

CASE STUDY

Integrating Laboratory Controls and Installations for a World-Class Research Hub

How GDI Ainsworth advanced controls, HVAC, and energy recovery strategy powers the University of Alberta's cutting-edge CCIS facility.



Project Details

Location

Edmonton, Canada

Number of Buildings

1 - 85,000 ft² facility

System Implemented

Integrated laboratory controls, advanced HVAC systems, energy management strategies, heat recovery systems, process-load cooling, and specialized laboratory installations

Project Goal

Deliver a fast-tracked construction solution capable of supporting complex laboratory environments, interdisciplinary research, and high-performance energy requirements

Impact at a Glance

- ✓ Delivered Canada's first facility of its kind, enabling unprecedented cross-disciplinary scientific collaboration
- ✓ Integrated laboratory controls supporting radiation labs, fluid dynamics labs, wet/dry physics labs, and multiple teaching theatres
- ✓ Advanced energy efficiency through recycled chilled water systems, glycol run-around coils, and enthalpy wheel heat recovery
- ✓ Achieved LEED Silver certification, reinforcing sustainable design and operational excellence

Challenge

The Centennial Centre for Interdisciplinary Science (CCIS) required an exceptionally large and technically demanding infrastructure installation.

The project involved integrating laboratory controls, metering systems, and energy management strategies within a challenging architectural footprint — while also meeting complex laboratory installation requirements across multiple specialty research spaces.

The scale and speed of construction amplified the need for precise coordination and technical innovation.



Solution

- ✓ Installed 750,000 CFM of primary air-handling equipment to support large-scale laboratory ventilation needs
- ✓ Integrated 250 low-flow, variable-volume fume hoods with manifolded exhaust systems
- ✓ Installed 900 Phoenix Venturi air valves for precise laboratory airflow and pressure control
- ✓ Implemented 131 heat pumps to support distributed heating and cooling throughout the facility
- ✓ Deployed a radiant cooling system to enhance thermal comfort and energy efficiency
- ✓ Designed and installed a dedicated instrument cooling water system
- ✓ Applied innovative process-load cooling using recycled chilled water to reduce energy consumption
- ✓ Maximized heat recovery through glycol run-around coils and enthalpy wheels
- ✓ Coordinated mechanical, electrical, and controls installations to meet complex laboratory requirements within challenging architectural constraints

Methodology

GDI Ainsworth approached the fast-tracked project with a deeply collaborative delivery model, working alongside consultants, general contractors, and specialty trades to ensure alignment at every phase.

The team prioritized early coordination of mechanical and electrical systems, enabling all equipment, controls, and energy systems to fit within the architectural constraints.

Innovative energy strategies—including process load cooling and advanced heat recovery—were incorporated into the design to support long-term sustainability.

Throughout the project, proactive problem-solving and continuous communication ensured smooth integration of all laboratory systems and metering infrastructure.

The Ripple Effect

- ✓ Strengthened the University of Alberta's position as a global leader in interdisciplinary science
- ✓ Supported long-term operational sustainability through advanced energy recovery strategies
- ✓ Provided a LEED-certified environment that will foster innovation