

From: [Janine Daradich](#)
To: [Jamie Hanson](#)
Cc: [Bobbie Selinger](#)
Subject: [15\(1\)\(b\), 16\(1\)\(a\)](#) Private Exec
Date: Wednesday, June 22, 2022 1:41:24 PM
Attachments: [15\(1\)\(b\), 16\(1\)\(a\)](#)

Hi Jamie,

[16\(1\)\(b\)](#)



J

From: Jamie Hanson <JHANSON@regina.ca>
Sent: Wednesday, June 22, 2022 10:39 AM
To: Shauna Bzdel <SBZDEL@regina.ca>; Laurie Shalley <LSHALLEY@regina.ca>
Cc: Janine Daradich <JRDARADI@regina.ca>; Bobbie Selinger <BSELINGE@regina.ca>; Eric de Waal <EDEWAAL@regina.ca>; Neil Struthers <NSTRUTHE@regina.ca>; Hayley Gislason <HGISLASO@regina.ca>; Sherry Marchiori <SMARCHIO@regina.ca>
Subject: [15\(1\)\(b\), 16\(1\)\(a\)](#) Private Exec

Hi Laurie and Shauna,

[16\(1\)\(b\)](#)



Thanks,
Jamie

1. Sportplex vs. Yards site

Could the yards site be explored for the IAF?

- Yes, Administration and the consultants for the IAF did focus their attention to the current site of the Sportplex, however in light of new information Administration believes its important to review the site addressed in the Arena presentation as well. We will share our feasibility study with Council in July and then will be asking for some time to do a review of the newly proposed location

2. Site Considerations

Why was the Sportplex site considered initially?

- A replacement of the LAC is required based on the assessment, so the team explored what that would look like on the current site both from a renovation perspective and doing a full rebuild
- The existing Sportplex site also presents efficiencies and synergies in staffing, programming and amenities by adjoining with Fieldhouse; and
- presents a central location with adjacencies to the City Centre core, the sport corridor and the REAL District and is located in the North Central Community

3. Fieldhouse and Lawson Life Expectancy

- The **Fieldhouse** is anticipated to have upwards of 25 years of useful life remaining, and if the Sportplex site is where the IAF gets developed, it is recommended that the Fieldhouse be adjoined to the IAF and leveraged for staff and program efficiencies.
- **Lawson** was built in 1974 and would require an investment of \$20M to keep it operational for another 10-15 years. However, it should be noted that this will not bring it in alignment with accessibility and inclusion or aquatic best practices.
 - Some major items to extend the life in a meaningful way are:
 - Main Floor Pool Deck and Changeroom Floor
 - Pool basin replacement, filtration/piping/equipment
 - Roofing, roof decking and acoustic panels
 - HVAC and controls
 - Fire Sprinklers, emergency Power, fire alarm
 - Doors and hardware
 - Electrical panels and feeds

4. Facility Options Sizes/Areas

15(1)(b), 16(1)(a)



5. Annual Visits to Indoor Pools

Current

- Lawson – 170,150 swim visits in 2019
- SSLC – 183,493 swim visits in 2019 (busiest indoor pool)
- NWLC – 94,859 swim visits in 2019

Proposed

- IAF
 - 600,000 swim visits
 - 1.2M TOTAL visits (includes meeting rooms, gyms and spectators, does not include FH)
 - 192,000 dry visits (fitness, multi-purpose use)
 - 396,000 spectator visits (watching only – swim lessons, events)

6. Financial

- Capital – Optimized New Build
 - Total Project Costs: \$173M
 - 15% premium included to align with Energy & Sustainability Framework
 - Escalation included based on 2024 construction start
 - Construction costs: \$156.5M
 - Design Fees: \$12.4M
 - Furniture, Fixtures and Equipment, Misc.: \$3.4M

7. Economic Impact

- Economic impact during construction is expected \$235M
- During operations it is estimated to be \$10.5
- We will have all of the details in our upcoming report

8. Schedule

Design: 18 months for design

Procurement: 4 months procurement time

Construction: 2 years

9. Engagement

- Public Coded Survey – Nov 2021 - 2481 responses
- Public Open Survey - 1400 responses
- CAC members
 - Marj Walton – Swim Sask
 - Taya Amundson – Sask Artistic Swimming
 - Andrew Mitchell – Dive Saskatchewan
 - Dave Boan – Regina Water Polo
 - Rob Nelson – Regina Multi-Sport
 - Lisa Robertson – U of R
 - Sandra Jackle – REAL District
 - Chelsea Galloway – Economic Development Regina
 - Melissa Lerat – RTSIS
 - Dylan Morin – Accessibility Advisory Committee
 - Morris Eagles – North Central Community Association
 - Kathy Rodger – Age Friendly Regina
 - Lance Dudar – The Regina Intersectoral Partnership (TRIP)
 - Jennifer Roset – YMCA
- Over 45 other community organizations engaged

10. Sustainability

- The plan is for the IAF to align with the ESF and be net zero energy ready (NZER).
 2. NZER is a highly energy-efficient building that minimizes energy use such that on-site or community renewables or energy from a clean grid can be used to reach net-zero energy.

15(1)(b), 16(1)(a)



New Indoor Aquatics Facility Feasibility Study

City of Regina

Issued:
June 23, 2022



Acknowledgements

Land

The City of Regina acknowledges we are on the traditional lands of the Treaty 4 Territory, a Treaty signed with 35 First Nations across Southern Saskatchewan and parts of Alberta and Manitoba, and the original lands of the Cree, Salteaux, Dakota, Nakota, Lakota and the homeland of the Metis nation.

The City of Regina owes its strength and vibrancy to these lands and the diverse Indigenous Peoples whose ancestors' footsteps have marked this territory as well as settlers from around the world who continue to be welcomed here and call Regina home.

Advisory Committees

The following Feasibility Study could not have been completed without the commitment and dedication of the New Indoor Aquatics Facility Community Advisory Committee, City Council and Administration and the multi-disciplinary consulting team.

Community & Stakeholders

It is also important to recognize the residents, stakeholder groups, potential partners and various other stakeholders who took time to share their feedback and insights related to recreation facilities and indoor aquatics through surveys, interviews and meetings throughout the planning process. Community input is integral to recreation facility planning.

The Feasibility Study Team

This feasibility study has been prepared in collaboration with the City of Regina project team, hcma Architecture + Design, P3A, and RC Strategies. Every effort has been made to address the comments received by the general public & stakeholder groups in preparing the content of this package.

Core Team:
hcma
P3A
RC Strategies

Consultant Team:
Fast & Epp + BBK
AME Group + MacPherson
SMP + ALFA
Scatliff+ Miller + Murray
KGS
Turnbull
Morrison Hershfield
BTY
RWDI
Tricia Heward

hcma designs buildings, brands, and experiences that maximize positive impact. They believe human connections are critical to solving the fundamental problems of our time, creating solutions that ignite conversation and build compassionate communities. **hcma** projects are the result of several decades of iterative exploration of aquatic building types, with each successive design informed by the public experience of those that preceded them. As Aquatics and Community Recreation Design Specialists, recognized internationally, hcma's knowledge and technical experience with recreation centres, pools, public buildings, and universal accessibility will assist with defining this project's goals, developing a well-aligned functional programme, and designing a leading-edge facility that reflects the City of Regina's unique values, needs, and aspirations. hcma will lead all phases of work for this new facility.

P3A has planted deep roots in Saskatchewan over their 65+ years, and they are committed to innovative design that makes a meaningful difference to people, the community, the environment, and the practice of architecture. The firm will provide on ground support to the project and as an immediate resource and interface for the City of Regina. P3A's core team combines world-class experience and technical skill with tremendous local knowledge and horsepower. P3A will participate in all phases of the project and will assist with the coordination of the expansive sub-consultant team. The core architectural local team brings a combination of experience on large, complex projects, experience with the City of Regina projects, processes, engagement acumen, and experience with the City and hcma in developing aquatics facilities.

RC Strategies is one of a select few professional consulting practices in Canada that specializes entirely in recreation, parks, trails and culture planning and policy development. Their knowledge gained in creating the 2019 Recreation Masterplan makes them critical advisors of the core team which provides a unique advantage in carrying out key deliverables including: engaging internal and external stakeholders alongside hcma, data collection on program and public needs, Cost benefit analysis, development of aquatic program, research and life cycle costing. Their involvement as the project moves forward will transition to an advisory role for items as required.



New Indoor Aquatics Facility Feasibility Study City of Regina

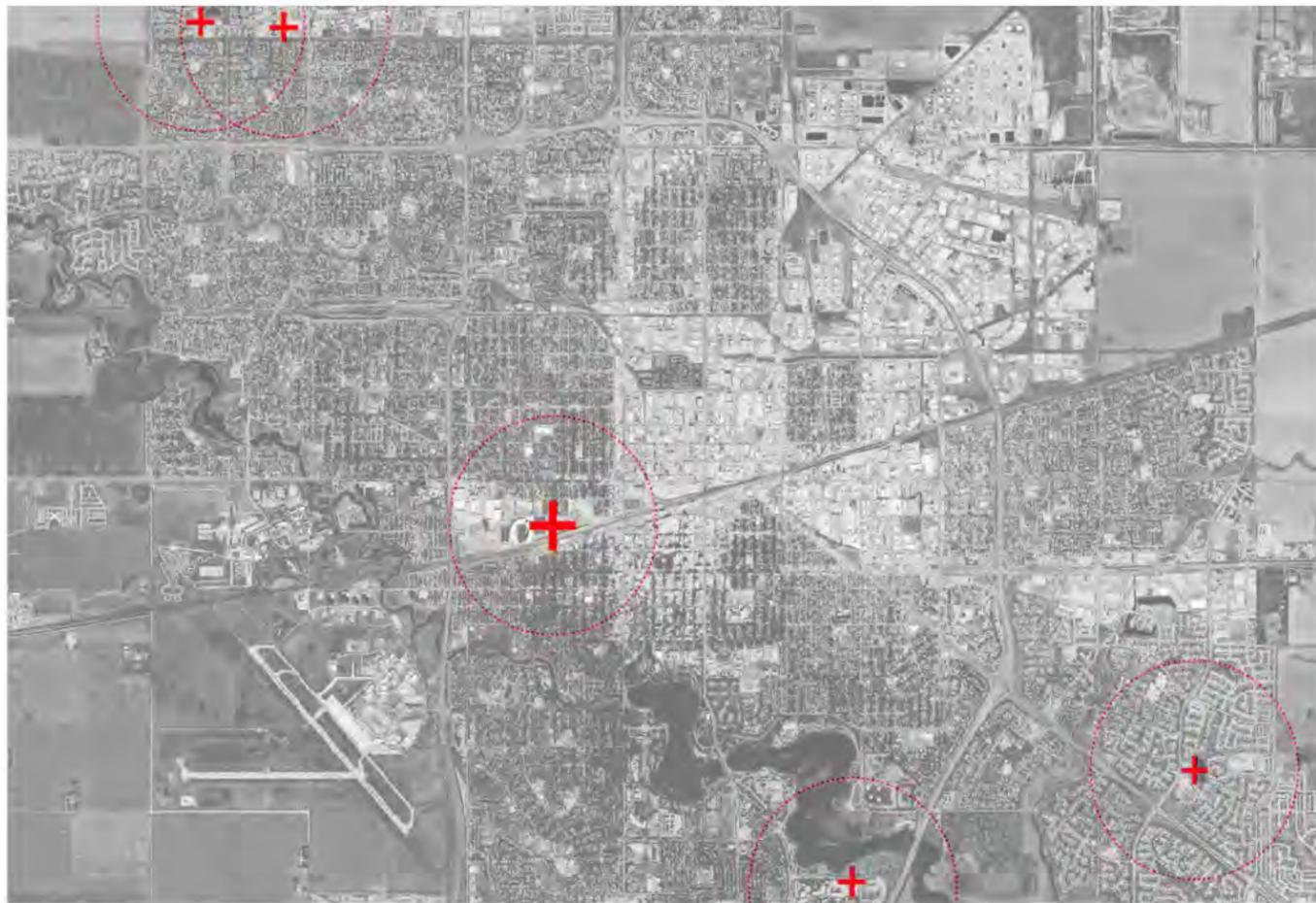
Issued:
June 23, 2022



Executive Summary

E.1 Introduction & Background
E.2 Input
E.3 Output

Regina's New Indoor Aquatics Facility is an **inclusive, accessible and sustainable community hub and destination facility**; that creates vibrancy & improves quality of life for the residents, future generations & visitors of Regina.



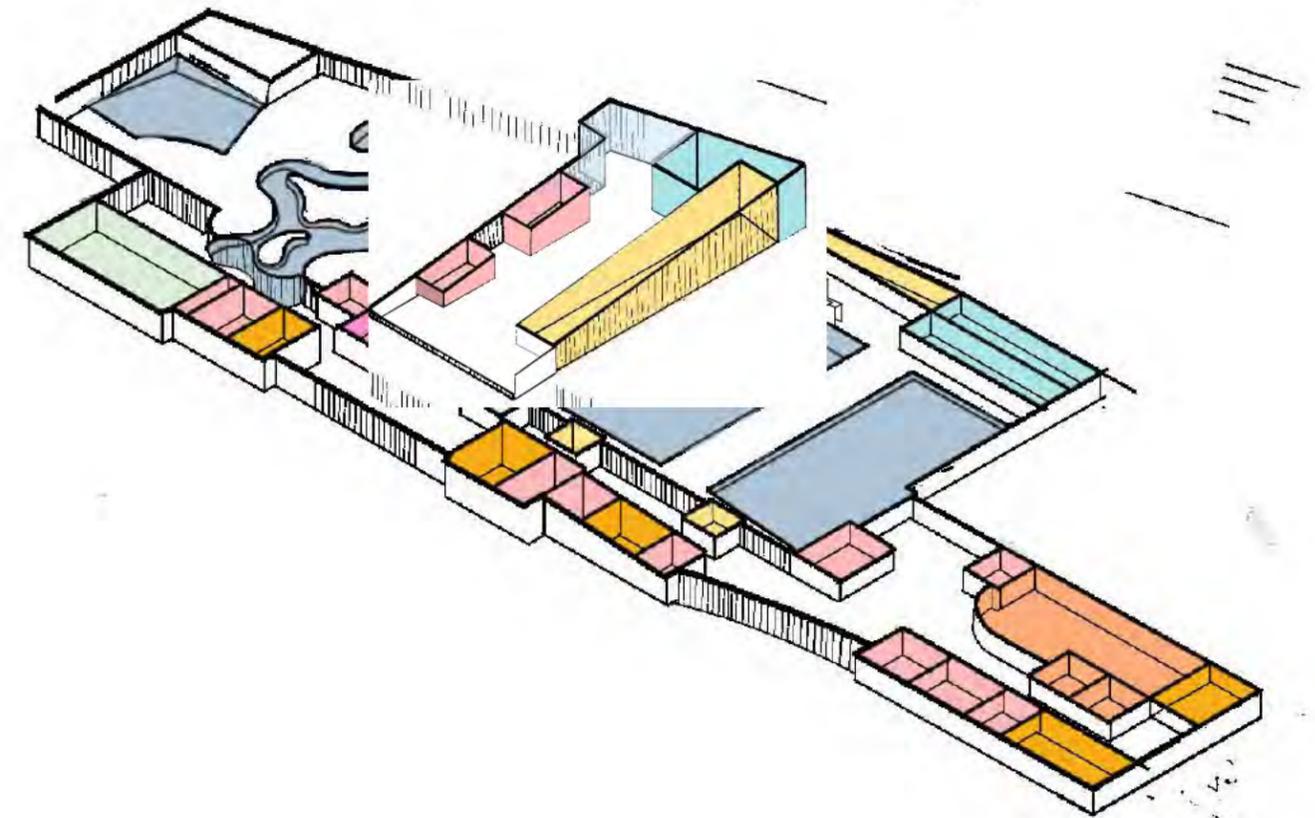
Existing Indoor Aquatics Facilities

E.1 Introduction & Background

In 2019, the City completed its Recreation Master Plan (Plan), which guides the future of recreation opportunities and services to meet the needs of Regina's growing community. The Plan was developed through meaningful engagement with key partners, stakeholders and the public, along with diligent research and assessment of the state of recreation in Regina. The most important priority in the Plan is the expansion in quality and quantity of indoor pool facilities. In 2021, the City began a feasibility study to explore a new indoor aquatics facility.

The feasibility study focused on the Lawson Aquatic Centre, the City's only aquatics competition facility. The Lawson is aging and in need of investment with significant and increasing costs for maintenance and life-cycle renewal. The Lawson does not meet current inclusivity, accessibility or sustainability targets and does not provide the broad range of programs needed to meet community demand.

This feasibility study report details multiple inputs and outputs, including a range of program options and a recommended solution for enhancing the indoor aquatics capacity in Regina.



Optimized New Build Test Fit

E.2 Inputs

In addition to a background review and a city-wide aquatics supply and demand assessment, the feasibility process included:

Community Engagement

Thorough market research and engagement was conducted with the public, user groups and community stakeholders. A Community Advisory Committee was also established to provide ongoing input throughout the project. The engagement findings identified several aquatics, fitness and community priorities including the need to accommodate future demand, competing priorities for competition and recreation elements, the need to provide community spaces, and address inclusivity and accessibility concerns.

Best Practices

The feasibility study considered best practices in three key areas: aquatics trends, accessibility & inclusion, and sustainability. Research was also conducted on five comparable precedent facilities across Canada with important takeaways mentioned in this report.

Existing Facility Assessment

The project scope includes a comprehensive assessment of the Lawson Aquatic centre. The assessment includes review of the physical components, and its ability to deliver necessary programming. The assessment is used to understand an upgrade cost that would be to bring the existing Lawson facility as close to best practice programatically and to modernize the building components in a major refurbishment.

Existing City Planning & Policy Documents

The feasibility study considered key planning and policy documents such as the Recreation Master Plan, Official Community Plan, Energy and Sustainability Framework, Regina Cultural Plan 2016, Transportation Master Plan and others.

E.3 Outputs

Vision & Principles

Vision: Regina's New Indoor Aquatics Facility is an inclusive, accessible and sustainable community hub and tourist destination – that creates vibrancy and improves quality of life for Regina residents and visitors for generations to come.

Program

The feasibility study confirmed significant demand for the new facility to meet seven activity elements, with a similar demand on the Recreation & Leisure and Competitive Sport & Training aquatic elements. An optimal program has been developed, balancing the various activity elements displayed in the feasibility study, with an overall program capacity increase of 620% compared to the existing site.

The feasibility study provides a program options matrix with a renovation + expansion option and three new build options. The matrix highlights the spectrum of service levels across multiple elements, including Recreation & Leisure and Competitive Sport & Training, associated costs and pros and cons for each option.

Recommended Program Option:

The recommended option in the feasibility study describes a new build that would consist of: a 10-lane 50-meter competition tank, a 10-lane 50-meter training tank, a 3,250-3,700m² (35,000-40,000ft²) water park, which could include a wave pool, lazy river, aquatic play structures, water slides; and complimentary community amenities that exceed current and meet future demand. These spaces could include multi-purpose spaces, lease spaces, a fitness centre, gymnasium, café and a cultural space for Indigenous communities' needs.

Concept Design

Two test fit options have been developed - a new build, and a renovation and expansion option. Both offer a functional layout that delivers similar program elements which meet best practice. The test fit options explore optimized programmatic relationships and are useful in understanding the overall scope of the project. These model relationships would then be influenced by site specific constraints and opportunities in future phases.

Costing

The total cost of the recommended solution has been estimated to be approximately \$173M based on a 2024 construction start.

This feasibility study report can be used to make key decisions for the future progression of the project. The program and concept options have been carefully analysed to be programmatically, functionally and financially feasible. The feasibility study lays the groundwork for recommended next steps, which would include further technical studies and a schematic design phase involving more public and stakeholder engagement.

The vision and following principles were developed to guide the feasibility study for a new indoor aquatics facility

- Improve quality of life for all residents and make Regina an attractive place to live, work and play
- Be multi-faceted destination & community hub for decades to come
- Improve aquatic leisure recreation opportunities, including swimming lessons
- Support excellence in competitive aquatics with a facility that can host National competitions
- Achieve ambitious sustainability targets in alignment with the City's commitment to be net zero by 2050
- Create a complete civic precinct with enhanced pedestrian, cycling & vehicular connections
- Provide opportunities for four-season outdoor recreation
- Be exemplary in providing enhanced inclusive & accessible environments
- Demonstrate leadership and commitment to reconciliation



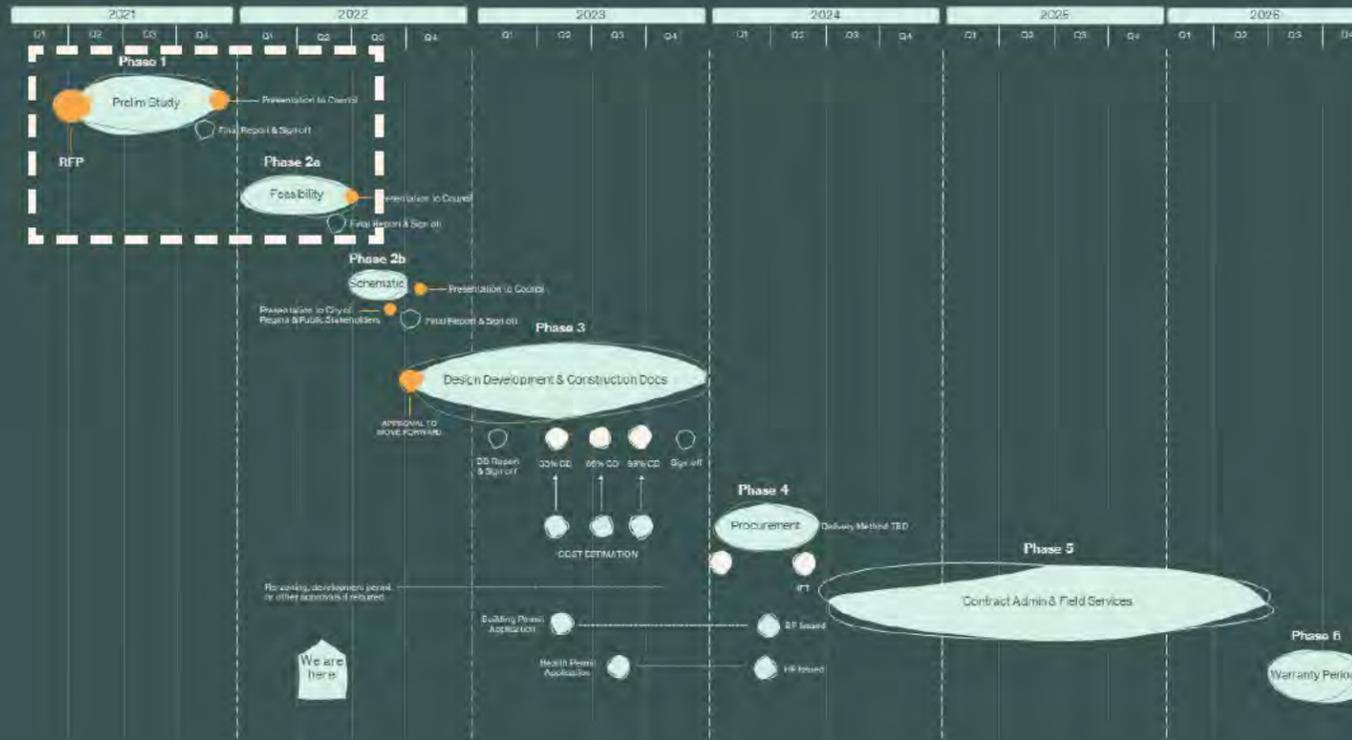
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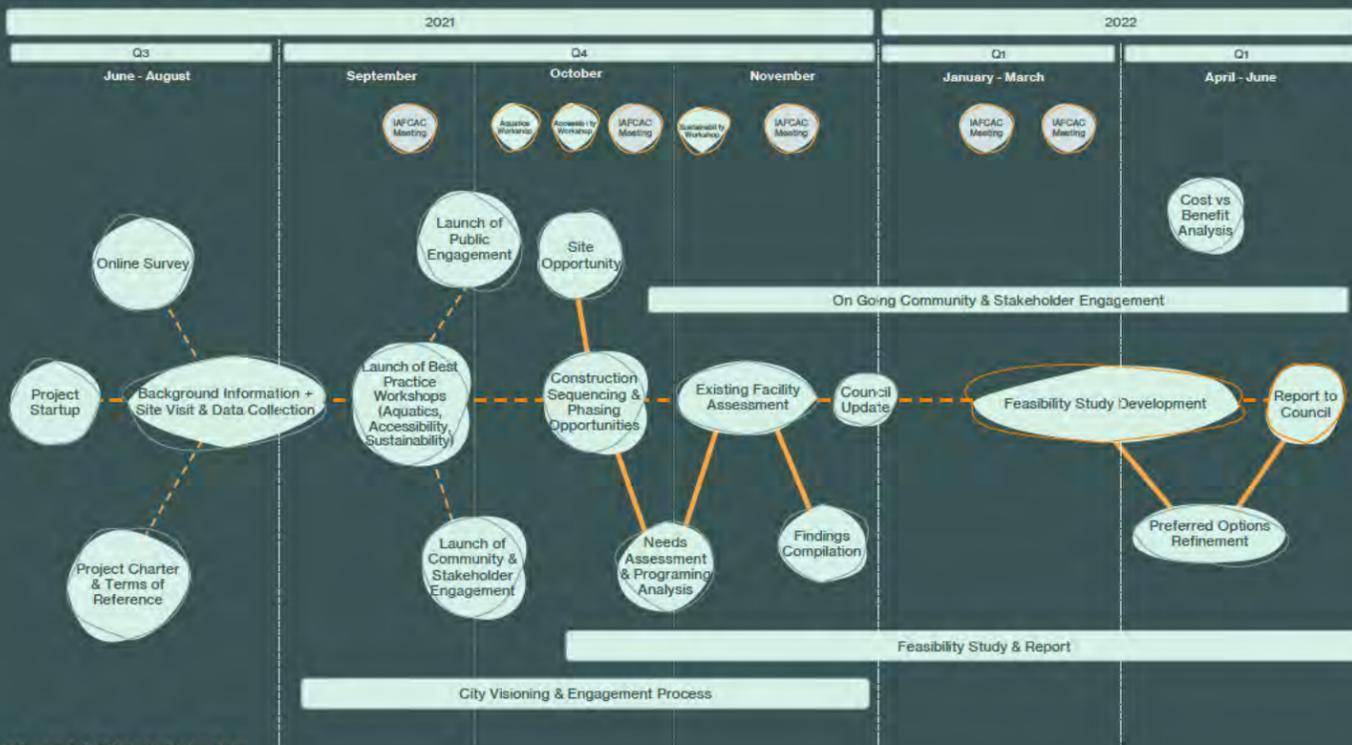
1.0 Introduction

Project Time line



Approximate Overall Project Schedule
Timeline is representative of a traditional project delivery method.

Feasibility Time line



Phase 1 & 2 Work Schedule

1.1 Overview

The City of Regina (the City) invests in public recreation facilities to make life better for residents and visitors of all ages and abilities. This investment is routed in the City's planning fabric, rationalized through key documents such as Design Regina: Official Community Plan and the Recreation Master Plan, and demonstrated through the vast array of indoor and outdoor recreation amenities offered throughout the community.

Indoor aquatics facilities are one of the most important and most significant public investments. These facilities lead to healthier individuals, more connected communities and economic activity by attracting people to the community. The City is the primary provider of publicly accessible indoor aquatics experiences in Regina and the surrounding region.

The City's most recent Recreation Master Plan, completed in 2019, outlined bold recommendations related to the City's provision of indoor aquatics facilities. It recommended investment to increase both the quantity and quality of indoor aquatics facilities, which currently is comprised of three indoor pools: the Lawson Aquatics Centre, the Sandra Schmirler Leisure Centre, and the Northwest Leisure Centre. Of note is that there are also publicly available indoor pools offered by the University of Regina and the YMCA.

In response to the recommendations in the Recreation Master Plan, in June 2021 the City commissioned a team lead by **hcma** Architecture + Design to undertake a feasibility study to further explore how enhancements to both quantity and quality of indoor aquatics could develop in the City, focusing on revitalizing or replacing the Lawson Aquatics Centre and enhancing service levels while doing so.

To guide this effort and ensure the voices of the indoor aquatics community in Regina were heard, the City invited aquatics and other community minded stakeholders to be part of the New Indoor Aquatics Facility Community Advisory Committee (IAFCAC). The IAFCAC provided integral and timely input throughout the planning process and has been key to the progress that has been made to date in determining need and articulating the kinds of facilities and spaces that would meet said need both now and into the future.

To complement the involvement of the IAFCAC, the consulting team conducted a comprehensive public engagement process that included surveys and community meetings, supplemented by research into trends, best practices and thorough analyses of current indoor aquatics participation in Regina. The information from this process is captured within this Feasibility Study to help City Council decide on how to move forward with this significant and important investment for the community.

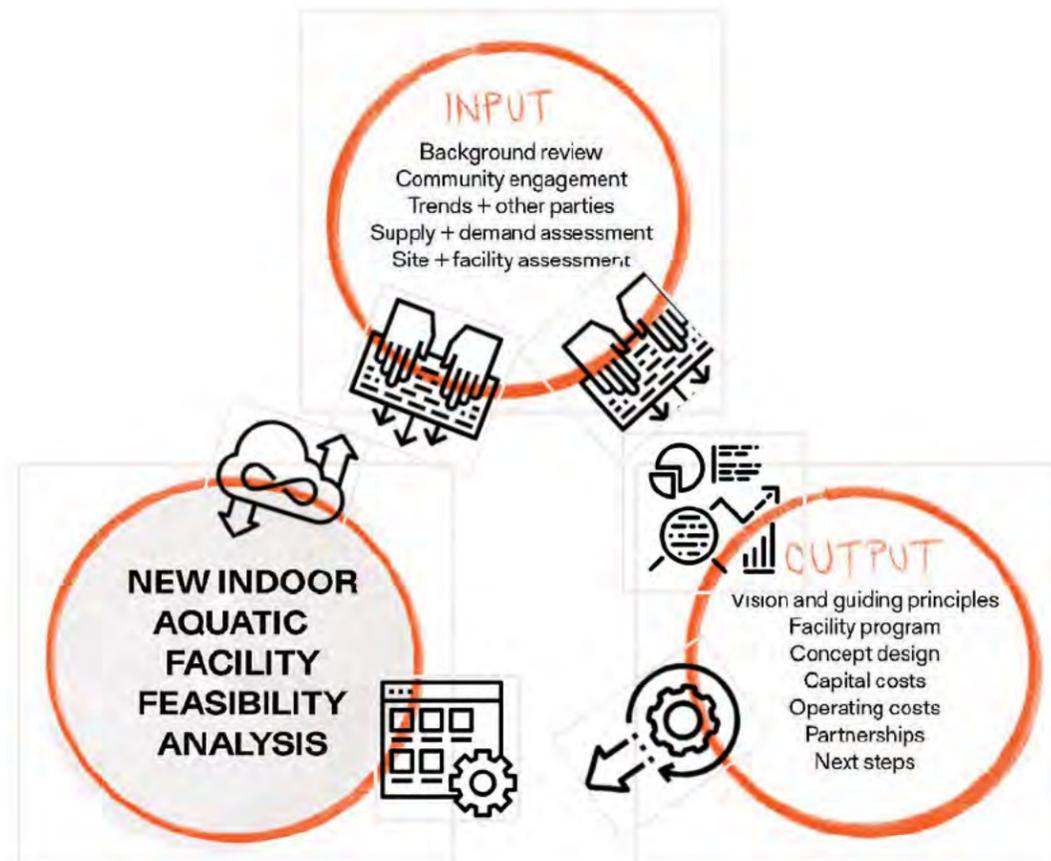
The body of the Feasibility Study includes summaries of large pieces of work for each section. For more detail, refer to the appendices.

Historical Regina Community Presence

Situated in the middle of the Prairie Provinces, the capital of Saskatchewan, Regina is in the south-central area of the province on Treaty 4 land and within the traditional territory of the Metis. Today, this diverse and vibrant community is one of Canada's fastest growing major cities that hopes to improve the quality of life for its growing population through the development of community recreational facilities.

Regina has deep seeded sporting roots; it was a recruiting ground for the All-American Girls' Professional Baseball League, as well, home to the Regina Pats - the oldest major junior hockey franchise in the world – and is proudly represented by the four-time Grey Cup-winning Canadian Football League franchise, the Saskatchewan Roughriders.

The city is also home to a variety of aquatic sports athletes who currently predominantly occupy the Sportplex as their daily training grounds. This facility is comprised of the Lawson Aquatic Centre and the Fieldhouse, and is one of the City's oldest recreation facilities, providing a variety of popular aquatic, fitness, and sport programs to residents of Regina.



Sportplex Site

The Sportplex, which includes the Lawson Aquatic Centre and Fieldhouse is a well used facility that serves a significant portion of the Regina Aquatic Sports groups. Despite its prominent role, the Lawson faces significant challenges due to age.

1.3 Project Background

The Recreation Master Plan recommended that the City increase the provision, both in quantity and quality, of indoor aquatics facilities in the short term to enhance both indoor program/competition and recreation/leisure capacity at the City-wide level. This recommendation was based on thorough community engagement and extensive research in the current state of recreation facilities and services in Regina and region in 2019.

Beyond the bold recommendations outlined in the Recreation Master Plan, a review of City planning as well as initiatives and aquatics related regulations at the provincial and national levels strengthened the justification for development and enhancement of indoor aquatics. Appendix A - Lawson Condition Assessment, articulates key findings from a review of 39 relevant documents and initiatives and how they relate to aquatics facility development in the City. Namely, it highlights the need for new facilities to be multi-purpose and flexible, able to host events and competitions, and built and operated in alignment with the City's energy and sustainability policies. The literature also highlights the opportunity for new facilities to further reconciliation and promote equity and inclusion.

Why the need for a new Aquatic and supporting community space?

The City of Regina is at a critical moment in the life span of the existing Lawson Aquatic Centre, which was originally built in 1974 and later expanded in 1986, when the adjoining Fieldhouse was constructed. This facility is no longer meeting program needs or best practice for programming, accessibility and inclusivity or sustainability. To address present deficiencies, an extensive renovation and addition or alternatively a replacement, has been assessed in this feasibility study as a viable solution for resolving & easing the challenges listed below.

- Aging and failing infrastructure
- Overcrowding of aquatic spaces
- Inadequate change room and multi-purpose spaces
- Rising operational costs
- Accessibility challenges
- Inability to meet evolving programming needs

The IAFCAC

The Indoor Aquatics Facility Community Advisory Committee (IAFCAC), played an influential role, as expert stakeholders to safeguard objective representation on the project teams' process, progress, and findings throughout the feasibility study.

The committee was asked to support the consultation process, based on consensus, with independence & respect in providing key perspective on community needs, financial impact, timing, options, and other project considerations. The IAFCAC also became advocates for the project as representatives of varied sports and community groups.

**Findings of a detailed assessment, on the existing facility and the site, are included in later sections of this study.

1.2 Supply & Demand Analysis

The analysis used to understand supply and demand for indoor aquatics, and ultimately inform a program for what amenities should be included in a new facility, is based on a framework that looks at enabling seven different types of activities:

- Recreation and leisure
- Skill development
- Fitness
- Sport training
- Special events
- Therapy and rehabilitation
- Leadership training

More information on these activity types and the supply and demand analysis can be found under Appendix C.

This feasibility study culminates in two conceptual design options, developed for consideration and evaluation, that meet and feature various combinations of amenities. This report puts forth a recommendation regarding the optimal scale of the proposed programmatic elements that will best serve Regina and region moving forward, with the realization that more investment in other city facilities will be required to support future growth. It is critical that a new municipal project of this scale provides not only enhanced aquatic experiences that address the gap in current City aquatic amenities but also leverage's this opportunity to invest and satisfy future aquatic and non-aquatic user needs.

2.0 Engagement Summary

- 2.1 Background
- 2.2 Public Engagement
- 2.3 City Led Engagement
- 2.4 City Staff & IAFCAC Visioning Sessions
- 2.5 Tactic Consideration & Conclusions

Public engagement helps ensure **multiple voices** are heard.

2.1 Background

Gathering the perspectives of the public, user groups, community organizations, and other stakeholders is integral to understanding the importance of and need for a public investment in recreation facilities. This is especially important for investment in indoor aquatics facilities as these types of facilities accommodate a variety of activities, including but not limited to competitive and programmed uses, recreation and leisure swimming, fitness, therapeutic purposes and more. Each person and organization in the community has a slightly different perspective on an indoor aquatics facility, particularly as it relates to its ability to meet their needs across the varied types of aquatic activities.

To understand these varying perspectives, a detailed and robust program of engagement was developed and implemented. The engagement activities gathered information from diverse audiences; this information served as an important input into the planning for a new indoor aquatics facility. Through the engagement activities information was gathered related to current levels of service, desired amenities and uses, willingness to travel and pay, and other values related to the City's investment in aquatics.

In addition to the program of public engagement described previously, a New Indoor Aquatics Facility Community Advisory Committee (IAFCAC) was formed. The IAFCAC includes representatives from many different aquatic interests as well as broader community champions and leaders; it has influenced the planning process significantly through various meetings and interactions with the project team. The formation of the IAFCAC is an important step to ensuring ongoing public and stakeholder involvement in the development of this Feasibility Study.

What was asked of the Community Advisory Committee

As part of the engagement process, to facilitate and outline the project parameters, to compile the necessary information needed for the project team to make informed decisions, the IAFCAC was engaged to gather advisement from representatives of sports and community groups who bring specialized expertise and can be advocates in their respective communities.

The IAFCAC was asked to support the broader consultation process, based on consensus, with independence & respect in:

- **Acting as an advocate** for the project
- **Providing key perspective on:** community needs, financial impact, timing, options, other project considerations.

2.2 Public Engagement

The feasibility team facilitated both a coded access (statistically representative) household online survey, an open access public online questionnaire, a stakeholder and group questionnaire, and a number of consultant-led interviews and meetings with user group representatives and key community stakeholders. The details related to engagement tactics and information gathered is presented under a separate “What We Heard Report” document which can be found in the Appendix (Appendix B - Engagement).

As well, there were numerous City-led discussions throughout the planning process with community stakeholders as well as internal subject matter experts, Administration, and City Council. All engagement efforts were conducted in alignment with the City’s policies and practices related to community engagement and were influenced by leading practices from the International Association of Public Participation (IAP2) and A projects Ethics Community Consensus Initiative (ARECCI). A summary of the consultant led engagement (from the What We Heard Report) is presented below along with a summary of the City led meetings. It is important to note that further community engagement will occur as the design process evolves.

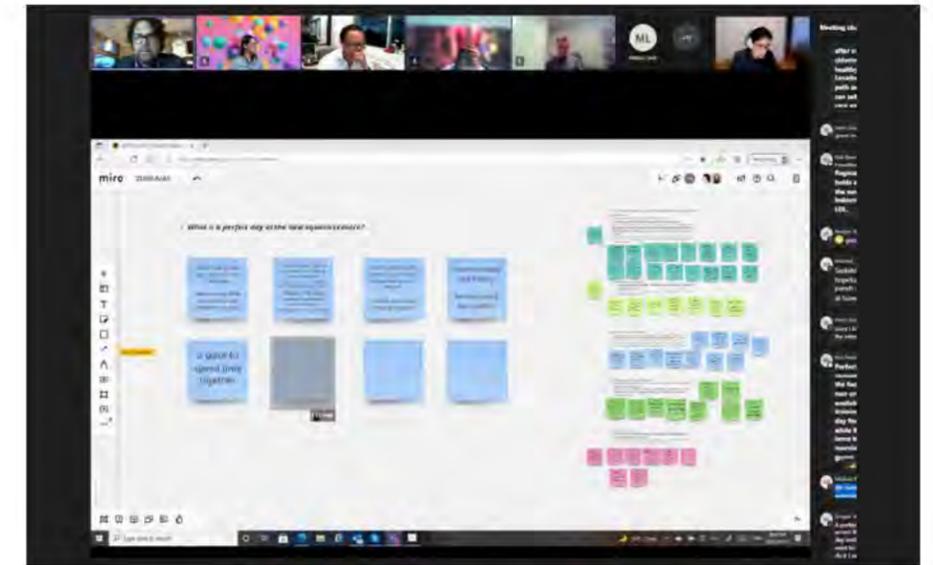
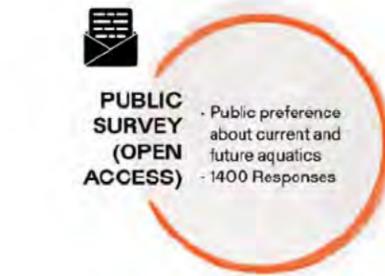
What We Heard Report

- Strong need for a new indoor aquatics facility that accommodates future demands
- A new indoor aquatics facility should accommodate recreation and leisure aquatics, swimming lessons, and fitness activities
- Training and competitive aquatic needs should be accommodated in a new indoor aquatics facility
- Aside from the range of aquatics activities, this new facility development needs to provide space for community organizations as well as members of the neighbouring community
- The new facility should address all issues as it relates to inclusivity and accessibility considering culture and heritage, as well as physical accessibility concerns



2.3 City Led Engagement

The City led over thirty meetings with stakeholders in the community. Stakeholders offered a diversity of perspectives and ranged from the University of Regina, YMCA, Regina Exhibition Association Ltd., Saskatchewan Roughriders, Economic Development Regina, Regina Police Services, Fire and Protective Services, the Accessibility Advisory Committee, Business Improvement Districts, the Public Library, internal City subject matter experts, Indigenous stakeholders and others.



Themes gathered from these meetings included the following:

- Accessibility, inclusivity, and affordability are important considerations to ensure it will truly be a community facility.
- The outdoor amenities and outward facing elements of the building have significant impact on the integration of the facility into the local area.
- Separation of the competitive and training elements from the leisure and recreational amenities of the aquatics facility is desirable.
- The facility has the potential to provide a significant draw for residents and visitors.
- Access to site and those nearby destinations need to consider spectators and visitors, as well as, emergency vehicle access
- The impacts of the development on existing parking should be taken into consideration
- The new facility will have a sizeable environmental footprint
- The new facility presents a unique opportunity to partner with the Indigenous community in the creation of a Cultural space

2.4 City Council & IAFCAC Visioning Sessions

In September of 2021, a series of virtual visioning sessions were conducted and used Microsoft Teams and Miro to actively ask members several key questions about the new facility. This feedback helped to determine the needs and aspirations of what City council and the IAFCAC wanted for the new facility.

The following questions were used as prompts for the group to start a conversation:

Big Picture

- What does success on the New Indoor Aquatics Facility mean to you?
- What do you think are the biggest challenges with the New Indoor Aquatics Facility?
- What do you think are the biggest opportunities with the New Indoor Aquatics Facility?

Headlines of Tomorrow

Fast forward five years from now - what headline would you want to read on the New Indoor Aquatics Facility?

A Perfect Day

What is a perfect day at the new aquatics centre?

A summary of the responses from the sessions can be found on the following page.



2.5 Consideration & Conclusions

- There is a strong need for a new indoor aquatics facility. As it relates to the current use of the Lawson, a new facility should not simply replicate the amenities but it must address the current deficit of space as well as accommodate future demands.
- A new indoor aquatics facility should accommodate the strong need for recreation and leisure aquatics, swimming lessons, and fitness activities.
- Specific recreation and leisure needs include:
 - Warm water pool
 - Beach entry
 - Water park amenities: spray / splash park; water slides
 - Social gathering / seating areas
 - Respite / quiet areas (to escape the highly stimulating environment)
- A new indoor aquatics facility needs to accommodate the needs of organizations for their training and competitive needs. The facility should meet the requirements and standards as described by national and international bodies for speed swimming, diving, artistic swimming, and water polo.
- Specific needs in the natatorium include:
 - 50m 10 lane pool
 - Secondary Tank
 - Separate dive tank
 - Cold and warm tubs / pools
 - Spectator seating (off the deck)
 - Separate gym / dryland training area (including trampolines)
 - Sufficient deck space to accommodate officials and athletes
 - Equipment storage for the City and clubs
 - Multi-purpose rooms for classrooms, officials rooms, hospitality rooms
- Other amenities to include in a new facility:
 - Change rooms: universal change rooms, separate change rooms for officials and coaches; consider a separate group change room
 - Café and social gathering space
 - Gymnasium and weight room
 - Public bathrooms potentially including showers for people otherwise not using the facility
 - Several program rooms that could be used by community organizations and agencies
 - Consider culturally specific rooms
- The facility should be designed to recognize the community and the heritage of the residents, particularly the Indigenous community.
- The transportation needs of people with mobility challenges needs to be addressed through appropriate parking near the entrances but also with suitable drop off and pick up area.
- All aspects of the new facility should accommodate people with physical disabilities including pool deck and access, change rooms, entrances, etc.

3.0 Aquatic Trends + Best Practices

- 3.1 Trends Influencing Recreation
- 3.2 Recreation, Rehabilitation and Therapy
- 3.3 Innovative Programming Occurring in Aquatic Facilities
- 3.4 Precedents Studies
 - 3.4.1 Windsor International Aquatic & Training Centre
 - 3.4.2 H2O Adventure & Fitness Centre
 - 3.4.3 The Shaw Centre
 - 3.4.4 Toronto Pan Am Sports Centre
 - 3.4.5 Grandview Heights Aquatic Centre
 - 3.4.6 temesewtxw Aquatic and Community Centre

“Swimmers have been found to be more **socially connected**, have higher levels of **community trust** & volunteer more.”

- Swim England 2021

Research into participation at indoor aquatics facilities in other cities has been conducted to better understand how contemporary user expectations might influence the design and operations of a new facility. The following trends have emerged to aquatics in the areas of service delivery and programming that should be considered for a new indoor aquatics facility in Regina:

- Recreational swimmers are increasingly looking for exciting aquatic experiences such as aquatic playgrounds for those of all ages and abilities, lazy rivers, wave pools, waterslides, etc.
- Swimming and all activity types are regaining popularity as people are looking for more spontaneous physical activities that fit into busy work/life schedules; working from home and freelance work has also shifted when people look for recreational opportunities rather than there being a pre- or post-work rush.
- Swimming lessons are also growing in popularity, resulting in greater demand for lessons for those of all ages, particularly as such lessons are viewed as integral to physical literacy, skill development, and preventing injury/drowning. Some municipalities are experimenting with offering swimming lessons for children jointly with adult programming such as aquacise.
- Providing opportunities for all family members to take part in different activities simultaneously at the same location can increase participation levels, as well as a sense of convenience and satisfaction for residents. For example, while children participate in swim lessons, guardians may wish to grab a coffee and visit in social areas in sight of pool tanks.
- Wellness and therapy pool users are one of the fastest growing user segments for aquatic services, particularly in communities with aging populations. These users tend to require warmer water, but can also benefit from access to cold water plunge tanks as well.
- Competitive swimmers have high expectations for facility design and governing bodies, too, have certain standards for tank configurations, spectator seating areas, timing systems, and so forth. Modern training facilities should include amenities such as dive tanks, warm up pools, starting blocks, advanced timing systems, and scoreboards.
- Aquatic exercise, including swimming, water-based resistance training, or water aerobics, are increasingly popular activities among those looking for a low impact workout in a fun environment. Accessible community pools and therapeutic tanks are necessary amenities to support these types of activities.
- Pools are being designed to have multiple tanks and 'zones', such as quiet areas for rehabilitation and therapy, as well as for users with sensitivities to sound and/or light, training areas with one or more 50 m tanks, separate 25 m warm up tanks, 25 m leisure and recreation pools, hot tubs, and saunas. Increasingly, users expect multi-use spaces as the norm and service providers need to quickly adapt to meet community needs.
- Many aquatic facilities in Canadian municipalities are nearing end-of-life and significant reinvestment is required to meet changing user expectations and provide quality environments for aquatic activities, preferring to go to newer or more feature-equipped facilities. Municipalities must compete with the private sector in the form of hotels or resorts that may have newer or more attractive amenities.



3.1 Trends Influencing Recreation

- A general aging of the population; longer periods of retirement
- Flexibility in the times when people seek out recreation opportunities; changing employment structures and work hours
- Increased variety in leisure options
- User demand for quality facilities and services
- Multi-use spaces that are community hubs and allow for multiple activities and user groups
- Growing popularity of unstructured activities.
- Growing recognition of the important role of physical wellness activity in managing chronic disease and support mental health
- More sustainable and eco-friendly infrastructure
- Multi-sector partnerships to leverage funding and expertise



3.2 Recreation, Rehabilitation and Therapy

- Participation for fun, relaxation, socialization and fitness
- Spontaneous recreation opportunities
- Inter-generational participation
- Desire for warmer water, aquatic playgrounds

3.3 Innovative Programming occurring in aquatic facilities include:

- Movie nights
- Beach parties
- Water mat aerobics
- Paddle board yoga
- Deep water hydro
- Scuba diving



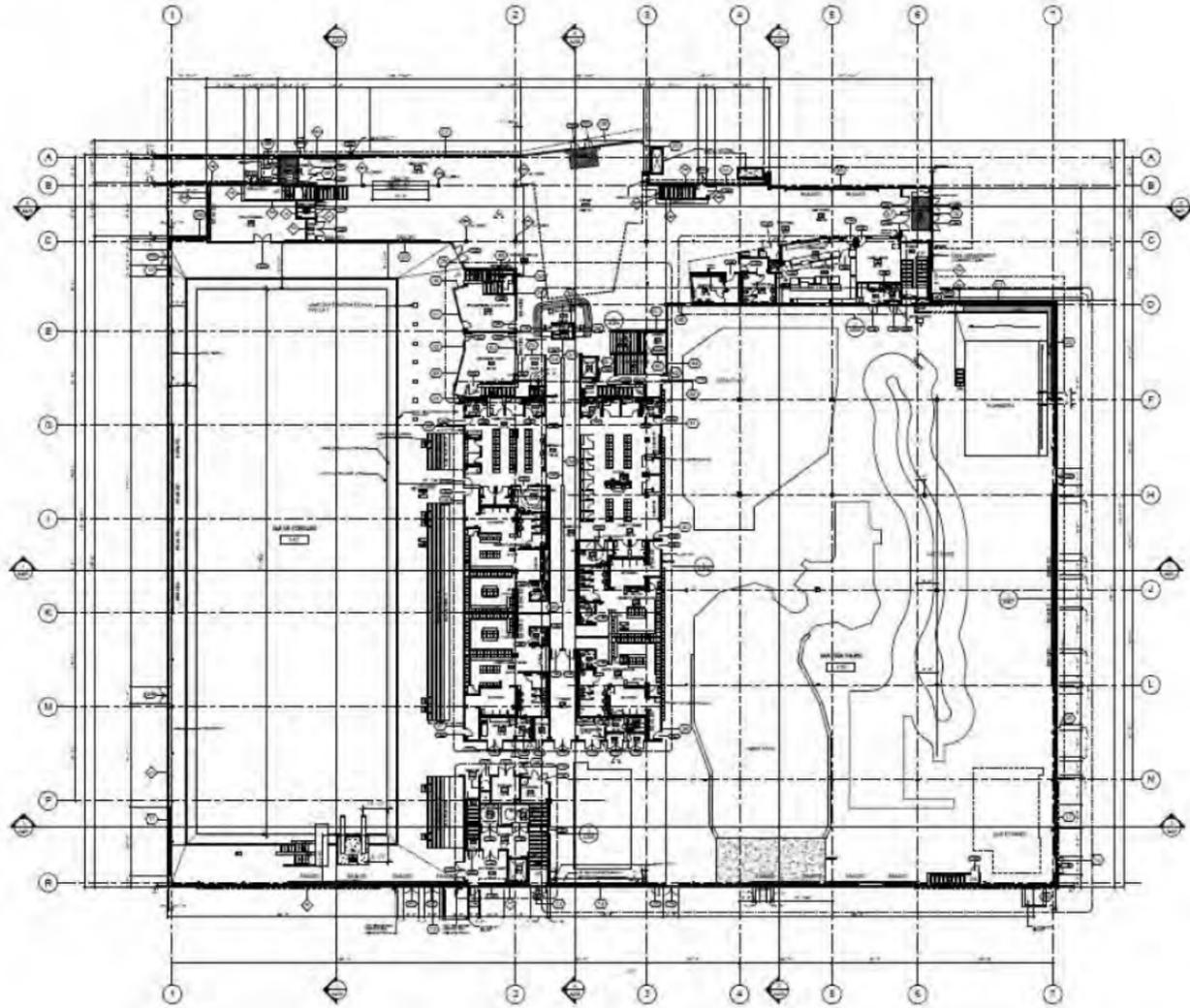
3.3 Precedents Studies

We strive to learn from past projects, both our own and those of others. We learn from what has worked well and from what could be better. Learning is a crucial component of design and building. The following pages include references of completed aquatic center projects from municipalities across Canada. Each building has its unique aquatic and community programming allowing for a range of leisure and competitive sport activities. Key takeaways have been outlined for each precedent to inform programmatic options for the design of the new community aquatic center.



1. Increased focus on wellness 2. Ongoing Evolution of Change rooms 3. Social role evolving 4. Pop-up culture

3.4.1 Windsor International Aquatic & Training Centre



Opened: 2014

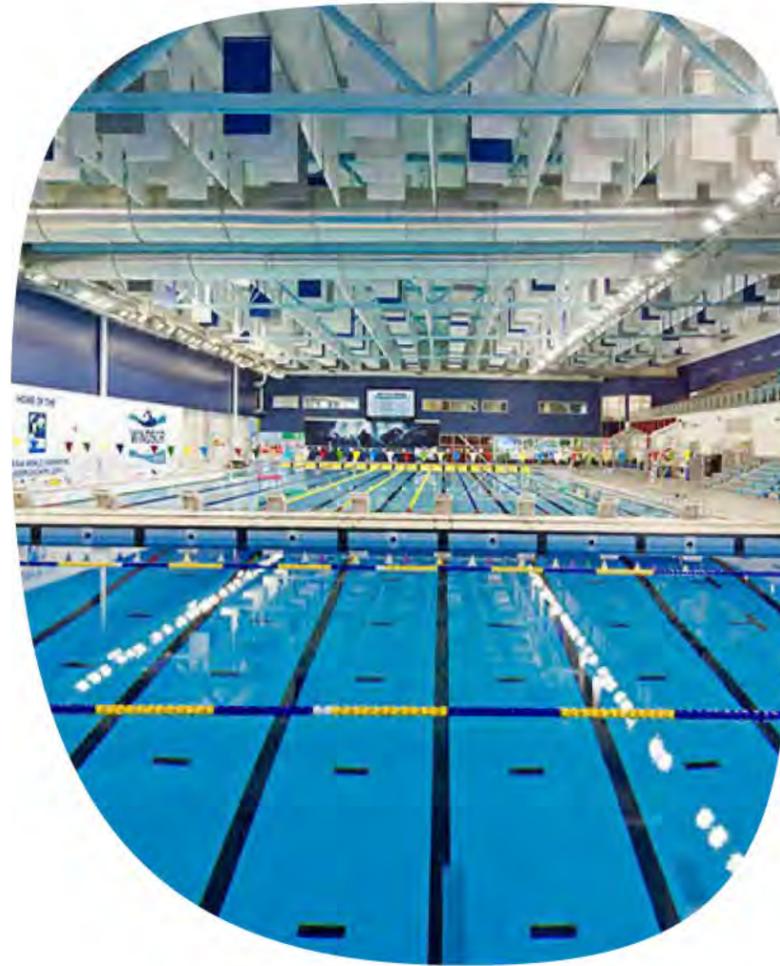
Location: Windsor, Ontario

Climate: Warm humid climate with cold winters

The Windsor International Aquatic and Training Centre (WIATC) is a state-of-the-art aquatics facility featuring a 71m x 25m, 10-lane pool with two moveable bulkheads that allow for multiple configurations to fit the ideal length for any competition or community use. The pool varies in depth from 2m to 5.2m in depth, but also features a moveable floor at the north end of the facility, which allows for shallower depths and greater accommodation for community programming. Adjacent to the Olympic-style pool, a leisure facility known as the Adventure Bay Family Water Park is home to 35,000 sq ft of all-ages, water park fun.

Amenities & Features:

1. 71m x 25m 10-lane lap tank
2. 2 moveable bulkheads
3. Dive tower 1m, 3m, 5m, 7m and 10m
4. 25m x 17m moveable floor
5. 900 spectator seats
6. Wave pool with zero-depth entry, lazy river, activity pool, splash zone
7. Interactive water play features (bubbling jets and geysers, aqua-cannons, tipping cones, and mini bungee swings)
8. 5 Slide (2 high slides, 1 roller-coaster-style, 2 toddler slides)
9. FlowRider surf simulator
10. Space for groups of up to 100 depending on set-up style
11. 9 Multi-purpose rooms (4 with built in data projector and screen, 4 with refrigerator, sink, cabinets and counter with views of the water park, 1 overlooking the lap tank)

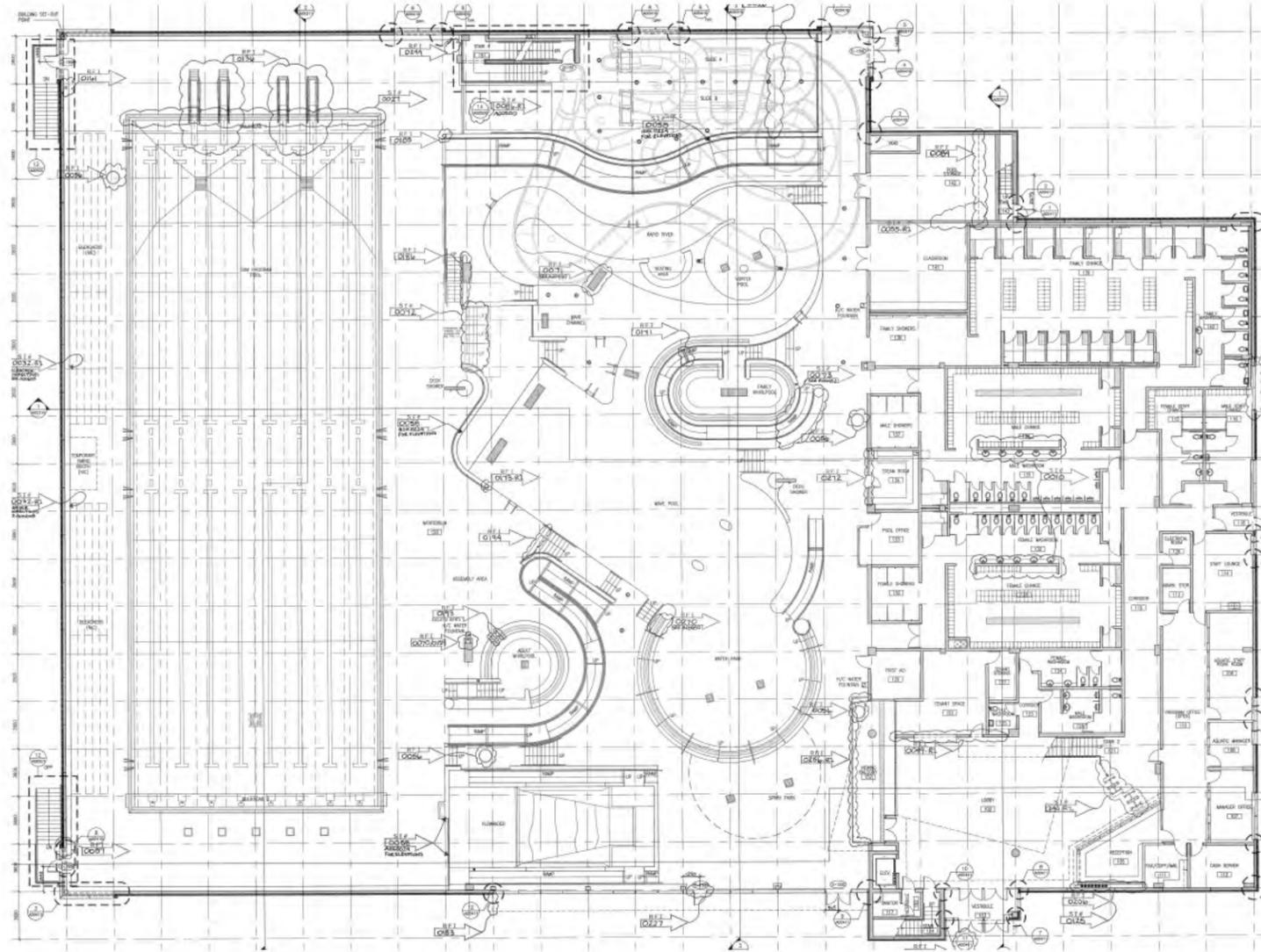


Key Takeaways:

- Moveable thermal bulkhead allows for flexible programming
- Large gathering spaces to accommodate events
- 71m long pool allows for division of pool tank for lane swimming and aquatic sports
- Comparable municipal, compact, destination, water park, with multi-programmable water bodies
- Large, well used, second floor, fitness with cardio machines and strength & conditioning amenities, over looking the competitive pool
- Pro's and Con's of separating water park from rest of the facility
- Operational challenges with operating a water park (staffing, programming)



3.4.2 H2O Adventure & Fitness Centre



Opened: 2009

Location: Kelowna, British Columbia

Climate:

H2O Adventure + Fitness centre is Kelowna's world-class destination for family fun in the water. The facility is owned by the City of Kelowna and operated by the YMCA of Okanagan. The facility is the largest municipal water park in Canada including; Olympic length pool, wave pool, river run, water-slides, a kid's spray park and a surf wave simulator. The building also includes 12,000 sq ft of fitness and cardio space.

Amenities & Features:

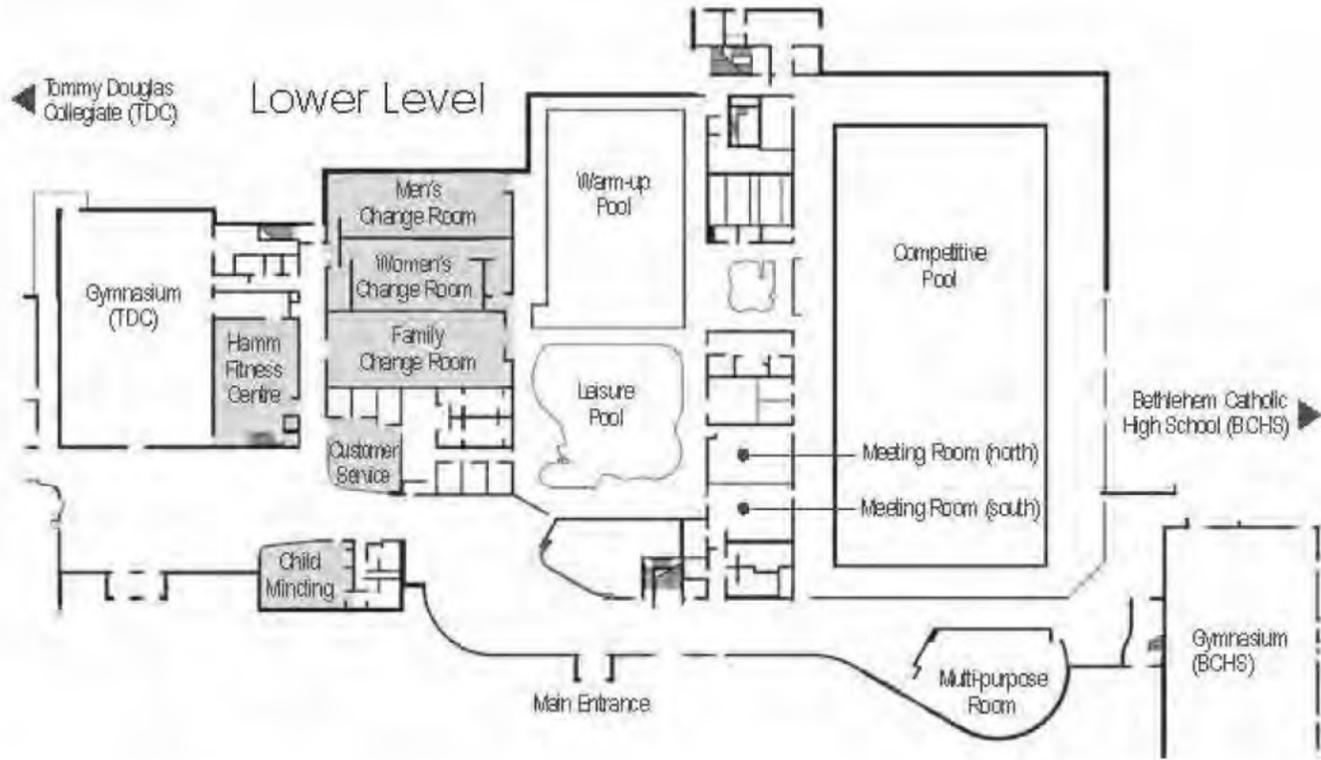
1. 50m- 8 lane competitive pool featuring 2 bulkheads
2. Leisure pool, wave pool, lazy river and splash park
3. Universally accessible family whirlpool & adult whirlpool
4. Children's water park
5. 4 Water-slides
6. Hot tub, sauna, steam room
7. WaveRider surfing facility
8. Fitness centre including aerobics studio, cycle studio, indoor walking track, gymnasium, cardio and conditioning areas, and low-impact fitness equipment
9. Childcare, Multi-purpose rooms, Café

Key Takeaways:

- Unique wave pool and WaveRider surfing make for a visitors attraction
- Significant operational cost with added aquatic features
- Ensure water park area and amenities are not undersized, the water park has proven to be extremely popular
- Lack of separation between water park and training presents operational challenges
- Staffing, lifeguarding and operational considerations are important to understand during the planning stages



3.4.3 The Shaw Centre



Opened: 2008

Location: Saskatoon, Saskatchewan

Climate: Semi-arid with warm summers and cool winters

A world-class aquatic facility with competitive, warm-up and leisure pools, drop-in swimming and fitness programs. Regularly hosts provincial, regional and national events in water polo, speed swimming, synchronized swimming and diving event disciplines throughout the year.

Amenities & Features:

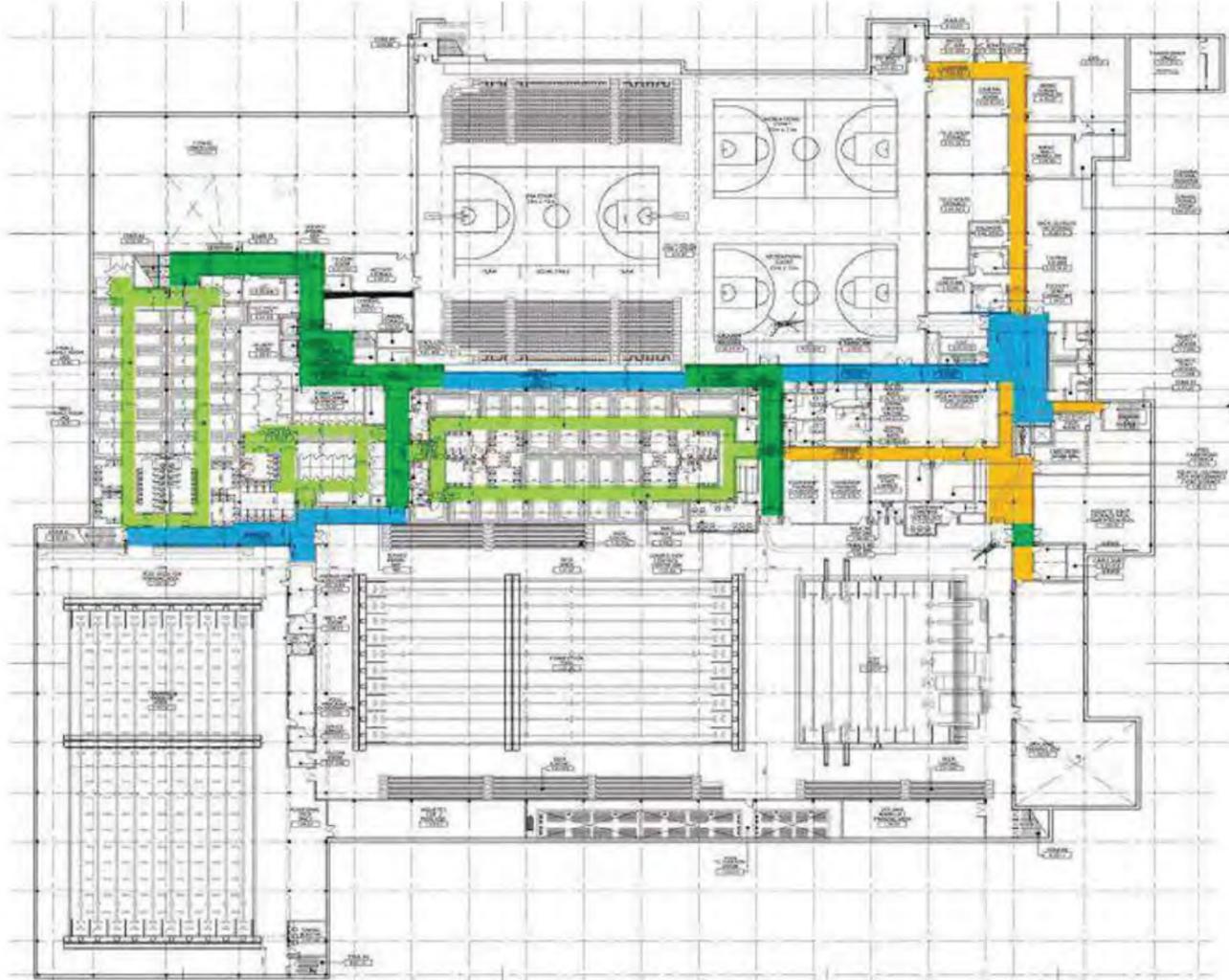
1. 50m 10-lane competition pool, Diving Boards & Platforms
2. 6-lane Warm-up Pool
3. 25m recreational pool with accessible ramp
4. Leisure pool and lazy river with accessible ramp
5. 34-person hot tub with accessibility lift
6. Fitness Centre, Walking Track, Community Gymsnasiums
7. Child Minding, Multi-Purpose & Meeting Rooms
8. Outdoor Playground, Sport Fields

Key Takeaways:

- Leisure component is significantly undersized. Less attractive as a destination compared to the H2O Centre
- Technical details such as materials and finishes are important
- Pro's and Con's of separating Leisure from Training pool



3.4.4 Toronto Pan Am Sports Centre



Opened: 2014

Location: Toronto, Ontario

Climate: Warm humid climate with cold winters

The largest sport new-build for the Games and the largest infrastructure investment in Canadian amateur sport history. Toronto Pan Am Sports Centre delivers extensive programming that serves recreational and community groups, high-performance athletes, as well as fitness centre clientele.

The 312,000 square-foot Centre includes two internationally sanctioned 10-lane 50-metre pools, a world-class dive pool and dry-land dive training facilities, a four court gymnasium, an indoor running track, a high-performance testing centre, studio spaces, and a state of the art fitness centre for members

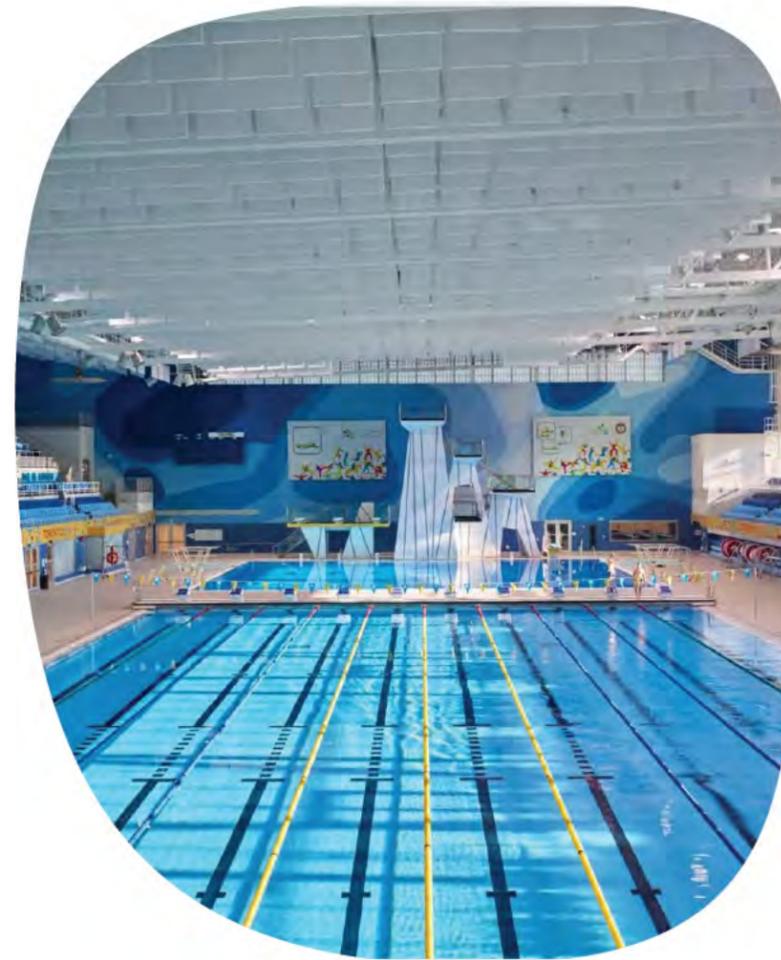
Built to international standards for competition, the Competition pool can be separated from the Dive Pool Activities via a curtain and plug-ins allow for an underwater sound system.

Amenities & Features:

1. 50m x 25m 10-lane competition pool
2. 50m x 25m 10-lane training pool
3. 25m x 25m dive pool, Dive tower 1m, 3m, 5m, 7m and 10m,
4. 3,500 spectator seats + 24 accessible seats
5. Dryland dive training centre, with trampolines, dive pit, harness rig and cushioned flooring
6. 4 full-sized courts, 200m walking track, indoor climbing wall, fitness centre & studios
7. Food court, retail, multi-purpose & meeting rooms
8. Outdoor sports field

The Canadian Sport Institute of Ontario (CSIO), located at Toronto Pan Am Sports Centre, provides world-leading sport science and sport performance services to identified high-performance athletes.

<https://www.tpasc.ca/facility/legacy>

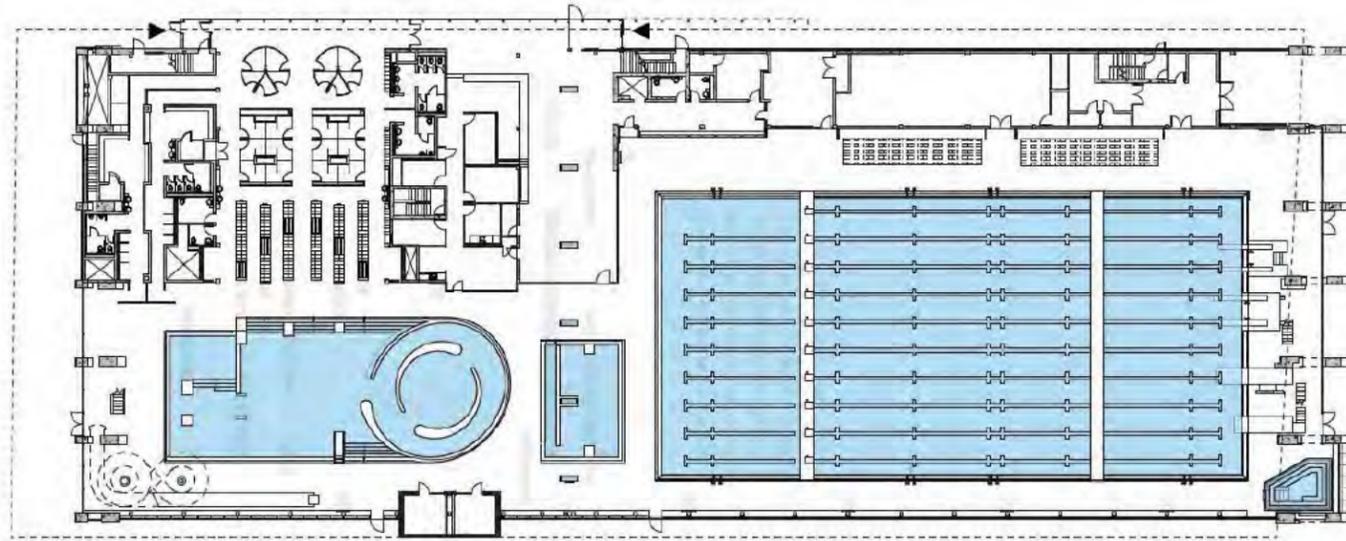


Key Takeaways:

- The largest competitive focused facility reviewed with 2 - 50m tanks and separate dive tank
- No recreational water at this facility
- Athletics and high performance focus



3.4.5 Grandview Heights Aquatic Centre



Opened: 2016

Location: Surrey, British Columbia

Climate: Warm and temperate climate, heavy rainfall

The project vision was to design and build a world-class aquatic centre to attract people from everywhere, while expressing the community's ambition for Surrey. Inclusivity and universal access help to support a diverse culture. Intended to accommodate the needs of its growing community, the aquatic centre plays a vital role as the area develops. It is Rick Hansen Foundation Accessibility Certified Gold and LEED certified.

It meets stringent FINA standards to host regional, provincial, national and international sporting events in its 10-lane, 50m Olympic size competition pool and dive platform. With seating for up to 900 spectators, it is poised to act as a premier destination for competitive diving and swimming, synchronized swimming and water polo events. Yet its pro-athlete capabilities are carefully balanced with the needs of recreational users – without compromising the unique needs of either group.

Amenities & Features:

1. 50m -10 lane FINA standard Olympic size competition pool
2. Dive tower 1m, 3m, 5m, 7m and 10m,
3. Spectator seating for 900 people
4. Hot tubs for families (with ramp access) and adults
5. A 500 square metre leisure pool
6. Water-slide, Lazy river, spray features, tot's area with access ramp & accessible steam room and dry sauna
7. Fitness and weight room facilities
8. Exterior terrace

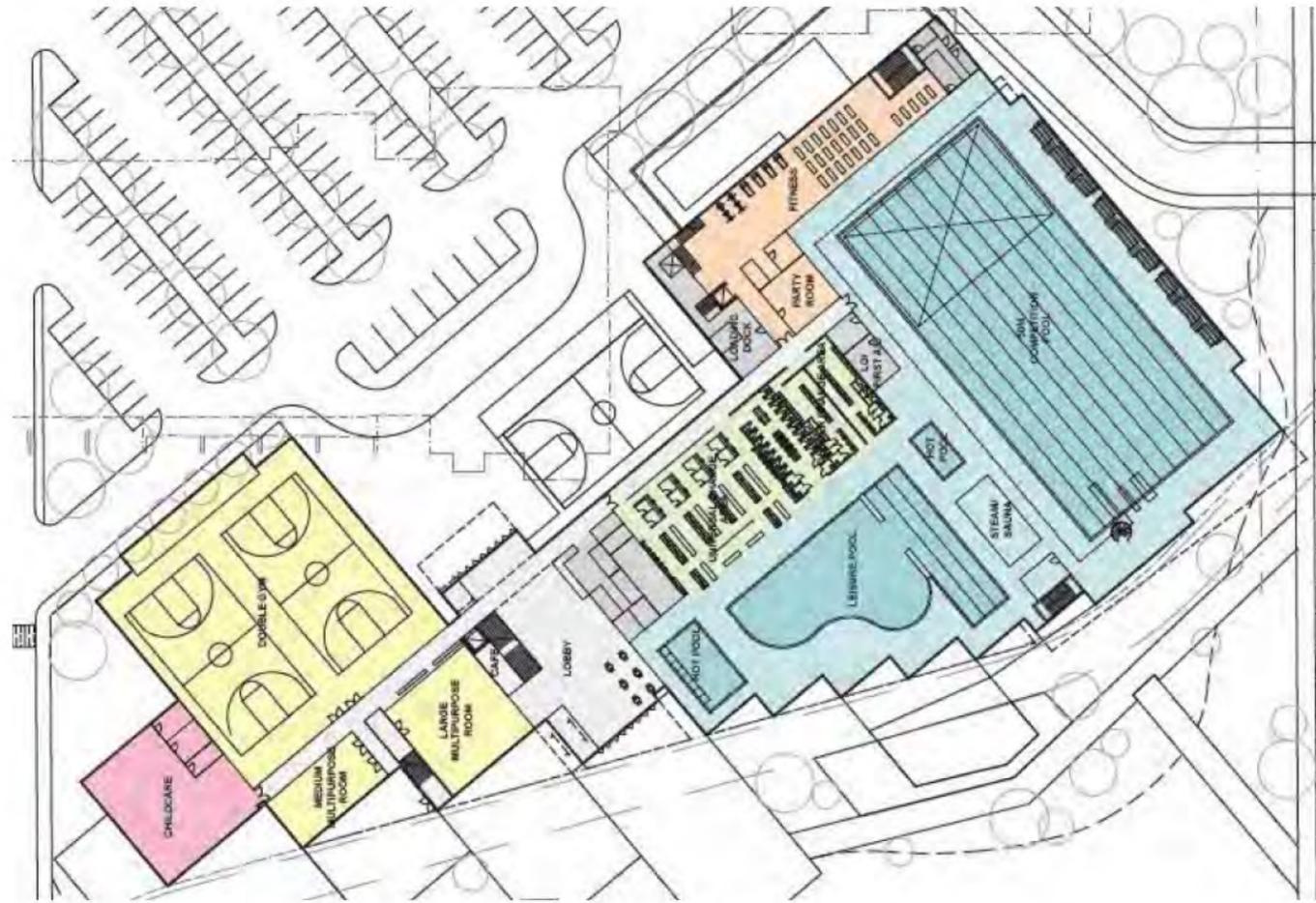


Key Takeaways:

- Leisure and Training pools in co-located in same space
- Single 50M pool tanks for competitions, training, diving and lessons programming
- Modest municipal recreation
- Large percentage of Change rooms are universal change layout



3.4.6 tēmәsewtx^w Aquatic and Community Centre



Opened: 2024 (Projected)

Location: New Westminster, British Columbia

Climate: Warm and temperate climate, heavy rainfall

The design was driven by a two-year community engagement process, prioritizing accessibility for people of all ages and abilities, as well as the flexibility to future-proof the facility. The centre includes a four-pool aquatic centre with sauna and steam rooms, universal washrooms and change rooms, a fitness centre, gymnasia, community rooms, licensed childcare, administrative offices, as well as significant new plazas and green-spaces.

Expected to open to the public in 2024, the future tēmәsewtx^w Aquatic and Community Centre is set to be Canada's first Zero Carbon-certified aquatic centre, aiming for a 90% reduction in GHG emissions and eliminating fossil fuels emissions completely. Targeting LEED v4 Gold.

* 'tēmәsewtx^w' is the hənqәmihәm word for 'sea otter house.'

<https://www.hcma.ca>

Amenities & Features:

1. 50m- 8 lane pool featuring 2 bulkheads and a movable floor
2. Leisure pool featuring 25m-3 lane, lazy river, spray toys and tot zone
3. 2 hot pools (adult and family), Steam & Sauna
4. Fitness area, spin, aerobic & yoga classes, 2 gymnasiums,
5. Health and Wellness space; physio, massage & chiropractic
6. Childcare, Multi-purpose rooms, Café
7. Landscaping for additional outdoor programming, lounging and play

Key Takeaways:

- Comparable to this study in its existing facility renovation and/or new build
- Innovative low energy filtration (In-Blue) system helps building performance.
- Warm leisure air, and cooler training air are separated by partition for enhanced building energy performance and comfort.
- Robust community programming alongside aquatic amenities

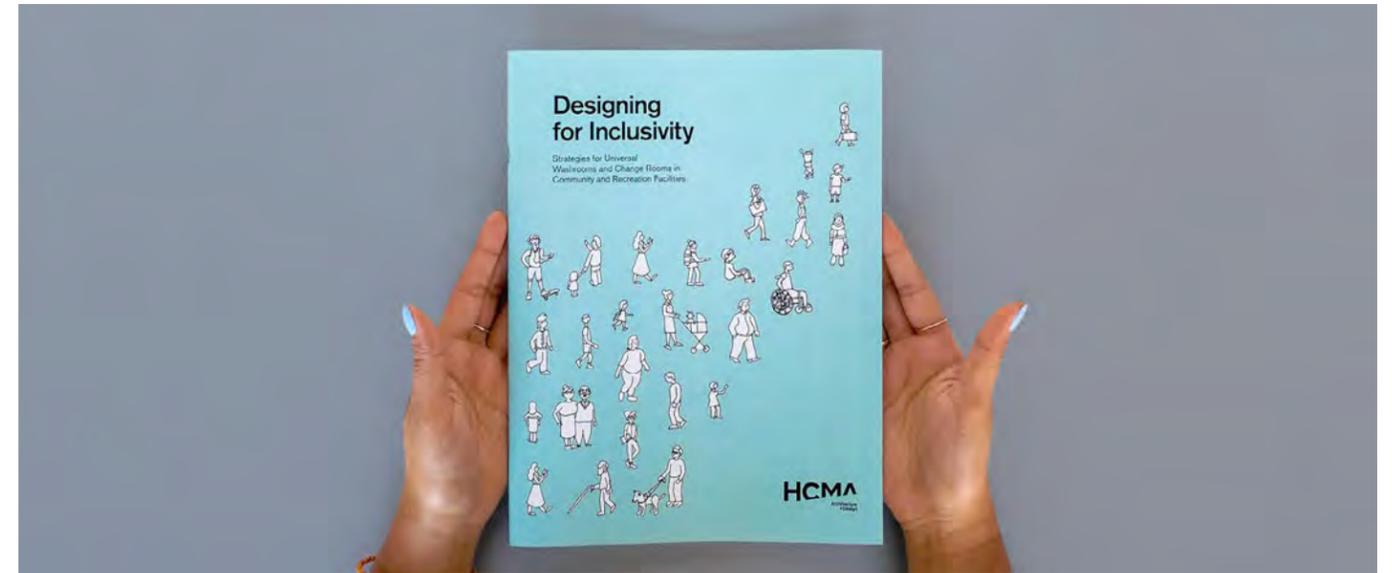


4.0 Accessibility + Inclusion Best Practices

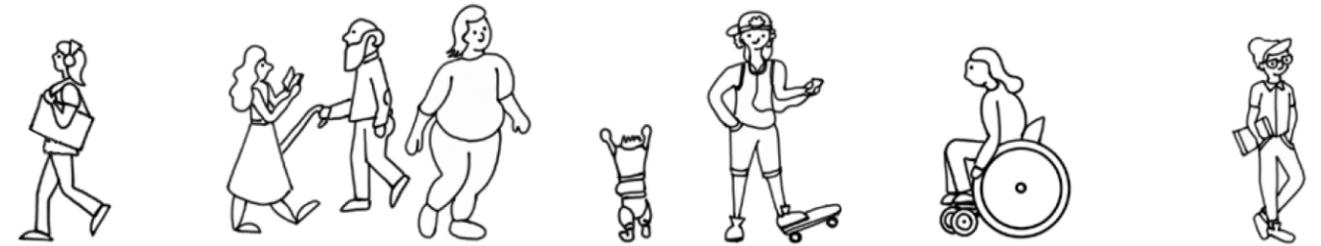
4.1 Inclusion and Accessibility
4.2 Reconciliation

“Every choice we make as designers determines who can use an environment or product. The mismatches that we create in the process are the building blocks of exclusion.”

- Kat Holmes
UX Designer & Author



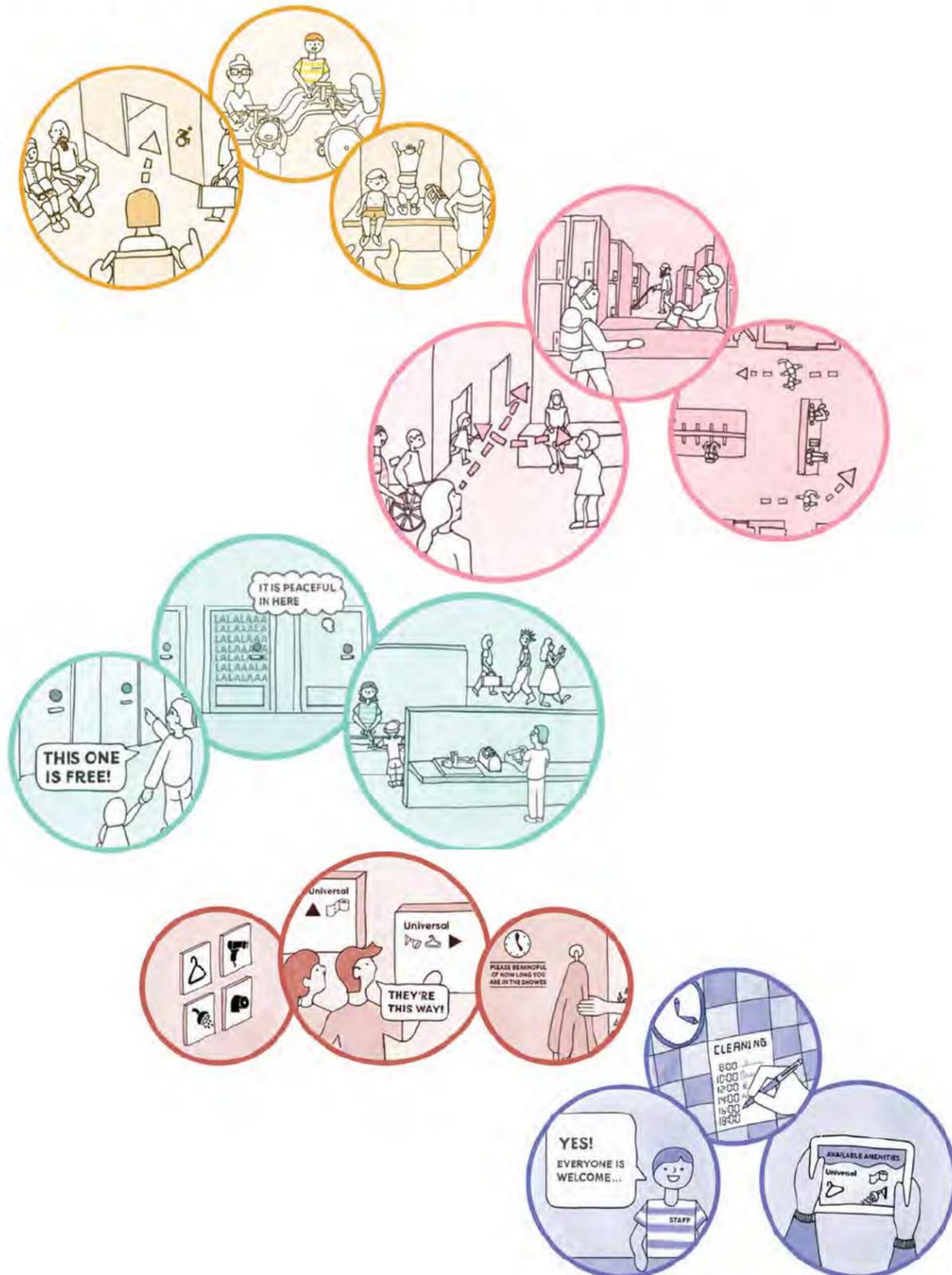
Inclusion and accessibility are critical priorities for the City of Regina and many policies and plans reflect the importance of providing programs, spaces, and opportunities that are accessible for everyone.



4.1 Inclusion and Accessibility

- Accessibility means looking at a facility holistically from the moment a potential user considers going to a facility to their experience arriving at and entering the facility, to how change rooms are configured, and finally, getting into the pool itself. There are numerous guidelines available that provide direction on how to design spaces to be universally accessible and municipalities are increasingly requiring universal accessibility as standard practice.
- Ensuring inclusion and accessibility, physical, financial, and social needs of all individuals, including those with physical and cognitive disabilities, those experiencing social and/or cultural barriers, and those from all socioeconomic backgrounds.
- Strategies for reducing barriers to participating in aquatic programs include allowing caregivers or support workers free access to facilities, providing 'quiet' times in the pool for those with sensory sensitivities, providing training to staff on how to assist swimmers with special needs, offering 'free' days, and so forth.
- Inclusion is the conscious practice of actively engaging people of different backgrounds in a way that everyone feels respected, heard, encouraged, and valued. Inclusion involves bringing people together to share experiences and to build a shared understanding of different perspectives. Strategies for promoting inclusion include incorporating multiple languages into facility signage and written materials, providing culturally sensitive programming such as women only times for women practicing Islam or LGBTQ+ dedicated swim times, and even designing admission counters to be offset from main entries to create a more open and inviting first impression.
- Specific efforts should be made through design and programming to address social isolation and challenges faced by vulnerable populations such as seniors, those with disabilities, those experiencing homelessness, newcomers, and Indigenous communities.

- 1 Strive for **inclusivity** and **access for all**
- 2 Use **openness** to **enhance safety** through activity and shared monitoring
- 3 Create **privacy** where most needed to **enhance comfort**
- 4 Welcome everyone with **signage** that **emphasizes function** and is clear, inclusive, and positive
- 5 Ensure **supportive staff operations** and communications



4.2 Reconciliation

Reconciliation challenges the recreation sector to more than just acknowledge territorial lands or the Truth and Reconciliation Commission's Calls to Action. Reconciliation provides an opportunity to learn more about the land and traditions of Indigenous peoples and cultures, as well as to foster new relationships that will lead to healthier individuals, communities, and partnerships. A renewed cultural awareness of the systemic nature of racism, inequity, and exclusion has emerged in recent years, revealing that municipalities have a key role to play in working to combat racism and foster inclusion/reconciliation in their operations. Advocacy groups have brought attention to the persistence of racism within Canadian communities and the need to create safe, inclusive spaces for all.

- The City of Regina has demonstrated its leadership and commitment to reconciliation in the design of māmawēyatitān centre that brings together many public and community services aimed at building trust and strengthening relationships with Indigenous communities.
- Providing dedicated spaces and amenities for Indigenous place-making, ceremonies, and community gatherings is becoming more common within municipal facilities across Canada. Opportunities to advance reconciliation should be explored through facility design and programming.
- Incorporating Indigenous language and names, artwork, and storytelling can both broaden understanding and appreciation of Indigenous cultures, as well as demonstrate respect for the long histories and traditions of Regina's Indigenous communities.

The purpose of the Integrated Accessibility and Inclusion Strategy is to outline the vision, principles, social sustainability goals and strategies specific to the New Regina Indoor Aquatic Facility.

The project hopes to set specific accessibility and inclusivity targets for meeting the goals under the following categories:

- Reducing Barriers
- Green Transportation
- Connection to Nature
- Social Capital
- Health & Wellness

Public community spaces face three categories of barriers. The following amenities, spaces & finishes help create more inclusive and accessible environments.

Physical Barriers

- Barrier free:
- Entrances & paths, Lifts, ramps & transfer edges, Rest points
 - Decision points, Visual contrasting, Tactile surfacing
 - All gendered change & washrooms

Socio-Economical Barriers

- Public amenities:
- Social and wellness opportunities
 - Sports courts, Gathering spaces, Community garden
 - Walking paths, Cycling paths & parking
 - Playground, Spray pad

Truth & Reconciliation

- Cultural Amenities:
- Co-creation
- Indigenous art incorporation
- Indoor/outdoor cultural space

5.0 Sustainability Best Practices

- 5.1 Introduction
- 5.2 Background
- 5.3 Current and Future Policy + Regulatory Contexts
- 5.4 Resilience + Future Climate Planning
- 5.5 The Grid Transition + Emissions Pricing
- 5.6 Embodied Carbon
- 5.7 Building Rating Systems
- 5.8 Grants and Funding for high performance buildings
- 5.9 Recommendations

Sustainability is embedded in the mission of many municipalities in Canada, as we plan in service of our communities and their future generations. Designing to manage environmental, social, and economic impact areas is imperative for the health and wellbeing of people and the planet.

5.1 Introduction

Climate change has and will continue to impact the provision of recreation services in Canada. Pools have high energy and water use profiles and are especially intense to operate in northern climates. As well, community recreation infrastructure is considered generational; the new aquatic centre will have a long service life that must consider both the immediate impact of new construction, the impact of evolving operational conditions, and the changing needs of the community as it grows and changes in a new climate.

Municipalities are also grappling with shifting economic landscapes and ongoing impacts of the COVID-19 pandemic that have challenged revenues and placed expenditures under greater scrutiny. Sustainable building strategies and technologies can help to reduce the ongoing operating costs of pools and better support social needs in the long term. Regularly reviewing user fees can also help to balance the importance of affordable, accessible services with revenues needed to maintain high service standards.

As of June 2021, from the feasibility commencement, the project team has been actively engaged with City staff, community, and stakeholders to facilitate a sustainability strategy for the New Regina Indoor Aquatic Facility. The project team members have made sustainability recommendations that align with the city, province, and Canadian 2030 and 2050 climate targets. These recommendations also consider the current trends and best practices for sustainable design of community and natatorium spaces. The initial phase of work included two best practices workshops, first with city staff and then with the IAFCAC to determine preliminary strategies and goals that align with the policy. The emphasis of the workshops was on energy and emissions, recognizing that more detail and analysis for other impact areas will be required when the project progresses to schematic design. During this time, the City of Regina launched the Energy & Sustainability Framework with which this work supports and aligns.

5.2 Background

The work to date has been future focused; planning for climate resilience, energy and GHG reduction, and overall resource conservation, has been central at this early stage, with the goal of supporting a holistic approach to sustainability and tailored targets for energy efficiency, emissions reduction, social impact measures, water conservation, ecosystems and site development, sustainable materials, and indoor environmental quality. The project hopes to set specific sustainability targets for meeting the goals under the following categories to align with the forthcoming City of Regina Aquatics Framework as the project progresses into schematic design:

- Ecosystems, Watershed + Site
- Water Conservation
- Energy Efficiency and GHG Reduction
- Climate Resilience
- Sustainable Materials
- Solid Waste
- Food

The content of this chapter builds upon a review of:

1. City of Regina's existing environmental, social, and economic development strategies.
2. Sustainability workshops held with City of Regina staff.
3. Existing best practices, certification schemes, and frameworks.



5.3 Current and Future Policy + Regulatory Contexts

The regulatory context for energy and emissions is evolving quickly in response to global climate commitments. It is important to evaluate the project within the current and expected future regulatory context, to plan for the future burden of risk, environmental impact, and potential opportunities. The new aquatics centre can support the city's Energy and Sustainability Framework seven "Big Moves" through thoughtful design and operations, ensuring that the project contributes to the goal of reducing greenhouse gas emissions and energy consumption.

Canada

Canada's response to the Paris Agreement is the Pan-Canadian Framework on Clean Growth and Climate Change (the Pan-Canadian Framework), which sets out the national strategy to meet the Paris Agreement targets. Within the built environment section of the Pan-Canadian Framework, Canada aims to improve energy efficiency for both new and existing buildings. This includes a net-zero ready energy code to be adopted by the provinces and territories by 2030, energy labelling, and an existing building energy code. Equipment performance, including that used in typical building mechanical and electrical applications in buildings, will also face new energy efficiency targets. To support the Pan-Canadian Framework, emissions pricing has been introduced to incentivize greenhouse gas reductions. In provinces that do not have their own carbon tax scheme, this will be mandated by the federal government. In 2022 emissions pricing is \$50/tonne, rising by \$15/year, to \$170/tonne by 2030, assuming no rate increases. Considering the future cost of operating a building through its greenhouse gas intensity (GHGI), is something that all building owners must consider at the time of major infrastructure projects.

Saskatchewan

Saskatchewan has taken steps to reduce greenhouse gas emissions throughout all sectors and is focused on climate resilience. In 2017, the province launched Prairie Resilience: A Made-in-Saskatchewan Climate Change Strategy (Prairie Resilience) which outlines climate resilience and mitigation strategies specific to Saskatchewan. The energy grid will continue to de-carbonize and utilize carbon capture and storage technology, with a goal of reducing the carbon intensity of the grid by 40% by 2030. Currently in Saskatchewan, buildings account for 4% of provincial greenhouse gas emissions and as part of the strategy outlined in Prairie Resilience, Saskatchewan was the first province to adopt the 2017 version of the National Energy Code for Buildings (NECB) on January 1, 2018. We expect the trajectory of the NECB to reflect the urgency of energy emissions reduction in the 2020 revision and beyond.

Regina

In 2022, after several years of analysis and public consultation, the City of Regina launched the Energy & Sustainability Framework (the Framework). The Framework contains 31 actions across seven "Big Moves" to reduce the city's greenhouse gas emissions by 52% by 2030 and energy use by 24% by 2030. The seven big moves are as follows:

1. Building retrofits
2. Clean heating
3. Net-zero new construction
4. Renewable energy generation
5. Low-emissions vehicles
6. Increase active transportation and transit use
7. Clean and re-energize industry



5.4 Resilience + Future Climate Planning

Resilience strategies and planning for future climate conditions is critical for all new infrastructure as we navigate climate impacts in the immediate, medium, and long term. Impacts already being experienced in Regina include hotter days and more forest fire smoke events. Immediate and long-term climate risks identified by the Climate Atlas of Canada (<https://climateatlas.ca/>) for the most optimistic climate change scenario for Regina include:

- **Heat:** Increased number of very hot days (above 30°C), increasing from a recent average of 18 days/year to 31 to 54 days/year between 2021 and 2100 (see Figure 1 for the low carbon scenario).
- **Water:** Increased precipitation in the winter, drought in the summer.
- **Air:** Forest fire risk and smoke

The new aquatics centre and surrounding community will benefit from considering the health and infrastructure related shocks and stressors associated with these and other climate risks. A comprehensive climate risk analysis as part of the schematic design phase is recommended to guide design decisions accordingly, so the building can adapt to these future conditions.

5.5 The Grid Transition + Emissions Pricing

As we move away from fossil fuels to mitigate the impact of emissions, electricity grids around the world are transitioning away from coal and natural gas to renewable energy sources. Currently, we are less than ten years from a majority renewable energy fuelled grid, so it is critical that new infrastructure evaluate service life of building systems relative to the grid transition time-lines to understand the impact of both emissions and cost for both capital and operational time horizons.

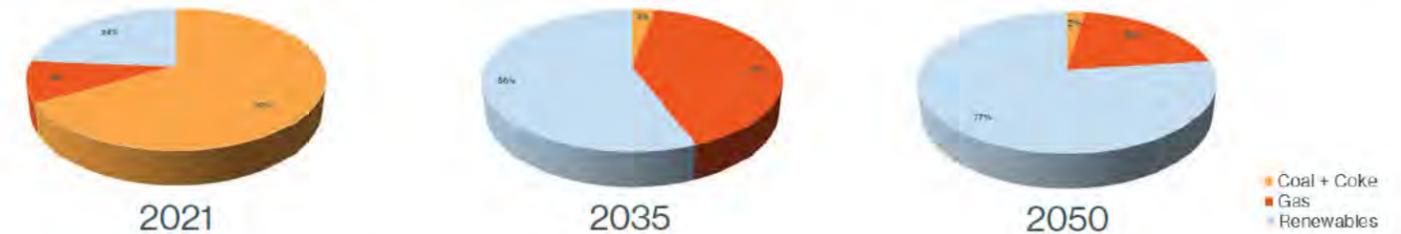


Figure 2 - Saskatoon Electricity Mix

In 2021, according to the Canadian Energy Regulator, 67% of the Saskatchewan electricity grid was fuelled by coal, 9% natural gas and 24% renewables. But in 2035, the same source forecasts coal will represent only 3%, natural gas 41% and renewables 56%, drastically improving the proposition for electrification relative to emissions. Furthermore, renewables are expected to contribute 77% to the grid by 2050.

For the new aquatic facility, it will be essential to consider this grid transition time horizon, coupled with the federal emissions pricing scheme, when evaluating building system options for both first cost capital investment and system replacement at the end of service life. To set this in context, the chart below plots electricity and natural gas emissions pricing against the grid transition, accounting for the incremental federal emissions pricing over time. The chart helps to illustrate the case for electrifying now, to benefit from the lowest emissions and operational cost in the long term.

Emissions pricing in 2023 will be \$65/tonne rising annually by \$15/tonne to a maximum of \$170/tonne by 2030. We have assumed a similar incremental emissions price increase beyond 2030 to level off at \$260/tonne in 2036.

Currently, gas boilers have the lowest carbon price. However, as the grid de-carbonizes over time, we expect to see comparable emissions costs for electricity and natural gas as soon as 2030. By 2036, electricity drops significantly in emissions compared to natural gas, as the grid further de-carbonizes, per the Canadian Energy Regulator's projected fuel mix for the provincial energy grid. Further support for this scenario is documented by the recent Canada Green Building Council Report A Roadmap for Retrofits in Canada that carbon intensive grids such as Saskatchewan and Alberta will de-carbonize enough in the next ten years to make electrifying in the near term cost competitive with natural gas systems, when considering emissions pricing.

Finally, we expect a national existing buildings energy code to be in place within the decade, further encouraging adoption of high-performance passive strategies and optimized, electric-based building systems.

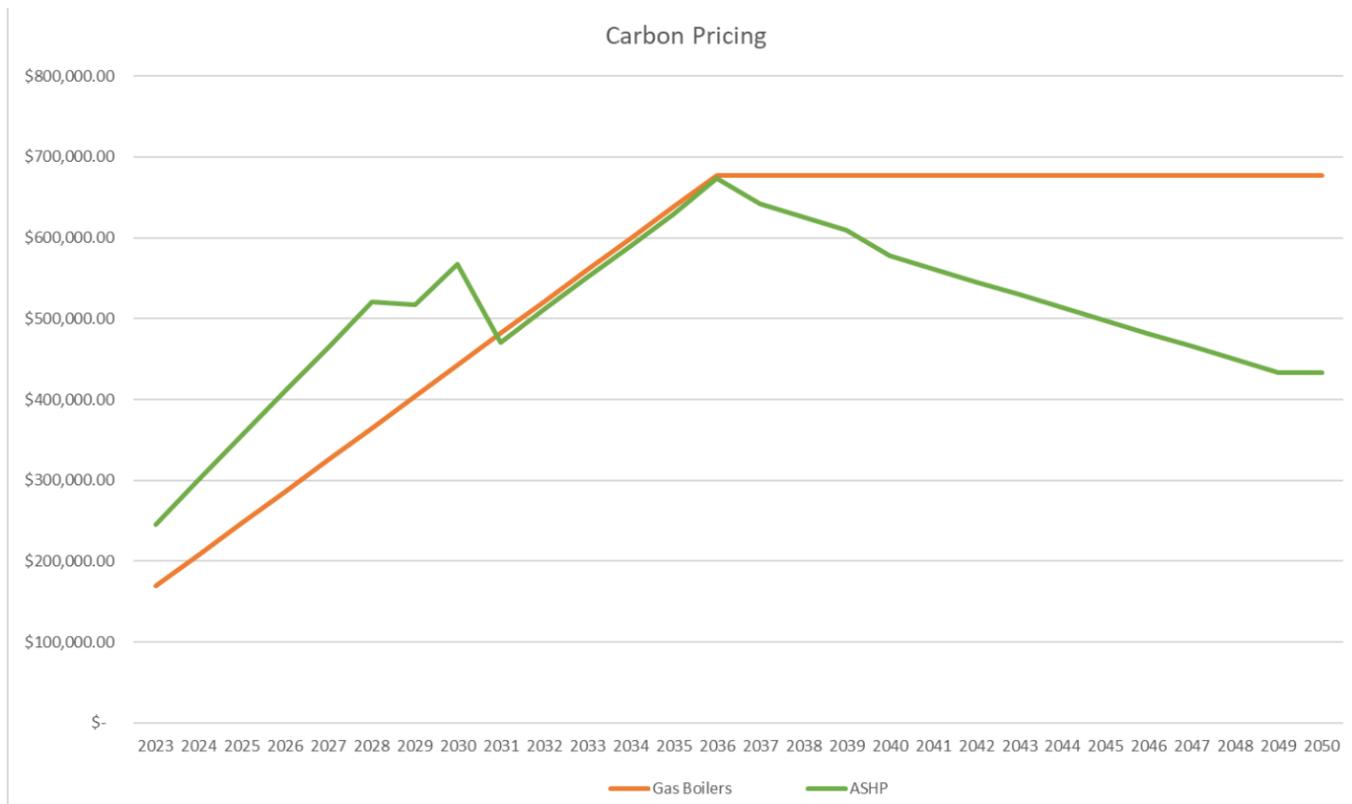


Chart 1: Expected emissions cost of natural gas and electricity in Saskatchewan, accounting for electrical grid transition from 2023-2050.

**This example illustrates the cost of emissions pricing for electricity using an air-source heat pump system (ASHP) and natural gas-based system, using energy demand data from a similar recreation and aquatic centre. Grid emissions factors for Saskatchewan were applied using NRCAN data available to 2035. Beyond 2035 we applied applicable emissions factors using representative provincial grid data from other provinces.

5.6 Embodied Carbon

Embodied emissions in buildings represent significant contributions to their full carbon impact. Most of the embodied carbon emitted from a building occurs before it is occupied, generated from the extraction, manufacturing and transportation of materials used to construct it. Also referred to as upfront carbon, it represents emissions we can only address before a project is built. This is especially significant as we try to eliminate emissions in the near term, to improve our chances of mitigating the impacts of significant climate change in the long term.

The materials contributing most to embodied carbon profiles of buildings are the heaviest, typically structural materials. Impact varies by project context and location, so evaluating a range of structural and other material options early in the design process can significantly reduce the impact of upfront carbon.

We know from industry analysis and many Life Cycle Assessments on similar buildings, that a comprehensive effort to address the embodied emissions of new construction in the early design stages can reduce embodied emissions significantly. We recommend an aggressive but realistic target of 20% reduction of CO₂e from baseline, by replacing structural concrete systems with lighter materials such as wood and specifying low carbon concrete for foundations and other strategic uses. Further reductions can be realized by assessing envelope systems, glass, and insulation.

In the case of the two options evaluated for the New Indoor Aquatic Facility, while no detailed life cycle assessment has been done, we expect the impact to be relatively similar for both the new construction and renovation options, simply because so much of the existing building components would require replacement in the renovation scenario. Any small, embodied carbon benefit that might be realized in the renovation scenario, the limitations on program and operational efficiency may, in the long-term, diminish these benefits. If the space is not optimal operationally due to re-use constraints and a new addition or new facility is needed sooner than anticipated to address program limitations, more upfront carbon emissions will be generated, and the relatively small benefit of material reuse lost.

5.7 Building Rating Systems

Green building rating systems are useful tools to advance project performance goals. Rating systems such as LEED and Passive House are often associated with sustainable design outcomes, and how successful a project may be relative to a perceived or desired threshold of performance. While rating systems offer many benefits, the main value is a framework for accountability. Formal, third party verified rating systems, ensure performance, and keep stakeholders accountable from project start to finish.

Rating systems are most effective if used as tools and methods to advance a project's vision rather than to set or define the vision. Successful projects set aggressive performance goals and targets, then apply the assessment methods, tools, and process within rating systems to advance them strategically. Many aquatics centres across Canada are pursuing one or more of these rating systems to track performance, verify outcomes and benefit from recognition. Another key consideration should be grant and funding opportunities, many of which are tied to green building rating systems to demonstrate greenhouse gas emissions reduction, energy efficiency, high quality accessible and inclusive design.

Rating systems offer a range of tools and methods; many address only one impact category such as Passive House and the Zero Carbon Building Program (ZCB), others are more comprehensive such as LEED. Passive House offers strong process, methods, and tools to guide design toward very low energy, highly comfortable, durable buildings, but does not address location impacts, site conditions, ecological systems, accessibility, or health. LEED offers more comprehensive approach but is less focused with more options, and stepped thresholds for evaluating performance.

Relative to the cost of implementation and certification, rating systems offer exceptional value. As code requirements become more stringent and local commitments to performance more aggressive, the cost gap to meet and exceed the minimum requirements of voluntary rating systems closes. Saskatchewan's minimum energy code and Regina's climate commitments are already aligned with strong performance against the most applicable voluntary rating systems including ZCB, LEED, and RHFAC, meaning the cost impact of pursuing them are likely to be relatively insignificant for the benefit gained.

For planning purposes only, capital costs ranges for pursuing select rating systems are provided here. Note that actual costs vary by location, market, typology, and performance level.

Capital cost ranges to pursue select rating systems	
Rating system	Additional Capital cost to pursue
Passive House	~ 10%
LEED	~ 0-5%
RHFAC	0-1%
ZCB	<1%

The feasibility study anticipates a combination of approaches for the new indoor aquatics facility to align with the City's Energy and Sustainability framework requiring an estimated cost premium of 15%.

5.8 Grants and Funding for high performance buildings

The evolving regulatory context to manage and reduce emissions is supported by a range of funding and grants to encourage low energy and low carbon buildings and infrastructure. The Pan Canadian Framework commits funding from the federal government in support, and the 2022 federal budget included \$2.2 billion over seven years starting in 2022-23 to expand the Low Carbon Community Fund. One hundred million dollars of that allocation is set aside to support green building. Accessing these funds typically requires consideration of future climate conditions, demonstrated reduction of greenhouse gas emissions and aggressive energy reductions, along with leading inclusive and accessible design strategies, determined through engagement with community members and local Indigenous groups.

We recommend identifying funding sources early, and aligning design process, performance targets, and rating systems accordingly. Select grant funding and financing opportunities that support reduction in greenhouse gas emissions and energy currently available or anticipated to reopen in the coming months include but are not limited to:

Green and Inclusive Community Buildings Program:

This incentive program supports projects that reduce greenhouse gas emissions, conduct climate risk assessments, and focus on inclusive and accessible design. The Canada Green Building Council's Zero Carbon Buildings design certification is required for successful projects. This program is anticipated to re-open in the coming months.

Federation of Canadian Municipalities (FCM):

FCM has various grants and loan programs that support reducing energy consumption and greenhouse gas emissions.

Anticipated federal funding:

In March 2022, the federal government announced the 2030 Emissions Reduction Plan, which creates a roadmap to achieving net zero emissions by 2050. The plan includes anticipated funding for existing building retrofits and high-performance new construction projects that significantly reduce greenhouse gas emissions and energy use.

5.9 Recommendations

Cities must transform in response to climate change; doing so successfully demands new infrastructure be future focused. Regina's Energy and Sustainability Framework sets out ambitious goals and strategies including clean heating, net zero in new construction, and a commitment to renewable energy generation. Responding to imperatives will require new thinking and new methods to deliver new community infrastructure. Below are the recommendations we have for the City of Regina's New Indoor Aquatics Facility:

Design for the Future

- Conduct a climate risk assessment early in Schematic Design to identify anticipated shocks and stresses. Anticipated resilience considerations include planning for use as a cooling centre during extreme heat, optimized air filtration systems including minimum MERV 13 on outdoor and recirculated air to manage forest fire smoke events, and water re-use strategies to serve landscape irrigation in the driest months, to support the cooling effects of healthy vegetation around the building.
- Evaluate design strategies against acute and chronic climate stressors, in the short, medium, and long term.
- Require energy modelling to account for future climate conditions of 2050 and 2080.
- Consider community needs during acute climate events such as extreme heat/cold/smoke, including multiple, overlapping conditions, such as Covid-19, a smoke event and extreme heat.
- Evaluate cost over the short, medium and long term, considering the value of investment over the life of the building, community benefit. Require life cycle costing to account for results of predictive energy and emissions modelling, future energy costs and pricing.
- Go beyond the code (Supports Big Move #2): Saskatchewan has adopted and enforced the National Energy Code for Buildings (NECB) 2017 and we recommend exceeding this code by at least 25%. This will support a grant application to the Green and Inclusive Community Buildings program once it reopens and pursuit of the Zero Carbon Building Standard. Depending on timing, the new NECB 2020 may be enforced by the time of building permit. Exceeding the current code will likely facilitate meeting a new energy code.
- Require an all-electric system (Supports Big Move #3): Grid de-carbonization is expected to reach a point where electrification is economically beneficial when considering emissions pricing (<10 years). Additionally, mechanical equipment that is available to the market today will continue to change as emissions standards from the Pan-Canadian Framework are enforced, potentially limiting availability of fossil fuel-based systems in the future. We recommend a heat pump-based system for this project.

Set Performance Targets

- Set aggressive but attainable performance targets for Thermal Energy Demand Intensity (TEDI), Total Energy Use Intensity (TEUI), Greenhouse Gas Intensity (GHGI) and air tightness (and require reporting on them at major design milestones. Set an air tightness target by the end of Schematic Design.
- Require water reuse. Aquatic infrastructure has high and constant potable water use. Reusing water from both process and fixtures can eliminate significant demand for irrigation and toilet flushing, as well as offer heat recovery opportunities.
- Set aggressive but attainable performance targets for all impact categories per the City of Regina Aquatics Framework including Ecosystems, Watershed + Site, Water Conservation, Energy Efficiency and GHG reduction, Climate Resilience, Sustainable Materials, Solid Waste, Food. Align the requirements with a verification strategy.
- Verify performance with Green Building Certification (Supports Big Move #2): Pursue the Zero Carbon Building Standard - Design certification at a minimum, along with LEED and RHFAC to maximize the benefit of third-party verification and opportunities to align with grant and funding opportunities.

Passive First

- Apply a passive first approach for design decision-making (Supports Big Move #2): Optimize the architecture for best performance (orientation, window-wall ratio, shading, heat gain, natural ventilation) to minimize the intensity of active systems to meet energy demands and manage comfort.
- Maximize and optimize use of available natural resources. Use building performance analysis direct design strategies. For example, model the impact of solar heat gain to optimize the benefit and manage comfort. Understand the potential to benefit from solar exposure throughout the year to optimize the benefit of on-site renewable energy generation through PV or solar thermal systems.

Optimize active systems

- Use a heat-pump based system and eliminate fossil fuels completely, if possible.
- Install on-site renewable energy generation (Supports Big Move #4): Regina has some of the best solar photovoltaic potential in Canada and we recommend investigating a solar-PV integrated roof or parking structure system or a solar-ready system for both the roof and parking.
- Consider InBlue pool filtration technology (Supports Big move #2): InBlue pool filtration is relatively new to North America (used at the City of New Westminster's tēmāsewtxw Aquatic and Community Centre). InBlue uses regenerative media pool filters, which have a lower water consumption than traditional filtration system. Lower water consumption means less energy is needed to heat the pool.

6.0 Context & Existing Lawson Assessment

- 6.1 Context
 - 6.1.1 City Aquatic Facilities
 - 6.1.2 Neighbourhoods
 - 6.1.3 Zoning
- 6.2 Existing Lawson Aquatic Centre

6.1 Context

6.1.2 City Aquatic Facilities

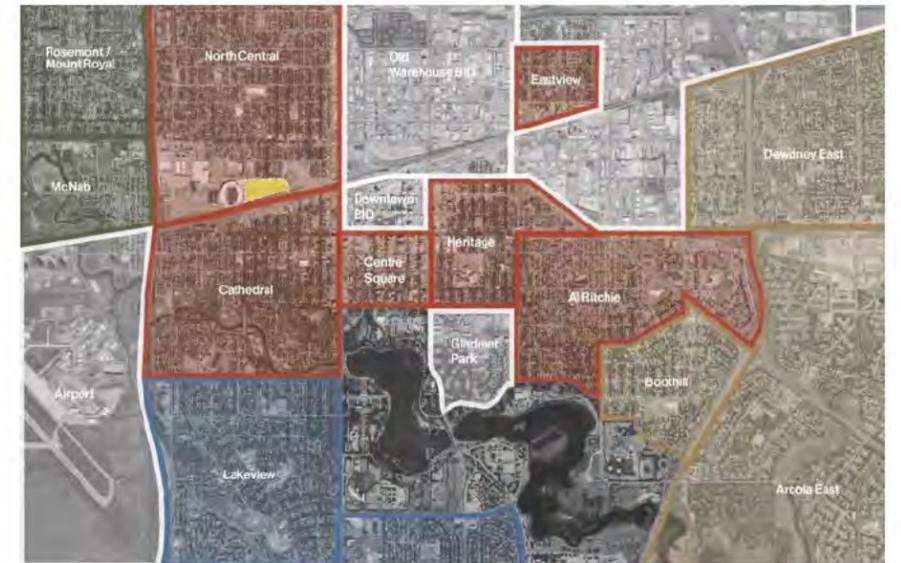
- + Indoor Pools
 - Lawson Aquatic Centre
University of Regina Swimming Pool 6.6 km*
 - Sandra Schmirler
Leisure Centre 8.5 km*
 - YMCA of Regina 8.7 km*
 - Northwest Leisure Centre 9.0 km*

- 10 minute walking distance
- * Distance travelled by car



6.1.3 Neighbourhoods

- Central Zone
- West Zone
- South Zone
- East Zone



6.1.4 Zoning

- Low Density Residential
- Medium Density Residential
- High Density Residential
- Commercial
- Mixed Commercial
- Large Format Commercial
- Light Industrial
- Heavy Industrial



6.2 Existing Lawson Aquatics Centre Assessment:

Part of the due diligence conducted during the planning process included an assessment of the existing Lawson Aquatics Centre. This was done to understand the current state of the existing infrastructure in order to assess the suitability for expansion and costs required to sustain the existing structure over the long term. The assessment report, found in the appendix, is intended to provide an overview based upon on-site visual observation, review of existing reports, interviews and discussions with the City of Regina Facilities representative(s), and application of Best Practice Design for Aquatic Facilities Including Accessibility. The following points summarize the findings of the report, the full report can be found in the Appendix (Appendix A).



Amenities & Features

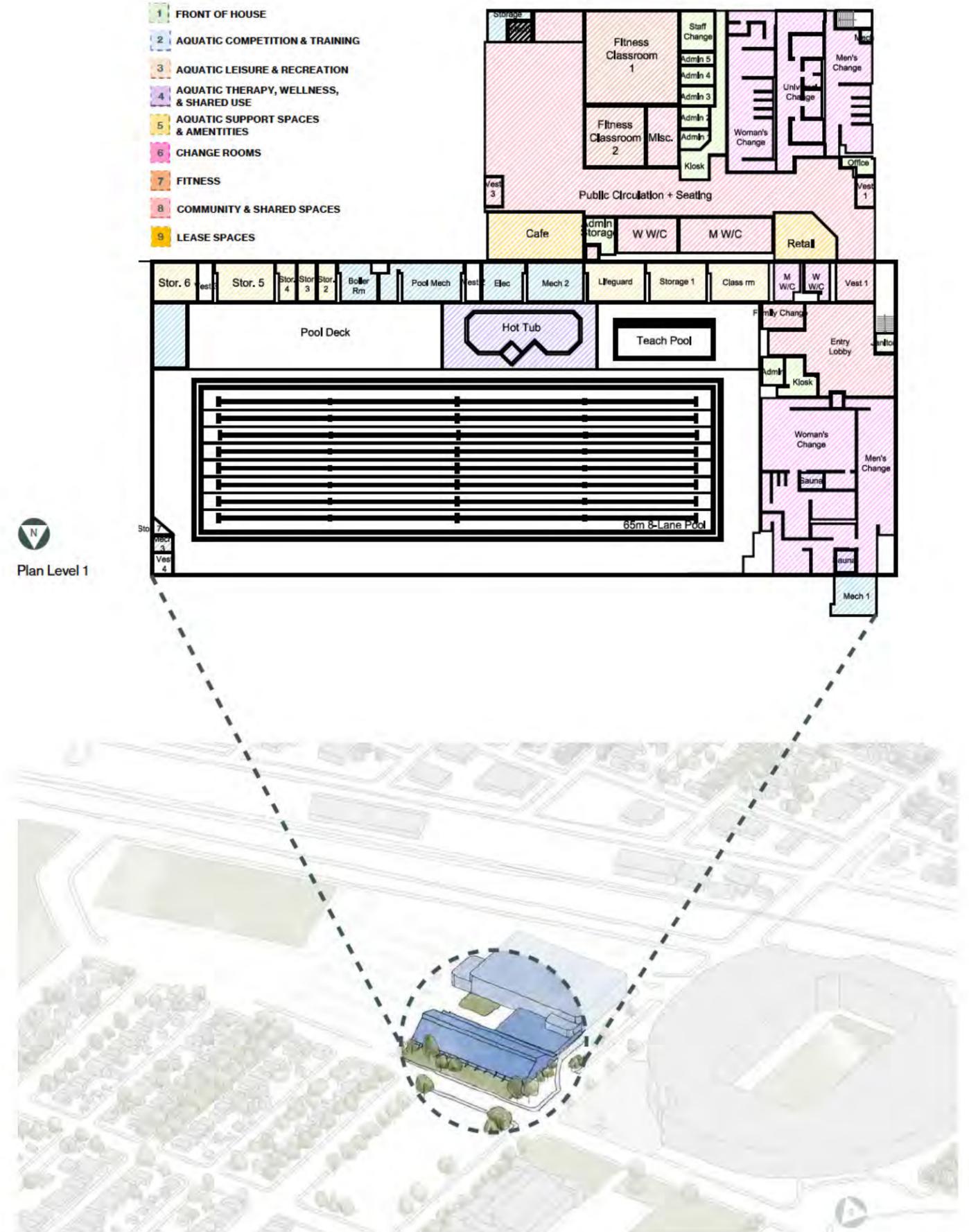
1. 65m Lap Tank
2. Above ground hot tub & teach pool
3. Dive Tower 1m, 3m, 5m, 7m and 10m
4. 300 Spectator seats
5. Fitness
6. Strength & conditioning

A Best Practice Shortfall...

The LAC would not qualify for the Rick Hansen Foundation Accessibility Certification (RHFAC) because it does not meet the prerequisite of having all public areas of the building universally accessible. This would necessitate the installation of an elevator to the mezzanine level and a strategy to obtain universal access to the timer's/judge's box.

The main tank utilizes a gutter system that is not unusual in older facilities, but it does make accessing the main tank a significant challenge even for able bodied swimmers. No ramp or access with dignity is possible to the main lap tank.

The hot tub and teaching pool are not accessible without the use of a lift. The main change room is dated and does not meet the ideal ratios of contemporary models for inclusive design. Best practice would have 60% universal change facilities with 40% designated male and female.



7.0 Vision & Principles

It is a centre for aquatic excellence and a destination facility for training, competition and recreation. It is a vibrant facility that improves the quality of life for Regina residents and visitors for generations to come.



Discipline	Capital Expenditure Forecast Summary			TOTAL
	Year 1	Year 2-5	Year 6+	By Discipline
Architecture	\$ 710,500.00	\$ 299,200.00	\$ 7,890,000.00	\$ 8,899,700.00
Building Envelope	\$ 190,000.00	\$ 140,000.00	\$ 742,000.00	\$ 1,072,000.00
Structural		\$ 2,000,000.00	\$ 150,000.00	\$ 2,150,000.00
Mechanical	\$ 180,000.00	\$ 2,512,500.00	\$ 2,660,000.00	\$ 5,352,500.00
Electrical	\$ 321,500.00	\$ 730,000.00	\$ 7,500.00	\$ 1,059,000.00
Controls (allowance)				\$ 500,000.00
Civil			\$ 2,366,000.00	\$ 2,366,000.00
Total Per Year	\$ 1,402,000.00	\$ 5,681,700.00	\$ 13,815,500.00	
Total All Disciplines				\$ 21,399,200.00

The Lawson Aquatics Centre (LAC) has been well maintained by the City of Regina with ongoing investments in building infrastructure and upgrades to specific areas related to programming and architecture.

The facility looks its age despite ongoing maintenance and upgrade efforts. Every discipline included in the report note that ongoing investment yearly will be required to prevent further deterioration, and some larger investments made to bring components up to current codes, or to replace end-of-life elements.

While there are no major structural issues with the existing facility, expected life cycle upgrades are needed. Significant mechanical upgrades are required despite the recent remedial work undertaken. As well, there is currently a risk that various electrical components could fail, necessitating a shut down of the facility until the fix could be completed. Replacement of mechanical and electrical systems with more modern and efficient equipment as end of life is reached will recognize an improvement in energy use.

The building envelope, however, presents a significant challenge given the lack of envelope continuity. The building also does not present to the public a contemporary architectural expression of a community gathering space and hub. It is a "black box" that does not engage the street or function as a beacon to the local community or the city. Coupled with the Fieldhouse the buildings are not welcoming nor do they advertise the range of activities that occur within through transparency. These are important considerations but are more philosophical in nature and have therefore not been included in the cost estimates.

The above table summarizes the expected costs associated with salvaging the existing LAC as part of the new indoor aquatics facility project.



The project background, engagement findings and trend and best practices all provide guidance and influence related to what a new indoor aquatics facility in Regina should include and what needs it should meet. The Aquatics Review and Supply and Demand report, found in the Appendix, provides detailed information related to design and operational considerations related to equity and inclusion, climate, and public health.

Based on all information gathered to date, the following vision and principles have been developed to explain the strategic intentions of a new indoor aquatics facility and how it should be designed and ultimately operated. The vision and principles are key in making sure that the City's investment is optimized and that it can be leveraged to make maximum impact in the local area as well as the broader City and Region.

The new indoor aquatics facility will have a direct role in the development of individuals, communities, the economy and the social infrastructure in the City. It will be a best-in-class aquatic facility offering opportunities for recreation, leisure, therapy and competitive aquatic sports. The pools are to be complemented by robust support spaces – including well designed and supportive staff areas, safe inclusive and forward looking change room design strategies and extended dry land spaces such as fitness, wellness, and health programs.

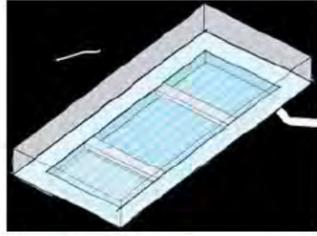
The new indoor aquatics facility will be a hub of wellness and social connectivity. It will be fully accessible (beyond codes) and inclusive of all groups. It will contain spaces and amenities that support inclusion and reconciliation. It is anticipated that there will be commercial and retail partners. Finally, this project does not end at the building envelope but includes outdoor recreation components and site infrastructure and planning to support the larger site developments and community connections.

A new Indoor Aquatics Facility should provide a unique opportunity to develop a community asset that will:

- Be a **multi-faceted destination and community hub** that will serve residents and visitors of all walks of life for decades to come.
- **Improve the quality of life** for all residents and make Regina an attractive place to live, work and play.
- Demonstrate leadership and commitment to **reconciliation**.
- Support **excellence in competitive aquatics** with a facility that can host National competitions
- Achieve **ambitious sustainability targets** and be a cornerstone of the City's commitment to be 100% renewable by 2050.
- Create a **complete civic precinct** with enhanced vehicular, cycling, and pedestrian connections.
- Expand the city's **outdoor amenities** which support open air community and sports events
- Be an exemplary facility in providing **enhanced inclusive & accessible environments**

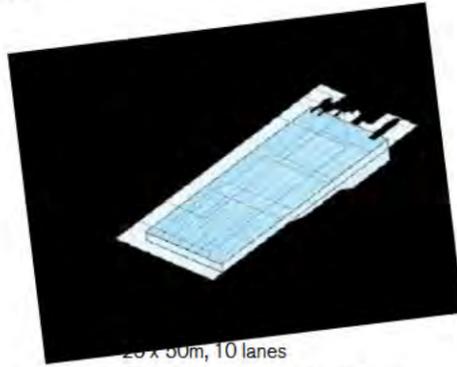


8.3 Major program components



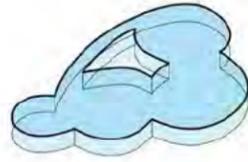
Lap Tank

- 25 x 50m, 10 lanes
- 10x Long course lanes
- Bulkhead - 20 short-course lanes
- 10x - removable starting blocks
- 1x water polo field of play
- Aquatics/lessons area



25 x 50m, 10 lanes

- International level Fields of Plays :
 - 1x water polo
 - Synchro/Artistic swimming
 - Diving platforms (1m, 3m, 7.5m, 10m)

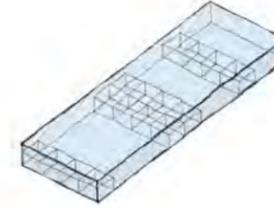


Leisure tank

- Zero-depth entry
- 1x Tot-zone w/ water feature toys (0-5)
- 1x Lazy river
- 3x 25m swim lesson lanes (5-12)

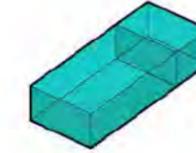
Additional Example features:

- 1x Accessible slide
- 1x basketball hoop
- 1x Climbing wall



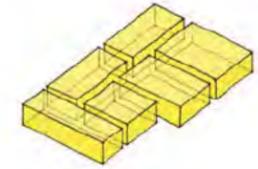
Change Rooms

- Universal change
- Female change
- Male change
- Team / group change
- Staff change



Other Support

- Media box
- Aquatic classroom
- CoR Sport program storage
- CoR Leisure program storage
- User group storage
- First Aid Room
- Lifeguard Room
- Bulkheads & provisions of timing equipment, starting blocks
- Scoreboards / video-boards



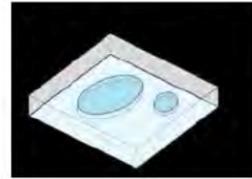
Administrative

- Receiving, Admissions & Cashier
- 4x Admin offices
- Admin open workstations :
- 20x admin staff open workstations
- 5x facility staff o.wsts.
- 25 lifeguards
- Copy/Supply
- 1x Staff lounge
- 1x meeting room
- 1x Bookable shared multipurpose room



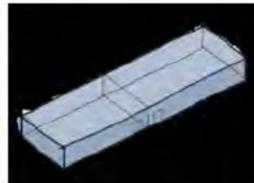
Water Park

- 3x High slides
- Extreme ride(s)
- 1x Tube/raft/drop slide(s)
- Interior/Exterior lazy river
- Sun deck w/ lounge chairs
- Wave Pool / Moving water tank
- Lounge chairs
- Concession (indoor/outdoor)
- Parent supervision area
- Access to leisure/toy storage, classroom(s), lifeguard & first aid room
- Access to exterior leisure area



Hot Zone

- 1x Hot tub – Adult
- 2x Steam Room(s)
- 1x Sauna
- 1x Plunge (cold)



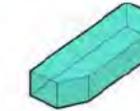
Therapy & Wellness

- 1x Hot tub – Therapy
- 1x Multipurpose room – Rehabilitation room
- Rest/Wellness deck area



Washrooms

- Accessible Washrooms
- All gender private stalls & shared vanities
- Outdoor Washrooms/Changerooms



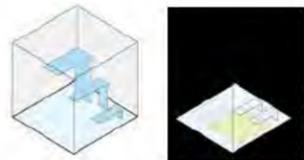
Cultural Space

- Social heart & entry atrium, community space
- Cultural / ceremonial space
- Elders room
- Community kitchen



Lease Spaces

- Retail / business area(s)
- Not-for-profit lease space
- Concession / food & beverage area(s)
- Complimentary professional lease space
- Major program lease spaces



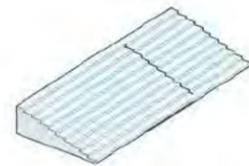
Diving

- Diving boards, platforms, and dive towers 1m, 3m, 5m, 7.5m, 10m
- Diving boards – springboards mounted on diving stands with movable fulcrums
- Dry-Land Training
 - Landing pads – stacked or foam pits
 - Trampolines
 - Crash mats
 - Somersault boxes
 - Stretching mats



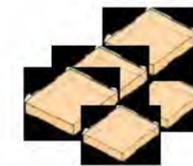
Deck

- Judging/Officials Area
- Secretary/Medical table
- Press stand
- Medal ceremony area
- 400-500x Coaches/Athlete seats
- Athletes hot tub
- Sports group dedicated storage
- Access to classroom(s), lifeguard & first aid room



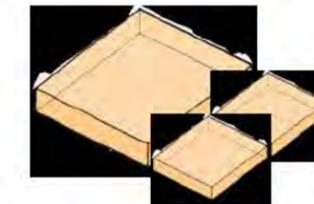
Spectator Seating

- 1200-1500 Spectator seating



Multi-purpose rooms

- Indoor Play ground
- Parents Viewing Area
- 2x large multipurpose
- 1x small multipurpose
- 1x Child minding



Strength & Conditioning

- Cardio machines
- Strength machines
- Stretching / balls
- Fitness open area
- Consultation / testing room
- Convenience accessible WC x3
- Group fitness storage
- Fitness equipment repair room
- 1x Large fitness studio (cap. 40)
- 1x Small fitness studio (cap. 20)



Gymnasiums

- Gymnasium
- Basketball court
- Court Sports
- Lounging area for viewing

8.4 Options Matrix

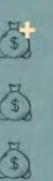
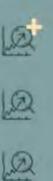
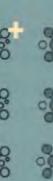
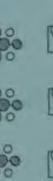
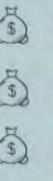
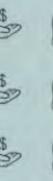
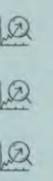
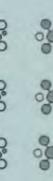
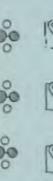
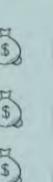
The options matrix outlines the range of primary programmatic components and provides a visual snapshot on how they respond to a wide range of criteria.

The range of programmatic combinations are Functional, Optimized, and Enhanced.

A fourth "renovate and expand" option is presented to best understand the implications of renovating the Lawson Aquatic Centre.

The Optimized options is presented as the recommended option as it best balances the current and future programmatic demands and capital and operational cost.

OPTIONS MATRIX

		Aquatic Competitive	Leisure	Community Support Other Programs	Sustainability	Accessibility	Construction Cost	Capital	Optimised Operational	Economic Spin-off	Pro/con	Phasing Challenges	Future Demand	Expandability	Draw & Attraction
New Build	ENHANCED	 <ul style="list-style-type: none"> 10-lane 50m competition tank 10-lane 50m dive tank enhanced competition standards Enhanced support spaces 	 <ul style="list-style-type: none"> Accessible Waterslide 40,000-45,000sf 				<ul style="list-style-type: none"> -25%> ~\$183M 	  	    						
	OPTIMIZED	 <ul style="list-style-type: none"> 10-lane 50m competition tank 10-lane 50m dive tank 	 <ul style="list-style-type: none"> Accessible Waterslide 35,000-40,000sf 				<ul style="list-style-type: none"> ~% ~\$146.2M 	  	    						
	FUNCTIONAL	 <ul style="list-style-type: none"> 10-lane 50m competition tank 10-lane 25m dive tank 	 <ul style="list-style-type: none"> 30,000-35,000sf 				<ul style="list-style-type: none"> ~25%< ~\$110M 	  	    						
	RENO + ADDITION	 <ul style="list-style-type: none"> 8-lane 65m warmup tank (Lawson tank) 10-lane 50m competition tank 	 <ul style="list-style-type: none"> Accessible Waterslide 35,000-40,000sf 				<ul style="list-style-type: none"> ~\$144.7M 	  	    						

Reviewed & Endorsed by the CAO

8.5 Recommended Program

The Space Need Summary is an idealized document based on project specific engagement, and also influenced by industry best practice. It reflects building areas in each programmatic component that support the activities and programming desired.

As an idealized document it does not account for site specific opportunities and constraints, nor does it look for opportunities for shared space between components. Given these two characteristics, the actual building design may find opportunities for efficiency and overlap that may result in a smaller building area.

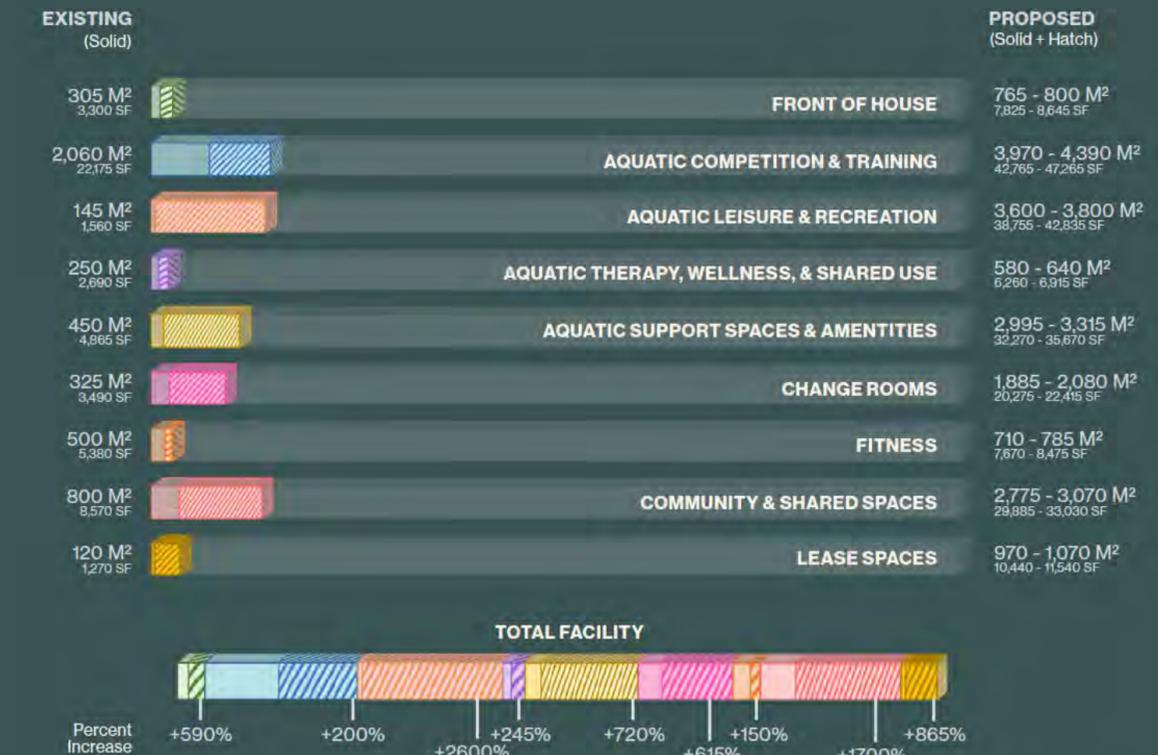
SPACE NEED SUMMARY			Recommended	
Program Components			Area (SM)	Area (SF)
1	Front of House			
1.1	Receiving, admissions, & cashier	300	3,229	
1.2	Admin offices	64	689	
1.3	Admin open work stations	355	3,821	
1.4	Copy/supply room	12	129	
1.5	Staff Lounge	16	172	
1.6	Meeting Room(s)	18	194	
	Subtotal	765	8,234	
2	Aquatic Competition & Training			
2.1	Long Course Competition Tank	1,230	13,240	
2.2	Secondary Tank - Warm Up/Dive Tank	1,230	13,240	
2.3	Deck area	1,722	18,536	
	Subtotal	4,182	45,015	
3	Aquatic Leisure & Recreation			
3.1	Leisure Tank	680	6,997	
3.2	High Slides	350	3,767	
3.3	Extreme Ride(s) (tube slide)	250	2,691	
3.4	Lazy River	450	4,844	
3.5	Wave pool/Moving Water Tank	350	3,767	
3.6	Deck area	1,710	18,406	
	Subtotal	3,790	40,796	
4	Aquatic Therapy, Wellness, & Shared Use			
4.1	Hot tub - Adult	150	1,615	
4.2	Hot tub - Athlete	60	646	
4.3	Plunge	15	161	
4.4	Steam Room(s)	22	237	
4.5	Sauna	15	161	
4.6	Deck area	350	3,767	
	Subtotal	612	6,588	
5	Aquatic Support Spaces & Amenities			
5.1	Spectator seating (national comp. standards)	1,556	16,749	
5.2	First Aid Room	10	108	
5.3	Lifeguard Room	80	861	
5.4	Bulkheads and provisions of timing equipment, starting blocks	-	-	
5.5	Scoreboards/videoboards	-	-	
5.6	Diving boards, platforms and dive tower	100	1,076	
5.7	Media Box/Judging Box/Area	-	-	
5.8	Dryland Training Studio	240	2,583	
5.9	Aquatic Class room(s)	120	1,292	
5.1	CoR Sport Program Storage	200	2,153	
5.11	CoR Leisure Program Storage	200	2,153	
5.12	User Group Storage	650	6,997	
	Subtotal	3,156	33,971	
Dash (-) indicates area incorporated elsewhere				
6	Change Rooms			
6.1	Universal change	1,111	11,955	
6.2	Female change	278	2,989	
6.3	Male change	278	2,989	
6.4	Team/Group Change	200	2,153	
6.5	Staff change	117	1,259	
	Subtotal	1,983	21,345	

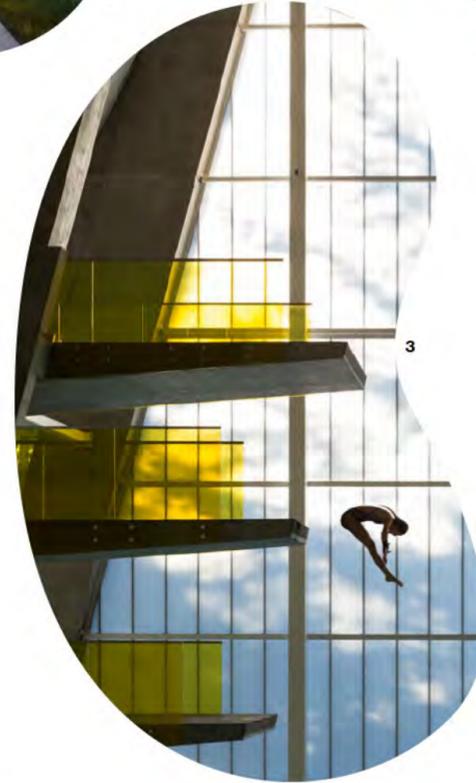
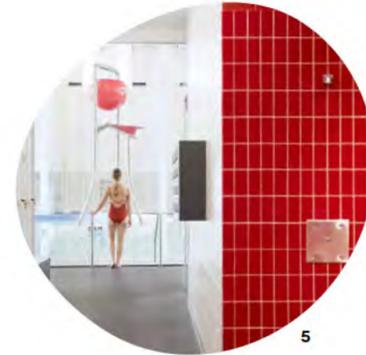
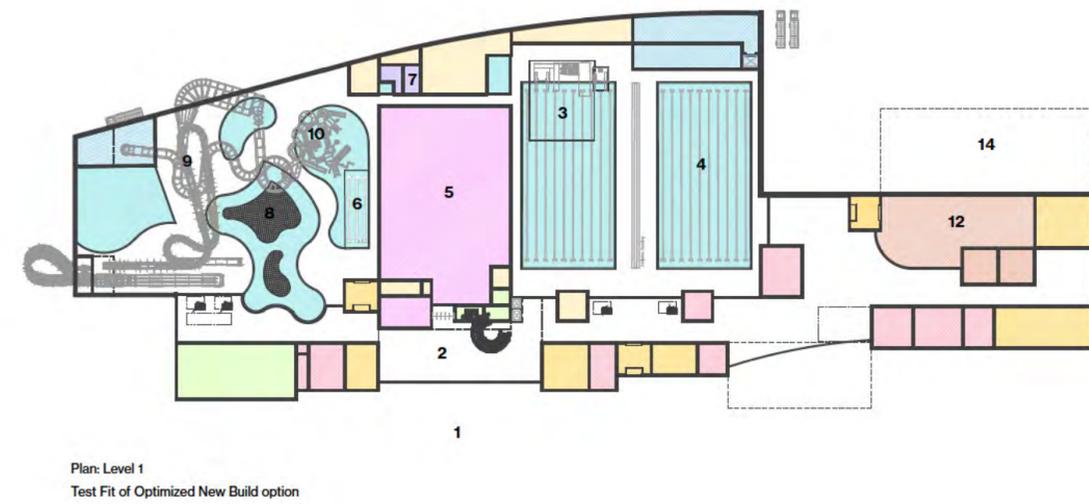
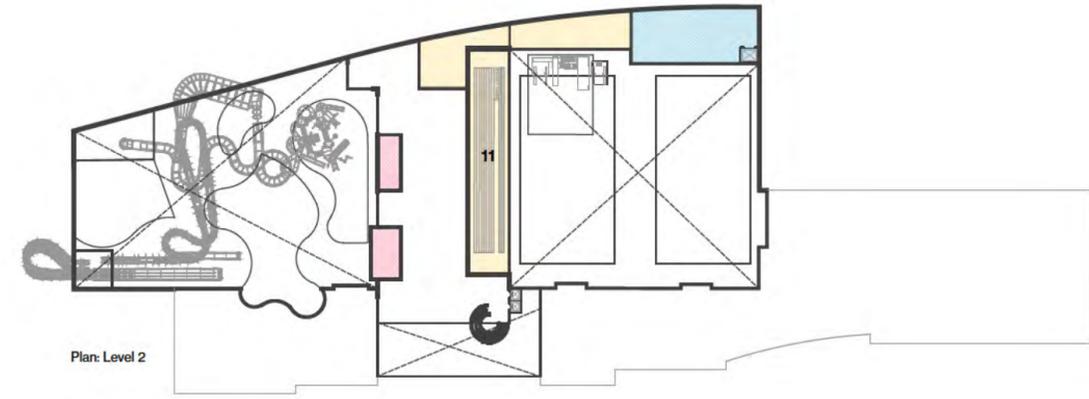
SPACE NEED SUMMARY			Recommended	
Program Components			Area (SM)	Area (SF)
7	Fitness			
7.1	Strength & Conditioning	600	6,458	
7.2	Studios	150	1,615	
	Subtotal	750	8,073	
8	Community & Shared Spaces			
8.1	Gymnasium c/w full size basketball court	750	8,073	
8.2	Lounging	200	2,153	
8.3	Parent viewing	175	1,884	
8.4	Kids area including indoor playground area	200	2,153	
8.5	Multipurpose Community Rooms	557	6,000	
8.6	Washrooms	300	3,229	
8.7	Outdoor Washrooms/Changerooms	40	431	
8.8	Child Minding	0	0	
8.9	Social Heart & Entry Atrium, Community Space	600	6,458	
8.1	Cultural Space(s)	100	1,076	
	Subtotal	2,922	31,457	
9	Lease Spaces			
9.1	Retail/business area(s)	200	2,153	
9.2	Not-for-Profit Lease Space	75	807	
9.3	Concession/food and beverage area(s)	150	1,615	
9.4	Complimentary Professional Lease Space	200	2,153	
9.5	Major Program Lease Spaces	396	4,263	
	Subtotal	1,021	10,990	
10	Back of House			
10.1	Building Mechanical & Electrical Rooms	900	9,688	
10.2	Pool Mechanical	1,000	10,764	
10.3	Crawl Space	2,000	21,528	
10.4	Building Operator (custodial) Space	250	2,691	
	Subtotal	4,150	44,671	
11	Circulation, Structural Footprint, & Misc Space			
11.1	Circulation	2,333	25,114	
11.2	Structural Footprint	933	10,046	
	Subtotal	3,266	35,160	
12	Outdoor Spaces			
12.1	Site development including parking lot for staff parking, accessible parking, and bus access	5,000	53,820	
12.2	Trails, Social Gathering, Landscaping	6,626	71,322	
12.3	Basketball court, Outdoor Amenities	750	8,073	
12.4	Accessible Recirculating Spray Pad	150	1,615	
12.5	Accessible Play/Playground Area(s)	700	7,535	
12.6	Outdoor seating area(s) connected to facility and concession(s)	400	4,306	
12.7	Space, amenities, design elements in support of Social and Cultural initiatives including truth and reconciliation	200	-	
12.8	Fencing, landscaping, traffic control and roads	400	-	
	Subtotal	14,226	153,129	
Total Interior Space			26,598	286,299
Total Exterior Space			14,226	153,129
Total Parking Spaces			18,200	195,905

** Total occupiable area is ~265,000 SF.
BTY Cost analysis performed on ~265,000 SF.

9.0 Test Fit

9.0 Features
9.1 Test Fit - Optimized
9.2 Test Fit - Reno + Addition





9.1 Test Fit - Optimized New Build

A competitive natatorium holds a 50m lap tank and 50m dive tank meeting national and international competition standards. Suited for the full range of competitive swimming and training needs. This separated natatorium is capable of National and International level competitions events with 1500, second level, spectator seats.

Adjacent leisure natatorium features a lazy river, slides, leisure pool with 3-lane teach pool, hot zone, and therapy zone. Bridging the two natatoriums, the change-room block will provide a variety of changing options and be able to respond appropriately to the variety of operational needs (teams, classes, individuals).

Indoor Amenities & Features

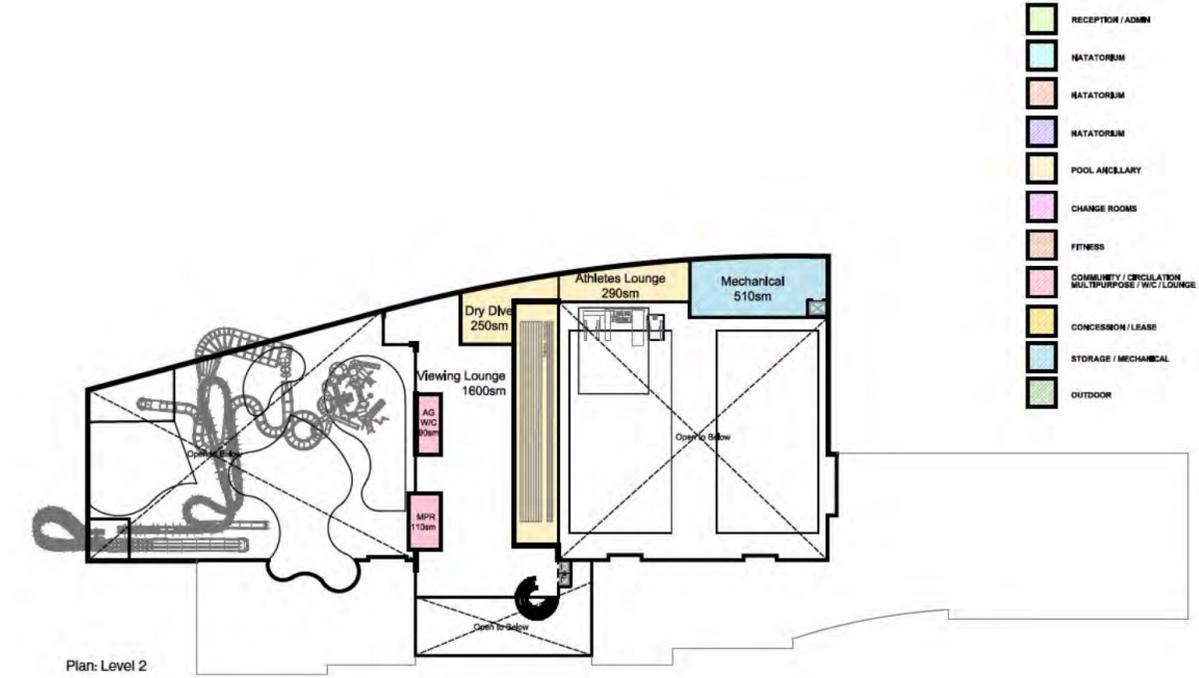
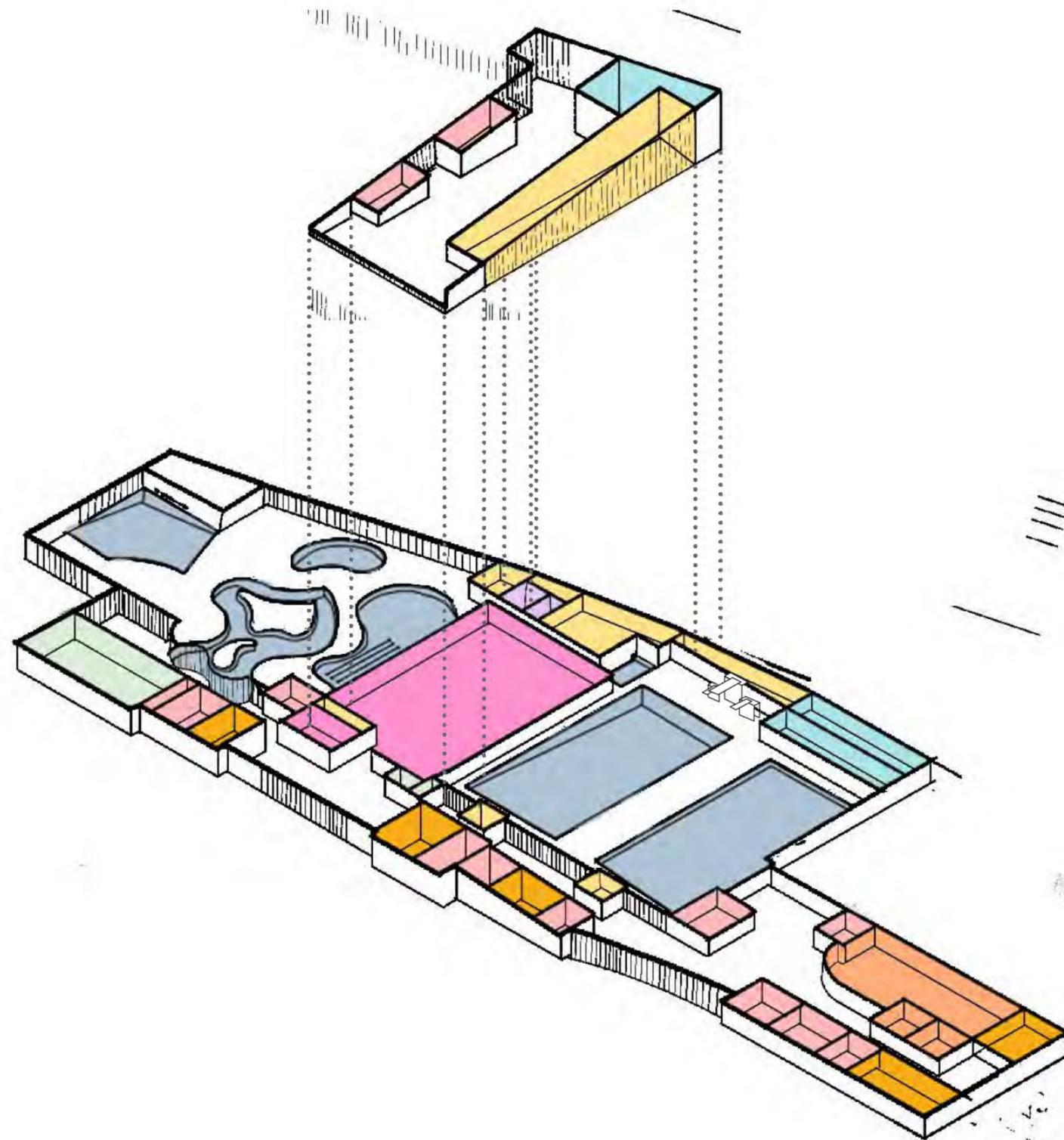
- 50m 10-lane Lap Tank
- 50m 10-lane Dive Tank
- Drydive
- On-deck classrooms & Storage
- 1500 spectator seats
- Leisure pool with 3-lane teach pool
- Lazy river
- 3 slides
- Hot Zone
- Therapy zone
- Fitness centre, studios, gymnasium
- Cultural, multi-purpose, cafe & lease space

Parking

Required peak hour parking: 580 Stalls

In addition to swimming amenities, a community space centred around a large atrium is comprised of multi-purpose rooms, cultural space, cafe, fitness centre with studios, gymnasium and lease spaces.

This option positions the facility to be a leading edge training and competition facility and a destination leisure facility for the community and region.



Plan: Level 2



Plan: Level 1

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This test fit strives to retain and extensively renovate the existing Lawson facility to meet current building and Industry best practices. The existing 65m pool will serve as the secondary tank due to the inability to widen the tank to the ideal 10 lanes, while incorporating spectator seating appropriately. The new 50m 10 lane tank will provide additional water area and serve as main competition tank for both diving & speed swimming.

The new addition supplements the renovated Lawson Aquatic Centre and concourse with a leisure natatorium, community spaces and fitness. Similar to the new-build option, an all gender changeroom acts as a transition zone between the leisure and competitive natatoriums. The second floor contains 1500 spectator seats as well as providing an informal viewing lounge.

Additional features include a 50m lap and dive tank, dry dive, all gender change, leisure pool, wave pool, lazy river, slides, a therapy and hot zone, and community area with a cultural space, multi-purpose rooms, cafés, gymnasium, and a fitness centre.

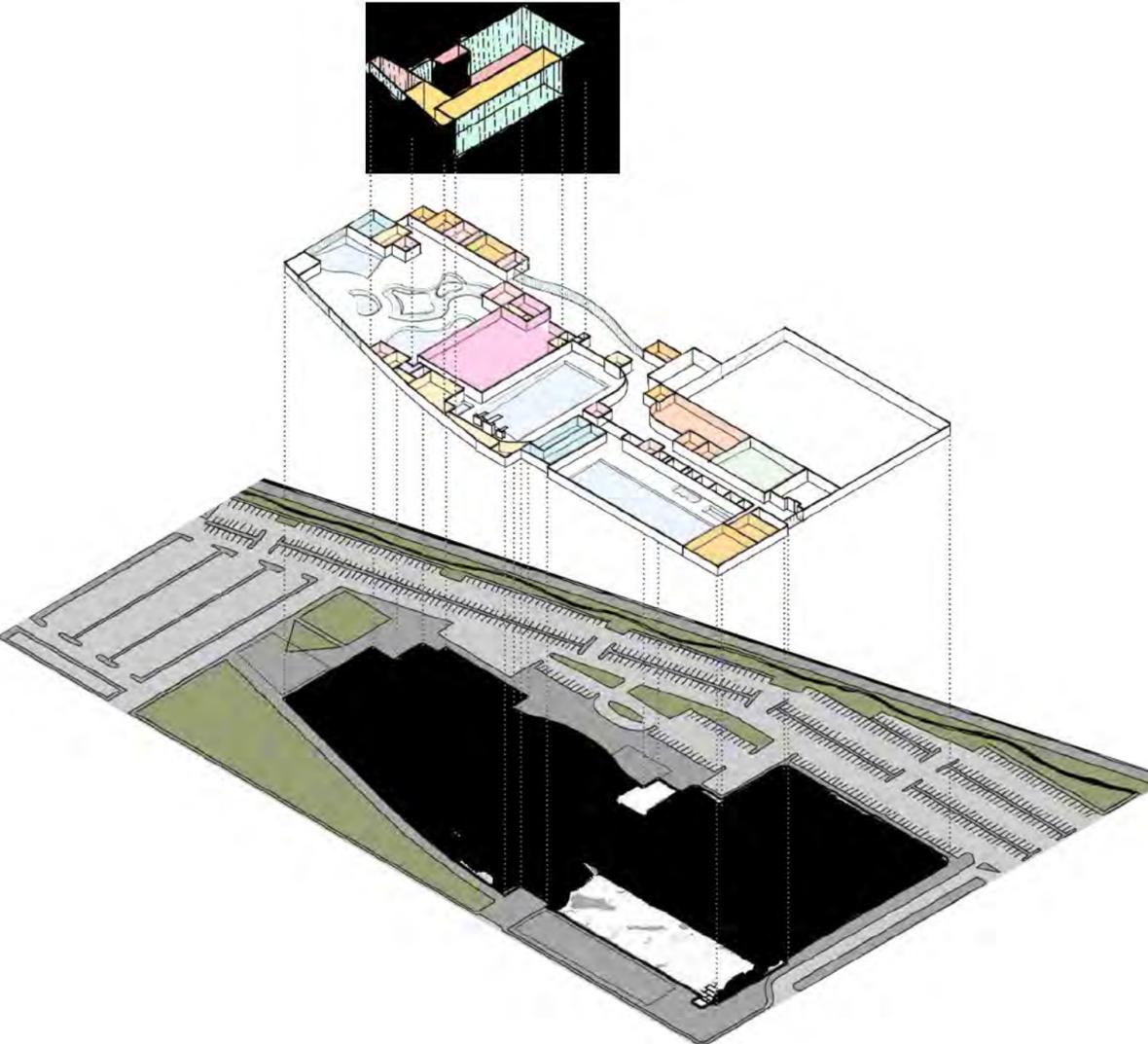
The concourse is extended throughout the length of the building to create a thoroughfare between the swimming natatoriums and community spaces.

Operational challenges exist with this option primarily because the renovated and new training tanks need to be separated due to pre-existing mechanical and access requirements in the existing Lawson tank. These challenges represent significant operations efficiencies, and also necessitate the primary entry to the facility to be from the south.

The main entry is accessible from Elphinstone Street with a rapid drop off and convenience parking to accommodate the existing Fieldhouse drop off and the new facility second entry on the East.

Primary parking is located to the west of the main entry, while drop off and overflow parking is situated on the South. This arrangement provides access to existing and new back of house components and utilizes the existing North Railway Street along with the open area north of the tracks to create space for the future green-way.

An accessible splash pad and playground build just off of a green-way spanning the north edge of the site to connect the facility to pedestrian access from Mosaic, the neighbourhood and future developments to the East.



Indoor Amenities & Features

- 50m 10-lane Lap & Dive Tank
- 65m 8-lane Renovated Warm-up Tank
- Drydive
- On-deck classrooms & Storage
- 1500 spectator seats
- Leisure pool with 3-lane teach pool,
- Lazy river
- 3 Slides
- Hot Zone
- Therapy zone
- Fitness centre, studios, gymnasium
- Cultural, multi-purpose, cafe & Lease space
- Outdoor Playground & Splash Pad

Outdoor Amenities & Features

- Hardscape: ~22,000,000m²
- Accessible Playground and Spraypad
- Potential NW plaza
- Multi-use pathway along 10th Ave
- Green space adjacent to Taylor Field site
- Efficient crowd management for events.
- Maintains emergency vehicle access

Parking & Access

- P** Parking -745
 - South (-540)
 - East (-205)
- L** Loading
- S** Site Access
 - 10th Avenue
 - Elphinstone St
- L** Landscaping
 - Green space: -1,780,000m²

Phasing Diagrams



- Phase 1:
- Competitive pools
 - Leisure pools
 - Hot pools
 - Aquatic support spaces
 - Admin & control



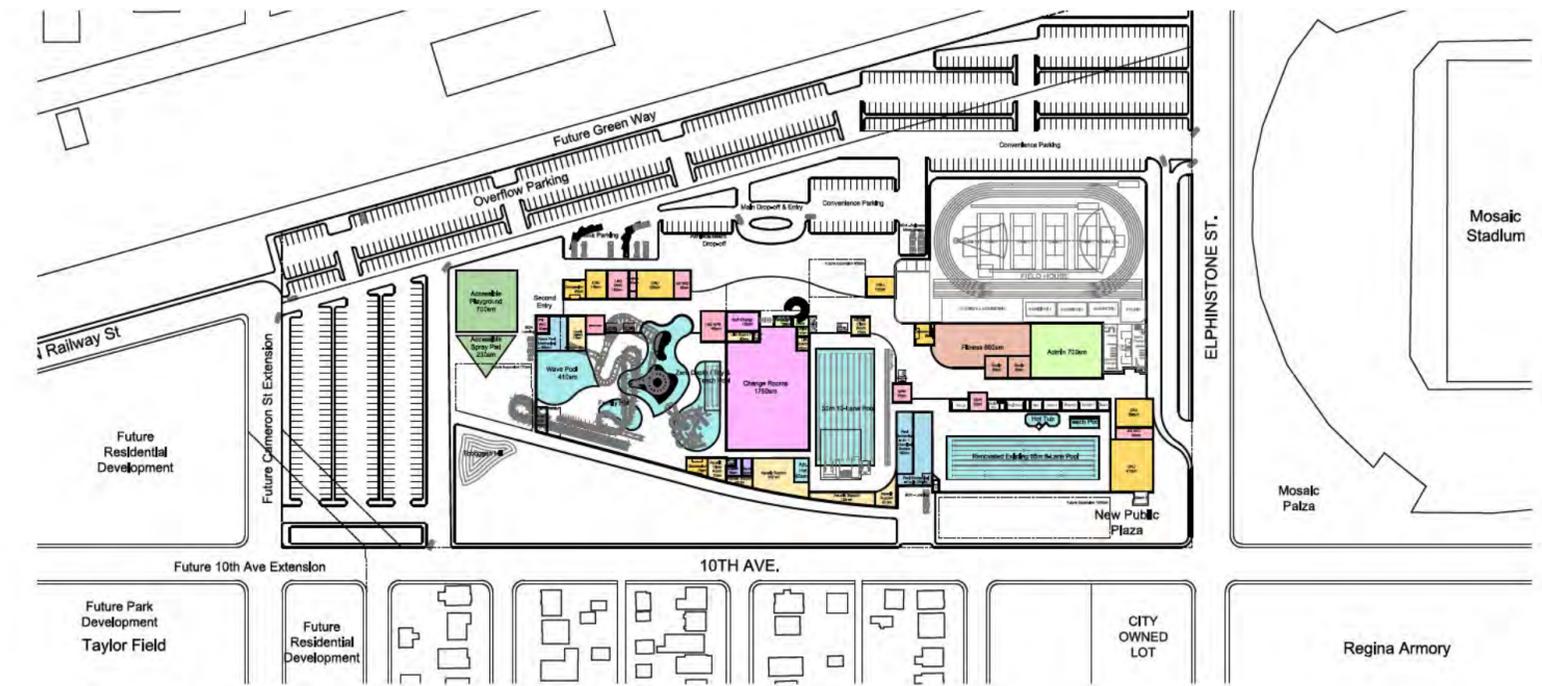
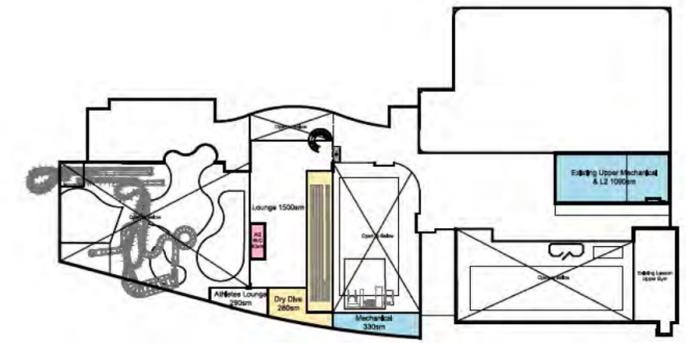
- Phase 2:
- Decommission Lawson
 - Renovate Lawson Tank
 - Upgrade Mechanical systems
 - Repurpose Lawson Changerooms
 - Renovate Concourse



- Phase 3:
- Build connecting community space
 - Landscaping

- RECEPTION / ADMIN
- HATATORUM
- HATATORUM
- HATATORUM
- POOL ANCILLARY
- CHANGE ROOMS
- FITNESS
- COMMUNITY / CIRCULATION MULTIPURPOSE / WC / LOUNGE
- CONCESSION / LEASE
- STORAGE / MECHANICAL
- OUTDOOR

Plan: Level 2



Plan: Level 1



10.0 Project Delivery

There are several different models of project delivery that can be considered for a project of this scale and complexity. The determination on which model is best suited should take into account a number of factors. Of primary consideration are: risk profile of owner, complexity of the project, need for cost certainty, and schedule. Additional consideration might include capacity and expertise of the owner, site complexities, funding requirements and or restrictions and market conditions or certainty.

Recommendation

The primary reason to select Design-Bid-Build (DBB) is for cost certainty and owner risk mitigation. DBB represents the most traditional and conservative delivery method and may suit the organizational needs of the City of Regina best. The DBB process requires the consultant to fully complete the contract documents in advance of contractor selection, and tender. This delays the start of construction but provides the owner with certainty that the bid price will fully capture the owners requirements.



Design-Bid-Build (DBB)

Risk level: Medium-high
City Admin effort: medium
Construction contingency: high

Pros: well understood, highly competitive, owner design control until procurement

Cons: contract price not guaranteed/checked in market until tender, contractor involved late (can create adversarial relationship), owner carries majority of risk (design error/omission), ridged schedule

CM (Construction Management) at Risk

Risk level: Medium
City Admin effort: Medium
Construction contingency: low-medium

Pros: well understood, highly competitive, owner design control until procurement, CM involved during design as advisor, high transparency, schedule acceleration, change in construction made simpler, risk for schedule delay & scope gap transferred

Cons: Higher admin effort than DBB, numerous points of accountability (contractual risk),

Design-Build

Risk level: low-Medium
City Admin effort: Medium-high
Construction contingency: low

Pros: owner has a single point of responsibility with the design builder who has contractual relationships, early schedule & cost certainty, risk transferred for design errors & omissions

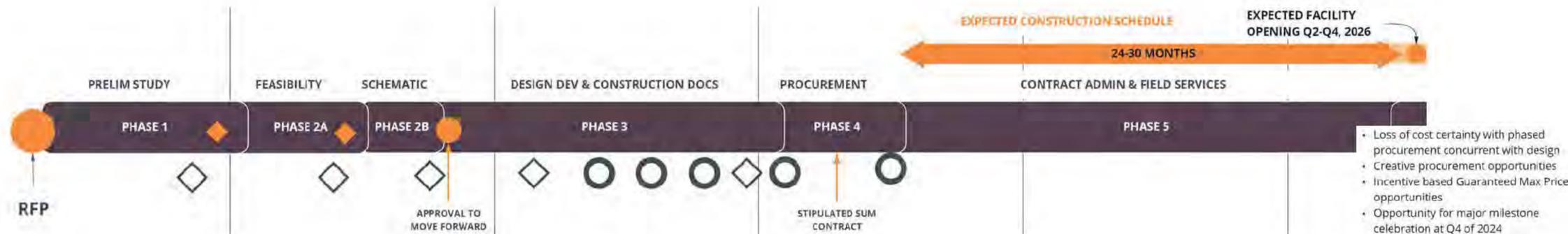
Cons: potentially reduced quality, limited design control, challenging with complex/renovation projects, owner has reduced flexibility to changes as design evolves

Integrated Project Delivery (IDP)

Risk level: Medium-high
City Admin effort: high
Construction contingency: N/A – Risk Pool

Pros: shared accountability (only to the extent that the risk pool is allocated), potentially compressed schedule, promotes coordination & alignment (when lean construction principles are applied)

Cons: Contract familiarity – CCDC 30 (relatively new, 2018), lack of market familiarity, challenges around market familiarity (potentially reduced design/contractor availability, challenges around finance & insurance, and owner solely responsible for cost overruns



11.0 Costing Analysis

11.1 Capital Cost

It is anticipated that the construction costs will be approximately \$146,161,800 based on a Preliminary Class D Estimate conducted in April 2022. This estimate includes typical contingencies that are reflective of the early stage of the project development and assumes a construction start in the year 2024. Class D estimates have a degree of variability (+/-25%) that reflects the early stage of the design process. The costing was based on program areas for both new build and renovation and addition scenarios. Key elements of the analysis include:

- Elemental breakdowns were utilized (meaning each building component was assessed – structure, envelope, interior partitions)
- Allowances were applied where not enough detail available at this time (typical for Class D estimates)
- Contingencies have been applied to capture areas of risk.
- Construction duration is assessed and accounted for.
- Is in alignment with the City's Energy and Sustainability framework.
- This estimate includes typical contingencies and assumes a construction start in the year 2024.

Net Construction Cost	\$104,993,500
Design Contingency (15%)	\$15,539,000
Construction Contingency (5%)	\$6,026,600
Total Construction Cost	\$126,559,100
Escalation (6.5%)	\$19,602,700
Escalated Construction Cost	\$146,161,800
Professional Fees (7.0%)	\$10,231,326
Project Contingency	\$5,000,000
Furnishing, Fitting & Equipment (Estimate)	\$1,500,000
Provincial Sales Tax (6% PST)	\$9,773,587
Estimated Total Project Cost (Apr 2024)	\$172,666,713

A cost analysis exercise was also performed on the Renovation and Addition option. This exercise confirmed that renovation and addition was effectively equivalent in cost, with an escalated construction cost of \$144,745,500. The similarity in cost being the result of the extensive scope and intensity of renovation, high contingencies associated with renovations due to the complexity of the work, and additional project schedule required.

For more information related to capital costs estimates, please refer to Appendix C.

11.2 Life Cycle Cost

An elemental Life Cycle cost analysis has been completed that indicates approximately \$50,000,000 in life cycle costs over a 50 year period. These costs are represented in 2022 dollars. The LCC analysis is based on anticipating replacement and upgrade costs to all major building components over time and representing them in current day values. The schedule of component replacements is based on historical data and best practices. Life Cycle cost analysis can be found in Appendix C.

11.3 Operational Cost

Although capital costs are a major consideration for these types of public investments, so too are the ongoing operating obligations related to making sure the facility is accessible to those who need it. At this stage of planning, the following estimates should be considered +/- 20%. Facilities like the one proposed require operating subsidy, and in this case the operational costs of the new facility will be somewhat offset by those incurred to operate the existing LAC. The new facility is expected to generate approximately \$3.4M in revenues and incur approximately \$8.78M in operating expenses for a required subsidy of \$5.63M. This equates to a 39% cost recovery rate, not including capital amortization or life cycle reserve budgeting. This operational cost recovery is in line with comparable municipal facilities both in the City of Regina and nation wide. (OCR of approximately 40% are the norm)

For more information related to operation costs, please refer to the Appendix C.

12.0 Partnerships

11.4 Economic Impact

Economic impact is also important to consider when contemplating investment in a public recreation centre. The following summarizes the expected economic impact of this project during construction, normal operation and special events. Detailed analysis can be found in Appendix C

Impact through Construction

Based on the capital cost of approximately \$146 million.

- Total economic output associated (direct, indirect, induced): \$235,758,983
- Total GDP generated (direct, indirect, induced): \$115,321,660
- Total employment created (direct, indirect, induced in FTEs): 886

These expenses will be incurred by the City of Regina over a multi-year period.

Impact through Operations

Annual operating projections for the new indoor aquatics facility were developed based on staff input on estimated revenues, expenses on salaries and benefits, and other annual operating expenses such as maintenance, utilities, and so forth. Inputs for this analysis are derived from the Operational Budget Forecasts report

- Total economic output: \$10,633,346
- Total GDP \$2,282,322
- Total Employment (FTEs) 99

Impact through Event hosting

Sports tourism and event hosting is an important dimension of Canada's tourism economy overall. Unlike more traditional forms of tourism, sports tourism is equally driven by domestic and inter-provincial and therefore is more resilient to disruptions such as pandemics and other unforeseen events. Sport Tourism Canada estimates that sport tourism contributed \$7.4 billion to the Canadian economy in 2019,

If on an average year the City were to host 6 regional events, 2 provincial events, and 2 national or international events, the total economic impact generated by the facility is estimated to be \$3,174,370 which is broken down to:

- \$121,818 for 6 regional events
- \$331,402 for 2 provincial events
- \$2,721,150 for 2 national / international events

While not all of this economic activity generated by event hosting would go directly to the City to support facility revenues, it can be assumed that at least some of this activity will help to support facility operations through spending on admissions, tickets, rentals, food, and other goods and services.

Partnerships are becoming more and more common during the development and operations of public recreation facilities. Partners can include user groups, non-profit or private sector facility operators, sponsors, post-secondary institutions or even other regional municipalities.

In order to understand the level of partnership interest in the New Indoor Aquatic Facility project, the City administered an partnership Expression of Interest (EOI) process. This entailed the creation and posting of a formal Expression of Interest package that outlined information about the project and some ideas related to potential partnerships the City might entertain. Groups or organizations interested in partnering were encouraged to respond to the EOI with details about their partnership proposal.

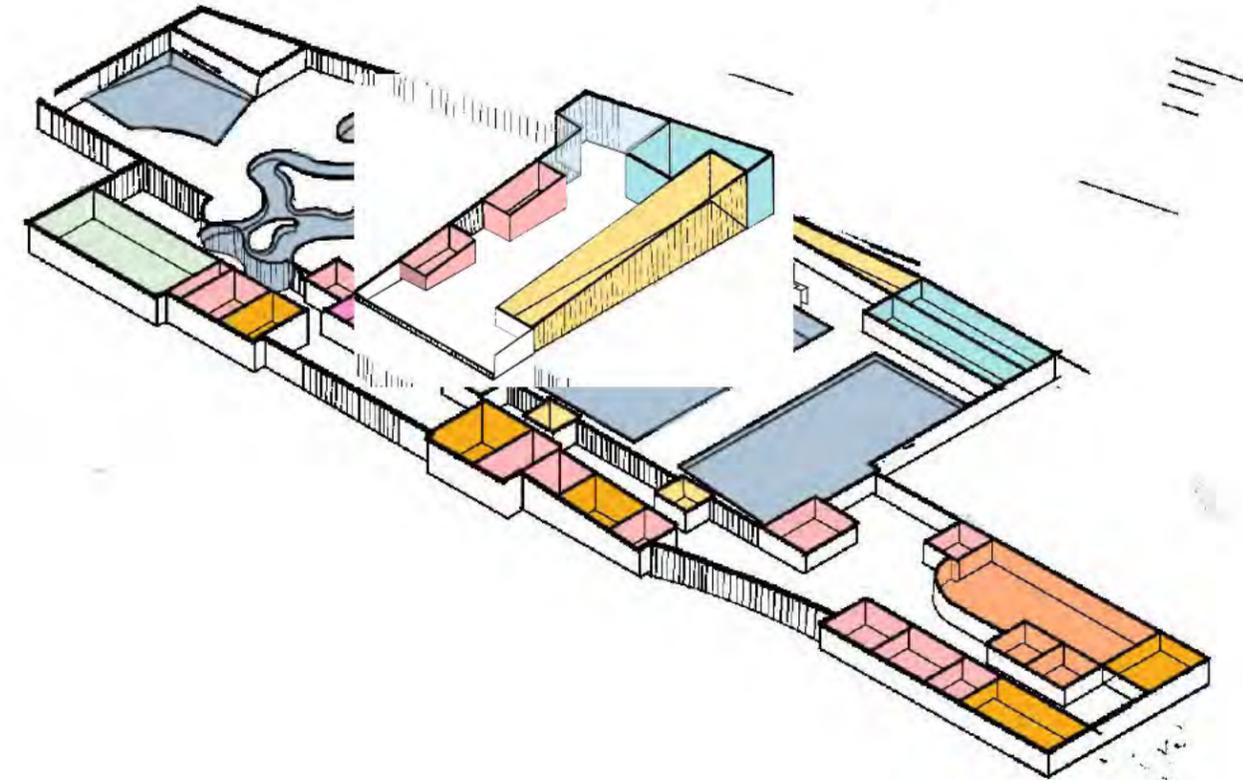
It was important for the City to under take a formal EOI process as it was a transparent and fair opportunity for any group to respond to.

Although partnership may materialize during future phases of the project, none of the proposals received have a significant impact on the program or concept design at this feasibility stage of planning.

Sponsorship is also very commonplace in recreation facilities in Canada. Naming rights for different amenities within a facility, or even for the overall facility, enable sponsors to get desired brand recognition and exposure, and demonstrate commitment to the community while helping recover capital or operating costs of a facility. A more formal sponsorship campaign will when the project progresses to the next stages of design and gets closer to taking physical form.

13.0 Discussion, Analysis & Recommendations

Regina's New Indoor Aquatics Facility is an inclusive, accessible and sustainable community hub and tourist destination – that creates vibrancy and improves quality of life for Regina residents and visitors for generations to come.



Background

The objective of the feasibility process was to produce a building program and test fit options that have been guided by stakeholder and public input, tested by careful analysis, and are programmatically, functionally and financially supportable to provide enough information to determine whether the project is feasible to move forward. The information in this report should guide key decisions for the future progression of this project and should be used as the basis for the schematic design.

Key decisions are:

- To determine the service level (Functional, Optimized, or Enhanced) that best meets the City's needs now and in the future
- To undertake a significant renovation of the Lawson Aquatic Centre coupled with an addition to meet programmatic needs, or, replace the Lawson Aquatic Centre with a larger new facility

Optimized New Build vs. Optimized Renovate and Expand Key Considerations:

1. The detailed Condition Assessment of the Lawson Aquatic Centre identifies the significant cost required to extend the facility's life. Furthermore, even with the required investment, an upgrades Lawson will not be able to meet best practice in a number of key areas.
2. Planning a significant addition to the Lawson is possible (see Reno and Addition Concept), however the planning presents significant operational challenges relating to circulation, control and adjacencies. These operational inefficiencies would surpass any capital savings associated with renovating.
3. The technical challenges in renovating the Lawson and the extent of the renovation necessary are financially inefficient.
4. Undertaking a renovation and expansion requires a significantly longer construction period to complete

Recommendation

The Optimized New Build represents better value and performs better operationally. It does not represent a significantly higher capital cost and has advantages in operational and life cycle costs.

Service Level Delivery - Key Considerations

1. The current and projected demand for fitness, training and competitive swimming indicates that an increase in water area equivalent to a second 50m length pool to meet demand due to future growth of Regina.
2. Demand for training support spaces and auxiliary programs is high.
3. The level of competition targeted is National Level, with the desire to promote economic development and sport tourism.
4. The engagement indicates that a robust recreation program is supported and should appeal to a broad spectrum of users.
5. Engagement indicates that additional non-aquatic community amenities are in demand and desired.

The optimized program fully responds to current demand, and projected future demand, in all three areas (competitive, recreation, and non-aquatic amenities). It should represent the baseline as the project moves into the design phases where the program can be further refined, the analysis on utilization and capacity can be further resolved, and the construction and operational costs can be detailed with greater certainty. If necessary, the optimized program could be adjusted to meet project financial constraints.

Next Steps

As part of the next stage in the process we would recommend that this report be shared with the community, and a continuation of the engagement process occur during the project's design phase.

The following studies should also be completed prior to commencement of schematic design:

- Legal & topographical site surveys.
- Geotechnical report and surveys. Soil conditions need to be assessed to gain a better understanding of any associated excavation and foundation costs.
- Environmental Assessment Report - this will also help in the understanding of costing relating to any issues surrounding the proposed facility location and potential cost if remediation or disposal is required.
- A full transportation impact assessment (TIA) - to determine the wider effects of the proposed facility.
- Confirm a site.

A COLLECTIVE
APPROACH
TO COMPLEX
CHALLENGES.



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The City of Regina acknowledges we are on the traditional lands of the Treaty 4 Territory, a Treaty signed with 35 First Nations across Southern Saskatchewan and parts of Alberta and Manitoba, and the original lands of the Cree, Salteaux, Dakota, Nakota, Lakota and the homeland of the Metis nation. The City of Regina owes its strength and vibrancy to these lands and the diverse Indigenous Peoples whose ancestors' footsteps have marked this territory as well as settlers from around the world who continue to be welcomed here and call Regina home.

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curiosity applied
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New Indoor Aquatic Facility Feasibility Study

Appendix

City of Regina

Issued:

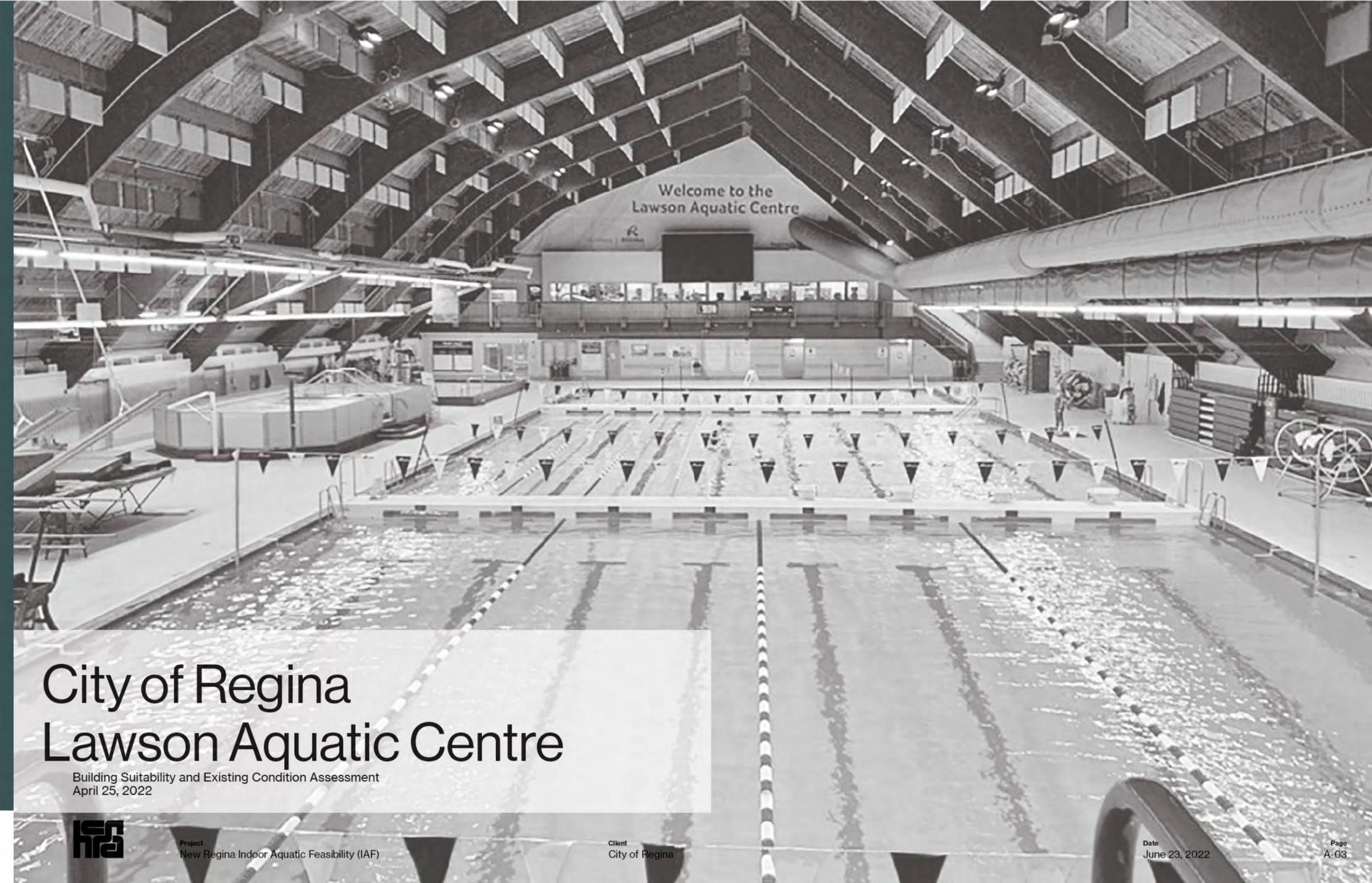
June 23, 2022

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Appendix A - Lawson Condition Assessment



City of Regina Lawson Aquatic Centre

Building Suitability and Existing Condition Assessment
April 25, 2022



Participants

This document was developed in consultation with the City of Regina and HCMA/P3A consultants with assistance from architectural and engineering consultants. The valuable contribution of these participants is acknowledged and greatly appreciated.

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City of Regina Lawson Aquatic Centre

Building Suitability and Existing Condition Assessment



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Section 1.0 Executive Summary

Introduction

The City of Regina has engaged an external consulting team led by HCMA to assess the condition and long-term usefulness of the Lawson Aquatic Centre (LAC) as part of a feasibility study for a proposed new Indoor Aquatic Facility (IAF). The LAC condition and building assessment report was created by numerous consulting team members including HCMA, P3A, Morrison Herschfield, BBK Engineering (with Fast and Epp), AME/MEI, SMP/Alfa Engineering, and KGS. This report is based upon on-site visual observation, review of existing reports, interviews and discussions with the City of Regina staff, as well as application of best-practice design and current aquatic facility standards including building sustainability, accessibility and inclusion.

This report presents a number of key findings related to the existing LAC facility:

1. The existing physical condition of the LAC, including current deferred maintenance and associated Facility Condition Index (FCI).
2. The anticipated remaining useful life based on current maintenance and operations practices and what investment would be required and when that investment would be required to extend the useful life.
3. A comparison of the LAC to contemporary best-practice in aquatic facility design.
4. A comparison of the LAC to program space needs.
5. The investment required to align the LAC to contemporary best-practice in aquatic facility design and the program space needs achieved for that investment.

1.1 Existing LAC Condition Overview

The LAC was constructed in 1975 and is interconnected with the Fieldhouse, constructed in 1987, via a common linking corridor. The LAC is the City's largest indoor aquatic facility that provides aquatic sport training to various aquatic user groups as well as community recreation opportunities. The building contains an 8 lane, 65m main pool tank with two moveable bulkheads providing opportunities for short and long course lane swimming, water polo, artistic swimming, diving and general aquatic recreation. The LAC contains a deep end with diving platforms as well as an on-deck hot tub and teach pool adjacent to the main tank. The entry lobby, administration, and change/wash room areas are on the west end of the facility. Viewing of the pool area is limited, however is available by the second level fitness centre or pool deck locations. The LAC has served the community well, but is approaching the end of its useful life and requires significant investment to renew its useful life in a meaningful way. The current deferred maintenance for the facility is estimated to be \$10M and based on the current replacement value, would result in an FCI of 48%. The FCI is an industry standard facility management benchmark that is used to objectively assess the current condition of a building asset. Typically a facility asset would be considered in critical condition when its FCI exceeds 30% and decisions need to be made on whether to continue to invest in that facility or build new.

Building Assessment Summary

The following is a summary of the building condition assessment.

Accessibility

As previously mentioned, the Building Condition Assessment outlines the capital expenditures required to keep the LAC operational. It does not address the shortfall of the facility related to best practice. For example, the building would not qualify for Rick Hansen Facility Accessibility Certification because it does not meet the prerequisite of having all public areas of the building universally accessible. Meeting this requirement would necessitate the installation of an elevator to the mezzanine level and a strategy to obtain universal access to the timers/ judge's box. The main tank utilizes a gutter system that is not unusual in older facilities, but it does make accessing the main tank a significant challenge even for able bodied swimmers. No ramp or access with dignity is possible to the main lap tank, the hot tub, or the teach pool. All are accessed via lifts. The main change room design is dated and does not meet the 60% inclusive design model of a contemporary facility.

Best practice would have 60% universal change facilities with 40% designated male and female. There is a lack of existing footprint to rectify this problem. The wind tunnel effect between the Fieldhouse and LAC can also make building access challenging for those with reduced mobility.

Architecture

The architectural finishes throughout require updating, and the main reception area does not align with best practice for accessibility or for the interaction of staff with the public. The pool deck requires a wholesale retiling. The existing tiles are no longer manufactured, resulting in a variety of tiles in the building. The tiles on the pool deck have been in a failing state for some time. The mezzanine fitness room has been recently renovated and in excellent condition; however the mechanical space above it is subject to ongoing water damage from condensation in the air handling units, which has caused minor water damage to the spaces below. There are issues with original construction techniques. This will require a complete replacement of this area to address. The LAC building envelope requires remedial work in many areas. Sealants require replacement throughout, the low sloped roof requires ongoing repairs. Replacement, patching and repairing of exterior components such as parapet flashing, masonry, louvres, and cladding is needed in many areas around the building. Overall, the envelope continuity was determined to be in poor condition and has been compromised over the years from several renovations.

Structural

Structural issues were observed despite remedial work done over the years. This is primarily related to the steel pool deck support continuing to corrode in various locations. The wood superstructure has not delaminated and appears to be in good condition. The mezzanine did not reveal any significant deficiencies and was determined to be in good condition. The dive tower structure was in fair condition and requires ongoing observation and potentially maintenance. The main floor structure was remediated in 1997 is in good condition; however, there was some mild corrosion of the remedial steel beams and the area below the change rooms and admin area, which were not reinforced in 1997, show significant corrosion to the steel floor pan. This is in poor condition and in need of reinforcement in the short term. The pool deck and crawlspace are in good condition. It was noted by the Architect that the concrete in the overflow tanks are spalling and in need of repair.

Mechanical

There are some significant mechanical upgrades required beyond the remedial work undertaken in recent years. Motorized dampers, hydronic heat piping replacement, and a combustion air fan are recommended for the immediate future. The make-up air units are beyond useful life and require replacement and the location carefully considered to reduce snow and frost build up. This will necessitate an architectural solution involving building envelope work on the roof and the construction of an insulated infill wall. The domestic hot water system needs replacement and consideration for complete replacement of plumbing fixtures. The latter should be replaced with low-flow, water efficient fixtures. The pool tank mechanical systems require significant work including replacement of pool deck drains, circulation pumps, chemical controllers, and many other systems. Other replacements will be required throughout the HVAC, plumbing, and pool mechanical systems. It should also be noted that dehumidification in the building is inadequate and the mechanical system is not current best practice relative to pool filtration, energy efficiency, the use of chlorine gas, and indoor air quality.

Electrical

Electrically the building requires upgrades to meet industry standards. These upgrades reflect the technological improvements and advancements over the years and the age of the building infrastructure. There is currently a risk that various electrical components could fail, necessitating a shut down of the facility until the fix could be completed. The electrical distribution systems require replacement. The lighting has been replaced in the pool cell and fitness area with LED fixtures, including a lighting control system. Minimum standards are met and light levels are functional in these areas. Other areas of the building still utilize fluorescent fixtures, and these require replacement with LED as part of a holistic sustainability initiative. Fire alarm replacement work is also required.

Civil Infrastructure

The report provides a review of the Civil Engineering findings. The engineers conducted an existing service review and indicated that the existing services on Elphinstone and 10th Avenue are adequate for the existing facility but the building services from these mains require replacement due to age. The capacity of the building services would need to be revisited and increased to accommodate new programming. The parking lot is in need of remedial work including paving as well as signage and accessible access routes. A repair of the parking lot would also present an opportunity to improve the storm water retention on the site.

Sustainability

If the Lawson were to be retained, it is unreasonable to incorporate many sustainable features and the facility would not be consistent with the City's long-term sustainable goals. Sustainability goals will be very difficult to meet with the retention of the existing building. Replacement of mechanical and electrical systems with more modern and efficient equipment as end of life is reached will recognize an improvement in energy use. The building envelope, however, presents a significant challenge given the lack of envelope continuity.

1.2 Remaining Useful Life

For a public recreation facility of its age, the LAC has been well maintained by the City of Regina with regular investments made into the facility related to programming and architectural requirements. The LAC has undergone numerous renovations and remedial projects, with some of the projects being extensive in nature including remedial work in the crawl space, structural reinforcement, roof replacement, pool mechanical upgrades, ventilation system upgrades and the addition of a fitness centre on the 2nd level. The LAC is best described as being "of its time" and significant upgrades to extend the useful life and bring the building closer to modern best practice for aquatics facilities would require a significant intervention. The LAC is showing its age despite ongoing maintenance and upgrade efforts. Every main category of building systems included in the body of the report note that investment will be required to prevent further deterioration, and some larger investments made to bring components up to current codes, or to replace end-of-life components.

Based on current operational and maintenance practices and smaller investments, the LAC can continue to function and deliver current programming for at least the next 5 years. Beyond 5 years, significant capital expenditures will be required to allow for the ongoing use of the LAC. For a 10 to 15 year horizon, a strategy could be applied including ongoing remedial work to allow for ongoing usage of the building in an "as-is" state. This approach does not consider any additions, major additions, modifications to pool tanks, upgrades to the building envelope or increasing the capacity of the building. This is effectively managing the aging of the building until such time that it becomes impractical to continue investing any further, and complete demolition of the facility is imminent. It is important to note that even with the significant cost and effort of this approach, this does not represent the cost to provide the community with a facility that meets the goals of energy efficiency, inclusion, accessibility, aquatics facility best-practice, or programming space needs. The cost of extending the life of the LAC for another 10-15 years in this manner is found to be within the range of \$21 million. A summary of costs extracted from each of the report sections is included in this Executive Summary.

A summary of costs required to keep the LAC operational for the next 10-15 years is provided below. This represents an investment in keeping the building operational with incremental upgrades to extend the life of the facility.

Discipline	Capital Expenditure Forecast Summary			TOTAL By Discipline
	Year 1	Year 2-5	Year 6+	
Architecture	\$ 710,500.00	\$ 299,200.00	\$ 7,890,000.00	\$ 8,899,700.00
Building Envelope	\$ 190,000.00	\$ 140,000.00	\$ 742,000.00	\$ 1,072,000.00
Structural		\$ 2,000,000.00	\$ 150,000.00	\$ 2,150,000.00
Mechanical	\$ 180,000.00	\$ 2,512,500.00	\$ 2,660,000.00	\$ 5,352,500.00
Electrical	\$ 321,500.00	\$ 730,000.00	\$ 7,500.00	\$ 1,059,000.00
Controls (allowance)				\$ 500,000.00
Civil			\$ 2,366,000.00	\$ 2,366,000.00
Total Per Year	\$ 1,402,000.00	\$ 5,681,700.00	\$ 13,815,500.00	
Total All Disciplines				\$ 21,399,200.00

1.3 Best Practice in Aquatic Facility Design Comparison

The building does not present to the public a contemporary architectural expression of a community gathering space and hub. It is a "black box" that does not engage the street or act as a beacon to the local community or the city. Coupled with the fieldhouse the buildings are not welcoming nor do they advertise the range of activities that occur within through transparency. These are important considerations but are more philosophical in nature and have therefore not been included in the cost estimates.

1.4 Program Needs Comparison

A visual summary of the existing LAC space is provided below:



Future Program

The basis of the LAC condition assessment is on existing conditions, however, it is important to note that through the feasibility study and development of the facility program, it is important to consider how the LAC can realistically meet these needs. The project team's programming efforts for the IAF provides a baseline for the comparison of the functional requirements and areas versus what currently exists. The future program requirement comparison in the graphics below demonstrate that the existing LAC is significantly deficient when the community needs and program are considered. The space outlined below in the future Concept Program will be refined as the project progresses.



The preliminary future space needs comparison graphic demonstrates that the existing footprint of the LAC provides only a portion of the required program area required to provide services to the community. This emphasizes the inadequacy of the existing LAC, and its inability to meet the current community needs. The difference between the current interior space (4,955 sm) and the preliminary program (14,390 sm minimum) is significant.

1.5 Investment to Align to Aquatic Facility Design Best Practices

Another key aspect of the Building Condition Assessment exercise is to provide commentary on how the LAC compares to contemporary best-practice in aquatic facility design and an outline of what it would take to meet some of the project key parameters described below. It is acknowledged that ongoing investment in the building to continue 'like for like' replacement would provide an inadequate aquatic facility that falls short of community aquatic needs. The order of magnitude to address the shortfalls in aquatic facility best practice, key program and parameters to the extent the existing footprint allows would result in a project estimated to be in the \$30-35 million range. Further supporting information is contained in the Architectural section of the report and this Executive Summary.

A renovation to the LAC would require extensive upgrades to all building components. Renovating may provide some net savings, but also limit the ability to add usable area to meet current best practice within the current facility footprint. The existing structure also presents limitations due to the geometry and limit expansion of the pool deck area. This option would not meet the program requirements, nor would it provide additional bather capacity or additional swim lanes to meet FINA international standards. The resultant facility would be "like new" but would still be space deficient for key aquatic components. It should be noted that this option assumes the existing sub-grade, glulam super-structure, and roof decking is salvageable and reusable. This would be a high risk item. A very high-level timeline for this project would be in the 4-6 month range for demolition and 28-36 month range for new construction. The timeline is dependent on the challenge of working with and around the existing structure and the extent of selective demolition. The LAC would be unusable for approximately 3.5 years or more.

Section 2.0 Introduction

In Summer of 2021, HCMA Architecture + Design in association with RC Strategies and P3A were engaged by the City of Regina to examine the feasibility of a New Indoor Aquatics Facility (IAF) for the City of Regina. This report is an existing facility assessment of the Lawson Aquatics Centre (LAC) with some additional exterior review of the Fieldhouse. The bulk of this report summarizes the remedial work necessary to extend the life of the LAC operational. The Executive Summary table outlines the scope of work needed to renovate the LAC to meet most best practice and code requirements as well as an incremental cost to provide some additional program areas.

The LAC was constructed in 1975 with the Fieldhouse and shared link area constructed in 1987. The facility is owned and operated by the City of Regina and is the only fieldhouse and competition aquatics facility in the city. The LAC consists of a 65 meter pool divided by 2 moveable bulkheads into a 10-land lap pool and deep/diving tank. The main floor also includes a teaching pool, hot tub/pool, bleacher seating on the pool deck, associated change rooms and ancillary spaces. The second floor mezzanine space has been renovated into a fitness centre. Diving and judge/timer spaces are located on the east end of the building.

The Fieldhouse addition provided a new shared public entry into the facility, and has its own change facilities, fitness area, track, and infield space. Shared common areas include a multi-purpose room, concessionaire, reception booth, public washrooms, and concourse. Fieldhouse amenities also include 4 tennis courts, 5 badminton courts, basketball court, handball courts, and track and field jump pits (sand).

The building can be entered from the west via a turn-out from Elphinstone Street and from the east from 10th Avenue through the existing parking lot. The site has extensive parking and is adjacent to the old Taylor Field practice field. This turf field is no longer utilized by the Saskatchewan Roughrider Football Club and is programmed by the City of Regina. North Railway Street, an unpaved road, bounds the south side of the site. The CP mainline runs immediately south of North Railway Street and is in regular use.

The facility has had numerous upgrades and remedial projects conducted over the years. Crawlspace remediation, mechanical renovations, the creation of a fitness centre on the mezzanine, the addition of family change and accessible washrooms, updated hot tub, and several more interventions have kept the LAC viable to the present day.

2.1 Description of Methodology

Each project specialist conducted a visual review of the facility in the fall of 2021, prior to the onset of cold weather. Existing materials were reviewed, and in some cases, where available drawing were consulted. The recent experience of team members involved with renovations of the Fieldhouse and Lawson family change rooms was applied. Interviews with the City Project Manager familiar with the facility and support staff assisted in assessing the age and performance of some building systems.

Each discipline provided an executive summary and a report of the specific building systems, utilizing a similar report spreadsheet. The spreadsheet identifies the issues viewed on site, described what was observed, it's severity and recommendations as well as an order of magnitude cost where reasonable. A few of the disciplines provided a shorter form report where appropriate, and not all sections warranted remedial cost estimates.

The accessibility assessment was based on information from a previous report and provides an overview of key elements. The comparison of the building to current best practice is based on applicable codes and standards and the experience of the consultant team.

2.2 Format of the Report

As noted in the Table of Contents the report is divided into sections by discipline. Each of the specialist consultants have provided a section specific to their area of expertise. Most of the sections include an executive summary, the body of the report, and photographs. Where possible order of magnitude costing has been provided to assess the potential liability for remedial work or replacement and an approximate time frame for the work. A summary of the report findings has been provided in the Executive Summary.

2.3 Terminology Used in the Report

The terminology used in the report is typical nomenclature to each of the disciplines. Where the assessments utilized a rating system of Poor, Fair, Good, Excellent, the following applies:

- NA = not applicable
This component's condition was not assessed.
- P = Poor
– This component has failed or is expected to fail in the near future. It does not provide functional performance.
- F = Fair
– The component shows wear and deterioration and will need to be monitored for failure through regular maintenance
- G = Good
– The component is in functioning order for its intended use. There may be some minor evidence of wear, but it is not impacting the function.
- E = Excellent
– The component is in functioning order and is in like-new condition.

2.4 Reference Documents

- The following documentation was utilized in the preparation of this report as reference material.
- Floor plans of the original construction
- Family / accessible change room renovation (tender documents) prepared by P3A, MacPherson Engineering, and Alfa Engineering.
- Lawson Roof Replacement Drawings – Stantec, October 2010
- Fitness Room Renovation Drawings – Kreate Architecture, April 2017
- Crawlspace Remediation Drawings – P3A, July 2018
- Miscellaneous information and photographs provided by the City of Regina Project Manager
- Questionnaire (for Morrison Herschfield) responses prepared by City of Regina Project Manager
- Accessibility Audit Report
- VFA Condition Assessment

2.5 Report Limitations

This report is based on a visual assessment of the as-found current conditions. Professional judgement was exercised in the gathering and analyzing the information and in the preparation of recommendations. The Consultant Team can not be responsible for actions or inactions based on the content of this report. No warranties expressed or implied should be construed from this report.

The visual review and information gathered through the assembly of this report represent a random sampling and is therefore limited in identifying hidden or latent defects.

This report does not represent a comprehensive preventative maintenance plan and is intended to provide the Client with an overview of the building condition. There may be issues not encountered or not described within this report due to the limited nature of the investigation and the information provided by the Client.

Cost estimates are "order of magnitude" only and are based on professional experience and represent only an indication of possible cost. More precise cost estimates would require significantly more detailed investigation and analysis. All costing should be considered within approximately +/-20% and would not include GST, PST, escalation, fees, permits, or contingencies.



Section 3.0 Architectural Report

3.1 Executive Summary

The architectural review focused on the visible interior of the building and did not include an assessment of the Fieldhouse. No deconstructive assessment was undertaken. The visual review examined the status of interior architectural components and assembled the observed issues into the report spreadsheet in Section 3.4. It is here that the approximate cost for remediation and the suggested timeframe or horizon for the work to be conducted is outlined in detail.

The architectural finishes throughout the building, excluding the mezzanine fitness centre, are dated and are at or are approaching the end of life. This ranges from flooring replacement to a complete upgrade and renovation of the change facilities to meet best practices and to enhance accessibility. This upgrade could also address leakage and condensation challenges in the shower areas at the exterior walls. The finishes in the locker rooms/change/shower areas are showing signs of wear and will be in need of replacement or a wholesale renovation in the 2-5 year time frame. The administrative areas are all past the end of life and need replacement. The efforts of the city maintenance and facilities group have maintained the building in good condition; however, given its age and use it is apparent that the effort to do so will increase over time.

The pool deck presents challenges relative to accessibility. The city has done a good job of maintaining the pool deck tile; however, the tiles are no longer manufactured necessitating the salvage of tile whenever work is conducted on the deck. At some point in the 5 to 10-year horizon a retiling project will need to be undertaken throughout. The existing cedar roof decking and cladding shows signs of extended exposure to moisture and bleaching due to chemical exposure.

Given the age of the facility the material has been very durable and is not presently a functional concern. A complete re-finishing of all wood structure and elements in the pool cell is required to ensure its usable life can be extended.

The overall accessibility of the facility was reviewed and utilized the accessibility audit previously completed by P3A and Universal Access Design (UAD). This report utilized the Rick Hansen Foundation Accessibility Certification (RHFAC) system. The report is summarized in this document and identifies the most pressing barriers to accessibility. The building does not meet the prerequisites of the RHFAC to achieve certification primarily due to the lack of an elevator to access all public areas of the building. Not only are RHFAC criteria not met, but the most basic of accessibility features are not met. There are also significant issues related to the pool deck and tanks. The main tank is not fully accessible in a manner that maintains the dignity of the user, and the teaching pool and the hot tub are only via a lift system. There is also no way to access the timer's/judge's booth or diving platforms for patrons with mobility challenges. Overall, despite renovations and remedial work, the LAC does not meet basic contemporary standards for inclusivity and accessibility.

HCMA/P3A also reviewed the existing facility through a contemporary aquatic "best-practice" lens. The pool gutter system, which is effective at keeping the pool deck relatively dry, is a barrier to entering and exiting the pool. This type of gutter design is not best practice and creates challenges for entry for all users. The dryland training location on the deck is not ideal from a temperature and ventilation perspective. The change facilities are well outside inclusive and best practice standards even with the recent alterations.

The order of magnitude interior architecture remediation costs are as follows: for immediate attention (Year 1) approximately \$710,000; year 2 to 5 approximately \$299,200; and the longer horizon approximately \$2.89m. If there is a desire to open the building to allow for natural light, or replace pool tanks, or undertake an extensive modernization the architectural cost would be higher than noted in this section.

Refer to the executive summary for full alteration costs.

3.2 Accessibility

The vision of the City of Regina has made universal accessibility a priority for its facilities. In 2021 it engaged a consultant team of UAD/P3A to conduct audits of many city owned and operated facilities using the Rick Hansen Foundation Accessibility Certification system as the quantitative measure. The Lawson Aquatic Centre (LAC) was one of those facilities. The report is an extensive document and is available for reference. This section will summarize the findings of that report. Note that there is considerable overlap with the previous section.

The Rick Hansen Foundation Accessibility Certification (RHFAC) has become a benchmark building assessment and rating system. This system seeks to improve the built environment by assessing the level of meaningful access to buildings and sites. The system has a minimum score requirement of 60% plus a building must meet minimum mandatory requirements. To achieve Gold Certification a facility must meet or exceed 80% and meet the more extensive mandatory certification requirements. The building achieved a score of 68% on the Rick Hansen Foundation Accessibility Certification

(RHFAC) preliminary scorecard. The LAC does not meet the mandatory requirement of access to all key functional spaces and would therefore not be a certified facility. The second floor (mezzanine) is not accessible by any means other than stair

General Commentary

The Lawson Aquatic Centre represents the building standards of "its time". Accessibility was not a priority for recreational facilities at the time the building was designed and constructed. Subsequent renovations have greatly improved access, however key functional components of the building do not meet the requirements and it would not be possible to do so without significant investment.

Access to all functional areas would require the addition of at least one elevator, new audible and visual fire alarms added in all public and private areas, new way-finding strategies and the inclusion of safety warning features would need to be added. These components would satisfy the mandatory requirements of a Gold Certified RHFAC building. The primary function of the facility, that is as an aquatics centre presents a significant barrier to accessibility. As noted previously, the pool tanks are a challenge to navigate for people with physical challenges. The pool deck itself provides an accessible path of travel to the tanks from the change rooms, however, the tanks themselves are not easily accessed. The report states:

"The main pool does not have a sloped/ramped entrance; the hot tub has several steps on both the exterior and interior. The teaching pool, while it does have a wheelchair lift seat, has a very large step to get into the pool without it. The colour contrasted perimeter of the pool is at two different levels, which may be confusing for people with limited vision."

The report does not mention that the diving platforms are also not accessible,

nor is the AV/judges booth. The barriers to accessibility presented by the design of the pool area are not easily rectified in a manner that assures dignity, independence, and safety for all clients. This is not limited to wheelchair users, but a much broader demographic that includes sensory and intellectual disabilities as well as the physical challenges relative to age, including toddlers to seniors.

The accessibility report provides assessment of vehicular access, exterior approach and entrance, interior circulation, internal services, sanitary facilities, way-finding, emergency systems and additional spaces. The following is a summary of "short term" issues. These are components that do not meet current codes and must be seen to immediately. Medium and long term items are not identified in this summary and can be found in the accessibility report. These represent the need for a master plan for remediation to achieve a best-practice solution above what is required by current codes. The basis of the RHFAC is to exceed the minimum requirements of code and achieve universally accessible buildings through best practice, national and international standards.

Accessible Report Summary (Short Term/ Non-Compliant Items)

- 1. Vehicular Access**
 - Accessible signage for parking is not visible from a distance and pedestrian pathways in the parking lot are not designated.
 - Facility signage will require a new signage plan and replacement on both the exterior and interior.
- 2. Exterior Approach and Entrance**
 - Directional and entry signage does not exist
 - Facility signage will require a new signage plan and replacement on both the exterior and interior.

3. Interior Circulation

- The fitness area on the second floor, diving platforms, judge's/timer's booth, and some facilities in the pool area require the use of stairs or steps.
- Door hardware requires upgrade to remove knobs, and many doors are only 740-800mm wide. In many cases the door frames can not be made larger without major reconfiguration or the space. Best practice accessible width is 900mm minimum.
- Visual cues are needed at expanses of glazing.
- There is no level access to the pool tanks.
- Handrails are of inconsistent design in stairwells and should be replaced.
- Tactile cues throughout the space are needed, in particular at stairs.
- Stairs do not have contrasting nosings or slip resistant treatments.

This is an extensive item, and would necessitate rework and renovation throughout the building. Most requirements would be satisfied under a major renovation project or with replacement of doors, signage, etc.

4. Internal Services

- Signage and wayfinding is inadequate. Circulation is confusing and cluttered.
- The only accessible washroom is part of the universal/family change room and shower, which could result in lengthy waits (a second accessible washroom has since been added).
- Lobby seating is inadequate (possibly a COVID-19 issue).
- The reception cubical does not meet accessible best practice.
- Kitchen areas do not have accessible counter space, sinks or appliances.
- Lighting at the stairs to the judges/timers booth is dim.

Most of these areas are approaching their end of life and are in need of major upgrades and renovations. The new family

accessible washrooms are suitable as remedial work. These items would all require more significant renovations involving a remodel of the non-pool deck areas throughout.

5. Sanitary

- Overall, existing washrooms are inadequate from an accessible best practice view. The renovated rooms are better, but are constrained by the physical limitations of the rooms. Many of the doors need replacing, there is a need for power operators, stall sizes, accessory hardware is outdated, and overall the existing washrooms should be completely renovated.
- The signage for the lobby washrooms indicate that they are wheelchair accessible however they are not. Overall the signage should be updated and include braille. Change room signage does not include the wheelchair logo.
- The family change room is also the universal washroom. This is not ideal as it could be in use for extended periods and not available as a washroom.
- Shower accessibility will require the inclusion of additional grab bars.

As previously noted, the support areas would need extensive renovations to meet the accessible and inclusive parameters that are a priority for the City and are representative of best practice. This would necessitate a complete removal and replacement of the administration and change facilities.

6. Wayfinding, Signage and Information

- Signage is clear and abundant, however, they tend to be text heavy reducing usefulness.
- Directional signage should be revised and updated. Mounting heights are not appropriate.
- More tactile features and braille is needed, sign locations revised. Signage is noted as inadequate

throughout the building. A complete signage plan should be developed and replacement planned.

7. Emergency Systems

- There is no area of refuge or evacuation chair from the level 2 fitness area.
- There are no visual fire alarms.

This may be resolved with the addition of an elevator with a fire rated area of refuge.

8. Additional Spaces

- The service counter area is cramped and manoeuvring would be an issue for someone in a wheelchair.
- The pool area has been previously identified as an area that is problematic. The pool safety equipment is limited to PFD's that hang high on the wall and are not accessible. Accessible equipment should be provided.

Accessibility Review Summary

The Lawson Aquatic Facility has been adapted over time to suit the evolving needs of the City of Regina and its stakeholders. The desire to create a "seamlessly integrated facility providing all users with appropriate access, safety and dignity as part of the core operating principles" has been partially met, however, if this was to be fully accomplished a significant renovation of the facility would have to occur. These renovations would entail invasive work. The cost of providing an elevator to access the second level mezzanine and diving platform would be in the \$250,000.00 range. Replacement of the pool tanks and deck would be challenging. In the short term there are improvements that can be made to enhance accessibility that involve more modest changes. Signage, grab bars, power operators, and other changes can be made with relatively low investment costs, but they do not address some of the larger obstacles to accessibility.



Figure 3.2.1 Lawson Aquatics Pool

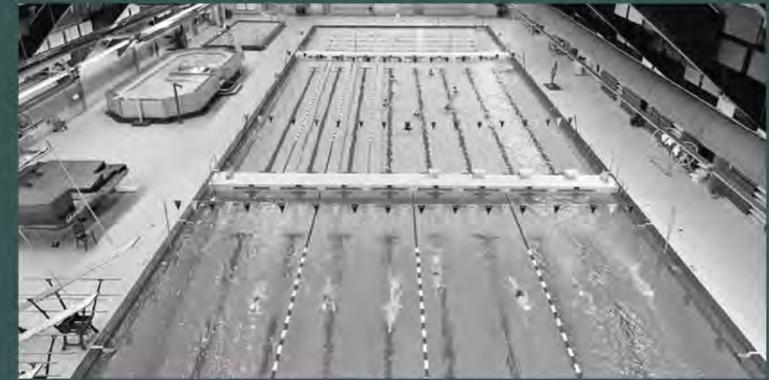


Figure 3.2.2 Lawson Aquatics Overall View



Figure 3.2.3 Lawson Aquatics Diving Platform

3.3 Aquatics Best Practice Assessment of the Lawson

Introduction

This report section will compare major components of the existing Lawson Aquatic Centre (LAC) to current best-practice. The LAC has had numerous upgrades over the decades since its original construction, particularly related to the addition of a fitness centre to the mezzanine, rehabilitation of the crawl space, re-roofing, replacement of the hot pool, score board upgrades, and renovations to change facilities including the addition of a family change space. This report section will review the Pool Design and Aquatic Support spaces.

Pool Design Standards

The design of an aquatic facility compromises a mix of individual aquatic components that vary based on the needs of the community. The LAC was constructed primarily as a competition facility. Contemporary best practice of a competition tank will be required to meet the standards of the Federation Internationale de Natation Amateur (FINA) and the needs of Swimming Canada, Provincial Swimming Organizations. The areas affected by these requirements include:

- Dimensions and tolerances for the pool tank and pool surrounds
- Sectional profile and water depths
- Provision of ancillary water areas such as a learner pool that can double as a warm down pool
- Poolside equipment including timing and score board
- Diving facilities
- Spectator Seating
- Support accommodation
- Standards of illumination and water treatment

Observed Issues with the Lawson Aquatic Facility Pool Design

- Competition pools range from 25m to 50m in length and typically

accommodate 6 to 10 lanes. Depth ranges depending on the diving requirements. The LAC combines the competition tank with the diving tank and includes a moveable bulkhead. This is an adequate solution. The LAC has 8 lanes, the recommended number of lanes is 10. The length of the LAC is not an issue, however, the combination of the tanks limits flexibility. Two primary tanks (or three when considering a recreational pool tank) increases programming opportunities and would be recommended to maximize flexibility and would present opportunities to maximize flexibility.

- The bulkhead design is not automated and requires physical labour to move it. This is dangerous and can result in injury. Current best practice is a powered floating bulkhead system. The risk of damage to the tank with the current system is higher than with a modern flow-through system.
- The gutter system is not uncommon in older pools, however, it is not current best practice. The gutter system makes the main tank very difficult to enter regardless of physical ability and exiting requires the use of a ladder. All tanks lack accessible entry.
- The dive platforms do not meet all applicable standards.
- Spectator seating on deck is suitable for 375 when the bleachers are extended. This presents several challenges and areas where best-practice is not met:
 - » When the bleachers are extended the minimum deck space is not met.
 - » The bleacher capacity is suitable for athlete seating but not both athlete and spectator during competitions.
 - » The lack of separation for athletes and parents is not best practice. Best practice design will separate

the parents and spectators from the athlete and coaches' areas.

- » The view to the pool is limited from the on-deck seating.
- The pool deck does not meet minimum standards for accessibility, as noted in the Accessibility Review included with this report.
- The teaching pool is in practice a small child pool, but is not generally useful in it's current configuration. Best-practice would provide a zero entry and would integrate it into a leisure or recreational pool.
- The tanks are not accessible via ramps or zero depth entries, this applies to all tanks.
- The dive tower, timers/judges booth are not accessible.
- There is minimal visual connection to the lobby and to the exterior, natural light into the pool area is practically non-existent.
- The LAC locates the dry-land training on the pool deck. This is not a good scenario as the pool deck temperature is very warm and the training space is not discrete. Best practice would locate it close to the deck but in an area where activity can be focused and within a more temperature controlled and ventilated space.
- The facility lacks a recreational pool component. This is a program issue, and best practice would not mandate the inclusion of a recreational pool in the design. Community need should be considered and an effort to maximize the use of an aquatics facility. The LAC was not designed with recreational swimming in the modern sense and is therefore limited in terms of flexibility and access for a broad cross section of users.

Observed Issues with Pool Support Spaces

- The entry sequence, lobby design, reception area are all contrary to contemporary best-practice.

» The Fieldhouse/ LAC connection is inefficient and is not welcoming to the public. Staff are behind barriers that are not friendly or accessible.

- » There is no or very little view to the pool deck from the lobby.
- » There is a lack of natural light in any area of the facility. Best-practice is to control natural light to the pool deck, however the overall lack of windows creates a disconnected feeling contrary to modern facilities.
- » The change rooms are antiquated and do not meet best practice for inclusion or for accessibility. The addition of the family change/ accessible washroom has improved the condition, but it is still well below best-practice. Visibility to the change area from the pool deck is very poor and does not provide a sense of safety nor does it align with Crime Prevention through Environment Design (CPTED) principles.

- Best-practice for aquatic facilities will provide universal facilities for 2/3 of capacity with the remaining 1/3 men's and women's. This is a different ratio than used by the RHFAC but indicates the underlying deficiency.
- The architecture provides no cues for way-finding and relies heavily on signage.
- There are no options for natural ventilation in the spaces.
- Hot rooms such as sauna or steam rooms are not accessible directly from the pool deck.
- There is no connection to the exterior and outdoor spaces from the public and support areas. The connection from the pool deck is small and does not provide visual security from any location.

- » The exterior space is underutilized and is located on the north-side of

the building where it is subject to north-west winds and shading in shoulder seasons when the use could be extended. Anecdotal evidence would indicate that the space is not much used.

- » The outdoor space also has poor grading and the hard surface is not suitable for outdoor use. Deck storage is inadequate throughout and in many cases is shared with other ancillary functions. Storage in general is inadequate, resulting in a cluttered pool deck.

- Administrative spaces have no access to natural light and very few if any have views to the pool deck or to public spaces. The administrative areas are in several disparate locations in the building.
- The staff and lifeguard rooms do not meet best practice in general.
- Lack of space for back-of-house items to allow for the proper upgrade of equipment.
- Pool mechanical and electrical systems have been upgraded incrementally and are reflect the principles of best practice for these systems. The spaces in which the systems occupy do not. Mechanical and electrical space has been carved out of existing service rooms and adjacent program areas. In many instances pool deck storage and mechanical equipment occupy the same spaces blending the "back-of-house" and semi-public spaces. This is not best practice but is reflective of the creative ways of managing the limitations of the existing facility.
 - » Water recycling and conservation and energy use would be well below current best practice and national energy code requirements.

Major Intervention Strategy

If the LAC was to have its life renewed a major renovation conducted within the existing footprint, would be required. This renovation would result in extensive upgrades to not only all building components, but also planning is required to bring the facility in line with best practice in aquatics and accessibility. This intervention would still result in a main pool tank with 8 lanes and would still be limited in which aquatic programs could be delivered in that space. An outline of what this major intervention would entail is described below:

1. Complete renovation of the administration, change area, support areas of the facility (including replacing the main floor assembly, which is at the end of its useful life and showing signs of deterioration)
2. A replacement of the teaching pool and hot tub with fully accessible replacements, integrated into the pool deck that aligns with aquatic best practices.
3. Replacement of the main tank, including replacement of the gutter system with complete demolition of the main tank, pool deck, main floor structure and associated piping.
4. Demolition and rework of the dive tower system to meet all regulatory requirements and current best practices
5. Replacement of the bulkheads to a motorized system.
6. Construction of an elevator to access the upper levels of the building.
7. Construction of an elevator to access the judges/times booth and possibly the dive tower.
8. Replacement of all mechanical systems to renew the useful life, align with best practice and meet current energy and sustainability codes and goals. (Note that some new energy codes are anticipated to be implemented prior to the IAF construction resulting in more stringent and challenging energy code requirements).
9. Replacement of pool mechanical to suit contemporary code and best-practice.
10. Replacement of end-of-life equipment throughout the facility.
11. Replacement of electrical systems to suit current code and best practice.
12. Building envelope upgrades to increase performance and to meet current energy and sustainability codes and targets.
13. Miscellaneous upgrades to other building systems such as acoustics, AV/IT. As previously noted, these interventions would not add program area to the building necessary to meet best practice and when complete, would still present limitations in the long-term. For example:
 - » The mechanical and electrical spaces would remain undersized and would be limiting in accommodating new systems. Increasing the area of these spaces to provide an appropriate amount of area for the equipment would reduce available program area on the pool deck
 - » Support areas on the pool deck, such as storage, staff areas, dryland training space, etc and within the facility are inadequate and would remain inadequate.
 - » The number of lanes in the main tank is limited to 8, which would not meet current best practice and would likely only ever be feasible as a secondary practice pool tank. There would remain no separation between the athlete viewing area and the spectator area, the pool deck has inadequate space to accommodate both, and this would not change. This extensive intervention would essentially be a complete replacement of the LAC, with the exception of the existing structure. Retaining the structure would provide a net savings, but also limit the ability to add usable area to meet current best practice within the current facility footprint. The existing structure also presents limitations due to the geometry and limit expansion of the pool deck area. In the scenario where the LAC is considered for extending the life, the following invasive construction sequence would generally apply. This would result in a significant intervention, and a lengthy interruption to the LAC:
 - » Remove a portion of the east wall of the LAC to facilitate demolition of the pool deck and interior systems.
 - » Demolish pool deck, tanks, dive tower either selectively or completely.
 - » Remove existing exterior wall finish and expose wall system to the sheathing in all locations and remove north wall of the facility in its entirety.

- » Remove all mechanical and electrical systems.
- » Demolish interior spaces including administration and change areas.
- » Construct new pool deck, teaching pool, hot tub.
- » Construct new main tank.
- » Replace the main floor slab below the administration and change area due to failing and corroded structural components.
- » Construct new addition to accommodate mechanical and electrical support spaces, program areas. These may allow for some obstructed view spectator areas depending on the location.
 - If no additional program area is added to the facility and it is a replacement with a "like" facility that meets accessibility and energy code requirements but does not address best-practice issues with viewing and support this would not be needed.
- » Construct new elevator(s) to provide access to all areas of the building. This may require one or two depending on the extent of any addition.
- » Remove the existing building envelop and construct new to contemporary energy efficiency standards (R-40+ minimum roof, R-30+ walls minimum).
- » Construct new dive tower.
- » Construct new interior to contemporary design standards and codes including entrances, administration, and change facilities.
- » Renovate the parking lot and drop off including signage throughout the facility to meet accessibility best practice.

This option would not meet the program requirements, nor would it provide additional bather capacity or additional swim lanes to meet FINA international standards. The resultant facility would be like new but would still be space deficient for key aquatic components. It should be noted that this option assumes the existing sub-grade, glulam super-structure, and roof decking is salvageable and reusable. This would be a high risk item. A very high-level timeline for this project would be in the 4-6 month range for demolition and 32-36 month range for new construction. The timeline is dependent on the challenge of working with and around the existing structure and the extent of selective demolition. The LAC would be unusable for approximately 3.5 to 4 years or more.

Aquatic Best Practice Summary

The LAC has been upgraded through a variety of projects over its almost 50 years in operation. The design of the facility is that of a “black box” in that it has no connection or visibility to the community it serves. Contemporary facilities act as billboards activating the street and performing as welcoming civic facilities. The LAC and the Fieldhouse both lack this connectivity from the exterior as well as from interior public spaces to the activities going on within. Active, engaged community hubs require this connectivity. This approach can be seen in the two examples provided on the next page.

Generally, universal accessibility, inclusion, energy efficiency, and program flexibility are all compromised with the Lawson Aquatic Centre and to bring it to modern best practice standards would require a renovation that would leave little more than the structure of the roof intact. This is described in the Executive Summary of this report. The replacement of the pool deck and tanks, diving towers, complete rework of change rooms and ancillary areas would be required to bring the facility up to modern standards and extend the life of the facility for another 25 years.



Figure 3.3.1 Calgary YCMA Aquatic Center



Figure 3.3.2 Killarney Community Pool- HCMA

3.4 Report

Reference Number	Component	Description of System	Condition P,F,G,E*	Age in 2021		Recommendation	Capital Expenditure Forecast		
				Estimated (E)	Actual (A)		Year 1	Years 2 - 5	Years 6+
Architecture V3									
A1	Entry	The rubber flooring is starting to bubble and delaminate in areas and is past its life expectancy. Rubber wall base appears to be near the end of its life expectancy.	F	Original		Rubber flooring and wall base will need to be replaced in about 5 years. The interior walls will need to be refinished and painted in about 2 years. Acoustic wall treatments should be considered in all public spaces to increase the acoustics of the concrete block walls.		\$ 50,000.00	
A2	Public Restrooms	Flooring has various locations of staining and discoloration which has become a maintenance issue. Acoustic ceiling tile has reached the end of its life expectancy.	F	A - 5 years (2016)		Flooring will need to be replaced in about 5-10 years. The concrete block walls will need to be painted in about 2 years. Acoustic ceiling tile should be replaced and any water damaged should be further reviewed. Toilet partitions will need to be replaced in about 5-10 years. The washrooms are not fully accessible. To do so would require door operators and possibly more extensive renovations.		\$ 12,000.00	\$ 15,000.00
A3	Reception Desk	Demountable walls were added to enclose the reception desk. The carpet tile is past its life expectancy. The acoustic ceiling tile is damaged, stained and has reached the end of its life expectancy. There is unprotected wiring and cables penetrating the ceiling tiles. Recessed light covers are missing covers in various locations. The desk is not welcoming or accessible.	P - F	E - 36 Years (1985)		Carpet tile should be replaced. Acoustic ceiling tile should be replaced and any water damaged should be further reviewed. All exposed wiring and cabling is to be re-routed and concealed. The desk is not welcoming and should be reconsidered for accessibility and inclusivity.	\$ 30,000.00		
A4	Offices	Carpet tile has been damaged and has started to delaminate. Acoustic ceiling tiles are stained and damaged. Unprotected wiring and cables penetrate ceiling tiles at various locations. Recessed light covers are missing covers in various locations. Offices are not accessible on the mezzanine, hardware is not accessible.	P - F			Carpet tile should be replaced. Acoustic ceiling tile should be replaced and any water damaged should be further reviewed. All exposed wiring and cabling is to be re-routed and concealed. Access to offices is not accessible. Offices should be redesigned and renovated to suit accessibility standards	\$ 11,000.00		\$ 120,000.00
A5	Change Rooms	There appears to be water infiltration behind resilient flooring in the shower and washrooms. Further investigation is required to determine the source of the water. Resilient flooring also has various locations of staining and discoloration which has become a maintenance issue. Grout for the wall tile is stained and has started to erode. Acoustic ceiling tile has some damage and staining. The finish on the ceiling diffusers has begun to rust and erode. Locker rooms are not best practice for inclusivity.	F	A - 5 years (2016)		Resilient flooring will need to be replaced in about 2-5 years. The walls need to be refinished and painted in about 2 years. Acoustic ceiling tile will need to be replaced in about 2-5 years. Lockers and toilet partitions need to be replaced in about 5-10 years. Wall tile will need to be regouted in about 2-5 years. Ceiling diffusers are to be refinished or replaced, however, the entire building and strategy to meet inclusivity would require extensive renovations. .	\$ 250,000.00	\$ 50,000.00	\$ 500,000.00
A6	Sauna	Cedar wood plank is re-clad annually due to the high moisture levels.	P	E - 1 year (2020)		Cedar wood planks to be re-clad, refinished, or replaced. More investigation and design work is required.	\$5,000.00	\$20,000.00	TBD
A7	Main Pool Deck	Floor tile and grout	F	E - 47 Years (1974)		Floor tile will need to be replaced in about 5 years. The product is no longer available and will require a complete replacement. Allowance for ongoing maintenance from year 1-5 with replacement after. This does not include a new pool deck.	\$ 6,000.00	\$ 30,000.00	\$ 600,000.00
A8	Hot Tub	Hot tub has been replaced with stainless steel liner. Floor tile surrounding hot tub was replaced with blue tile. There is an indication of leakage. Leakage under the stair has been ongoing.	G	A - 5 years (2016)		Floor tile surrounding hot tub will need to be regouted in about 2 years. A complete removal and renovation of the hot tub in conjunction with the deck replacement will make the building fully accessible. Remedial work to repair leakage is required in year 1.	\$ 5,000.00	\$ 7,500.00	

Reference Number	Component	Description of System	Condition P,F,G,E*	Age in 2021 Estimated (E) Actual (A)	Recommendation	Capital Expenditure Forecast		
						Year 1	Years 2 - 5	Years 6+
Architecture V3								
A9	Teach Pool	Training pool appears to be good condition.	G	A - 5 years (2016)	Floor tile surrounding training pool will need to be regouted in about 2 years. Concrete pool ledge will need to be repainted in about 2 years.		\$ 10,000.00	
A10	Aquatic Classroom	Floor tile and grout is in good condition. Acoustic ceiling tile is damaged in various locations.	F	E - 47 Years (1974)	Floor tile is to be replaced in about 5-10 years. Acoustic ceiling tiles are to be replaced in about 2-5 years.		\$ 9,500.00	
A11	Maintenance Room	Concrete floor and finish is in poor condition and needs to be replaced to eliminate water penetration and spalling.	F	E - 47 Years (1974)	Floor finish is to be replaced to protect concrete from further erosion. There are various wall penetrations that need to be repaired.	\$ 6,000.00	\$ 1,500.00	
A12	Electrical Room	Concrete floor and finish is in poor condition and needs to be replaced to eliminate water penetration and spalling.	F	E - 47 Years (1974)	Floor finish is to be replaced to protect concrete from further erosion. There are various wall penetrations that need to be repaired.		\$ 5,000.00	
A13	Filter Room	Concrete filter tank finish has eroded causing water infiltration and spalling. Concrete floor and finish is in poor condition and needs to be replaced to eliminate water penetration and spalling. Steel grates are rusting and require refinishing.	F	E - 47 Years (1974)	Concrete filter tank needs to be refinished to eliminate further damage and spalling. Floor finish is to be replaced to protect concrete from further erosion. Steel grates are to be refinished to eliminate further erosion. There are various wall penetrations that need to be repaired. Rigid gate is to be provided at filter tank opening.		\$ 25,000.00	
A14	Boiler Room	Concrete floor and finish is in poor condition and needs to be replaced to eliminate water penetration and spalling.	F	E - 47 Years (1974)	Floor finish is to be replaced to protect concrete from further erosion. There are various wall penetrations that need to be repaired.		\$ 3,000.00	
A15	Pool Storage	Acoustic ceiling tile is damaged in various locations. Demisable wall is beyond the life expectancy.	F	E - 47 Years (1974)	Acoustic ceiling tile is to be replaced in about 2-5 years. Demisable wall is to be replaced in about 2-5 years.		\$ 2,000.00	
A16	General Storage	Stainless steel door has started to rust and needs to be refinished. Stainless steel louver is in good condition.	F	A - 5 years (2016)	Stainless steel door is to be refinished to eliminate further erosion.		\$ 1,200.00	
A17	Diving Tower	Resilient flooring has various locations of staining and discolouration which has become a maintenance issue. Diving platform retains dirt and debris which has become a maintenance issue.	F	A - 5 years (2016)	Resilient flooring is to be replaced in about 2-5 years. Diving platform is to be replaced in 6+ years.		\$ 5,000.00	\$ 55,000.00
A18	Gym	Resilient and gym flooring is in excellent condition. Acoustic ceiling tile is in excellent condition.	E	A - 5 years (2016)	This is new and will not require rework other than minor fixes unless a complete renovation is required.		\$ 2,500.00	
A19	Second Floor Offices	Carpet has been damaged and stained. Acoustic ceiling tiles are beyond their life expectancy. Wood ceiling has stains suggesting water infiltration. Recessed light covers are missing covers in various locations.	P - F		Carpet is to be replaced in about 2 years. The concrete block walls will need to be painted in about 2 years. Acoustic ceiling tile should be replaced and any water damaged should be further reviewed. Wood ceiling is to be refinished in about 2 years. Replace doors and hardware.	\$ 7,500.00	\$ 50,000.00	
A20	Penthouse Room	Currently there is no hatch or roof access. Exhaust louver creates substantial frost build up during the winter months which becomes a maintenance issue. Building ventilation needs to be further reviewed as poplar dust penetrates building envelope in the summer months.	P	E - 47 Years (1974)	The exhaust louvers need be to be removed or properly sealed to eliminate the frost build up. See Mechanical and Building Envelop sections. Allowance for interior repairs.	\$ 50,000.00		
A21	Crawlspace	Remedial work was completed in the crawlspace in 1989 including a vapour barrier, sump pumps, revised drainage and cribbing structure.	G	E - 32 Years (1989)	Water was noted in crawlspace and needs to further reviewed. Allowance provided for remedial work.	\$ 20,000.00		

Reference Number	Component	Description of System	Condition P,F,G,E*	Age in 2021 Estimated (E) Actual (A)	Recommendation	Capital Expenditure Forecast		
						Year 1	Years 2 - 5	Years 6+
Architecture V3								
A22a	Main Pool Tank	The existing tanks do not meet best practice. A complete redesign involving removal and replacement is required. This would entail removal of the tanks to the top of the piles. This would create new, accessible tanks, but would not add additional lanes to the main tank. No additional program areas would be included. The cost for 22a-22c are included in this line item. The existing tanks are not accessible, gutter system not best practice, bulkhead is not powered. Dive tower does not meet all standards.	P	E-varies	This element would require major intervention and design effort. The systems should be demolished and replaced if best practice and accessibility is a priority. Refer to Executive Summary of this report. 22a to 22c are "all-in" interventions requiring removal of the pool deck structure.			
A22b	Hot Tub	The hot tub was recently redone, but remains above the main pool deck. This makes it with only a lift	G		Long term this element should be replaced with a fully accessible hot tub.			
A22c	Teach Pool	This tank is not accessible and inclusive.	F		Long term this element should be replaced with a fully accessible tank.			
A23	FF&E	Clock and Clock electronics renewal	F		It is expected tthat renewal of the touch pads will be needed in the next 2-10 years. Allowance provided.		\$ 15,000.00	
A24	Signage	Interior and exterior signage	P	Varies	The interior and exterior signage is out of date and does not meet inclusivity requirements. Replace with new signage package.	\$ 70,000.00		
A25	Doors/Hardware	Doors and hardware do not meet accessibility requirments	F	Varies	Replace hardware and interior doors where necessary.			\$ 200,000.00
A26	Acoustic Panels and Systems - Main Deck Area	Acoustic Hanging panels in main deck area, acoustic material behind cedar interior cladding	F	Original to building	The acoustic material is suseptible to high humidity and will likely require replacement or augmentation within the next 10 years. The acoustic material behind the cedar interior cladding has deteriorated and will need replacement.			\$ 700,000.00
A27	Roof Decking	Cedar Decking		Original	The decking shows signs of previous water staining from condensation and/or roof leaks. It has bleached in several areas. A restoration of this is required to extend the usable life. This is a very difficult exercise requireing scaffolding and an extended closure. It is combined with the Acoustic Treatment above and would be part of the same remedial work.			\$ 700,000.00
A28	Elevators	No elevators for access to dive tower platform or mezzanine exist.	P	n/a	Add elevators to the building, two two stop hydraulic or similar recommended	\$ 250,000.00		
SUB-TOTAL BY YEAR						\$ 710,500.00	\$ 299,200.00	\$ 2,890,000.00
TOTAL						\$ 3,899,700.00		

3.5 Photographs



Figure 3.5.1 Entry Resilient Flooring

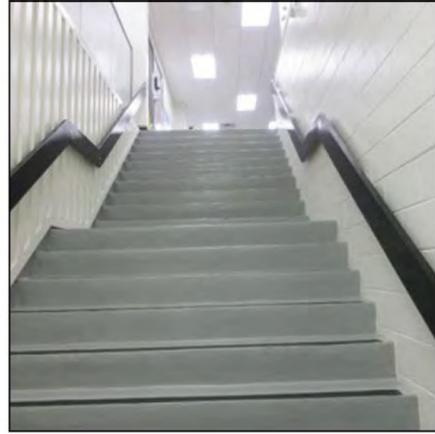


Figure 3.5.2 Main Staircase to Gym

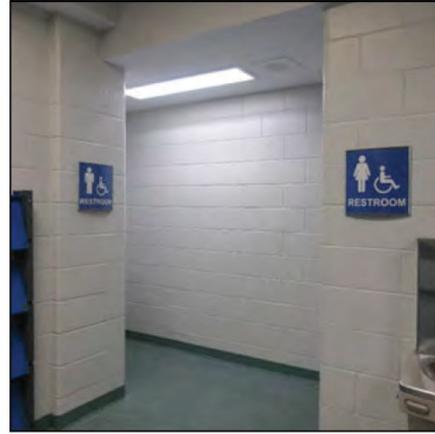


Figure 3.5.3 Public Restroom Entry



Figure 3.5.4 Men's Public Restroom



Figure 3.5.9 Reception

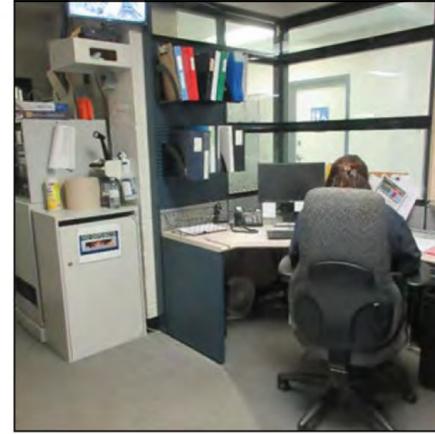


Figure 3.5.10 Reception 2



Figure 3.5.11 Reception 3

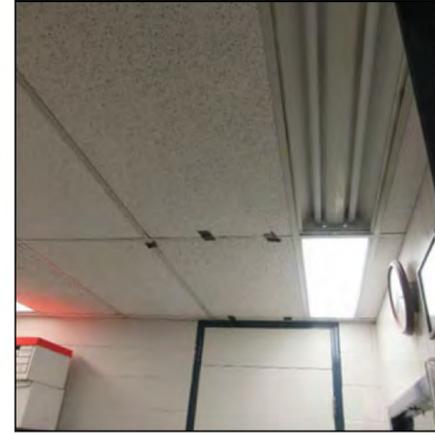


Figure 3.5.12 Offices



Figure 3.5.5 Men's Public Restroom



Figure 3.5.6 Family Change room

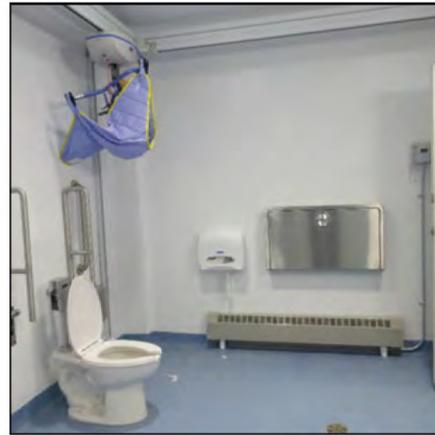


Figure 3.5.7 Family Change room 2



Figure 3.5.8 Public Barrier Free Restroom

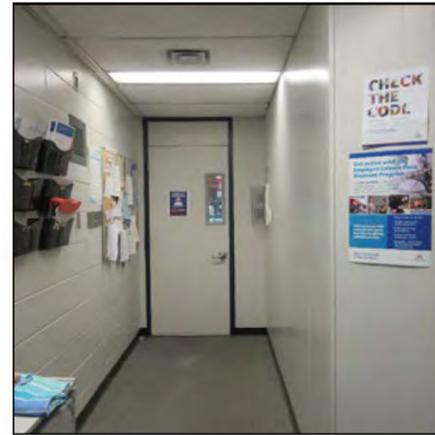


Figure 3.5.13 Back of House Offices



Figure 3.5.14 Men's Change Room Ceiling Diffuser



Figure 3.5.15 Family Change room 2



Figure 3.5.16 Public Barrier Free Restroom

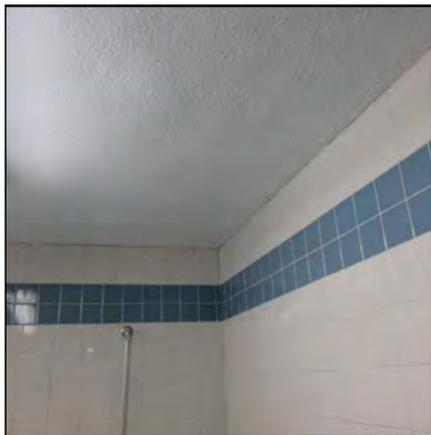


Figure 3.5.17 Men's Change Room Showers



Figure 3.5.18 Men's Change Room Sinks



Figure 3.5.19 Men's Change Room Entrance

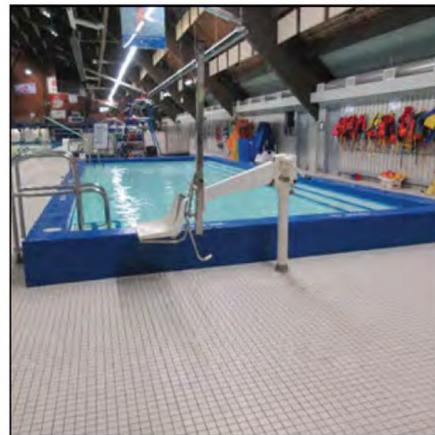


Figure 3.5.20 Training Pool



Figure 3.5.25 Pool Deck



Figure 3.5.26 General Storage



Figure 3.5.27 Diving Tower

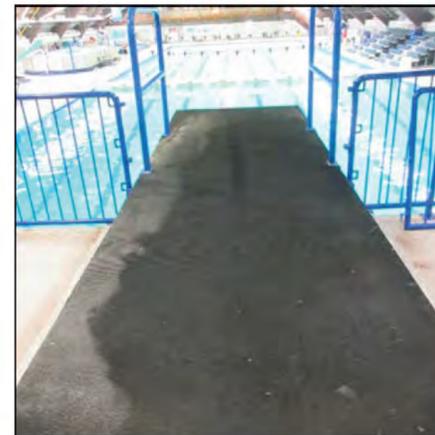


Figure 3.5.28 Diving Tower 2



Figure 3.5.21 Wood Wall Paneling

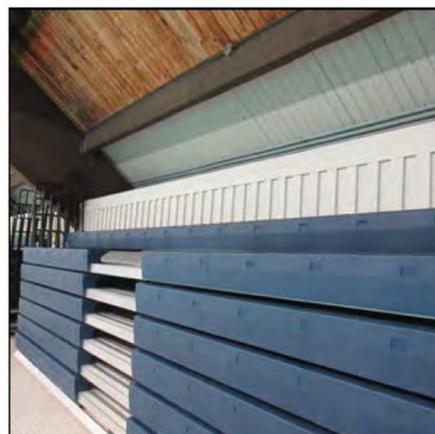


Figure 3.5.22 Pool Bleachers

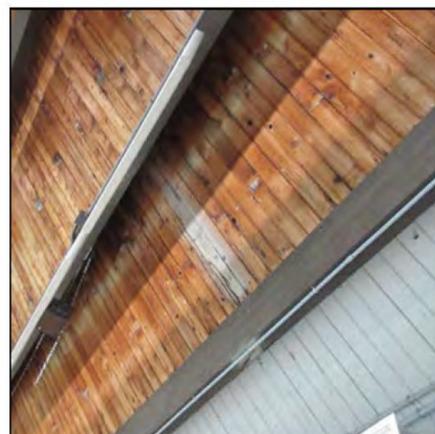


Figure 3.5.23 Pool - Wood Ceiling

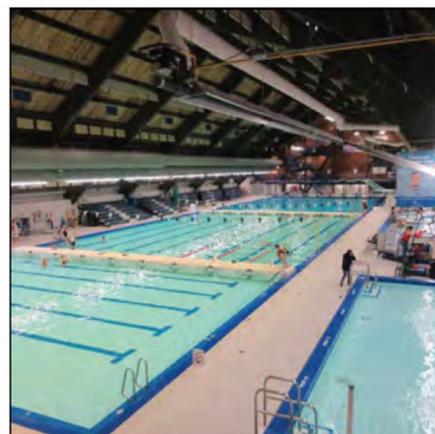


Figure 3.5.24 Main Pool

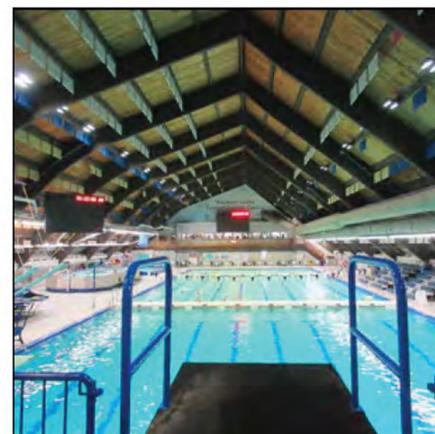


Figure 3.5.29 Diving Tower 3



Figure 3.5.30 Diving Tower Ceiling



Figure 3.5.31 Viewing Room



Figure 3.5.32 Classroom flooring



Figure 3.5.33 Aquatic Classroom

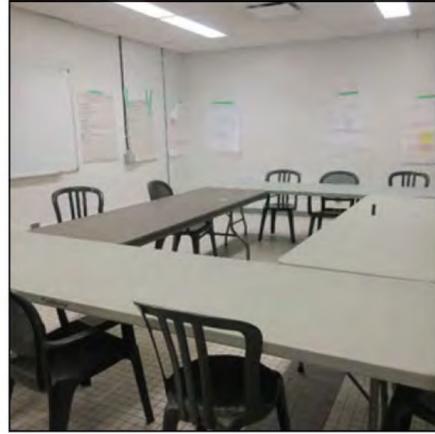


Figure 3.5.34 Aquatic Classroom 2



Figure 3.5.35 Maintenance Room



Figure 3.5.36 Maintenance Room 2



Figure 3.5.41 Filter Room 2



Figure 3.5.42 Filter Room 3

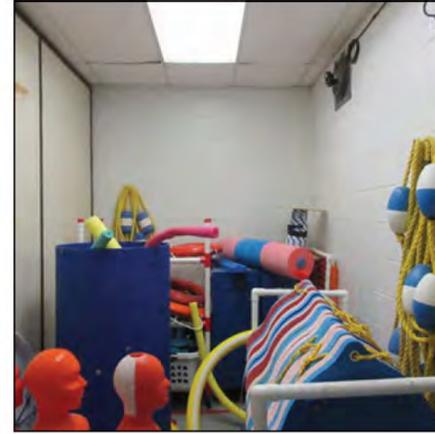


Figure 3.5.43 Storage Room

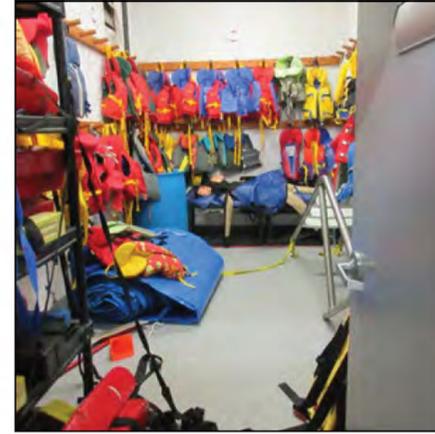


Figure 3.5.44 Storage Room 2



Figure 3.5.37 Maintenance Room 3



Figure 3.5.38 Maintenance Room 4



Figure 3.5.39 Electrical Room



Figure 3.5.40 Boiler Room



Figure 3.5.45 Bubbler Room

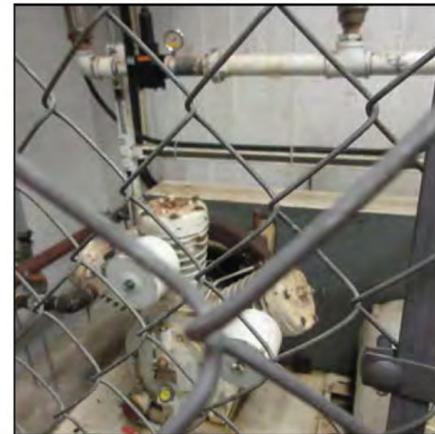


Figure 3.5.46 Bubbler Room 2

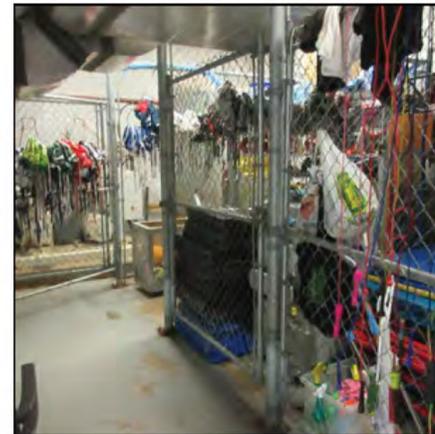


Figure 3.5.47 Bubbler Room 3



Figure 3.5.48 Bubbler Room 4

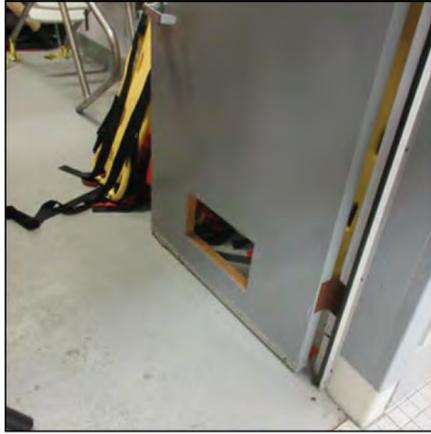


Figure 3.5.49 Bubbler Room 5

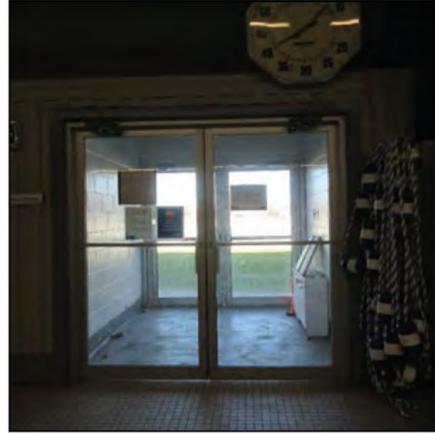


Figure 3.5.50 North Vestibule to sun area



Figure 3.5.51 Second Floor Gym



Figure 3.5.52 Second Floor Office

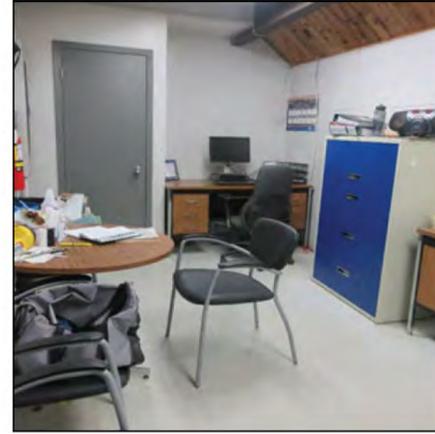


Figure 3.5.57 Second Floor Office 5



Figure 3.5.58 Mezzanine Level

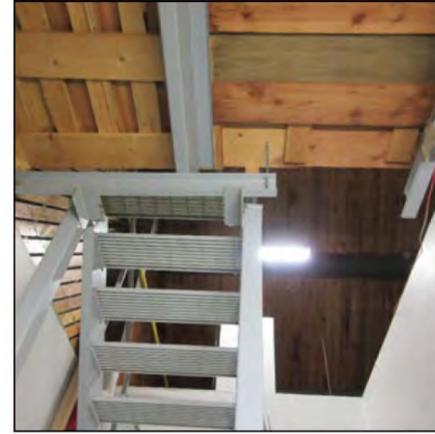


Figure 3.5.59 Mezzanine Level 2



Figure 3.5.60 Mezzanine Level 3



Figure 3.5.53 Second Floor Office 2



Figure 3.5.54 Second Floor Office 3

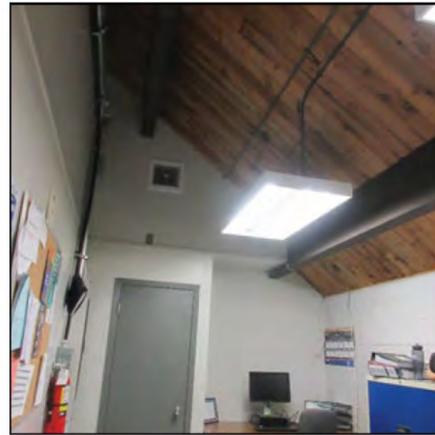


Figure 3.5.55 Second Floor Office 4

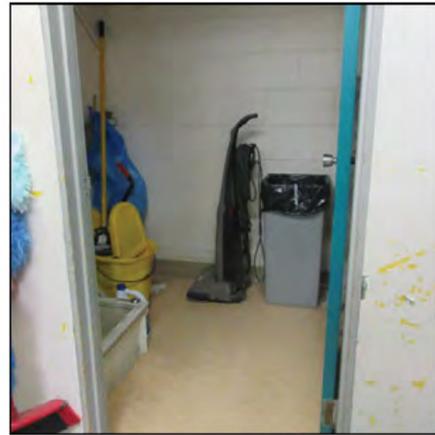


Figure 3.5.56 Second Floor Janitor Room



Figure 3.5.61 Mezzanine Level 4



Figure 3.5.62 Mezzanine Level 5



Figure 3.5.63 Mezzanine Level 6



Figure 3.5.64 Pent-House Room

Section 4.0 Building Envelope

4.1 Executive Summary

Lawson Aquatic Centre

Based on our visual review and the as-constructed conditions, the property is generally in fair condition. Some elements are reasonably new while some are original and date to 1975. There are, however, as noted by the Architect, issues related to envelop continuity. The building envelop would not meet current best practice or code for envelope design. The envelop continuity is regarded as poor.

The building envelope assessment was done through the lens of maintaining the operations of the LAC for the next 10-15 years. This is not a reflection of replacement costs or additional program areas. Our survey did not reveal any evidence of major structural failures, soil erosion, or differential settlement, unless otherwise discussed below. During our limited visual assessment, Morrison Hershfield did observe a safety concern that falls under immediate mandatory repairs. We recommend immediate mandatory repairs as follows:

- Repair the parapet cap flashing that appears loose on the west elevation. No budget is include as the cost of repairs is estimated to be below the study threshold.

We also identified capital recommendations of approximately \$1,072,000 over the next ten years. Please note this amount represents only budgetary items for the facility elements reviewed which, in our opinion, are likely to exceed the threshold amount. This should not be misconstrued as all capital expense budgeting requirements for this complex within the study period. Detailed information on the building components and findings from our assessment are summarized in section 4.3 Report. The largest budgetary item are as follows, with a brief description:

- An evaluation and related repairs of the west wall in relation to the issues that were reported. As the scope is unknown without intrusive testing and in-depth evaluation, a preliminary budget of \$115,000 has been included within the next five years. It should be noted that this will not solve the overall building envelope continuity issues. Replacement and installation of the sealants throughout the building has been budgeted to occur within the next five years. We have allotted \$30,000 for replacements and installations. This budget includes replacement of sealants throughout the linking building.
- Replacement of the modified bituminous membrane low sloped roofing assemblies has been budgeted to occur near the end of the study period. We have also included a budget to complete localized repairs prior to the full replacement project. We have allotted \$150,000 for full replacement and repairs of the low-sloped roof surfaces.

The table provided in Section 4.3 Report shows Morrison Hershfield's opinion of the probable cost to carry out the recommendations (in 2021 dollars) during the study period. The repairs and replacements we have forecasted do not represent a fixed schedule for replacements; repairs or replacements may be required sooner or later than we have anticipated. The costs forecasted do not include tax or consulting fees.

Based on our visual review and the as-constructed conditions of the linking building, the property is generally in fair condition. Some elements are reasonably new while some are original and date to 1988. Our survey did not reveal any evidence of major structural failures, soil erosion, or differential settlement, unless otherwise discussed below. During our limited assessment, Morrison Hershfield

did not observe any safety concerns that fall under immediate mandatory repairs. We identified capital recommendations of approximately \$1,072,000 over the next ten years. Please note this amount represents only budgetary items for the facility elements reviewed which are likely to exceed the threshold amount. This should not be misconstrued as all capital expense budgeting requirements for this complex within the study period. Detailed information on the building components and findings from our assessment are summarized in Section 4.3 report. The largest budgetary item are as follows, with a brief description:

- A refurbishment project for the curtain walls located at the linking building has been budgeted to occur near the end of the report term. We have allotted \$74,000 for a refurbishment project.
- Replacement of some service doors has been budgeted to occur near the end of the study period. We have allotted \$24,000 for replacements.
- Replacement of the EPDM membrane low-sloped roofing assemblies has been budgeted to occur near the end of the study period. We have also included a budget to complete localized repairs prior to the full replacement project.

The table provided in section 4.3 report shows Morrison Hershfield's opinion of the probable cost to carry out the recommendations (in 2021 dollars) during the study period. The repairs and replacements we have forecasted do not represent a fixed schedule for replacements; repairs or replacements may be required sooner or later than we have anticipated. The costs forecasted do not include tax or consulting fees.

4.2 Objectives

The purpose of this Building Envelope Condition Assessment report is to provide an overview of the existing condition of the facility, and identify significant facility problems or ownership liabilities that might influence the design decisions for expansions and tie-ins. In addition, the report is to provide an opinion on future performance expectations and replacement cost estimates.

Specific objectives are to:

- Provide the current condition of the building envelope components (including the wall cladding and exterior seals, fenestration, roofing, pool roof framing, and other related details such as flashing and penetrations) and estimate the remaining life of these major components.
- Identify significant building problems or ownership liabilities which may affect design decisions for expansions and tie-ins. This may include identification of typical building envelope details that are at risk for potential water intrusion.
- Provide opinion on future performance expectations and replacement cost estimates.
- Provide a report with observations and recommended actions, opinion of probable costs over a ten-year period, with a priority (mandatory, recommended, discretion possible) ranking, and identify any areas (and associated costs) where further investigation is required to determine the extent of problems found and the scope of remedial action required. The report will include replacement items above \$10,000.HCMA and other stakeholders as it relates to this specific assignment will rely on the report regarding the defined objectives.

Terms of Reference

To meet the proposed objectives, we have completed the following scope of work.

1. Document review and owner questionnaire
 - a. Reviewed available original design documents, previous assessment reports, repair and/or renewal reports to become familiar with the designer's intent with respect to the exterior enclosure of the building.
 - b. Prepared questionnaire (to be distributed by our client) to the current owners /operators. The purpose of this questionnaire is to obtain information from current occupants with respect to the performance of, and/or problems with, building envelope components throughout the complex. The majority of the information provided in the questionnaire was provided during the on-site review.
2. Visual Review
 - a. Interviewed site personnel regarding maintenance history and concerns.
 - b. Performed a visual review of the building envelope associated with the buildings. In general, the building envelope consists of common exterior wall / roof items such as wall cladding assemblies, windows / doors, roof membranes and flashings, etc. Visual review was completed at floor/grade level on the interior and exterior of the building, and on accessible roofs.
 - c. Photographed representative building elevations, roof levels, and representative envelope detailing to highlight observed concerns and deterioration.
3. Assessment report
 - a. Provided a report with observations and recommended actions, opinion of probable costs over a ten-year period, with a priority (mandatory, recommended, discretion possible)

ranking (outlined below), and identify any areas (and associated costs) where further investigation is required to determine the extent of problems found and the scope of remedial action required. The report will include replacement items above \$10,000.

- b. The report is divided into sections according to major building elements. Each section presents the observations, assessments, and recommended remedial work for that element.
- c. Identified all anticipated expense items in a
 - » Table summary which will include current condition, anticipated replacement costs, and timing.
- d. We will be available for one teleconference meeting to discuss the findings of our report.

Project Team and Site Visits

This report has been prepared and/or reviewed by various personnel. The following are the personnel, their qualifications and the respective disciplines for which each was responsible:

- Julie Malmberg, A.T, CVT, Building Science Technician of MH conducted the on-site evaluation and reporting.
- Michael Ball, P.Eng. Principal, Manager, of MH provided senior technical support and review of the study.

The visual review and interviews were completed on October 25, 2021. During our review of the building, we were accompanied by Neil Struthers, Senior Engineer, Land, Real Estate & Facilities Financial Strategy & Sustainability, from The City of Regina. We performed a visual review of the building envelope associated with the buildings. In general, the building envelope consists of common exterior wall / roof items such as wall cladding assemblies, windows / doors, roof membranes and flashings, etc.

Visual review was completed at floor/grade level on the interior and exterior of the building, and on accessible roofs.

Reference Documents and Information

We reviewed the following documents and selected drawings for general background and to inform ourselves about the layout and intended construction:

- Main floor layout plan of the Lawson Aquatic Centre
- Renovations and Lighting Replacement Drawings for the Fieldhouse, prepared by P3A, MacPherson Engineering Inc., and ALFA Engineering LTD. Dated July 2020 (Issued for tender)
- Lawson Work Summary, provided by HCMA Architecture + Design
- Lawson Roof Replacement Drawings, prepared by Stantec, dated October 2010 (As built)
- Bulkhead Replacement Shop Drawings, prepared by Stark Bulkheads, dated May 2013
- Fitness Room Renovation Drawings, prepared by Kreate, dated April 2017 (Issued for bid)
- Crawlspace Improvements Drawings, prepared by P3A, dated July 2018 (Issued for construction)
- Site Plan, provided by HCMA Architecture + Design
- Photos of the frost accumulation, provided by CoR, dated January and February 2021
- Photos and information regarding the south wall failure, provided by CoR and P3A, dated October 2020
- Questionnaire response, provided by CoR, dated November 5, 2021

Property Description

The property reviewed consists of the Lawson Aquatic Centre, constructed in

1975, and linking building to the Fieldhouse, constructed in 1988. The property is located at municipal address 1717 Elphinstone St, Regina. The City of Regina owns the building, which functions as an aquatics centre, fitness centre, and fieldhouse with multiple change rooms and classrooms. The building is accessed from doors on both the east and west elevations located at the linking building.

The buildings are constructed on concrete piles, as visible from the crawlspace. The Lawson Aquatic Centre walls are constructed of wood stud framing and concrete masonry units which support a wood deck and sloped metal roof assembly throughout most of the building. The exterior wall cladding is a combination of metal cladding and brick veneer. The sloped metal roof and metal wall cladding were reported to have been installed in 2010. At the south and north elevations, portions of the aquatic centre have low-sloped roofs. The roofing is a conventional SBS membrane assembly. The roof was replaced in 2012.

At the Linking Building, most of the exterior walls are steel stud with metal cladding, with the exclusion of curtain wall assemblies located at the linking building entrances. The roofing at these buildings is an EPDM membrane. The roof was replaced in 2012.

It should be noted that this report has been edited by the HCMA/P3A Prime Consultant Team to fit into the format and reporting information required for this assessment report.

Reference or Number	Components	Description of Systems	Condition on P.F.G.E.	Age in 2021 Estimated (E) Actual (A)	Recommendation	Year 1	Year 2 - 5	Year 6+
Building Envelope								
B1.1	Concrete Buttresses	<p>Lawson Aquatic Centre</p> <p>There are painted concrete buttresses extending from the sides of the building. The topside of some of the concrete was observed to be covered with a painted steel cap north side exterior.</p> <p>Peeling of the paint and slight spalling at the concrete surfaces was noted (<i>Figure 4.4.1 Figure 4.4.2</i>).</p> <p>Coatings like paint can trap moisture in the concrete and restrict the moisture from drying ultimately causing deterioration of the concrete. Slight corrosion and local damage of the steel caps were noted (<i>Figure 4.4.3</i>). Generally, the buttresses were in fair condition.</p>	F	A-46 years	<p>We recommend repainting and repairing the concrete buttresses and the steel caps periodically.</p> <p>It is anticipated the steel caps will need to be replaced within the study. As the estimated cost of replacement is below the study threshold no budget for replacement has been included. As the estimated cost of replacement is below the study threshold no budget for replacement has been included.</p>	<\$10,000.00		
B2.1	Envelope Continuity	<p>Lawson Aquatic Centre</p> <p>The following issues with the overall thermal performance and air barrier control were reported or observed:</p> <ul style="list-style-type: none"> Water staining of the interior finish was noted at the interior face of the west wall at the first penthouse level above the fitness centre. (<i>Figure 4.4.4</i>). It was reported that when the weather is cold this portion of the wall is also cold. At this location, no interior insulation or cedar finish were present though were observed to be present throughout the rest of the exterior walls. Water staining was observed at the insulation where the interior insulation and cedar finish are terminated (<i>Figure 4.4.5</i>). It was reported that a heavy layer of winter frost often accumulates on the interior surfaces at the second level penthouse over the fitness centre. Snow will blow into the room due to the louvers located on the north elevation (<i>Figure 4.4.6 Figure 4.4.7</i>). When the snow and frost start to melt, water reportedly runs down the west wall down to the washrooms located on the main floor. Water staining was observed throughout the interior finishes at the west exterior wall at the main level (<i>Figure 4.4.8 Figure 4.4.9</i>). Condensation was also observed building up at the interior wall that separates the two penthouse levels (<i>Figure 4.4.10</i>). It was reported that poplar fluff enters through the louvers in spring coating the entire room, including the first penthouse level, (<i>Figure 4.4.11</i>) in fluff. So much fluff enters the building the filters located in this room need to be cleaned multiple times a day. It was reported the relief damper above the first-level penthouse is no longer needed and remains closed but continues to allow significant leakage. It was also reported that the north wall of the shower at the men's change room will freeze up during the winter. The cause of this is unknown; it is believed it may be related to the issues noted above or changes in ventilation. <p>Based on the issues discussed, the envelope continuity appears to generally be in poor condition.</p>	P	A - 46 years	<p>We recommend an investigation for the west wall and louvers to determine proper repairs to address the issues reported. We have budgeted for an investigation in the near term followed by repairs based on the findings. A preliminary budget has been included only as the scope of the repairs is unknown without an in-depth evaluation and intrusive testing.</p> <p>The north wall of the building in the men's shower area shows evidence of air leakage and piping has frozen in this area in the past. The envelop should be dismantled and repaired.</p> <p>The recommendations are remedial in nature and do not result in correction of overall building envelope continuity issues.</p>	\$15,000.00	\$100,000.00	

Reference or Number	Components	Description of Systems	Condition on P.F.G.E.	Age in 2021 Estimated (E) Actual (A)	Recommendation	Year 1	Year 2 - 5	Year 6+
Building Envelope								
B3.1	Metal Cladding	<p>Lawson Aquatic Centre</p> <p>There are vertical metal panels with concealed joints at the upper part of the east and west elevations and around the perimeter of low-sloped roofs. The backup walls are generally wood stud framed walls with the addition of concrete masonry units at some locations (based on drawings). We believe the steel cladding is a drained system (based on site observations). There is local minor damage to the cladding, assumed to be the result of impact (<i>Figure 4.4.12</i>). Also, there is a slight separation of the cladding from the wall along the base of the cladding at multiple locations (<i>Figure 4.4.13</i>).</p> <p>There is corrosion of the cladding at the north side of the building where a vent penetrates the wall (<i>Figure 4.4.14</i>). This is believed to be the result of constant steam leaving the vent. Generally, the metal cladding was in fair condition.</p>	F	A-11 years	<p>We recommend locally replacing the corroded cladding and installing a means for the moist air from the vent to be directed away from the cladding and prevent future corrosion. A budget for repairs has been included.</p>	\$10,000.00		
B3.2	Metal Cladding	<p>Interface (Aquatic Center to Linking Building)</p> <p>Where the aquatic center and the building linking to the fieldhouse are joined the following was noted:</p> <ul style="list-style-type: none"> At the east elevation it appears the metal cladding at the linking building is completed with a trim along the edge of the wall and butted up against the side of the brick veneer located at the aquatic centre (<i>Figure 4.4.20</i>). It appears the cladding at the aquatic centre is cut to form around the linking building cladding where the metal cladding of each building meets near the top of the building (<i>Figure 4.4.21</i>) At this location there are gaps which could allow water ingress into the wall cavity (<i>Figure 4.4.22</i>). A lack of sealants was noted at this location. At the west elevation the sloped roof meets the cladding of the linking building (<i>Figure 4.4.23</i>). The cladding is cut to form around the roof surface. At this location there are gaps between the roofing and wall cladding that allows for water ingress behind the metal cladding at the linking building. Gaps were also noted at the roof level where up-close review revealed a rather large gap between the sloped roofing and the wall cladding (<i>Figure 4.4.24</i>). The wall-to-wall connection at this location appears to be similar to the one located on the south side of the building; however, it is covered with an overhang. There are a lack of sealants this location and what sealants are present are in poor condition (<i>Figure 4.4.25</i>). <p>Gaps at interfaces such as those discussed above may allow bulk water to ingress behind, but the building envelope details behind these areas will dictate overall water management performance. As there were no reports of issues at these areas, we assume they are functioning as intended.</p> <p>Generally, the interfaces are in fair condition.</p>	F	A-33 years	<p>Although leakage is not evident on the inside at these locations, we recommend installing sealants at these locations to limit water ingress into the wall assembly as a precaution. It is estimated the installation can be completed below the study threshold; therefore, no budget has been included.</p> <p>A complete envelop recladding and rebuild would be required to correct continuity and tie-in issues. This is not priced in the remedial work but would be part of an overall re-build/renovation of the LAC. Sealant replacement is required to maintain the system, but is not intended as a "fix" to water infiltration issues not related to proper sealant locations.</p>	<\$10,000.00		

Reference or Number	Components	Description of Systems	Condition on P.F.G.E.	Age in 2021 Estimated (E) Actual (A)	Recommendation	Year 1	Year 2 - 5	Year 6+
Building Envelope								
B4.1	Brick Veneer	<p>Lawson Aquatic Centre There is brick veneer cladding at the base of the building. The backup walls are generally wood stud framed walls with the addition of concrete masonry units at some locations (based on drawings). The brick veneer walls appeared to be supported on the concrete foundation walls. Drainage (weep holes) was not observed.</p> <p>Wood was present at the base of the building at some locations at the west elevation (Figure 4.4.26). The purpose of this wood is unclear. Wood is not recommended to be left exposed as it is susceptible to rot. It was noted the brick extends to grade throughout the building. This is typically not recognized as best practice as the bricks can absorb water near grade from snow / ice and ponding / splash-back during rain. This moisture can be absorbed into the porous clay brick resulting in freeze thaw related brick spalling.</p> <p>There are local areas of water staining. It is believed the staining is the result of improper water shedding of the materials above the brick veneer.</p> <p>There is local deterioration and cracking at the bricks and mortar (Figure 4.4.27). There is also local areas of damage assumed to be the result of impact located at the base of the building at corners and doors (Figure 4.4.28).</p> <p>Some of the bricks at the south side of the west elevation appear loose due to the deterioration of the mortar (Figure 4.4.29). At the same location a large crack in the brick and mortar is present and appeared wet (Figure 4.4.30). It is unclear if there is water egress from the wall cavity or if this location was still wet from the rain the day prior to review. Water staining along the wall was also noted at this location suggesting this is a common occurrence. No other locations with similar conditions were observed.</p> <p>There are multiple wide vertical control joints at the east and west elevations of the building (Figure 4.4.31). The joints were filled with sealant that were split and falling off throughout (as discussed below). The splitting of the sealants can allow for water ingress into the wall assembly through the joints.</p> <p>Generally, the brick veneer cladding is in fair condition.</p>	F	A-46 years	We recommend completing general masonry reviews and repairs periodically. A budget for review and repairs has been included.		\$10,000.00	
B5.1	Aluminum-Framed Curtain Walls	<p>Linking Building There is an aluminum-framed curtain wall system at the east and west entrances to the linking building (Figure 4.4.32). The system includes assemblies combining fixed glazing and swing doors. The glazing is insulated glass units (IGUs), the majority of which are original to the building (1988) based on date stamps.</p> <p>It was noted local IGUs have been replaced. At the time of the site review an IGU was observed to be broken and boarded up. We assume the damage is due to vandalism and the IGU will be replaced.</p> <p>There were no leaks reported. Generally, the curtain wall was in fair condition.</p>	F	A - 33 years	It is expected the curtain wall assemblies will require a major refurbishment at approximately half-life (i.e. around 35 to 40 years of age). The refurbishment project would likely include removal and replacement of glazing units, cleaning out drainage holes, resetting glazing with new glazing tape and sealers, replacement of glazing pocket seals, and replacement of exterior pressure plates and beauty caps. The frames are expected to remain in place. Based on current conditions we have included a budget for refurbishment near the end of the study period.			\$74,000.00

Reference or Number	Components	Description of Systems	Condition on P.F.G.E.	Age in 2021 Estimated (E) Actual (A)	Recommendation	Year 1	Year 2 - 5	Year 6+
Building Envelope								
B6.1	Exterior Soffit	<p>Lawson Aquatic Centre There are soffits where the roof overhangs the exterior walls at the doors located at the west end of the building (Figure 4.4.33). There are also sloped soffits along the north elevation (Figure 4.4.34). These soffits are clad with prefinished metal panels. According to drawings, the soffits are as follows (from outside in): prefinished metal cladding, dimensional lumber framing for cladding attachment, polyurethane spray foam insulation, wall structure.</p> <p>No issues with the soffits were reported or observed. Generally, the soffits were in good condition.</p>	G	A-11 years	No anticipated expenditures within study period above study item cost threshold.			
B7.1	Exterior Sealant	<p>Fieldhouse and Linking Building There are sealant joints at door perimeters, curtain wall perimeters, and around penetrations (pipes, vents, etc.). The age of the sealants could not be confirmed; however, it is estimated they are nearing the end of their typical service life.</p> <p>No leaks through the exterior walls were reported; however, sealants are deteriorating and splitting where randomly reviewed (Figure 4.4.35 Figure 4.4.36 Figure 4.4.38). As well, sealants appeared to be missing from multiple penetrations. In some cases (such as that pictured in Figure 4.4.37) sealant is installed at areas where it normally would not be, such as the transition from the metal cladding to the curtainwall beauty caps. It is not known if this is poor detailing or a response to poor curtainwall installation as it relates to moisture barrier connections. Generally, the sealants were in poor condition where reviewed.</p>	P	E-20 years	We recommend full replacement of sealants and installing sealants at locations where sealants are missing and required. A budget has been included in the line item above. Review of the curtain wall seals prior to resealing these locations should occur.			
B8.1	Entrance Doors	<p>Lawson Aquatic Centre Inner and outer double-swing, aluminum-framed glass doors are located at the north elevation (Figure 4.4.39). These doors appear newer. No issues with the doors were reported or observed. Generally, the doors are in good condition.</p>	G	E-10 years	No anticipated expenditures within the study period above the study item cost threshold.			
B8.2	Entrance Doors	<p>Linking Building The main entrances to the Lawson Aquatic Centre are via the linking building (Figure 4.4.40). These doors are located within the curtain wall assemblies at the east and west elevations and include inner and outer double-swing, aluminum-framed glass doors (eight outer and eight inner doors total). One outer door and one inner door on each side of the building is equipped with a power opener for barrier free access. The age of the doors could not be confirmed; however, they do appear to be newer than the curtain wall.</p> <p>It was reported that the door hardware requires on-going maintenance due to the high volume of traffic through these doors. Generally, the doors were in fair condition.</p>	F	E-10 years	No anticipated expenditures within the study period above the study item cost threshold. It is expected doors will be repaired as needed at a cost below the study threshold. Due to heavy usage it is expected that new hardware will be required in approximately 10 years.			\$20,000.00
B9.1	Exterior Service Doors	<p>Lawson Aquatic Centre There are painted steel service doors, located around the building. There are gaps between the door and the frame at some locations (Figure 4.4.41). It was reported that snow and ice build up at the interior of some of the service doors. Where randomly reviewed, no issues with operations were noted. It was reported the doors are locally repaired and replaced as needed, and the age of the doors ranges.</p> <p>Generally, the doors were in fair condition.</p>	F	N/A	We recommend locally replacing and repairing doors as needed. As the cost of this is estimated to be below the report threshold, no budget is included.	\$5,000.00		\$24,000.00

Reference or Number	Components	Description of Systems	Condition on P.F.G.E.	Age in 2021 Estimated (E) Actual (A)	Recommendation	Year 1	Year 2 - 5	Year 6+
Building Envelope								
B9.2	Service Doors	Field House and Linking Building There are several painted steel service doors, located around the building. Local damage to the doors was noted from the exterior (Figure 4.4.42). It is not believed the damaged reviewed will affect the performance of the doors. No issues with these doors were reported. It was reported doors are locally repaired and replaced as needed. Generally, the doors were in fair condition.	F	E-33 years	As the doors are approaching the end of their typical service life, we have included a budget to replace some of the doors. We recommend continuing to locally replace and repair doors as needed. As the cost of this is estimated to be below the report threshold, no budget is included.			\$24,000.00
B11.1	Metal Roofing	Lawson Aquatic Centre Most of the roof surfaces are sloped and protected by metal roofing complete with exposed and concealed fasteners. There is a prefinished cap flashing located along the edges of the roof assembly at the east and west elevations. According to the drawings, the roof assembly is as follows (from exterior inwards): prefinished metal roofing, sheet underlayment, plywood, rigid insulation with Z-girts, air/vapour barrier, wood deck. The cap flashing appears to be loose on the west elevation (Figure 4.4.44). Loose flashing is a fall risk and a safety hazard. Minor impact damage to the roofing, assumed to be from hail, was noted from grade. Water staining of the wood decking was noted from the interior (Figure 4.4.45). It is believed the staining is the result of high humidity within the pool area or leakage prior to the roof replacement. No current leaks or problems were reported or observed. It was reported the wood structure has a faint musty smell likely caused by the leakage over the years. Generally, the metal roof is in fair condition.	F	A - 11 years	We recommend repairing the cap flashing in the immediate term as this is at risk of falling. It is anticipated this can be completed below the study threshold. We expect the metal roof to last beyond the study period with a normal service life of 25 to 30 years. There are no anticipated expenditures within the study period above the study item cost threshold.	<\$10,000.00		\$10,000.00
B12.1	Eavestroughs and Downspouts	Lawson Aquatic Centre There are downspouts located on the west side of the building for the purpose of discharging water from the gutters to grade. These downspouts were installed during the metal roof installation (based on drawings). The north downspout is damaged and appears to no longer be attached to the wall as intended (Figure 4.4.46). Generally, the downspouts were in fair condition.	F	A - 11 years	We recommend repairing the damaged downspout. As the cost for repairs is estimated to be below the report threshold, no budget has been included. Any future damage to the eavestrough should also be repaired as needed. We expect the eavestrough and downspouts to last beyond the study period with a normal service life of more than 25 years. There are no anticipated expenditures within the study period above the study item cost threshold.	<\$10,000.00		

Reference or Number	Components	Description of Systems	Condition on P.F.G.E.	Age in 2021 Estimated (E) Actual (A)	Recommendation	Year 1	Year 2 - 5	Year 6+
Building Envelope								
B12.2	Eavestroughs and Downspouts	Linking Building There are eavestroughs and downspouts located at the canopies over the main entrance doors. The age of these could not be confirmed. It is estimated they are original to this portion of the building. The eavestroughs and downspouts are damaged (Figure 4.4.47), and discharge at the base of the building. It is not recognized as best practice for water to discharge at the base of the building as it could cause flooding. Generally, the eavestroughs and downspouts are in fair condition.	F	E-33 years	We recommend locally replacing the eavestroughs and downspouts as needed. We also recommend extending the downspouts so the water discharges away from the base of the building. It is estimated the cost of this will be below the report threshold. Therefore, no budget has been included.	<\$10,000.00		
B13.1	Modified Bituminous Membrane Roofing Assemblies	Lawson Aquatic Centre There is a low-slope roof at the south side of the building protected with a modified bituminous membrane roof assembly (likely SBS), with prefinished metal flashings at the parapets and upturns. There are also two low-slope roofs at the north elevation. These roofs were not accessible for review. We assume they are of similar construction and condition as the south roof. The age of the roofing could not be confirmed; however, the majority was installed prior to the metal roofing replacement in 2010 based on the drawings. Access to the south roof is available via the fieldhouse roof and a set of metal stairs between roof surfaces. The north roof surfaces were not accessible. The roof drains by area drains (connected to rainwater leaders inside the building). The following was noted during review of the south roof surface: <ul style="list-style-type: none"> Local areas of ponding including a build up of vegetation (Figure 4.4.48). Ponding can accelerate the wear of the roofing membrane over time. General wear and staining at the roofing throughout the surface (Figure 4.4.49 Figure 4.4.50). Water staining at the electrical room was observed from the underside of the south roof (Figure 4.4.51). As no leaks were reported, it is unclear if the leakage is active. We recommend this area be monitored for leakage. Local deficiencies at the roof surface including fish mouths and splitting of the membrane at penetrations (Figure 4.4.52). Generally, the roofing was in fair condition. 	F	E-15 years	Based on current conditions we recommend budgeting for full replacement of the low-slope roofing assemblies. A budget has been included accordingly. The replacement budgets allow for replacement of the full roof assembly, including the membrane, insulation and vapour barrier. We also recommend monitoring for water leakage. If leakage is determined to be active, repairs should be completed accordingly. As the scope of repairs is unknown, no budget has been included. We have, however, included a localized repair related budget leading up to full replacement that can be used to address local leakage and deficiencies.		\$10,000.00	\$140,000.00

Reference or Number	Components	Description of Systems	Condition on P.F.G.E.	Age in 2021 Estimated (E) Actual (A)	Recommendation	Year 1	Year 2 - 5	Year 6+
B14.1	Exposed Single Ply Roof Assemblies	<p>Linking Building</p> <p>The roofs over the linking building are protected with an exposed single-ply EPDM membrane. There are prefinished metal flashings at the parapets and upturns. The age of the roof assemblies could not be confirmed; however, it is believed they have been replaced within the last ten years based on their condition.</p> <p>Access to the roofs are provided by a service door at the fieldhouse and multiple steel ladders to access the different levels. The roofs drain by area drains (connected to rain water leaders inside the building) and over flow scuppers.</p> <p>Ponding was noted at some locations throughout the roof surfaces (Figure 4.4.53). Ponding can accelerate the deterioration of the roofing membrane over time.</p> <p>Tenting of the membrane was noted periodically along the parapet wall upturns (Figure 4.4.54). Tenting can allow for water and snow build up at the creases, which will deteriorate the membrane and can allow for water ingress over time.</p> <p>No current leaks were reported or observed at the sample areas reviewed. Generally, the EPDM membrane was in fair condition.</p>	F	E-10 years	<p>As the age of the roof could not be confirmed, we have included a budget for full replacement near the end of the study period as a precaution.</p> <p>We have also included a budget for localized repairs leading up to the full replacement.</p>		\$20,000.00	\$450,000.00
B15.1	Crawlspace Waterproofing	<p>There is a Permalon membrane throughout the walls and floor at the crawlspace. An adhesive tape like material is used at upturns and connections. It was reported this membrane was installed after falling slopes and flooding had occurred. The membrane was reported to be helping with flooding and that crawlspace is dry most of the time.</p> <p>The purpose and function of the membrane appears to be related to structural, civil and geotechnical issues rather than building envelope. However, the following were noted during review of the crawlspace:</p> <ul style="list-style-type: none"> It was noted at the west side of the crawlspace water was ponding (Figure 4.4.55). The city reports they believe this is the result of a slow leak with a pipe and not caused by an issue with the membrane. Debonding of the membrane from the adhesive tape was noted periodically throughout the surface and at upturns (Figure 4.4.56). <p>Generally, the membrane was in fair condition due to the debonding of the adhesive tape.</p>	F	A-3 years	<p>As this membrane does not appear to be related to the building envelope no budgets for repairs or replacements have been included.</p> <p>We recommend review by structural, civil, geotechnical, and mechanical disciplines prior to completing any major repairs or renovations to the building.</p> <p>Note: The above risks have not been costed in this section beyond repairs to the membrane.</p>	<\$10,000.00		
		Smaller, uncosted items				\$100,000.00		
					Total anticipated costs	190,000.00	\$140,000.00	\$742,000.00
					Total			\$1,072,000

4.4 Photographs



Figure 4.4.1 Peeling Paint, Concrete Buttress



Figure 4.4.2 Spalling, Concrete Buttress



Figure 4.4.3 Corrosion and Damage, Concrete Buttresses, Steel Cap



Figure 4.4.4 Water Staining at Interior Finish, West Wall, First Penthouse Level Above Fitness Center



Figure 4.4.5 Water Staining at Interior Finish, West Wall, First Penthouse Level Above Fitness Center 2

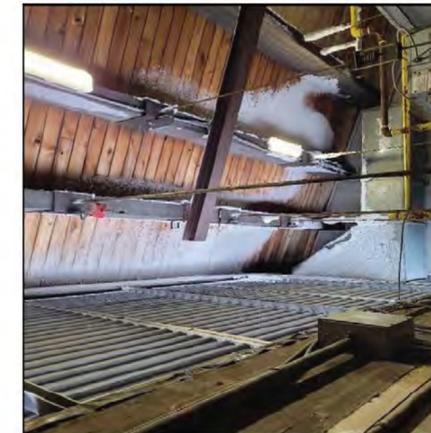


Figure 4.4.6 Frost Accumulating at Ceiling, as Provided by Client



Figure 4.4.7 Frost and Snow Covered Interior, as Provided by Client

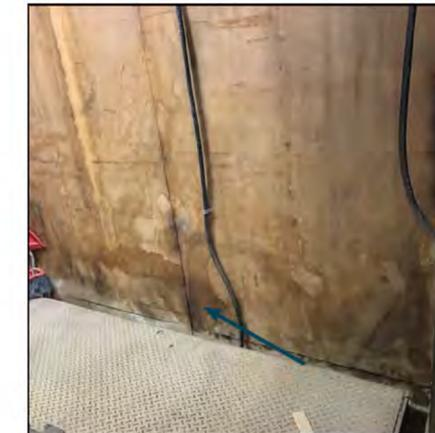


Figure 4.4.8 Water Staining, West Wall, Second Level Penthouse Above Fitness Center

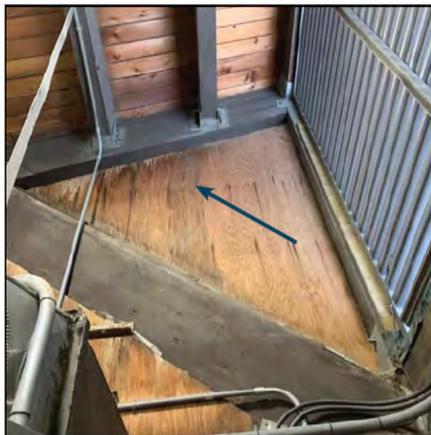


Figure 4.4.9 Water Staining, West Wall, Second Level Penthouse Above Fitness Center



Figure 4.4.10 Condensation Build Up at the Interior Wall Between the Penthouse Levels

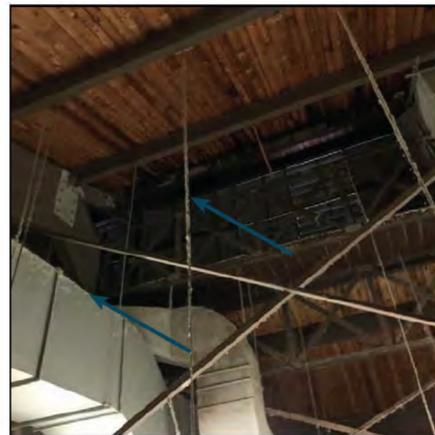


Figure 4.4.11 Poplar Fluff Remains, First Level Penthouse Above Fitness Center



Figure 4.4.12 Damaged Metal Cladding, West Wall



Figure 4.4.17 Peeling Paint and Corrosion, Underside of Canopy, Linking Building

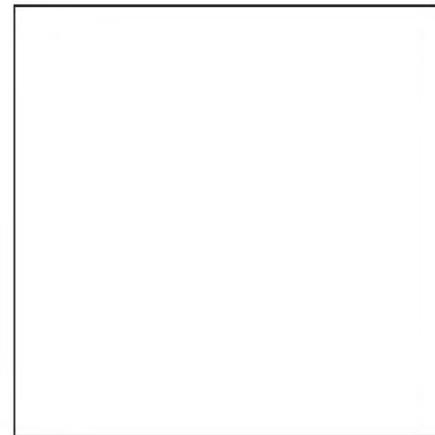


Figure 4.4.18 Photo removed

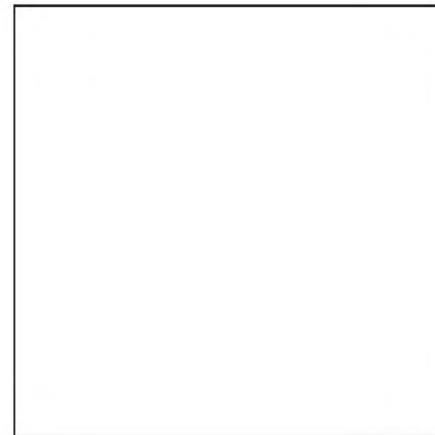


Figure 4.4.19 Photo removed

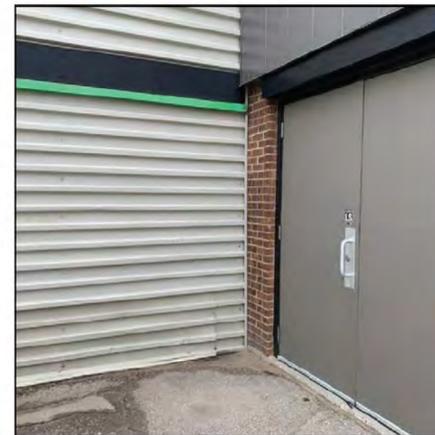


Figure 4.4.20 Wall Interface, East Elevation



Figure 4.4.13 Separation of Metal Cladding From Wall



Figure 4.4.14 Corrosion of Metal Cladding, North Elevation



Figure 4.4.15 Batt Insulation Exposed Due to Impact Damage and Corrosion at Base of Wall, East Wall



Figure 4.4.16 Corrosion at Steel Band, Fieldhouse



Figure 4.4.21 Cladding Cut to Form Around Linking Building Cladding, East Elevation



Figure 4.4.22 Gaps at Cladding Interface, East Elevation



Figure 4.4.23 Wall and Roof Interface, West Elevation

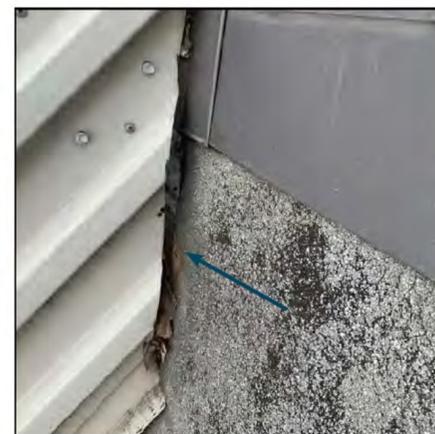


Figure 4.4.24 Gaps at Interface, West Elevation



Figure 4.4.25 Interface with Gaps and Poor Sealants, West Elevation



Figure 4.4.26 Wood at Base of Brick Veneer, West Elevation



Figure 4.4.27 Cracking at Brick Veneer Near Vertical Control Joint

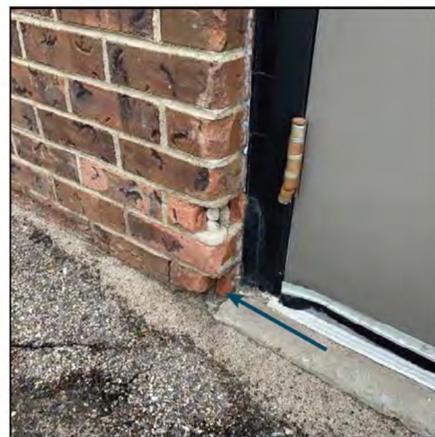


Figure 4.4.28 Impact Damage to Brick Veneer



Figure 4.4.33 Soffit Over Doors



Figure 4.4.34 Sloped Soffit

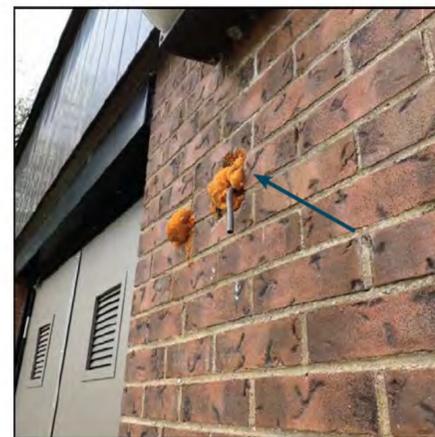


Figure 4.4.35 Spray Foam Being Used as Sealant, North Elevation



Figure 4.4.36 Split Sealant at Brick Control Joint

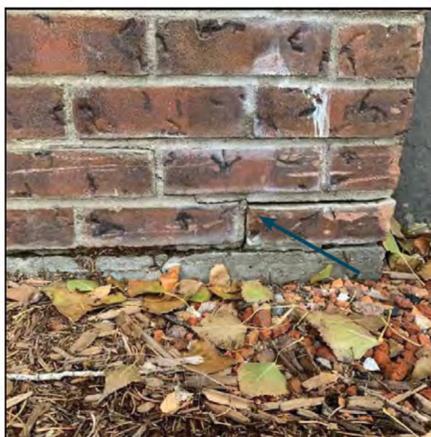


Figure 4.4.29 Deteriorating Mortar Around Bricks



Figure 4.4.30 Large Crack with Wetness and Water Staining, West Elevation



Figure 4.4.31 Control Joint at Brick Veneer



Figure 4.4.32 Curtain Wall Assembly, Linking Building

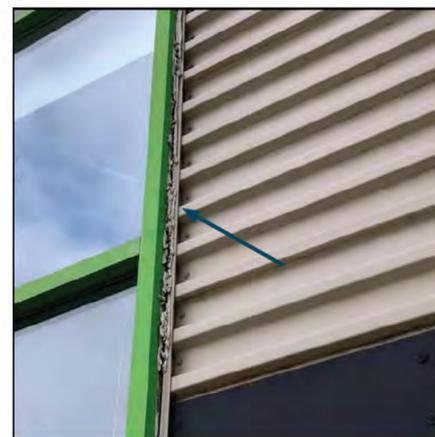


Figure 4.4.37 Sealant at Curtain Wall to Metal Cladding Interface, Linking Building



Figure 4.4.38 Sealant at Penetration, Fieldhouse

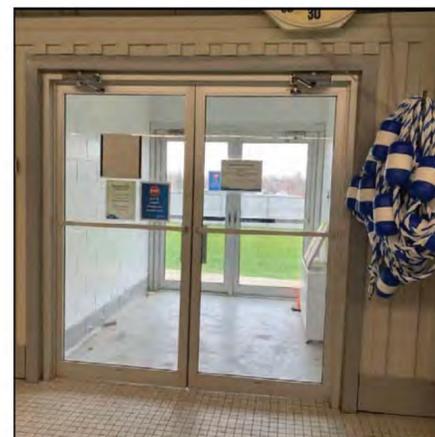


Figure 4.4.39 Entrance Doors, North Elevation



Figure 4.4.40 Main Entrance Doors, Linking Building



Figure 4.4.41 Gaps at Service Doors



Figure 4.4.42 Damage to Door Exteriors, Fieldhouse

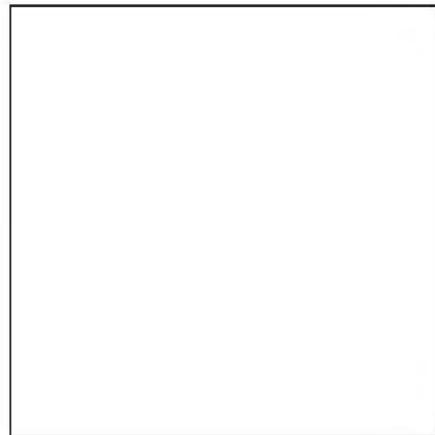


Figure 4.4.43 photo removed



Figure 4.4.44 Loose Cap Flashing, West Elevation

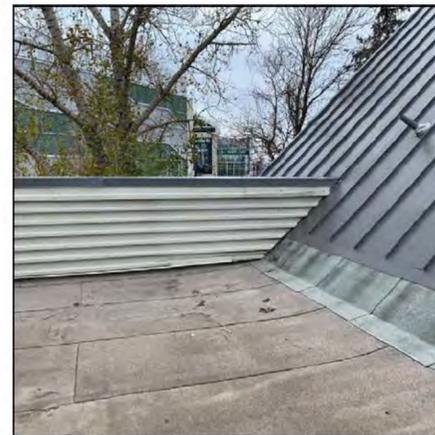


Figure 4.4.49 Wear of Modified Bituminous Membrane, South Roof



Figure 4.4.50 Staining, South Roof

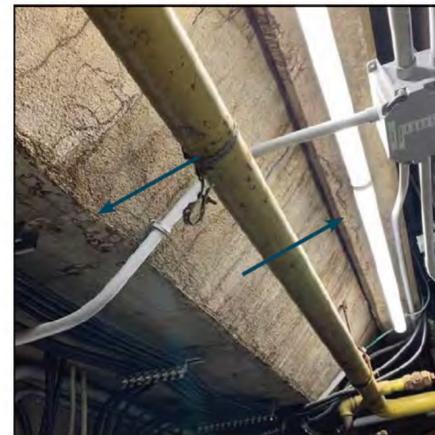


Figure 4.4.51 Signs of Water Leakage Below South Roof



Figure 4.4.52 Splitting of Roofing Membrane at Penetration, South Roof

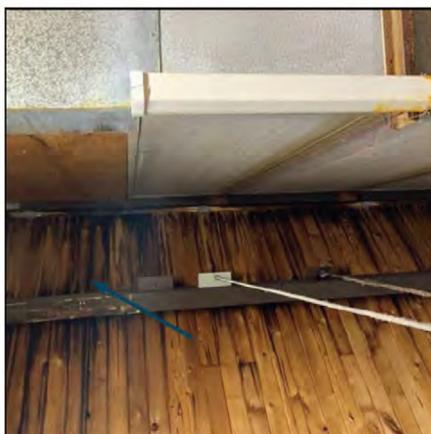


Figure 4.4.45 Water Staining at Roof Deck



Figure 4.4.46 Damaged Downspout, West Elevation



Figure 4.4.47 Locally Damaged Eavestrough and Downspout Discharging at Base of Building, Linking Building Canopies

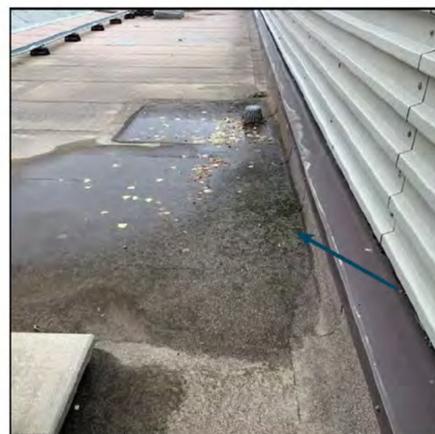


Figure 4.4.48 Ponding with Vegetation, South Low Sloped Roof



Figure 4.4.53 Ponding at EPDM Membrane Roofing, Linking Building

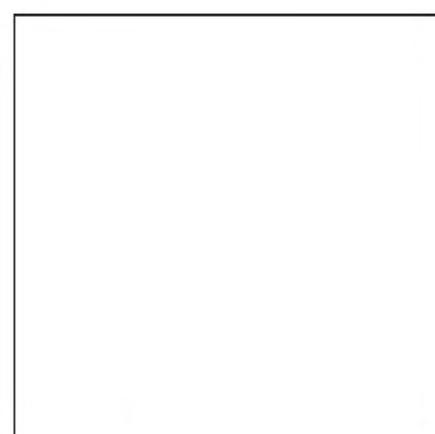


Figure 4.4.54 Photo removed



Figure 4.4.55 Ponding at Crawspace likely due to a glycol leak.



Figure 4.4.56 Debonding of Permalon Membrane, Crawspace

Section 5.0 Structural

5.1 Executive Summary

The Lawson Aquatic Facility is a single storey timber frame structure, with a small mezzanine at the west end of the building. The building structure is generally described as follows:

- The superstructure consists of primary glulam arch frames supporting wood purlins and a wood tongue & groove roof deck (Figure 5.3.1). The glulam arch frames are supported by concrete buttresses at the building perimeter which are, in turn, supported on pile caps and battered piles.
- The mezzanine floor comprises precast concrete hollow core planks supported by a combination of steel beams and load bearing masonry block walls.
- The pool construction consists of cast-in-place reinforced concrete walls and floor and are supported on a grid of concrete piles.
- The deck surrounding the pool is a suspended slab comprising 5-inch concrete topping on 24-gauge v-rib pan supported on open web steel joists (OWSJ). The OWSJ span between the interior pool walls and the building perimeter foundation wall, which in turn, are supported on piles.
- A service crawl space occupies the entire space below the suspended deck slab.

Since its original construction, the following structural repair projects have been performed:

- In 1997, remedial steel reinforcement was added to the pool deck structure to address extreme corrosion in the OWSJ's and the crawlspace deepened.
- In 2017, the wood cribbing around the deep end of the pool was replaced with a structural steel and wood

lagging shoring system. This cribbing replacement project was part of a major excavation and refurbishment of the entire crawlspace to address soil failure and water infiltration.

- Structural repairs have also been completed to the diving tower due to rotten sections of the wood framing
- These structural repairs were performed to extend the service life of the structure for another 10-15 years with the intent to re-assess the area at that time to ensure the repair remains adequate.
- This current conditions assessment of the structure concluded that most structural components are performing adequately except for the main floor structure and the elevated dive tower. It was recommended that the main floor is replaced in the near future, and the dive tower monitored with possible repairs in the short term.

5.2 Condition Survey

Fast + Epp Structural Engineers and BBK Engineering visited the Lawson Aquatic Centre on July 22nd, 2021 to undertake a visual survey of the existing structure with the purpose of identifying the current condition, including any major deficiencies, and provide repair recommendations as/where required. We also note that BBK Engineering is very familiar with the Lawson Aquatic Centre, having completed various remedial works to the existing structure in the past. Our structural observations are as follows:

Superstructure

Observations to the main wood framed superstructure were taken from the pool deck area and the upper mechanical room above the mezzanine level. Minor water staining on the underside of the wood roof decking was

noted, which appears to be caused from condensation within the humid pool environment. This appears to only be surface staining which we anticipate has not compromised the structural integrity of the decking.

The primary glulam frames and purlins appear to be in good condition. In the areas observed, the glued laminations did not display any signs of delamination or material degradation due to moisture ingress. The steel purlin connections generally appeared to be in good condition without any significant signs of corrosion or delamination of the paint coating (Figure 5.3.2). Overall, the main wood superstructure which forms the shell of the building appears to be performing adequately but would require a re-finish to renew its life.

Mezzanine

Most of the mezzanine structure was not viewable, however we did not observe any deficiencies within the architectural finishes that would suggest movement or any underlying structural deficiency. The precast concrete floor panels, load bearing block walls and steel support structure all appeared to be in good condition.

Diving Tower / Walkways

Recent repairs to the bottom of the main diving tower support (Figure 5.3.3) included removal of the rotten portion of the column bases, a new elevated concrete base, and a new steel base connection. This repair and support condition appear to be in good condition. Remaining support column bases (Figure 5.3.4) appear to be in fair condition with softer wood material near the bottom of the columns. We recommend monitoring these column bases with a view to undertaking a repair in the near future, similar to what was completed for the

main tower support base.

Main Floor

Most of our main floor observations were taken from the underside within the crawlspace area. Here we were able to observe the remedial steel reinforcement added in 1997 (Figure 5.3.6 / Figure 5.3.7) complete with the new concrete sonotube columns and support piles. This reinforcement was added to relieve floor load from the adjacent corroded steel floor joists (Figure 5.3.10). During our review we also observed mild corrosion to some of the new remedial steel beams (Figure 5.3.9) and to the connections at the concrete foundations (Figure 5.3.8). Currently the corrosion is not severe; however, we recommend that the corrosion is cleaned to bare steel and a new protective coating be applied in the near future.

Areas below the change rooms and administration area were not reinforced in 1997 and were observed to have significant corrosion to the underside of the steel floor pan as well as mild corrosion to the OWSJ's (Figure 5.3.11). This unreinforced main floor area is in poor condition and should be re-assessed in the near future for possible reinforcement or replacement. This work would necessitate significant intervention to access and construct.

Overall, the main floor system can continue to perform in the short term. However, with the ongoing deterioration of the floor structure, we would recommend a full replacement of the main floor structure to ensure the longevity of the facility and to maintained safety of the building occupants.

Pool Structure

Based on observations from the exterior side of the exposed pool walls,

the pool structure appears to be in good condition. We did not observe any cracking that would suggest differential movement of the pool foundations, or failure due to the hydrostatic pressure from the pool water.

The new steel and lagging shoring system around the deep end of the pool appears to be in excellent condition given the recent installation (Figure 5.3.12). This shoring was installed to replace the failed original wood cribbing, and to maintain access to the exterior of the deep end pool walls. Some of the original wood cribbing (Figure 5.3.13) remains in place where the deep end recedes to the shallow side of the pool (Figure 5.3.13). This cribbing appears to be in good condition.

Foundations

Throughout the building we did not observe deficiencies or signs that would suggest major structural issues within the deep foundations of the building. Therefore, it is our opinion the pile foundations are performing adequately and remain in good condition.

Concrete grade beams, floor beams and pile caps for the most part appear to be in good condition. We did however observe a crack at a tee intersection of two floor beams (Figure 5.3.14). This either appears to be cracking due to shear or caused from internal pressures of corroded rebar. We recommend that in the near future this beam intersection is reinforced with steel plate to ensure adequate shear transfer and structural integrity.

Reference or Number	Components	Description of Systems	Condition on P.F.G.E.	Age in 2021 Estimated (E) Actual (A)	Recommendation	Year 1	Year 2 - 5	Year 6+
Structural								
S1.1	Superstructure	The superstructure consists of primary glulam arch frames supporting wood purlins and a wood tongue & groove roof deck.	G	A - 46 Years (1975)	Gluelam structure requires periodic review for checking and cracking. None was noted at this time. The exposed decking requires refinishing to ensure it's continued viability, although no issues were noted in the visual assessment. Refinishing is an architectural item.			
S2.1	Mezzanine	The mezzanine floor comprises precast concrete hollow core planks supported by a combination of steel beams and loadbearing masonry block walls.	G	A - 46 Years (1975)	This is included for information, no work is required based on the visual review.			
S3.1	Diving Tower/ Walkways	The diving tower and walkways are comprised of wood timber framing and wood plank decking.	G	A - 46 Years (1975)	Some remedial work has been completed. Ongoing monitoring for rot and deterioration particularly at the bases is required and it is likely that within a 10-year period a more significant intervention is likely to be required to refurbish and repair.			\$150,000
S4.1	Main Floor	The deck surrounding the pool is a suspended slab comprising 5-inch concrete topping on 24-gauge v-rib pan supported on open web steel joists (OWSJ). The OWSJ span between the interior pool walls and the building perimeter foundation wall, which in turn, are supported on piles. A service crawl space occupies the entire space below the suspended deck slab.	P	A - 46 Years (1975)	Replacement of the main floor pool deck structure including the concrete on metal deck and open web steel joists. Reinforce existing floor system below west admin and change room area. This is remedial work and not a full replacement cost and would extend the life of the facility.		\$2,000,000.00	
S5.1	Pool Structure	The pool construction consists of cast-in-place reinforced concrete walls and floor are supported on a grid of concrete piles	G	A - 46 Years (1975)	No work required unless tank replacement is contemplated			
S6.1	Foundation	The glulam arch frames are supported by concrete buttresses at the building perimeter which are, in turn, supported on pile caps and battered piles	G	A - 46 Years (1975)				
					Total anticipated costs		\$2,000.00	\$150,000.00
					Total			\$2,150,000.00



5.3 Photographs



Figure 5.3.1 Roof Structure



Figure 5.3.2 Roof Purlin Connection

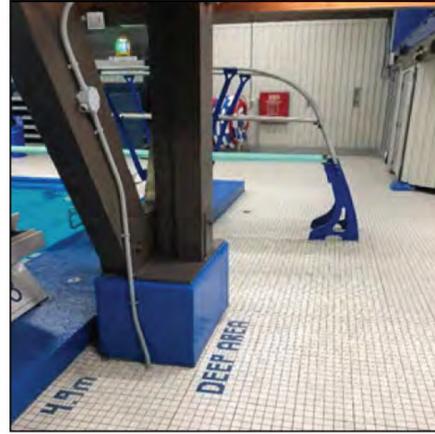


Figure 5.3.3 Main Diving Tower Support Columns

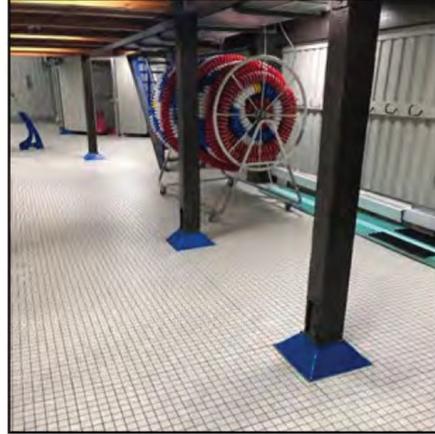


Figure 5.3.4 Remaining Diving Tower Support Columns



Figure 5.3.9 Steel Reinforcing Beam



Figure 5.3.10 Corroded Steel Floor Joist



Figure 5.3.11 Underside of Main Floor Corrosion



Figure 5.3.12 New Deep End Shoring



Figure 5.3.5 Diving Tower



Figure 5.3.6 Main Floor Reinforcing Foundations



Figure 5.3.7 Main Floor Steel Reinforcing



Figure 5.3.8 - Beam Connection

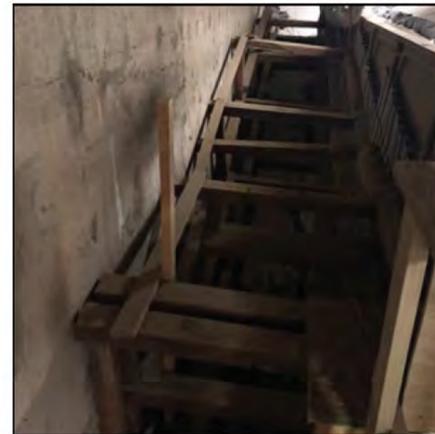


Figure 5.3.13 Existing Remaining Wood Cribbing



Figure 5.3.14 Concrete Floor Beam

Section 6.0 Mechanical

6.1 Executive Summary

The LAC has had a series of mechanical system renovation and upgrades over the years to facilitate the ongoing operations of the facility. These range from replacement of pool systems to some HVAC upgrades. There remains a list of systems that require remedial work to keep the facility operational over the next 10-15 years or beyond. These systems will improve operations and to some extent the energy efficiency of the systems but it will not be as effective as a system in a new building due to the holistic nature of building operations. The systems that have been replaced have been constrained by budget and somewhat by space limitations within the existing building.

The building requires ongoing upgrades to the building systems as well as the pool systems including replacement of piping. The make-up air system is subject to issues during winter months due to condensation and freezing and is in need of replacement and relocation. The plumbing fixtures do not meet contemporary standards for low flow, hands free operation and should be replaced. The building is not sprinklered, and any major renovation would likely require the installation of sprinklers. The overall remedial work will cost in the \$5.5 to \$6m range based on preliminary costing.

6.2 Facility History

The LAC natatorium HVAC distribution system was upgraded in 2014 to distribute the ventilation more evenly, draw exhaust air from low level (previously it was drawn from the apex of the roof), introduce trichloramine exhaust from the deck level, and upgrade some of the pool circulation components.

The pool heating boiler plant was replaced in 2015 as the previous plant had

reached end of life. The replacement plant introduced a measure of redundancy to the system.

The teaching pool was renovated in 2017 to separate it hydraulically from the lap pool. The teach pool received its own heat exchanger, filters and circulation system so that it could operate independently from the lap pool but maintains a valved connection with the larger pool to allow quick filling after the teach pool is drained.

In parallel with the work on the teach pool, the fitness room HVAC was also renovated in 2017 to replace the existing equipment and add cooling. Also in 2017, the crawlspace ventilation system was updated and upgraded to improve air flow and air quality in the crawlspace.

In 2018, the building boiler system that provides heat to the building systems was replaced as the equipment had reached end of life. In a parallel project in 2018, the natatorium radiant tube heating system was renovated and upgraded as the equipment was nearing end of life and had been the source of complaints over the years.

MacPherson Engineering Inc. completed a visual (non-destructive) site inspection on October 25, 2021 at the Lawson Aquatic Centre, in Regina, SK to review the current status of the mechanical systems, which have been reviewed with respect to their age and current condition and performance. Each system or major component has been evaluated separately, and recommendations have been divided into categories as follows:

- Items that need to be repaired due to Code or Life & Safety,
- Items requiring immediate repair or replacement (within the next year),
- Items that should be budgeted for

repair or replacement in the future (2 – 5 Years), and

- Long-term replacement items (items that should be budgeted for repair or replacement more than 6 years in the future). The long-term replacement items should be re-evaluated closer to the estimated ages where noted.

The review was limited to the equipment serving the natatorium, fitness spaces, change rooms, admin spaces and support spaces. It doesn't include a review of the existing fieldhouse or the lobby in between the natatorium and fieldhouse buildings.

This report has been prepared by MacPherson Engineering and the AME Consulting Group for the exclusive use of the design team and the City of Regina. The material in this report reflects the best judgment of MacPherson Engineering and the AME Consulting Group with the information made available to them at the time of preparation. Any use a third party may make of this report, or any reliance on or decisions made based upon the report, are the responsibility of such third parties. MacPherson Engineering and the AME Consulting Group accept no responsibility for damages suffered by any third party as a result of decisions made or actions taken based upon this report.

6.3 Recommendations

Immediate Recommendations

- It is recommended to immediately confirm if a gas-tight motorized damper is installed on the fresh air intake to the gas chlorine room and install one if none currently exists.

Recommendations for Next Year:

- Budget for replacement of a portion of the existing hydronic heating piping as it is showing signs of its age and it is

anticipated that sections will require replacement regularly until the entire system is replaced.

- Budget for design and installation of a combustion air fan and ductwork to serve the natatorium radiant heating system. This will extend the life expectancy of the radiant system as it will be no longer drawing combustion air from the natatorium directly, which is corrosive.

Recommendations for Next 2-5 Years:

- Replace the existing facility make-up air units serving the natatorium, washrooms, change rooms and lobby/admin areas. The existing location of these units experiences issues every winter as the units pull air from the room, which in turn communicates with the exterior directly via a series of louvers. Snow and frost builds up and frequently blocks the air intake. These units should be replaced and relocated to a location so that this situation is avoided.
- Replace the existing domestic hot water system, which includes DHW heaters, a storage tank, mixing valves and recirculation pumps. The system components have reached end of life and should be scheduled for replacement.
- Consideration should be given to replace the existing plumbing fixtures in the facility as they are mostly manually operated, high flow fixtures. Hands-free, low-flow options should be considered to reduce the facility's water consumption.
- As originally recommended, it should be budgeted to replace the existing vacuum DE filter tank in the future as spare parts become harder to acquire. This would be a superior technology and would come with a higher cost than the DE tank.
- Chemical controllers replaced in 2014 and metering pumps that appear to pre-date that renovation should be

budgeted for replacement as they near the end of their recommended service lives.

- Pool deck drains appearing to be corroded should be replaced. Drain bodies should be monitored and replaced if leaking.
- Both the lap pool circulation pump should be budgeted for replacement in 3-5 years.
- The following should be budgeted for replacement in 2-5 years as they have likely reached end of life:
 - » Hot tub jet pumps
 - » Pool sparger system (This device aerates the pool and breaks surface tension for diving)
 - » Filter room exhaust fan
 - » Filter room eyewashes
 - » Chemical mixing agitator and tanks
 - » Chlorine gas detector
 - » Pool make-up water line and meter

Recommendations for Long-term (6+ Years):

The following should be budgeted for full replacement in the long-term:

- Hydronic piping
- Event, staffroom and storage area HVAC systems
- Fitness HVAC system
- BMS controls system
- Domestic water piping
- Sanitary drainage piping
- Fire protection standpipe system
- Teach pool and hot tub filters UV filters/lamps on pool circulation systems
- Pool heat exchangers
- Pool piping, both in the crawlspace and in the filter rooms
- Teach pool and hot tub circulation pumps
- Pool heating boilers
- Teach pool and heating boiler circulation pumps



Reference Number	Component	Description of System	Condition P,F,G,E*	Age in 2021 Estimated		Recommendation	Capital Expenditure Forecast		
				(E)	Actual (A)		Year 1	Years 2 - 5	Years 6+
Mechanical - Building									
M1	Building Heating System								
M1.1	Boilers & Pumps	This plant includes a single Lochinvar 85% efficient hot water boiler with a constant volume primary boiler pump and two ECM motor equipped secondary system pumps.	G	6-10 years	The boiler plant is relatively new and in good repair.	\$0.00	\$0.00	\$0.00	
M1.2	Radiation & heating element piping system	This is the heating piping network that supplies perimeter radiation, entrance force-flow units, and a supplementary pool ventilation system reheat coil	F	E - 45 years	Most of the distribution piping systems are original and will require replacement. The pool ventilation system reheat coil is damaged and off line and requires replacement.	\$10,000.00		\$500,000.00	
M1.3	Natural Gas System					\$150,000.00			
M2	Building Ventilation & Air-Conditioning Systems								
M2.1	Crawlspace Ventilation system	This system includes an electric, crawlspace-located make-up air unit, two crawlspace-located exhaust fans and related outside air & exhaust ductwork.	G	A-4 years	The system is relatively new and in good repair.	\$0.00	\$0.00	\$0.00	
M2.2	Washrooms, Change Rooms, & Lobby Ventilation	These spaces are ventilated from direct-fired make-up air unit MUA-1 located on the ventilation unit mezzanine. The spaces are exhausted by roof-mounted exhaust fans on the roof of the north mechanical room	F	E - 10 years	The make-air unit MUA-1 is located on the louvred mezzanine. During windy winter conditions, frost forms and snow collects all around the equipment and electrical switchgear and sometimes blocks the equipment outside air intakes. This system should be changed to an indirect-fired make-up air unit located in a suitable outdoor location at grade, with new ductwork to the conditioned areas.		\$200,000.00		
M2.3	Pool Cell Make-Up Air ventilation units	Conditioned outside air for ventilation is supplied to the main pool area by two direct-fired make-up air units MUA-2 & MUA-3.	F	E - 10 years	The make-air units MUA-2 & 3 are located on the louvred mezzanine. During windy winter conditions, frost forms and snow collects all around the equipment and electrical switchgear and sometimes blocks the equipment outside air intakes. These units should be changed to indirect-fired make-up air units located in a suitable outdoor location at grade. The existing fabric ducts in the natatorium were installed in 2014 and should last for many years provided they are properly maintained and periodically cleaned.		\$750,000.00		
M2.4	South Event, Staff, Electrical Room & Storage Areas HVAC system	These spaces are heating, ventilated and air-conditioned with packaged heat/cool unit RTU-1. The main electrical room is exhausted to the outdoors by a roof-mounted exhaust fan.	G	E - 10 years (RTU-1) A 7 years (Exhaust Fans)	This system is functioning as intended. Equipment replacement should be planned for approximately 8 years time.			\$200,000.00	
M2.5	Pool Cell Radiant Tube Heating System	The main pool cell deck area is heated with a gas-fired radiant tube vacuum heating system.	G	A-3 years	This system currently draws air from the space. Chlorine in the air will cause corrosion of the radiant system components over time. An outdoor combustion air fan & ductwork should be installed.	\$20,000.00			

Reference Number	Component	Description of System	Condition P,F,G,E*	Age in 2021 Estimated		Recommendation	Capital Expenditure Forecast		
				(E)	Actual (A)		Year 1	Years 2 - 5	Years 6+
Mechanical - Building									
M2.6	Fitness Mezzanine HVAC System	The Fitness Mezzanine area is conditioned with a ventilation unit mounted on a mechanical mezzanine above the fitness area ceiling.	G	A - 4 years				\$50,000.00	
M2.7	Sauna Heaters							\$20,000.00	
M2.8	Unit Heaters							\$30,000.00	
M2.9	Various fans	Circulation and Exhaust						\$60,000.00	
M3	Controls - Building Mechanical Systems								
M3.1	BMS System	The mechanical building ventilation systems and heating plant are controlled by a Honeywell DDC / pneumatic system.	F	E - 10 years	Many of the radiation zone valve actuators and thermostats are pneumatic. We recommend that the BMS be updated to a current Niagara N4 based controls system.			\$200,000.00	
M3.2	Compressor	Air compressor and tanks for pneumatic system	F		This is approaching end of life and scheduled for replacement.			\$75,000.00	
M4	Building Plumbing	Roof drain piping is asbestos containing.							
M4.1	Domestic Hot Water Boiler Plant	The domestic hot water boiler plant includes two atmospheric hot water boilers, a 1000 gal. storage tank, tempered water mixing valves and recirculation pumps.	F	E - 25 years	The domestic hot water boilers, storage tank, pumps and accessories have surpassed their life expectancy and should be scheduled for replacement			\$250,000.00	
M4.2	Domestic Water Piping	The domestic water system utilizes a combination of copper piping with soldered joints and copper piping with press-fit joints within the Boiler Room.	F	E - 5 to 45 years	Most of the domestic water copper piping distribution appears to be original. Replacement of the older piping system should be considered.			\$250,000.00	
M4.3	Sanitary Piping	Most plumbing fixtures are on the main level with sanitary drains dropping into piping within the crawlspace.	G	A - 3 years	The copper and cast iron sanitary mains within the crawlspace were recently replaced with PVC mains. Sanitary piping within main floor wall cavities is likely originally installed copper or cast iron and should be replaced when fixtures are upgraded.			\$75,000.00	
M4.4	Plumbing Fixtures	Includes showers, urinals, water closets and lavatories, bottle fillers	G	E - 2 to 20 years	The urinals, water closets and lavatories are white vitreous china. The urinals and water closets re equipped with manually operated flush valves and the lavatories are equipped with manually operated lever handles. Consideration should be given to replacing these fixtures with low flow fixtures with electronic hands-free trim. The showers have institutional vandal-proof heads with tempered water manual metering valves.			\$180,000.00	
M4.5	Sump Pump							\$15,000.00	
M5	Fire Protection								

Reference Number	Component	Description of System	Condition P,F,G,E*	Age in 2021 Estimated (E) Actual (A)	Recommendation	Capital Expenditure Forecast		
						Year 1	Years 2 - 5	Years 6+
Mechanical - Building								
M5.1	Standpipe System	The Lawson facility does not have sprinklers and is equipped with firehose / extinguisher cabinets	NA	E - 5 to 45 years	We assume that the firehose cabinets and extinguishers function properly. If a code assessment indicates that sprinklers are required, They will have to be installed. Sprinklers would be done in conjunction with architectural work and would be \$500,000 of the total amount listed.			\$850,000.00
M6	Pool Systems and Equipment	Existing tank has some features that were previously raised in the 2014 BCA including the presence of a single main drain and the operation of the skimmer wiers, which are of some concern still. Current codes surrounding anti-entrapment require multiple main drains, sized and spaced apart following prescribed requirements.			If the existing facility is integrated in some way with the new facility, it would be required that these items be addressed to ensure the new facility complies with current Code requirements as the existing pool would no longer be grandfathered.	\$25,000 - \$40,000 for additional main drains/remediation of existing main drains to meet current Code. \$15,000 per skimmer replacement should the encased skimmer body need to be replaced in full due to condition or lack of parts available.		
M6.1	Lap Pool Filter	Original vacuum DE open tank filter.			Availability of spare parts for septums, etc., is challenging as time goes on and manufacturers stop making them. Recommend budgeting for replacement with 3-7 years as previously recommended in 2014.		\$600,000.00	
M6.2	Teach Pool Filters	The teach pool was separated from the lap pool circulation/filtration system in 2017. New cartridge type filters were installed at this time.	E	A - 4 years	Filters are to be replaced as they fail, but should last for 5+ years. Cartridge elements are to be replaced in accordance with manufacturer's recommendations. Cartridge and cleaning cost provided but not included in total.	\$500-1000 per year per filter for cartridges and cleaning		\$35,000.00
M6.3	Hot Tub Filters	Existing cartridge filters	G	E - 8 years	Filters are to be replaced as they fail, but should last for 5+ years. Cartridge elements are to be replaced in accordance with manufacturer's recommendations. Cartridge and cleaning cost provided but not included in total.	\$500-1000 per year per filter for cartridges and cleaning		\$50,000.00
M6.4	Pool UV Lamps	UV filters were added to the lap pool and hot tub in 2014 and to the teach pool in 2017	E	A - 4 years (teach) A - 7 years (lap and hot tub)	Generally appear to be in good shape as expected. Recommend monitoring surface (exterior) and crevice (interior) corrosion.			\$35,000.00
M6.5	Pool Heat Exchangers	New heat exchangers were installed for the lap pool and hot tub in 2014 and to the teach pool in 2017	E	A - 4 years (teach) A - 7 years (lap and hot tub)	Generally appear to be in good shape. No issues reported.			\$15,000 - \$20,000
M6.6	Pool Chemical Controllers	New BECSys5 chemical controllers were installed for all three pools in 2014.	G	A - 7 years	No issues reported. However, the controllers are nearing their end of recommended service life (8 - 10 years), so they should be monitored and budgeted for replacement.		\$10,000.00	
M6.7	Hot Tub Chemical Feed Pump	Metering pump appears to be the same pump that was in service in 2014 during the lap pool work.	F	E - 10 years	No issues reported. However, the pump is likely to have reached the end of its recommended service life (7-10 years), so they should be budgeted for replacement.		\$3500 - \$5000	
M6.8	Lap and Teach Pool Chemical Feed Pumps	Metering pump appears to be the same pumps that were in service in 2014 during the lap pool work.	F	E - 10 years	No issues reported. However, the pumps are likely to have reached the end of their recommended service life (7-10 years), so they should be budgeted for replacement.		\$3500 - \$5000	

Reference Number	Component	Description of System	Condition P,F,G,E*	Age in 2021 Estimated (E) Actual (A)	Recommendation	Capital Expenditure Forecast		
						Year 1	Years 2 - 5	Years 6+
Mechanical - Building								
M6.9	Pool Deck Drains	Assumed to be original deck drains. Possibly replacement drain strainers.	F to P	E - 30+ years	No overt issues observed. Strainers that are observed to be corroded should be replaced. Drain bodies observed to be corroded should be monitored and replaced if found to be leaking in the future.		\$5,000.00	
M6.10	Pool Piping - Crawlspace	Generally plastic piping that is either suspended from the pool deck above, or supported from below on grade. Piping that wasn't replaced in 2014 to accommodate the trichloramine exhaust system is assumed to be quite old. It is not clear if this is original piping or not.	F	E - 20+ years	No issues observed on site with plastic piping, which generally has an accepted/expected lifespan of at least 50 years. Corrosion can be seen on anything metal in the crawlspace that hasn't been epoxy coated or otherwise treated.			\$275,000.00
M6.11	Lap Pool Circulation Pump	Pump was replaced around 12 years ago in full and was remediated in 2014 to accommodate the installation of the UV filter in the circulation line.	G	E - 12 years	No issues noted. Pump is within it's recommended service life of 10-15 years. Replacement should be budgeted within the next 3-5 years.		\$15,000.00	
M6.12	Spray Bar Pump	The age of this pump was not determined during the site review, but based on the appearance of the pump, it is	F	E - 12+ years	No issues noted. Pump is within it's recommended service life of 10-15 years. Replacement should be budgeted within the next 3-5 years.		\$7,500.00	
M6.13	Teach Pool Circulation Pump	Pump was installed in 2017 during the Teach Pool renovation.	G	A - 4 years	No issues noted. Pump has approximately 6-11 years left in its recommended service life with routine maintenance.			\$10,000.00
M6.14	Hot Tub Circulation Pump	Pump was installed in 2014.	G	A - 7 years	No issues noted. Pump has approximately 3-8 years left in it's recommended service life with routine maintenance.			\$370,000.00
M6.15	Hot Tub Jet Pumps	Pumps appear to be the same pumps that were in service in 2014.	F	E - 10 years	No issues reported. However, the pumps may have reached the end of their recommended service life (10-15 years), so they should be budgeted for replacement.		\$10,000.00	
M6.16	Pool Heating Boilers	Lochinvar condensing boilers were installed in 2015 to replace the previous pool heating boiler, which had reached end of life.	G	A - 6 years	No issues reported. Boilers should have a service life of between 15 - 20 years with proper and regular maintenance.			\$150,000.00
M6.17	Teach Pool Heating Water Circulation Pump	Pump was installed in 2017 during the Teach Pool renovation.	G	A - 4 years	No issues noted. Pump has approximately 6-11 years left in it's recommended service life with routine maintenance.			\$10,000.00
M6.18	Pool Heating Boiler Circulation Pumps	Pumps were installed in 2015 during the pool boiler renovation.	G	A - 6 years	No issues noted. Pump has approximately 4-9 years left in their recommended service life with routine maintenance.			\$10,000.00
M6.19	Pool Sparger System	System includes an air compressor, air tanks, valving, and controls. The age of the system was not determined on site.	F	E - 10+ years	No issues were noted, but the equipment is showing significant signs of corrosion and is likely close to its recommended service life limit. It is recommended to budget for replacement.		\$50,000.00	
M6.20	Pool Piping - Filter Rooms	Piping that wasn't replaced in 2014, 2015 or 2017 to accommodate the renovation work is assumed to be quite old. It is not clear if this is original piping or not.	F	E - 20+ years	No issues observed on site with plastic piping, which generally has an accepted/expected lifespan of at least 50 years. Corrosion can be seen on anything metal in the crawlspace that hasn't been epoxy coated or otherwise treated.			\$200,000.00
M6.21	Filter Room Exhaust Fan	Fan is a thru-wall type and is the same fan that was installed during the 2014 renovation work.	P	E - 10+ years	Fan and associated grilles are showing signs of severe surface corrosion due to the type of air that is being exhausted. It is recommended that this fan be budgeted for replacement.		\$3,500.00	

6.5 Photographs

Reference Number	Component	Description of System	Condition P,F,G,E*	Age in 2021 Estimated		Recommendation	Capital Expenditure Forecast		
				(E)	Actual (A)		Year 1	Years 2 - 5	Years 6+
Mechanical - Building									
M6.22	Natorium Ductwork in Filter Rooms	Ductwork was installed during the 2014 renovation to exhaust the natatorium at low level.	E	A - 7 years		Ductwork appears to be generally free from corrosion and should last many years.			
M6.23	Eyewashes	Two eyewashes were observed on site - one is a fixture type that is hard piped to domestic water (located above the DE filter pit). The other is a portable bottle type that is located in the bulkfeed chemical room.	F	E - 10+ years		The bottle type eyewash should be compared with current local OSHA requirements and may need to be replaced as it appears to be fairly old. The fixture type eyewash is showing signs of corrosion and should be budgeted for a replacement.		\$5,000.00	
M6.24	Chemical Storage (non-chlorine)	The non-chlorine chemical storage, mixing and feed room adjacent to the DE filter pit consists of storage, a make-up water line, plastic mixing tanks and a large propeller type agitator.	F	E - 10 years		No issues noted. Equipment and tanks appear to be the same that were in service during the 2014 renovation. The mixer is showing signs of corrosion.		\$7,500.00	
M6.25	Chlorine Gas Detector	Chlorine detector is a QEL brand detector.	F	E - 10 years		No issues noted. Detector should be calibrated based on manufacturers recommended interval and replaced as recommended by manufacturer.	\$500.00	\$5,000.00	
M6.26	Gas Chlorine System	Original primary disinfection system. In 2014 it was noted that there was no motorized damper on the fresh air inlet to the room. If not installed <u>vet. this should be done immediately</u> .	F	E - 10 years		No issues noted, aside from the motorized damper note.	\$5,000.00		
M6.27	Pool Make-up Water - Lap Pool Filter	Metal piping to provide pool water make-up. Non-automated.	P	E - 10 years		No issues noted, however, fill is understood to be manually operated. Piping is showing signs of corrosion and is recommended for replacement (including meter) within 1-2 years.		\$4,000.00	
TOTAL BY YEAR							\$180,000.00	\$2,512,500.00	\$2,660,000.00
TOTAL							\$5,352,500.00		



Figure 6.5.1 Lochinvar Heating Boiler



Figure 6.5.2 Boiler Circulation Pump

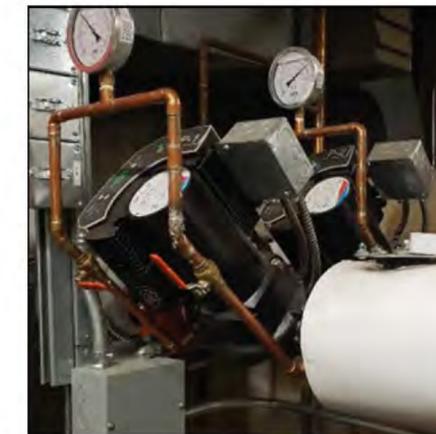


Figure 6.5.3 Secondary Heating Pump



Figure 6.5.4 Freeze-Damaged Pool Ventilation Reheat Coil



Figure 6.5.5 Crawspace Make-Up Air Ventilation Unit



Figure 6.5.6 Crawspace Ventilation Ductwork



Figure 6.5.7 MUA-1 Make-Up Air Unit



Figure 6.5.8 Pool Area Make-Up Air Units MUA-2 and MUA-3



Figure 6.5.9 Roof-Top Unit Rtu-1



Figure 6.5.10 Pool Cell Radiant Heating System



Figure 6.5.11 Fitness Area HVAC Unit



Figure 6.5.12 Domestic Hot Water Boilers



Figure 6.5.17 Water Closet with Manual Flush Valve



Figure 6.5.18 Urinals with Manual Flush Valves



Figure 6.5.19 Drinking Fountain / Bottle Filler Units



Figure 6.5.20 Firehose / Extinguisher Cabinets



Figure 6.5.13 Domestic Hot Water Piping in Boiler Room



Figure 6.5.14 Crawspace Sanitary Piping

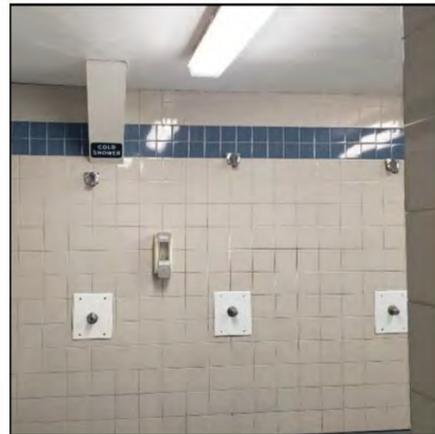


Figure 6.5.15 Showers With Tempered Water Metering Valves



Figure 6.5.16 Lavatories With Single Lever Handles

Section 7.0 Electrical

7.1 Executive Summary

The Lawson Aquatic Centre (LAC) electrical systems have had some spot upgrades where necessary however, a large majority of the equipment is dated technology or past the expected lifetime of the equipment. Recommended upgrades in areas of sub distribution, lighting, motor control, communication systems, fire alarm, security, emergency lighting, exit lighting. These items are reviewed in further detail within the report. The facility has been reviewed in terms of their operational condition, compliance to both the Canadian Electrical Code, National Building Code, and other relevant standards such as FINA. This report is based on discussions with CoR personnel and a comprehensive site review.

The main distribution is a 400A 347/600V 3 phase 4 wire system and is appropriately sized based on utility consumption reports received. The board appears to be original to the buildings construction and is showing signs of degradation due to corrosion and age. Replacement parts are hard to come by and it has reached end of life, so it is recommended that it get replaced as soon as possible. Most of the sub distribution is also original to the building; however, some new distribution has been installed over the years which is in good condition. All distribution that is original should be replaced with new with 25% spare capacity and breakers. The distribution that has been added recently should undergo regular maintenance routines along with thermal scans.

The interior lighting has had spot upgrades over the years, with the most significant upgrade in the natatorium. The natatorium has been converted to LED and meets the minimum code requirements for lighting in pools relating to light levels, uniformity, and glare. The

balance of the facility is fluorescent technology with T8 lamps as the primary source of light. For energy and maintenance considerations, upgrading the remainder of the fixtures to LED would be of cost benefit. The lighting control in the natatorium has been upgraded to a nLight system which incorporates scene control and dimming to provide flexibility with the space and energy efficiency. The system could be further expanded to accept the control of the balance of the facility and would offer energy reductions along with expanding the life of the light fixtures. Occupancy and vacancy sensors would reduce the energy consumption and extend the life of the fixtures. The exterior lighting is illuminated by high pressure sodium sources for wall packs and pole mounted lighting. Some of the fixtures are not operational and need to be replaced with new LED.

The life safety systems including exit lighting, emergency lighting, and fire alarm, have been maintained over the years and aligned with the current codes. Exit lighting was recently upgraded and no further recommendations are offered. Emergency lighting is a combination of generator powered base building fixtures and battery packs in combination with remote heads. Ideally these are consolidated to a single system and it provides coverage for all egress paths as per the NBC requirements. The emergency power is limited to emergency lighting and to sump pumps only. This is not best practice for a recreational facility where large number of people could be gathered.

The fire alarm system is tested annually and passes inspection. The conventional system is single stage and a mix of horns and horn strobes in select areas. The system has been augmented over the years to align with the necessary

maintenance upgrades. It is recommended that the system is upgraded to a two-stage system with speaker/strobes as the signalling devices. Speakers on a two-stage system would allow for the operator to investigate issues prior to evacuating the building.

The power to the building has proven to be unreliable. The existing generator allows only for minimal life-safety system operations such as emergency lighting. A stand alone generator sized to suit the owner's requirements for systems and operations in case of a power outage would be part of a redesign project. A new genset would allow for operation of some building HVAC to maintain air supply and some heat to the building. This is not currently a capability of the existing system. A package genset and associated infrastructure would be in the \$250,000 range.

The remaining low voltage systems including data, voice, and security (intrusion, card access, CCTV) are meeting the needs of the facility. The facility does not currently have a card access system. The data system installed is to a Cat 5/6 standard and is distributed in a mix of free air and conduit. The system backbone is a multi-mode fiber which aligns with current industry standards for vertical cabling. Wireless access points (WAPs) are located throughout the facility, expected to provide complete coverage. The data systems seem to be meeting the needs of the users however, additional cable management and an upgraded universal Cat 6 or Cat 6A standard is recommended. The intrusion system and CCTV could be updated to provide additional coverage and align with new technologies.

In conclusion, the electrical systems in the Lawson Aquatic Centre are in need of upgrades to be brought up to industry standards. The upgrades are mostly due to technology advancements over the years and age of existing infrastructure that requires urgent attention. There is a risk various components of the electrical system could fail and require the facility to shut down until the systems can be addressed. If the opportunity presented itself, the entirety of the electrical systems should be replaced with new in order for the LAC to remain functional and in use into the future.