

## 2.0

# PROJECT BACKGROUND & OVERVIEW

*“CIRS is a precedent – the beginning of a process [of sustainable building] but not the end”*

*- Alberto Cayuela, UBC Sustainability Initiative, CIRS Project Manager*



Image 2.1 Centre for Interactive Research on Sustainability.  
Photographs By Enrico Dagostini.

## 2.1 Overview

The Centre for Interactive Research on Sustainability (CIRS) was developed in response to the challenge of creating a more sustainable society. Its intention is to be an internationally recognized research institution that accelerates the adoption of sustainable building technologies and sustainable urban development practices in society. CIRS was designed to be the most innovative and high performance building in North America at the time of its construction. Integrated building systems, comprehensively monitored and centrally controlled, are designed to meet goals of zero carbon emissions, water self-sufficiency, net-positive energy performance and zero waste.

The ongoing research agenda at CIRS investigates the interactions of building inhabitants with a comprehensive high-performance building and the integration of education, community outreach, applied research and market-based replication. The building itself acts as a “living laboratory” that allows research and investigation of current and future sustainable building technologies, as well as the impact of inhabitant’s actions and engagement with the systems. Research on effective policies, civic engagement and group decision-making combined with advanced visualization and simulation technologies capable of communicating data through various means aid outreach efforts that encourage individuals and communities to explore a more sustainable future. Partners from private, public, and non-government organization sectors share the research facility, working with dedicated CIRS researchers to identify areas for innovation in sustainable technologies and practices and to create a springboard for their development and widespread implementation.

## LESSONS LEARNED

- Keep focusing on the objective
- Set ambitious performance targets
- Capture and communicate the goals and decisions

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- 23.0 Community (food...)
- 24.0 Operations & Maintenance
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## AGENTS

*Project Sponsor: Dr. Jon Robinson,*

*Project Manager: Alberto Cayuela*

*Architects: Perkins + Will*

*Structural Engineer: Fast & Epp*

*M/E/P Engineer: Stantec*

*Landscape Architect: PWL  
Partnership*

*Water Consultants: Eco-Tek  
Ecological Technologies Inc.,  
NovaTec Consultants*

*UBC Campus and Community  
Planning*

*UBC Properties Trust*

*Academic Partners: Simon  
Fraser University, BC Institute of  
Technology, Emily Carr University*

*Industry Partners: BC Hydro,  
Honeywell, Haworth, Modern  
Green*

*Funding Agencies: Canada  
Foundation for Innovation, BC  
Knowledge Development Fund*

## 2.2 Project History

As a concept and a process, CIRS has been an ongoing venture since 1999. The project went through three different iterations, at different sites and with different owners and inhabitants over that time. Simultaneously, there were significant advancements in public awareness, policy and market developments, and technological capabilities relating to sustainable buildings. The dedicated leadership team maintained the strong project vision through all of these changes and ensured that the ambitious project goals would be achieved.

### 1999

- The president of UBC at the time, Dr. Martha Piper, asked all the research units on campus to develop a strategic plan for future development.
- Dr. John Robinson, then at the Sustainable Development Research Initiative (now part of the Institute for Resources, the Environment and Sustainability), proposed an idea to create a “BC Showcase”, a building that would demonstrate sustainable principles and practices holistically.

### 2001

- Dr. John Robinson met with Peter Busby, the architect, to discuss the creation of the “greenest building in North America”. Multiple key concepts including the “living laboratory” and “accelerating sustainability” were developed during this meeting.
- Busby & Associates Architects prepared a feasibility study for the first iteration of Centre for Interactive Research on Sustainability, located on UBC’s Vancouver Campus.
- The leadership team applied for the first Canada Foundation for Innovation (CFI) grant to fund the project. It was denied.

### 2002

- BC Hydro became an industry partner.

### 2003

- The Steering Committee was created to provide expert advice and guidance on the project. It included representatives from local academic institutions, government agencies, academic researchers and industry.
- A decision was made to move CIRS to a site on the Great Northern Way Campus.
- Other academic institutions became partners in the project: Emily Carr University of Art and Design, British Columbia Institute of Technology, Simon Fraser University.
- A feasibility study was undertaken for the Great Northern Way campus context with a new program accommodating all four academic institutions.
- The team applied for a second CFI grant.
- The team applied for a British Columbia Knowledge Development Fund (BCKDF) grant.

### 2004

- The feasibility study was completed.
- The CFI and BCKDF grants were approved.

**2005**

- A Sustainable Development Technology Canada grant was secured for the photovoltaic cells.

**2007**

- Honeywell and Haworth become industry partners.

**2008**

- The CIRS project returned to a location on the UBC Vancouver Campus, with UBC as the sole owner and under the management of UBC Properties Trust.
- A Western Economic Diversification Canada grant was secured.
- Over the winter, the design teams responded to new Requests for Proposals for the new project program and context.
- Four interdisciplinary design charrettes were held between March and July.
- Schematic design began in May and transitioned to design development in September.

**2009**

- Documents for the tender set were completed in July.
- Construction documents were created between July and October.
- Site service work and demolition of the previous building occurred over the summer.
- Construction began in October.

**2010**

- Modern Green Development became an industry partner.

**2011**

- Construction was completed in August.
- Building occupancy granted late August.
- Building inhabitation began in September.

## 2.3 Project Description

The CIRS building is 5,675 square meters (61,085 square feet) on a site area of 2,008 square meters (21,614 square feet). The structure is comprised of a pair of four-storey office/lab blocks running east-west, linked by an atrium which acts as building lobby and entry to a 450-seat lecture auditorium for general campus use. The program of interior spaces contains a mix of academic office spaces, dry labs, meeting rooms, social spaces and service spaces. The basement of the building holds building services, storage facility, a locker and shower facility, and electrical, mechanical and plumbing spaces for the building systems. The ground floor contains the Modern Green Development Auditorium, the Loop Cafe, the BC Hydro Theatre and the Policy Lab. The upper floors of the building contain academic spaces and meeting rooms. The academic office spaces are designed to be flexible to accommodate a variety of uses, as the tenant groups change over the lifetime of the building. The data and research hub of the building, the Building Monitoring Assessment Lab including the CIRS Operation Centre, is located on the third floor.

## **Building Program**

While CIRS was always intended to be an academic building, the exact groups that would inhabit it were not officially confirmed at the outset of the design process. Since university buildings rarely retain the same purpose over the long-term, this aspect was viewed positively and the main academic spaces were designed to accommodate a variety of different uses over the life of the building. The University had certain programmatic requirements for the project, including a large lecture auditorium and a café. In addition, a space for campus-wide storage was added to the program to accommodate the warehouse function that had previously occurred on the chosen site. Specific spaces related to the sustainability research and purpose of CIRS, such as a building simulation software lab, an indoor environmental quality lab,, a group decision environment theatre (BC Hydro Theatre) and a policy lab, were also included in the project.

### ***Office/Lab space***

The main spaces of the building are the academic spaces, located on the upper floors of the two thin wings on the north and south sides of the building. The office spaces were designed to accommodate a range of uses for different group sizes, although they function best as open offices. The offices have been fitted out to accommodate the requirements of the different tenant groups currently in place and include open areas of workstations, closed offices, dry lab space and meeting rooms. Printing and copy spaces are located in these areas on each floor.

### ***Modern Green Development Auditorium***

Included in the building program is a large, 450 seat lecture auditorium that will serve the entire campus community. Located on the ground floor, the auditorium is the largest on campus and fills the space between the two narrow office block wings. It will subtly market the building and the CIRS mission by drawing in audiences and exposing th ambitious sustainability agenda to a large proportion of the campus community. The inclusion of a living roof on the Auditorium provides an upper level courtyard for the offices on the upper floors.

### ***The Loop Cafe and Kitchen***

The Loop Cafe, operated by UBC Food Services, is located on the ground floor adjacent to both the main interior and exterior circulation spaces. The food served in this space will be locally sourced and seasonal.

### ***BC Hydro Theatre***

The group decision theatre located in the north wing on the ground floor is a digital multi-media black box theatre. It is part of the communication aspect of the CIRS research agenda that focuses on developing tools for modelling, visualization and community engagement.

### ***Policy Lab***

The Policy Lab, in the north wing on the ground floor, accommodates large meetings and remote collaborations. It includes multiple screen configurations for QUEST and other simulation programs, digital presentations and high quality video-conferencing.

### ***Commons and Student Lounges***

Informal common spaces available to the public are located on the bridges of the second, third and fourth floors of the atrium. The common spaces and the student lounges in some of the office areas provide places for casual interactions, studying and socializing.

### ***Circulation***

The main interior circulation space is the four-storey, open atrium on the west side of the building. The stairs and bridges in the atrium are the main route for public circulation in the building. The egress stairs are located at the northwest, northeast and southeast corners and the elevator core is located at the northwest corner of the building.

### ***Bike Storage and Showers***

A secure room with lockable storage to accommodate 36 bikes is located in the basement. Men's and women's shower rooms and lockers are located adjacent to the bicycle storage for use by the building inhabitants.

### ***Campus Storage***

UBC Classroom Services previously used the CIRS site for a small warehouse housing the short-term storage of furniture. That function is now transferred to a large storage space in the basement of the CIRS building. The basement was later added to accommodate the storage function for UBC Campus and Community Planning.

### ***Building Systems and Services Spaces***

Most of the service spaces and rooms for building systems are located in the basement, including electrical rooms, pump rooms, potable water processing room and the main data and communication room. The wastewater treatment system, however, was placed in a glass volume on the ground floor and adjacent to an existing campus pedestrian route. This strategic positioning places one of the most important sustainable features of the project in a prominent and publicly visible location.

### ***Building Operations Center***

The Building Monitoring and Assessment Lab, including the CIRS Operations Center, is located on the southwest corner of the third floor. This is where the building and its systems are monitored and the data recorded is collected. Experiments and changes to the building systems will be coordinated from this center.

### ***Lobby/Atrium***

The large atrium of the building, with the main lobby and the circulation, serves as a science and technology common. Through design features and digital communications equipment, visitors to the building make an immediate connection with the sustainable attributes and research agendas of CIRS.

## RELATED SECTIONS:

- 3.0 Vision & Leadership*
- 4.0 Goals & Targets*
- 5.0 Partnerships*
- 6.0 Research*
- 7.0 Building Design*
- 8.0 Design Process*
- 20.0 Construction*
- 22.0 Inhabitants vs. Occupants*
- 23.0 Community*

## 2.4 Goals & Targets

An extensive list of project goals was created early on by key project leaders. This list was revised with each new iteration of CIRS, incorporating new standards and strategies for achieving sustainable design and development. The goals provided a framework for making design decision, as well as a challenge to the design and leadership team to create a high performance sustainable building. Refer to Section 4.0 Goals & Targets for a complete list of project goals and targets.

## 2.5 Benefits

The history and process of developing CIRS benefitted the project in the following ways:

### Moved from being a ‘Pioneer’ to ‘Early Adopter’

- When CIRS was first conceived in 1999, the sustainability goals and the associated strategies were visionary and ambitious. In the 12 years between conception and occupation, other similarly ambitious buildings have been designed, constructed and occupied. The market for sustainable building products and technology has developed and matured over the last decade and therefore CIRS could be delivered for a reasonable construction cost.

### Spread the Message Widely

- The timescale for bringing the project from concept to completion helped spread the message of CIRS widely and increased support for the project. The existing partnerships developed and matured while new partnerships emerged. Modern Green Development became an official CIRS partner in 2010 and is an important partner as they are taking lessons learned at CIRS to developments in China and North America.

### Refined the Design

- The high-performance targets for CIRS challenged the design team to search for innovative design solutions and strategies. The lengthy development period allowed some of those design solutions to become more refined and better suited to achieving the sustainability targets. The massing and orientation of the final building design is better suited for daylighting the interior spaces than previous design iterations.

## 2.6 Challenges

The history and process of developing CIRS was challenging in the following ways:

### Maintaining the project team energy

- At times during the 12 year development of the project, CIRS was “on life support” and the prospect of project completion was thought unachievable. Without the relentless energy of Dr. John Robinson and the determination of Peter Busby, Alberto Cayuela and others, the project would never have been completed or the project ambitions might have diminished by compromise. Similarly ambitious projects will require a core of project champions with great determination, stamina and perseverance.

### Maintaining the project team continuity

- A number of important stakeholders in the history of CIRS have left the project team or joined other organizations. This proved to be a challenge where detailed and easily accessible project documentation is imperative to maintain the continuity of the project design process and ensure achievement of project objectives.

## 2.7 Lessons Learned

The experience gained through the history and process of developing CIRS provided valuable lessons to apply to future projects. Some of the key lessons are:

### Keep Focusing on the Objective

- Twelve years and many “near-death experiences” tested the resolve of the project team. A clearly defined vision for the project helped to focus the efforts on project completion and strengthen the support for the project.

### Set Ambitious Performance Targets

- Creating an exemplary and visionary set of project goals and objectives allowed the project to remain innovative, 12 years after the concept emerged, despite a number of other sustainable buildings that were completed in the meantime.

### Capture and Communicate the Goals and Decisions

- During the lengthy development process, a number of the members of the project team changed organizations or left the team. Internal communication within the team and the continued involvement of the core team members was essential for project completion. A clearly defined set of goals and objectives was a critical communication tool for organizing the project team.

## 2.8 Future Learning

Additional lessons learned over the operational life of the building will be added at periodic intervals

### RESOURCES:

- *Feasibility Studies*
- *CFI Applications*
- *Institute for Resources, Environment and Sustainability:* [www.ires.ubc.ca](http://www.ires.ubc.ca)
- *UBC Sustainability Initiative:* [www.sustain.ubc.ca](http://www.sustain.ubc.ca)
- *UBC Campus and Community Planning:* [www.planning.ubc.ca](http://www.planning.ubc.ca)
- *UBC Properties Trust:* [www.ubcproperties.com](http://www.ubcproperties.com)
- *Perkins + Will:* [www.perkinswill.ca](http://www.perkinswill.ca)
- *Fast & Epp:* [www.fastepp.com](http://www.fastepp.com)
- *Stantec:* [www.stantec.com](http://www.stantec.com)
- *PWL Partnership:* [www.pwlpartnership.com](http://www.pwlpartnership.com)
- *Eco-Tek Ecological Technologies Inc.:* [www.ecotek.ca](http://www.ecotek.ca)
- *Novatec Consultants:* [www.novatec.ca](http://www.novatec.ca)
- *Canada Foundation for Innovation:* [www.innovation.ca](http://www.innovation.ca)
- *BC Knowledge Development Fund:* [www.cse.gov.bc.ca/TRI/research/funding/BCKDF](http://www.cse.gov.bc.ca/TRI/research/funding/BCKDF)
- *Simon Fraser University:* [www.sfu.ca](http://www.sfu.ca)
- *BC institute of Technology:* [www.bcit.ca](http://www.bcit.ca)
- *Emily Carr University of Art & Design:* [www.ecuad.ca](http://www.ecuad.ca)
- *BCHydro:* [www.bchydro.com](http://www.bchydro.com)
- *Haworth:* [www.haworth.com](http://www.haworth.com)
- *Honeywell:* [www.honeywell.com](http://www.honeywell.com)
- *Modern Green:* [www.mgreen.com.cn](http://www.mgreen.com.cn)