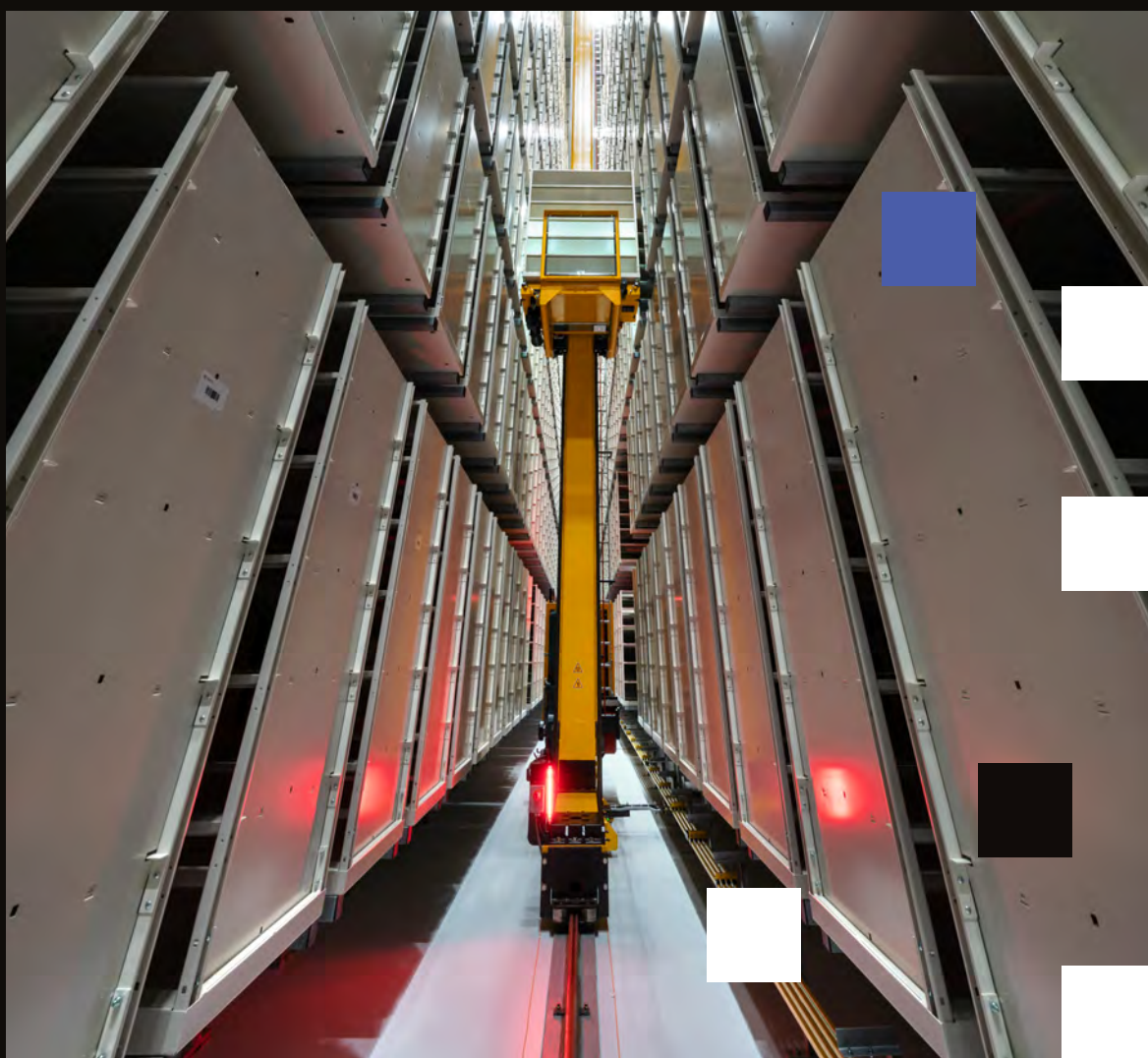


LIBRARY AND ARCHIVES CANADA

Gatineau 2 Project: Future Forward Design to Protect Canada's Past



THE CANADIAN COUNCIL FOR PUBLIC-PRIVATE PARTNERSHIPS
2022 NATIONAL AWARDS CASE STUDY





**The Canadian Council for Public-Private Partnerships
2022 National Award Case Studies**

**Gold Award for Infrastructure:
Library and Archives Canada's Gatineau 2 Project**

CCPPP Membership

As the voice of Canada’s infrastructure community, the Council offers unique networking opportunities, industry insights gleaned from important research & thought leadership opportunities, while advocating for the sector and promoting the use of public-private partnerships. Amplify the voice of your organization with membership.

Why our Members are Members

Virtually all major players in the infrastructure sector are members of the Council. They represent public sector owners and the leading construction, engineering, legal, advisory firms, banks and financiers, and operators and facilities maintenance firms working hard to build Canada’s much needed public infrastructure.

Our members are diverse but our 2022 member survey found there are shared reasons why they’ve joined CCPPP:

- Networking
- Concern about the infrastructure industry. They consider their organization an important player and want to be at the table
- Access to government decision-makers
- Access to research
- Access to private sector decision-makers

We’ve also responded to their desires for more value added to their membership. This includes:

- Round-table discussions on critical issues
- Council programs and activities to reach promising new audiences
- Networking events outside of the Annual Conference
- Revised and updated CCPPP website
- Ability to work with the Council to promote their thought leaders

To learn more about joining our network, please contact us!

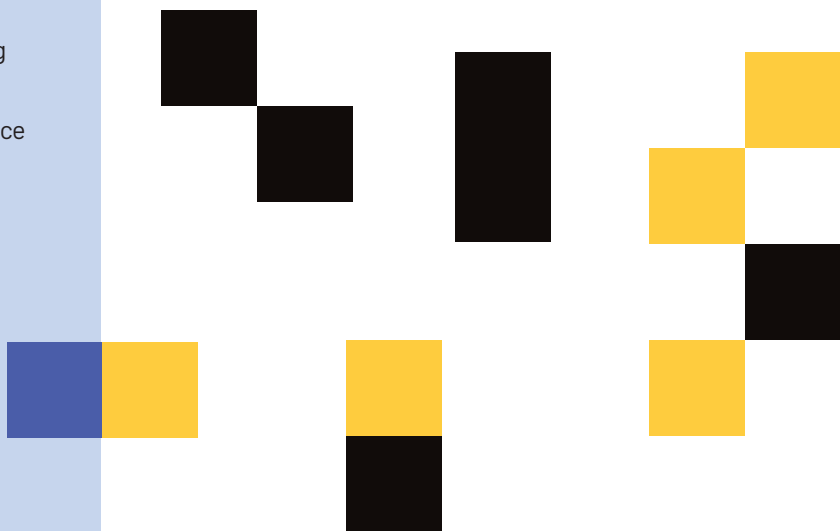
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Introduction

For more than 30 years, The Canadian Council for Public-Private Partnerships (CCPPP) and its members from the public and private sectors have played a strong role in refining the P3 model and promoting new approaches to infrastructure development and service delivery.

Governments across Canada are using the public-private partnership (P3) model to build, maintain and operate much needed infrastructure, from schools and hospitals to bridges and highways.

In 2024, there are more than 300 active P3 projects in operation or under construction valued at more than \$139.4 billion. Along the way, the 'made-in-Canada' P3 model has become globally renowned but, as the winners of the 2022 National Awards for Innovation and Excellence in Public-Private Partnerships demonstrate, it has never stopped evolving.

This year, CCPPP is publishing three case studies on these exemplary projects, joining the more than 80 that have been published to date. Designed to inspire others to consider innovative and efficient models for procuring infrastructure, the studies highlight many of the lessons learned about P3s. Each case provides a close look at how a successful P3 has worked, including how the partnership was established, its structure and operation and its resulting benefits.

It is important to learn from these complex projects as we move forward. After all, investment in infrastructure is critical for the future of our communities and country because it creates jobs, drives growth, stimulates productivity, and builds a legacy for us to thrive.

Canadians want – and expect – critical infrastructure to be built quickly and with the best value for taxpayers. Using public-private partnerships is an advantage given the model's greater potential to offer a fixed price and on-time delivery, a more optimal allocation of risks and improved life cycle maintenance and operations.

In 1998, CCPPP established the National Awards for Innovation and Excellence in Public-Private Partnerships to honour governments and/or public institutions and their private sector partners who have demonstrated excellence and innovation in P3s. Gold, Silver and Awards of Merit are given in the areas of project development, financing, infrastructure, service delivery or other notable attributes to projects from across the country and at all levels of government.

Winning projects are chosen on the basis of the following criteria:

- Innovative features;
- Relevance or significance as a national and/or international model;
- Economic benefit (job creation, enhanced economic value, export potential, etc.);
- Measurable enhancement of quality and excellence of service or project;
- Appropriate allocation of risks, responsibilities and returns between partners; and
- Effective use of financing and/or use of non-traditional sources of revenue.

2022 Award Winners



Project Development – Gold Award: P3 Schools Bundle #2, Alberta

The \$300.3-million project is the first ever P3 schools bundle in Alberta comprised exclusively of high schools. Once completed in 2024, the state-of-the-art schools will serve almost 7,000 students in the municipalities of Blackfalds, Edmonton, Leduc and Langdon. In addition, using a design-build-finance-maintain P3 will save an estimated \$114.5 million over the 30-year life cycle of the project compared to a traditional build contract. The ability of the project to progress from procurement to financial close in the midst of

the pandemic as well as deliver Value-for-Money for taxpayers showcases the benefits and value of a P3 bundling approach to delivering schools.

Partners: *Alberta Infrastructure, Concert Infrastructure and partners Bird Construction, Wright Construction, and Ainsworth*



Project Development – Silver Award: Accelerated High Speed Internet Program, Ontario

This innovative \$1.25-billion project is the first of its kind to execute a large-scale electronic reverse auction in Canada designed to foster competition among national, regional and local internet service providers (ISPs) with the goal of connecting up to 266,000 of the hardest to reach homes and businesses across Ontario with high-speed internet by the end of 2025. Under AHSIP, ISPs had the opportunity to bid for provincial subsidies for defined geographic areas as part of a two-stage competitive procurement process. In August 2022, the province announced it had signed DBFOM agreements with eight ISPs to serve as many as 339 municipalities. The project is a unique example of how P3s can be used to bring digital equality quickly and efficiently to rural and remote Canadians.

Partners: *Ontario Ministry of Infrastructure, Infrastructure Ontario, Bell Canada, Bragg Communications, Cogeco Connexion, Community Network Partners, Eh!Tel Networks Inc., North Frontenac Telephone Company, Rogers Communications Canada Inc., and Xplore Inc.*



Infrastructure – Silver Award: Highway 7 West Bus Rapid Transit, Ontario

In-service since 2019, this \$333.2-million project delivered a 12.6-kilometre bus rapid transit (BRT) corridor in Vaughan and Richmond Hill, connecting to the 34-kilometre BRT network serving York Region’s growing urban centres. The system, which was delivered on time and on budget, included the construction of 20 centre-median station platforms, a unique multi-use path on the Highway 7 bridge over Highway 400 and enhanced streetscaping. To date, the corridor has provided residents and commuters with better connections, has led to a decrease in traffic collisions and supported a big boost in commercial and residential development. Strong and effective partnerships enabled this project’s seamless delivery.

Partners: *York Region Rapid Transit Corporation and EDCO (EllisDon Civil Ltd. and Green Infrastructure Partners Inc.)*



Project Development – Award of Merit: Grandview Children’s Treatment Centre Redevelopment Project, Ontario

This project, currently in the development phase, will serve as the new headquarters for Grandview Kids, which specializes in care and support for children and youth with physical, communication and

developmental needs, and their families. The new four-storey facility will have a gross area of 94,733 sq. feet and will increase the centre's ability to offer more services and serve a greater number of children and youth in Ontario's Durham region. In 2021-2022, Grandview Kids provided services to more than 16,000 young people, however there are an estimated 11,500 children on the waitlist. As part of the development phase, the consortium is hosting design workshops with the centre's clinical and non-clinical staff, families and clients to receive feedback on drawings and plans, which include input on the architecture, electrical, structural and mechanical design. Construction is currently underway.

Partners: *Infrastructure Ontario, Grandview Children's Centre, and Children First Consortium (Amico Design Build Inc. and Sacyr Construction S.A)*



Infrastructure – Award of Merit: Royal Inland Hospital – Phil & Jennie Gagliardi Tower, British Columbia

In operation since February 2022, this new \$417-million, 300,000 sq. foot patient care tower at Royal Inland Hospital in Kamloops houses new clinical, administrative and support spaces, including a surgical suite and neonatal intensive care unit serving 220,000 residents of B.C.'s Thompson Cariboo Shuswap region. Under a single project agreement, the project used a DBFM model with a construction management agreement, resulting in an estimated savings of \$64 million compared with a traditional procurement. During construction, the project faced a number of extraordinary impacts caused by the pandemic, wildfires and extensive flooding caused by the 2021 atmospheric rivers. The events impacted resources, supply chain logistics, workflows, and budgets yet EllisDon still found innovative ways to ensure project success with the hospital completed on time and on budget. The project demonstrates the P3 model's delivery of value, timeliness, and accountability.

Partners: *Infrastructure BC, Interior Health Authority, and EllisDon Infrastructure Healthcare*

Service Delivery – Award of Merit: Oakville Trafalgar Memorial Hospital, Ontario

In operation since 2015, this \$2-billion DBFM hospital project remains one of the largest infrastructure projects in Ontario. The LEED® Gold facility, with 457 beds and shelled-in space to facilitate 602 beds by 2023, is equipped with multiple smart technology enhancements and opened on time and on budget. The project demonstrates the resiliency of the P3 model, with top service delivery continuing despite the global collapse of initial consortium partner Carillion Canada Inc. in 2018. As a result, EllisDon stepped in at short notice and took over 100 per cent responsibility for the 30-year management of the hospital's facilities and services. Partners: Infrastructure Ontario, Halton Healthcare Services Corp., and Hospital Infrastructure.

Partners: *Halton Healthcare Services Corporation, Infrastructure Ontario and Hospital Infrastructure Partners (Carillion Canada Inc., EllisDon Corp. and Fengate Capital Management Ltd.)*

Acknowledgements

CCPPP has a team of dedicated Award selection committee volunteers who review the applications, select the winners and provide feedback on the case studies. Using their extensive P3 knowledge and experience, they select the winners from a pool of qualified applications and then ensure the case studies provide a learning tool for seasoned practitioners, as well as those new to the P3 model. The following panelists comprised the 2022 selection committee:

- Brad Nicpon, Chair of the Awards Selection Committee and Partner, McCarthy Tétrault LLP
- Shariq Alvi, Managing Director, Energy Infrastructure and Transition Investment Banking, CIBC Capital Markets
- Rupesh Amin, Managing Partner, Infrastructure & Development, Forum Equity Partner
- Peter Hepburn, Managing Director and Head, Infrastructure and Project Finance, National Bank Financial Markets
- Alain Massicotte, Partner, Blake Cassels and Graydon LLP
- Johanne Mullen, Partner, National Capital Projects and Infrastructure Leader, PwC Canada
- Dr. Alan Russell, Professor Emeritus, Department of Civil Engineering, University of British Columbia
- Lindsay Wright, Senior Manager, Global Infrastructure, KPMG LLP

Erica Leung, Ian Podmore and Mark Raboud, Concert Infrastructure; **Amy Kasnickas and Stephanie Williamson**, Plenary Americas; **Linda Cabral and Jennifer Robinson**, CCPPP, authored the 2022 Award Case Studies, which were developed with significant input and review from the project partners and procurement agencies as well as the diligent work of the researchers.

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Plenary

CCPPP would like to thank them for their contributions as well as Infrastructure Canada for its research support for the case studies.



**Infrastructure
Canada**

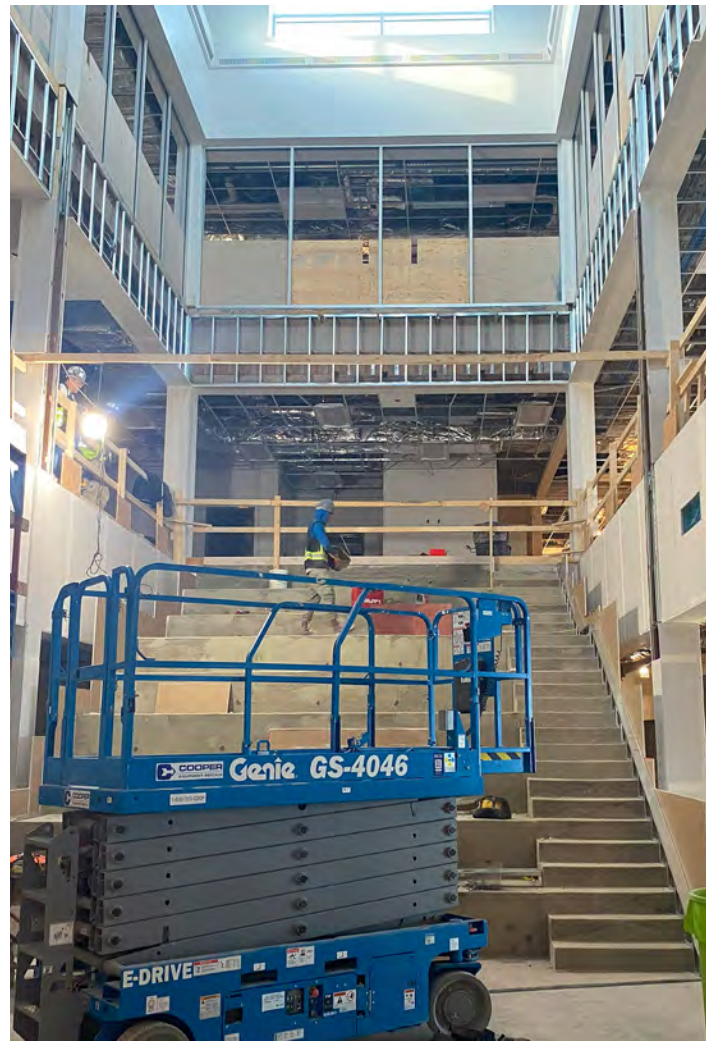
The National Awards for Innovation and Excellence in Public-Private Partnerships were made possible by the generous support of the following 2022 sponsors:

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The atrium at Heritage Valley in January 2024.

About CCPPP

Established in 1993, The Canadian Council for Public-Private Partnerships is a national not-for-profit non-partisan, member-based organization with broad representation from across the public and private sectors.

Our Mission: To shape the future of Canada's infrastructure and services by delivering value to Canadians through public-private partnerships (P3s).

CCPPP is committed to the advancement of public-private partnership models through:

- Convening both public and private market participants to discuss leading practices and harness lessons learned and adapting the model as needed
- Advocating for the use of public-private partnership models, where appropriate to build a sustained pipeline of projects across the country, and
- Conducting research to support evidence-based decision making and demonstrate the benefits of the model

The Council will advocate for procurement models to deliver infrastructure and services to Canadians that provide efficient solutions to public sector objectives, provide value to taxpayers, and encompass each of the following four essential attributes of most effective P3s:

- Allocate the appropriate risk transfer to the party best suited to manage it
- Consider the whole life cycle of the asset
- Drive innovation and efficiencies, and
- Leverage private capital and expertise

The Council will first and foremost support the long-term alignment of incentives through the inclusion of private capital, given its demonstrated effectiveness as a tool to achieve desired outcomes. It will also continue to work with the broader partnership-model community to advance areas of common interest.

Our awards case studies, guidance and analysis reports are available on CCPPP's website at pppcouncil.ca/what-do-we-do/research

Quick Facts – Library and Archives Canada's Gatineau 2 Project¹

Project type

Design-Build-Finance-Operate-Maintain (DBFOM)

Asset/Service

- Design and construction of new Preservation Storage Facility
- Optimization of specific vaults in existing Preservation Centre, which includes shelving and environmental set points within 28 collection vaults, and
- Financing, energy retrofitting, facility maintenance and life cycle of both the new and existing archival facilities

The new Preservation Storage Facility is a specialized, flexible and sustainable building, meeting the Government of Canada's priorities to invest in sustainable federal infrastructure and Canadian culture.

The new state-of-the-art facility is the world's largest equipped with an Automated Storage and Retrieval System (ASRS) for archival collections. It is also the first Net Zero Carbon archival facility in the Americas.

Design and construction period:

- 3 years

Maintenance period:

- 32 years (includes two-year interim operational period for the existing Preservation Centre)

Status

Substantial Completion: June 2022

Operational:

- Existing Preservation Centre: April 1, 2020
- New Preservation Storage Facility: June 28, 2022

¹ Background and facts in this case study rely on the information contained in the award application submitted jointly by the project partners in September 2022 to The Canadian Council for Public-Private Partnerships. Information from the submission has been supplemented and updated with information from the procurement documents, the project agreement, the project report, other sources as noted and personal interviews with project partner representatives.

Partners

Public Sector

Owner/Project Authority: Library and Archives Canada (LAC)

Contracting Authority: Public Services and Procurement Canada (PSPC)

Private Sector

- Plenary Properties Gatineau, comprised of:
 - Plenary Americas
 - PCL Investments Inc.
 - Construction PCL Inc.
 - B+H Architects
 - Equans (formerly ENGIE Services)

Other participants

Public Sector

- Tíree Facility Solutions Inc. – Project Management
- Deloitte LLP – Financial and P3 Advisor
- P1 Consulting – Facility Management Advisor
- GRC and Dialog Architects – Advocate Architects
- KPMG – P3 Advisors
- HKA Global (Canada) Inc. – Fairness Advisor

Private Sector

- Dematic Corp. – ASRS Provider
- Fasken Martineau DuMoulin – Lenders Legal Advisor
- Davies Ward Philips & Vineberg LLP – SPV Counsel

Project cost, financing and Value-for-Money (VfM)

Total project cost

- \$300 million NPV

Project financing

- Equity: \$11.7 million
- Long-term debt: \$123.9 million

Short-term credit facility: \$30.6 million

Public sector

- Substantial Completion Payment: \$36.1 million
- Service Payments: \$318 million²

Payments

During Construction

- Substantial Completion Payment of \$36.1 million

During Operations

- Monthly service payments over a 30-year period to cover the cost of construction, building maintenance, life cycle repair and renewal and project financing
- Subject to financial deductions based on performance requirements established in the project agreement

Value-for-Money – DBFM

- \$57.6 million or 13 per cent NPV³

Project highlights and innovative features

The new storage facility has become a global benchmark in purpose-built preservation infrastructure. It is the:

- First Net Zero Carbon building dedicated to the preservation of archives in the Americas.
- The first federal building built to the requirements of Canada's Greening Government Strategy.
- The largest archival preservation facility in the world equipped with ASRS.

Additional innovative design features include:

- Archival storage vaults are located above grade with an environmental buffer zone surrounding them on all sides creating a "building within a building." These design features reduce the risk of leaks and temperature/humidity fluctuations
- The building's exterior texture, which represents the geological layers found below site grade, required the development of customized 3D digital profiles that were used to cast the molds for the precast concrete façade

The project includes facilities management services for both LAC's existing facility and the new storage facility. The private sector partner took over responsibility for the maintenance and life cycle renewals of the existing facility on April 1, 2020.

The project set ambitious energy targets for the existing facility, such as an 80 per cent reduction of greenhouse gases by 2050, and Net Zero Carbon for the new storage facility.

Project website

preservationgatineau.com/

² Annual service payments of \$10.6 million are made for 30 years, which is equal to \$318 million. The \$10.6 million annual payment is broken down into monthly installments.

³ Based on the Procurement Options Analysis completed in 2020 by Library and Archives Canada.



Overview

Protecting Canada's documentary heritage is a key priority for Library and Archives Canada, from the only known copy of one of the oldest surviving printed items in Canada (the March 23, 1752, issue of the *Halifax Gazette* printed by Canada's first printer, John Bushell) to original copies of the Proclamation of the Constitution Act, 1982, signed by Queen Elizabeth II.⁴

With the \$330-million Gatineau 2 project, the government has not only set a new benchmark for archival facilities worldwide, it is the first net-zero carbon archival preservation facility in the Americas.

The project involved upgrading the existing preservation centre at the site in Gatineau, Que., as well as the design and construction of a new, adjacent, purpose-built, state-of-the-art storage facility.

Based on qualitative and quantitative analysis and the market sounding reports, the Design-Build-Finance-Operate-Maintain (DBFOM) public-private partnership was identified as the preferred delivery model for the Gatineau 2 Project.

With this type of partnership, the private sector holds a major share in the risks and financing and provides best value for Library and Archives Canada as it ensured both preservation facilities would be managed with maximum efficiency, minimal risk to LAC and lower overall operating costs.

In 2019, Plenary Properties Gatineau, a private consortium, was selected by the Government of Canada through a competitive procurement process for the DBFOM agreement.

The new Preservation Storage Facility contains six vaults to house archival records. Each individual vault has its own Automated

Storage and Retrieval System (ASRS), and each must meet specific temperature and humidity set points depending on the type of collection materials it holds: textual records, motion picture film or microfilm. Security and fire prevention and suppression systems are also of critical importance.

The project achieved substantial completion on time and on budget in June 2022 and received LEED® (Leadership in Energy and Environmental Design) Gold certification seven months later.

The new Preservation Storage facility, combined with the optimization of the current Preservation Centre, is providing several benefits, such as:

- Optimal conditions for the preservation of Canada's documentary heritage
- Use of the latest technology to "green" Library and Archives Canada's operations and reduce operating and maintenance costs
- Increased efficiency by using modern storage and access systems to maximize space utilization, and
- Decreased risks and costs related to transportation of holdings.

With completion of the new storage facility and optimization of 28 vaults in the existing Preservation Centre, approximately 70 per cent of Library and Archives Canada's existing analogue holdings can be stored in high-quality, purpose-built preservation storage spaces.

This case study examines distinctive features of this unique public-private partnership (P3), which won the gold award for infrastructure at CCPPP's 2022 National Awards for Innovation and Excellence in P3s.



The courtyard between the Preservation Storage Facility and the Preservation Centre was designed as a peaceful and quiet outdoor garden space for the employees of both facilities.

⁴ This landmark document allowed Canada to achieve full independence from Britain and enshrined the Charter of Rights and Freedoms in Canada's Constitution.

Background and Rationale

Library and Archives Canada (LAC) is mandated with preserving and sharing the cultural, social and economic contributions of all Canadians through public and private records that have historic and archival value, to help all of us gain a better understanding of who we are. LAC also serves as the continuing memory of the federal government and its institutions and as the guardian of Canada's distant past and recent history.

To fulfill its mandate, the department relies on a portfolio of purpose-built facilities with strict environmental conditions that will support the long-term preservation of its holdings.

The Gatineau Preservation Campus, a Crown-owned greenfield site in Gatineau, Que., was purchased in 1989 by the federal government and dedicated to purpose-built archival infrastructure. Since its inauguration in 1997, the existing Preservation Centre has been the only installation on the campus, located in a growing, mixed-use, urban environment.

In 2011, the department undertook a comprehensive review of its infrastructure needs and updated its Long-Term Real Property Plan to ensure the requirements of its ever-growing collection would continue to be met. The plan found that:

- Holdings and public access services were being delivered from 22 facilities across Canada. Many of these facilities failed to meet the government's specialized collections storage requirements

- Part of the national collection could be at risk because storage space was not meeting advanced standards and best international practices for optimal long-term preservation, including limited light exposure, controlled temperature and relative humidity
- Some facilities posed challenges as they did not appropriately support the department's changing program requirements, were widely dispersed across Canada, and were aging.

Taking the strengths and weaknesses of the existing spaces into consideration, the Long-Term Real Property Plan laid out a roadmap for the transformation of the department's portfolio. It included the:

- Consolidation of holdings into facilities appropriate for the storage of archival materials
- Transfer of special purpose facilities from Public Services and Procurement Canada to Library and Archives Canada
- Construction of a new preservation facility, and
- Upgrading of the existing Preservation Centre to meet the latest standards.

Library and Archives Canada worked with Public Services and Procurement Canada and the former PPP Canada to identify the best procurement approach, which was determined to be the P3 Design-Build-Finance-Operate-Maintain (DBFOM) model.



A rendering showing an aerial view of the older Preservation Centre (left) and the new Preservation Storage Facility (right) at Library and Archives Canada's Gatineau 2 project location.

Description of the Project

The Gatineau 2 Project consists of three key elements:

- The design, construction and financing of the new state-of-the-art Preservation Storage Facility, constructed to meet stringent technical, site specific and environmental specifications. Substantial completion was reached on June 28, 2022
- The optimization of selected vaults in the existing Preservation Centre to enable the proper housing of various types and sizes of collection material moving to Gatineau from other facilities, and
- The Operation, Maintenance and Rehabilitation (OM&R) work for Library and Archives Canada's new storage facility and for the existing Preservation Centre.

1. The Preservation Storage Facility

The new storage facility is a diamond-shaped building, designed and constructed to achieve a service life of 100 years, with a footprint of 4,542 sq. metres and a gross building area of 12,873 sq. metres standing approximately 38 metres tall.

The ground level contains collection circulation and processing areas, meeting rooms and mechanical spaces.

The second level houses the six collection storage vaults, providing 21,500 cubic metres (750,000 cubic feet) of collection storage space, equivalent to the volume of 8.5 Olympic swimming pools.⁵

To promote a 500-year archival lifespan of the stored material, the six vaults are required to maintain strict environmental set points with little variation in temperature or relative humidity.

Five of these vaults are intended for textual records kept at 10°C and 40 per cent relative humidity. The sixth, intended for a mix of motion picture film, microfilm and textual records, is maintained at 6°C and 30 per cent relative humidity.

The design requires highly accurate and reliable environmental sensors linked to the facility's building management system. The sensors are positioned on a 3D grid pattern throughout each vault to provide continuous monitoring of the environmental conditions and to set off alarms if conditions exceed the mandated requirements.

2. Optimization of selected vaults in Existing Preservation Centre

The existing Preservation Centre has 48 vaults. Shelving modifications were required in 28 vaults, with major changes occurring in nine of the vaults. Highlights include:

- Converting one textual storage vault into a vault for the storage of framed art,
- Converting three motion picture film and microfilm vaults into textual vaults, and
- Converting five textual vaults into vaults for the storage of maps and plans.

As a result of the shelving optimization work, mechanical and electrical upgrades were required to modify the relative humidity (RH) settings to provide optimal preservation conditions for the new material moving into four vaults:

- Increasing the RH from 25 per cent to 40 per cent in two vaults
- Increasing the RH from 25 per cent to 35 per cent in one vault
- Increasing the RH from 40 per cent to 50 per cent in one vault.

3. Operation, Maintenance and Rehabilitation (OM&R)

On April 1, 2020, Plenary Properties Gatineau took over responsibility for the operation, maintenance and rehabilitation of the existing Preservation Centre until 2052; a 32-year period.

In June 2022, when the new storage facility reached substantial completion, the consortium also took on OM&R responsibilities for it until 2052.

These responsibilities include general management, pest control, plant services, utilities management services, roads, grounds and landscape maintenance services, and cleaning services.

Some of the performance specification requirements include:

- **BOMA Best Gold®** certification, as a minimum, of both facilities
- **GHG emission reductions:** Plenary Properties Gatineau is required, through the Preservation Centre life cycle work, to reduce emissions by 40 per cent by 2030 and 80 per cent by 2050. In 2023, these emissions were close to 2,000 tonnes annually. An 80 per cent reduction would bring this close to 460 tonnes
- **Joint Technical Review:** An independent inspector will conduct a Joint Technical Review every five years to assess the performance and effectiveness of the facilities' management services including the maintenance activities and the life cycle management of both facilities.

⁵ In comparison, the existing Preservation Centre provides 19,000 cubic metres of collection storage.



Construction progress at the site in April 2020, in the midst of the pandemic.

Design Innovations

Imagine that classic final scene in *Indiana Jones and the Raiders of the Lost Ark* where a lone worker is seen pushing the wooden crate containing the ark through a massive dusty warehouse filled haphazardly with priceless treasures as far as the eye can see.

Canada's new Preservation Storage Facility is the exact opposite of that scenario. Every square metre of this facility has been carefully thought through and maximized, while maintaining the rigorous, highly specialized standards required of a state-of-the-art building housing such culturally important materials. **Protection is critical for this facility.**

The collection vaults are raised approximately 6.3 metres above the average grade of the building. These propped up vaults protect the collection from any potential water infiltration due to the high-water table located 1.5 metres below grade on the project site.

The elevated vaults also serve to mitigate any potential flooding from the lowlands and the river near the building. From a structural perspective, a force analysis also concluded the building at grade

would be less susceptible to external forces compared to a building submerged below grade.

Even the roof design has been carefully considered to control rain, snow and ice. From the ground, the roof may appear flat but looks are deceiving. In the middle, a ridge with a simple outwards slope leads to a series of drains, strategically placed on the perimeter of the building to pose less risk to the vaults inside and minimize the number of perforations on the roof. An exterior roof membrane and a rain screen on the sides of the building also mitigate any leaks.

Inside, an additional layer of protection is provided by a two-metre-wide buffer zone, which runs around the perimeter of the vaults, isolating them from direct outdoor conditions, including temperature, humidity and weather fluctuations.

Materials and Finishes

Due to the sensitive nature of the collection items, an extensive list of 26 prohibited materials was included in the project specifications. Common materials such as gypsum board and wood were

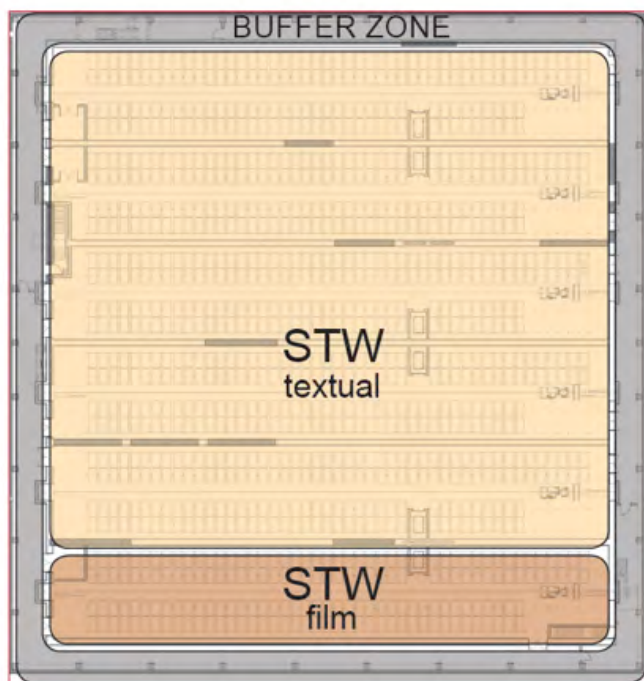
prohibited near the collection vaults because of acidic properties or susceptibility to create dust over time.

The design team also avoided materials with a high content of volatile organic components (VOCs) that could affect the air quality in collection spaces through long-term off-gassing. As a result, the vault walls, floor and roof are constructed completely from concrete, a safe material for the collection.

The Storage Vaults

Think of the six storage vaults like separate containers within the larger cubic mass of the facility. Each one is protected from the outside world with a special internal buffer zone, has its own temperature and humidity controls and its own automated, motorized forklift-like device to retrieve and deposit shelving units.

Each vault is identical in proportion, measuring 10.47 metres wide, 58.65 metres long and 28.26 metres high. With these dimensions,



The vaults are located in a single cubic mass, which is surrounded on all six sides by a two-metre-wide Buffer Zone.⁶

⁶ The Buffer Zone serves several functions: 1.) It acts as a second barrier between the vaults and the exterior atmosphere; 2.) It provides space for mechanical and electrical infrastructure outside the vaults; 3.) It acts as an environmental buffer isolating the vaults from outdoor conditions, including temperature and humidity fluctuations and weather; and 4.) It provides emergency access for exiting and maintenance for all the vaults.

the vaults combined can store more than 900,000 archival document containers of various formats and sizes.

The seed of their vault design started with an analysis of the size of a modular storage box. The size of the box then dictated the sizing of the shelving units, which could all be double-loaded and extended vertically to the maximum crane height of the Automated Storage and Retrieval System (ASRS).

The design team decided each vault would have two rows of shelving units on both the left and the right of the central aisle, which dictated the width of the vault. Finally, the appropriate length of the vault was determined to ensure each vault could accommodate 3,540 cubic metres of storage space.

Automated Storage and Retrieval System (ASRS)

Staff rarely have to enter the six storage vaults. Instead, they rely on a state-of-the-art Automated Storage and Retrieval System (ASRS) to fetch collection containers within the storage vaults and transport them to and from the central circulation room.

This allows Library and Archives Canada staff to process material in and out of the vaults with greater efficiency and less physical labour.

Each of the six storage vaults has its own Storage and Retrieval Machine (SRM) with a mast that measures 25.6 metres (84 feet) in height. The SRM can move in three dimensions:

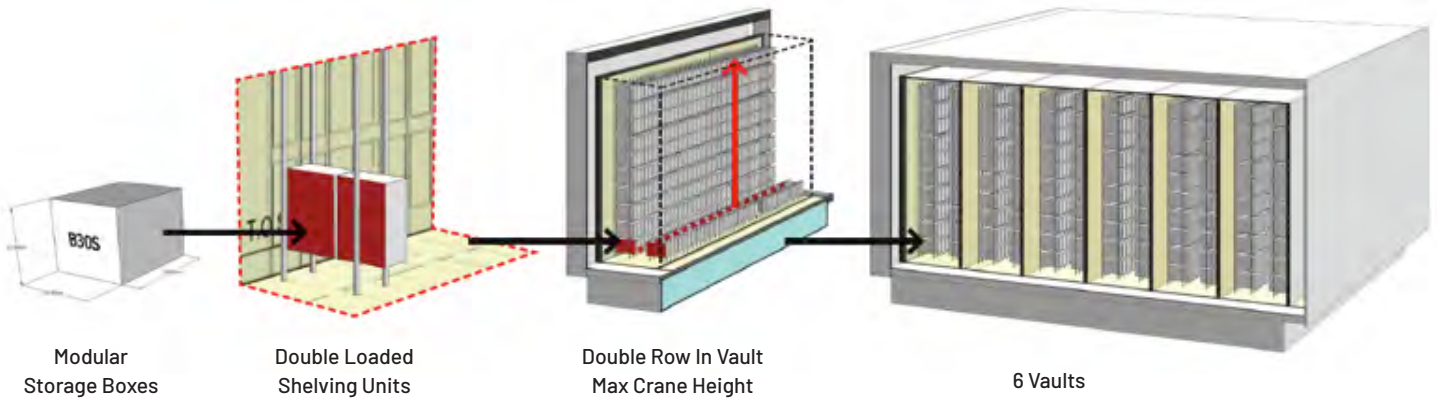
- horizontally from the front to the back of the vault on a fixed rail down the central aisle
- vertically from the floor of the vault to the top of the storage racking on a vertical mast, and
- horizontally by extending the forklift into the storage racking.

The SRM can remove an entire shelving unit filled with containers from the racking and deliver it to the top of an elevator, which then lowers it to a central circulation room.

The ASRS is required to be fully available 24 hours/7 days a week. It is also designed to have a reliability performance of 98.5 per cent or greater each month.

This performance criteria helps reduce downtime spent on preventative or spontaneous maintenance and ensures that Library and Archives Canada will be able to fulfill its mandate to provide access to Canada's collection of documentary heritage.

Internal factors driving vault proportions



Interesting Fact: As the ASRS can operate in the dark, the lighting in the storage vaults can be kept off (or kept low as required) during normal operations. These low-lighting levels help to further protect the collection material and increase energy efficiency.

Want to See the ASRS in Action? A special accessible viewing window enables visitors at the new Preservation Storage Facility to see the internal workings of a vault and watch a Storage and Retrieval Machine (SRM) moving shelving units around the storage racking.



A special accessible viewing window is a portal into the inner workings of the state-of-the-art tech at the new Preservation Storage Facility.

Sustainability Considerations

The design of the new Preservation Storage Facility had to respect the strict environmental conditions and the associated energy and GHG targets. This was accomplished in various ways, but

fundamentally relied on using high-efficiency, electrically fed mechanical heating and cooling systems supplied by Hydro-Québec's carbon-neutral electricity grid. These systems are supplemented by efficient non-carbon generating geothermal and robust, highly efficient building envelope compositions.

A Look Inside the new Preservation Storage Facility

The Circulation Room

The circulation room serves as the heart of the new Preservation Storage Facility and is where most of the interactions with the archival materials take place.

This first-floor room spans nearly the full length of the facility and is strategically placed below the second level vaults. Within the circulation room, visitors can find six pick stations corresponding with the six different storage vaults. These double-sided, accessible and ergonomic pick stations allow facility users to comfortably and safely interact with collection containers.

Staff use a computerized system (the Document Management System or DMS) to request individual containers, triggering the ASRS's Storage and Retrieval Machine to pick the corresponding shelving unit from the vault racking and deliver it to the first floor. Staff then select and scan the desired container to remove it from storage. The process occurs in reverse when users are finished with the archival materials and are ready to return them to the vaults.



Within the circulation room, visitors can find six different pick stations corresponding with the six different vaults.

The two buildings on the site are linked together, enabling visitors and staff to avoid having to go outside. The extra wide corridor separates pedestrian traffic from the cart movement of archival documents with an accessible railing.



Procurement Process

Selecting the P3 Model

Library and Archives Canada worked with Public Services and Procurement Canada and the former PPP Canada⁷ to identify the best procurement approach, which was determined to be the P3 Design-Build-Finance-Operate-Maintain (DBFOM) model.

Early in the planning phase of the project, a procurement options analysis was done on behalf of Library and Archives Canada that included qualitative and quantitative analyses of different procurement models with the goal of recommending the best model for the Gatineau 2 Project.

Three procurement models were shortlisted based on the program needs:

- a. Design-Bid-Build (DBB) traditional model
- b. Design-Build-Finance-Operate-Maintain (DBFOM) fully integrated P3 model
- c. Design-Build-Operate-Maintain (DBOM) P3 model.

The qualitative analysis consisted of a workshop held in November 2016 to assess the merits of each procurement model relative to the government's procurement objectives. The DBFOM model scored highest and the DBB model scored lowest but was retained for further analysis as it represents the best traditional comparator.

Two market sounding studies were conducted. The first in 2013 specific to the new facility and the second in 2016 bundling the existing Preservation Centre optimization and OM&R with the new facility under a single project.

In 2016, 19 of the 26 companies in various areas of P3 expertise that received a market sounding package participated in one-hour calls to answer specific questions.

Key findings included:

- Strong market interest
- Sufficient size and complexity for P3 delivery
- Synergies could be gained by bundling the existing Preservation Centre within the Gatineau 2 Project
- Project finance terms including Debt Service Coverage Ratio (DSCR) and gearing ratio likely consistent with other federal P3 projects.

The quantitative analysis compared the risk-adjusted, net present cost of the DBB and DBFOM, which were retained following the qualitative analysis. The quantitative analysis followed PPP Canada's federal Value-for-Money (VfM) methodology. The VfM compared the different procurement models on a Net Present Value, risk-adjusted, whole of life cycle cost basis.

Based on the qualitative and quantitative analysis and the market sounding reports, the Design-Build-Finance-Operate-Maintain (DBFOM) public-private partnership was identified as the preferred delivery model for the Gatineau 2 Project. It showed the greatest ability to transfer risk and provide performance, cost and schedule certainty.

With this type of partnership, the private sector holds a major share in the risks and financing and provides best value for Library and Archives Canada as it ensured both preservation facilities would be managed with maximum efficiency, minimal risk to Library and Archives Canada and lower overall operating costs.

Selecting a Partner

The procurement process for the project had two stages: Request for Qualifications (RFQ) and Request for Proposals (RFP). It took 18 months to complete the process from RFQ to financial close.

Request for Qualifications

An RFQ was issued by Public Services and Procurement Canada (PSPC) on October 31, 2017. The primary objectives of the RFQ were to evaluate the **technical capacity, business capability and financial position** of each consortium. The objective was to pre-qualify the best three consortia capable of providing superior and innovative proposals and deliver the design, build, finance, operate and maintenance (DBFOM) of an approximately 12,000-square-metre LEED® certified preservation facility with a 100-year service life and predefined environmental set points including a 30-year operating term.

In January 2018, PSPC received statements of qualifications from three teams. Following evaluation of the submissions, three teams were shortlisted:

- EllisDon Infrastructure
- Heritage Archives Canada
- Plenary Properties Gatineau.

⁷ PPP Canada was a federal Crown Corporation responsible for promoting and facilitating public-private partnerships. It operated from 2009 to 2018.

Three Qualified Proponents

	EllisDon Infrastructure	Heritage Archives Canada	Plenary Properties Gatineau
Lead	EllisDon Corp	Axiom Infrastructure	Plenary Americas
Equity	EllisDon Corp	Axiom Infrastructure & Pomerleau	Plenary Americas & PCL Investments
Financing	EllisDon Corp	Axiom Infrastructure & National Bank Financial	Plenary Americas
Design	Diamond and Schmitt & Crossey Engineering	Provencher_Roy & Arup	B+H Architects
Construction	EllisDon Corp & EBC Inc	Pomerleau Inc	PCL Constructors
Operation Maintenance & Rehabilitation	EllisDon Facilities Services	Johnson Controls	Equans

Request for Proposals

The RFP was issued on April 23, 2018. Proponents were asked to prepare high-quality, competitive proposals that included technical and financial submissions. The RFP technical proposals were due on November 6, 2018, and the financial proposals were due on January 10, 2019.

The method of selection involved a minimum score in two key technical categories and an overall score to be deemed technically compliant. An analysis of Library and Archives Canada's requirements and financial framework suggested the lowest price approach should strongly be considered.

LAC's decision to use a 'lowest price wins' selection method considered the following:

- After having carefully refined project specifications and requirements, LAC was confident that any consortium that passed the technical evaluation phase would be a suitable candidate for the contract.

- Selecting the lowest bid is a mitigation measure in ensuring LAC's Real Property portfolio had the longest financial sustainability possible.

Innovation envelopes

Because of the "lowest price wins" format, proponents had the opportunity to provide innovation envelopes containing proposals (with associated pricing) for sustainable, optional enhancements to their design. The envelopes were opened after the selection of the preferred proponent and could be incorporated into the output specifications prior to financial close, if the total cost did not exceed the financial thresholds.

Preferred proponent

On January 30, 2019, the federal government selected Plenary Properties Gatineau as the preferred proponent. The Plenary Properties Gatineau proposal was selected for this public-private partnership because it met all the required technical criteria and could be implemented at the best possible cost to taxpayers.

Fairness of the Process

A team of fairness monitors from HKA Global (Canada), Inc. was hired in May 2016 to provide formal oversight of every step of the procurement process to ensure an independent validation and to attest to the fairness of the process. They participated in key meetings with the public sector organizations, training sessions for the evaluators, observed meetings, information sessions and site visits with the proponents, etc. They also reviewed the RFQ and RFP documents prior to launch, as well as their respective amendments. They also reviewed various supporting documents including questions and answers (Q&A), responses to Request for Information (RFI) and training materials for the evaluation of each phase of the procurement process.

In an attestation of assurance, the fairness monitor stated the procurement activities were conducted in a fair, open and transparent manner and did not identify any fairness deficiencies.

Table 1: Project Timeline

<p>2011</p> <p>Library and Archives Canada (LAC) updates its Long-Term Real Property Plan (LTRPP) to ensure requirements of its ever-growing collection would continue to be met</p>	<p>March 21, 2018</p> <p>Three shortlisted teams announced</p>
<p>2015</p> <p>Findings from the 2011 review were used to confirm LAC's future infrastructure requirements and to update its LTRPP</p>	<p>April 23, 2018</p> <p>RFP issued</p>
<p>October 31, 2017</p> <p>Letter of Interest posted to inform the public and industry about the P3 procurement for the Gatineau 2 Project</p>	<p>November 6, 2018</p> <p>RFP closed</p>
<p>January 4, 2018</p> <p>RFQ issued</p>	<p>January 30, 2019</p> <p>Preferred proponent selected</p>
<p>April 17, 2014</p> <p>RFQ closed</p>	<p>April 23, 2019</p> <p>Commercial close</p>
	<p>April 26, 2019</p> <p>Financial close</p>
	<p>August 12, 2019</p> <p>Ground-breaking and construction start</p>
	<p>April 2020</p> <p>Operations and maintenance phase for the existing Preservation Centre begins</p>
	<p>June 28, 2022</p> <p>Substantial completion and start of maintenance services on new Preservation Storage Facility</p>
	<p>December 12, 2022</p> <p>Preservation Storage Facility awarded LEED® Gold Certification</p>
	<p>June 28, 2052</p> <p>Expiry Date (Hand back/End of P3 agreement)</p>

Overall Structure of the Agreement

Partner Roles and Responsibilities

Plenary Properties Gatineau (PPG) was incorporated as a special purpose vehicle to enter into the project agreement with Public Services and Procurement Canada (PSPC) to deliver the Gatineau 2 Project.

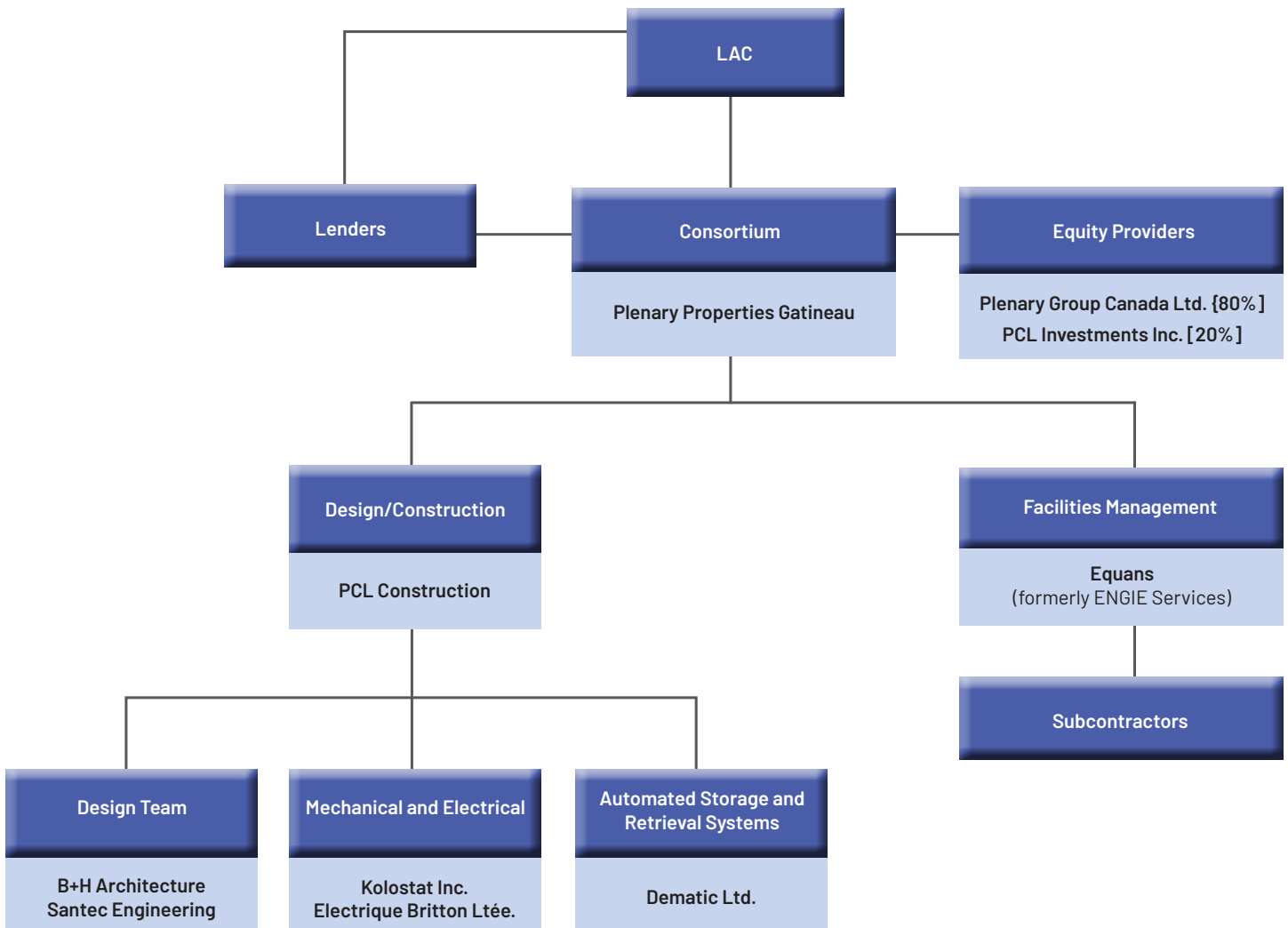
PPG's financing team members include Plenary Americas as sole developer, majority (80 per cent) equity sponsor and financial

advisor; and PCL Investments Canada Inc. as minority (20 per cent) equity sponsor together with TD Securities Inc. (TDSI) and ATB as underwriters/lenders.

The PPG consortium is comprised of:

- Plenary Americas as lead developer, sponsor, and lead equity investor,
- Construction PCL Inc. (PCL) as the design-build lead and equity investor,
- Equans as facilities management lead, and
- B+H Architects as the design prime member

Figure 1: Partnership Structure



Financial Arrangements

The total cost of the contract with Plenary Properties Gatineau (PPG) is \$330 million (net present value or NPV) with private financing for the project consisting of:

- Long-term bond: \$123.9 million
- Short-term credit facility: \$30.6 million
- Equity: \$11.7 million.

A milestone payment of \$36 million was made by Library and Archives Canada at substantial completion.

PPG worked closely with underwriters and direct lenders to investigate multiple financial structures to minimize capital costs and maximize value for money for LAC. Consistent with many past Plenary P3/DBFOM projects, the ultimate financial solution included a fully underwritten bond solution combined with a short-term credit facility. With respect to the long-term bond solution, Plenary and TD Securities Inc. reviewed and tested several structural options and features under various stress cases, particularly:

- An upfront long-term bond used in conjunction with a structured deposit note reinvestment product;
- An accreting long-term bond (interest free throughout the construction period) used in conjunction with a structured deposit note reinvestment product;
- Upfront long- and medium-term bonds used in conjunction with a structured deposit note;
- Delay-draw long and medium-term bonds with various amortization profiles; and
- A delay-draw long-term bond.

Based on thorough analysis of each of these options (all used in a hybrid solution with the short-term credit facility), including value for money, current pricing levels, investor appetite and capacity, certainty of reaching financial close, construction schedule, and possible ongoing counterparty risk post-financial close, PPG chose to implement the delay-draw amortizing long-term bond – a rarity in recent P3 project financings – providing an innovative and efficient solution for LAC. All funding sources are further described below.

Lenders

The project financing structure is the result of a highly competitive process involving several reputable global financial institutions. The

resulting financing structure is comprised of two debt tranches (short-term and long-term) and equity.

Short-term debt

The short-term senior credit facility of \$30.6 million was provided by Alberta Treasury Branches. The credit facility was drawn into the project as needed, and the delayed draw flexibility had few associated cost premiums and enabled efficient draw timing towards the back end of construction. Proceeds from the substantial completion payment were used to repay the credit facility in full.

Long-term debt

The long-term fully amortizing bonds in the amount of \$123.9 million were underwritten by TDSI, and proceeds were immediately available at financial close. At the end of the construction period, the outstanding principal was fully amortized over the concession period, saving a three-month tail versus the P3 market standard of six months – another money-saving feature of PPG's financial structure.

Equity

The equity commitment of \$11.7 million is provided by two partners in the following proportions:

- Plenary Americas: 80 per cent
- PCL Investments Canada Inc.: 20 per cent.

Payments

Substantial completion payment

PPG received a lump sum payment from Library and Archives Canada at substantial completion in the amount of \$36 million, which was used to repay the credit facility.

Availability stream

Annual service payments from Library and Archives Canada are projected to total \$10.6 million with a portion indexed to prevailing inflation rates. These payments are made monthly over a 30-year period for building maintenance, life cycle repair and renewal and project financing. If PPG does not meet the performance requirements established in the project agreement, it will face financial deductions.

Revenue sharing

There is no revenue sharing in the project agreement.

Responsibilities and Risk Allocation

Using a P3 procurement model provided the Government of Canada with a greater opportunity to ensure risks were allocated to the partner best equipped to manage them. This reduced the costs attributed to risk and improved the VfM assessment for the project. Risks transferred to Plenary Properties Gatineau (PPG) added value through private sector design and innovation.

The project agreement includes detailed risk allocation provisions over the construction period and the 30-year maintenance term. A summary is presented in Table 2.

Risk Allocation

The project agreement defines the obligations and risks of all parties involved. Key highlights that pertain to the construction terms are below:

- **Contract Price Certainty:** A Net Present Value (NVP)-price contract (without inflation) to design, build, finance, operate and maintain the Gatineau 2 Project. Any extra costs incurred because of a schedule overrun caused by PPG will not be paid by PSPC or LAC.
- **Scheduling, Project Completion and Delays:** The schedule could be modified in limited circumstances, in accordance with the terms of the project agreement. PPG had the obligation to mitigate impact on the project schedule as much as possible on the occurrence of particular delays, as specified in the project agreement. A sizeable payment was made by PSPC and LAC at substantial completion, providing further incentive for PPG to complete construction on time.
- **Site Conditions and Contamination:** PPG was responsible for maintaining and managing and where required, remediating any contamination, at the site. This included contamination that was disclosed from site condition reports or readily apparent/discoverable from inspecting the site, or that is caused by PPG or any of its parties.
- **Construction Financing:** PPG was required to finance the construction of the project.

- **Commissioning and Facility Readiness:** PPG had to achieve a prescribed level of commissioning at substantial completion within the agreed to schedule. This ensured the new Preservation Storage Facility was able to achieve operational service in 2022.
- **Interim Operational Period:** PPG was required to complete policies and procedures and develop and implement a service commencement and startup plan prior to the start of the Interim Operational Period (April 1, 2020). This ensured the smooth transition and effective management of the OM&R Services for the existing Preservation Centre during the Interim Operational Period.
- **Ongoing Maintenance and Life Cycle:** PPG must meet the performance requirements as outlined in the project agreement, for the maintenance and life cycle renewal of the Preservation Centre and the new Preservation Storage Facility. PPG will face deductions on monthly payments if they do not meet the performance obligations during the 32-year maintenance term.
- **Asset Hand Back:** Upon expiry of the 30-year maintenance term for both facilities, plus a two-year interim operational period prior to substantial completion for the existing Preservation Centre, PPG must hand back the facilities to LAC and PSPC in good working order within specific prescribed standards. Financial penalties can be levied if the asset condition does not meet the prescribed requirements. Of particular interest, is that the existing Preservation Centre will be more than 50-years-old at the time of this hand back.



COVID-19 Pandemic

Both the public and private sector partners involved in this project demonstrated resourcefulness while managing the unprecedented pandemic in 2020-2022. The project agreement included the possibility of a pandemic in the legal requirements under a supervening event. This helped the team navigate this complex situation and aided in the mitigation of risks, including unexpected site shutdowns, labour supply and availability constraints, onsite

procedure changes, extreme supply chain disruptions, inflation, etc., affecting both the construction of the new facility and the operations of the existing Preservation Centre.

Contract management throughout the pandemic required the team to stay abreast of the rapidly evolving context to ensure the latest health and safety recommendations were followed by the private partner. As a result, only one COVID case was reported on the construction site.

Table 2: Allocation of Key Responsibilities and Risks

Risk	Risk Bearer	Mitigating Measures
Construction Risks		
Schedule Overruns	PCL	PCL committed to taking risks associated with the project being complete by the Substantial Completion date. The commitments under the Construction Contract will be reinforced by a parent company guarantee and a letter of credit if it deems appropriate.
Cost Overruns	PCL	PCL committed to a fixed price contract based on the construction obligations laid out in the project agreement.
Equipment	PCL	PCL was responsible for the procurement, purchase and/or installation, commissioning and user training including the ASRS.
Management of Sub-trades	PCL	PCL has extensive knowledge of the subtrades in the local Ontario and Quebec market, and this enabled them to mitigate the risks of co-ordination and capacity. PCL mitigated the credit risk of the subtrades by utilizing sub guard or third-party bonding as it deemed appropriate.
Design Risk	PCL	This was retained by PCL who managed the risk in conjunction with the design team of B+H, Stantec and other specialty consultants (the Design Team). The mitigation of this risk started during the initial phases of the design development through the RFP process. The Design Team worked with the consultants, PCL, Equans, and Plenary to understand the detailed requirements of the Gatineau 2 project so that costly errors and delays were avoided later in the design process.
Permits, Licenses and Approvals	PCL/Plenary	PCL managed the permitting, licensing and approvals where necessary under the project agreement insofar as they applied to work within the site boundary and Plenary was responsible for the payment of any development charges applicable to the project.
LEED® Certification	PCL	PCL was responsible for managing the design process as it related to LEED® and for ensuring that the construction processes met the targeted points. Final certification risk lies with PCL.
Scheduling	PCL	PCL developed a schedule that was detailed and thorough and based on the government's timeline; drawing on experience from other projects on transition lead time requirements and experience from Equans and any external advisors.
Commissioning	PCL	PCL developed the commissioning plan through the design and construction period and managed the independent commissioning agent so that all systems were appropriately tested prior to substantial completion.
Transition		
Transition of Services	Equans	Plenary and Equans have significant in-house experience in managing facilities during the transition from construction to operations and transitioning the management of operations from existing facilities.

Risk	Risk Bearer	Mitigating Measures
Facilities Management		
Failure to Meet Output Specifications	Equans	PPG subcontracted all responsibility for facilities management performance services to Equans whose obligation to meet the output specifications is supported by a security package sufficient to senior lenders. Equans has been involved in a number of Alternative Finance and Procurement (AFP) projects and is familiar with the risks involved in these projects.
Asset Condition/ Equipment Maintenance and Life Cycle	Equans	Equans is responsible for both maintenance and life cycle replacement throughout the project term for both the existing Preservation Centre and for the PSF. Placing this dual responsibility and risk with a single party motivates Equans to strike the proper balance between continued maintenance and product/system replacement.
Cost Increases	Equans	Equans is a financially robust corporation and has taken the risk of facility management services cost increases over the 32-year operating period in accordance with the terms of the project agreement.
Timing of Life Cycle Replacement	Equans	Timing of the life cycle replacement has been passed to Equans and they will fund necessary expenditure if this occurs prior to the agreed payments.
Renovation of Existing Facility	Equans	Equans is responsible for the shelving optimization renovation project in the existing Preservation Centre.
Project Co Risks		
Legal Risk	Plenary	Plenary took the risk of the co-ordination of the suite of legal documentation. This documentation was developed with the AFP process in Canada and has been through due diligence processes on numerous occasions.
Financing Risk	Plenary	Plenary and PCL to the extent it exercises its equity option, were responsible for arranging the required financing. This risk was mitigated through fixed rate funding agreements with its debt providers and with contractually committed equity.
RFP Bid Costs	PCL/Plenary	Plenary and PCL were responsible for ensuring the adequacy of funds available for RFP bid costs.
Project Authority Risks		
Supervening Events	LAC	To mitigate this risk, LAC ensured that the Project Agreement included language related to risk allocation and processes for Supervening Events. When an event arose, LAC met with the Private Partner in the very stages to ensure a mutual understanding.
Latent Defects Affecting the Existing Preservation Centre	LAC	For the existing facility, LAC mitigated the risk by carefully drafting and reviewing the definition of Latent Defect based on various scenarios to ensure that risks would be allocated properly. LAC also shared a list on ongoing projects during the bid period to ensure there would be no surprises for the Private Partner. Latent Defects are not applicable to the new facility.
Collection Moves In Line with PPG's Schedule	LAC	LAC accepted the risk of retaining responsibly for ensuring collection material was moved out of the existing Preservation Centre. LAC mitigated the risk of impacting PPG's prescribed schedule for the shelving optimization work by relying on in-house experience gained from previous collection moves as well as contracting a move company to provide physical support.

Benefits

Cost Savings/Value-for-Money

The Procurement Options Analysis (POA) completed in 2017 on behalf of Library and Archives Canada (LAC) confirmed the Design-Build-Finance-Operate-Maintain (DBFOM) model best met LAC's qualitative and quantitative needs and delivered the most Value-for-Money (VfM).

Based on the qualitative and quantitative analysis, the DBFOM model was identified as the preferred delivery model compared to the DBB model. The DBFOM model had the greatest ability to transfer risk and provide performance, cost and schedule certainty. Furthermore, the DBFOM model generated positive VfM relative to the DBB model: 8.2 per cent or \$46.5 million (NPV), based on the quantitative analysis.

An additional VfM assessment was completed in 2020, after financial close, and found an increased total savings to the Government of Canada in the amount of \$57.6 million, likely the result of a well-managed competitive procurement process.

Local Community Benefits

The project constituted a significant capital investment that strengthened the economy through local and regional job creation during construction of the facility. In 2018, a study conducted on behalf of LAC looked at the economic impact of the project on the City of Gatineau and the Province of Québec.

- Based on direct, indirect and induced costs, it was estimated that every dollar invested in the project's development and construction would support \$0.83 in GDP (Gross Domestic Product) contribution to the Québec economy, of which \$0.64 in GDP would contribute to the Gatineau economy.
- This translated to an estimated 1,310 full-time equivalents (FTE) across Québec during the construction phase, with an estimated 1,015 FTEs in the City of Gatineau. More than 400,000 total worker hours were recorded for the project during the construction period.
- Over the 30-year operational period for the new Preservation Storage Facility and the existing Preservation Centre, it is estimated that:

- Operation and maintenance activities will create or sustain 47 FTEs across Québec and 37 FTEs across the City of Gatineau.
- Rehabilitation activities will create or sustain 730 FTEs across Québec and 570 FTEs across the City of Gatineau.

The construction, operations and maintenance, and rehabilitation activities required by the project will result in a remarkable and long-lasting boost to the local economy.

Environmental and Social Benefits

Greening Elements

The new Preservation Storage Facility was designed to meet the requirements of the federal government's 2017 *Greening Government Strategy*, which sets a target to reduce greenhouse gas emissions from federal operations with an aspiration to be carbon neutral. It is the first federal government building constructed to meet the strategy's net zero carbon requirements.⁸

In 2022, the Gatineau 2 project achieved Leadership in Energy and Environmental Design (LEED®) Gold Certification.⁹ The project also has a requirement to maintain BOMA Best Gold certification throughout the project term.¹⁰

To achieve Gold Certification rather than the required LEED® Silver, Plenary Properties Gatineau (PPG) targeted four credits that affected the landscaping design:

- The Reduced Parking Footprint credit was achieved by providing the minimum parking required by the City of

⁸ In terms of the Greening Government Strategy, net zero carbon is a condition where carbon-free renewable energy sources for the day-to-day operations of a facility are used to reduce the annual greenhouse gas (GHG) emissions to almost zero. Only small amounts of GHG emissions (5.4 tonnes per year) are permitted to account for the residual emissions associated with a very low carbon electricity grid. The net zero carbon requirement, combined with a strict energy target, will ensure design innovation and energy performance.

⁹ LEED® is an international symbol of sustainability excellence and green building leadership. LEED® Certification helps to promote lower carbon emissions and conservation of resources by prioritizing sustainable practices.

¹⁰ BOMA BEST Sustainable Buildings certification recognizes excellence in energy and environmental management and performance in commercial real estate.

Gatineau and designating five per cent of the spaces as preferred parking for carpools.

- Light-coloured pavers used in selected site areas are effective at reflecting solar heat and will grant the Heat Island Reduction credit.
- By pursuing the Light Pollution Reduction credit, PPG ensured site lighting does not disrupt nocturnal ecosystems by reducing light trespass, glare and sky glow.
- The project also obtained the Outdoor Water Use Reduction credit by selecting drought-tolerant native species for the landscaping, which minimize outdoor water use by eliminating the need for an irrigation system.

Respectful, Minimalist Design

Determination of the best design for new Preservation Storage Facility was guided by LAC's requirements and Authorities Having Jurisdiction, including the National Capital Commission approval process.

The facility is designed to complement but not compromise the iconic image of the existing award-winning Preservation Centre. The minimalist design is also respectful of the cultural and natural heritage of the site.¹¹

A high-water table at the site meant the original PSF building design had to change, with more height added. The team also adjusted the orientation of the new building, rotating it 45 degrees and placing it 20 metres away from the existing Preservation Centre to maximize natural light into the fifth floor of the centre where workshops and labs are located. The building design also maintains the Preservation Centre's northern facing views.

Site limitations

In addition to the high-water table, the consortium also had to contend with site limitations to protect a population of protected Western Chorus Frogs and an easement for a Hydro Québec project to modernize the 120kV line that passes through the Gatineau Preservation Campus site, which meant there was minimal circulation, storage of material or work possible within the limits of the easement.



The Western Chorus Frog, a species protected under the *Species at Risk Act*, has established habitat on the Gatineau Preservation Campus. In 2018, a ministerial order was issued by Environment and Climate Change Canada (ECCC) to protect the frogs.

Design and construction elements were incorporated to preserve the frog's habitat. The landscape design uses low-lying shrubs and a small number of trees to ensure minimal disruption. The installation of construction fencing was also timed to avoid mating and migration time periods, and sediment barrier fences were installed around work areas to prevent frogs from entering the work site.

During the operational period, staff and subcontractors are aware of the species at risk on site and are familiar with appropriate procedures and reporting requirements. Grass will be cut to a minimum height of 10 centimetres to 15 centimetres between the months of May and November to reduce injury or death to the frogs. Pesticides, herbicides and fertilizers will also be avoided where runoff is directed to the frog habitat.



Construction was limited to the zones (identified in orange) to limit the impact of new construction on the frog habitat.

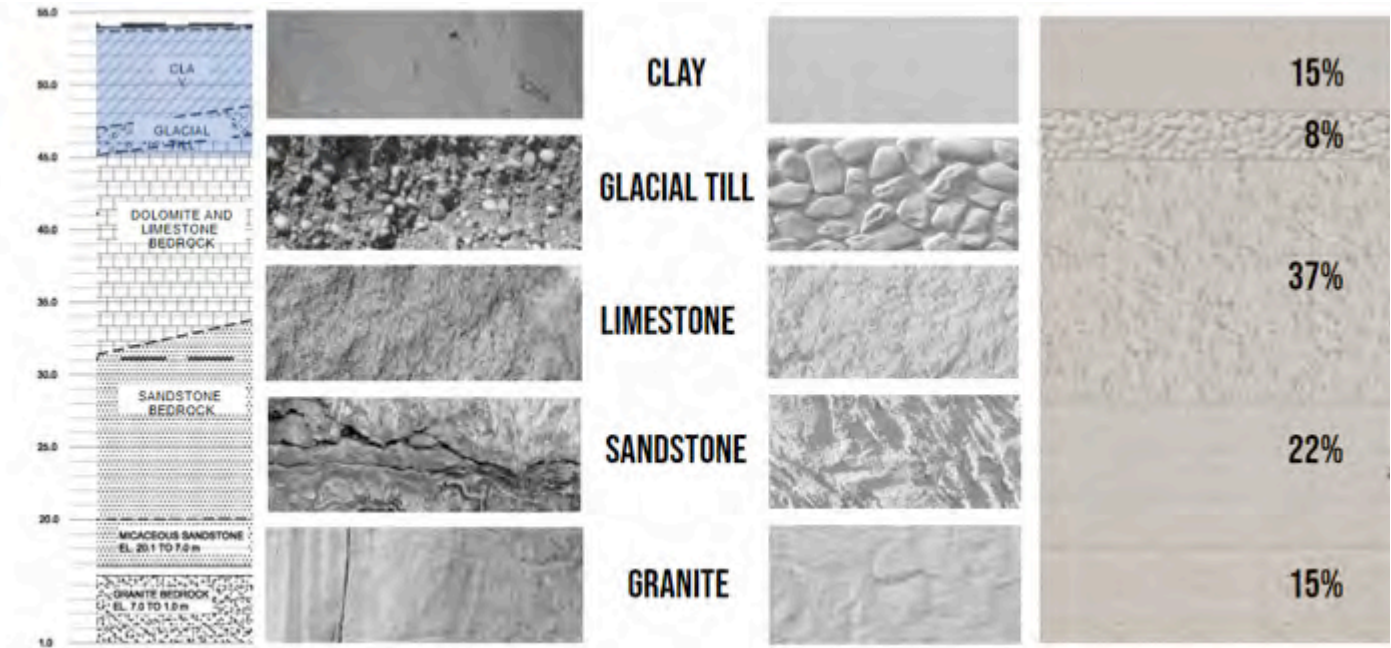
¹¹ Thorough plans for environmental management and erosion/sediment control, ecological and archeological mitigation measures were implemented throughout construction.

Photo Credit: Scott Gillingwater

Precast concrete panel exterior

The precast concrete panels on PSF's exterior façade are inspired by the site's geology. The different textural patterns on the precast concrete panels are meant to resemble the site's subsurface of clay, glacial till, sandstone, limestone and granite.

The designs were developed with the Carleton Immersive Media Studio from the Carleton University Research Centre, using computer software to generate 3D digital profiles used to cast the molds.



The concrete panels on the exterior façade have various textural designs (right) that proportionately mimic the geological layers found beneath the site, including clay, glacial till, sandstone, limestone and granite (left).

Landscape design

The landscape design allows the community to take advantage of open spaces and learn more about the facilities and the surrounding site, including Indigenous origins, local wildlife and vegetation, through the Interpretive Trail.

The path is well used by members of the local community and has helped to weave the new Preservation Storage Facility into the fabric of the overall Gatineau Preservation Campus.



Communications

Between the Partners

From the onset, multi-stakeholder opportunities for timely meetings were put forth through the governance committees and other ad hoc sessions with various project members and stakeholders from government and the project consortium. These meetings helped ensure a mutual understanding of all the intrinsic elements of the project, namely design, construction and facility management. The frequency of meetings helped in having clear communication channels between all parties during the ensuing critical phases.

A weekly meeting of primary contact persons was established to discuss all aspects of the project including, but not limited to process, procedures, schedules and strategies.

A Partnership Committee was established as part of the project agreement governance and is in place for the duration of the project term. This committee promotes a productive, collaborative, and cooperative relationship in respect of the project and the

administration of the project agreement between the parties. It is anticipated that the role and mandate of the Partnership Committee will evolve throughout the project term, based on needs. As a result, the members of the Partnership Committee shall periodically review and agree on the scope of mandate of the Partnership Committee. Partnership Committee meetings are held annually and contribute to effective communications across the project team, including current issue resolutions, lessons learned and strategy.

At the beginning of the design and construction phase, a partnering session with members from both Library and Archives Canada and Plenary Properties Gatineau, including consultants and Public Services and Procurement Canada representatives that were working closely with LAC, was held to help all parties understand each other's role in the project and alleviate any issues that could arise over the course of time. A subsequent partnering session was held specific to the OM&R phase of the project, which provided an opportunity to review issues as a group, align on next steps and review lessons learned together resulting in a strengthened relationship and proactive issue resolution and decision making.



The groundbreaking was attended by dignitaries and media in 2019.

With the Public

Library and Archives Canada held a number of public media events on the project to launch awareness and provide updates on progress, including a joint ground-breaking ceremony on the grounds of the future preservation facility on August 12, 2019, which was well attended by dignitaries and media. Social media posts and news releases were also developed and posted.

During construction, PPG and LAC also developed a public website (www.preservationgatineau.com) that provided Canadians with all the details of the project along with up-to-the-minute updates on the building progress with a live webcam onsite. The website also invited members of the public to sign up to receive email updates about the project and an email address and telephone hotline were available to receive public comments/inquiries.

LAC also developed its own section for the project on its main website.¹² The section contains details pertaining to the project, including the design and the project objectives.

PPG and LAC also developed communication plans for each of the different phases of the project: Design and Construction, Interim Operational Period and the Operational Period.

Dispute Resolution

No disputes have occurred as of the time of publication in March 2024. Moreover, Library and Archives Canada has implemented a structure to mitigate disputes and address issues at the root. If a dispute was to arise, the project agreement clearly defines the mechanisms to resolve it.¹³

Performance Monitoring

To provide an effective framework that clearly defines roles and responsibilities as well as decision-making process during the delivery of the project, Library and Archives Canada developed an Integrated Governance structure which combined two streams of governing mechanisms, the Internal Project Governance and the Project Agreement (PA) Governance. Both were established to support the delivery of LAC's Gatineau 2 Project and minimize risks associated with timely decision-making. The Integrated Governance also defined the framework for monitoring, reporting and payments based on prescribed performance.

To mitigate risks, the decision-making process developed and implemented supported compliance with the approval and review process as prescribed in the project agreement throughout the design, the construction and preparation phase prior to the interim operational period.

For the Gatineau 2 Project, failure points will be awarded for every quality failure, service failure and availability failure that occurs during the interim operational period and operational period.

Due to the critical and important functionality of the ASRS for the Gatineau 2 Project, a new quality failure category, the ASRS Quality Failure, was introduced to this project.

Lessons Learned

Structured Governance

An approved governance with clear roles, responsibilities and accountability is key in the delivery of a successful project. The structured governance model used on this project ensured ongoing consultation with key stakeholders and collaboration throughout the design and construction period. Roles and responsibilities among all teams were made clear from the outset and partnering sessions established the basis for honest and transparent communications between all parties. Plenary Properties Gatineau and Library and Archives Canada remained respectful and professional while having difficult and challenging discussions. Project success was always the common goal of our partnership.

Team Approach to Permitting

During the preferred proponent period, Library and Archives Canada advanced certain permits that had seasonal impacts, even though permitting risk was ultimately the responsibility of Plenary Properties Gatineau. Once financial close was achieved, the private sector took over the permitting that had commenced.

This team approach to a risk that affects all parties provided crucial lead work on a time sensitive permit and showed that working as partners for the success of the project, and not always sticking to contract terms, is sometimes necessary and beneficial for success. In this case, it provided significant upfront assurance that project schedules would not be jeopardized.

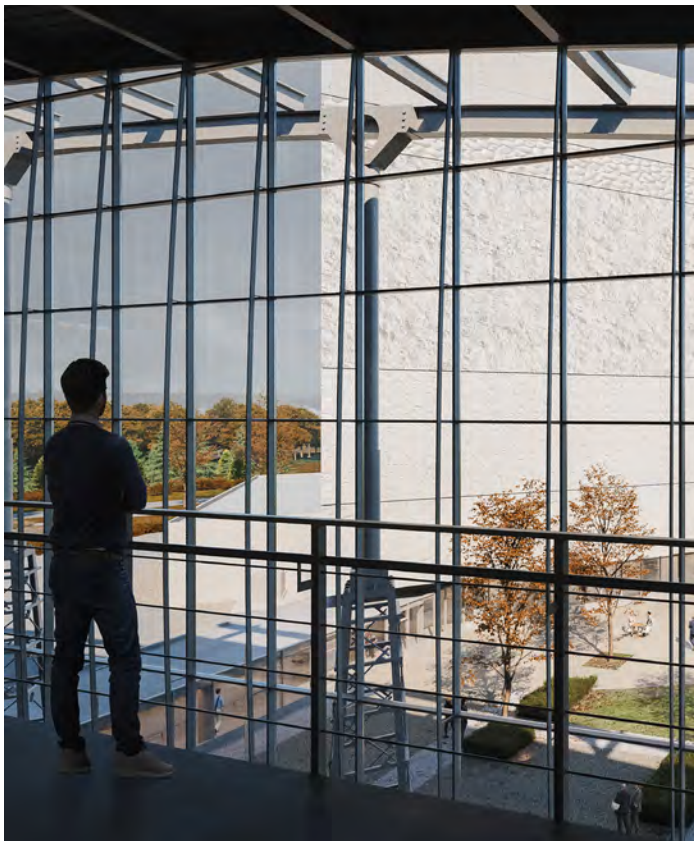
¹² <https://library-archives.canada.ca/eng/corporate/about-us/building-projects/new-preservation-facility/Pages/new-preservation-facility.aspx>

¹³ Nathalie Ethier, Acting Director General, Real Property Branch, Library and Archives Canada, discussed collaboration and partnership at P3 2024.

View video of panel: <https://www.youtube.com/watch?v=01Y6i1dtLws>

Prioritizing the Partnership

During the operational phase of the project, the project's sustained success hinges on the overall health of the partnership between the PPG and LAC. Over the next 30 years, this focus on the relationship becomes increasingly crucial, as it not only ensures the efficient management of the project but will also foster innovation and adaptation to evolving needs. Recognizing the significance of this aspect, PPG and LAC continue to be dedicated to maintaining open lines of communication through regular meetings (both informal and formal). These meetings serve as important forums for transparent dialogue, allowing the stakeholders to address challenges proactively, promptly and make informed decisions.



Public Sector Contact

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Concluding Comments

As one of the first federal government vertical infrastructure P3s, the Gatineau 2 Project has set the bar for future federal P3 projects and is an excellent example of how a P3 should be planned and delivered to provide the best value for Canadian taxpayers. The project was delivered on time, on budget and with limited changes to its original design despite numerous challenges faced along the way.

Choosing the P3 model was the best way to ensure the Government of Canada would receive a sustainable, reliable and highly efficient facility to provide long-term storage and preservation of textual records and archives of national importance.

Throughout the construction period, the team prioritized effective and proactive communication through formalized meeting structures, ad hoc and weekly informal catchups as well as biweekly communications meetings.

Library and Archives Canada and Plenary Properties Gatineau worked seamlessly to successfully navigate an unprecedented pandemic that included unexpected site shutdowns, labour supply and availability constraints, onsite procedure changes, extreme supply chain disruptions, inflation, etc., affecting both the construction of the new facility and the operations of the existing Preservation Centre. In fact, PPG successfully transitioned and became responsible for the operations of the existing Preservation Centre in March/April 2020, right as the pandemic started to wreak havoc on economies around the world.

Throughout it all, professionalism, respect, a steadfast commitment to partnership and pride in the project meant that the private and public sector members continuously found opportunities for mutual success.

LAC's Gatineau 2 Project has set a new benchmark for federal public-private partnerships in Canada and state-of-the-art archival facilities worldwide.

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Appendix: CCPPP's National Award Case Studies 1998–2022

Broadband

Accelerated High Speed Internet Program, Ontario (2022)

Defence

Communications Security Establishment Canada Long-Term Accommodation Project (2011)

Education

P3 Schools Bundle #2, Alberta (2022)

Quad at York University, Ontario (2018)

Saskatchewan Joint Use School Projects (2015)

Alberta School Alternative Procurement – Phase 1 (ASAP I), Alberta (2010)

O'Connell Drive Elementary School, Nova Scotia (1998)

Energy

Energy Services Acquisition Program (ESAP)/Energy Service Modernization (ESM) Project, Ottawa–Gatineau (2020)

Fort McMurray West 500-kV Transmission Project, Alberta (2018)

John Hart Generating Station Replacement Project, B.C. (2014)

Britannia Landfill Gas to Electricity Project, Ontario (2005)

Vancouver Landfill Gas Cogeneration Project, B.C. (2003)

Bruce Nuclear Power Facility, Ontario (2000)

Waterloo Landfill Gas Power Project, Ontario (2000)

Government Services

Gatineau 2, Library and Archives Canada (2022)

Archives of Ontario – Offsite Archival Storage (2006)

Cook Chill Food Production Centre, Ontario (2005)

DriveTest: Ontario Driver Examination Services (2004)

Transforming the Delivery of Ontario's Social Assistance System (2003)

Emergency Service Mobile Communications in Ontario (2000)

Electronic Child Health Network, Toronto, Ontario (1999)

Teranet, Ontario (1998)

Health

Cortellucci Vaughan Hospital, Ontario (2021)

New Oakville Trafalgar Memorial Hospital, Ontario (2016)

Humber River Hospital, Ontario (2015)

BC Cancer Agency Centre for the North and Fort St. John Hospital & Residential Care Project, B.C. (2012)

Centre Hospitalier de l'Université de Montréal Project (2012)

Glen Campus – McGill University Health Centre, Quebec (2010)

Women's College Hospital Redevelopment Project, Ontario (2010)

Royal Jubilee Hospital Patient Care Centre, B.C. (2009)

VIHA Residential Care and Assisted Living Capacity Initiative, B.C. (2007)

Abbotsford Regional Hospital and Cancer Centre, B.C. (2008, 2005)

Facility Management for the Royal Ottawa Health Care Group, Ontario (2000)

Devonshire Care Centre, Alberta (2000)

Shaikh Khalifa Medical Centre, United Arab Emirates (2000)

IT Infrastructure

Connecting Small Schools in Newfoundland (2003)

Justice & Corrections

Forensic Services and Coroner's Complex, Ontario (2016)

Okanagan Correctional Centre, British Columbia (2015)

Elgin County Courthouse, Ontario (2014)

Ontario Provincial Police Modernization Project (2013)

Surrey Pretrial Services Centre Expansion, B.C. (2011)

Durham Consolidated Courthouse, Ontario (2007)

Central North Correctional Centre, Ontario (2002)

Five Corners Project, B.C. (2002)

Real Estate

Aurora College Family Student Housing, Northwest Territories (1999)

Legislative Chamber, Offices and Housing, Nunavut (1999)

Recreation & Culture

L'Adresse symphonique, Quebec (2011)

SHOAL Centre: Seniors Recreation Centre, B.C. (2004)

John Labatt Centre, London, Ontario (2002)

Skyreach Place, B.C. (2000)

Social Housing

Single Room Occupancy Renewal Initiative Project, B.C. (2013)

Transportation

L.F. Wade International Airport Redevelopment Project, Bermuda (2021)

Valley Line West LRT, Alberta (2021)

Waterloo LRT ION Stage 1, Ontario (2020)

Regina Bypass, Saskatchewan (2020)

Gordie Howe International Bridge Project (2019)

Stoney CNG Bus Storage and Transit Facility, Alberta (2019)

Tłı̨chǫ All-Season Road Project

North Commuter Parkway & Traffic Bridge Replacement, Sask. (2018)

Iqaluit International Airport, Nunavut (2017)

Southwest Calgary Ring Road, Alberta (2016)

Disraeli Freeway and Bridges Project, Winnipeg, Manitoba (2012)

Canada Line, B.C. (2009)

Confederation Bridge, PEI (2009)

Highway 407 ETR, Ontario (2008 & 1999)

Autoroute 30, Montreal, Quebec (2008)

Northwest Anthony Henday Drive, Alberta (2008)

William R. Bennett Bridge, B.C. (2008)

Autoroute 25, Montreal, Quebec (2007)

Kicking Horse Canyon Project –Phase 2, B.C. (2007)

Golden Ears Bridge, B.C. (2006)

Anthony Henday Drive Southeast Leg Ring Road, Alberta (2005)

Sea-to-Sky Highway Improvement Project, B.C. (2005)

Sierra Yoyo Desan Resource Road, B.C. (2004)

Fredericton–Moncton Highway Project, New Brunswick (2003)

Belledune Port Authority, New Brunswick (2000)

Retendering Alberta's Highway Maintenance Contracts (2000)

Cobequid Pass Toll Highway, Nova Scotia (1998)

Water, Wastewater & Biosolids

Calgary Composting Facility, Alberta (2017)

City of Saint John Safe Clean Drinking Water Project, New Brunswick (2017)

Regina Wastewater Treatment Plant Upgrade Project, Saskatchewan (2014)

Biosolids Management Facility, Sudbury, Ontario (2013)

Britannia Mine Water Treatment Plant, B.C. (2006)

Goderich Water and Sewer Services, Ontario (2000)

Port Hardy Treatment Project, B.C. (2000)



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