

CASE STUDY

# Engineering Excellence for Advanced Radiopharmaceutical Research

Inside GDI Ainsworth's multidisciplinary approach that delivered one of Canada's premier medical isotope and cyclotron research facilities



## Project Details

### Location

Edmonton, Canada

### Number of Buildings

1 - 29,000 ft<sup>2</sup> cold-storage facility

### System Implemented

Full mechanical and electrical integration, specialized vault construction for cyclotron, hot-cell installation, and radiopharmaceutical handling infrastructure

### Project Goal

Transform an existing cold storage space into a state-of-the-art academic, research, and radiopharmaceutical production facility, including specialized containment for a cyclotron

## Impact at a Glance

- ✓ Successfully repurposed a legacy cold-storage facility into **one of only eight cyclotron facilities in Canada**
- ✓ Enabled production of clinical-quality technetium-99m used in 80% of nuclear medical diagnostic procedures
- ✓ Established the University of Alberta as a national centre of excellence for cyclotron research and radiopharmaceutical innovation
- ✓ Achieved Green Globe certification, reinforcing sustainable design and construction practices

## Challenge

GDI Ainsworth was tasked with converting an existing cold-storage building— never designed for high-spec radiopharmaceutical production — into a fully compliant cyclotron and medical isotope facility.

The project required specialized containment systems, radiation shielding, hot-cell installations, and exceptionally tight mechanical and electrical coordination within a compact interstitial space where every inch mattered.

## Methodology

Integrated design-build approach to repurpose existing infrastructure for specialized academic, research, and production functions

Precise coordination between mechanical, electrical, and specialty trades to maximize limited interstitial space

Deployment of specialized installation practices for arco-plast wall finishes and radiopharmaceutical spaces

Close collaboration between consultant, general contractor, and subtrades to streamline decision-making

Rigorous quality management to mitigate issues and ensure smooth delivery of a highly complex facility

## Solution

- ✓ Constructing a specialized vault to house the cyclotron (particle accelerator)
- ✓ Installing hot cells and radiopharmaceutical handling areas designed for safe, compliant production
- ✓ Integrating dense mechanical and electrical systems within constrained interstitial space
- ✓ Coordinating all trades to align installation sequences, specifications, and quality requirements
- ✓ Applying advanced materials and installation methods tailored to high-containment environments
- ✓ Ensuring seamless collaboration across engineering, contracting, and subtrade partners to deliver a complex, multidisciplinary facility with minimal issues

## The Ripple Effect

- ✓ Positioned the University of Alberta as a leader in medical isotope research and cyclotron technology
- ✓ Strengthened Canada's supply of technetium-99m, reducing reliance on external sources
- ✓ Advanced national healthcare by supporting the diagnostic imaging needs of millions of patients
- ✓ Established a sustainable, modern research environment through Green Globe–certified design practices

