracted and Manufactured Regionally**
- Credit 6 **Rapidly Renewable Materials**
- Credit 7 **Certified Wood**
- Credit 8 **Durable Building**

Required	
	Interior fit-out will include recycling zones and UBC's recycling program addresses minimum credit requirements.
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1	There is no existing structure available to reuse.
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1	Specification manuals will include a section on construction waste management that will be mandated through the construction project.
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1	It is uncertain whether there will be sufficient materials available for reuse. Further investigation is required.
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1	Specifications will mandate minimum recycled content for various materials including concrete, structural steel, rebar, gypsum wallboard, ceiling tile and carpet.
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1	This credit is dependent on the manufacturers that are selected by the contractor. While sole sourcing is an option, the design team generally does not recommend eliminating competitive pricing between multiple suppliers.
1	
1	Rapidly renewable material products are not widely available on the market & it is unlikely that there is an application within the SUB for sufficient quantities.
1	
1	Specifications will mandate that all wood used in the building be FSC certified & follow chain of custody documentation.
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1	A building envelope specialist has been retained to comply with the credit requirements.

Yes ? No

11 3 1 Indoor Environmental Quality 15 Points

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- Prereq 1 **Minimum IAQ Performance**
- Prereq 2 **Environmental Tobacco Smoke (ETS) Control**
- Credit 1 **Carbon Dioxide (CO₂) Monitoring**
- Credit 2 **Ventilation Effectiveness**
- Credit 3.1 **Construction IAQ Management Plan: During Construction**
- Credit 3.2 **Construction IAQ Management Plan: Testing Before Occupancy**
- Credit 4.1 **Low-Emitting Materials: Adhesives & Sealants**
- Credit 4.2 **Low-Emitting Materials: Paints and Coating**
- Credit 4.3 **Low-Emitting Materials: Carpet**
- Credit 4.4 **Low-Emitting Materials: Composite Wood and Laminate Adhesives**
- Credit 5 **Indoor Chemical & Pollutant Source Control**
- Credit 6.1 **Controllability of Systems: Perimeter Spaces**
- Credit 6.2 **Controllability of Systems: Non-Perimeter Spaces**
- Credit 7.1 **Thermal Comfort: Compliance**
- Credit 7.2 **Thermal Comfort: Monitoring**
- Credit 8.1 **Daylight & Views: Daylight 75% of Spaces**
- Credit 8.2 **Daylight & Views: Views 90% of Spaces**

Required	
	The ventilation system will be designed to meet ASHRAE Standard 62 requirement (year 2001 or later).
Required	Tobacco smoking will be prohibited in the SUB, as it is on campus.
1	CO2 sensors will be provided in occupied spaces to provide demand control ventilation, modulated through the building management system.
1	Further investigation is required.
1	Specifications will mandate that a construction IAQ Management Plan be developed and implemented by the contractor.
1	Specifications will mandate that a before-occupancy IAQ test or flush-out be implemented by the contractor.
1	Mandated by specification & verified during construction.
1	Mandated by specification & verified during construction.
1	Mandated by specification & verified during construction.
1	Mandated by specification & verified during construction.
1	Design will include required elements & specification will mandate that filtration be replaced before occupancy.
1	Design team will target with operable windows and adequate lighting controls.
1	May be difficult to achieve in certain occupancies. Further investigation required.
1	Compliance with ASHRAE Standard 55 will be achieved in HVAC design. Thermal comfort monitoring will be achieved with room space sensors providing feedback to the building management system.
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1	A large number of regularly occupied spaces throughout the building will not have daylight exposure.
1	The basement (approx 20% of floor area) is anticipated not to meet the view criteria.

Yes ? No

5 Innovation & Design Process 5 Points

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- Credit 1.1 **Innovation in Design - Exemplary Performance Water Use Reduction**
- Credit 1.2 **Innovation in Design - Exemplary Performance Recycled Content**
- Credit 1.3 **Innovation in Design - Exemplary Performance Regional Materials**
- Credit 1.4 **Innovation in Design - Green Cleaning**
- Credit 2 **LEED® Accredited Professional**

1	See WEc2 for proposed water saving fixtures.
1	Mandated by specification & verified during construction.
1	Mandated by specification & verified during construction.
1	UBC has agreed to implement a green housekeeping program.
1	Several members of the UBC Student Union Building project team are LEED Accredited Professionals.

Yes ? No

52 11 7 Project Totals (pre-certification estimates) 70 Points

Certified 26-32 points Silver 33-38 points Gold 39-51 points Platinum 52-70 points