Crystal Pool and Wellness Centre (CPWC) Feasibility Study

Report for
City of Victoria

Date
May 30, 2024

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CITY OF VICTORIA

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Land Acknowledgment

The City of Victoria is located on the homelands of the Songhees Nation and Esquimalt Nation.

The team at large

Thank-you to the below key stakeholders that provided input and direction throughout the study.

The City of Victoria Project Team

Derrick Newman - Acting Director, Parks, Recreation and Facilities

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The City wishes to thank all community members and stakeholders who took part in the public engagement processes for this project.

This study was supported by and includes findings from:

RC Strategies , who provided input on operating impacts of a new facility.

Fast and Epp - Structural, who provided design input on structural aspects of design.

AME - Mechanical, who provided design input on mechanical aspects of design.

AES - Electrical, who provided design input on Electrical aspects of design.

WATT Consulting, who provided input on parking and traffic impacts of the report.

Evoke Buildings Engineering, who provided facility condition assessment update of the existing Crystal Pool and Fitness Centre

Talmack Urban Forestry - who provided demolition impact and construction impact assessments on the urban forest for each site option.

Turnbull Construction Project Managers was engaged by **City of Victoria** to provide a Community Impact and Service Continuity Assessment Report.

Infrastructure BC was engaged by **City of Victoria** to provide input on qualitative risk analysis.

Advicas Group Consultants Inc. and LEC Group were the professional quantity surveyors for this project and provided capital cost estimates and inputs.

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Executive Summary

A new Crystal Pool and Wellness Centre for Victoria!

In 2018 City of Victoria Council approved the planning of a new facility to replace the aging Crystal Pool and Fitness Centre. The project was put on pause at the onset of the COVID-19 pandemic in 2020. This feasibility study is in response to City Council making a motion in February 2023 for staff to **report back on the implications of reviving the process of planning and budgeting for a new recreation and aquatic centre.** Two distinct scopes of review are contained in this report.

1 Staff were asked to identify changes to the construction costs so that the **public's willingness to borrow the capital funds requisite to build a new recreation and aquatic centre** can be ascertained through a binding referendum.

Conclusion

The construction costs and project budget for the new facility have increased since they were determined in 2017. The largest impact is due to unprecedented construction cost escalation in the last six years due to labour shortages and significant material increases arising from construction demand in the local market and exasperated by the COVID-19 pandemic. Additional budget costs were incurred with the addition of underground parking in response to Council direction in 2019 to ensure no net loss of green space. Lastly, changes to building code and energy regulations are requiring more robust building systems to meet set targets which results in increased costs.

2 Staff were tasked with identifying and assessing 2 to 4 sites within or adjacent to the North Park Neighbourhood, on City-owned land, to be considered as the preferred location for the new facility in a non-binding referendum.

Conclusion

Three sites were identified and then assessed for their suitability for the new facility: Central Park North, Central Park South and 940 Caledonia Avenue. Opportunities and constraints of each site have been identified and the assessment shows the two Central Park site options are preferable to the Caledonia site option. A quantitative assessment identifies differences in total project budgets between the three site options. A final evaluation of the qualitative assessment, the quantitative assessment as well as the outcomes of a multi-site construction delivery assessment, by Turnbull Construction Project Managers, ranks Central Park North highest, or most favourable, of the three site options.

(Renderings above and left) Conceptual visualizations of the new facility

1 - Introduction

The existing Crystal Pool and Fitness Centre was built in 1971 and is no longer able to meet the needs of Victoria's growing population. Many of the building's components are at the end of their life and the facility is the largest emitter of greenhouse gases of city-owned properties.

As the City of Victoria's only public pool and a provider of a wide range of public programs, this facility provides an important service to residents and visitors in Victoria. Replacing this facility will ensure that it continues to meet the community's social, health and wellness needs for years to come.

This Feasibility Study report seeks to inform the replacement of the Crystal Pool with a new high-quality facility that is climate-resilient, inclusive and accessible.

There are a very limited number of publicly-owned sites large enough to accommodate a new facility that are located within or immediately adjacent to the North Park Neighbourhood and available to the City for development.

The three options selected by City staff, being considered are:

- **Central Park North** replacing the existing facility on the same site.
- **Central Park South,** location of the playgrounds and sport courts, also identified as the preferred location in the 2017 feasibility study.
- **940 Caledonia Avenue**, a public parking lot serving daily and special event needs. Currently, a portion of this site is occupied by Caledonia Tiny Homes Village.

2017
Feasibility Study and Report

2018
Schematic Design Phase and Report

2019
Design Development Phase

2019
Direction to review other sites

2020
Project put on hold due to COVID-19

2023
Feasibility Study Development

2024
Feasibility Study and Report

Crystal Pool and Fitness Centre has been serving the Community since 1971

1a - Background and Policy Direction

Replacement of the Crystal Pool is consistent with objectives and goals outlined in the City's Official Community Plan:

> *9.15 - Seek innovative options and mechanisms to upgrade and provide new sports and recreation, equipment, infrastructure and facilities, including for the Crystal Pool and Fitness Centre and the Royal Athletic Park.*
>
> *14.7 - Support innovation and reinvestment in community assets that attract investment and support economic activity, and that address barriers to economic performance, including, (....) arts and culture, parks and public spaces, recreation facilities, (....) and green infrastructure.*
>
> *21.20.1 - Renew citywide recreational facilities at Crystal Pool and Royal Athletic Park and explore opportunities for diverse public uses.*

An earlier feasibility study for the replacement of Crystal Pool was completed in 2017 upon which Victoria City Council approved a project budget of $69.4 million to replace the facility. As the project progressed through schematic design, a functional program was developed with broad public input. The program included a fully accessible, inclusive and energy-efficient building with multiple pool tanks, expanded fitness areas, inclusive changerooms and multipurpose rooms to accommodate 35% more visits than the existing facility.

In January 2019 a Draft Design Development Report was being developed for City staff. Concurrently, Council directed staff to develop a new plan to revisit the objectives, scope and schedule of the project to ensure it aligns with the new Strategic Plan of the city. This included the evaluation of the project through the following aspects for Council's consideration:

- Ensure no net loss of green space in the neighbouring area
- Apply an equity lens to siting, design, amenity selection, engagement, procurement, and evaluation, to inform decisions about and investment in community
- Apply an affordability lens to assess total cost of ownership, siting, amenity selection, operating costs, costs to taxpayers and users
- Invite potential partners and neighbourhood representatives to collaborate to align and help achieve these equity, accessibility and affordability objectives
- Embed distributional, procedural, structural and inter-generational equity into the City's corporate policies guiding hiring, staff training and professional development, procurement and civic engagement
- Report back to Council on potential locations in the North Park and Hillside / Quadra neighbourhoods

The project team were completing a range of additional studies to evaluate possible alternate sites to locate a replacement Crystal Pool, when in April of 2020 Council directed the project be placed on hold due to the COVID-19 pandemic.

In February 2023, Council approved the following motion:

> *THAT Council direct staff to report back on the implications and procedures for the following:*
>
> *a) Reviving the process of planning and budgeting for a new recreation and aquatic centre;*
>
> *b) Organizing a public referendum for the voters of Victoria at the earliest possible time to include two questions:*
>
> *1. A binding question: The public's willingness to borrow the capital funds requisite to build a new recreation and aquatic centre;*
>
> *2. Non-binding public input: The location and features of a new recreation and aquatic centre.*
>
> *c) Identifying between two and four sites for the recreation and aquatic centre, to be listed as options on the referendum, taking account of all the following:*
>
> *1. that the locations be situated within or immediately adjacent to the North Park neighbourhood;*
>
> *2. that the options provide voters with a high-level understanding of potential or expected costs, features, and impacts;*
>
> *3. that staff apply a climate, equity, and accessibility lens to the project;*
>
> *4. that the options account for impacts on workers;*
>
> *5. that the options include community amenities and aquatic features, as outlined in the functional program previously presented to Council;*
>
> *d) Seeking and obtaining funding from partner governments to offset or minimize the capital costs of constructing a new recreation and aquatic centre.*

The feasibility study, as summarized in this report, addresses the scope identified in the above Council motions and as described in the Scope of Work below.

1b - Equitable and Sustainable Design

The new Crystal Pool and Wellness Centre aims to be a place where everyone feels welcome. Achieving equitable social outcomes requires addressing various dimensions of equity including structural, distributional, procedural and intergenerational factors. Accessibility and inclusion are embedded in the project principles, *pages 18 - 19*, all aspects of the new facility's program, *pages 20-27*, and its future operation, *pages 28-29*.

With a focus on the intersectionality of needs of our communities, the new facility will promote all facets of physical, mental and social health and wellness, benefiting people of all ages, abilities, and backgrounds.

This feasibility study is aligned with the objectives of the City's Equity mandate objectives and incorporates sustainability goals set by out by Council.

Grandview Heights Aquatic Centre, sloping floor pool access

Social Sustainability

Implement an equity lens in site selection, design, planning, engagement, and procurement.

With the renewed commitment to equity, the City strives to ensure that everyone can equitably access and participate in the City's programs, services and spaces. Respecting Council's direction in February 2023, the sites selected for this feasibility study are situated within or immediately adjacent to the North Park neighbourhood. Community mapping efforts undertaken both through community and city efforts indicate that these sites are well positioned to serve residents and take into account demographic, socio-economic and other characteristics of the surrounding communities.

With meaningful access and universal design as guiding principles, the Crystal Pool and Wellness Centre seeks to consider all and everyone's entire experience. This focus extends beyond considerations for physical accessibility and includes mind-friendly environments, access to services, digital accessibility and beyond. The pursuit of the Rick Hansen Foundation's Accessibility Certification (RHFAC) and meaningful community engagement on facility's accessibility will inform decisions to enhance accessibility for all.

Financial Sustainability

Apply an equity lens to assess total execution costs, site selection, operational expenses, and the financial impacts on taxpayers and users.

Investing in a new Crystal Pool and Wellness Centre will ensure that individuals of all ages, abilities, identities, experiences and backgrounds will benefit from the enhanced services and programs offered through improved social infrastructure.

This feasibility study considers not only the typical hard and soft costs associated with construction, but also total execution costs informed by various construction implementation studies, operating scenarios, risk assessments, and impact studies. This work is summarized in both qualitative and quantitative (financial) assessments by a team of subject matter experts and professionals, ensuring that the project is economically viable while meeting its long-term sustainability goals.

Environmental Sustainability

Consider intergenerational dimensions of equity by assessing environmental impacts on current and future generations.

Guided by the City's Climate Leadership Plan, the new facility is a key component in achieving the city's environmental targets. The current facility accounts for approximately 40% of the City's total building greenhouse gas (GHG) emissions. A project-specific framework has been developed to guide sustainability strategies and building performance targets, aiming for CaGBC - Zero Carbon certification. The design of the new facility is also driven by preserving existing green spaces and minimizing impacts on the urban forest in the surrounding area.

2 - Scope of Work

This report investigates **three potential site locations** for a **new Crystal Pool and Wellness Centre** to inform a referendum on the borrowing of funds for project execution and a preferred site option.

In Section 3 - Basis of Design describes and clarifies all the elements that are equal for all three proposed options.

In Section 4 - Site Comparisons describes the elements, factors and impacts that differ from option to option based on the site attributes.

In Section 5 - Community Impacts, includes a summary of a multi-site construction delivery assessment undertaken by Turnbull Construction Project Management (and appended to this document). The assessment work undertaken reviewed project impacts holistically, identifying and measuring such factors as neighbourhood disruption, loss of community amenities, and added construction logistics relative to executing the project construction work at the three identified sites. It compares the three site options with regards to the impacts during the project development stage.

Section 6 Comparison of Options, concludes the report with a ranking of the site options considering cost, construction complexity and the findings of a qualitative assessment.

Three appendices are included with this report:

Appendix A - Crystal Pool and Wellness Centre Multi-Site Construction Delivery Assessment, prepared by Turnbull Construction Project Managers.

Appendix B - Qualitative Assessment. This section prepared by the Project Team qualitatively assesses and evaluates the criteria described in Section 4 of the report.

3 - Basis of Design

All three site options investigated in this study share common elements that are based on criteria established through extensive stakeholder and public engagement in earlier phases of this project.

3a. Project Principles
3b. Project Program
3c. Design Principles
3d. Operational Impact
3e. Vehicle and Bicycle Parking
3f. Review of Regulations
3g. Project Visualizations

3a - Project Principles

Five guiding principles guided the siting and design of each site option investigated.

1. **Accessible**
   Ensuring meaningful access to the facility and all its parts.
   - Among key considerations are:
     - fully accessible site circulation
     - front door, drop off and ease of access
     - multiple options to access each pool
     - level transitions throughout the facility
     - clear wayfinding
     - universally designed spaces

2. **Inclusive (All ages, Abilities, Identities and Experiences)**
   Creating a facility that caters to the needs of a range of different users.
   - Key considerations include:
     - spaces that can cater to programming for different age groups
     - large universal change space
     - creating a universal facility (excluding gendered change rooms)
     - culturally inclusive
     - universal design

3. **Efficient and Sustainable**
   Reducing energy usage and minimizing the carbon footprint of the new facility.
   - Strategies employed to achieve this include:
     - creating a high performing building envelope
     - using low carbon building systems for heating and cooling
     - designing an efficient mechanical system that reuses waste heat
     - reducing water consumption
     - considering alternate means of energy generation
     - using low-VOC materials

4. **High Quality Health and Wellness Facility**
   Creating a multi-use facility that accommodates a wide range of health and wellness activities.
   - This has been achieved by:
     - including multipurpose spaces that can accommodate various health and fitness activities
     - creating connection between indoor and outdoor spaces
     - designing a flexible aquatic configuration that can accommodate a range of programming

5. **Place for Community**
   Creating a facility that is welcoming and enables community-building.
   - Key considerations include:
     - creating a public lobby before the control point
     - including community focused multipurpose rooms
     - designing spaces that encourage informal and formal gathering

The Project Principles and Design Strategies diagram *(right)* is a result of extensive stakeholder and public consultation during the 2018 design phase.


COMMUNITY VOICES
PROJECT PRINCIPLES
DESIGN STRATEGIES
Accommodate those with non physical disabilities
Access for those who are aging
Improve security
Increase accessible parking
Consider needs of staff with disabilities
Way finding for those with vision challenges
Inclusive change rooms
Parking close to front door
Encourage sporting activities for girls
Provide privacy where required
Facilities for bicyclists
City of Victoria Climate Leadership Plan
Focus on low carbon building
Healthy materials
Maximize retention of trees
Operational efficiency
Energy efficient building
Water retention and conservation
Include opportunity for indoor sports
Don't lose the basketball court
Adequate space for therapy in leisure pool
Reduce the amount of chlorine
Good water and air quality
Water temperature for different users
Places for therapy and rehabilitation
Flexible programming
Include opportunity for food services
Safety getting across street
Places for gathering
Places for community events
Privacy for adjacent buildings
Carefully consider surface parking
ACCESSIBLE
INCLUSIVE
EFFICIENT and SUSTAINABLE
HIGH QUALITY HEALTH and WELLNESS FACILITY
PLACE FOR COMMUNITY
No split levels at each floor
Fully accessible for all users
Elevator access to upper level
Multiple means to access all pool tanks
Universal change rooms
Universal wayfinding
Crime prevention through environmental design
Universal washrooms
Change rooms exit adjacent to both pool tanks
High performance building envelope
Low carbon building systems
Balance of capital and operational cost
Waste heat transfer from dry land program to pool
Significant retention of mature trees
Natural light
Alternative energy solutions
Low voc materials
Views to the park
Flexible fitness area
Environmental separation of fitness from pool
Two hot tubs that may be kept at different temperatures
25m warm water lanes
Gymnasium style multi-purpose room
Outdoor patio adjacent to pools and fitness area
Movable floor and two bulkheads in main tank
Full lazy river
Expanded lobby and community spaces
Opportunity for future food vendors
Multiple options for pool viewing
Mix of community and active multi-purpose rooms
Landscape buffer to neighbourhoods

3b - Project Program

The project program is a summary of the spaces that will be provided in the new facility. It is a balanced combination of the requirements, uses, spaces, relationships and experiences that are to be included in the new facility for it to meet the Project Principles.

Each option consists of a lobby, administration, 2 multipurpose rooms and aquatic changerooms on level 1 along with a large double height natatorium space for aquatic programs. Level 2 includes a large open fitness studio, 4 additional multipurpose spaces, dryland change rooms and a viewing gallery into the natatorium. The building's basement houses the main service spaces of building and pool mechanical rooms, workshop, storage, and an electrical room. In addition, the lobby for each option has connection to a lower lobby and underground parking lot.

The following is a summary of the program, grouped into aquatic and dryland areas.

Aquatic Area

Important considerations for the aquatic program include the configuration of the pools, the relationships between various aquatic elements, their connection to the exterior and ease of access to each body of water.

Main Pool Tank

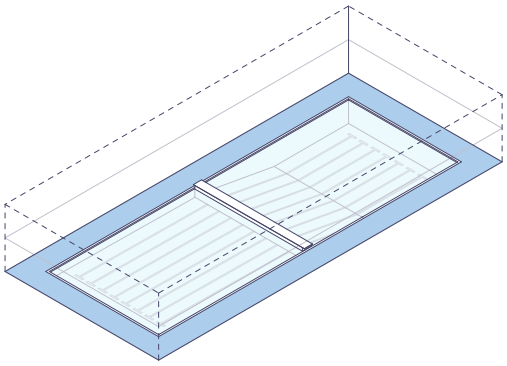
A 50 by 18.5 metre main pool tank with a single movable bulkhead located at the deep end of the main pool tank. The main pool tank includes lifts and a transfer bench for accessibility. Depths at the end of the pool tank have been set to allow diving options up to a 5-metre platform and deep water play features such as a climbing wall and rope swing.

Leisure Pool

The leisure pool area is made up of a 25-metre lane pool plus a leisure and play area. Its position in the corner of the natatorium provides a connection to the surrounding exterior environment.

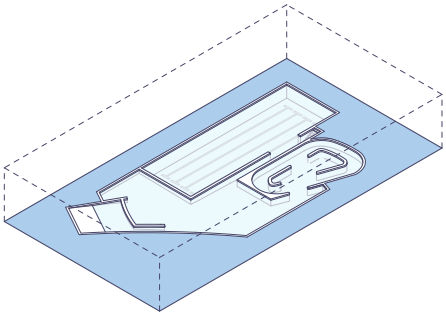
The 25-metre tank has been configured to accommodate a wide range of programming. Its movable floor allows swim lessons for different age groups and a range of therapy functions to be accommodated in this area. A hinged ramp and collapsible stairs provide access to the variable depth area within the warm lanes.

The leisure and play area includes a tot area with zero-depth entry and an enlarged zone for leisure activities that contains a range of water play features. A full lazy river is also included to accommodate play and



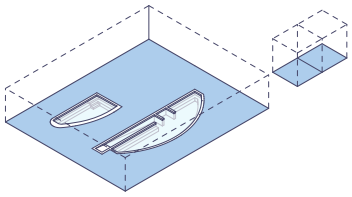
Main Pool Tank

- 18.5m x 50m tank, 8 lanes
- Movable bulkhead
- Deep end allows for up to 5m high dive board
- Double-height space



Leisure Pool Tank

- 8.5m x 25m tank, 4 lanes with movable floor
- Zero entry beach access
- Lazy river
- Water play features
- Double-height space



Wellness Amenities

- Large family hot pool with ramp and lift access
- Small hot pool
- Steam room
- Sauna

therapeutic functions. With the zero-depth entry, integrated ramps and lifts, the leisure pool provides seamless access for a range of abilities.

Hot Pools

The larger and cooler of the two hot pools is intended for a mix of play and therapeutic activities. Ramp and lift access has been provided for this hot pool.

A smaller and warmer hot pool is included for therapeutic and wellness activities. Its location provides separation from the active leisure zone and connection to the park and adjacent trees. A transfer bench and lift access are included for this hot pool.

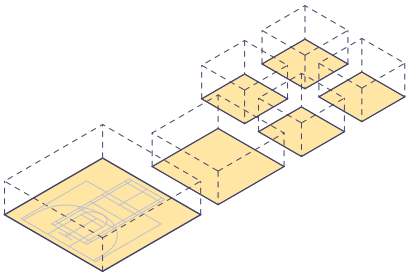
Steam and Sauna

Steam and sauna rooms have been planned with views to the exterior. Their proximity to the hot pools creates a wellness and therapeutic zone in the natatorium.

Other Spaces and Features

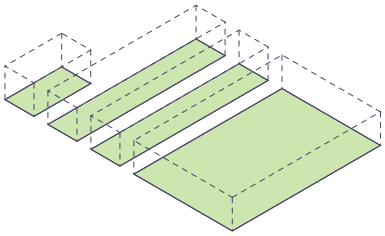
Aquatic storage occupies a large amount of the space within the natatorium. This has been located adjacent to the Main and Leisure pools to provide ease of access for play accessories and pool equipment. Bleacher seating has been integrated along the main pool tank for swim meets and events and a viewing area has been included at the upper level, overlooking the leisure pool.

3b - Project Program



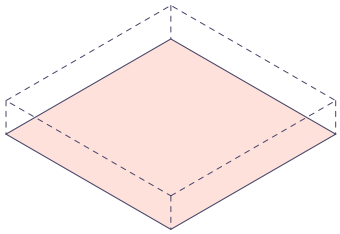
Multipurpose Rooms

- Half gym
- Dance/yoga studio
- Seniors room
- Aquatic multipurpose room
- Child minding room
- Art room



Changerooms

- Universal change
- Women's aquatic change
- Men's aquatic change
- Dryland Change



Fitness

- Cardio machines
- Strength machines
- Stretching / balls
- Fitness open area
- Consultation rooms

Dryland Area

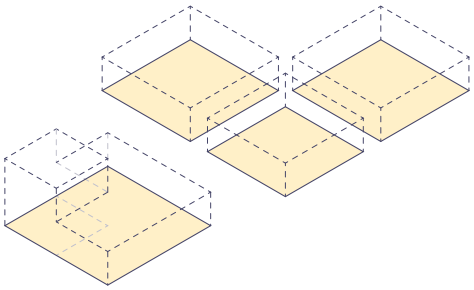
Important considerations for the dryland program areas include connectivity to the exterior, user experience, improving functionality, reducing circulation and simplifying wayfinding.

Reception, Lobby and Control Point

Users entering the lobby have a clear line of sight to both the reception and the pool area, creating a visual connection throughout the facility.

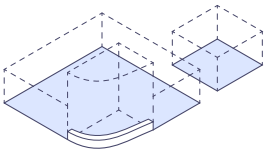
The desire to pull programs away from the exterior wall and enhance visual connection to the street and park resulted in the creation of an interior grouping adjacent to the main entry that includes multipurpose rooms, washrooms and administration areas. The zone between this interior volume and the exterior wall is occupied by the lobby, control point and primary circulation spaces. Beyond enhancing visual connectivity, this interior volume also serves as a significant wayfinding device between the lobby, natatorium, vertical circulation and other spaces at street level.

The lobby is located before the control point, creating a freely accessible gathering space that encourages community members to use the facility for social connection.



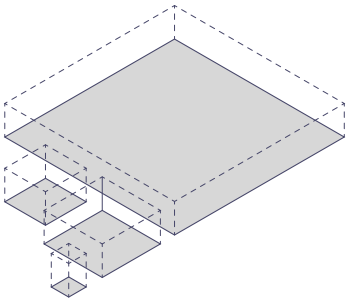
Lobby and Circulation

- Double-height space with visual connection levels 1 and 2
- Visual connection to natatorium
- Community living room
- Control point
- Accessible routes of travel to all building areas
- Tactile wayfinding to aid all users
- Clearly visible vertical circulation



Administration

- Reception
- Lifeguard station
- Admin meeting room
- Admin offices



Service Areas

- Loading Bay
- Pool Mechanical
- Building Mechanical
- Workshop

Change Rooms

Past the control point, a large universal change room and gendered change rooms accommodate the needs of a wide range of users.

The universal change room is a universal space meaning that all washrooms, shower stalls and dry change stalls are independent private units. Privacy measures have also been incorporated within the gendered change rooms to enhance inclusivity.

Fitness Area

The fitness area occupies a majority of the street facade on level 2 to maintain its role as an active beacon to the community and allow users to look out onto activity on the street below. The fitness area layout is designed to improve functionality and long term flexibility.

The fitness area is mostly located above lobby, circulation and changeroom space, mitigating concerns about the transmission of sound and vibrations to level 1 programs. An acoustically isolated floor system has been included to further reduce the passage of sound and vibrations to level 1 spaces.

Multipurpose Rooms

Recreation staff undertook a review of anticipated programming and recommended a series of different multipurpose rooms to accommodate current and projected needs of the community. Based on their recommendations, the following spaces have been included in the current designs.

3b - Project Program

- **Half Gym** - configured as a space for active recreation and large social gatherings with a sprung wood floor for active uses.
- **Dance/Yoga studio** - a smaller room with a sprung floor to accommodate dance and other active programs.
- **Seniors room** - designed to accommodate seniors programming including games, presentations and community lunches, located close to the entry for ease of access.
- **General multipurpose rooms** - located next to the pool area and suitable for wet activities including aquatic training and birthday parties.
- **Child minding room** - a small room that can be used for child minding and programming.
- **Arts room** - designed to accommodate arts programming.

All multipurpose rooms include storage for furniture and equipment required for their range of programs. Additionally, kitchenettes have been provided in the seniors room and the general multipurpose rooms to support anticipated uses.

Administration

The primary administration spaces are located at the corner of the building. This allows the public circulation spaces to occupy the edge of the building, increasing the visibility of activities and enhancing the indoor-outdoor connection.

Circulation Areas

Circulation areas were carefully reviewed through the design development process with the aim of reducing area, simplifying paths of movement and ensuring clear wayfinding. Primary vertical circulation elements including the main stair and elevator have been located at the corner of the building.

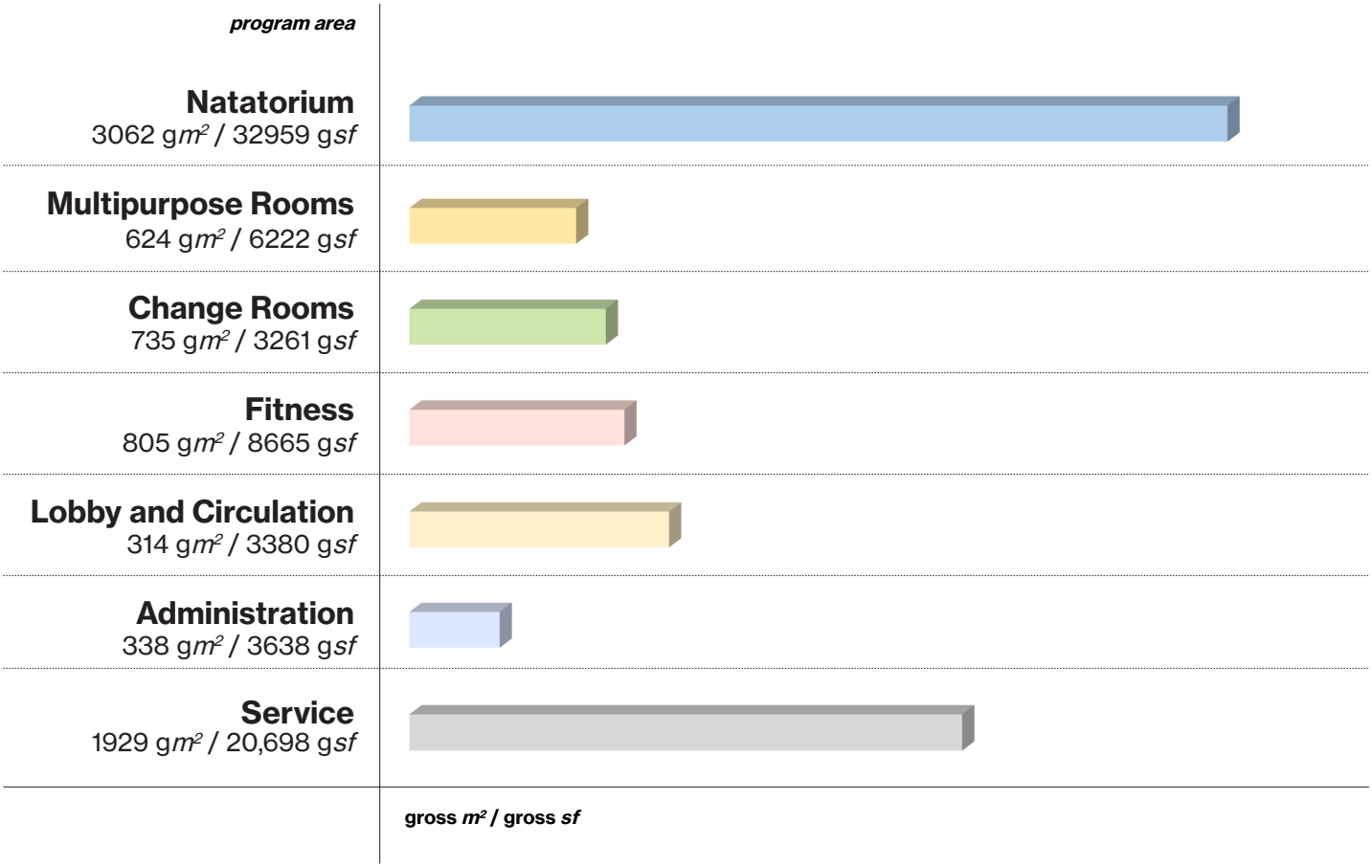
Vertical circulation elements are clearly visible to users moving through the control point at street level. As users arrive at level 2, they are situated at the head of the main circulation path that connects all level 2 programs. There is a simple and clear path through the building that connects all major program elements.

Tactile wayfinding and contrasting colours are being considered at all interior and exterior paths of movement to aid those with limited vision.

Service Areas

The basement contains most of the required service areas including mechanical rooms, electrical rooms, storage areas and a workshop. Additional loading, garbage and chemical storage areas are located at street level. Loading of chemicals and equipment will occur at street level and a mechanical lift or hoist will assist moving these to the basement when required.

An acoustically screened enclosure is also located on the roof that contains major mechanical equipment serving the natatorium and upper-level dry land programs.



Program Composition, This program results in a total gross area of 8520-8600m2.

3c - Design Principles

Design - Architectural

The design for each of option has been developed with the five Project Principles of the project, outlined in section 3a. All options have been designed to meet and exceed certifications from the Rick Hansen Foundation and CaGBC -Zero Carbon Building to meet goals for accessibility and sustainability.

The design for each option is similar with the prominent use of glazed curtain wall for the for the main building envelope material along with solid sections to reduce envelope costs. This creates a pavilion like structure that is characterized by simple and transparent vertical walls supporting a visually bold horizontal surface at the roof. Transparency ensures uninterrupted visual connections between the exterior and interior. The roof plane serves as a visual connector between the dryland and natatorium areas and as a unifying element for the entire design. To reach the goals for an efficient and sustainable building, high performance double glazing along with careful detailing is to be used to minimized thermal bridging. To mitigate unwanted solar gains, vertical fins are integrated into the curtain wall system along the east, south and west elevations. The desire is for a simple and clean building façade, as such the design will be carefully detailed to integrate all building components including structural elements, mechanical elements and solar control shades, along with the termination of finishes and interior elements.

Each option will accommodate an exterior entry plaza that allows for clear legibility of the main entrance and public lobby, with an opportunity for the public lobby to house a coffee shop or vending machines that can cater to both the lobby and the outdoor plaza area.

Each option will employ generous glazed facades surrounding the fitness and pool areas to enhance the user experience, showcase the many activities supported inside and attract the wider public. The glazed exterior also provides eyes on the street and an increased sense of safety for the immediate surrounding.

Design - Structural

The structural scheme for all options includes a concrete raft slab foundation bearing directly on bedrock at portions of the building and at other areas a raft slab supported on caissons depending on subgrade conditions. The pool tanks will be formed with concrete retaining walls supported by the raft slab below and support L1 suspended concrete slab. The cast in place concrete floor slabs of Level 1 and level 2 are supported by concrete columns and walls. The roof is a metal deck over steel beams and trusses.

With the adoption of the new BCBC-2024 in March 2024, the design that was developed during the Design Development phase in 2019 will need to be slightly updated. This is to meet the requirements for increased seismic force resisting systems. Conceptual analysis of future seismic loading requirements has resulted in relatively minor changes to building design and have been incorporated.

Design - Mechanical

The proposed mechanical systems are a crucial aspect in meeting the project principle of efficiency and sustainability. All 3 options will include the same mechanical components to substantially reduce the carbon footprint of the building in comparison to the existing facility and provide a zero-carbon-consuming facility. The mechanical systems will generally be housed indoors, in the basement to serve the building. To mitigate noise from air handling equipment on the roof to the surrounding area, it is proposed that these systems also be located underground and acoustically treated. One of the major components in reaching net-zero carbon impact is by using air-source heat pumps for HVAC and pool heating rather than using gas-fired boilers.

Design - Electrical

The building will only have electric power, allowing for all energy to be renewable and a zero-emissions building. The major component to this is the use of air-source heat pumps for HVAC and pool heating.

The power system is designed to address all anticipated future power requirements of the facility, with minimum 25% spare capacity. A 3-phase 25kV BC Hydro primary service into the property is required with an onsite transformer to step voltage down to 347/600 volts. In addition to the primary electrical service to the building a 250kW diesel generator would be included for emergency and standby power.

In an aim to reduce energy consumption of the building, all interior and exterior lighting will be LED. Occupant sensors will be used to control lighting automatically in all intermittently used areas. Additionally, the design of the building embraces the use of daylight to reduce energy consumption but also as a natural and healthy form of light to enhance the environment. All exterior lighting will meet illumination requirements for creating a safe outdoor space at night for pedestrians and the community. Exterior lighting will also ensure the elimination of light pollution by minimizing light spillage into neighbouring areas and helping local nocturnal wildlife.

One other electrical system to aid in the use of renewable energy is the implementation of a photovoltaic solar panel system. This would be a 216kW array mounted flat to the roof to offset energy cost of the building by approximately $1885 per month and have a payback period of 20-25 years.

3d - Operational Impact

RC Strategies was engaged as part of this study to evaluate the operational financial impacts of a new facility. This assessment builds on their previous work, completed in 2017 during an earlier phase of this project. Their work highlights the significance of the Guiding and Design Principles in the context of financial performance. This section includes assumptions and context outlined in the 2017 report and considers new implications based on what has and has not changed since 2017.

Aquatic Facility Operating Context

Due to their significant community benefits, public aquatic swimming facilities are typically quite highly subsidized. In addition to taxpayers having to contribute to the capital costs of indoor pools, the typical recovery rate for an indoor pool in Canada is between 30% and 60%, with tax revenue subsidizing the remainder of operating costs.

Facility Utilization

The existing facility accommodates an estimated 300,000 swims annually with an annual capacity for about 690,000 swims, using only about 43% of the available swimming capacity. While prime hours were almost fully utilized, there was a significant amount of unused capacity during off-peak periods. Space constraints prevent any significant amount of additional use despite the unmet need for more swimming in the City. In other words, new and different types of aquatic spaces were required to accommodate all current and future outstanding needs.

Capacity and Demand

There was a demonstrated current need for an additional 66,000 swims per year in the City that the existing facility was unable to meet, and that number would grow in the longer term as the City continued to grow.

The outstanding need in Victoria was largely in the areas of recreational and fitness swimming as well as rehabilitation and therapy swims. These aquatic services had been growing in most cities across Canada and are likely to continue growing in the foreseeable future.

In the longer-term, the total number of annual swims was projected at 4.3 swims per capita, a conservative projection which is at the lower end of what is expected in indoor public pools in Canadian urban centres.

Operating Costs

Like all other indoor public pools in Canada, the existing facility was operating at a net deficit of about $4.90 per swim, for a total annual operating deficit of about $2.65 million.

The proposed new facility would be better able to accommodate existing and future demand and would operate more efficiently. Since the 2017 report, improved energy savings, better use of floor space and accelerated population growth have further improved operating efficiencies.

Site Options

Because the three site options considered in this study are functionally identical, their operating impacts, should be similarly identical. Because the Central Park North site option replaces the existing facility, and requires facility closure during construction, additional impacts have been identified:

1. Building services and maintenance opertional cost savings can be realized.
2. It will likely be possible to relocate many of the current swims (mostly in the swim training and program categories) to other pools in the region. However, during the shutdown a large portion of the total annual swims will simply disappear. It could take one or more years once a new pool is open to recapture those swims, gradually rising to the projected swim rates. During that recapture period, the operating deficit will likely be slightly higher than is projected herein as an ongoing savings.

Existing Crystal Pool used largely for recreational and fitness swimming as well as rehabilitation and therapy swims.

3e - Vehicle and Bicycle Parking

WATT Consulting conducted a traffic impact analysis that considered other regional aquatic facilities, industry best practices and the City's bylaws and regulations. Their analysis determined that there would be a parking demand of 1 vehicle per 30m2 of floor area of the new facility which translates to a parking demand of 262 vehicles for each of the site options.

On-site Parking Stalls

For this study, City staff directed the project to include 110 on-site vehicle parking stalls (+/- 5 stalls). In 2018, Council directed staff to explore parking alternatives that ensured no net loss of green space. As such underground parking has been included for all options.

Each of the options also include the following parking types:

- 5 accessible parking stalls plus 2 van-accessible parking stalls (all accessible stalls should be EV ready)
- 6 level-3 EV charging stations
- 6 level-2 EV charging stations
- 4 dedicated car-share stalls with access to level-2 EV charging stations
- All remaining general stalls should be designed as level-2 EV-ready

On-site Bicycle Parking Stalls

Minimum long- and short-term bicycle parking requirements are dictated by the current zoning bylaws and calculated based on the building area. A total of 100 bike stalls are included with each option consisting of 56 short-term covered, 20 short-term open and 24 long-term secure bike parking spaces. This exceeds long-term bicycle parking requirements by 25%.

More specifics on bicycle parking include:

- Long-term bicycle parking to include a minimum of 25% of parking stalls for oversized/cargo bicycles or personal mobility devices
- 10% of stalls with access to electric charging
- Stacked bicycle parking to be limited to no more than 50% of required bicycle parking
- Stacked bicycle parking to include lift assist

Off-site Parking Stalls

The surface parking at Save on Food Memorial Centre and street parking will be used to make up for an expected demand for vehicle parking above and beyond the on-site parking stalls provided. Loading zones are not included in parking counts.

3f - Review of External Regulations and Best Practices

British Columbia Building Code

British Columbia Building Code (BCBC) 2012, was applicable during the schematic and design development phases of the project (2017 – 2019). The current code, BCBC2024, was adopted on March 8th, 2024. Changes that will affect the construction of the planned facility include:

- new seismic and site-specific geotechnical considerations
- new minimum spatial requirements for accessibility embedded into the code
- new energy efficiency standards

Accessibility and energy code changes have limited effects on the planned facility given that the project exceeds those thresholds with a design that seeks to meet the Rick Hansen Foundation Accessibility Certification and the CAGBC - Zero Carbon Building Initiative.

Rick Hansen Foundation Accessibility Certification (RHFAC)

Careful consideration was given to accessibility and inclusivity of the new facility with those factors embedded into the project principles. The accessibility focus extends beyond consideration for those with physical disabilities to also include those with sensory and cognitive disabilities. The pursuit of the Rick Hansen Foundation's Accessibility Certification (RHFAC) means that the new facility will go beyond minimum code compliance for accessibility delivering meaningful access for all.

CaGBC - Zero Carbon Building Initiative

In keeping with the City of Victoria Climate Action Plan, the project includes a low carbon strategy for the new facility using an all-electric system for space and water heating with the intent to obtain design certification under the CaGBC Zero Carbon Building Program.

3g - Visualizations

Lobby

Fitness Centre

Natatorium

Conceptual Visualizations

These artistic conceptual visualizations imagine the new facility as a light-filled, welcoming and universally accessible community facility.

4 - Site Options and Context

Three Site Options being considered
To assist with identifying potential site options, Council provided the following direction in February 2023:

> *c.1. that the locations be situated within or immediately adjacent to the North Park neighbourhood;*
>
> *c.5. that the options include community amenities and aquatic features, as outlined in the functional program previously presented to Council;*

There are a very limited number of publicly-owned sites large enough to accommodate the program established in the schematic design phase, located within or immediately adjacent to the North Park Neighbourhood and available to the City for development.

The three options being considered are:

- Central Park North, replacing the existing facility on the same site.
- Central Park South, location of the playgrounds and sport courts, also identified as the preferred location in the 2017 feasibility study.
- 940 Caledonia Avenue, a public parking lot serving daily and special event needs. Currently, a portion of this site is occupied by Caledonia Tiny Homes Village.

Facility Design Concepts
As emphasized in previous sections, the design concepts for each site are closely aligned to adhere to the consistent basis of design.

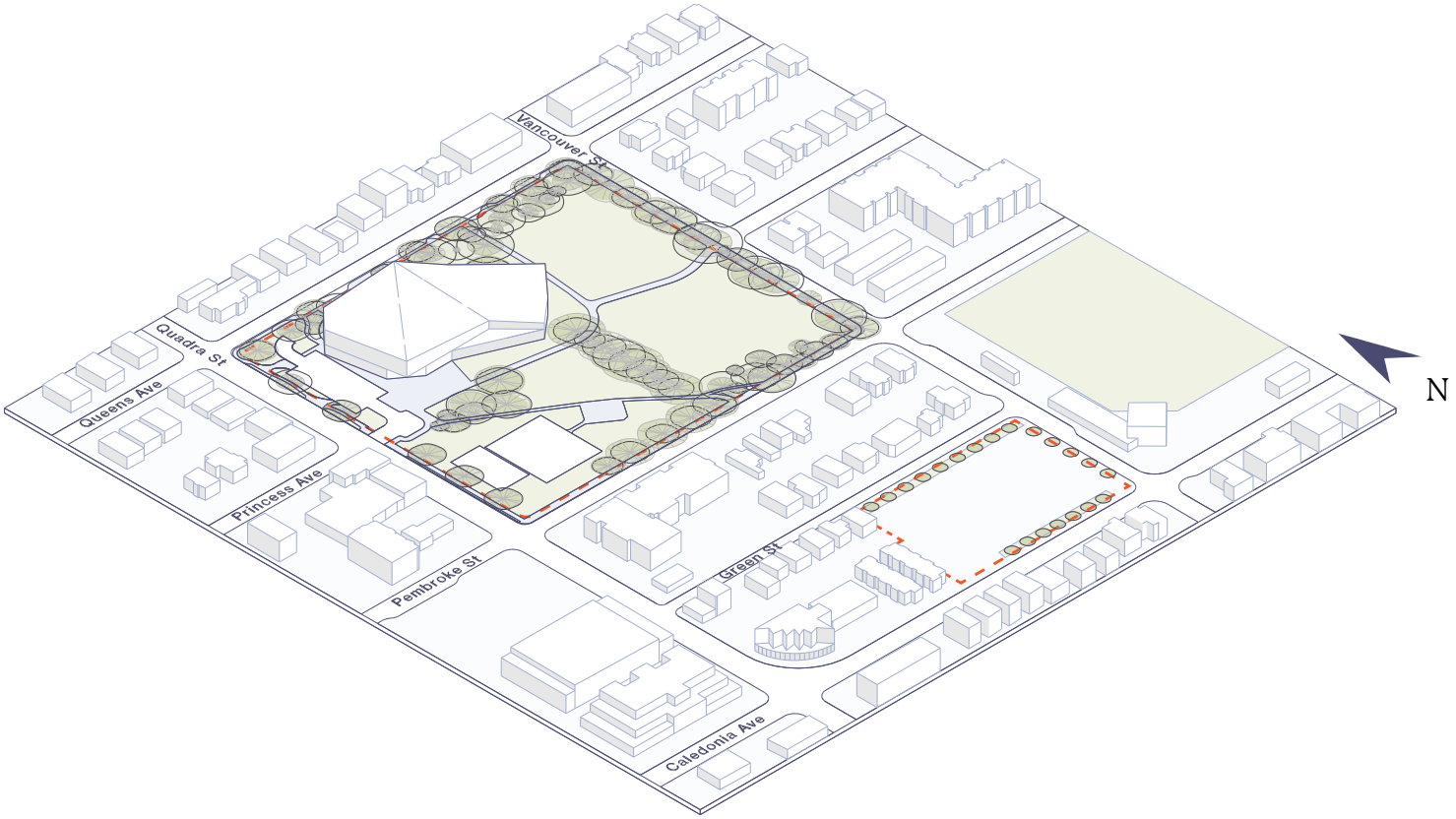
Each option will be an equally welcoming, light-filled and airy building of high-quality and durable materials carefully situated into its immediate site and context.

Some aspects of building design concepts have been adjusted to suit the unique site conditions. The differences are described in this section to inform a qualitative assessment of each site's suitability for the new Crystal Pool and Wellness Centre.

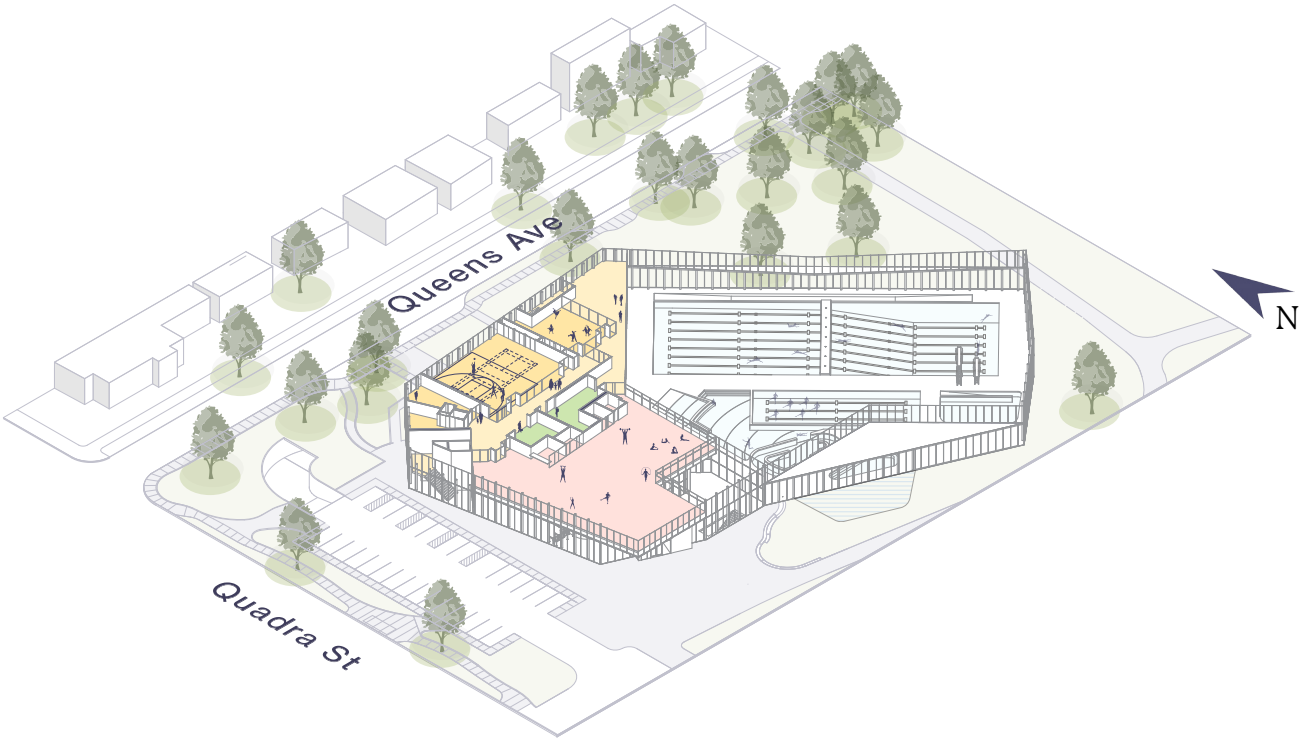
Qualitative Assessment
Section 4 - Site Options and Context informs the qualitative analysis that is attached to this report in Appendix B - Qualitative Assessment. where the Project Team qualitatively assesses each site and evaluates against the criteria of site and design and mobility impacts using a qualitative scale allowing for the direct comparison of the site options.

4a - Central Park North

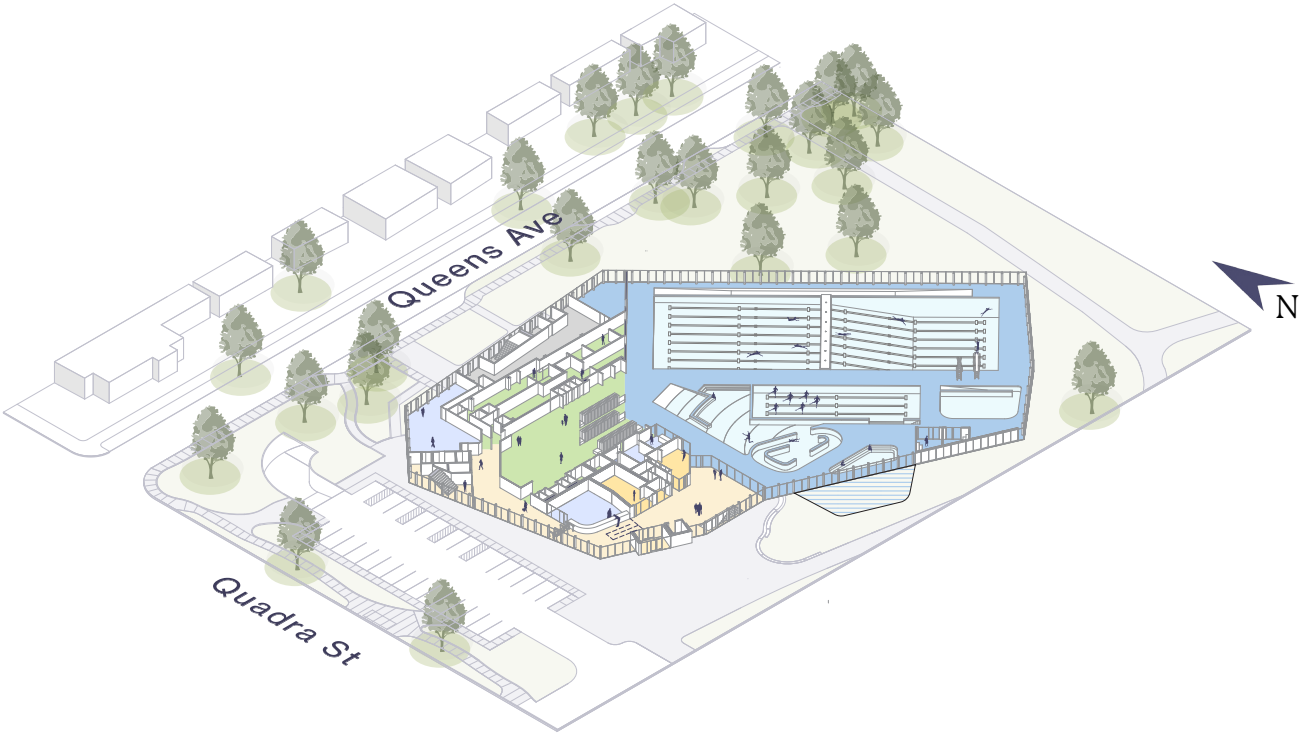
The layout of the Central Park North site is very similar to the Central Park South option, with the floor plan mirrored to maintain the same desirable relationships between the interior spaces and the park. A carefully modulated shape allows the building to fit between the existing trees. Because the building location is impacted by the existing footprint, it is a bit further set back from Quadra St., and a bit more exposed inside the park. This design concept was adjusted slightly to articulate the massing with varying roof heights, becoming lower towards the centre of the park.



Central Park North Site



Central Park North Level 2



Central Park North Level 1

Admin
Change Rooms
Lobby
Multipurpose Room
Natatorium
Patio
Fitness
Services

4a - Central Park North

Site and Design

This option locates the facility at the northwest corner of Central Park, which is located between Quadra St., Vancouver St., Queens Ave., and Pembroke St. Central Park is generally flat with a 3m drop in grade between Pembroke St., and Queens Ave. Preliminary geotechnical review found variable ground conditions across the site that is composed of clay and glacial till. It is expected that bedrock will be within 0.7m below grade at the west side and 12.2m below grade to the east side of the site. Central Park is zoned as a PB, Public Buildings District, and does not require any rezoning or development permit prior to issuing a building permit application or starting construction.

Central Park is a recreation and wellness hub for the North Park neighbourhood and Victoria as a whole, with basketball and tennis courts, baseball diamonds, a playground and exercise equipment in addition to the existing Crystal Pool facility. The park features numerous mature trees adding to Victoria's urban forest.

This site option is predominantly designed within the footprint of the existing pool facility to limit the amount of additional excavation required for the project. The exterior façade has a more conventional linear and faceted design to simplify the footprint and construction of the building in the aim to be a positive for the project budget.

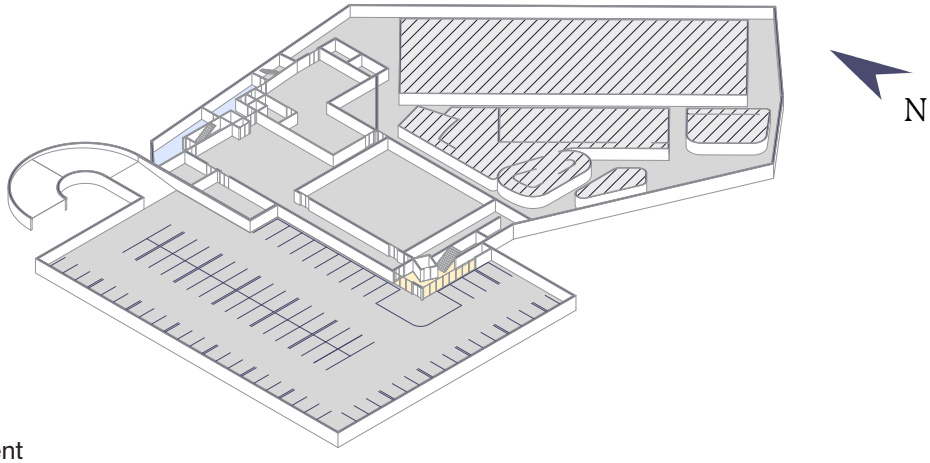
The building is designed to be a pavilion in the park, reducing impact to the existing trees by building upon the footprint of the existing facility. From the natatorium, the building's transparency ensures uninterrupted visual connections to the trees, enhancing the connection to the park. The entrance is located at the southwest corner of the building opening up onto a public plaza that connects to the park.

Mobility Impacts

Central Park is situated between Quadra St., an arterial road and frequent transit route, and Vancouver St., a local street and all ages and abilities bike route. Transit stops are located within 30m of the building entrance. A pathway through the park, aligned with Princess Ave., will improve access through the park to Vancouver St. To improve vehicle access and road safety, access to the on-site parking and drop-off zones would be aligned with a new four-way traffic signal at Princess Ave. and Quadra St. The service entrance and delivery zone would be on Queens Ave.

On-site vehicle parking consists of 110 vehicle parking stalls including accessible parking – 28 surface and 82 underground. This parking is located in the northwest corner of the site with the surface parking above the underground parkade. Additional off-site vehicle parking nearby is made up of surface parking lots at Save on Food Memorial Centre and Royal Athletic Park.

The 100 bicycle parking spots will consist of 20 short-term open within 10m of the entrance plus 56 covered short-term and 24 covered long-term secure located within the park at 45m from the entrance.



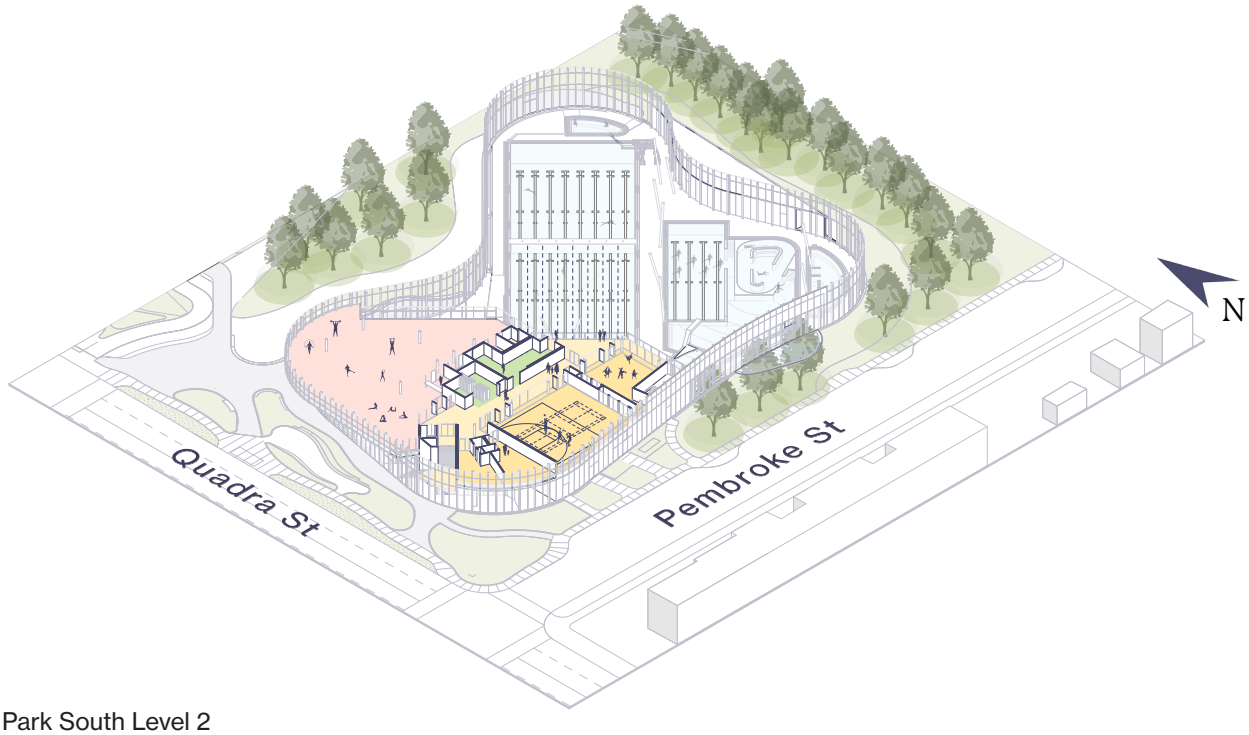
Central Park North Basement

Admin
Change Rooms
Lobby
Multipurpose Room
Natatorium
Patio
Fitness
Services

4b - Central Park South

The design concept for the Central Park South site can be characterized as a welcoming and light-filled pavilion in the park. With a simple massing without modulation of building height, it is distinguished by a smoothly articulated floor plan shape that nestles itself into a clearing between and around the trees in the south-west quadrant of the park, currently occupied by the tennis and basketball courts. This concept was derived to focus on the user experience of swimming and working out amongst the trees.

Central Park South Site



Central Park South Level 2

Central Park South Level 1

Admin
Change Rooms
Lobby
Multipurpose Room
Natatorium
Patio
Fitness
Services

4b - Central Park South

Site and Design

This option locates the facility at the southwest corner of Central Park, which is located between Quadra St, Vancouver St, Queens Ave and Pembroke St. Central Park is generally flat with a 3m drop in grade between Pembroke St and Queens Ave. Preliminary geotechnical review found variable ground conditions across the site that is composed of clay and glacial till. It is expected that bedrock will be within 0.7m below grade at the west side and 12.2m below grade to the east side of the site. Central Park is zoned as a PB, Public Buildings District, and does not require any rezoning or development permit prior to issuing a building permit application or starting construction.

Central Park is a recreation and wellness hub for the North Park neighbourhood and Victoria as a whole, with basketball and tennis courts, baseball diamonds, a playground and exercise equipment in addition to the existing Crystal Pool facility. The park features numerous mature trees adding to Victoria's urban forest.

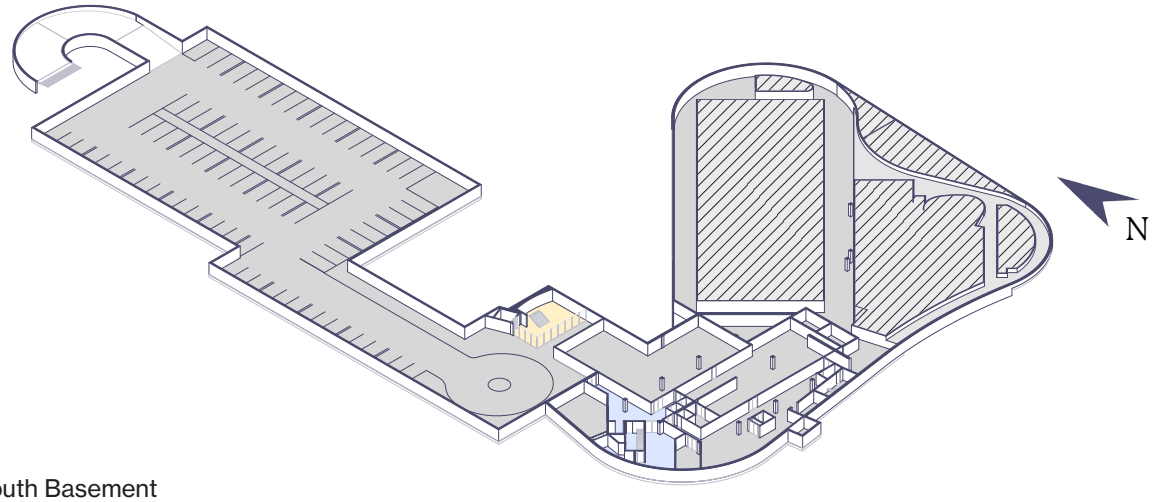
This option uses the design developed in 2019 with slight reworking to current building code including structural elements for seismic restraint. The building is designed to sit within the park like a pavilion and limits impact to the existing trees by occupying an existing clearing and curving the building around protected trees. From the natatorium, the building's transparency ensures uninterrupted visual connections to the trees, enhancing the connection to the park. The entrance is located at the northwest corner of the building opening up onto a public plaza that connects to the park.

Mobility Impacts

Central Park is situated between Quadra St., an arterial road and frequent transit route, and Vancouver St., a local street and all ages and abilities bike route. Transit stops are located within 30m of the building entrance. A pathway through the park, aligned with Princess Ave., will improve access through the park to Vancouver St. To improve vehicle access and road safety, access to the on-site parking and drop-off zones would be aligned with a new four-way traffic signal at Princess Ave. and Quadra St. The service entrance and delivery zone would be on Pembroke St.

On-site vehicle parking consists of 110 vehicle parking stalls including accessible parking – 28 surface and 82 underground. This parking is located in the northwest corner of the site with the surface parking above the underground parkade. Additional off-site vehicle parking nearby is made up of surface parking lots at Save on Food Memorial Centre and Royal Athletic Park. During the demolition of the existing pool facility and construction of onsite parking, 35-39 temporary on street parking stalls would be made available along Queens Avenue and Pembroke Street .

The 100 bicycle parking spots will consist of 20 short-term open within 10m of the entrance plus 56 covered short-term and 24 covered long-term secure located within the park at 45m from the entrance.



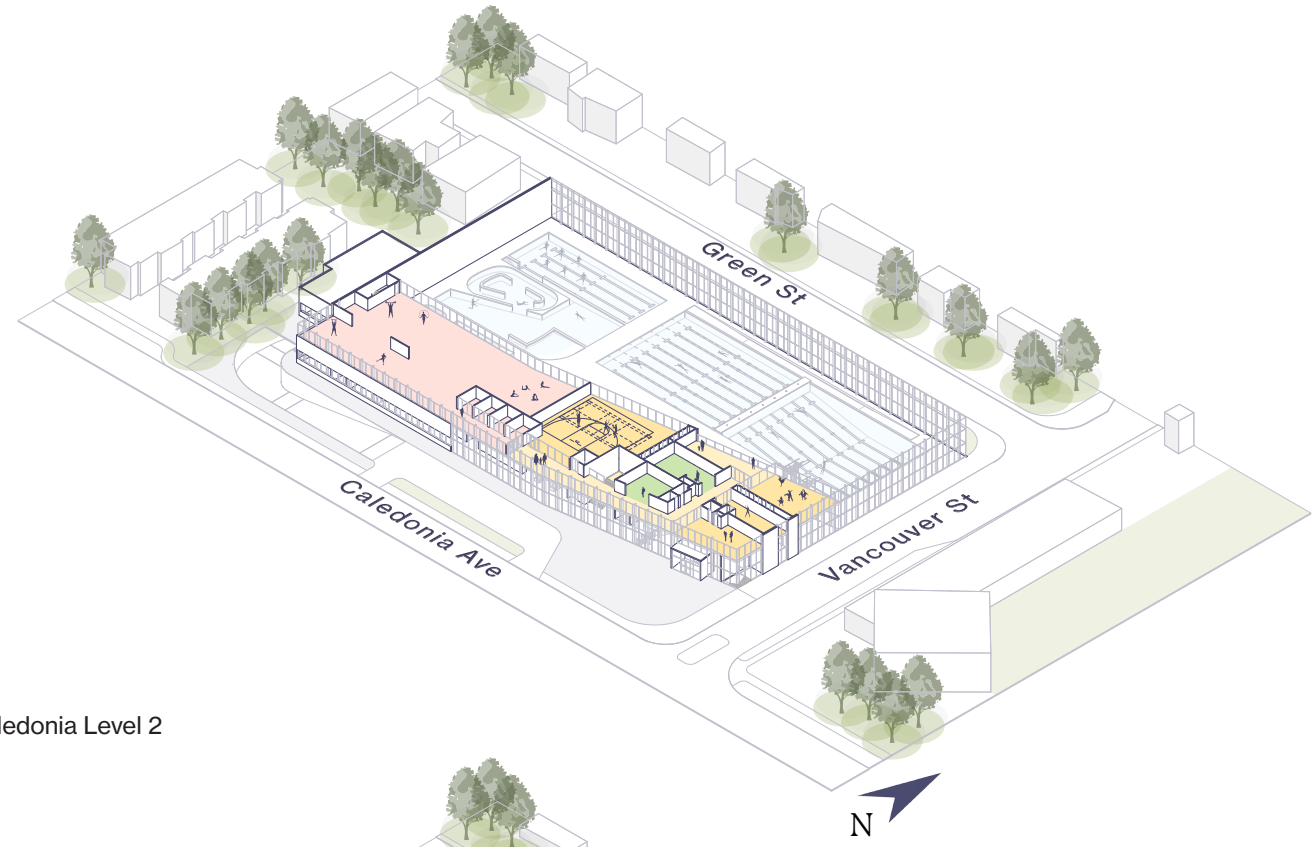
Central Park South Basement

Admin
Change Rooms
Lobby
Multipurpose Room
Natatorium
Patio
Fitness
Services

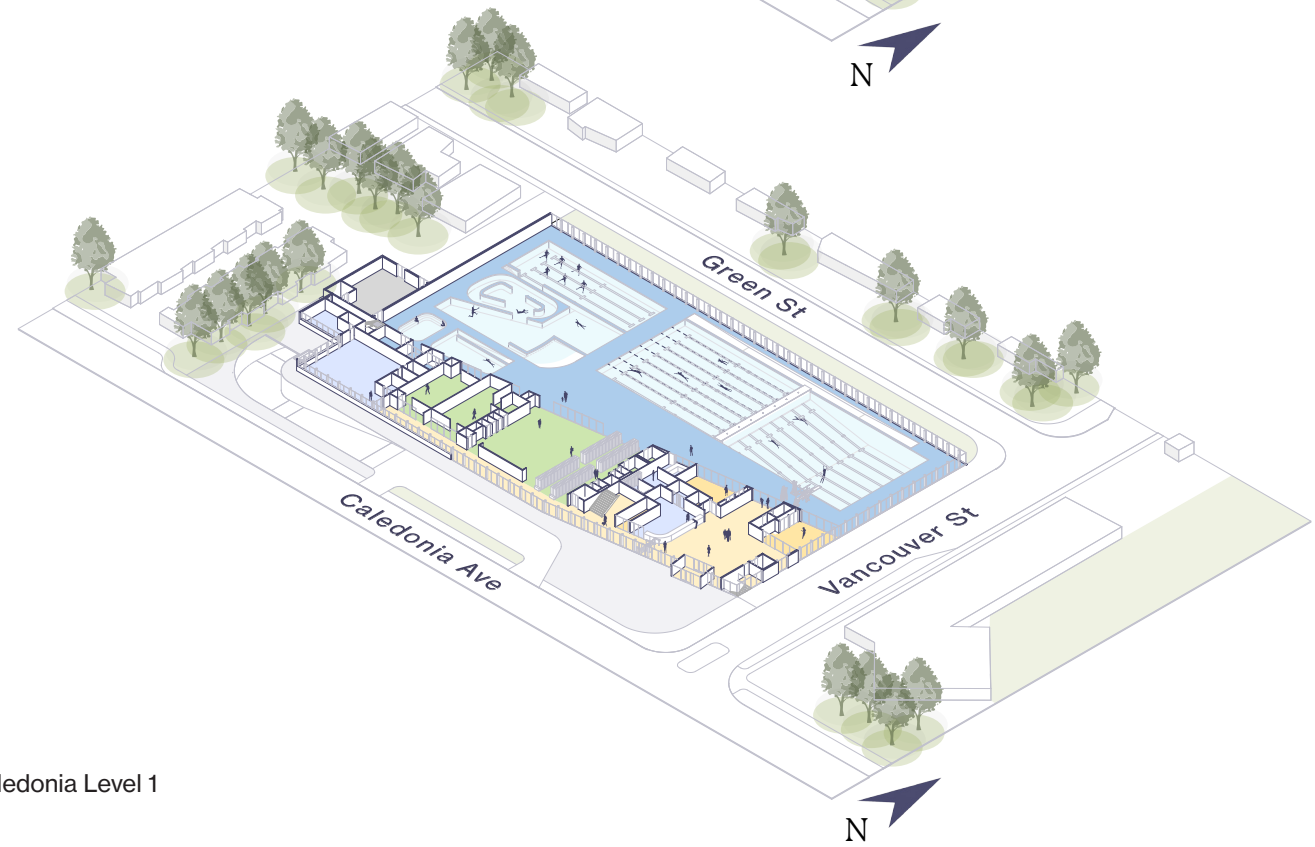
4c - Caledonia

The available site area and the immediate context at 940 Caledonia differs from both Central Park sites, thus, this site needed a different design concept. Rather than a facility that entices swimming and exercising amongst the trees in a park, this facility will result in an urban design solution. Without compromising the goal of enhancing user experiences in all spaces, the indoor-outdoor relationships are more limited and concentrated. Opportunities for modulating the footprint are limited and, if selected, further design refinement of this option is necessary to ensure that the massing and facade articulation are copacetic to the adjacent buildings.

Caledonia Site



Caledonia Level 2



Caledonia Level 1

Admin
Change Rooms
Lobby
Multipurpose Room
Natatorium
Fitness
Services

4c - Caledonia

Site and Design

The site at 940 Caledonia Ave. is currently used as a City-owned surface parking lot containing 220 stalls.

The site consists of 3 lots (940 Caledonia Ave. and 953 and 963 Green St.) and is bound by Green St., Vancouver St., Caledonia Ave. and two private properties to the west – a single family home and a multi-unit townhouse complex. The Caledonia site is limited by its compact size and the design requires the building footprint to be maximised to the property lines. The current zoning for this site is R-2, Two Family Dwelling District and will require a development permit application and rezoning prior to issuing building permit application, lengthening the project schedule.

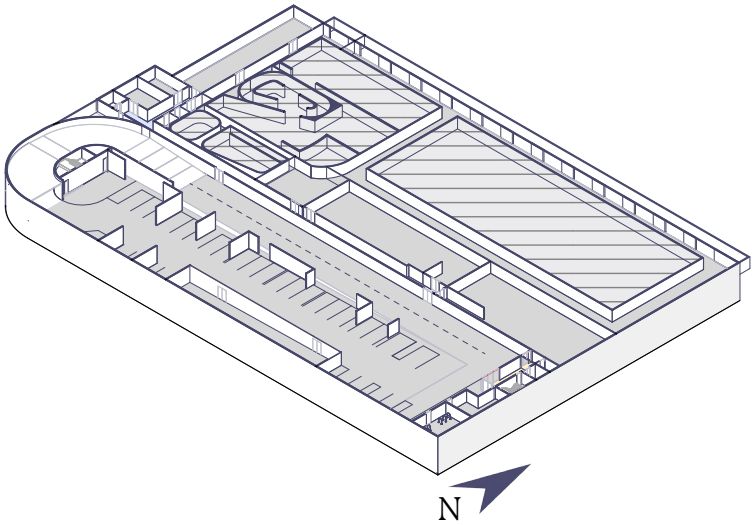
It is expected that the subsurface conditions of this site are typical of Victoria with a thin layer of till, variable thickness of clay and bedrock. It is estimated that bedrock is 10-15m below grade in this area. If this site is selected for the project, further geotechnical analysis is required for a more accurate understanding of the ground conditions.

This option has a similar distribution of programs to Central Park options but includes 2 levels of underground parking. All dryland program elements are located to the south side of the building with the natatorium to the north side.

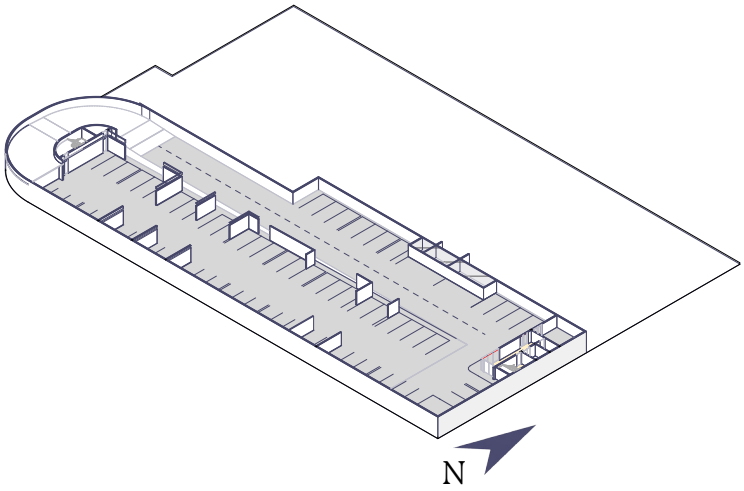
Level 1 aligns with grade at Caledonia Ave. and as the site's grade drops 2m from the south to the north it creates privacy within the natatorium from the sidewalk. The building's entrance is located to the southeast corner of the building opening onto a public plaza that connects to the AAA bike route and across Vancouver St. to Royal Athletic Park. Its proximity to Royal Athletic Park could allow for increased programming connections between the facility and the athletic field.

Because the building footprint occupies the majority of the site, there is limited site design opportunities aside from developing the intersection between Caledonia Ave. and Vancouver St. to create a better connection between the facility and Royal Athletic Park.

Caledonia Basement 1



Caledonia Basement 2



Admin
Change Rooms
Lobby
Multipurpose Room
Natatorium
Fitness
Services

4c - Caledonia

Mobility Impacts

This site is situated along Vancouver St., an all ages and abilities cycling route. Caledonia Ave. does not have direct access to transit, with the nearest stops 250m away on both Quadra St. and Cook St.

Underground parking is the only option for this site due to its compact size. City staff noted that access for this parking could only be from Caledonia Ave. due to Vancouver St. being the AAA bike route and Green St. being a residential street.

Vehicle parking consists of 95 vehicle parking stalls across 2 levels with 29 stalls on parking level 1 and 67 on parking level 2. In addition to this on-site parking, additional off-site vehicle parking is located at the surface parking lot at Save on Food Memorial Arena. Due to the surrounding road network and requirement for right-in/right-out access to the parkade, it only allows for vehicle access from one direction, west-bound along Caledonia Ave. The service entrance and delivery zone would be on Green St.

The existing City-owned, 220-stall parking lot is used by the public daily but most commonly for events at Royal Athletic Park and Save on Food Memorial Centre. Additionally, this parking lot is factored into off-site parking supply for the existing Crystal Pool. Using this site would impact the off-street parking supply for the neighbourhood, with a net loss of roughly 125 off-street parking stalls, as well as loss of flexible space for special events at Royal Athletic Park. To offset the loss of the surface parking at this site and the loss of the surface parking at the existing Crystal Pool facility, 59 - 67 permanent offsite parking stalls would be added on nearby streets in the North Park neighbourhood.

The 100 bicycle parking spots will consist of 20 short-term open and 56 covered short-term within 10m of the entrance within the plaza at the southeast corner, and 24 covered long-term secure located on parking level 1.

Additional Offsite Parking (Permanent)


01.0

5 - Community Impacts

This section summarizes investigations undertaken to understand the community impacts of undertaking a development of this scale and duration.

5a. Crystal Pool and Wellness Centre Multi-Site Construction Delivery Assessment
Provided by Turnbull Construction Project Managers.

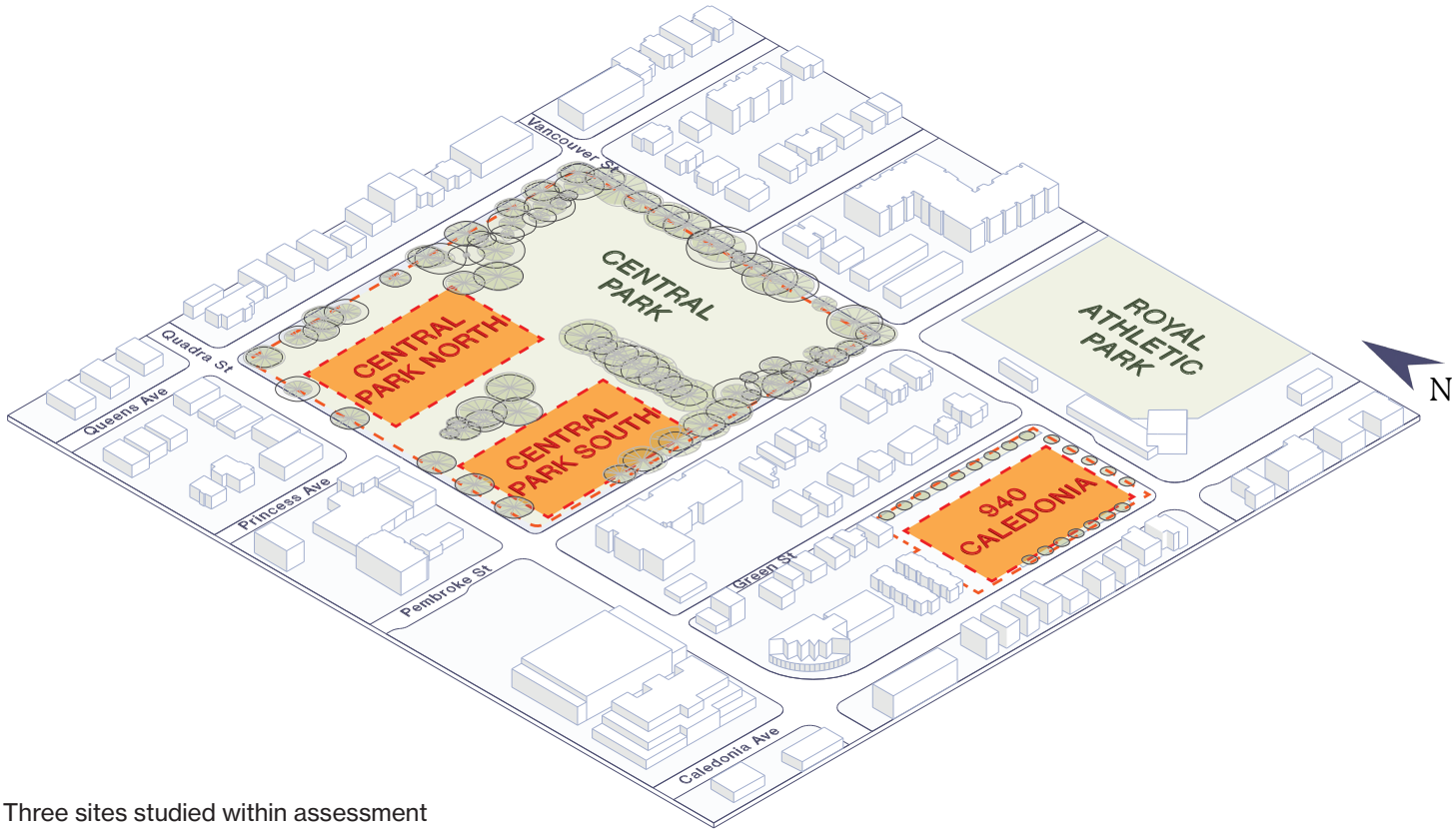
5b. Interim Recreation Services Proposal
Provided by City of Victoria

5a - Multi-Site Construction Delivery Assessment

Turnbull Construction Project Managers Ltd. (TCPM) was hired by the City of Victoria to complete a comprehensive multi-site review of construction logistics, impacts, and assessment to risk of service continuity for existing community amenities across the three sites being considered for the Crystal Pool Replacement Project.

The assessment work undertaken reviewed project impacts holistically, identifying and measuring such factors as neighbourhood disruption, loss of community amenities, and added construction logistics relative to executing the project construction work at the three identified sites. Additionally, in collaboration with City of Victoria Staff and HCMA Architecture + Design (HCMA) site specific characteristics related to project budget and total project schedule were reviewed and adjusted to capture the specific requirements of delivering a new facility at each of the selected sites.

Site logistic plans and construction schedules were developed to support the evaluation and impact assessment. Site Logistics plans were created to evaluate practical implications of construction on the various sites, identifying logistical requirements and constraints to accurately assess the broader impacts of the site. Project schedules were also reviewed with a critical eye to ensure phasing considerations and other site-specific requirements were accurately captured and reflected in both the project timelines and budgets.



Three sites studied within assessment

Specific to Crystal Pool South and the Caledonia sites, a risk analysis considered the visual Facility Condition Assessment Report (FCA) prepared by Evoke Buildings Engineering (Evoke) and sought to define requirements needed to maintain operations of the existing facility until approximately 2029, which is the date a new facility would be operational.

The FCA report was analyzed with Evoke to determine an order of importance and priority to building components requiring planned repair, replacement, or contingency reserve to ensure continued operations most effectively through the coming years. These building items and their associated costs were categorized in two ways to inform the assessment, budget impacts, and planning.

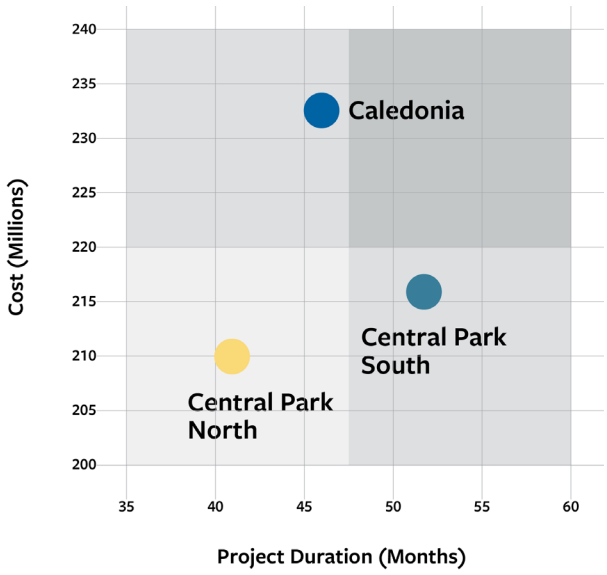
First, Capital Life Cycle Costs considered a series of regular planned or preventative maintenance items necessary to be completed immediately to achieve the highest likelihood of continued operations, while a Risk Reserve was established to estimate systems with probable failure during the required operational timelines. Risk Reserve limits were established with definitions measuring repair costs and repair durations. Potential system failure risks falling outside these thresholds were not carried in the Risk Reserve and with a failure outside of these thresholds it is understood the facility would be closed ahead of the desired operational date.

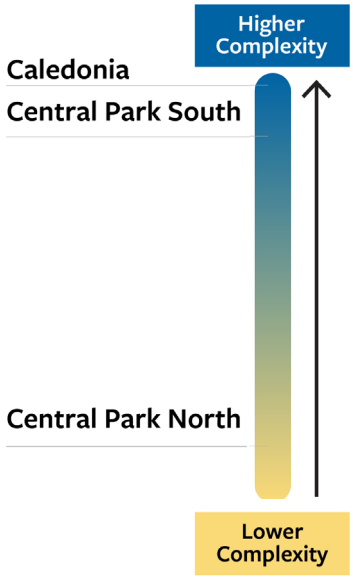
Considering the evaluation criteria and various factors identified, the Multi-Criteria Assessment provides a comprehensive view to measuring key variables for the three site options.

The **Caledonia site** option has the highest cost of execution, highest degree of impact and complexity factors and a 46-month construction duration. This site is deemed the least viable site option compared to the other sites.

Central Park South contained many risk factors, high cost of execution, and longest construction duration. This site is particularly hindered with the most impact to overall community amenities and the inherent risk associated with its proximity to the existing facility, and therefore scored in the less ideal quadrant.

Central Park North is the least complex option to construct, with the lowest cost of execution, and shortest construction duration. Considering conventional site logistics, high tree retention, and minimal impact to Central Park facilities, it has the lowest site complexity of all three site options, and has scored in the most desirable quadrant.





Multi-Criteria Analysis

5b - Interim Recreation Services Proposal

Lessons from other municipalities underscore the high risks of maintaining an aging facility during construction. The Community Impacts and Service Continuity Assessment has identified significant risks and logistical challenges associated with maintaining operations at the existing Crystal Pool facility during construction of the new facility.

Early closure of the existing facility has cost and complexity benefits for the Central Park South and Caledonia site options but is not required. If the Central Park North site option is selected, early closure of the existing facility is mandatory.

Existing Crystal Pool and Fitness Centre fitness loft.

To continue providing community services during construction of the new Crystal Pool and Wellness Centre, the City proposes offering temporary dryland recreation programs and services at Crystal Garden. This approach ensures that all of the current dryland programs and services will remain accessible to the community and the aquatic programs will be unavailable until the new facility is open.

Crystal Garden is operated as part of the Victoria Conference Centre. Currently underutilized, it is well positioned to provide service continuity of dryland programs and services. As a former social and recreational hub, it is conveniently located in Victoria's downtown core, adjacent to major transit routes and stops. With high ceilings and 25,000 square feet of naturally bright, open space, it can accommodate a range of uses with minimal need for physical modification.

A financial analysis of the anticipated operation, maintenance and revenue impacts of this interim service proposal results in an operating budget reduction of $1.8 million annually or a total operating budget reduction of $6.3 million over the 3.5 years of construction. A one-time capital investment to support the change of use of Crystal Garden is estimated at $750,000, resulting in a net financial savings of $5.53 million.

Continuing operations of the existing Crystal Pool facility during construction of the Central Park South and Caledonia site options necessitates considerable additional financial commitment in the range of $8.13-9.63 million. Despite this investment, the risk of major building system failure is high, potentially leading to service interruptions and/or an unplanned facility shutdown.

Three sites studied within assessment

6. Comparison of Options and Recommendation

A thorough examination of all site options shows that the Caledonia site is the least favoured option due to a low qualitative assessment score, a longest project timeline and a highest project budget.

While both Central Park options have no notable difference qualitatively, Central Park North option requires the closure of the existing facility prior to construction of the new facility while Central Park South option enables the existing facility to remain operational while the new facility is being constructed. Providing service continuity incurs a cost premium for the Central Park South and Caledonia site options due to necessary operational and capital investment to extend the service life of the existing facility.

If the factors of cost and timeline are considered, in addition to the qualitative assessment, Central Park North ranks highest, or most favorable, among the three site options as it is the most economical, fastest, and least complex to build, effectively mitigating undue risks and minimizing significant additional costs.

	Central Park North	Central Park South	Caledonia
Qualitative			
Schedule			
Complexity			
Cost			

Legend

Good **Acceptable** **Not Good**

Crystal Pool and Wellness Centre (CPWC) Feasibility Study

Appendix A - Crystal Pool and Wellness Centre Multi-Site Construction Delivery Assessment

Strength

Knowledge

Consciousness

tcpm.ca

Crystal Pool and Wellness Centre Replacement Project

Multi-Site Construction Delivery Assessment

Prepared by: Jonathan Almas - TCPM

Date: May 15, 2024

TURNBULL
CONSTRUCTION PROJECT MANAGERS

Contents

Executive Summary

Turnbull Construction Project Managers Ltd. (TCPM) was hired by the City of Victoria to complete a comprehensive multi-site review of construction logistics, impacts, and assessment to risk of service continuity for existing community amenities across the three sites being considered for the Crystal Pool Replacement Project. The three sites analyzed included: Crystal Park North, Crystal Park South, and Caledonia.

The assessment work undertaken reviewed project impacts holistically, identifying and measuring such factors as neighbourhood disruption, loss of community amenities, and added construction logistics relative to executing the project construction work at the three identified sites. Additionally, in collaboration with City of Victoria Staff and HCMA Architecture + Design (HCMA) site specific characteristics related to project budget and total project schedule were reviewed and adjusted to capture the specific requirements of delivering a new facility at each of the selected sites. Unique to the Crystal Park South and Caledonia sites, the evaluation and assessment included a risk analysis of continued operation of the existing Crystal Pool & Fitness Centre (Existing Facility).

Detailed project planning and execution review of Community Impacts, Project Schedule Duration, Site Logistics, and the Service Continuity of all affected amenities were issues identified through the analysis of Construction Delivery for the three site options. Upon evaluation and comparison of the factors imposed by or affecting the three unique site options, comparison tables were developed to allow for comparison and contrast of the various elements for each site.

The site logistic plans and construction schedules were developed to support the evaluation and impact assessment. Site Logistics plans were created to evaluate practical implications of construction on the various sites, identifying logistical requirements and constraints in order to accurately assess the broader impacts of the site. Project schedules were also reviewed with a critical eye to ensure phasing considerations and other site-specific requirements were accurately captured and reflected in both the project timelines and budgets. Included Figure 7 – Construction Complexity Comparison was formulated to determine the degree to which each issue impacted the delivery of the new Crystal Pool & Wellness Centre (New Facility) at each site option. With TCPM's experience on current projects with similar mandates, costs were established and applied to each factor from Figure 7.

Establishing a cost for each impacting factor, we were able to determine an estimate of the anticipated Service Continuity Premium in Figure 10, and Site Logistics Premium as summarized in Figure 11.

Specific to Crystal Pool South and the Caledonia sites, a risk analysis considered the visual Facility Condition Assessment Report (FCA) prepared by Evoke Buildings Engineering (Evoke) and sought to factor define requirements needed to maintain operations of the existing facility until approximately 2029, which is the date a new facility would be operational. The FCA report was analyzed with Evoke

to determine an order of importance and priority to building components requiring planned repair, replacement, or contingency reserve to most effectively ensure continued operations through the coming years. These building items and their associated costs were categorized in two ways to inform the assessment, budget impacts, and planning. First, Capital Life Cycle Costs considered a series of regular planned or preventative maintenance items necessary to be completed immediately in order to achieve the highest likelihood of continued operations, while a Risk Reserve was established to estimate systems with probably failure during the requirement operational timelines. Risk Reserve limits were established with definitions measuring repair costs and repair durations. Potential system failure risks falling outside these thresholds were not carried in the Risk Reserve and with a failure outside of these thresholds it is understood the facility would be closed ahead of the desired operational date. Figure 2 identifies the various Categories as established by Evoke's review and the summary of resulting Capital Life Cycle and Risk Reserve amounts. Planning for service continuity of the CPFC while constructing the new facility presented construction delivery challenges.

Upon completion of the analysis, the three sites were weighed in a Multi-Criteria Assessment framework evaluating the project delivery at the selected sites against critical factors of: Project Budget, Schedule, and Site Complexity. This Multi-Criteria Assessment is referenced in Figure 12.

Considering evaluation criteria and various factors above, the multi-criteria assessment established a comprehensive view to measuring key variables for the three site options. As illustrated, the Caledonia site option scored in the less than ideal quadrant primarily due to the highest cost of execution, highest degree of impact and complexity factors, along with the 46-month construction duration. Therefore, this site is deemed the least viable site option when compared to the other sites for the new facility.

Central Park South contained many risk factors, high cost of execution, and longest construction duration. This site is particularly hindered with the most impact to overall community amenities as well as the inherent risk associated with its proximity to the existing facility, and therefore scored in the less ideal quadrant.

Central Park North presents the least complex option to construct, with the lowest cost of execution, and shortest construction duration. Considering conventional site logistics, high tree retention, and minimal impact to Central Park facilities, it has the lowest site complexity of all three site options, therefore has scored in the most desirable quadrant.

In consideration of the criteria and sites evaluated, the Central Park North site presents the preferred site option to construct the new facility.

1. Introduction

a) Company Background

For more than 25 years, Turnbull Construction Project Managers (TCPM) has been helping clients realize their strategic goals and delivering projects that have created diverse and strong economic opportunities as well as vibrant and healthy communities. From recreational facilities in new suburbs to city halls and public libraries that have revitalized downtown areas, we understand what it means to work on behalf of organizations putting the community first.

TCPM provides comprehensive project management services for owners. TCPM looks between the lines and manages the people aspect of the project. Ensuring the overall health of the project team and ongoing satisfaction of the stakeholders are two of the key drivers behind our successful project portfolio.

TCPM has a long and successful track record of delivering recreational projects in BC and Alberta. Most recently, we are working with The City of New Westminster on the təməsewtxʷ Aquatic & Community Centre. The project mandate was to maintain operations of the existing aquatic community centre while constructing the new aquatic community centre on the same property as the then Canada Games Pool. Although the existing facility was ultimately decommissioned prior to occupancy of the new facility, TCPM appreciates and understands the nuances of complex sites with intense existing uses.

In the last ten years, TCPM has completed over $600M in recreational community projects and we currently have another $400M in progress. We currently have more than 30 active projects, including numerous phased projects involving complex tie-ins and renovations so we certainly have our finger on the pulse of the industry. As a result of the significant volume of work underway, we are up to date with the latest requirements from the municipalities in which we work and are continually addressing the changing tides of policy that affect our projects. As demonstrated through our numerous recently delivered projects such as təməsewtxʷ Aquatic & Community Centre and the Willoughby Soccer Stadium, we are experts in phased construction within and around operational facilities.

Appendix I – TCPM Recreation Project Matrix is a list of select relevant recreation and aquatic community facilities we have completed or are currently in progress.

b) Scope of Work

TCPM was hired by the City of Victoria to complete a holistic site impact and construction logistics assessment of the three potential sites for the new facility. Of particular importance was the risk analysis in determining the continued operations of the existing facility for the duration of the construction to complete the new facility. In support of the logistics assessment, TCPM were asked to

analyze the variation in construction delivery schedules at the three chosen site options of Central Park North, Central Park South, and Caledonia.

The initial construction delivery analysis informed the team of three additional factors to consider beyond the risk associated with service continuity of the existing facility. To further the understanding of practically delivering the new facility at each of the three sites TCPM, with support of City of Victoria Staff and numerous project consultants, including HCMA Architecture + Design (HCMA), analyzed in detail project execution impacts related to: Community Impact, Project Schedule, and Site Logistics and Complexity

The findings of the three sites were weighed in a multi-criteria assessment framework evaluating the project delivery at the selected sites against the critical factors analyzed, including impacts to project budget.

2. Issues and Analysis

a) Community Impacts

Community impacts go beyond the loss of the use of the existing facility, or maintaining its service continuity, and extend to how construction of the new facility will affect the use of Central Park greenspace, park facilities and amenities. The disruption of an active construction site will also have significant impact on the road network, public and active transportation, parking, safety, and the quiet use and enjoyment of the park.

With two site options located within Central Park, the active construction zone with its supporting requirements to facilitate such activities as staging, laydown, deliveries, and logistics will impact the use of the Central Park greenspace. Central Park South further impacts the use of the park facilities, as the site location will require decommissioning of the existing basketball courts, tennis, playground, and outdoor fitness facilities. These facilities will need to be removed to allow construction of the new facility, with temporary use and permanent reinstatement considerations to be reviewed.

All three site options will utilize Central Park greenspace for construction staging, as at each site location, the new facility building utilizes the entire site boundary, leaving little to no working space for staging, fabrication, and assembly areas for such items as large span structural elements, common in aquatic centre design.

The Caledonia site option takes this a step further, requiring use of the southeast quadrant of Central Park to be utilized by the general contractor for logistics and staging, which will necessitate management of two site locations given Caledonia's proximity to Central Park. Additional offsite staging at Central Park has been considered given the tight site constraints of zero lot line boundary and priority to maintain street use and multi-use path requirements around the site as opposed to allowing

street use permits for construction. This will impact the local road network, and active transportation, as equipment and materials will move frequently between locations.

An active construction site will bring a hundred tradespersons or more to a site each day. The load on the surrounding neighborhoods road network and available public parking will be strained. In consideration of the additional neighbourhood requirements of the construction site, combined with the ongoing need for public parking on and off street, park users, the general neighbourhood parking requirements will be taxed. As Caledonia is also currently a public parking lot, its loss during construction will limit the available parking for the neighboring Royal Athletic Park.

The assessment and analysis of the Central Park South option also considered the requirements of construction next to the existing facility. This will require additional safety protocols that would not be required on a typical construction site. These additional protocols, and general construction activity will limit the quiet use and enjoyment of the existing facility and Central Park.

b) Project Schedule Duration

Each site option will have a different construction duration due to Central Park South and Caledonia maintaining service continuity, and Central Park North closing the existing facility before the start of construction. Anticipated construction schedules for each site option can be found in Appendix II.

Central Park North has the shortest construction duration since it is situated in the footprint of the existing facility, requiring the existing facility to be demolished. The project schedule will follow a linear duration, as park reinstatement of the construction staging area can occur concurrently with the building construction. The additional schedule duration for the demolition of the existing facility is anticipated to be 8 months.

The Central Park South site allows for the new facility to be constructed while giving the option of maintaining service continuity of the aging existing facility. However, due to the underground parking design of Central Park South being located under the footprint of the existing facility, this site option will have a phased construction schedule. The project would be phased by completing construction of the new facility in the first phase, then completing wind down and demolition of the existing facility, before proceeding with the second phase of constructing the underground parkade and park reinstatement. It is anticipated that construction duration would be extended by 18 months due to maintaining the service continuity of the existing facility. The phased construction schedule will also result in the new facility being complete without the necessary public parking for 18 months, limiting the public's ability to access the new facility.

The Caledonia site also allows for service continuity and will use Central Park greenspace for construction staging. The demolition of the existing facility and Central Park reinstatement will require a

considerable scope of work that will continue post occupancy of the new facility that will result in an additional 10 months to the project schedule.

c) Site Logistics

In reviewing the three site options, each location has its own unique variables, and when factoring in service continuity, additional impacts to the construction process should be recognized. TCPM analyzed each site option from a constructability perspective to determine impacts beyond service continuity, and the site logistical challenges each site will face.

With both Central Park North and South site options located within Central Park, maintaining the heath of the existing large caliper trees is paramount. The general contractor will need to prioritize clear pathways between the tree canopy for equipment and materials and stay clear of the tree root structure or risk premature unintended trees loss. Further risk of trees will arise from all site options utilize a construction staging area in Central Park. Extra duty and care will need to be taken by the contractor to not adversely affect the health of the trees and premature tree loss.

Given Central Park Souths proximity to the existing facility, additional safety and contractor awareness will be required. It is recommended that construction vibration monitoring will be required to safely conduct the excavation, shoring, and foundation works while observing the highly sensitive building elements found in the existing facility.

As mentioned, Caledonia will have an offsite construction staging area at Central Park. This will result in the general contractor having to manage two sites instead of one, leading to increased work effort of safety, security, and traffic control, as equipment and materials are transferred from one site to the other.

d) Facility Condition Assessment

The City of Victoria first conducted a facility condition assessment existing facility in 2015, prepared by Morrison Hershfield. As the existing facility continued to degrade, a new facility condition assessment (FCA) was required and conducted by Evoke in 2024. Evoke investigated the complete exterior and interior elements of the existing facility, and grouped each building element into sections titled Structural, Building Enclosure, Mechanical, Fire Protection System and Electrical. The FCA categorized each component with a risk level based on duration to repair and severity of impacts to service continuity. Risk levels, as provided by Evoke, are described in Figure 1 – Risk Level below. This table identifies the highest risk level with building elements that require a facility

shutdown of more than 1 month plus a system redesign due to unavailability of like for like replacement parts.

Risk High		Failure in major system. 1 month plus closure of facility. System redesign required.
		Less than 4-week closure. Some system design required.
		No closure of facility. Repair of system to take 4 weeks.
Risk Low		No closure of facility. Repair of system to take 1 week.

Figure 1 - Risk Level

e) Cost and Duration Thresholds

TCPM held a workshop with Evoke and the City project team to determine thresholds for Capital Lifecycle Costs and Risk Reserve based on the desire to achieve service continuity until 2029 and applied these to the building categories.

Capital Lifecycle Costs are the repair costs needed to maintain the continued operation of the aging existing facility beyond the typical operating expenditures, as these repairs aim to prolong existing facilities' useful life until 2029.

A Risk Reserve is the contingency required for key building elements that were identified being past their useful life and are susceptible to failure at any given time. As these building elements are costly and would require temporary to permanent closure of the existing facility, it is prudent to carry a Risk Reserve amount instead of repairing these building elements at this current time.

It should be noted that even with the additional investment of the capital lifecycle cost and risk reserve, along with typical operating expenditures, it is not guaranteed that the aging existing facility will not experience an unforeseen failure that would result in a significant operational shutdown, as is the nature of facilities that are past their useful life expectance.

Threshold values and durations were determined as the highest value and longest length of facility shutdown that could be tolerated before programing would be severely affected, jeopardizing operation of the existing facility.

The thresholds to repair the existing facility during construction of the new facility that if breached would result in the permanent shutdown of the existing facility are as follows:

- $1,000,000 or less and 6-month facility shutdown or less, during the first half of the new facility construction process.

- $800,000 or less and 3-month facility shutdown or less, during the second half of the new facility construction process.

- Repairs that exceed thresholds are considered Catastrophic and would result in permanent closure of the existing facility.

- Cumulative repairs that exceed cost and duration thresholds, or single event repairs that exceed thresholds, resulting in shutdown of the existing facility to be determined but the City's governance model.

Figure 2 below summarizes at a high level, the building elements, remaining life, and risk levels for each building category that is key to the continued operation of the existing facility.

Category	Description	Remaining Life (Yrs.)	Threshold Risk	Risk Level
Structure	Pool Waterproofing	1	Catastrophic	
Building Enclosure	Skylights	0	Catastrophic	
Building Enclosure	Envelope	2 - 3	Low	
Mechanical	Pool Drainage	1	Catastrophic	
Mechanical	Mechanical Systems	1 - 5	Moderate	
Fire Protection	Fire Protection System	2	Low	
Electrical	Electrical Systems	1 - 5	Moderate	

Figure 2 – FCA Building Elements Summary

Figure 2 above classifies three building elements as Catastrophic. Pool Waterproofing, Skylights, and Pool Drainage were labeled Catastrophic as each building element is at or near its useful life expectancy, has considerable deterioration where visible, and a failure would exceed cost and duration thresholds for repair.

3. Construction Delivery Assessment

In assessing the overall construction delivery of each site option, TCPM worked with HCMA to complete construction staging diagrams for each site option. These diagrams highlight site logistical challenges, tree protection impacts, proximity to the existing facility, staging areas required, and road use requirements that the general contractor will need to navigate to complete the project.

a) Central Park North Scenario

This location represents the baseline condition where the existing facility would be demolished, and the new facility would be constructed in the same footprint. The construction logistics would be conventional, with park facilities maintained, allowing for public use of the existing facilities, partial use of the greenspace, and tree retention maximized. Additionally, the construction timeline would follow a conventional path and would not require any portion of the work to be phased, with the existing facility demolished, underground parkade built with the new facility in one linear process.

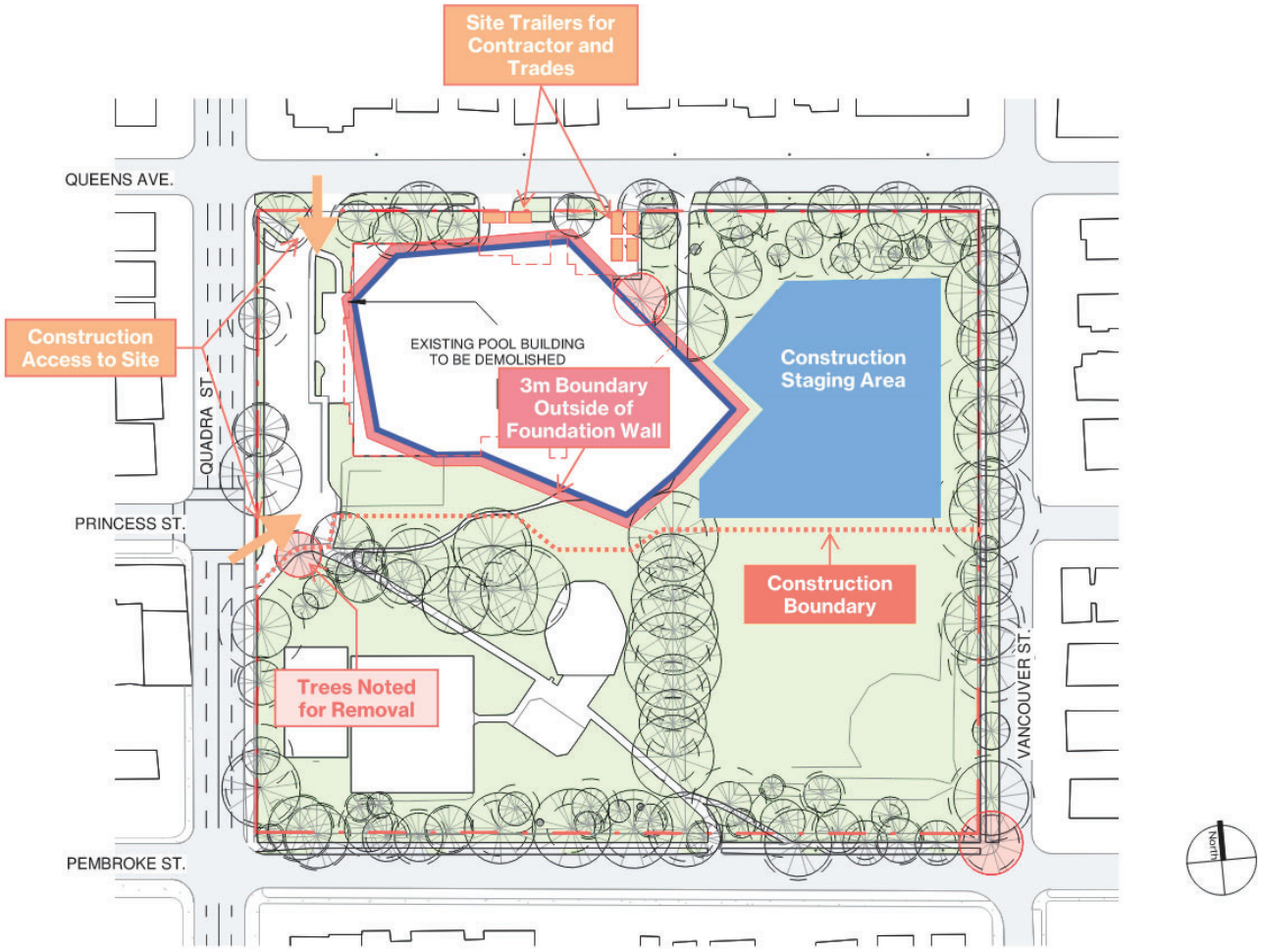


Figure 3 - Central Park North Site Logistics Plan

The above site logistics plan details the anticipated construction boundary and utilizes the existing facility's street access points. Construction staging is contained to the north, and existing park amenities of basketball, tennis, playground, and fitness are maintained. Tree retention is maximized due to the building being located within the existing buildings footprint, limiting the amount excavation work needed when compared to the other site options.

b) Central Park South Scenario

Construction activity within proximity to the existing facility requires additional site safety, security, and traffic control, while maintaining public access to the existing facility.

Due to the soil conditions common for all scenarios, rock blasting will be prevalent. With the existing facility's proximity to the active site, vibration monitoring will be required to safely conduct the excavation, shoring, and foundation works while observing the highly sensitive building elements noted in Figure 2 for failure.

Tree retention is also a major concern for this scenario, as outlined by the arborist report from Talmack Urban Forestry. Given the project boundary, depth of the excavation, construction access for deliveries, loading and staging areas, retaining the existing trees that are not currently marked for removal is not guaranteed, and in fact many are at high risk to be damaged or lost.

Once occupancy is achieved for the new facility, demolition of the existing facility will be needed to build the underground parking for the new facility. This will leave the new facility without suitable public parking for the first estimated 18 months of operation. To alleviate this issue, it is proposed that the construction staging area in Central Park be converted to public and staff parking, and a temporary Off-site parking solution be provided to service the new facility, as shown in Figure 4 below. These temporary solutions will need to be in place for approximately 18 months, impacting the community until the underground parking is complete.

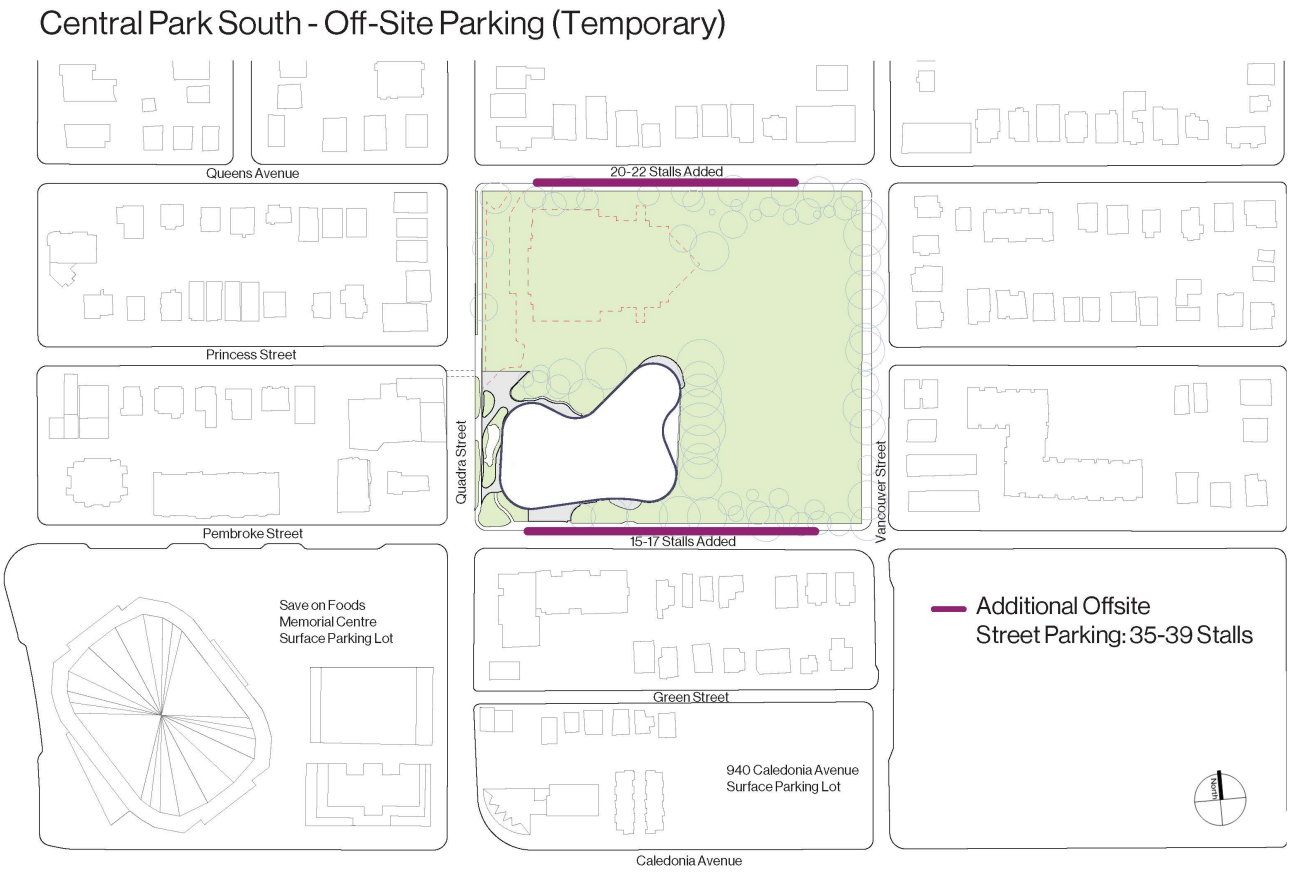


Figure 4 - Central Park South Offsite Parking (Temporary)

Below is the Central Park South logistics plan prepared with HCMA. The logistics plan details the extent of the excavation boundary, overall construction boundary, site access points, construction staging through retained trees, and trees highlighted in red, that are required to be removed to facilitate construction.

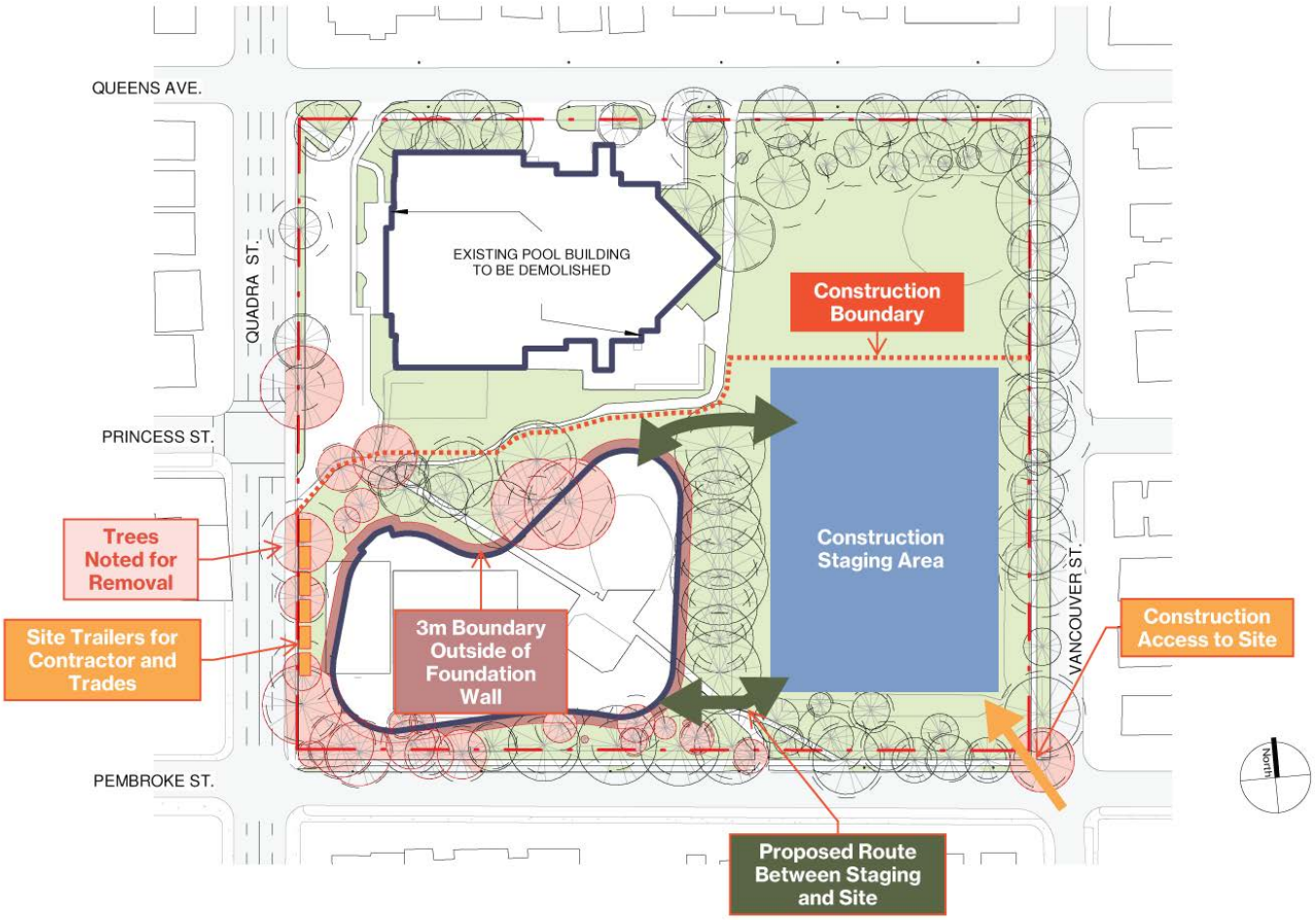


Figure 5 - Central Park South Site Logistics Plan

The above logistics plan considers the continued operations of the existing facility. Construction activity is focused away from the public and utilizes Central Park greenspace for construction staging. This results in additional tree protection and geotextile pathways through the retained trees, putting these retained trees at risk for failure.

c) Caledonia Scenario

The site at 940 Caledonia Avenue alleviates the concerns of proximity to the existing facility but still requires additional steps to facilitate the construction work due to the unique challenges of this site location.

With the loss of the parking lot at 940 Caledonia Ave due to the construction of the new facility, several factors contribute to the concerns noted in the Watt Consulting Group's traffic study dated March 11, 2024 (Watt). These concerns are the site's proximity to Royal Athletic Park which hosts sporting events and annual festivals, a significant number of existing monthly parking pass holders, and service continuity of the existing facility. Watt's traffic study recommended that additional on and off-street parking be constructed and that during event periods, local residential parking be converted to 1 and 2

hr. parking stalls. To alleviate the parking concerns for the public and trades during the construction of the new facility, it is proposed by the project team that trade parking will be supported at the Central Park staging area, which will require site safety, security, traffic control, and tree protection while maintaining public access to the park.

Given the excavation boundary is to the edge of the property, construction staging will be difficult to contain within the construction site. If onsite staging is required for large span roof structures, such as trusses, which are common in green building design for aquatic community centres, staging will be accommodated at Central Park, as it was identified as the closest City owned lands to the development. This will require additional general contractor oversite to manage two site locations and precautions will need to be taken along Vancouver Street to accommodate the movement of equipment, materials, and trades to facilitate the works.

Below is the Caledonia Ave. logistics plan prepared by HCMA. The logistics plan details the extent of the excavation and construction boundary, site access points, construction staging at Central Park and the use of Vancouver St, while maintaining a 3-metre-wide bike path.

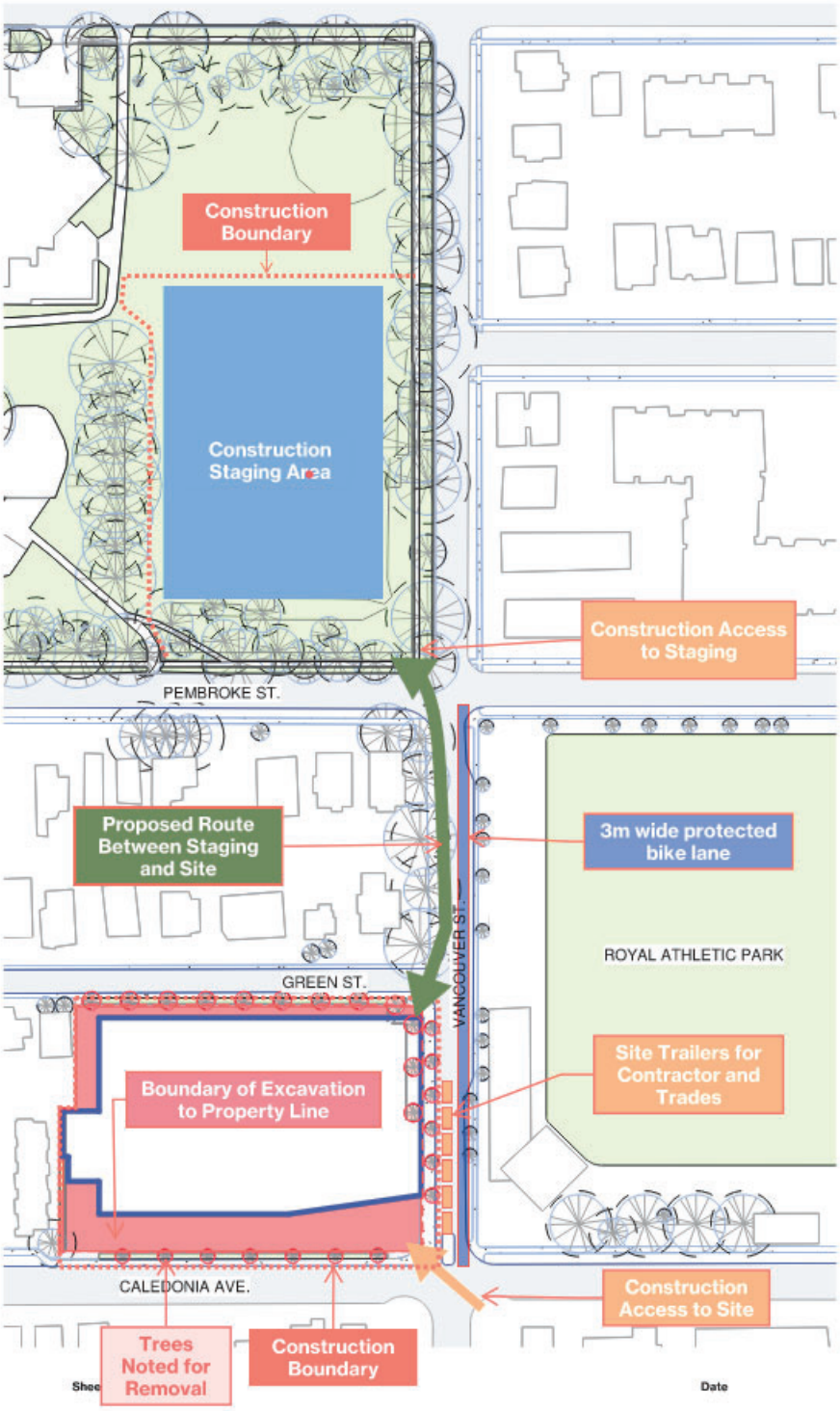


Figure 6 - Caledonia Site Logistics Plan

The above logistics plan highlights the constraints of building within a tight urban neighbourhood and the logistics needed to maintain two construction areas: CPWC at 940 Caledonia and construction

staging / trade parking at Central Park. Maintaining public access and safety along Vancouver St. and Royal Athletic Park will be challenging, but achievable.

4. Quantitative Analysis

a) Construction Delivery & Complexity Comparison

Figure 7 below analyzes all the factors found in the analysis of the Construction Complexity, Project Duration, Site logistics, and Service Continuity for all three site options. To estimate a premium needed to construct one option over another, all options were compared to the Class C and D construction cost estimates prepared by the LEC Group updated to February 29, 2024, being conventional construction delivery, linear schedule. typical site logistics, and no service continuity.

Central Park North does not have service continuity but will need to factor is additional precautions in maintaining the health of the large caliper bylaw protected trees in Central Park.

Central Park South will have service continuity, and given its proximity to the existing facility, will need to take precautions during the excavation, shoring, pile foundation stages to prevent construction vibration from damaging the existing facility. Central Park South is also situated in close proximity to many large caliper bylaw protected trees as previously shown on the site logistics plan. The general contractor will have to closely monitor equipment and material movements onsite as well as the excavation to prevent undue loss of these trees.

Caledonia will also carry the capital lifecycle costs and risk reserve for service continuity, and need to maintain the heath and protection of the trees in Central Park due to its construction staging area, but additionally the general contractor will have to work at two site locations which brings with it additional security, traffic control, road use, and temporary access points that will need to be maintained and monitored for public safety

Figure 7 details the construction variables and the degree to which each variable is present in the 3 site options.

Construction Complexity Comparison	Site Options		
	Central Park North (CP Closed)	Central Park South (Service Continuity)	Caledonia (Service Continuity)
Site Logistics			
Security	-	x	xx
Traffic Control	-	-	xx
Trade Parking	-	-	x
Hoarding / Fencing / Signage	-	-	xx
Street Use	-	xx	-
Tree Protection / Geotextile Pathways	x	xx	x
Temporary Accesses	-	x	xx
Schedule Variance			
Additional GC Costs	x	xx	x
Offsite			
Permanent Parking Improvements	-	-	x
Temporary on Street Parking	-	x	-
Capital Cost / Risk Reserve			
Capital Cost / Risk Reserve	-	x	x
Construcion Induced Risk	-	x	-
Vibration Monitoring Costs	-	x	-
Total # of X's	**2**	**12**	**13**

xx Extreme Condition
x Condition Over Baseline
- Baseline Condition / Not Applicable

Figure 7 – Construction Complexity Comparison

Figure 7 above identifies that the two scenarios with service continuity contain the most site variables, thereby significantly increasing complexity and resulting in higher construction costs to complete the new facility.

b) Project Schedule Duration

Maintaining service continuity, or closing the existing facility directly affects the construction duration for each site option. Construction duration timelines found in Appendix II were completed by HCMA with oversite provided by TCPM.

The below Figure 8 shows the total construction durations that each site option will have when considering the completion of the new facility, demolition of the existing facility, and reinstatement of Central Park.

Construction Duration	Site Options		
	Central Park North	Central Park South	Caledonia
Time to First Swim (From Start of Construction)	41	34	36
New Facility Construction	31	32	34
Underground Parkade		8	
Post Construction / Move In	2	2	2
Demolition of Existing Facility	8	8	8
Park Reinstatement	-	2	2
Total Construction Duration	**41**	**52**	**46**

Figure 8 - Construction Duration

Central Park South has the longest total construction duration but given the phased construction it will be able to deliver the quickest schedule to First Swim by the public, albeit without the necessary public parking to service the new facility.

c) Condition Assessment Key Findings

Based on the analysis of the FCA findings, mandate for service continuity until 2029, and threshold requirements, the following Figure 9 - Capital Lifecycle / Risk Reserve Matrix was established to calculate the required capital lifecycle and risk reserve for each building category.

Category	Description	Remaining Life (Yrs.)	Total Value	Capital Life Cycle	Risk Reserve	Threshold Risk	Risk Level
Structure	Pool Waterproofing	1	$1,531,000	$150,000	$850,000	Catastrophic	
Building Enclosure	Skylights	0	$3,000,000	$0	$0	Catastrophic	
Building Enclosure	Envelope	2 - 3	$3,061,000	$100,000	$0	Low	
Mechanical	Pool Drainage	1	$1,525,000	$0	$0	Catastrophic	
Mechanical	Mechanical Systems	1 - 5	$3,582,000	$277,000	$723,000	Moderate	
Fire Protection	Fire Protection System	2	$33,000	$33,000	$0	Low	
Electrical	Electrical Systems	1 - 5	$539,000	$278,000	$261,000	Moderate	
Totals			**$13,271,000**	**$838,000**	**$1,834,000**		

Figure 9 - Capital Lifecycle / Risk Reserve Matrix

The above Figure 9 summarizes the key findings from the FCA investigation for each building element, and applies the following:

- The Capital Life Cycle and Risk Reserve value was determined by identifying immediate maintenance requirements and contingency needed to maintain service continuity until 2029.
- Threshold Risk and Risk Level was applied to identify which building elements posed the most risk to service continuity. Three individual building elements, Pool waterproofing, Skylights, and Pool Drainage were classified as Catastrophic as each building element is at

or near its useful life expectancy, has considerable deterioration where visible, and a failure would exceed cost and duration thresholds for repair.

At a minimum, the Capital Lifecycle Costs of $838,000 must be budgeted for maintaining the existing facility until 2029. This budget is required to maintain the safety and continued operations of the facility and should not be considered as improvements, but the costs that are needed additional to the operating budget to extend the life of the facility beyond 2029.

A Risk Reserve contingency of $1,834,000 is recommended to be held for additional repairs of the Pool Waterproofing, Mechanical, and Electrical building systems, as they are past their useful life with an unknown failure date.

There are three individual building elements that have been categorized as Catastrophic: Pool Waterproofing, Skylights, and the Pool Drainage system. If one of these catastrophic failures occurs, the cost and duration would far exceed the thresholds for service continuity, therefore it would be strongly advised to permanently close the existing facility.

TCPM recommends that the City of Victoria completes a governance model for deciding the cumulative repair and or single event repair that would result in closing the existing facility.

d) Service Continuity Premium

To analyze the Service Continuity Cost Premium for Central Park South and Caledonia, TCPM assessed costs for individual variables as shown below in Figure 10, and the severity that these factors would be found to exist in Figure 7. TCPM relied on an internal cost database of active projects with similar site constraints which will be further refined once third-party input can be utilized. Where counts were available, construction takeoffs were utilized to derive cost figures. Based on TCPM's experience working on projects where service continuity of an existing facility has been mandated, and constructing within zero lot line urban centres, it was determined that the following parameters will result in additional costs not accounted for in the construction cost estimates for each scenario. Figure 10, shown below, outlines the additional cost of execution for service continuity for Crystal Pool South and Caledonia site options. The costs for Capital Lifecycle and Risk Reserve were pulled directly from Figure 8. These additional costs should be applied to the total project budget for both site options.

Service Continuity Premium	Site Options	
	Central Park South (Service Continuity)	Caledonia (Service Continuity)
Div 1 / Site Logistics		
Security	$35,200	-
Traffic Control	-	-
Trade Parking	-	-
Hoarding / Fencing / Signage	-	-
Street Use	$19,163	-
Tree Protection / Geotextile Pathways	-	-
Temporary Accesses	-	-
Schedule Variance		
Additional GC Cost	$972,000	
Offsite		
Permanent Parking Improvements	-	-
Temporary on Street Parking	$350,000	-
Capital Cost / Risk Reserve		
Capital Life Cycle Cost	$838,000	$838,000
Risk Reserve Cost	$1,834,000	$1,834,000
Vibration Monitoring Costs	$64,497	-
Service Continuity Premium	**$4,112,860**	**$2,672,000**

Figure 10 – Service Continuity Premium

The above matrix establishes the tangible costs for service continuity. Central Park South has the greater cost of service continuity, given its proximity to the existing facility. This results in additional Site Logistics costs, additional GC Cost costs due to a longer construction duration, and the need for temporary parking to offset the lack of onsite parking once the new facility is built.

e) Site Logistics Premium

Figure 11 below, Site Logistics Premium, establishes the additional tangible costs of construction delivery between the three options, irrespective of Service Continuity.

Site Variables	Site Options		
	Central Park North	Central Park South	Caledonia
Site Logistics			
Security	-	-	$374,000
Traffic Control	-	-	$216,000
Trade Parking	-	-	$61,200
Hoarding / Fencing / Signage	-	-	$16,320
Street Use	-	$34,067	-
Tree Protection / Geotextile Pathways	$21,000	$65,000	$12,000
Temporary Accesses	-	$41,667	$62,500
Schedule Variance			
Additional GC Cost	$720,000	$648,000	$900,000
Offsite			
Permanent Parking Improvements	-	-	-
Temporary on Street Parking	-	-	-
Capital Cost / Risk Reserve			
Capital Life Cycle Cost	-	-	-
Risk Reserve Cost	-	-	-
Vibration Monitoring Costs	-		-
Site Logistics Premium	**$741,000**	**$788,733**	**$1,642,020**

Figure 11 – Site Logistics Premium

Figure 11 shows that the Caledonia site option has the greatest site logistic premium due to the general contractor having to manage work at 940 Caledonia, and the construction staging area located at Central Park. All sites will face some construction complexity, with tree retention requirements of Central Park, and additional GC costs due to schedule variances resulting from the demolition and abatement of the existing facility, along with reinstatement of park facilities at Central Park.

5. Conclusion

After careful analysis and measuring of the key project factors identified as Community Impacts, Project Schedule Duration, Site Logistics, and Service Continuity, the quantitative analysis established the premium for the three site options that would occur over a conventional project.

Below Figure 12, Multi-Criteria Assessment, takes the quantitative analysis Figures and applies them to a single graph for a visual comparison of the three site options. Figure 7's totals are recorded on the right side of the graph's complexity scale. Figure 8's Project Schedule Duration is recorded on X axis of the graph, and Figure 10 and 11's costs premiums are applied to the overall total project costs, prepared by the City project staff, for each site option and applied to the Y axis of the graph.

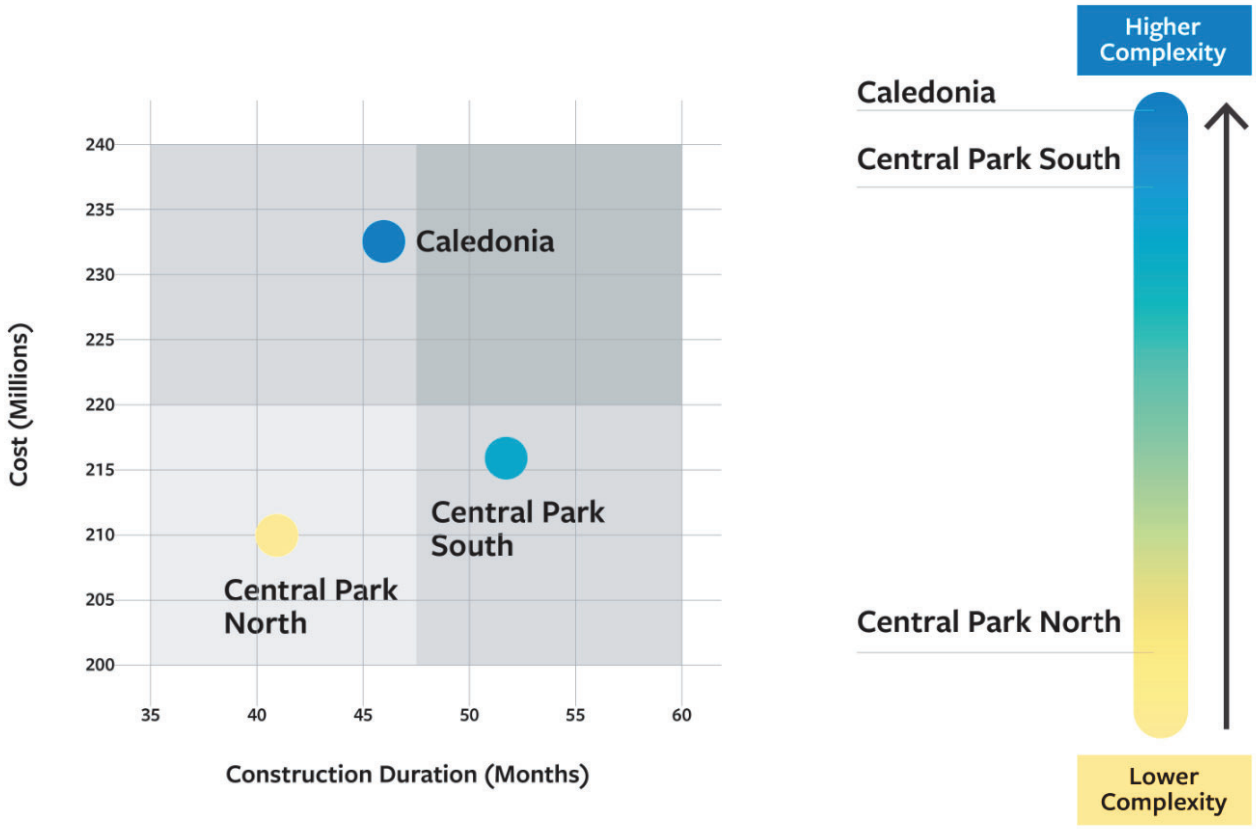


Figure 12 – Multi-Criteria Assessment

The Caledonia site option has the highest cost of execution, and highest degree of complexity, with a 46-month construction duration, therefore it has scored in the less than ideal quadrant of the graph making it the least viable site option as compared to the other sites for the new facility.

Central Park South is a challenging site option to construct, with high cost of execution, and longest construction duration, therefore it has scored in a less than ideal quadrant of the graph.

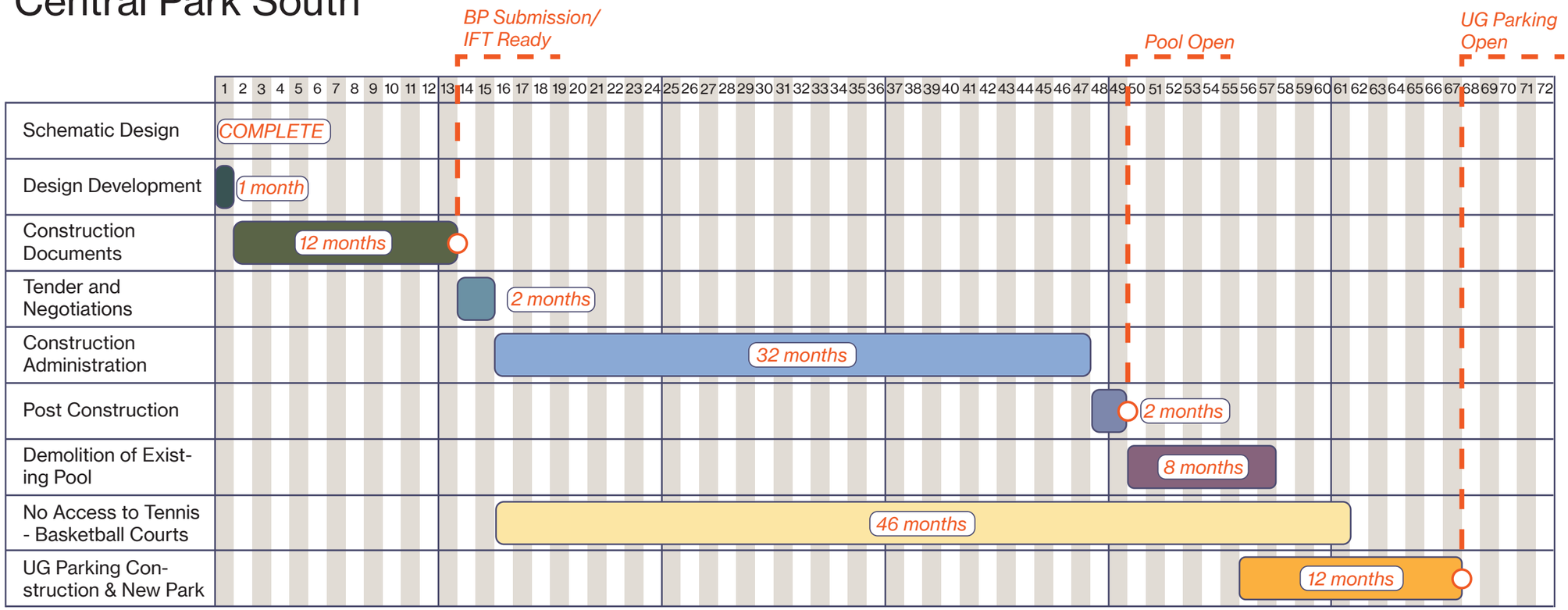
Central Park North is the least complex option to construct, with the lowest cost of execution, shortest construction duration, and with conventional site logistics, high tree retention, and minimal impact to Central Park facilities, it has the lowest construction complexity of all three site options, therefore it has scored in the most desirable quadrant and is the preferred site option to construct the new facility.

Appendix I: 2024.03.26 – TCPM Recreation Project Matrix

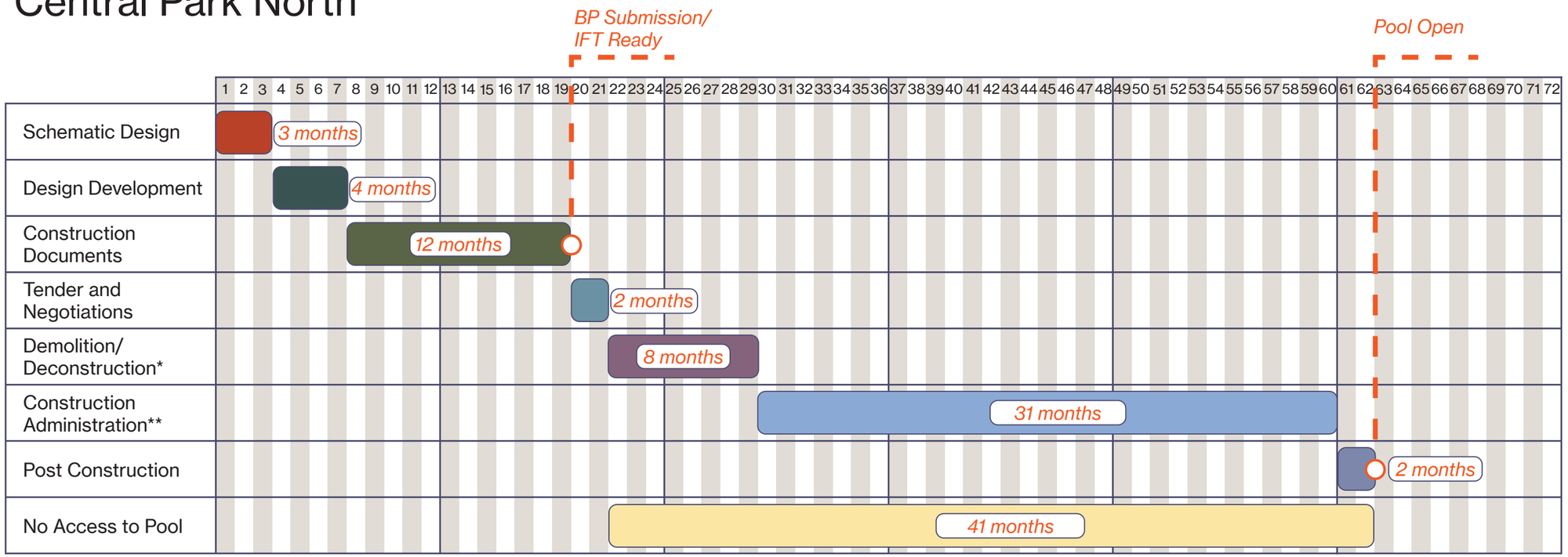
	Project Matrix - Recreational TCPM Experience																	
	Hollyburn Country Club - Major Facility Renovation	North East Community Centre	Spani Pool	Willougby Soccer Stadium	New Westminster Aquatic and Community Centre	Lac La Biche New Aquatic Facility	Yellowhead County & Town of Edson Recreational Facility	North Surrey Sports and Ice Complex	Aldergrove Credit Union Community Centre	Clayton Community Centre	Grandview Heights Aquatic centre	Guilford Indoor Pool	Timms Community Centre	Cloverdale Recreation Centre	Langley Events Centre	Numerous Alberta Schools	Luxury Home	Totals
Program Components	NHL Sized Ice Rink						✓✓✓	✓	✓						✓✓✓			8
	Aquatics Facility (Leisure & Competitive)	✓	✓		✓	✓	✓		✓		✓	✓		✓			✓	8
	Lazy River				✓	✓	✓		✓		✓	✓						6
	Curling Rink						✓										✓	2
	Gymnasium	✓			✓		✓		✓	✓			✓	✓	✓	✓	✓	9
	Walking Track	✓					✓	✓	✓	✓	✓		✓	✓	✓		✓	9
	Fitness Space	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	13
	Adequate Storage	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	13
	Skate Sharpening/Pro Shop						✓	✓	✓						✓			4
	Food Areas	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	13
	Steam Room/Sauna	✓			✓	✓	✓		✓		✓	✓	✓				✓	8
	Change/Universal Change Areas	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓		11
	Spectator Seating	✓		✓	✓	✓	✓	✓	✓		✓	✓			✓	✓	✓	9
	Therapeutic Area	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓	11
	Youth Areas/Preschool Space				✓		✓		✓	✓	✓	✓		✓	✓	✓	✓	11
	Art Spaces	✓								✓			✓			✓	✓	4
	Public Areas/Multi Purpose Rooms	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	13
Design Features	Pre-fabricated Elements	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓		9
	Mass-Timber Elements	✓			✓	✓	✓	✓	✓	✓	✓		✓					8
	Extensive Pavement Work	✓		✓	✓	✓	✓	✓	✓	✓	✓				✓	✓	✓	9
	Extensive Glazing	✓			✓	✓	✓			✓	✓	✓					✓	7
	Overall Building Systems Efficiency	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					8
	Universal Design & Accessibility	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓							7
	Award(s)							✓	✓		✓	✓						5
Risks	External Funding Requirements	✓	✓	✓	✓	✓	✓	✓	✓	✓								5
	Complex Stakeholder Management	✓	✓	✓	✓	✓		✓	✓	✓	✓				✓	✓		8
	Budgetary Challenges & Significant VE	✓	✓	✓	✓	✓			✓	✓	✓							5
	Urban Site Redevelopment		✓	✓	✓			✓	✓			✓			✓	✓		7
	Significant Offsite Infrastructure	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓		✓	8
	Specialized Mechanical Equipment	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓			✓		✓	10
	COVID-19				✓	✓	✓									✓		3

Appendix II: 2024.04.19 – HCMC_CPWC Design and Construction Timelines

Central Park South

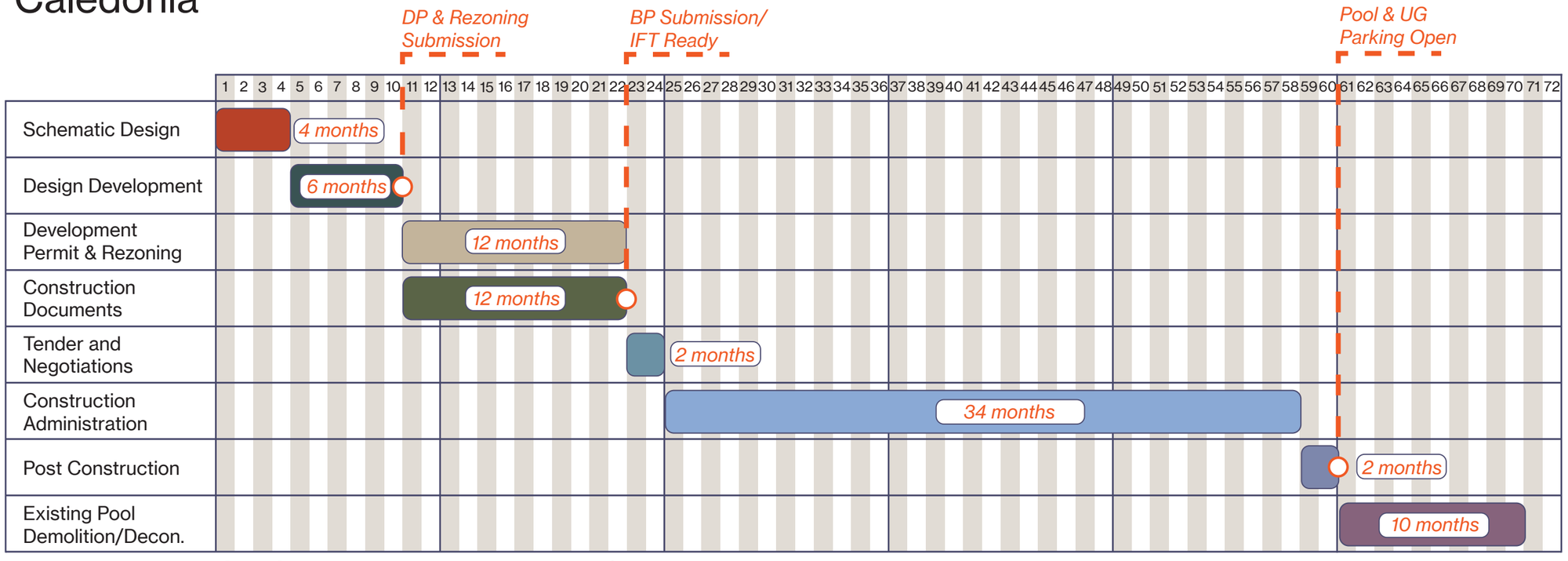


Central Park North



* Demolition of existing Crystal Pool post Tender
**Includes UG Parkingpost Tender

Caledonia



*Start Construction Documents prior to DP/Rezoning approval

Crystal Pool and Wellness Centre (CPWC) Feasibility Study

Appendix B - Qualitative Assessment of Site Options

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Appendix B - Qualitative Assessment of Site Options

The following section qualitatively reviews and assesses the three site options based on the following criteria:

- Building Design and Site
- Mobility impacts of the new facility such as parking, road networks and access to public transit

Along with giving background information of all sites for each criteria, there is a qualitative grading of each site as assessed by the project team.

Each criteria is assessed on a scale of 0 to 2 and colour coded:

Good **Acceptable** **Not good**

This approach allows comparison of the three sites based on their average qualitative score, the results of which are summarized in a table at the end of this section.

B.1 - Site and Design

A new Crystal Pool and Wellness Centre will be a community hub where people can meet, spend time and use all the amenities that it has to offer. How the new facility is sited and designed has a significant impact on meeting the project's five Project Principles, outlined in section 3a. The design and site impacts for the Central Park North and South options are comparable, both being within the same city-owned park, however the impacts for the Caledonia option differ due to the site's size, proximity to neighbouring properties and existing use as a surface parking lot.

Central Park North

- Requires new design which will lengthen the project schedule
- Sits within the park like a pavilion
- Limits impact to the existing trees by building on location of existing facility, within existing clearing
- Visual and physical connections to the trees and green space
- Entrance is located at the southwest corner of the building immediately adjacent to a generous public plaza in the park

Central Park South

- Design developed in 2019
- Sits within the park like a pavilion
- Visual and physical connections to the trees and green space
- Entrance located at the northwest corner of the building immediately adjacent to a generous public plaza in the park

Caledonia

- Requires new design which will lengthen the project schedule
- Site is bounded by three streets with the fourth side directly adjacent to two residential properties
- Compact site requires the building footprint to extend to the property lines with limited availability of green space
- Entrance is located at the southeast corner of the building immediately adjacent to a small urban public plaza

Qualitative Criteria per Site Option	Central Park North	Central Park South	Caledonia
Connection to Green Space	**2**	**2**	**0**
Available Open Space for Public Plaza	**2**	**2**	**1**
Impact of Facility Location on Neighbouring Properties	**2**	**2**	**0**
Total Score	**6**	**6**	**1**

Legend

Good
2 points

Acceptable
1 point

Not good
0 points

B.2 - Mobility Impacts

The success of community facilities can be measured by ease and convenience of access for all forms of mobility including pedestrians and those with accessibility requirements, cyclists, public transit and vehicles. As there is an expected increase in users of the new facility, it is important to assess mobility impacts and their effects on the surrounding community. Proximity of transit service and bus stops, impacts to traffic circulation, available vehicle and bicycle parking and consideration to delivery needs are all essential mobility considerations.

Central Park North

- Located along Quadra St., a major transit and vehicular route, and near Vancouver St., an all ages and abilities bike route
- Direct access to frequent transit service with a bus stop within 30m of building entrance
- 110 vehicle parking stalls including accessible parking; 28 surface, and 82 underground
- Parking is located directly beneath the new facility with the surface parking to the west of the new facility adjacent to Quadra St.
- Additional off-site vehicle parking available at the Save on Food Memorial Centre and Royal Athletic Park parking lots
- 100 bicycle parking spots; all at street level
- Creation of a 4-way signalized intersection at Quadra St. and Princess Ave. to improve safety and access for all road users
- Service entrance and loading zone for deliveries on Queens Ave

Central Park South

- Located along Quadra St., a major transit and vehicular route, and near Vancouver St., an all ages and abilities bike route
- Direct access to frequent transit service with a bus stop within 30m of building entrance
- 110 vehicle parking stalls including accessible parking; 28 surface, and 82 underground.
- Parking is located predominantly in the northwest corner of the site with the surface parking above the underground parkade
- Additional off-site vehicle parking available at the Save on Food Memorial Centre and Royal Athletic Park parking lots
- 100 bicycle parking spots; all at street level
- Creation of a 4-way signalized intersection at Quadra St. and Princess Ave. to improve safety and access for all road users
- Service entrance and loading zone for deliveries on Pembroke St

Qualitative Criteria per Site Option	Central Park North	Central Park South	Caledonia
Direct access to Transit	2	2	0
Connection to AAA Bike Network	2	2	1
Vehicle Access to Facility and Impact on Traffic Flow	2	2	0
Impact to neighbourhood traffic and street parking	2	2	0
Meeting On-site Parking Demands	2	2	0
Total Score	10	10	1

Legend

Good	Acceptable	Not good
2 points	1 point	0 points

Caledonia

- Site directly adjacent Caledonia Ave. (collector road with planned improvements to cycling facilities) and Vancouver St. AAA bike route
- Bus stops are 250m from building entrance
- 95 vehicle parking stalls including accessible parking, all within underground parkade
- Access to underground parking from Caledonia Ave.
- Additional off-site parking nearby at the parking lot at Save on Food Memorial Centre
- 100 bicycle parking spots; 76 short-term at street level and 24 long-term secure at parkade level.
- Net loss of roughly 125 off-street parking stalls in the North Park neighbourhood due to loss of existing parking lot, as well as loss of flexible space for specialty events.
- To offset the loss of the surface parking at this site and the eventual loss of the surface parking at the existing Crystal Pool facility, approximately 59 - 67 offsite parking stalls will be permanently added in the North Park neighbourhood
- Site would have a higher reliance on street parking impacting the neighbourhood, including additional street parking introduced on Pembroke St.
- Requirement for right-in/right-out of parkade allows for only one vehicle access route
- Service entrance and loading zone for deliveries on Green St

B.3 - Qualitative Analysis Table

This final table summarizes average scores for Site and Design and Mobility Impacts into a single, combined average score for each site.

Both Central Park site options score full marks in Site and Design and Mobility Impacts categories and Caledonia site option scores considerably lower. The main reason that the Caledonia site option is unable to match the Central Park site options is because of its location and site size.

In summary, there is no notable qualitative difference between Central Park North and Central Park South site options, both scoring 16 or “good”. Caledonia scores significantly lower at 2 or “not good”.

Summary of Scores

Qualitative Criteria per Site Option	Central Park North	Central Park South	Caledonia
Site and design	6	6	1
Mobility Impacts	10	10	1
Total Score	16	16	2

Legend

Good **Acceptable** **Not good**

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