UBC DISTRICT ENERGY CENTRE

Development Permit

2012.December.07

DOCUMENT LIST

- Project Description
- Design Policy Compliance
- LEED Checklist
- Site Photos
- Shadow Analysis
- Appendix A - Drawings

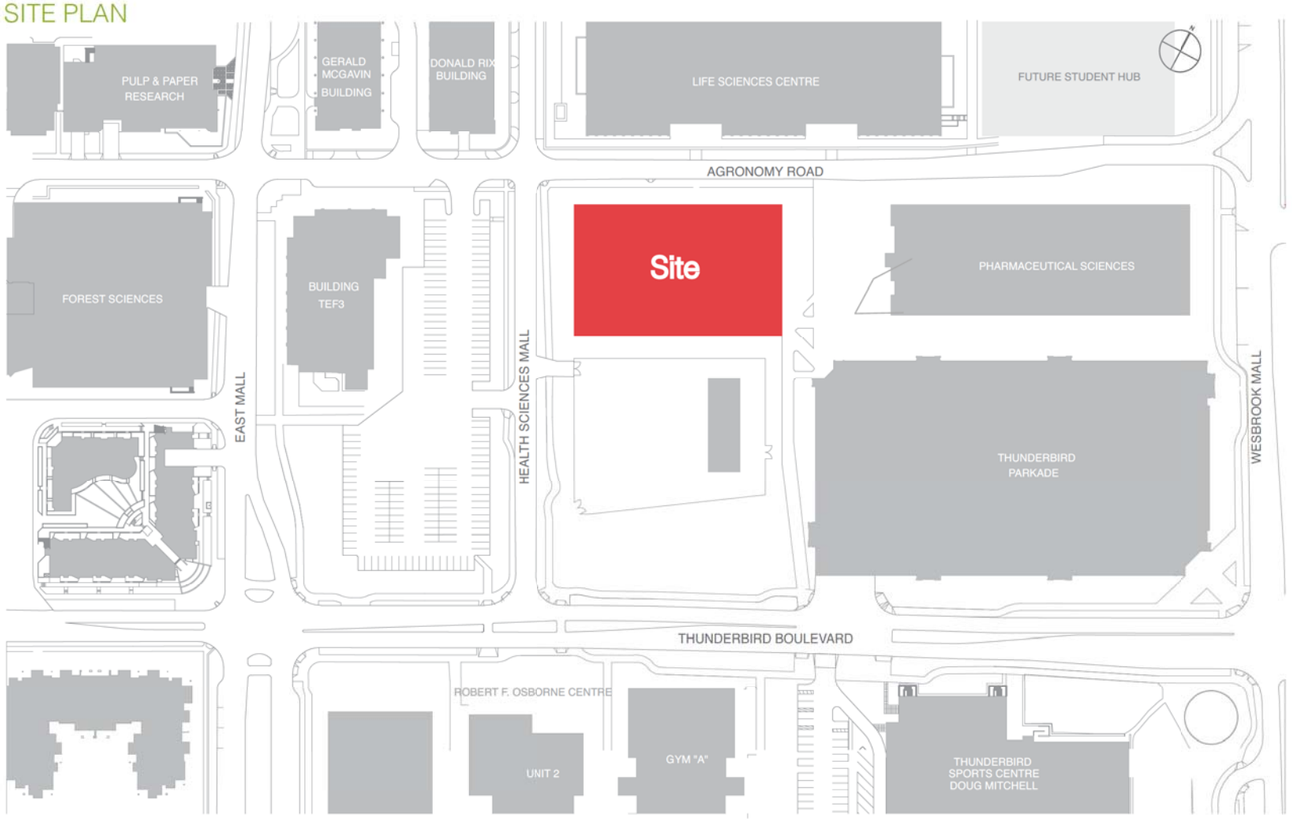
PROJECT DESCRIPTION - SITE + CONTEXT

UBC has made a commitment to reduce greenhouse gas emissions by 33% by 2015. Converting the existing district steam heating system to a higher efficiency hot water system will be central to meeting this goal. A key part of the upgraded system will be the new District Energy Centre that will generate efficient heating and electricity while also incorporating learning and display elements that respond to UBC's Living Lab initiative.

The proposed site for District Energy Centre is at the southeast corner of Agronomy Road and the Health Sciences Mall, next to the new Pharmaceutical Sciences Building. The Centre will be constructed in two Phases. Phase One will include the boilers and service block (including the living lab component and end-of-trip facilities). Phase Two will include the Cogen Plant, also known as the future clean energy space.

The building will not only serve as an efficient energy provider, but also represent UBC's thought-leadership, innovation, and cutting-edge approach to sustainability.

SITE PLAN

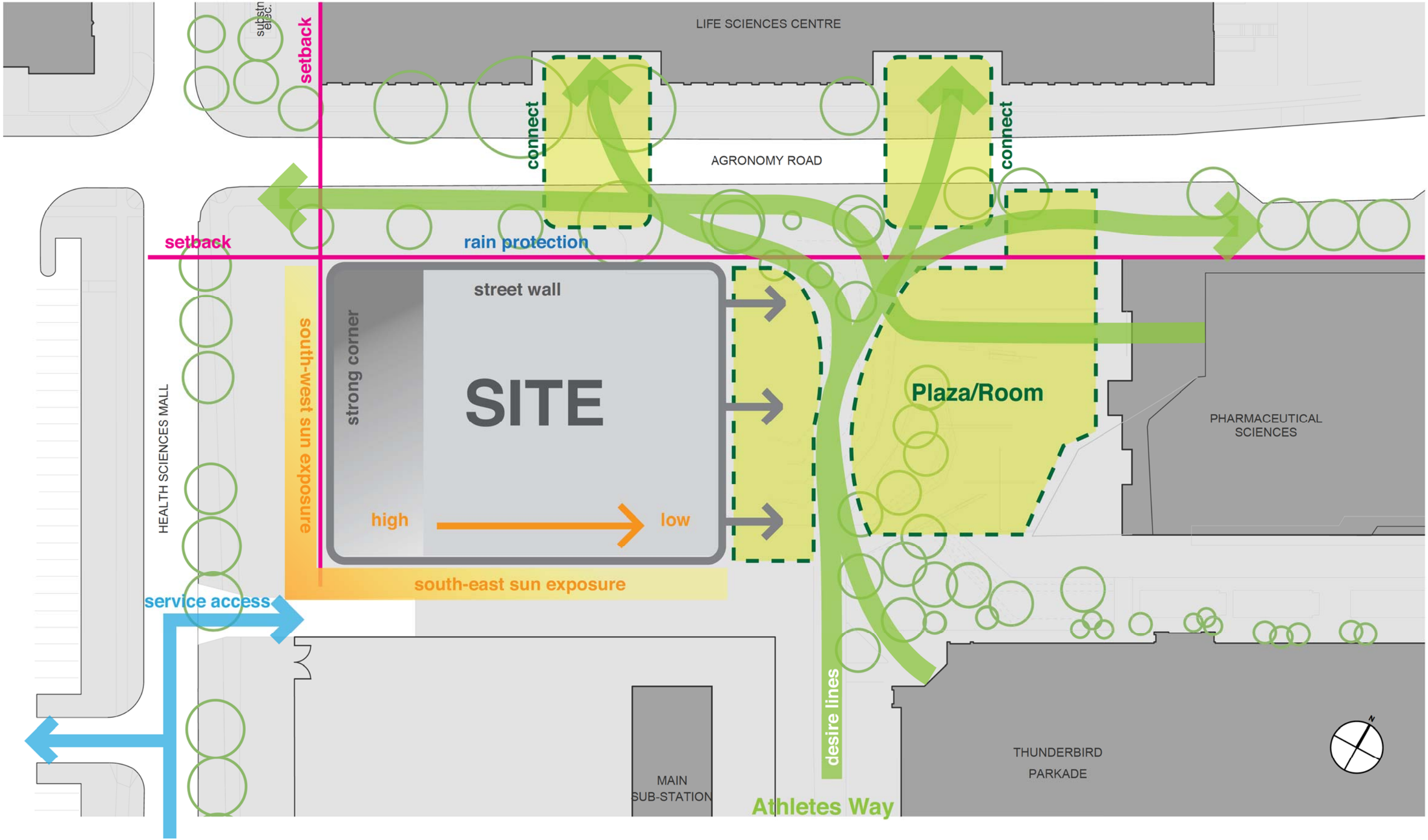


CAMPUS SIGNATURE SITES

Academic | Residential | Sports | Health

CAMPUS AERIAL

PROJECT DESCRIPTION - SITE + CONTEXT



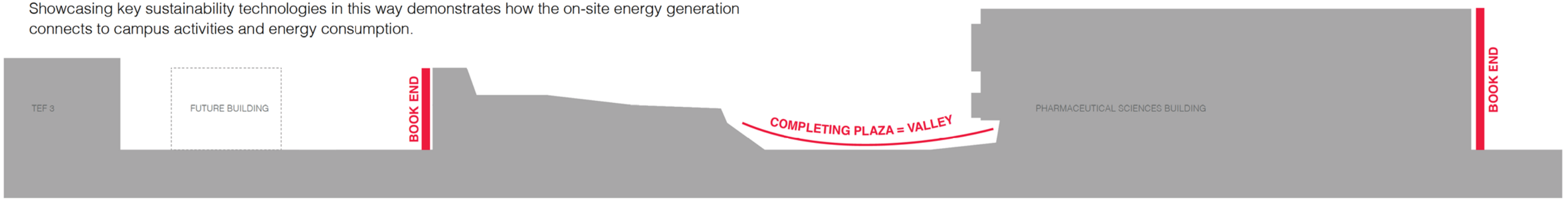
PROJECT DESCRIPTION - DESIGN RATIONALE

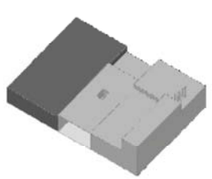
- The new District Energy Centre anchors the corner of Health Sciences Mall and Agronomy Road. The building's higher massing on the west end enhances the natural ventilation process and encloses the boiler stacks. Its 17-metre height matches the height of the Life Sciences Building, creating a uniform street wall along Health Sciences Mall
- The ample glazing in the skin of the boiler room creates transparency and provides views into the vaulted space of the process area, celebrating the energy centre's function.
- The building responds to the site's existing circulation paths and seeks to better define its edges:
  - its entrance on Agronomy Road 'looks' over to west entrance of the Life Sciences Building
  - As the District Energy Centre approaches the plaza, the building 'steps' back to provide better pedestrian access into this public area
  - A bouldering wall on the east face of the building clearly establishes a new edge to the plaza and will help animate this public space
- The service alley provides vehicular access to the District Energy Centre and is where the oil tank and transformer have been located – away from the more public areas of the building.
- The building's design follows the site-specific guidelines set out by the University of British Columbia's Vancouver Campus Plan as well as the Planning Principles outlined in 'A Legacy & a Promise' [see 6. Policy Compliance for more detail].
- The building will act as a 'Living Lab'. Dedicate learning spaces, building tours, and visual connections into the process space will allow the energy production functions to be studied and observed. Showcasing key sustainability technologies in this way demonstrates how the on-site energy generation connects to campus activities and energy consumption.

DRAFT SITE DEVELOPMENT DESIGN BRIEF

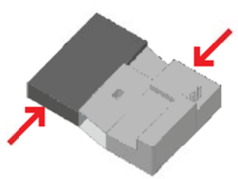
by UBC Campus Planning October 23, 2012

- Establish pedestrian scale streetscape on south terminus of Health Sciences Mall and complete Agronomy Street streetscape
- The siting and massing of new building are to strengthen the definition of the adjacent open space
- The open space is to be a "positive" room rather than "negative" void.
- The site is located within the bounds of the Contemporary District: the Contemporary palette is intended to project a sense of lightness and optimism and to demonstrate innovation, research, and sustainability
- West setback line to match west setback line of the Life Sciences Centre
- North setback line to match build-to line of the adjacent anchor reference buildings: TEF 3 to the west and/or new Pharmacy Building to the east
- Its infill nature should provide a visual break in the context of the dominant neighbouring buildings such as Life Sciences Centre and new Pharmacy Building
- Incorporate interactive features reflecting both: energy generating nature of the facility as well as adjacency of the athletic district
- Seek opportunities to reveal and celebrate ecological storm water management in the landscape

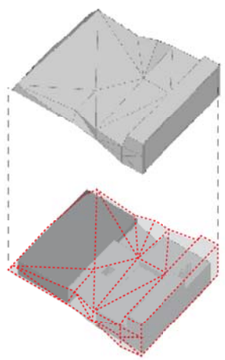




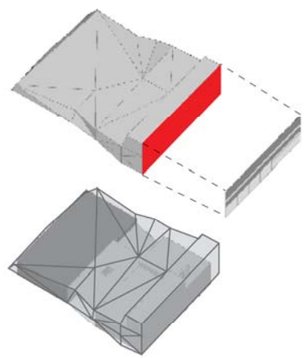
1 PROGRAM



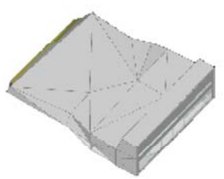
2 PUSH / PULL



3 GEO-MORPHIC SCREENING



4 SLICE



5 GEO-MORPHIC + OPEN + RESPONSIVE

DESIGN POLICY COMPLIANCE

The following outlines compliance with the eight key planning principles from '*A Legacy and a Promise*':

Principle 1: The University Lands: As One

Each physical change should enrich and complete the whole

- The District Energy Centre (DEC) will help to define a new public space at the southern end of campus, frame pedestrian movement and activity, and serve as an active learning environment for the university

Principle 2: The Community: Vibrant and Ever-Changing

Sustain this energetic, sociable, safe and diverse community ... support the intellectual curiosity, social well-being, and spiritual life of it students, residents, faculty, staff and visitors

- The DEC will contribute to an active and vibrant community by offering students a unique learning lab environment.
- End-of-trip facilities will encourage students and faculty to get to campus the 'green way' (cycing and running)
- The DEC will provide a book-end edge to the plaza, which will help to spatially define a new gathering space along with the Pharmaceutical Sciences Building

Principle 3: The Experience: A Place to Remember

The University's history, culture and natural setting combine to give the campus meaning and a sense of permanence ... physical changes will celebrate these attributes

- The DEC marks an important shift in UBC's approach to meeting its energy demands and reducing its greenhouse gas emissions; despite its utilitarian nature, the building will seek to engage its neighbours, by making visible the story of energy production
- Celebrates a culture of sustainability at UBC

Principle 4: The Environment: Incredible Riches

The University will be a responsible steward, respecting and valuing the land, air, and water

- District energy is a highly efficient method of energy production
- On-site water collection and storage opportunities are being explored for the building's grey water requirements and any landscape irrigation
- Communicating to students, staff, faculty, and visitors how district energy works and its campus-wide impact is an integral design goal for the new DEC

Principle 5: The Endowment: A Legacy Retained

The 1,000 acres that make up the University Lands will be retained ... in perpetuity

- The DEC is designed to assist UBC in meeting its future energy requirements in a low-impact, efficient way
- The building will replace a surface parking lot and will greatly enhance the surrounding public space

Principle 6: The Perspective: A World Beyond

The aesthetic, social, economic, and ecological significance of each proposed physical change will be viewed from a broader perspective

- The DEC will help the University meet its greenhouse gas emission reduction targets, which, in turn will contribute to its reputation as a global sustainability leader

Principle 7: The Opportunity: Global Leadership in a Changing World

The process of physical change must be flexible and responsive to the changing needs and values of society

- The DEC is a integral piece in UBC's transition to a low-carbon future on campus and demonstrates the univeristy's thought-leadership and innovation
- Few academic institutions have undertaken such aggressive steps to reducing their greenhous gas emissions

Principle 8: The Process: Open and Integrated

To work in collaboration with all members of the University community

- Community involvement is a vital part in the process of design
- At the outset of the project, a visioning charette was conducted with all of the stakeholders (UBC Utilities, Project Services, neighbouring faculties, local residential association and design consultants); From this session the design aspirations for the project were determined and have served as consistent check as the design has progressed

This next section demonstrates compliance with The University of British Columbia – Vancouver Campus Plan with a special focus on the Contemporary District:

Sustainability

- The DEC is an important piece of infrastructure for UBC to meet its greenhouse gas reduction targets

Universal Accessibility

- Both the external landscape and the internal public spaces are designed to provide access to all

Architecture

- The building's architecture grows out of functional programme requirements and the desire to display the energy production processes
- At an urban scale, the building's massing steps down from the elevated volume of the boiler room (used to facilitate natural ventilation) along Health Sciences Mall to a more pedestrian-scale at the plaza.

Open Space

- The DEC is sited and landscaped to complete the adjacent plaza space shared with the Pharmaceutical Sciences Building

Site Furnishings

- Site furnishings will blend with the existing benches/lighting used in the plaza, while along Health Sciences Mall will be in keeping with campus standards

Contemporary District

- The DEC will align its building edges with Life Sciences along Health Sciences Mall and Pharmaceutical Sciences along Agronomy Road
- The form, massing, and height of the DEC respond to the massing of neighbouring buildings, along with the space requirements of the process equipment
- The DEC's palette of materials will include metal panels, board form concrete, glazing, and wood, all of which are listed as preferred materials in the Contemporary District design guidelines

Crime Prevention through Environmental Design (CPTED) Strategies:

- The DEC project follows the guidelines of the CPTED, including active street wall, public realm and semi-public spaces, which have surveillance and active programs

UBC DEC

LEED Canada-NC 2009 Summary Scorecard

Target LEED Rating: Gold
Current Rating: Gold
Latest Update: 2012-10-26

RECOLLECTIVE
Buildings • Community • Ecology

Project Totals (pre-certification estimates) — 110 Possible Points

64 | 32 | 5 | 9

Certified 40-49 points **Silver** 50-59 points **Gold** 60-79 points **Platinum** 80 points and above

Sustainable Sites — 26 Points

Target	?T	?N	No			
15	6	4	1			
T				SSp1	**Construction Activity Pollution Prevention**	Required
1				SSc1	**Site Selection**	1
	3	2		SSc2	**Development Density and Community Connectivity**	3, 5
			1	SSc3	**Brownfield Redevelopment**	1
6				SSc4.1	**Alternative Transportation:** Public Transportation Access	3, 6
1				SSc4.2	**Alternative Transportation:** Bicycle Storage & Changing Rooms	1
3				SSc4.3	**Alternative Transportation:** Low-Emitting & Fuel-Efficient Vehicles	3
		2		SSc4.4	**Alternative Transportation:** Parking Capacity	2
1				SSc5.1	**Site Development:** Protect and Restore habitat	1
1				SSc5.2	**Site Development:** Maximize Open Space	1
1				SSc6.1	**Stormwater Design:** Quantity Control	1
	1			SSc6.2	**Stormwater Design:** Quality Control	1
1				SSc7.1	**Heat Island Effect:** Non-Roof	1
	1			SSc7.2	**Heat Island Effect:** Roof	1
	1			SSc8	**Light Pollution Reduction**	1

Water Efficiency — 10 Points

Target	?T	?N	No			
4	6					
T				WEp1	**Water Use Reduction**	Required
2	2			WEc1	**Water Efficient Landscaping**	2, 4
	2			WEc2	**Innovative Wastewater Technologies**	2
2	2			WEc3	**Water Use Reduction**	2 - 4

Energy & Atmosphere — 35 Points

Target	?T	?N	No			
19	14		2			
T				EAp1	**Fundamental Commissioning of Building Energy Systems**	Required
T				EAp2	**Minimum Energy Performance**	Required
T				EAp3	**Fundamental Refrigerant Management**	Required
12	7			EAc1	**Optimize Energy Performance**	1 - 19
	7			EAc2	**On-Site Renewable Energy**	1 - 7
2				EAc3	**Enhanced Commissioning**	2
2				EAc4	**Enhanced Refrigerant Management**	2
3				EAc5	**Measurement and Verification**	3
			2	EAc6	**Green Power**	2

Materials & Resources — 14 Points

Target	?T	?N	No			
6	1	1	6			
T				MRp1	**Storage and Collection of Recyclables**	Required
			3	MRc1.1	**Building Reuse:** Maintain Existing Walls, Floors, and Roof	1 - 3
			1	MRc1.2	**Building Reuse:** Maintain Interior Non-Structural Elements	1
2				MRc2	**Construction Waste Management**	1 - 2
			2	MRc3	**Materials Reuse**	1 - 2
2				MRc4	**Recycled Content**	1 - 2
2				MRc5	**Regional Materials**	1 - 2
		1		MRc6	**Rapidly Renewable Materials**	1
	1			MRc7	**Certified Wood**	1

Indoor Environmental Quality — 15 Points

Target	?T	?N	No			
10	5					
T				EQp1	**Minimum Indoor Air Quality Performance**	Required
T				EQp2	**Environmental Tobacco Smoke (ETS) Control**	Required
1				EQc1	**Outdoor Air Delivery Monitoring**	1
	1			EQc2	**Increased Ventilation**	1
1				EQc3.1	**Construction IAQ Management Plan:** During Construction	1
1				EQc3.2	**Construction IAQ Management Plan:** Before Occupancy	1
1				EQc4.1	**Low-Emitting Materials:** Adhesives and Sealants	1
1				EQc4.2	**Low-Emitting Materials:** Paints and Coatings	1
1				EQc4.3	**Low-Emitting Materials:** Flooring Systems	1
1				EQc4.4	**Low-Emitting Materials:** Composite Wood and Agrifibre Products	1
	1			EQc5	**Indoor Chemical and Pollutant Source Control**	1
1				EQc6.1	**Controllability of Systems:** Lighting	1
	1			EQc6.2	**Controllability of Systems:** Thermal Comfort	1
1				EQc7.1	**Thermal Comfort:** Design	1
1				EQc7.2	**Thermal Comfort:** Verification	1
	1			EQc8.1	**Daylight and Views:** Daylight	1
	1			EQc8.2	**Daylight and Views:** Views	1

Innovation in Design — 6 Points

Target	?T	?N	No			
6						
1				IDc1.1	**Innovation in Design: Green Building Education**	1
1				IDc1.2	**Innovation in Design: End of Trip Amenity**	1
1				IDc1.3	**Innovation in Design: Building as acoustical sponge**	1
1				IDc1.4	**Innovation in Design: SEEDS program**	1
1				IDc1.5	**Innovation in Design: Exemplary energy performance**	1
1				IDc2	**LEED® Accredited Professional**	1

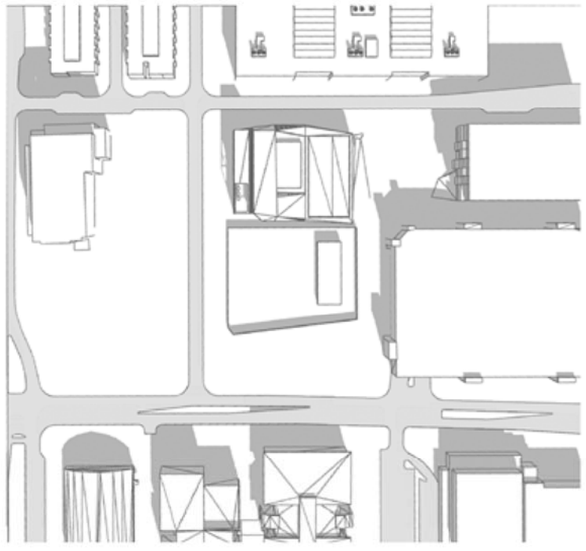
Regional Priority — 4 Points

Target	?T	?N	No			
4						
1				RPc1	**Durable Building**	1
1				RPc2.1	**Regional Priority Credit: EAc1**	1
1				RPc2.2	**Regional Priority Credit: SSc6.1**	1
1				RPc2.3	**Regional Priority Credit: WEc3**	1

SITE PHOTOS

Key Map

SHADOW ANALYSIS



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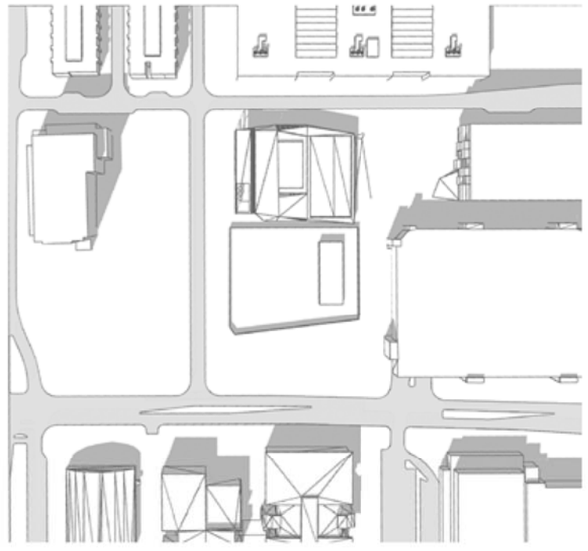

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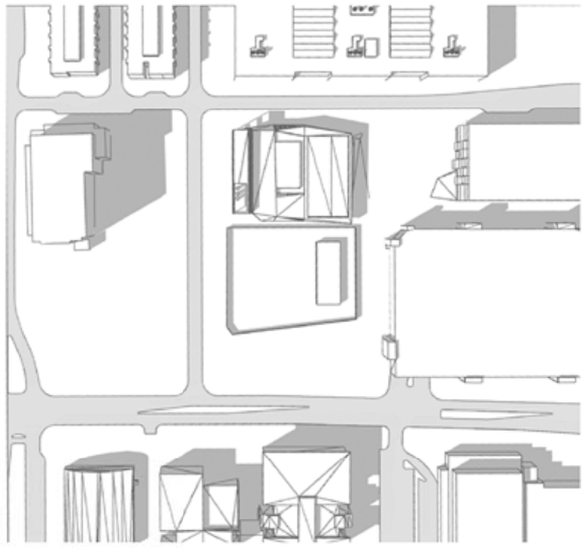

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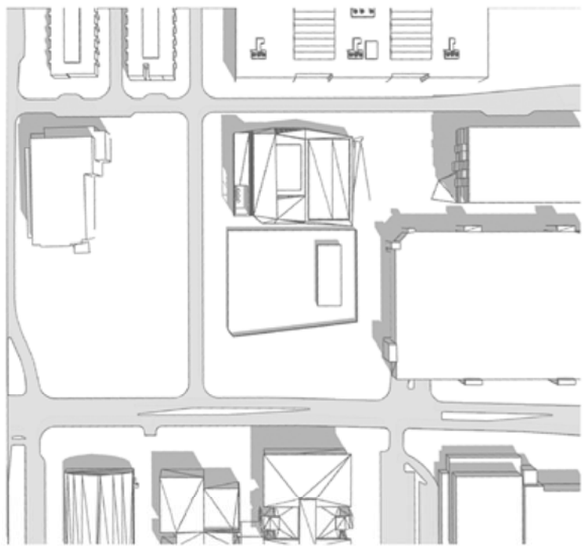

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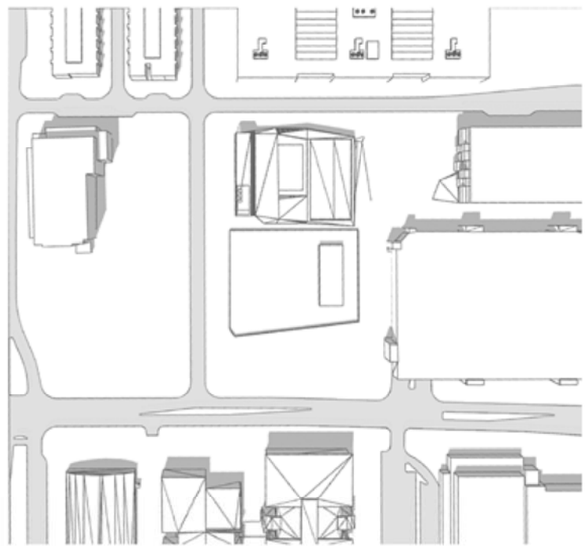

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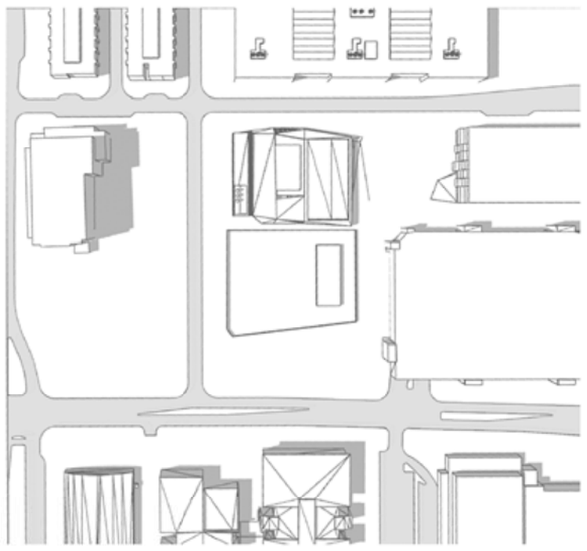

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APPENDIX A - DRAWINGS