



Designed for excellence

How our state-of-the-art facility in Calgary
builds on our promise to Canadians



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Foreword

Oftentimes, when people think of Canadian Blood Services, the first image that comes to mind is of a smiling donor care associate tending to the comfort of donors relaxing in recliner chairs, arms extended, as they give the ultimate gift: their donated blood.

But collecting blood is only one part of our business, one part of the complex process of creating products that can save the lives of patients anywhere in Canada.

Canadian Blood Services is a manufacturer of biological products — medications created from biological raw materials. As such, there is a scientific and highly technical component to our work that most of the public never sees, and it is this technical component that really shines in our newest facility, in Calgary, Alberta.

The Calgary operations facility is a purpose-built, state-of-the-art facility dedicated to converting donated blood into transfusable units of red blood cells, platelets and plasma and putting those products, with confidence, into the hands of physicians in hospitals throughout western Canada. The building was thoughtfully designed and constructed to the highest standards, reflecting the skill and dedication of the employees who work inside. We couldn't be prouder of the stories this building has to tell about our organization.

The layout and design tell a story of quality, efficiency, safety and the technical competence required to achieve our goals.

The architecture tells a story of openness and transparency in our culture.

The workplace and its amenities are designed to support a healthy and diverse workforce, where employees are empowered to work in the ways that suit them best.

The environmental and sustainable design tell a story of an organization committed to doing its part for the communities to which it belongs.

All of these themes are explored in this book, which celebrates the completion, in November 2020, of this milestone project for Canadian Blood Services.

We hope that you enjoy reading about this accomplishment and exploring some of the history behind the building. It has been many years in the making, and we have many stories to tell.

Canadian Blood Services welcomes you to Calgary.



– Rick Prinzen,
*Chief Supply Chain Officer and
Vice-President, Donor Relations*



History of the National Facilities Redevelopment Program

When Canadian Blood Services was established in 1998, Canada's blood system was entrusted to our organization from the Canadian Red Cross, along with all of the buildings that the Red Cross had used for its blood operations. At the time, Canada was reeling from the damage of the contaminated blood crisis, which saw thousands of Canadians infected with blood-borne pathogens like HIV and hepatitis C virus. It was clear that new standards had to be established, and Canada's blood system underwent a complete overhaul, guided by the principles and recommendations set out in the Krever report, published by the Commission of Inquiry on the Blood System in Canada.

Many of the buildings we inherited as part of this process had not been designed specifically for the purposes of the blood system, and while the blood system itself grew and adapted to the changes required by the Krever report, the buildings housing our operations remained the same. In 2005, we completed a facilities strategic plan based on current and future business needs. Funding from Canada's provinces and territories supported the launch of this program to modernize our facilities, which would allow us to provide services more efficiently. The National Facilities Redevelopment Program (NFRP) was launched in 2012 to undertake a massive update of our facilities across the country, so that we could offer our teams physical spaces that would reflect their own commitment to organizational excellence. Phase I of the NFRP revamped our facilities in Ontario and eastern Canada, while phase IIa is focusing on Alberta and Saskatchewan.

In Calgary, we operated out of a downtown office building that had been converted to a multipurpose space containing our donor centre, logistics, blood testing operations, and production and distribution operations. The building soon came to be known by the number of its street address, 737. Besides simply not being large enough, the space also was not designed to accommodate our work.



Front entrance of the building at 737 – 13th Avenue SW.



Opening ceremony, held in 1974, for the building at 737 – 13th Avenue SW in Calgary, which Canadian Blood Services would later inherit from the Canadian Red Cross.

Opposite: Front entrance of the new building featuring the reception desk, LEED gold plaque, wood ceiling, branding, main stairwell and waiting area.

With operations spread over multiple levels, team members found themselves pushing carts full of blood bags up ramps and hoping that the 1970s-era elevators to other floors would be working — which they sometimes weren't. In addition, the fridges and freezers for storing blood components and testing supplies weren't large enough for the quantities that had to be stored.

"It was awkward, congested and inefficient, and it certainly created a lot of extra work in many cases," says David Krol, director of supply chain operations — west. "We're more efficient with the new facility, even after consolidating operations from other locations. Product flows out the back door of our trucks into the logistics area, and then across the hall into the production area where it's staged for processing. It's a simple, clean process, and our operational metrics such as productivity reflect that."

The challenges

"It was the commitment of Canadian Blood Services employees at the former Calgary site that allowed us to so effectively operate in something that was so antiquated. I wouldn't even be able to reasonably guess the people hours it took that nobody on the outside saw. It was all behind the scenes."

— **Laurie Smith**, associate director of facility infrastructure and operations

Environment

Because our former facility had not been purpose-built, extra effort was required to make our operations fit the existing spaces. In a regulated environment, this amounted to being subject to two sets of restrictions in doing our work: the restrictions necessary to ensure the quality of our products and the physical restrictions imposed by the building itself. The space wasn't large enough to set up a logical flow of product among different departments, and the building certainly wasn't effective at maintaining the environmental conditions required for our operations, such as appropriate temperature and humidity. Additional heating, ventilation and air conditioning (HVAC) units were set up, and an exterior corridor was even constructed around the testing space to help control temperature and humidity so that the equipment could function properly.

The regulations governing our work are strict, so we have early warning systems that let our teams know when there is a risk of temperature or humidity levels going outside the specified range. In our building at 737, we were often dealing with at least 100 of these early warnings per month. Each warning required action to address the problem, which could entail production or testing employees having to stop their work and move product to an acceptable area.

What it means to be world-class

"This building boasts, 'What we do matters, and what we do, we do well.'"

— **Adrian Schuster**, manager of production

For 20 years, Canadian Blood Services focused on earning the trust of Canadians, who had seen a critical system fail. When we launched our new brand in 2018, we also made a promise. We promised Canadians that Canadian Blood Services would be the central link for patients in a system of connections and collaborations among donors, recipients, employees, volunteers, researchers, medical professionals and health-care partners.

And in a system of infinite connections, the buildings that house our lifesaving products at any stage in their journey must be every bit as world-class as the employees who work in them. That is the goal of the National Facilities Redevelopment Program (NFRP), and that is what the new Calgary operations building represents: our commitment to excellence in the provision of service to Canadians.

Location

While the downtown location of our former facility was ideal for collections, it consistently created more work and difficulties for our logistics team. Larger trucks, including the tractor trucks and five-tonne trucks that we use to carry substantial amounts of product, weren't able to access the site at all, and we had to rely on smaller trucks to transport shipments in and out. The loading areas were also difficult to access, particularly in winter. The building's garbage cans were situated close to the doors, as was an electrical pole, and more than one driver found themselves scraping their doors while trying to reverse in. We also dealt with vandalism on some of our fleet vehicles.

As is the case with downtown areas around the world, parking was extremely limited, and our fleet was split up between a parking lot that we rented from a nearby apartment building and another lot outside the downtown core. Similarly, staff members had to refresh their parking payments regularly or move their vehicles throughout the day to avoid parking tickets, a process known affectionately as the "two-hour shuffle."

Most importantly, though, the downtown location put us in the midst of traffic and one-way streets whenever we needed to ship our product to a hospital or to another site. The location limited the efficiency with which we were able to operate and required us to layer contingency plan upon contingency plan.

Building infrastructure

In addition to the space constraints and difficulties maintaining temperature and humidity, the building itself was old enough to pose challenges to any organization, let alone one working with delicate biological materials. Our building at 737 had been constructed in 1974, and there were times when the parts required to service the building's systems were simply no longer available.

"When we needed to replace breakers in the main electrical circuitry system, we were only able to find them through the electrician who had originally serviced the building when it was built," recalls Laurie Smith, associate director of facility infrastructure and operations. "The main generator was serviced during our time at 737, but before that, it had essentially been held together with baling wire and duct tape."



Decommissioning of the fifth and sixth floor laboratory air handling units from 737 - 13th Avenue SW.



A building designed for our operations and brand

The Calgary operations building was purpose-built, allowing us to achieve a higher level of excellence in design and environmental leadership than would ever have been possible at 737. In particular, the design has given us the opportunity to improve our processes and enhance our high standards. We were able to apply learnings from previous projects, embrace change, and seek new ideas and opportunities that are now incorporated into this facility.

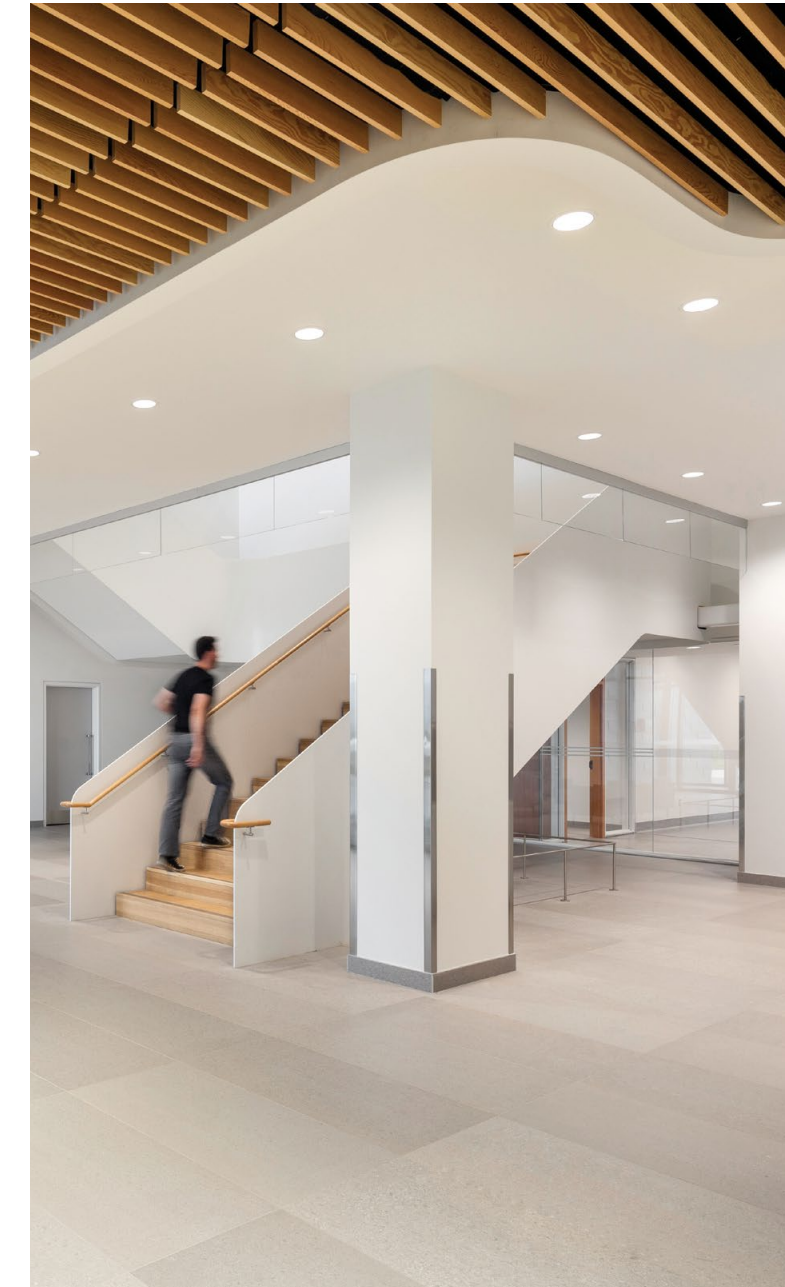
Employees who work in this building form the connection between the sincere generosity of donors and the heartfelt appreciation of recipients. Our logistics team members deliver blood and blood products from donors to the Calgary operations site, where the blood is tested, processed and then distributed to hospitals in western Canada to reach patients in need.

The space

The new building has 153,000 square feet of floor space, slightly more than three football fields. The fridge and freezer area occupies more space than the entire production and distribution area at the previous location. The facility has multiple benefits for different groups:

- Employees: a modern work environment that will enable transparency, collaboration and productivity.
- Hospitals and patients: a strategically located facility that will provide high-quality biological products and services and that will support efficient and high-volume processing of products and samples.
- Funders and taxpayers: a purpose-built facility designed to enable lean and effective processes with a commitment to sustainability.*

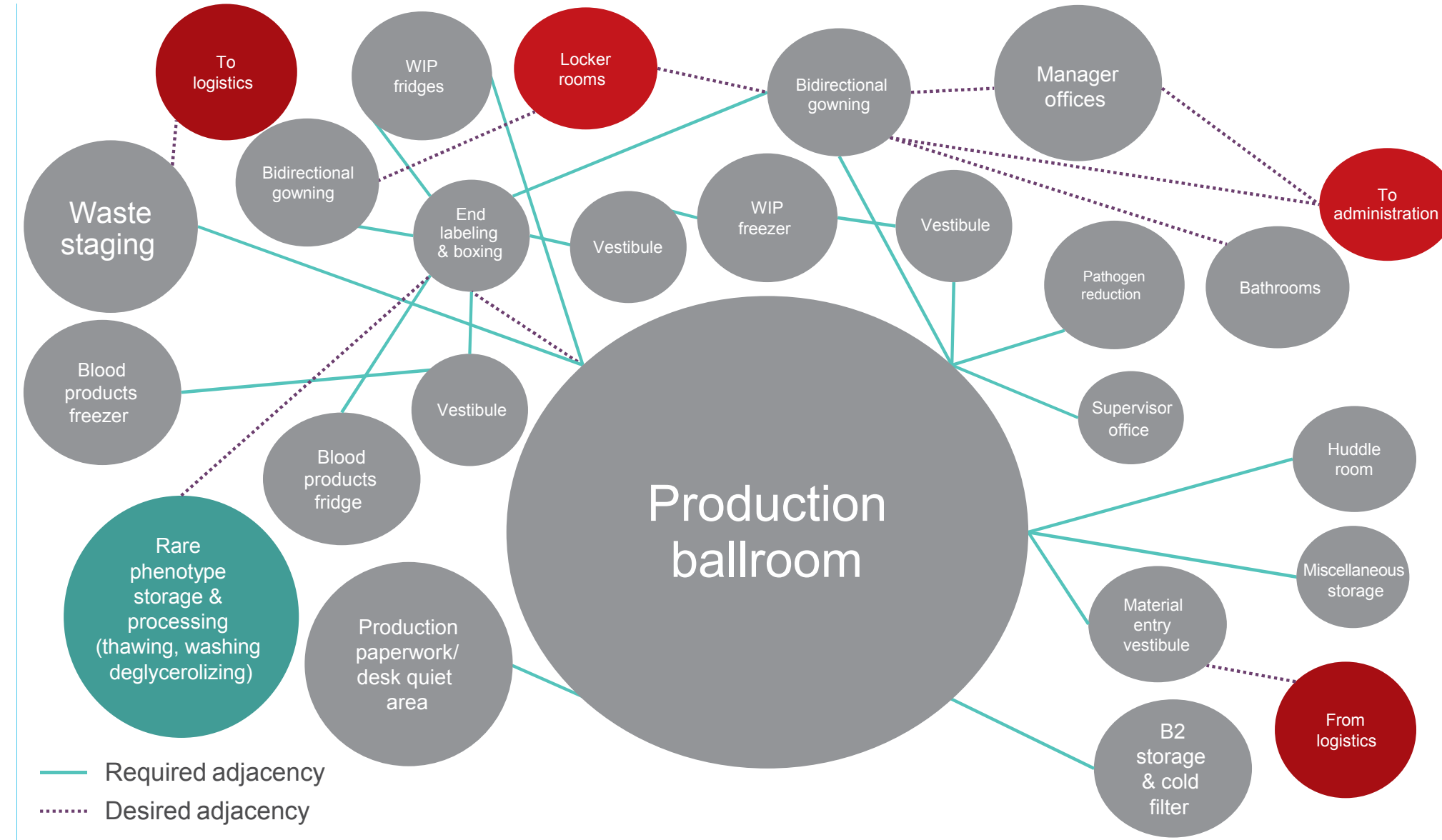
*Lean is defined as a system for developing process improvement that is continuous and has a focus on reducing and eliminating waste. Learn more about lean here: lean.org



Feature stairwell reception area.

Opposite: Summer sunset reflecting off the glass curtainwall at 2775 – 116th Avenue NE.

A bubble diagram illustrating the required adjacencies between various functions.



Concept design

The design process began with identifying our general needs and outlining a basic plan that showed each function and the floor space required. Next, a comprehensive user requirement specification for the facility was developed, setting out our requirements in greater detail. Finally, a concept design was created to outline how the user requirements would be achieved; this concept design formed the basis of the more detailed design work that followed.

The process experts used a variety of tools to first assess required adjacencies within the building and then create a functional block diagram guiding the final layout.

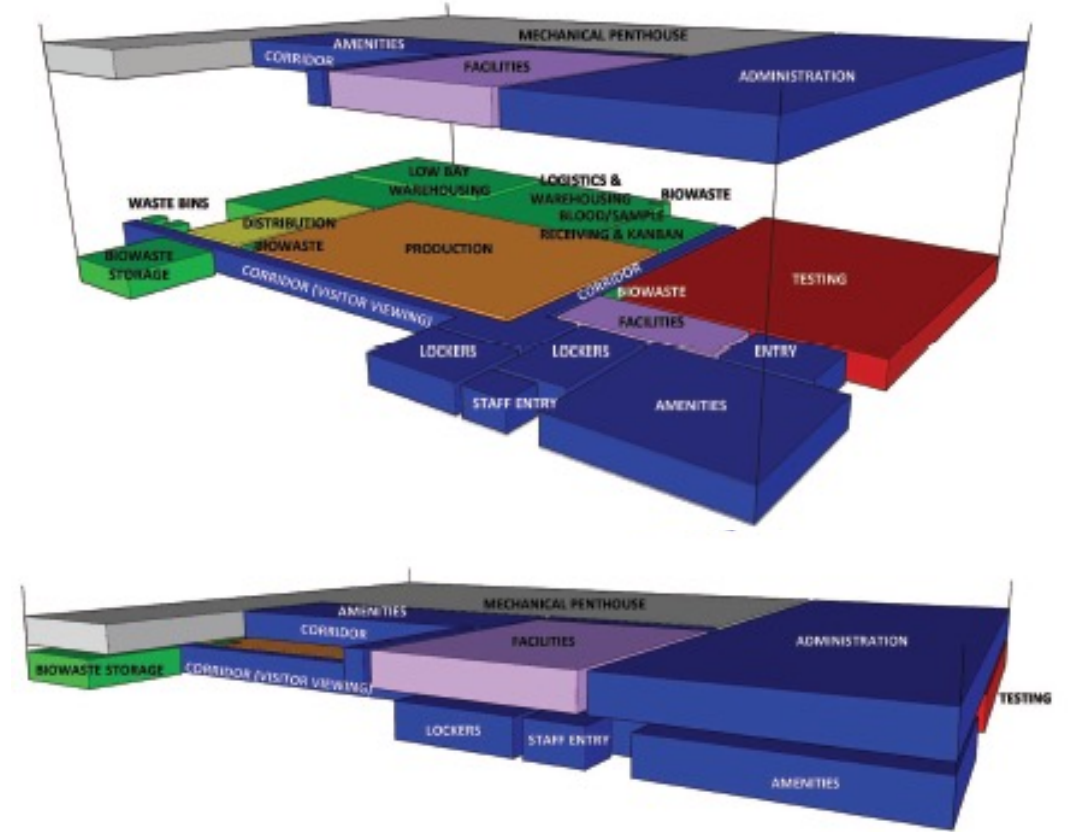
Key design principles

The building's design followed good manufacturing practices (GMP) for pharmaceutical manufacturing in Canada. The GMP process is intended to ensure that products are consistently produced and controlled according to established quality standards. Although our previous location allowed us to adhere to these practices, the new building offered an opportunity to embed GMP principles directly into the design, incorporating that rigour and commitment to excellence into our everyday work.

Compliance with these principles is exemplified by the following aspects of the design:

- Incorporating “lean” principles of efficiency
- Incorporating lessons learned from previous projects and other facilities
- Preventing contamination and cross-contamination
- Adhering to health and safety requirements, including the following environmental considerations:
 - Control rooms and access-controlled walls and doors
 - Air pressurization and airflow
 - Flow of products and goods inside and outside the building
 - Temperature and humidity requirements

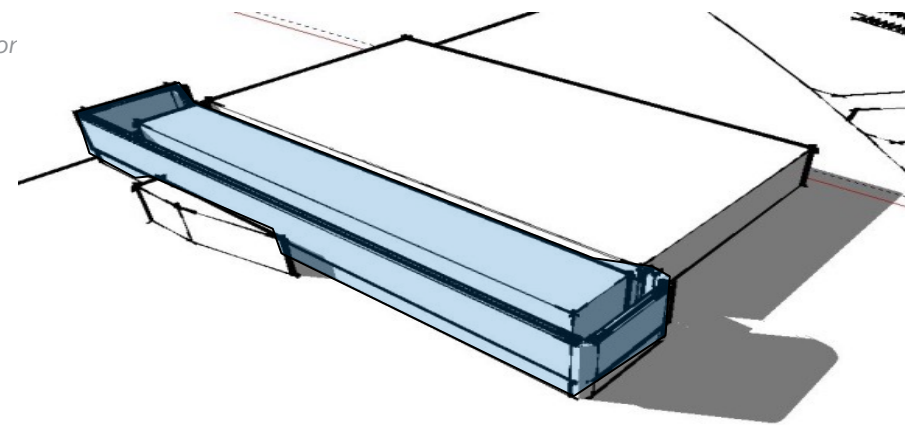
A functional block diagram illustrated the proposed layout.



An architectural vision of the building's front elevation.



An architectural sketch showing progression from the original vision.



In addition, specifying user requirements in detail meant that employees — our subject matter experts, with their years of experience processing and manufacturing blood products — would be able to perform their work with an ease that would not be possible in any other setting.

Architectural vision

We partnered with an architect to bring the concept design to life. Working with the architect, we outlined what we were looking to achieve with this building:

- To instill optimism and confidence while achieving excellence in service delivery.
- To create a facility that ensures reliable and safe testing and processing of blood, in accordance with GMP principles.
- To create a collaborative working environment.

An architectural vision to guide the design process:

The project will begin with a bold gesture: a transparent facade will wrap the central processing facility — reflecting an open and transparent process that fosters collaboration, integrity and respect.

The transparent facade is anchored by a stone entrance contrasting the glass massing of the building allowing light and nature to engage with its occupants.

The form and materiality of this bold gesture will make tangible the optimism and confidence and excellence in delivering service.

Designed for business continuity

Calgary is the second-largest production site in the Canadian Blood Services network.

Constructing the new facility enabled us to consolidate manufacturing operations from existing sites in Calgary, Edmonton and Regina, driving efficiency, but it also meant that we needed to install robust systems to protect the new site from problems like power failures.

Such problems in the consolidated Calgary facility would affect our ability to meet hospital demand in all of western Canada.

The new building incorporates a building automation system, which monitors conditions such as temperature and humidity at more than 100,000 points throughout the building, offering fine-grained control over the internal environment.

With 10 separate air-handling units, we can customize conditions in different areas according to the requirements of the work being done. This level of control necessitated a substantial shift in mindset for the facilities operations team, who were used to working in a leased building without this level of control.

All of the core systems of the building, including power and water, have also been designed with redundancies, to protect the building in the event of a failure. Every critical system has at least one backup in place, a design concept known as “N + 1.”

Similarly, our solar energy systems are designed to provide up to 28 per cent of the building’s power, specifically during peak times when energy costs are at their highest.



Electrical switchgear controlling the primary power and generator backup to the building. The large conduits feeding the electrical switchgear panels were digitally modelled, fabricated off site and installed ready for use.

Steam boilers provide the moisture necessary to maintain humidity in the testing and production spaces. Only two boilers are required to meet operational needs, but three have been installed for redundancy.

Right: The chiller units are part of the cooling system that maintains optimal conditions in all areas of the building, including the sensitive environmental conditions of our laboratories.

Natural gas-fired boiler units provide heat to the air-handling units, which distribute warm air throughout the building.

Opposite top: Aerial view of the new building at 2775 – 116th Avenue NE, which has ready access to the city's arterial roads, provincial highways and the Calgary International Airport.

Opposite bottom: Production control room provides ample space for storage of personal items and use of required apparel.



Location

With construction of the new Calgary operations facility, it was important that we resolve one of the most important challenges facing the old building: its location. For the new Calgary operations building, we were able to secure a location near several major highways and close to the airport, facilitating connections with hospitals and other sites in our network. With access to those important arterial routes, we can now use larger trucks for transporting our products, and our operations are not affected by traffic in the downtown core to the same extent.

The new location also allowed us to expand our floor space significantly without spreading our operations over six floors, as in the former building. In fact, because our building is on the flight path for one of the landing strips at the Calgary International Airport, the design was subject to specific height restrictions.

Control rooms

Control rooms are transition spaces for employees between their arrival for work and their entry into any of the GMP spaces. In the control rooms, employees can lock up their personal items, wash their hands and put on a clean lab coat before entering the laboratory. There are six control rooms facilitating access to the production, distribution and testing areas. Each control room also includes an emergency shower and eye wash station for accidental splashes and spills.

Our GMP areas

The new Calgary operations facility has been laid out to follow the flow of our products through the space. More specifically, blood components flow in only one direction, from entry to exit. They enter through the loading bays in the logistics area, and then flow directly toward the production and distribution areas. Blood samples for testing are routed directly from the logistics receiving area into the adjacent testing laboratory.

The building was also designed to control access to any areas where blood and blood products are present. A separate GMP corridor forms a transition area from regular building spaces into the controlled testing and manufacturing areas.

As a regulated biologics manufacturer, we must maintain stringent safety and cleanliness standards in the areas where we process and test blood. These standards include the use of lab coats and gowns, as well as restrictions on eating or drinking. To help maintain controlled access to these areas, “huddle rooms” are provided, where employees can gather for meetings.

Front-end automation, using the Cobas p612 platform for sample management, sorts and uncaps the samples allowing employees to work efficiently.



Testing

Testing is an integral part of our supply chain, and we test every unit that we collect, whether whole blood, plasma or platelets. Through extensive testing on blood samples to identify infectious diseases and blood groups we strive to ensure a safe and secure blood supply that protects both donors and recipients. The Calgary testing lab is one of two donor testing sites in the country and is vital for business continuity.

Donor testing occurs on the main level in the new Calgary operations facility, and all necessary operational activities are located within the laboratory for ease of operation and maintenance. Modern HVAC systems and building automation minimize temperature and humidity excursions. The space is clean, modern and bright, with more consistent and controlled lighting in the testing space than was the case in the old building. In addition, the ceilings were deliberately kept at a height of no more than 10 feet (three metres), to minimize noise from the instruments.

The donor testing space was designed as a GMP-compliant laboratory space. It is located next to the shipping and receiving area for ease of sample transfer into the laboratory and removal of waste.

The space ensures that co-workers can collaborate and support one another, with clear lines of sight for supervisors.

Automatic doors allow for the easy flow of employees, samples and carts, and there is ample room for all our processes, with extra space available for future growth.

Substantial improvement has been made to our walk-in fridge capacity. These units now have sufficient storage space for all samples and reagents, both quarantined and released. In addition, our room temperature storage capacity has increased, and shelving units throughout the testing area provide dedicated, well-planned storage for consumables not requiring refrigeration.



Nucleic acid testing. The Cobas 8800 tests blood for transmissible pathogens such as HIV, hepatitis C and West Nile viruses.



Nucleic acid testing. The Cobas 8000 tests blood for antibodies of transmissible diseases.

Whole blood units are received in our computer system for vein-to-vein traceability, and 'hung' to filter the whole blood, removing the donor's white blood cells (leukocytes) before further processing.



Production pooling station where separate platelet units are combined to make one transfusable unit.



Opposite left: Receiving and assessment area in the production department.

Opposite right: Finished goods walk-in freezer.

Production and distribution

The production and distribution department manages the manufacture of blood components (production) and the packaging of products and their preparation for shipment to hospitals (distribution).

More specifically, the production function separates and manufactures blood into its various components to meet patients' clinical needs. These components include red blood cells to improve delivery of oxygen to tissues, platelets to treat bleeding and plasma to replace proteins.

Like the donor testing space, the production space was designed to GMP standards, with all functions located on the same floor for good sight lines and ease of product flow. The team has a dedicated huddle room for meetings, and the space is clean, modern and bright. The space ensures that co-workers can engage with one another, with height-adjustable workbenches.

Unidirectional product flow reduces the risk of mixing in-progress products with released products. There are also separate streams for removal of waste products. The distribution area is directly linked to the logistics department for easy flow of product.

The production space also houses storage for plasma protein and related products (PPRPs). These pharmaceuticals are derived from human plasma donations and recombinant proteins. Our facility in Brampton, Ontario, stores PPRPs in its warehouse and supports the PPRP inventory requirements of all Canadian Blood Services operation sites in the eastern part of Canada, while the warehouse in the Calgary facility supports the PPRP inventory requirements of the Winnipeg, Regina, Edmonton and Vancouver operations sites.



Equipment services workbench and assessment area.



Equipment services

The equipment services department provides support for the validation, maintenance and repair of our equipment. The department's workspace is in the centre of the building to allow for easy movement across departments and thus to optimize overall functionality and speed.

The equipment services space was modelled after those in manufacturing settings, with state-of-the-art workbenches and parts storage system. The space was designed using “lean” principles of continuous improvement to create the most effective layout, optimizing the space available and ensuring the operation can run efficiently.

Logistics

The logistics team manages materials and supplies for all departments in the building. They ensure that our blood and blood products are distributed to hospitals as required and are an integral part of our donor events. Logistics prepares and transports the supplies and equipment for donor events held in the community and manages the transportation of donors through our Lifebus program.

The logistics area has been designed to maximize safety and efficiency and to optimize use of the available space. Logistics activities occur on a single level of the building, with no requirement for elevators. This is in stark contrast to the situation in the old facility, where our logistics team operated on the first floor and had to transport blood components to the fifth and sixth floors for production and testing. The parking area and entrance of the new building allow for safe and easy building access for fleet vehicles. Two delivery loading docks make deliveries smooth and enable unloading with a forklift.

The warehouse is spacious, with effective temperature controls to maintain safe and comfortable working conditions no matter the weather, even with doors opening and closing to receive or ship out product. Large fans installed in the warehouse ensure adequate airflow.

The logistics group has also benefited greatly from the location of the new Calgary operations site, as larger trucks can now access the facility, and all of our fleet vehicles can be parked in one place.

“We really have improved the efficiency of our operations,” says Brian Myziuk, manager of field logistics. “We designed flow into and out of our loading bays to be unidirectional so there’s no risk of collisions with trucks going two ways. We used to be able to just shout for someone to open the door when we saw that a courier had arrived, but now we use two-way radios for communication in the loading bays and warehouse. We also have nine loading bays instead of two, so we’ve put in alarm bells for each loading bay so we know which door a courier is at. There is a different sound for each bay, so that the team knows immediately which door to open.”

Facilities team

All of the operations in the building would not be possible without the behind-the-scenes support of a facilities team trained to manage the highly technical systems that control the building's indoor environment. The team is responsible for monitoring and maintaining the building automation system and for maintaining equipment, including generators, boilers, HVAC components, refrigeration units and solar panels. They maintain security, health and safety throughout the facility, and coordinate waste removal, cleaning and administration of environmental policy.

For the facilities team, the transition to the new building involved a steep learning curve, because of several major technological advances over what was available at our former 1970s-era site.

In response, we've supplemented our facilities team with building technicians who have the expertise to operate the new building systems.



Logistics receiving bays give employees access to multiple transport vehicles, while providing a sheltered area to protect temperature-sensitive products from the weather.

The logistics shipping area, where boxes of blood are loaded for distribution to the hospitals.



The warehouse provides high and low bay storage for supplies and consumable products, and a forklift supports the high bay racking for bulk storage.



Employee experience

Building design and culture

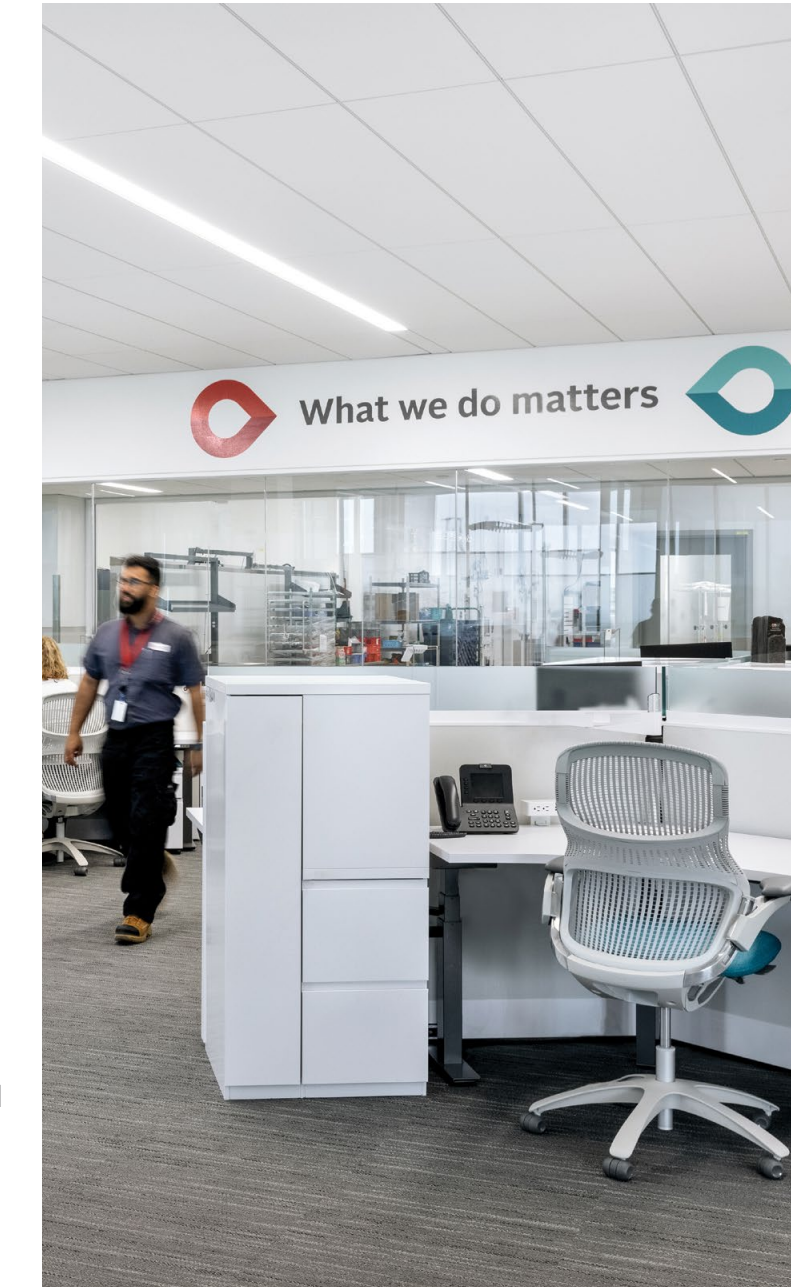
Walking through the Calgary operations facility would give you a sense of what it's like to work at Canadian Blood Services. The building was designed with openness and collaboration in mind, and the workspaces reflect those principles, with ample meeting rooms and an open floor plan. The production, distribution and testing areas, meanwhile, demonstrate the rigour and logical flow of our processes. Most areas of the building have natural light and windows opening into other spaces instead of walls.

Some aspects of the design, though, are invisible. One of the biggest changes employees have experienced since moving to the new facility is consistent internet access everywhere in the building. At our 737 location, built in 1974, we relied on old data cables for internet access, and the data closets would frequently overheat because they were too small and didn't have the necessary ventilation.

The new building, by contrast, has 57 wireless access points, and everything — from lights to printers to room-booking tablets — has been connected to that greatly expanded network. The change has given employees the unexpected benefit of freedom of movement, allowing them to take calls with wireless headsets while sitting near a window or stretching their legs. The new technology also supports large-scale virtual events such as organizational town halls and other broadcasts. The flexibility in technology subtly yet consistently enhances our opportunities for collaboration.

The administrative space at the front of the building features various workspace configurations that empower employees to choose where they want to work. In addition, each employee has a dedicated workstation, including an adjustable sit/stand desk, storage and seating for a guest.

Various breakout rooms are available, including individual focus rooms where employees can take private calls or find space for uninterrupted work, as well as casual open spaces for teamwork.



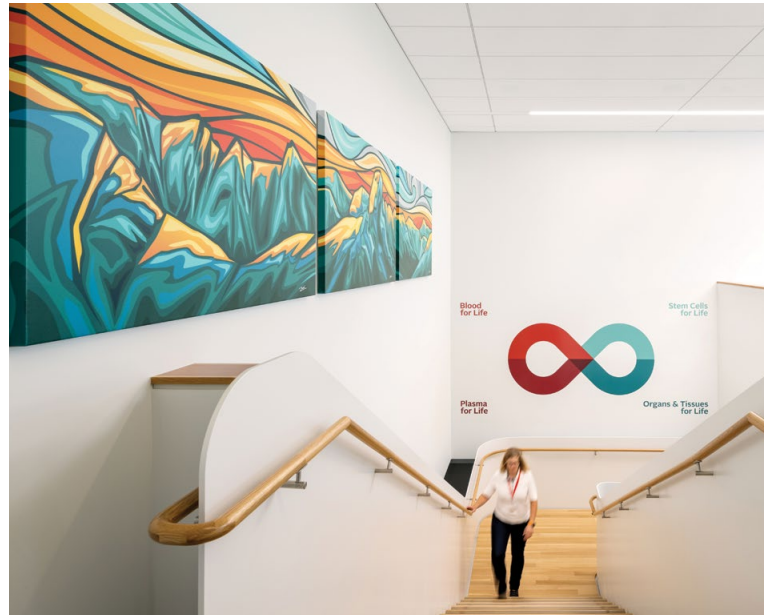
The main floor administrative area has windows to provide natural light into the production and distribution spaces.

Opposite: The café and lounge area for employees is open concept with a variety of seating options.

Looking into the cafeteria and lounge on the main floor.



Second floor administration stairwell provides access from the main floor administration area. Custom artwork was commissioned for the building, complementing the branding elements.



Locker area based on universal design principles

These days, a growing number of organizations are striving to follow universal design principles in the design of their buildings. With awareness of this trend, we saw an opportunity to upgrade the original plans for our locker area to enhance privacy and functionality for all, an important step in our efforts to support diversity, equity and inclusion throughout our organization.

Upgrading the locker area allowed us to create nine private changing spaces, as well as several three-piece washrooms instead of the previous gender-designated rooms with stalls. We have also removed the doors into these spaces to enhance the feeling of openness that characterizes the rest of the building. Meanwhile, we have maintained the availability of locker storage space that employees need when regularly accessing any GMP space.

Branding and artwork

No building is complete while the walls remain bare, and considerable thought went into the artwork and branding that we selected to complement the design of the Calgary operations building. A group of employees volunteered to collaborate on choosing artwork that would bring a spirit of western hospitality into the building. Visitors and employees are surrounded by images of Alberta's landscapes created by local artists and photographers.

The same employee group was responsible for naming many of the meeting rooms throughout the building, with names often borrowed from the local landscape or culture or from our principles as an organization. For example, a large meeting room next to the lobby is called the I CARE room, which represents our core values of integrity, collaboration, adaptability, respect and excellence.

The artwork integrates seamlessly with our corporate branding, which is also featured throughout the building. Our infinity loop logo appears in numerous places, both subtle and prominent, along with a daily reminder: *What we do matters, and we are **Canada's Biological Lifeline.***

Building features

Gym and yoga room

- The gym and yoga room are available to support employees in nurturing their health and well-being to achieve optimal balance in their lives.

Prayer and reflection room

- The prayer and reflection room offers a designated private space for spiritual or religious activities, as well as simply peace and quiet.

Outdoor amenities

- The grounds have been landscaped and designed for employees to enjoy the outdoors. There are three pergolas with picnic tables, as well as a bicycle rack and a 500-metre walking path.



Main floor gym and yoga room provides a variety of fitness and exercise options.



Construction, commissioning, validation and move

The completed design package for the Calgary operations facility was issued for competitive pricing in November 2016, and tender submissions were received from a selection of pre-qualified general contractors. At the time of tender, Alberta was recovering from low oil prices and slower economic conditions, which had reduced construction activity in the province. Timing was optimal for construction of the Calgary operations facility, and we benefited from competitive pricing.

As a “greenfield” development, the building was designed from the ground up, which allowed us to plan critical systems and infrastructure. The ground-breaking ceremony, signalling the start of construction, occurred in May 2017, and construction crews worked continuously through to demobilization in March 2019. At the height of construction, approximately 140 tradespeople were on the site working on various aspects of the project. Our general contractor achieved the significant safety milestone of having no lost-time accidents over the course of the construction work.

Commissioning and validation of building systems

During the design phase, we prepared a plan for commissioning the building systems, as part of the process requirements for our LEED (Leadership in Energy and Environmental Design) application. Each building system was commissioned in the later stages of construction, setting the stage for validation by Canadian Blood Services subject matter experts.

Our intense validation process took everything that had been conceptualized on paper and checked that it worked in the newly constructed building. This process included verifying temperature and humidity ranges in the testing laboratory, as well as temperature ranges in the production, distribution, logistics and warehouse areas and in the 13 walk-in fridges and freezers.



View of the site before construction began in 2017.



Construction progression showing structural steel shell of the new building.

Opposite: Groundbreaking event in May 2017 at the new Calgary operations site.

Validation of equipment and move-in

Extensive planning and scheduling by our subject matter experts was required to execute the move of operations from our former downtown location to the new facility.

The process began when we consolidated production from Regina into the 737 location in May 2018. The combined production and distribution operation moved into the new Calgary operations facility over the August 2020 long weekend, followed by the move of testing operations in October 2020. In support of the production and testing operational moves, over 100 pieces of equipment were qualified by the teams supporting the validation process. The final step was moving our production activities from Edmonton, which we completed in November 2020.

Pandemic conditions complicated these processes, but all original schedule dates were achieved by the project teams, including successful remote inspections by our regulator, Health Canada.



Original design rendering by the architect showing the east side exterior elevation.

Left: Building exterior, including patio, pergola and landscaping.

Construction progression of the east side exterior elevation.

Opposite top: Original design rendering by the architect showing the front elevation.

Opposite bottom left: Construction progression of the front elevation.

Opposite bottom right: Construction progression of the front exterior, including the rock wall featuring local stone quarried near Canmore, Alberta.

Original design rendering by the architect showing the reception area.

Right: Construction progression of the reception area.



Original design rendering by the architect showing the reception desk and main entrance.

Right: Construction progression of the reception desk and main entrance.



Construction progression of the main stairwell from the second-floor administrative space.

Left: Original design rendering by the architect showing the main stairwell from the second-floor administrative space.



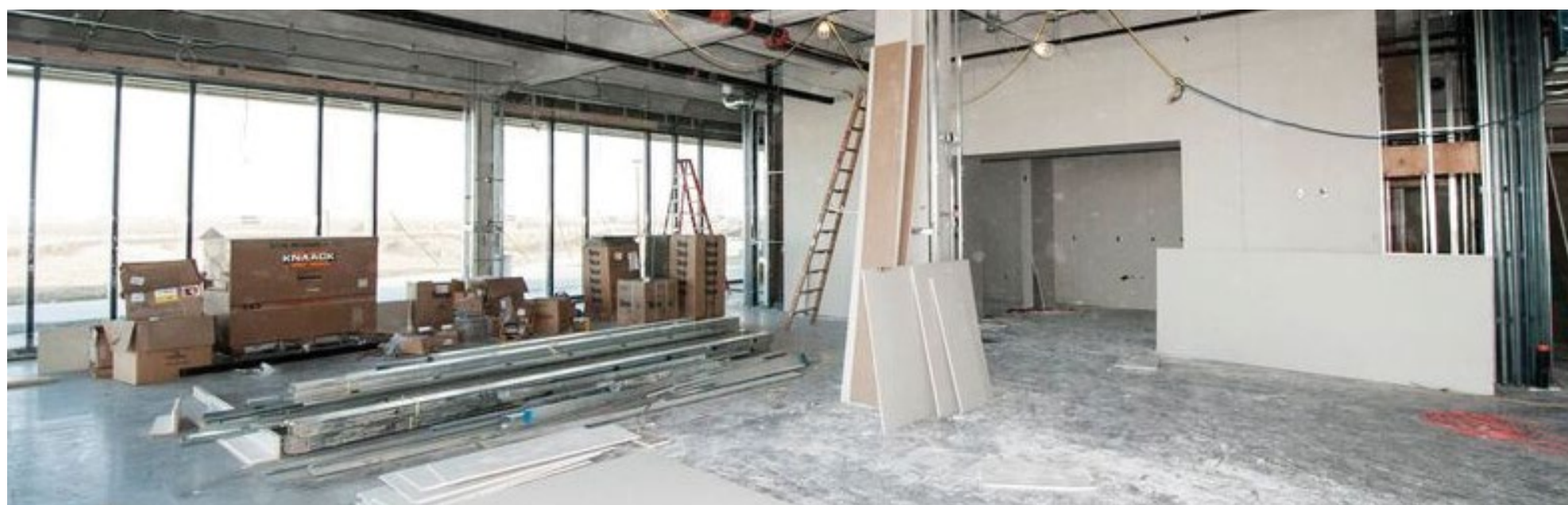
Construction progression of the café and lounge area.

Left: Original design rendering by the architect showing the café and lounge area.

Original design rendering by the architect showing another view of the café and lounge area.



Construction progression of the café and lounge area from another angle.



Opposite: East side patio looking into the main floor cafeteria.



Original design rendering by the architect showing the first-floor administrative space.

Right: Construction progression showing the first-floor administrative space.



Construction progression of the logistics shipping doors.

Right: Logistics shipping doors.



Construction progression showing early progress inside the high bay warehouse.



Construction progression inside the warehouse showing the high bay racking area where supplies and products are stored.





Raising our environmental standards

You can't see them from ground level, but high up on the roof of our Calgary operations facility, there are 1,597 rooftop solar panels collecting the sun's rays and converting them into 28 per cent of the building's electricity.

"Calgary is the sunniest city in Canada, so it just makes sense," says Carlene van der Heiden, Canadian Blood Services' environmental services manager. "The building has a large footprint, so there was plenty of space for a lot of panels. We put on as many as would fit."

Built with environmental sustainability in mind, the building has been approved by the Canadian Green Building Council and achieved LEED (Leadership in Energy and Environmental Design) gold certification.

What is LEED?

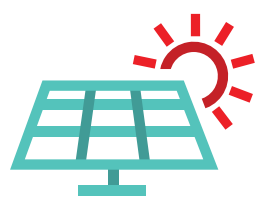
LEED stands for Leadership in Energy and Environmental Design. There are four possible ratings — certified, silver, gold and platinum — relating to the steps that organizations are taking to improve their environmental sustainability.

Originally, the new building was on track for a silver rating, but the addition of solar panels provided a chance to shine with gold certification and aligned with Alberta's regional priorities.



There are 1,597 solar panels on the roof of the Calgary facility.

Opposite: The front facade of the Calgary operations facility, with drought-resistant native landscaping.



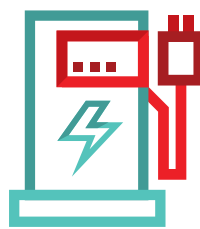
1,597

rooftop solar panels
generating 28% of the
building's electricity



635,000 kWh/year

energy generated by solar panels



6

electric vehicle
charging stations



881,000

litres of water
saved each year



81%

(632 metric tonnes)
of construction waste
diverted from landfill



22%

construction material
came from recycled
content



54%

of energy savings from
efficiencies saving 38%
of energy costs



12

covered bicycle racks



21,000 m²

of area is vegetated
with trees, shrubs, native
grass and wildflowers

Environmental design from the ground up

Environmental standards were worked into every aspect of the project, from design to construction. Here are some highlights:

- During construction, contractors sorted waste and diverted more than 80 per cent from landfill.
- Builders also identified, sourced and constructed the building using 22 per cent recycled materials.
- Low-energy LED lights use sensors to adjust their brightness to the weather, as well as to turn on and off according to motion in the room.
- Our landscapers used natural vegetation that was already on the site and brought in natural prairie flowers where needed.
- The new building has an innovative water capturing system that provides all the water needed for landscaping.
- All water outlets have water-saving devices.
- The building is oriented to take advantage of natural light, with an open floor plan where possible.

It doesn't end with construction

The shift to a more sustainable environment didn't end when the facility's doors were opened — green building principles extend to creating a healthy workplace with a lot of natural light and fresh airflow. The workspaces are open concept, with big windows and natural finishes in many areas throughout the building.

The new building makes it easier for people to commute in an eco-friendly way, with six on-site electric vehicle charging stations in a prime location near the building, as well as priority parking spaces for carpoolers. There are also bicycle storage facilities and locker rooms with showers for employees who bike or jog to work.

These changes have spilled over into how employees interact with their workplace and into operating it in the most environmentally sustainable way possible.

"It's a really nice building and environment to be in. So many people have mentioned to me that before LEED came along, they never really thought about how integral the environmental side of things is in going to the office every day," says Carlene.

What LEED means for us

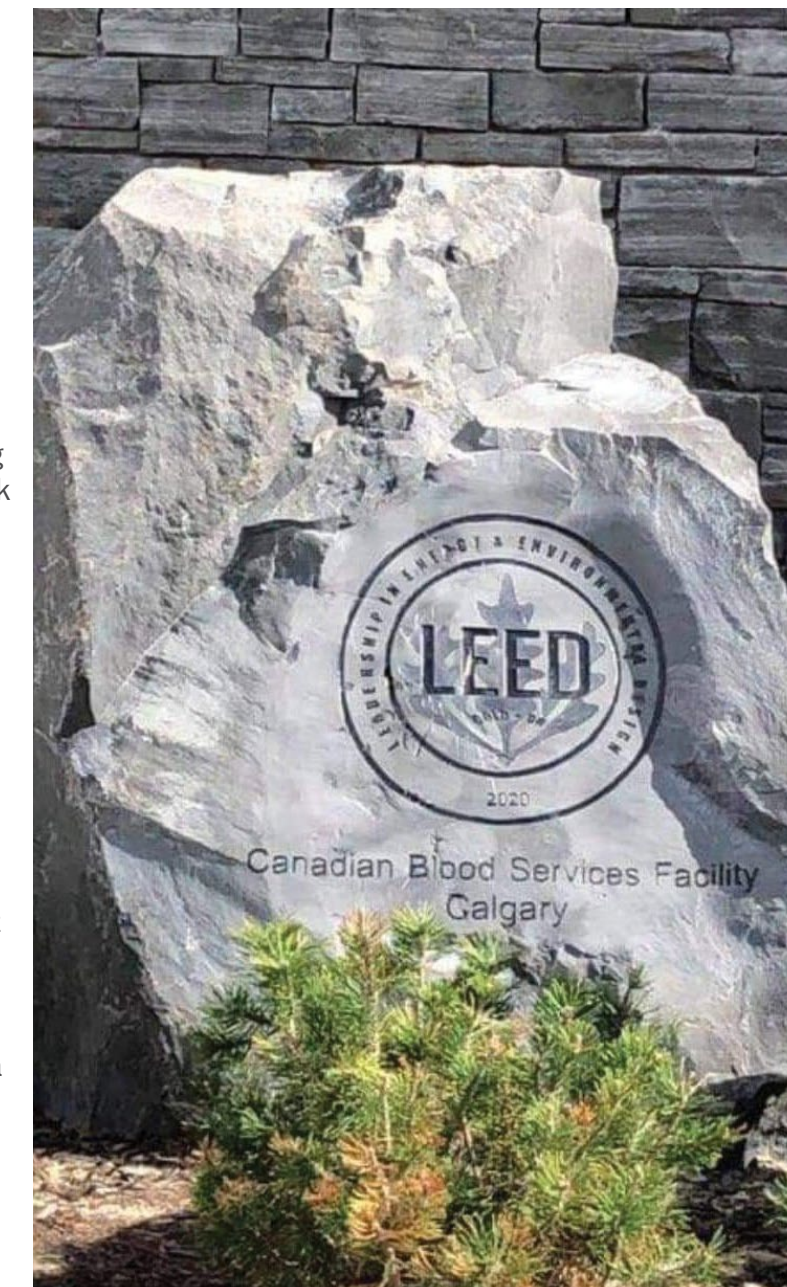
The Calgary operations facility is the first Canadian Blood Services facility to receive LEED certification. LEED is a rating system that is recognized as the international mark of excellence for "green" buildings in more than 160 countries. LEED recognizes that sustainability should be at the heart of all buildings — in their design, their construction and their operation.

Achieving a LEED gold certification marks how seriously we take the goal of achieving excellence in our building design and operations, and it encourages employees to think about how they can work to protect and improve the environment in their daily lives. It's an important contribution to improving the employee experience and reflects our commitment to serve Canadians. This commitment is just one additional way that the Calgary operations facility was designed to reflect the values of our organization. After all, the infinite connections among people — as well as with the environment — represent a core principle informing our work as **Canada's Lifeline**.

Why pursue certification?

Our newer facilities across the country already align with LEED standards, but pursuing certification is a separate challenge. The process of attaining LEED certification takes time and money, but it is a valuable recognition of our commitment to sustainability and a significant source of pride for employees.

"We pleasantly surprised ourselves as to what we could aspire to and attain," says Ann Lagrandeur, associate director of performance and business integration. "It was a testament to what we could do when we chose to go through that public process. It's something we can be very proud of."



LEED gold certification engraved into a stone monument from the same Canmore quarry that supplied the front stonework.



Afterword: Thank you to our employees

The completion of the Calgary operations facility marks a significant achievement for the organization, one we are proud to spotlight. The building reflects our principles and mission, and it will continue to serve Canadians well for decades to come. This accomplishment would not have been possible without the dedication and patience of our employees. Building to purpose is a significant undertaking, and we know that many people gave their time and energy, often outside of standard working hours, first to design and construct the building and then to transfer our operations from our former location — all during a pandemic.

The transition to the new Calgary operations facility was seamless. Moving our highly technical equipment and processes without interrupting operations was a significant and complex achievement by our project team. They were able to plan and execute through each phase of the move strategy, allowing us to continue our critical work without missing a beat. At completion, this was a true testament to the quality of our work and the ability of our teams. While we now have a facility that supports us in everything we do and reveals the full extent of our commitment to excellence, the reality is that our teams have always had what it takes to keep **Canada's Lifeline** strong in any building. Our employees have proven that for decades.

To the Calgary employees and broader team, thank you for everything you do: your years of experience and expertise; your commitment to getting the job done; your patience in living and working through a major change in how we operate; and your willingness to adapt and improve, always in pursuit of true excellence. Your support has enabled us to provide better service to patients in Canada.

Through all of the challenges, you have never forgotten that what we do matters. You know that the products we manufacture save and improve lives. We are proud that you now work in a facility designed to support you and your activities, and we hope that you will continue to enjoy it for many years to come.



– **Dr. Graham Sher,**
Chief Executive Officer

Appendix: An overview of Canadian Blood Services



Who we are

Canadian Blood Services is a not-for-profit charitable organization that operates independently from government. Created through a memorandum of understanding between the federal, provincial and territorial governments, we opened our doors in 1998. Our funding comes primarily from the provincial and territorial governments.

Canadian Blood Services is one part of Canada's broader network of health-care systems and is the only national manufacturer of biological products funded by Canada's provincial and territorial governments. We provide blood and blood products, as well as transfusion and stem cell registry services, on behalf of all provincial and territorial governments except Quebec. Our national transplant registry for interprovincial organ sharing and related programs extends to all the provinces and territories. We have a unique relationship with Héma-Québec, the provincial blood system operator that provides products to patients and manages Quebec's stem cell donor registry. Our two organizations work closely to share blood products in times of need, and we collaborate regularly to share information, insights and data.

What we do

A fundamental conviction anchors the diverse responsibilities of Canadian Blood Services: what we do matters. We ensure that Canadian patients have reliable access to the safe, high-quality blood and blood products, stem cells, and organs and tissues they need. To do this, we undertake a broad range of activities in four areas:

Blood: We collect, test and manufacture blood and blood products, including red blood cells, platelets and plasma. We also provide diagnostic laboratory testing services in some provinces.

Plasma: We collect plasma from unpaid volunteer donors in Canada. We retain some of this collected plasma to meet the transfusion needs of Canadian patients, but most of it is shipped to contract manufacturers who use a process called fractionation to

create plasma protein products. We distribute approved plasma protein products — those derived from our own plasma, in addition to the finished products we purchase — to hospitals in Canada (excluding Quebec) to treat patients with immune disorders and diseases such as hemophilia.

Stem cells: We operate a stem cell program that supports better outcomes for patients living with any of the more than 80 diseases and disorders that can be treated with stem cell transplants. We collect cord blood and manufacture stem cells through our cord blood bank. We operate a robust national registry of potential adult stem cell donors and participate in an international network of donor registries. We provide human leukocyte antigen (HLA) typing services to ensure the best possible matches between those willing to donate stem cells and those who need them.

Organs and tissues: We manage a national transplant registry for interprovincial organ sharing and related programs for organ donation and transplantation. Working with partners across the organ and tissue donation and transplantation (OTDT) community, we develop and share leading practices, provide educational resources and collaborate on new ways to share data on the performance of the OTDT system in Canada.

To support these activities, as well as the advancement of transfusion and transplantation science and medicine in Canada and around the world, Canadian Blood Services conducts a wide range of research and development activities and participates in research led by others. Through these efforts, we help to translate new knowledge, processes and technologies into the manufacturing environment.

Our research and development work also supports problem-solving in the blood supply chain, contributing to improvements in quality and efficiency. We support professional education and public awareness activities related to transfusion and transplantation and share our knowledge and expertise with our health-care partners, stakeholders and funders.

Our mission

We are ***Canada's Biological Lifeline***

We are the connection between the sincere generosity of donors and the heartfelt appreciation of recipients, between the profound discoveries of science and the joyful restoration of health. As such, we are nationally responsible for a secure system of life essentials for transfusion and transplantation that is reliable, accessible and sustainable. That's why our organization must be efficient and our performance disciplined. We must work as one with our colleagues and partners at all levels.

We must be prudent yet smart, rigorous yet agile, capable yet concerned. And we must be innovative, reinventing today so we can find better answers for tomorrow. In a very real way, what we do affects the well-being of all Canadians, and every day we must earn their trust. We make a difference, and in that, we take great pride.

Together, we are Canada's Lifeline

