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CITY OF FORT SASKATCHEWAN

HARBOUR POOL CONCEPTS REPORT

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EXECUTIVE SUMMARY

BR2 Architecture was commissioned by the City of Fort Saskatchewan in June 2014 to assist with the development of a Master Plan for the modernization of the Harbour Pool facility. The ultimate goal of the project is to develop a concept plan for future modernization and expansion of the facilities. The City of Fort Saskatchewan has undertaken the task of reviewing the city wide recreation infrastructure with the intent of generating a master plan for providing recreation services to the community which will be implemented over the coming years. The information in this report will be used in conjunction with several other reports completed on various recreation facilities in and around the City of Fort Saskatchewan to determine the best plan of action for each facility and determine how each facility will participate in the future of recreational service to the Community.

This project was separated into two phases; the first exercise was an evaluation of the facility. BR2 Architecture along with engineering sub-consultants representing structural, mechanical and electrical disciplines completed the facility evaluation in September, 2014. The Facility Assessment Report identifies specific life safety and operation deficiencies compared to a current facility of similar size and function. In general terms the assessment team observed that the building is well maintained but is now not able to meet the current aquatic needs of the community. The Harbour Pool, constructed in 1982, is approaching 34 years of service to the community.

The Facility Assessment Report identifies recommended repairs and upgrades with a priority rank and a budget to modernize the facility within the existing footprint. In summary the consultants find the building to be in stable and useable condition and provided ongoing maintenance and equipment upgrades are maintained, the building should continue to be serviceable for the foreseeable future.

The following submission and review of the Facility Assessment Report, the project focused on identifying the operational shortcomings for the facility and to develop a concept for redevelopment of the building based upon stakeholder input. BR2 Architecture met with representatives from the City of Fort Saskatchewan to outline the objectives of the redevelopment and establish the parameters that would be presented within this report.

An initial meeting with the City of Fort Saskatchewan representatives was conducted on July 09, 2014 during which the intent and direction of the report was clarified and initial thoughts and comments were received. The representatives were asked to identify the known operational deficiencies of the facility and what specific improvements would be most beneficial to each of their programs.

With the comments from the City representatives, BR2 architecture visited the Harbour Pool site and conducted the initial facility investigation and interviewed the facility maintenance personal and the pool director. The information received from this meeting was incorporated into the facility evaluation report and set the baseline for the work to follow on the concept development. Once the state of the existing facility was determined, BR2 Architecture and the design team began the process to develop concept redevelopment plans for the aquatics facility. A second review workshop was convened at which point the concept site and floor plans were presented for discussion purposes. Suggestions from the representatives identified further refinements to the concept floor and site plans. The revisions to the concept designs are incorporated in the floor plans contained within this report.

In addition to establishing the modernization and expansion concepts for the Harbour Pool, the consultants reviewed the potential for expanding the number and type of pool bodies to provide for additional recreational amenities as well as program opportunities to the public.

The Harbour Pool is unique from most aquatics facilities constructed in the early 1980s. During that era, the idea of a wave pool was gaining strength and was a popular design amenity considered for new facilities. The Harbour Pool was one such facility that embraced the idea of the wave pool concept and made it integral to the design of the pool tanks. This design feature from the 1980s has lost a lot of it's appeal, not because of the lack of enjoyment it gave to the public, but mainly due to the cost to operate and the impact the design and operations had on the public programming of the pool. The design of the pool required sloping decks and large freeboard walls to contain the waves and keep the water in the pool during the wave generation periods. This undulating deck and large distance from the deck level to the water surface makes it extremely difficult to provided teaching programs to classes, not to mention making access to the pool more difficult than a traditional pool. During wave events the pool became dedicated to only those who wanted to participate, thereby relegating the users who were not comfortable in the waves, i.e. the elderly, young children and those not confident in their swimming abilities, to the sidelines until the wave event was over. Therefore the concept development plan centered around the idea of adding pool bodies that would restore the ability for all users to use the pool uninterrupted and give the pool staff additional program opportunities for the public. The Harbour Pool could be expanded to the south or the east in order to add more flexible and usable program components. In addition to the proposed program pools, the desire for other leisure amenities was raised by the Stakeholders. The concept plan also included the ability to provide waterslides and a surfing machine to increase the amenities offered to the public user. The concept included in this report identifies an initial plan for modernization and expansion that will meet the community's needs for the present and into the future as a Community Aquatics Facility. The plan does anticipate the potential for expansion to either the east or south with the areas designated for the expansion opportunities fitting well into the space available on the site and not impacting existing infrastructure significantly.

The redevelopment plan is a major upgrade to the existing pool and was reviewed to understand the impact of the construction on the operations of the facility. The design does provide opportunities to maintain the operation of the facility during a portion of the construction, however there will be a point when the facility needs to be shut down for potentially up to one year in order to perform the tie in of the 2 pool environments, the pool mechanical and electrical systems, and the renovation of the existing facility. At that time, the City of Fort Saskatchewan would be required to make alternate arrangements for aquatics delivery to their residents.

The modernization and expansion to the Harbour Pool is proposed to the existing facility, with major redesign of the existing change rooms along with an addition concentrated on the south and east sides of the facility. An expansion of 3528 square meters with an additional 2134 square meters of renovation are proposed. The estimated construction time to complete the additions and renovations is 18 -24 months. A construction budget of $19,514,100 is estimated for this facility (2015 dollars).

Harbour pool – Site

1.0 BACKGROUND

In June 2014, the City of Fort Saskatchewan retained BR2 Architecture to assist them in preparing a facility analysis and developing a master plan for modernization of the Harbour Pool facility. BR2 Architecture along with a consulting team of structural, mechanical and electrical engineers met with representatives from the City to review the current facilities.

Representatives from City Operations and the pool operators toured the facility with the assessment team. Historical documents of the facility were made available to the consultants. In addition to the drawings provided, the consultants carried out an as-found measurement of the building to verify the existing dimensions and spaces. Various reports and records outlining upgrades and assessments carried out to date were provided to the consultants.

As part of the initial process, the consultants completed a review of life safety requirements of the current Alberta Building Code and Fire Code identifying deficiencies to the current legislation. Short of specific directives issued from the Local Authority Having Jurisdiction, the requirements of current legislation do not apply to existing facilities. The current requirements of the Alberta Building and Fire Code will be enforced when major renovations or additions are carried out within the buildings.

The objective of the facility analysis was to determine the current condition of the facilities as follows:

.1 Compliance with current building and safety codes.

.2 Building structure including visual observations of foundations, floor slabs on grade, supporting structures, suspended floors and roof assemblies.

.3 Building envelope including exterior walls, doors, windows, parapets, fascia, soffit and roofs.

.4 Interior surface and finishes.

.5 Mechanical HVAC, plumbing and fire suppression systems.

.6 Electrical power, lighting, low voltage and fire alarm systems.

.7 Exterior site hard and soft landscaping.

The facility analysis report summarized the current deficiencies and established recommendations and budgets to maintain the buildings in their current form with minimal allowances for enhancements. Copies of the Facility Analysis Reports dated September, 2014 have been submitted to the City of Fort Saskatchewan for their information and use.

The reports identified a maintenance budget of $1,327,200 (2014 dollars) for the existing Harbour pool. The noted Building Code and service deficiencies have been addressed in the proposed modernizations and expansion concept plans.

2.0 PROGRAM DEVELOPMENT

2.1 Project Methodology

In order to determine the programming requirements and to develop the concept design, BR2 worked together with the following representatives from the City of Fort Saskatchewan and representatives:

.1 <u>Project Management Team</u>

Chair of the Committee
- Troy Fleming, General Manager Infrastructure and Community Services, City of Fort Saskatchewan

Members
- Grant Schaffer, Director Project Management, City of Fort Saskatchewan
  Barb Shuman, Director, Recreation, City of Fort Saskatchewan
  Chris Enders, Manager Facilities Management, City of Fort Saskatchewan
  Kelly Almer, Manager DCC, City of Fort Saskatchewan
  Lindsay Poitras, Aquatics Operations Supervisor, City of Fort Saskatchewan
  Kayla Berehulke, Aquatics Operations Supervisor, City of Fort Saskatchewan
  Ron Hale, Facilities Foreman, City of Fort Saskatchewan

At this time, we would like to thank the committee members in conjunction with the stakeholders, for their valued input and support throughout this concept design development process.

.1 <u>Consultant Team</u>

Architectural/Programming – BR2 Architecture
- Shaun Visser, Partner

Structural Engineering – Protostatix Engineering
- Larp Chitnuyanondh

Mechanical Engineering – Reinbold Engineering
- Reggie Nicholas

Electrical Engineering – MCW Hemisphere Engineering
- Brian Rozak

2.2 Stakeholder Input

The project management team working with BR2 Architecture was responsible for bringing forth the stakeholder input and comments. BR2 met with the Fort Saskatchewan representatives and reviewed the gathered information and proposed program additions and revisions. Through this process each representative had the opportunity to bring forth and raise any issues and or comments regarding the development of the renovation, concept plans and proposed program.

.1 <u>Existing Harbour pool</u>

The deficiencies were recorded as follows:

.1 The main entry is too small.

.2 Change rooms lacking a universal change room.

.3 Pool administration areas over crowded and not conducive to the successful operation and delivery of programs for the facility.

.4 Existing pool tanks hamper functional and effective program delivery due to the sloped deck and the depth of the pools.

.5 There is a lack of drop-in leisure space and activities.

.6 Finishes are starting to require more maintenance and replacement

.7 Hot tub pool requires repairs and upgrades.

.8 Additional public viewing opportunities are required.

.9 Conflict between providing unstructured and unscheduled leisure events and programmed events, such as swim lessons.

.10 On deck equipment storage too small for the current equipment.

.11 There is a lack of storage space throughout the building.

.12 Program room does not have direct access to the pool deck.

.13 Blind spots for life guarding.

.14 Lack of the ability to individually control water temperature by body of water of activity.

.15 Lack of storage for programs and public user groups.

.16 Acoustics make it difficult to run multiple swim classes.

.17 Poor lighting in pool tanks. Retro fit program is in place and should be completed shortly.

.18 Security concerns at reception counter

.19 Limited space for janitorial supplies and equipment.

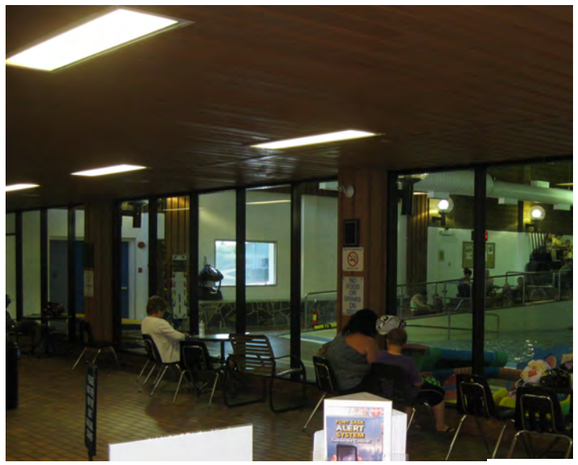
2.3 Program

.1 Existing Conditions

The Harbour Pool is a destination facility for regional aquatics programs and activities. With the growth of the City of Fort Saskatchewan over the last 20 years, the community is finding that the existing pool is slowly being stretched to its capacity and is now not being able to fully provide for the ever changing and increasing needs of the public. Activities that are currently being offered at the pool are public swimming lessons, Party events, facility rentals, leisure aquatics activities and drop in use.

In addition to programmed sports activities, Harbour Pool is home to the Piranhas Swim Club. This club is not a year round club but does require special consideration for uses and time of availability during the months that they are active.

The Harbour Pool contains the majority of its functions on the main level, some of these spaces include the public male and female change rooms, administration suite, reception, public viewing / waiting, party room, natatorium, storage and first aid.



Public Viewing

Entrance Lobby

Staff Change Room

Mens Change Room

Below the main floor of the pool, storage and building service space is provided. This basement area is located adjacent to the pool tanks and is limited to providing areas for pool mechanical equipment and some storage space. The basement is not the full area of the main floor and is located mainly in the south west Corner.

Pool Basement

The pool facility also has a mezzanine level that contains the overall facility mechanical HVAC and heating plants. This area is directly over the part of the building that also has the basement areas.

Pool Mechanical

Pool viewing is accommodated in 2 main areas. An area that is separated from the pool environment can be found directly off the main reception area. This area has a good view of the pool space, but due to the sloping deck and structural elements sight lines to all areas of the pool are compromised. In order to allow the public to have a better view of the activities in the pools, the pool deck to the east, has been set up to accommodate the public for viewing with seating , as well the bleachers at the end of the competition pool is utilized for viewing of competition tank.

Pool Viewing

As is typical of pools designed in this era, the amenity areas are small by current standards. The administration suite is small and cannot accommodate the staff currently needed to provide the programming needs of the pool. Storage areas are inadequate for all the new leisure activities and equipment associated with them. The increased usage is requiring a larger lobby and viewing area to support the public who has come to watch events at the pool. The pool natatorium is not adequate to provide the necessary leisure components and instructional spaces as demanded by today's user.

The pool enclosure is constructed using a glue laminated wood beams and purlins, supported on steel columns. Portions of the roof of the pool enclosure have been upgraded with a 2 ply SBS modified membrane roof. Perimeter walls of the facility enclosure are concrete block with a recent upgrade including new insulation, new windows and doors and new prefinished metal cladding.

The pool is a combination of combustible and non-combustible construction. The majority of the finishes in the pool facility are worn and dated having met their useable service life expectancy.

Hot Tub (above) Program Room (below)

Pool Deck (above) Pods (below)

.2 Design Approach

.1 General

The overall concepts as developed we believe, provides the optimal concept development solution considering the existing building construction type, current plan layout and available.

.2 Objectives

The following primary concept objectives guided the design process for the development of

- Retain existing structure, roof and wall assemblies wherever practical.
- Provide a new main entry with large entrance vestibule, Automatic barrier free entrance doors.
- Provide a new large family change room.
- Provide Code compliant barrier free accessible public washrooms.
- Provide a universal washroom.
- Provide a new competition pool.
- Provided additional new leisure amenities including 2 water slides, hot tub, tot pool, lazy river, wave rider and a play pool.
- Provide a dedicated program pool.
- Provide an administration suite to accommodate the staff required to provide comprehensive programming opportunities.
- Provide a flexible program room, dividable and directly accessed from the pool deck.
- Provide mechanical and electrical room capacities for new pool equipment.
- Adequate on deck pool storage.
- Increased general facility storage.
- Provide a leasable space for potential concession or merchandise.
- Increased parking to accommodate the new increased user count.
- Public viewing areas, both wet and dry viewing.

2.4 Program Development

In order to implement the ideas and priorities identified for the project, various preliminary conceptual options were generated for review and comment. Early on in the project, two distinct opportunities for the potential expansions were identified and put forward for discussion and review. The first opportunity (Option 1) was to utilize the existing Harbour Pool asset and renovate and expand the facility to meet the projected needs of the community. This concept was primarily driven by the focus on preserving a current facility and utilizing the existing infrastructure thereby seeing if there could be a cost savings for using the existing assets. The second opportunity presented was captured in the concept design of Option 2. The driving force behind Option 2 was to strengthen the existing recreation hub currently in place at the Dow Centennial Center by exploring the possibility of adding an aquatics component to the DCC facility. The premise of this concept was to leave the existing Harbour Pool in place while constructing a new aquatics component to the existing DCC, thereby maintaining aquatics service to the community uninterrupted during the construction period and once the new pool was open to the public, the existing pool would be either repurposed or closed. The question on what to do with the old pool in Option 2, generated a third option. The third option was to build a pool component at the DCC that was reduced in scope and split the aquatics functions between the existing Harbour Pool and the new DCC aquatics addition. The proposed split was to use the existing pool to provide mainly program and structured/ scheduled events, with the DCC pool offering a more leisure and drop-in orientated facility. Each of these options are identified and broken down

2.5 Concept Option 1 – Expanded Harbour Pool

The existing pool is functional and supported by the adjacent spaces. Where the facility is lacking is mainly in its ability to provide the level of service that is demanded by the local residents. A lack of program dedicated pools and leisure components limits the ability of the City to provide an adequate level of service including programmed events such as swimming lessons and senior activities as well as allowing for the unscheduled and uninterrupted leisure activities that occur throughout the day by drop-in public. The existing pool deficiencies as noted in the facility evaluation report are mostly cosmetic in nature and would not be required other than to bring the facility up to current standards and finishes. The structural shell of the pool is considered to be stable and worth retaining re-use with new and upgraded fit up, and the mechanical and electrical systems are considered to be in good condition and can be upgraded or retrofitted to increase the life of the systems. Above deck pool lighting has under gone a retrofit in the past year and therefore one of the issues identified in the evaluation report has been already addressed.

The desire to retain functional public occupancy of the facility as long as possible was is a factor in the design of the renovations and expansions. The basic strategy of the design and eventual construction would be to retain the current amenity in its general use while an initial phase of construction is carried out. The initial construction phase would be concentrated along the south and east faces of the facility and within this new area the majority of new pool spaces including the new pools and change facilities would be constructed. Once this construction had reached a point where the need to remove the line between the new and existing pools was required, then the existing pool would be required to be turned over to the contractor and closed to the public until the construction was complete.

Ideally, construction would commence immediately and be coordinated with the regularly scheduled events and the initial phase of work would concentrate on the expansion of the facility to the south and east. Once the addition is at a point where the need to tie into the existing building has presented itself and the wall between the new and existing is required to be removed, the existing pool would need to be closed. This closure can be scheduled as part of the required annual or less frequent maintenance shut down and therefore would be treated in the same manner as a typical shut down. The duration of the shutdown of the facility is expected to close the facility for up to one year. At this point the existing pool building would be gutted and renovated and the overall construction completed. The entire project would be completed by the fall, approximately 18 – 24 months from construction start.

Based upon this approach to construction, the program was tailored to the construction and developed as represented in the concept design.

A new expanded entry will be constructed along the northwest face of the existing pool complex. The existing northwest entry will be retained by the public and this component would need to be constructed after the facility is closed for the end of construction.

Along the existing south face of the pool enclosure a new natatorium will be created to house the leisure components such as the water slides, lazy river, hot tub wave rider tot pool and play pool. In addition to these leisure pools, a dedicated program pool will also be included. Serving these pool tanks, 3 new change rooms will be constructed. A large family change room will be the primary change area with the men's and women's change rooms feeding out through the same deck entrance. The discussion on the sizes of these change rooms identified that the primary user would be families and / or parents with opposite gender children. By creating a larger family change room with individual change cubicles, parent can monitor and change with their children no matter the age or gender. This family style of change room is seen as being the most widely used by the majority of patrons and therefore was identified to be the largest of the 3 change rooms.

In addition to the change rooms, an on deck wet viewing area is provided for parents to supervise and monitor their children during lessons and leisure activities. This viewing area ties directly to the main lobby and change room deck access.

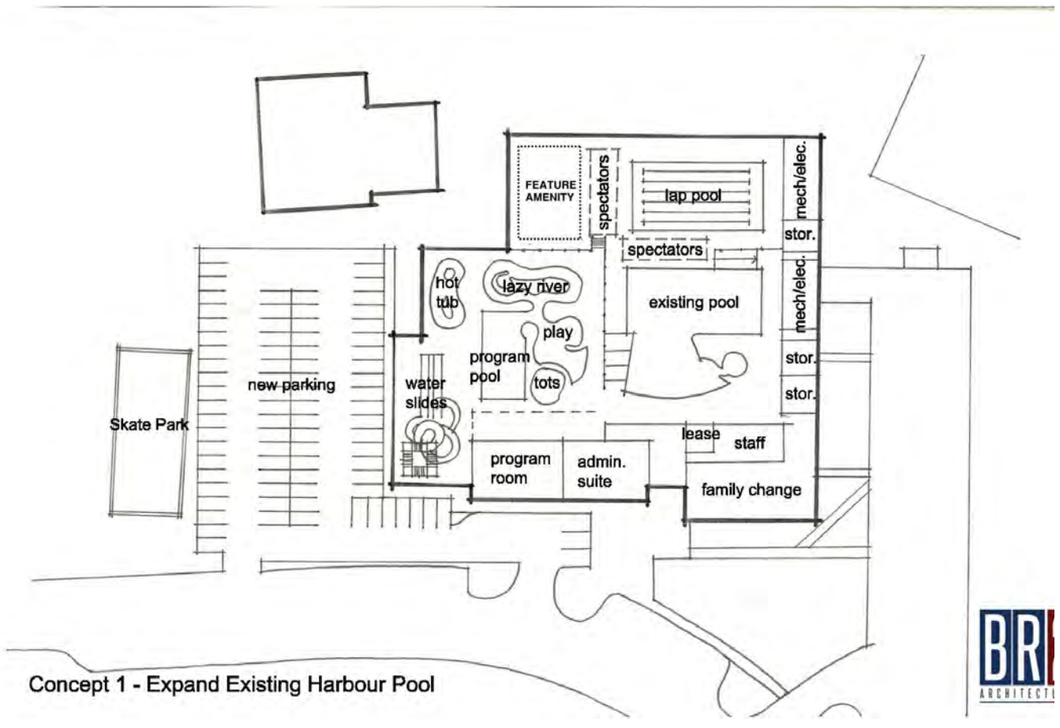
The final component of the new addition would be the placement of the new competition pool. This pool is designed as a 6 lane competitive pool tank and would be elevated to the level of the highest point of the existing pool deck. This concept of a raised pool is in direct response to the fact that the existing pool was designed as a wave pool and the deck levels vary along its perimeter. By raising the new competition pool, sight lines and lifeguarding opportunities are increased and made more manageable.

All of the new pool components would be separated from the exterior by a high performance glazing system thereby maximizing the daylighting in the space and providing a visual connection to the exterior. Potential glare and overheating from glazed areas will need to be controlled through passive design measures such as sun shades and glazing films. The use of glazing on the exterior walls will also allow the building to engage the passer by and let them have a glimpse into the activity and events in the pool.

Upon completion of the initial phase and at the end of public use, the pool complex will be turned over to construction and the existing partitions demolished where required. The primary renovation in the existing building will centre around the original change room and administration areas. This area will be cleared and resurrected in the form of an increased administration suite and new program rental room. This transformation will allow the pool to provide services for the staff as well as rental and revenue opportunities for the facility.

A new lease space will be designed directly off the main lobby and immediately serving the pool deck. By adding these adjacencies it has been designed to provide the greatest appeal to potential leases.

Along with the new pool components comes the requirement for expanded mechanical services. The design of the pool addition allows for the direct expansion of the existing mechanical rooms by placing the new service rooms adjacent the existing ones. With the expansion of the pool areas, the opportunity is presented to provide a larger basement surrounding the pool tanks. This provided numerous benefits and increases the ability for servicing of the pool tanks and distribution systems without getting in the water or having piping located in areas that are covered by concrete slabs. This space in the basement around the pool tanks can also be used for locating a lot of the pool distribution lines, pump and filters. By locating these elements close to the pools they serve, the amount of piping can be reduced and the efficiencies of the pumps, etc., can be achieved.



Concept 1 - Expand Existing Harbour Pool

.1 Existing Construction Upgrades for Option 1

The original 1982 building was constructed of load bearing concrete masonry walls sitting on cast-in place structural main floor slab on concrete foundation walls or slab on grade where basement conditions are not present. Exterior and interior walls are constructed of concrete block masonry units, exposed and painted. The roof assembly is constructed of 38mm steel deck at all locations outside of the natatorium of a base sheet and cap, insulation, fiberboard and four-ply built-up roofing covered with gravel ballast. From the drawings and information provided the roof appears to have been replaced in approximately 1988 or 1989.

The exterior of the facility has been upgrade twice since the original construction in 1982. The original exterior finish consisted of exposed split face block or prefinished metal cladding on the pool wall above the lower roof. In approximately 1988-89 the exterior of the facility underwent renovations to re-clad the building with new stucco and rigid insulation, and then again in the 2012 the exterior was completely clad in prefinished metal.

The interior of the facility has not received many improvements or upgrades. The existing finishes remain in all areas where repairs or changes have not been required. Areas that have received upgrades include Public Washrooms, Staff Locker Room, Staff Lunch Room, Administration Offices, Sauna Room and the Program Room.

a) Exterior Wall

The exterior superstructure of the facility consists of load bearing concrete masonry units with reinforced concrete fill and steel reinforcing. The remaining voids in the concrete block walls are filled with loose fill insulation. This insulation should be reviewed for hazardous materials in the event that an expansion or disturbance of this material is expected. The entire exterior envelope is clad with prefinished metal cladding over 75mm rigid insulation on the original concrete masonry load bearing wall. No details of the latest envelope upgrade were available therefore it is not possible to verify the presence of the vapour barrier or its continuity. The lack of staining and cracking on the interior suggests that the vapour barrier is achieving the required performance.

The only exterior wall area that is not load bearing concrete block is found above the lower roof section and is part of the north wall of the natatorium. This wall construction consists of prefinished metal cladding on hat channels, 75mm rigid insulation on the existing 12mm exterior gypsum board, R-20 fibreglass batt insulation, 92mm steel stud framing, air space for structural framing, 92mm steel studs, fiberglass batt insulation poly vapour barrier and 12mm gypsum board.

The thermal performance of these walls is approximately R15 for the concrete block walls and R35 for the steel stud wall. The performance of these walls is close to today's current standards and will continue to perform at this level for the next 10 - 15 yrs.

The nature of load bearing block walls does not readily lend itself to modifications. The pattern of vertical and horizontal core reinforcing and concrete fill is difficult to make major modification to without significant cost implications. The existing concrete block units are filled with loose fill insulation and would need to be tested for the presence of hazardous materials and abated if tested positive.

Exterior Wall Finishes

The exterior prefinished metal cladding is performing as required and in good shape. Some small areas of peeling finish is evident, however these locations can be touched up with localized treatment and touch up. Some minor damage to lower panels was observed, this damage appears to have been done by ground-keeping activities. These items are minor and do not require any action.

b) Proposed Roof Upgrade

Three different roofing structures are used in the construction of this facility. A 38mm steel deck on open web steel joist on a steel super structure is found in all areas except for the natatorium and the mechanical roofs. The natatorium roof structure consists of a structural 38 x 140 T& G cedar wood deck on glue laminated wood beams supported by steel columns. The mechanical roof system is fabricated of wood plywood decking on 28 x 289 dimensional wood joists on load bearing concrete block walls. This assembly is rated for a 1 hour fire resistance rating. All the roof assemblies are a flat roof configuration with localized roof drains controlling the collection and drainage of rain water on the roof.
The roof assembly above the structural components is comprised of the following items:

12mm drywall
#180 base sheet
93mm fiberglass base cap
12mm rigid fibreboard
4 ply built up roofing

This roofing system was installed in approximately 1988-89.

The roofing membrane is showing signs of bubbling and leaching up through the gravel ballast. From the colour of the ballast it appears that patching has been completed in the past, however, no current leaks were noted by the staff and maintenance crews. It is recommended that a professional roofing inspector be retained to confirm the overall condition of the roof and its components prior to a roof retrofit being commissioned.

c) Entrances and Glazing

The new entrance vestibule is to be constructed of small box aluminum curtain wall framing, with double glazed sealed units. Powered entrance doors are to be provided. New interior vestibule glazing is to be small box aluminum curtain wall framing, with single glazed tempered glass.

All new interior entrances to be welded pressed steel frames and hollow metal doors. Institutional grade hardware to be specified throughout.

New exit doors other than the main entry to be insulated hollow metal doors in welded pressed steel frames. New overhead doors to be thermally insulated with heavy duty commercial grade hardware.

d) Interior Finishes

The additions and renovations to the lower level areas will be constructed from concrete masonry units, full height, sealed and painted. The majority of ceilings will be finished as exposed structure, painted. Public washrooms and multipurpose rooms to have dropped ceilings. Main level partitions to be constructed from steel studs and impact resistant gypsum board. New offices, sound rooms, concession and concourse areas to have acoustic ceilings.

New vestibule entry floor to include a walk-off recessed entry grille and non-slip porcelain ceramic tile.

e) Spectator Seating

The new raised spectator seating to be constructed from light gauge steel framing with concrete filled metal deck floor panels. The new south bleacher seating tiers, steps and aisles to be constructed in accordance with current Code legislation.

f) Exterior

The east sidewalk and curb will require realignment to accommodate the expanded front entry vestibule. The parking lot and drive aisles will be reconfigured to better serve the new southeast entrance. The east and south facades will be reconstructed or new finishes.

2.5.1 Structural Concept Option 1 - Renovations and Addition to the Existing Harbour Pool

The existing single storey building was constructed in 1982, and consists of timber roof deck supported by a series of Glulam, Beams/ Purlins, spanning between Glulam Girder Beams.

The mezzanine floor has been constructed utilizing one way reinforced concrete slab spanning between concrete beams.

Load bearing masonry walls with masonry pilasters have been utilized for the perimeter building walls. As per PEC, report dated August 12, 2014 (attached) structurally the existing structure is in good condition, and with minor modifications the existing building should be suitable for expansion if it is deemed viable from a usage view point.

2.5.2 Mechanical Concept Option 1 - Expanded Harbour Pool

This architectural option involves a major 3,580 square meter expansion to the existing Harbour Pool facility . The mechanical requirements for this upgrade are:

.1 Site Servicing

.1 Upgrade gas service and meter to accommodate additional gas fired equipment.

.2 Potential upgraded water service to accommo0date facility to be converted to be sprinklered to NFPA 13.

.3 New sanitary and storm drainage may be required to service the expansion areas where the existing services may be inadequate.

.2 Mechanical Plumbing

.1 New infrared high efficiency low flow water closets, urinals and lavatories suitable for the facility.

.2 New electronic, push button shower valves complete with vandal resistant shower head and thermostatic mixing valve.

.3 New mop sinks to suit programming requirements.

.4 New roof drains, floor/trench drains to suit architectural design.

.3 Mechanical Heating Plant

.1 Additional condensing boilers, pumps, air separator and expansion tanks.

.2 Additional heat exchangers to provide heating to each new pool.

.3 Renovation of heating distribution loop to accommodate the increased boiler capacity and pumps flow rates.

.4 New terminal heating equipment for perimeter / envelope heating.

.4 Mechanical Air Systems

.1 Upgraded ventilation air supply system and exhaust system to provide additional natatorium and change room ventilation.

.2 Glycol heat recovery system complete with air to water heat exchangers, circulation pump, air separator expansion tank.

.3 A separate packaged gas fired DX rooftop unit for the new lease space.

.5 Controls

.1 Updated and refreshed DDC control system complete with energy management system to allow for the trending of HVAC system function and allow for enhanced system operations by identifying existing and potential energy waste in the mechanical systems.

.6 Pool Filtration

.1 Additional sand and/or regenerative media filters c/w pumps, controls and distribution piping, inlets, outlets to accommodate new pools.

.2 Pool disinfection and water chemistry system c/w dosing pumps and controls.

.3 Potential surge tank and/or backwash buffer tank to prevent surging existing sanitary service lines.

2.5.3 Electrical Concept Option 1

.1 Introduction

The following report outlines in detail the electrical system upgrades required to accommodate the proposed addition and renovation to the existing Harbour Pool in Fort Saskatchewan, Alberta

.2 Power Service and Distribution

The existing service to this facility is fed underground from a pad mounted transformer to a 347/600 Volt, 600 Amp Bus, 1982 Square D distribution. The main breaker is a 3 pole 400 Amp. The 600 V distribution provides power to mechanical equipment, site lighting and a 125 KVA transformer which supplies power to a 120/208V, 3 phase C.D.P. 400 Amp Bus . The main board has 4-3 pole spaces.

The existing power service to the facility will need to be upgraded to accommodate the addition and renovation. The exact size of service to be determined during detail design.

If the existing pool needs to stay operational, we will need a location for a new electrical room which will have the upgrade service in it and we would back feed the existing service.

.3 Lighting

Lighting in the main lobby consists of fluorescent one lamp fixtures of which the lenses are yellowed due to age.

The office/administration consisted of recessed fluorescent fixtures with either lamp removed or ballasts due to the room being too bright. The pool area has a combination of H.I.D., direct/indirect suspended light fixtures and LED perimeter wall mounted fixtures all of which were recently upgraded to accommodate Occupational Health and Safety and lighting levels as required by (IES) Illuminating Engineering Society of North America. All of these light fixtures will remain.

For the new lap pool and program pools, we propose a similar light fixture utilizing LED technology. For the existing and new offices, and change rooms, we propose removing the existing fluorescent fixtures and replacing them with LED type.

.4 Lighting Control

The existing lighting control is a combination of occupancy sensors and line voltage switch. We propose replacing all line voltage switching and replace them with new low voltage switching, which will allow total building lighting sweep controlled from the mechanical BMS system.

.5 Emergency Lighting and Exit Lights

The existing facility is equipped with emergency battery packs and exit lights. We recommend that these exits be replaced with LED types and the battery packs be replaced with new self-test technology. Add new throughout the addition to suit the requirement of the Canadian Electrical Code.

.6 Telephone System

The existing system is an analog system, to be reviewed with The City of Fort Saskatchewan.

.7 Security System

The existing system supervised by Telsco, consists of a keypad in the kitchen area with 3 security cameras just over the reception counter, door contacts and motion sensors. Expansion of the system throughout the addition is to be reviewed with The City of Fort Saskatchewan.

.8 Sound System

The existing sound system is a Bogen located in the reception area with speakers throughout the facility. No exterior speakers are on the building. This system is to be reviewed with The City of Fort Saskatchewan.

.9 Fire Alarm System

The existing system is an Edwards EST series with the fire alarm control panel in the main electrical room with an annunciator in the vestibule. The system has eight zones and a fan shut down. The system was last verified on October 3, 2013.

We propose replacing the existing system with new to accommodate additional zoning requirements to accommodate the addition and replace the existing bells with new strobes as required to meet current codes.

.10 Exterior Car Parking

Exterior receptacles are damaged and should be replaced.

We propose replacing the existing with new and adding new receptacle to accommodate staff and the City of Fort Saskatchewan.

2.6 Concept Option 2 – Reduced Aquatics at DCC with Expanded Harbour Pool

As a direct response to the facility evaluation report identifying the existing Harbour pool as a viable candidate for a facility renewal, and the desire to expand the DCC facility with the addition of an aquatics component, the stakeholder group requested that the design team review the potential of a hybrid solution. This Hybrid concept was to try to utilize the existing Pool and all of its strengths, renovating and upgrading all of the issues in the Evaluation report thereby creating a fully restored facility that would provide the for the community aquatics needs. This revitalized facility would be primarily focusing on offering aquatics programs and lessons that can be structured and scheduled. The second part of the hybrid concept was to take all of the program short comings that the Harbour pool has and provide for the offering of these at a new Aquatics component at the Dow Centennial Centre.

The benefit of this hybrid concept is the fact that the existing pool could remain operational and provide for the community aquatics needs while the new pool at the DCC is being constructed. Once the new pool was finished and operational, the existing pool could be closed and the renovation process could begin at that site. The down side to this concept is the fact that the City would now be required to operate 2 aquatics facilities, requiring additional staffing and operation and maintenance costs. One issue raised during the review of this concept was the fact that staffing the existing pool is difficult right now and with the requirement for additional staff at a second pool, they saw an issue with getting the proper trained staff for both facilities.

The Renovations at the Harbour pool would involve all of the items and issues as identified in the Facility evaluation report conducted in September of 2014.
These upgrades include:

a) Re-roofing of facility
b) Interior finish and aesthetic upgrades
c) Pool tank and pool deck re tiling
d) Building code deficiencies
e) Additional dehumidification
f) Minor Mechanical repairs and upgrades
g) Minor electrical repairs and upgrades.

The expansion at the DCC would focus on the leisure components of aquatic activities. The proposed elements to be added to the DCC would be:

a) Water slides
b) Surf rider
c) Hot tubs
d) Lazy river
e) Program pool with adjustable floor
f) Splash Play area
g) Tot pool
h) Spectator area
i) Program room
j) Administration suite
k) Change rooms – male, female and universal.
l) Facility storage
m) Service space
n) Suitable space for future expansion

The organizational layout of the new addition to the DCC is to place the aquatics addition on the northeast corner of the existing facility, adjacent the existing main entrance to the DCC. This placement would allow for the potential to use the existing main entrance, providing the pool with visual access front and centre to those that are coming to the facility. Aquatics facilities are great opportunities to show case the activities on the inside of the natatorium, therefore the placement of the new addition at the front door allows for views into an active and exciting space. This placement also allows for the potential to create another entrance on the east side of the facility. This is important mainly for the reason that the main entry is lacking sufficient parking for the number of users and it does not face any street, therefore the face of the building is effectively not present until you walk or drive around the building to the front door.

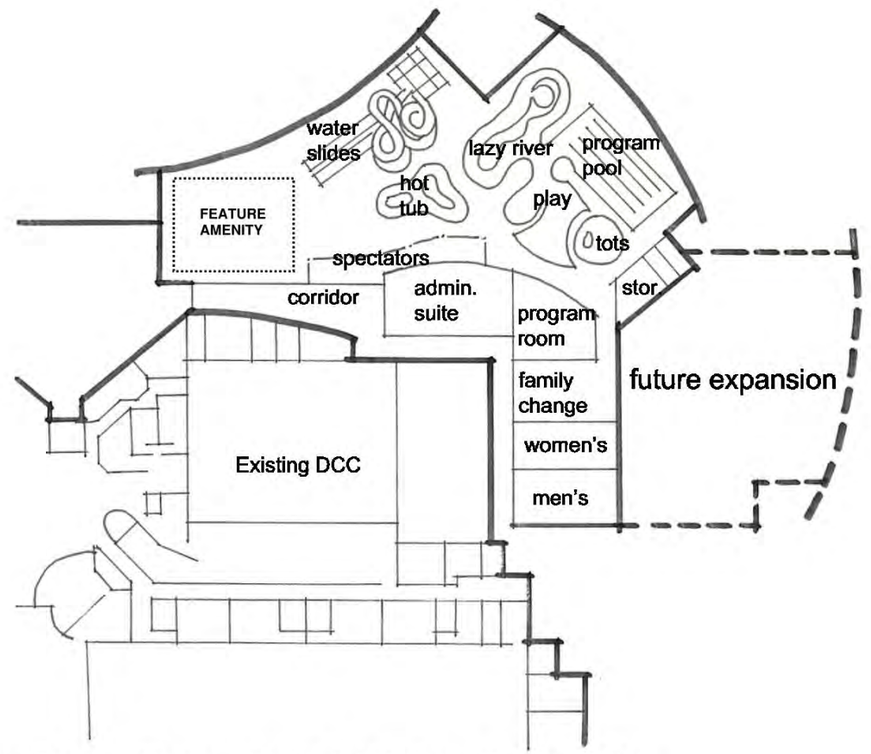
The administration and change rooms are located internal to the addition in an attempt to utilize area that is difficult to get natural light to. The change rooms do not require natural light or vision to the outside so these are great candidates for internal isolation.

A corridor was designed to separate the existing building from the new addition. This serves two purposes. First it allows the combination of pool access circulation with the required exits from the gymnasium. Second it allows for a more simple connection to the existing building and separates a very intensive pool environment from the existing facility. The separation will allow the appropriate measures to be in place to seal the pool natatorium from the rest of the building and keep the elements contained inside the space.

The pool components were placed along the exterior edge of the addition. By locating these elements to the exterior, all of the pools and amenities can access natural light through windows to the exterior. Keeping the pool amenities in one large area allows for the simplification of supervision and life guarding, prime concern for any pool. The on deck spectators area is located central to the pool elements allowing views to all the components of the pool and giving the viewer the ability to view multiple areas at a quick glance. The party room is also located directly off the pool deck and is connected to the viewing area, the corridor and the administration suite.

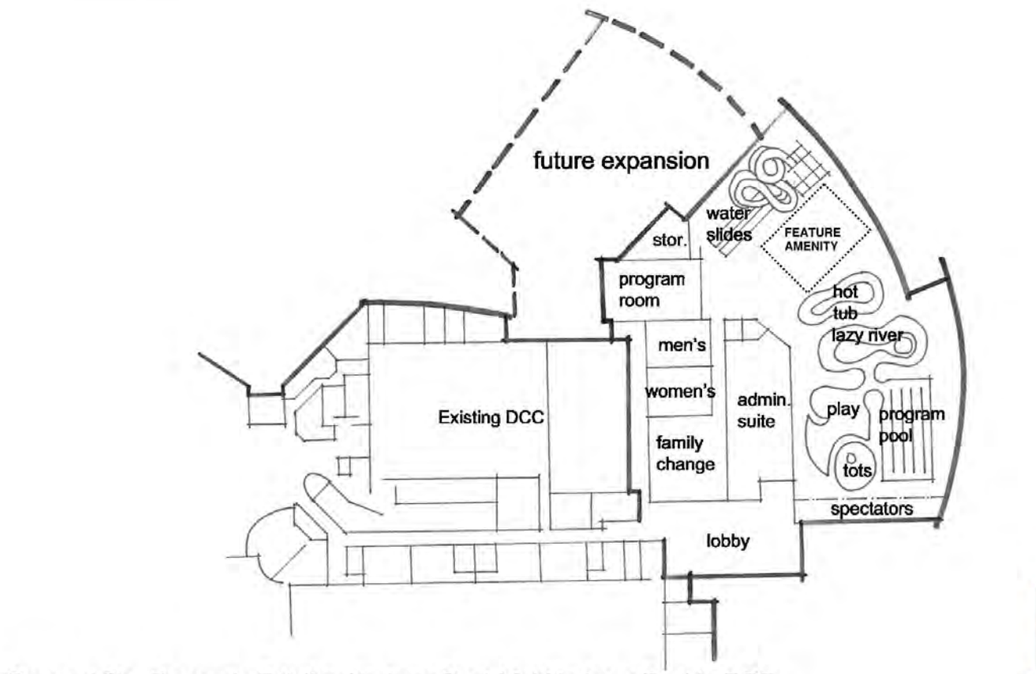
The second level above the change rooms and the administration suite, allows for the expansion of the fitness spaces in the existing DCC. The lack of fitness space in the existing DCC facility was identified as a deficiency and was added as a potential space in this program. The second level also allows for added viewing opportunities for various events and activities.

This option incorporates a potential for future expansion of the pool to accommodate the growth of aquatics in the community. The future expansion is located to the east side of the addition and would contain a competition pool and additional spectator seating for competition events.



Concept 2a - Renovate Existing Harbour Pool / Add Leisure Pool to DCC

The option 2b sketch is an exercise completed to see how the facility may work should the desire to create another entry on the east side of the facility that would be directly and more closely connected to parking that was displaced with the pool addition be used.



Concept 2b - Renovate Existing Harbour Pool / Add Leisure Pool to DCC

2.6.1 Structural Concept Option 2 - Renovations to the existing pool and a new Addition to Dow Centre

Renovation to the existing Harbour pool as described under option 1, is structurally viable, and depending on the extend of the renovations it should not pose a big risk factor.

Addition to the existing Dow Centre as indicated in the preliminary Architectural layouts will also be structurally possible. Protostatix Engineering Consultants Inc. was the original structural consulting engineers of the existing Dow Centre, and as such we are aware of the existing structure its history, and any associated critical areas that may require special attention.

Based on our experience with the existing Dow Centre the challenge with the existing building was to overcome weak soil conditions. Dynamically cast-in-place (compacto or Franki) piles were utilized as a foundation system and we will assume that the same system will be utilized for the new proposed addition.

As far as the proposed structural systems for the superstructure the following systems are recommended.

MAIN FLOOR

A reinforced cast-in-places slab on grade will be provided for the main floor. The floor will consist of 130 mm reinforced concrete slab unless noted otherwise by the soils report, resting on compacted 150 mm clean well-graded granular base over native clay till soils below. Cast-in-place concrete structural supported floors will be provided for all exterior concrete stoops at doorways, and any other areas which may be designated as “sensitive to movement”, such as the new swimming pool.

SECOND FLOOR

The second floor structure will consist of 125 mm reinforced concrete topping over 38 mm composite steel deck, supported by a series of steel joists on top of load bearing masonry walls, and or steel beams and columns.

MECHANICAL ROOMS

Pending on the Architecture layout if a new mechanical room will be necessary at a mezzanine level, the floor system for the Mechanical room will consist of 125 mm thick reinforced concrete topping acting composite with 38 mm steel decking, supported by steel beams.

Utilization of steel deck and joists becomes feasible and economically viable due to multiple units, where the repetitive use of standard components manufactured in a factory may be fully utilized.

This system has excellent structural rigidity and at the same time provides fire resistance, sound control, durability, low maintenance and rapid construction, thus eliminating any unwanted construction waiting periods.

ROOF SYSTEM

The roof structure over the new addition will consist of a combination of steel deck supported by steel joists, beams, and steel trusses, which is compatible to the existing building. Exposed steel trusses will be utilized to support the roof over the pool areas, as well above areas that maybe required to satisfy the Architectural design.

WALL SYSTEM

152 mm insulated metal studs in combination with masonry walls will be utilized for the construction of the new perimeter walls.

SITE CONSTRUCTION OVERVIEW

Pre-fabrication of structural members combined with speed of erection saves valuable overall construction time. Pre-fabricated steel joists, beams, and steel deck are manufactured and precut to length while foundations and site work proceed at the same time, allowing delivery and erection from truck to structure on a precise and predetermined construction schedule. Once installation of the precut members is underway, construction of the roof will proceed shortly afterwards, thus reducing unwanted construction schedule delays.

In terms the structure will be environmental friendly mainly by using construction materials high in recycled content. Steel is one of the most recycled construction material in the industry. Components of recycled materials proposed for the new addition, will include but are not limited to: structural steel members, steel stud, open webbed steel joists, roof and floor deck, rebar, and other miscellaneous metals. Steel products, being shop fabricated, also reduce the amount of waste compared to other construction materials.

For the concrete components of the structure, an effective mix will be designed where fly ash, slag or silica fume replace a certain percent of the cementitious materials. Replacing Portland Cement with recycled content in this way is a sustainable design choice that will also result in cost savings. Recycled aggregate will also be used in concrete structures, as well as for base course for the slab-on-grade.

2.6.2 Mechanical Concept Option 2 - Reduce Aquatics at DCC with Harbour Pool Renovation

This architectural option involves a major renovation of the existing facility without any expansion to the Harbour Pool existing areas and a major expansion to the DCC to integrate aquatics programming.. The mechanical requirements for this upgrade are:

.1 Site Servicing

.1 Install a new backflow preventer at the Harbour pool building service.

.2 No other upgrades to the existing Harbour pool site services beyond normal operation and maintenance requirements are required under this option.

.2 Mechanical Plumbing

.1 No upgrades to the existing plumbing fixtures beyond normal operation and maintenance requirements are required under this option.

.3 Mechanical Heating Plant

.1 No upgrades to the existing boiler plant beyond normal operation and maintenance requirements are required under this option.

.4 Mechanical Air Systems

.1 No upgrades to the existing ventilation systems beyond normal operations and maintenance requirements are required under this option.

.5 Controls

.1 No upgrades to the existing DCC controls systems beyond normal operations and maintenance requirements are required under this option.

.2 Consideration for an updated and refreshed DDC control system complete with energy management system to allow for the trending of HVAC system function and allow for enhanced system operation by identifying existing and potential energy waste in the mechanical systems.

.6 Pool Filtration

.1 No upgrades to the existing pool filtration, disinfection, chemistry and distribution systems beyond normal operation and maintenance requirements are required under this option.

DCC

.1 Site Servicing

.1 Upgrade existing DCC gas service and add new 2 PSI distribution to expansion area to accommodate additional gas fired equipment.

.2 Add new DCW lines from existing main water service to new facility expansion area.

.3 Reuse existing sprinkler tree fire pump system and add new sprinkler zone to service expansion. Sprinkler to NFPA 13.

.4 New sanitary and store drainage service and expansion areas where the existing services may be inadequate.

.2 Mechanical Plumbing

.1 Review existing domestic hot water system for recovery rates and storage capacities to accommodate the additional domestic heating water loads for the expansion. Retrofit the system to include additional heaters and/or storage tanks to accommodate . If retrofitting the existing system is not feasible, a new dedicated system can be utilized for the expansion.

.2 New infrared high efficiency low flow water closets, urinals and lavatories suitable for the facility.

.3 New electronic, push button shower valves complete with vandal resistant shower head and thermostatic mixing valve.

.4 New mop sinks to suit programming requirements.

.5 New roof drains, floor/trench drains to suit architectural design.

.3 Mechanical Heating Plant

.1 New boiler plant with condensing boilers, pumps, air separator and expansion tank.

.2 New heat exchangers to provide heating to each new pool.

.3 New heating distribution loop.

.4 New terminal heating equipment for perimeter/envelope heating.

.4 Mechanical Air Systems

.1 New Natatorium ventilation air supply system and exhaust systems to provide pool and change room ventilation.

.2 Glycol heat recovery system complete with air to water heat exchangers, circulation pump, air separator expansion tank.

.5 Controls

.1 Expand and integrate a DDC control system complete with energy management system to allow for the trending of HVAC system function and allow for enhanced system operation by identifying existing and potential energy waste in the mechanical system.

.6 Pool Filtration

.1 New sand and/or regenerative media filters complete with pumps, controls and distribution piping, inlets, outlets to accommodate new pools.

.2 Pool disinfection and water chemistry system complete with dosing pumps and controls.

.3 New surge tanks and/or backwash buffer tank to prevent surging existing sanitary service lines.

.7 Demolition/Renovation Scope

.1 Some demolition and renovation will be required where the new expansion areas tie into the existing facility. Some scope such as relocation of existing plumbing, heating terminals and ventilation distribution piping and/or ductwork drainage.

2.7 Concept Option 3 – Full Scope Aquatics at DCC

Option 3 as presented in this report was generated with the intent of making the pool part of the DCC and therefore enhancing the already successful recreation facility and adding to the services it currently offers. This option is similar to the additions made to the DCC in Option 2 with the addition of the competition pool and spectator seating components.

This proposed development allows the City to amalgamate the aquatics program delivery with an existing facility, increasing amenities offered at one location and thereby seeing return on the partnerships that can be forged between the new aquatics and the rest of the DCC. The addition of a full Aquatics facility to the DCC, will allow a broader marketing strategy and a more efficient operational organization.

The expansion at the DCC would provide the same leisure component aquatic activities as option 2 and add Competition features.

The proposed elements to be added to the DCC would be:

a) Water slides
b) Feature Amenity
c) Hot tubs
d) Lazyriver
e) Program pool with adjustable floor
f) Splash Play area
g) Tot pool
h) 10 lane competition pool
i) Competition spectator seating
j) Leisure pool Spectator area
k) Program room
l) Administration suite
m) Change rooms – male, female and family.
n) Facility storage
o) Service space
p) Suitable space for future expansion

The organizational layout of the new addition to the DCC remains consistent with option 2 and places the aquatics addition on the North east corner of the existing facility.

The Administration and change rooms are still located internal to the addition in an attempt to utilize area that is difficult to get natural light to. The change rooms do not require natural light or vision to the outside so these are great candidates for internal isolation.

The corridor designed to separate the existing building from the new addition remains a design element to accommodate ease of construction and separation of unlike environments.

The pool components placed along the exterior edge of the addition still provide the ability for views to the exterior and from the exterior providing a visual engagement for both the user and the passer by.

The second level does not change from option 2 and provided the desired expansion ability to the existing fitness spaces.

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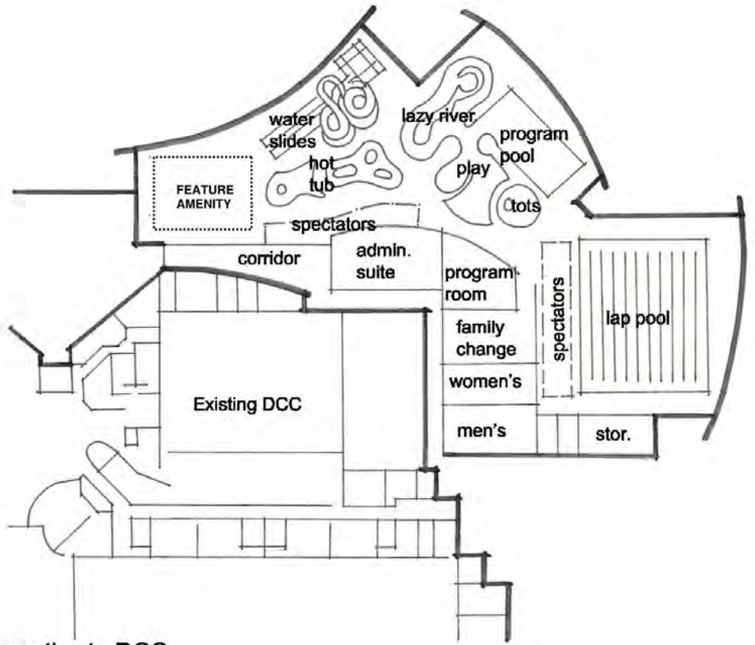
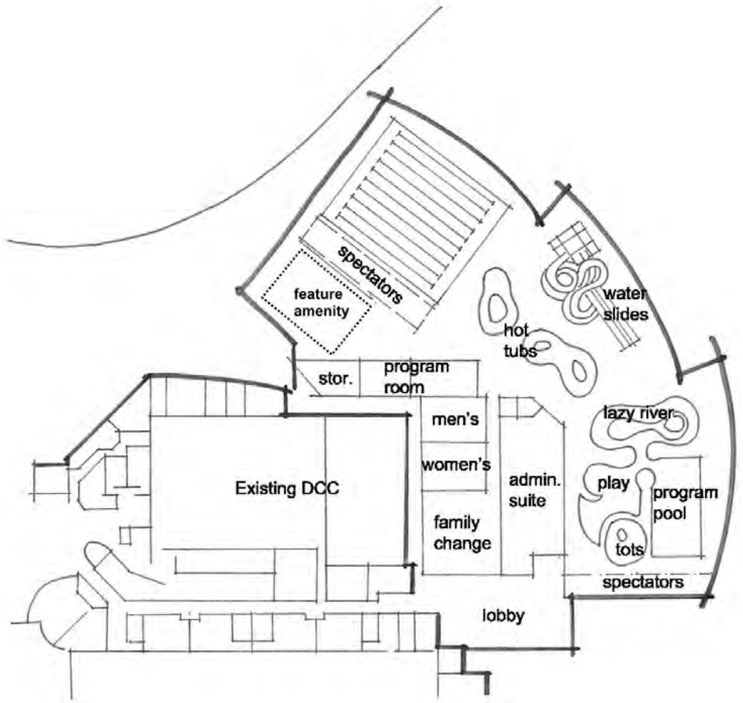


Concept 3a - Add Aquatics to DCC

The option 3b sketch was also created to explore the option introducing a new east entry, effectively reducing the stress on the current main entry and providing a more direct connection to the new parking required for such an addition.



Concept 3b - Add Aquatics to DCC

2.7.1 Structural Concept Option 3 - Addition to Dow Centre

Addition to the existing Dow Centre as indicated in the preliminary Architectural layouts will also be structurally possible. PEC was the original structural consulting engineers of the existing Dow Centre and as such we are aware of the existing structure, its history and any associated critical areas that may require attention.

Based on our experience with the existing Dow Centre the challenge with the existing building was to overcome weak soil conditions. Dynamically a cast-in-place (compacto or Franki) pile was utilized as a foundation system and we will assume that the same system will be utilized for the new proposed addition. As far as the proposed structural systems for the superstructure the following systems are recommended. Steel joists, which in turn will be supported by a series of steel beams and columns.

A steel structure as such is compatible and complimentary to the existing structure and a reinforced cast-in-place concrete floor on grade will be provided for main floor.

Cast-in-place concrete structural supported floors will be provided for all exterior concrete stoops at doorways and any other areas, which may be designated as “sensitive to movement”, such as the new swimming pool.

SECOND FLOOR

The second floor structure will consist of 125 mm reinforced concrete topping over 38 mm composite steel deck, supported by a series of steel joists on top of load bearing masonry walls.

MECHANICAL ROOMS

Pending on the Architecture layout if a new mechanical room will be necessary at a mezzanine level, the floor system for the Mechanical room will consist of 125 mm thick reinforced concrete topping acting composite with 38 mm steel decking, supported by steel beams.

Utilization of steel deck and joists becomes feasible and economically viable due to multiple units, where the repetitive use of standard components manufactured in a factory may be fully utilized.

This system has excellent structural rigidity and at the same time provides fire resistance, sound control, durability, low maintenance and rapid construction, thus eliminating any unwanted construction waiting periods.

ROOF SYSTEM

The roof structure over the new addition will consist of a combination of steel deck supported by steel joists, beams, and steel trusses, which is compatible to the existing building. Exposed steel trusses will be utilized to support the roof over the pool areas, as well above areas that maybe required to satisfy the Architectural design.

WALL SYSTEM

152 mm insulated metal studs in combination with masonry walls will be utilized for the construction of the new perimeter walls.

SITE CONSTRUCTION OVERVIEW

Pre-fabrication of structural members combined with speed of erection saves valuable overall construction time. Pre-fabricated steel joists, beams, and steel deck are manufactured and precut to length while foundations and site work proceed at the same time, allowing delivery and erection from truck to structure on a precise and predetermined construction schedule. Once installation of the precut members is underway, construction of the roof will proceed shortly afterwards, thus reducing unwanted construction schedule delays.

In terms the structure will be environmental friendly mainly by using construction materials high in recycled content. Steel is one of the most recycled construction material in the industry. Components of recycled materials proposed for the new addition, will include but are not limited to: structural steel members, steel stud, open webbed steel joists, roof and floor deck, rebar, and other miscellaneous metals. Steel products, being shop fabricated, also reduce the amount of waste compared to other construction materials.

For the concrete components of the structure, an effective mix will be designed where fly ash, slag or silica fume replace a certain percent of the cementitious materials. Replacing Portland Cement with recycled content in this way is a sustainable design choice that will also result in cost savings. Recycled aggregate will also be used in concrete structures, as well as for base course for the slab-on-grade.

2.7.2 Mechanical Concept Option 3

This architectural option involves a major expansion to the existing DCC facility. The mechanical requirements for this upgrade are:

.1 Site Servicing

.1 Upgrade existing DCC gas service and add new 2 PSI distribution to expansion area to accommodate additional gas fired equipment.

.2 Add new DCW lines from existing main water service to new facility expansion area.

.3 Reuse existing sprinkler tree fire pump system and add new sprinkler zone to service expansion. Sprinkler to NFPA 13.

.4 New sanitary and store drainage service and expansion areas where the existing services may be inadequate.

.2 Mechanical Plumbing

.1 Review existing domestic hot water system for recovery rates and storage capacities to accommodate the additional domestic heating water loads for the expansion. Retrofit the system to include additional heaters and/or storage tanks to accommodate . If retrofitting the existing system is not feasible, a new dedicated system can be utilized for the expansion.

.2 New infrared high efficiency low flow water closets, urinals and lavatories suitable for the facility.

.3 New electronic, push button shower valves complete with vandal resistant shower head and thermostatic mixing valve.

.4 New mop sinks to suit programming requirements.

.5 New roof drains, floor/trench drains to suit architectural design.

.3 Mechanical Heating Plant

.1 New boiler plant with condensing boilers, pumps, air separator and expansion tank.

.2 New heat exchangers to provide heating to each new school.

.3 New heating distribution loop.

.4 New terminal heating equipment for perimeter/envelope heating.

.4 Mechanical Air Systems

.1 New Natatorium ventilation air supply system and exhaust systems to provide pool and change room ventilation.

.2 Glycol heat recovery system complete with air to water heat exchangers, circulation pump, air separator expansion tank.

.5 Controls

.1 Expand and integrate a DDC control system complete with energy management system to allow for the trending of HVAC system function and allow for enhanced system operation by identifying existing and potential energy waste in the mechanical system.

.6 Pool Filtration

.1 New sand and/or regenerative media filters complete with pumps, controls and distribution piping, inlets, outlets to accommodate new pools.

.2 Pool disinfection and water chemistry system complete with dosing pumps and controls.

.3 New surge tanks and/or backwash buffer tank to prevent surging existing sanitary service lines.

.7 Demolition/Renovation Scope

.1 Some demolition and renovation will be required where the new expansion areas tie into the existing facility. Some scope such as relocation of existing plumbing, heating terminals and ventilation distribution piping and/or ductwork drainage.

2.7.3 Electrical Concept Option 3

.1 Introduction

The electrical information within this report is intended to indicate the upgrades required to accommodate the proposed addition.

.2 Power Service and Distribution

Based on the proposed addition of lap pool, program pool, surf rider, and administrative area and new the mechanical loads, the existing electrical service to the facility will have to be upgraded.

The exact size of service to be determined during the detail design. To keep the existing facility in operation, a new electrical room should be provided for in the addition. This new electrical room will feed the existing service.

.3 Lighting

The existing lighting throughout the facility and controls will be reviewed in detail at the time of detail design in reference to age of fixtures and the possibility of replacement with new LED type.

Lighting throughout the addition will utilize LED type fixtures and the possibly of utilizing LED suspended direct/indirect fixtures throughout the pool areas.

.4 Lighting Control

Lighting control throughout the addition will utilize low voltage switching with master switch detail located in the pool office for all areas of the pools.

.5 Emergency Lighting and Exit Lighting

The existing facility's emergency lighting and exit lights will be reviewed during detail design in reference to locations and conditions. Within the new addition exit and emergency lighting will be provided to meet all current code requirements.

.6 Telephone System

Telephone/data requirements will be reviewed with The City of Fort Saskatchewan during design with their IT personnel.

.7 Security System

Security system requirements will also be reviewed during detail design in reference to door access, card readers and CCTV cameras.

.8 Fire Alarm System

The existing facility is equipped with a fire alarm system. This system will be investigated in reference to its capacity to handle the proposed addition.

2.8 Dow Centennial Centre Master Plan

In addition and concurrent to this report, BR2 is reviewing the recreation Master Plan for the DCC and looking at potential expansion opportunities that might include more than just an aquatics facility. As a result of the feedback and options presented for the DCC master plan study, the aquatics addition was relocated to the southwest corner of the existing facility, immediately adjacent the current Gymnasium. This shuffling of components is responding to a rethinking of the overall site and facility and the idea of creating a whole new face for the facility, facing the park area to the south. The addition of the aquatics facility, a soccer field house, a new hockey rink and a potential partnership with a high school, dramatically rethinks how the facility can be sited and accessed and provided new opportunities to engage the site, the street and new parking in a more beneficial manner. The sketch depicted below is an indication of how the master plan envisions the potential expansion components in a new improved facility.

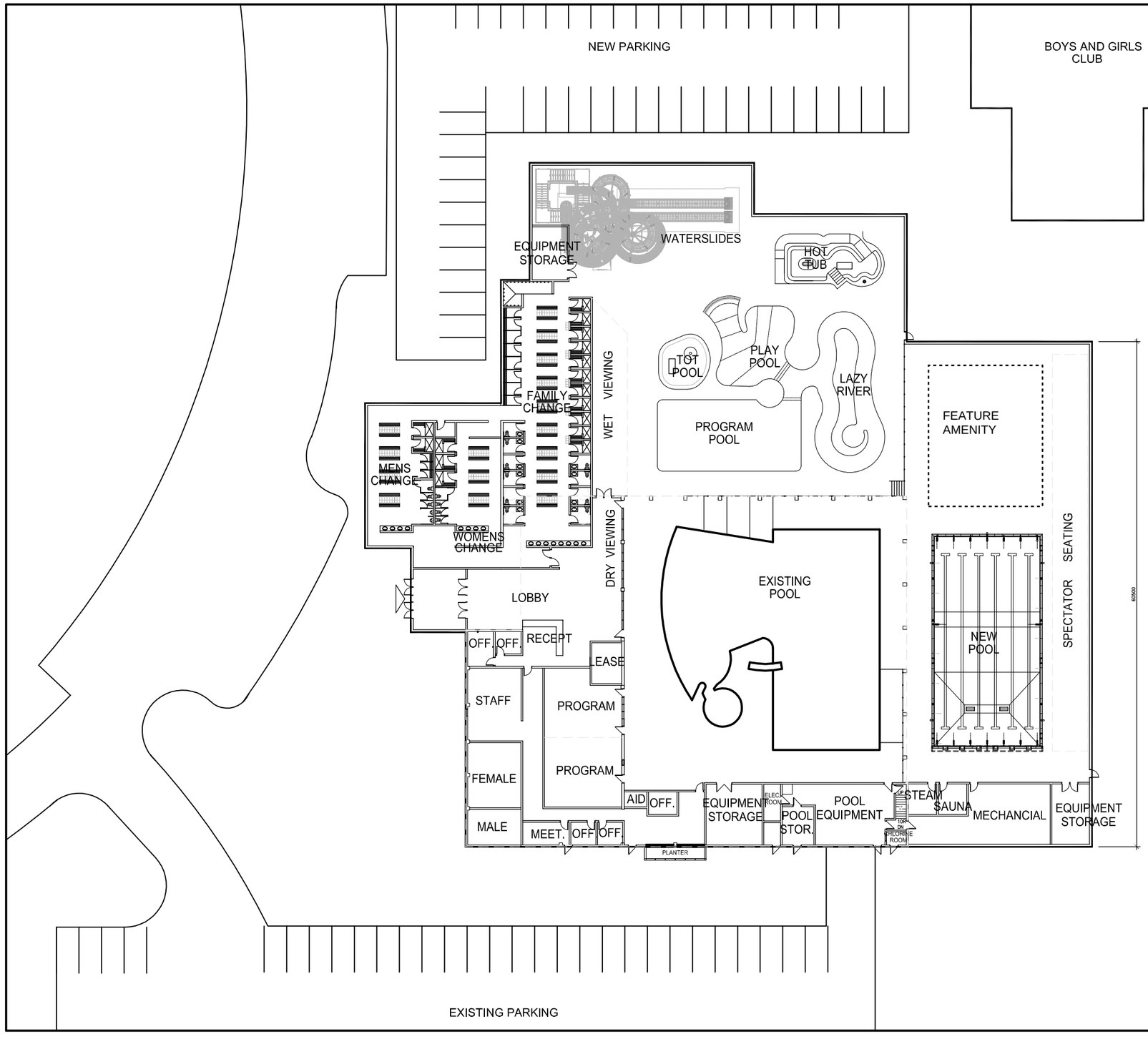
3.0 COST OPINION

A cost opinion was generated by Altus Group at the request of BR2 Architecture. The complete cost opinion is contained in Appendix B and was completed as a high level assessment of the conceptual options presented by the design team. This cost opinion required many assumptions based on the limited level of detail available from the design concept, and does take into account current market conditions, construction values and historic costing of other projects that are similar in scope, size or program elements. The Costing presented gives a solid representation for a typical facility of this size and magnitude.

4.0 Conclusion

4.0 CONCLUSION

In conclusion, it is felt that Option 1 and 3 are the front runners in the race to the goal of providing the increased level of service and the programs that the residents of Fort Saskatchewan have come to enjoy and realize in other recreation opportunities provided by the City. The final determination of which option is right for the City of Fort Saskatchewan will be greatly influenced by a few external factors. While the existing Harbour Pool is in good shape and would benefit from a renovation / expansion, the DCC is also looking at its future and how it can provide a better and more complete service to the community. The factors of Budget, time, impact to operations and the future master plan of the DCC all play direct roles in what the best plan of action might be. This report identifies that the option 1 and 3 are viable and would work to provide for the current and future aquatic needs of the City. The selection of either option will require a more detailed refinement of the program and consultation with input from all of the stakeholders to make sure that everything that is needed, desired and expected is incorporated. These conceptual designs represent high level discussions and thinking to generate information that will assist the City with reshaping the future of Recreation in Fort Saskatchewan.



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BR2Architecture@caisnet.com

REVISIONS

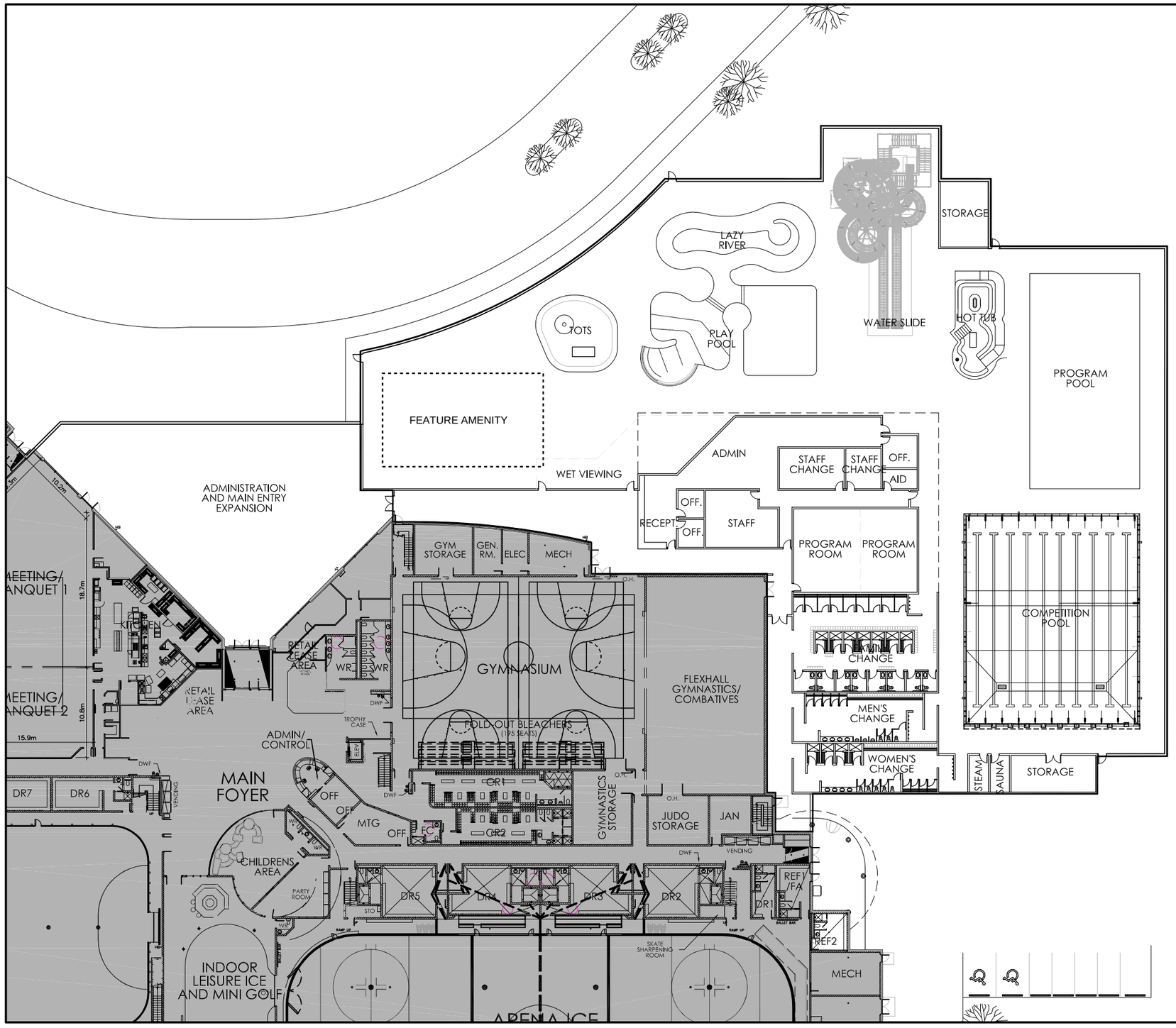
PROJECT
Harbour Pool
Addition / Renovation

SHEET TITLE
Concept 1
Main Floor Plan

Drawn	Checked

Project No.	Date
214320	June 08, 2015

Scale	Sheet No.
1:500	A01



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REVISIONS

PROJECT
DOW CENTENNIAL CENTER

ADDITION

SHEET TITLE
CONCEPT 3
MAIN FLOOR PLAN

Drawn	Checked
Project No.	Date
214320	JUNE 08, 2015
Scale	Sheet No.
1:500	A02

AQUATICS CENTRE STUDY

Fort Saskatchewan, Alberta

FUNCTIONAL/CONCEPTUAL DESIGN CONSTRUCTION COST ESTIMATE

Prepared for:
BR2 ARCHITECTURE
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Edmonton, Alberta T5N 1N8
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Issued: February 23rd, 2015
Job No. 12130.100040.000

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Street Smart. World Wise.

February 23rd, 2015 Job No.:12130.100040.000

BR2 ARCHITECTURE
201, 10441-123 Street
Edmonton, Alberta T5N 1N8

Attention: Mr. Shaun Visser

Re: Dow Centennial Centre Master Plan - Functional Construction Cost Estimate

Dear Shaun,

We submit for your review the Functional Conceptual Design Construction Cost Estimate, in accordance with the terms of our engagement.

Please note that this estimate in general includes all direct and indirect construction costs, general conditions, as well as contractor's overheads and profit. The estimate also addresses the following contingencies and allowance values, detailed within the body of this report.

- 10% Design and pricing contingency has been included for new options and 12% and new/renovation options
- Escalation of construction costs to anticipated tender dates has not been included, as the timeline for design and construction has not been contemplated
- Construction (change order) contingency has been included; at a recommended percentage 5.5% for new and 7% on renovation

Please note that this report is not intended for general circulation, publication or reproduction for any other person or purpose without prior express written permission to each specific instance. Furthermore, this report was written for the exclusive use of BR2 Architecture/City of Fort Saskatchewan and is not to be relied upon by any other party. Altus Group Limited does not hold any reporting responsibility to any other party.

Should you have any questions related to this report please do not hesitate to contact Curtis Cameron at the address listed below.

Yours truly,

ALTUS GROUP LIMITED

Per: Curtis Cameron, PQS, C.E.T.
Associate

Per: Kevin Ellis, MBA, FRICS, PQS
Senior Director

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Appendix A – Cost Estimate Summary
Appendix B – Cost Estimate Details
Appendix C – Drawings / Documents List

1 Introduction

1.1 Scope

The scope of work includes 3 concepts for the Aquatics Centre in Fort Saskatchewan. Concept one is the expansion and renovation of the existing Harbour Pool, Concept two is the renovation of the existing Harbour Pool with an addition to the Dow Centennial Centre (Split Aquatics Centre), and concept three is a new aquatics addition at the Dow Centennial Centre and abandoning the existing Harbour Pool. In addition new parking, demolition, site servicing and landscaping were also considered in the development of the concepts.

The Functional Construction Cost Estimate is intended to provide a realistic budget check based on the design information provided. The estimate reflects our opinion as to budget value for the construction of this proposed project.

The estimate includes all direct and indirect construction costs consistent with the information provided for the project. Certain exclusions and qualifications may apply; please refer to Section 4.2 and the detail contained within the functional estimate included within the Appendices.

2 Project Details

2.1 General Information

From the information provided, we have measured quantities where possible and applied unit rates for the specific item of work based on historical and current cost data for this type of project. Where design information was limited, we have spoken and/or attended meetings with the relevant design discipline or indeed made design assumptions based upon our experience on projects of a similar type, size, and standard of quality.

We confirm that for the development of this report, we spoke to the prime consultant (Architect).

2.2 Location

The location cost base for this estimate is Fort Saskatchewan, Alberta.

2.3 Measurement and Pricing

The estimate has been derived using generally accepted principles on method of measurement as per the Canadian Institute of Quantity Surveyors Elemental Cost Analysis.

The rates used and developed for this estimate where applicable include labour and material, equipment, and subcontractor's overheads and profit. Pricing developed for this project is based upon our firms and indeed teams experience with similar projects, and/or quotes provided by subcontractors as noted within the estimate.

2 Project Details (Continued)

2.4 Environmental Sustainability

The estimate incorporates design elements consistent with a sustainable project as identified within the design information provided for this project. Although the design and pricing incorporates energy efficient and sustainable elements, actual certification with a regulatory body has not been included in the estimate.

2.5 Taxes

The estimate excludes the Goods and Services Tax (GST).

2.6 Fees and General Requirements

The general requirements and fee included within the estimate for the General Contractor is included as a percentage of the hard construction cost. The general requirements are based on our assumptions of the anticipated construction approach and construction schedule for the project. The general requirements percentage includes the cost associated with bonding and insurance, however excludes development and/or building permit costs.

2.7 Procurement Methodology

We have assumed that the project will be procured with a Stipulated Lump Sum approach under a CCDC standard form of contract. We have assumed a minimum of 5 General Contractor bids and at least 3 major subtrade/supplier bids received for all trade categories to establish competitive bidding and tender results. The estimate is a determination of fair market pricing and not a prediction of lowest bid in any trade category.

2.8 Schedule / Phasing

The existing occupied facility will close during construction and will be completed as a single project; decanting during the construction process should be minimal. Decanting costs have not been included in this construction cost estimate. The unit rates in our estimate are based on construction activities occurring during normal working hours and proceeding within a non-accelerated schedule.

2.9 Gross Floor Areas / Project Statistics

The gross floor areas for this project have been measured in accordance with the Canadian Institute of Quantity Surveyors Standard Method of Measurement. Detailed areas and project statistics are included in Section 5 of this report.

3 Contingencies

3.1 General

The effective use of contingencies in construction cost planning requires a clear understanding of estimating risks in both a project specific and general construction market sense. The appropriate level of contingency is dependent on the amount of information available, knowledge of the design teams' methods and philosophy, the timing of the estimate preparation relative to the project design and construction schedule, and the anticipated complexity of the construction work.

3.2 Design and Pricing Contingency

10.0% design and pricing contingency has been included in the estimate for new construction concepts and 12% for Addition/Renovation concepts. This allowance is meant to cover the design and pricing evolution of the tabled design during the preparation of this estimate, this contingency is not intended to cover additional scope or additional functional program requirements.

3.3 Escalation Allowance

Construction escalation has been excluded from this report. This allowance typically addresses anticipated changes in construction costs due labour and material increases between the date of this estimate and the anticipated tender date for the project, however no timelines were provide so this allowance was excluded.

3.4 Construction (change order) Contingency

Construction (change order) contingency has been included from this report, at the recommended percentage, 5.5% for new construction and 7.0% for addition/renovation, of the hard construction cost for change orders that may occur during the construction phase of the project.

3.5 Phasing Allowance

0.0% phasing contingency has been included; it is assumed the construction can be completed in a single phase and the existing Harbour Pool will be closed during the renovations. It should be noted this estimate does not cover the decanting of the occupants or existing equipment.

4 Project Description and Scope Assumptions

4.1 Inclusions and Assumptions

All details of inclusions and assumptions are specifically described and itemized within the various estimate details located in the Appendices of this report. Please refer to the Appendices for assumptions and/or design for the applicable option.

4.2 Exclusions

The following is excluded from the estimate:

- Goods and Services Tax (GST)
- Soft costs and professional fees
- Land, survey and associated costs
- Moving / Relocation Cost
- Removal and/or handling of hazardous/contaminated material
- Acceleration Premium
- Owner's administration expenses
- Legal fees
- Marketing/promotion
- Realty taxes and levies, if applicable
- Operating expenses
- Interest/finance charges
- Remedial work to existing buildings/structures/property (unless noted)
- Owner supplied FF&E (except as noted)
- Loose furniture and equipment
- Development and/or building permit fees
- Extensive winter construction
- Market (non-competitive) allowance

The estimate is based on a building Gross Floor Areas, measured and priced by Altus Group Limited and verified by the Architect.

5 Project Statistics

5.1 Gross Floor Area / Project Statistics

Concept One	6,171 m2
Concept Two	6,171 m2
Concept Three	4,552 m2

6 General Statement of Liability

6.1 Probable Costs and Ongoing Cost Control

Altus Group Limited does not guarantee that tenders or actual construction costs will not vary from this estimate. Acute market conditions, proprietary and/or sole source specifications, or reduced competition among contractors will cause tenders to vary from reasonable estimates based on normal and abnormal competitive conditions.

Altus Group Limited recommends the owner and/or design team review the cost estimate report including line item descriptions, unit prices, allowances, assumptions, exclusions, and contingencies to ensure the appropriate design intent has been accurately captured within the report.

It should be noted that cost consultants are not qualified to confirm that construction work and design is in accordance with approved plans and specifications.

Appendix A
Cost Estimate Summary

Job No: 12130.100040.000
February 23rd, 2015

Aquatics Centre Study
FUNCTIONAL/CONCEPTUAL COST ESTIMATE
Fort Saskatchewan, AB
February 23rd, 2015

EXECUTIVE SUMMARY
The 'Hard' Construction Cost Estimate can be summarized as follows :

Description	Concept 1	Concept 2	Concept 3
Decription	Existing Harbour Pool Expansion Includes Renovations to Changerooms/Admin and minor changes to the pool area	Reduced Dow Centennial Centre Addition Renovations to Existing Harbour Pool	Full Expansion at Dow Centennial Centre Harbour Pool to remain with no renovations
Gross Floor Area	6,171	6,171	4,552
Total Construction Dollars	$19,514,100	$19,944,600	$20,228,600
Cost per GFA	$3,162	$3,231.99	$4,444
Sub Total - GFA (Excluding Site and Demolition)	**$19,514,100**	**$19,944,600**	**$20,228,600**
Demo Existing Harbour Pool	$250,000	$125,000	$0
Demo Existing Parking Lot DCC	$0	$69,700	$91,040
Demo Existing DCC	$0	$25,000	$25,000
Sub Total - GFA (Excluding Site)	**$19,764,100**	**$20,164,300**	**$20,344,640**
Site Development :			
Parking Lot (includes curbing and lighting)	$250,800	$599,300	$706,000
Landscaping (combination of hard and softscape)	$75,000	$50,000	$50,000
Mechanical Site Servicing (Assumes service to site is adequate for expansion)	$0	$52,275	$68,280
Electrical Site Servicing (Assumes service to site is adequate for expansion)	$0	$34,850	$45,520
TOTAL CONSTRUCTION COST (excluding Contingencies)	**$20,089,900**	**$20,900,725**	**$21,214,440**
Design Contingency 10%/12%	$2,341,692	2,393,352	$2,022,860
Owners Change Order Contingency 5.5%/7.0%	$1,529,905	1,563,657	$1,223,830
TOTAL CONSTRUCTION COST (Excluding GST)	**$23,961,497**	**$24,857,734**	**$24,461,130**
Goods and Services Tax (GST)	$0	$0	$0
TOTAL CONSTRUCTION COST (Excluding GST)	**23,961,497**	**24,857,734**	**24,461,130**

Appendix B
Cost Estimate Details

ELEMENTAL COST SUMMARY

FUNCTIONAL/CONCEPTUAL COST ESTIMATE

Cat: N/A

Project: Aquatics Centre Study — Concept 1 — File: N/A

Location: Fort Saskatchewan, AB — Date: February 23rd, 2015

Owner/Client: City of Fort Saskatchewan — Project Number: 12130.100040.000

Architect: BR2 Architecture — **Gross Floor Area: 6,171 m2**

Element		Ratio to GFA	Elemental Quantity	Elemental Unit Rate	Elemental Amount	Cost/m2	Amount	
A SHELL								
A1 SUBSTRUCTURE						**$77.59**		
A11 Foundation		0.56	3,485 m2	$80.00	$278,800	$45.18		
A12 Basement Excavation		0.65	4,000 m3	$50.00	$200,000	$32.41	**$478,800**	**2%**
A2 STRUCTURE						**$282.37**		
A21 Lowest Floor Construction		0.56	3,485 m2	$150.00	$522,750	$84.71		
A22 Upper Floor Construction		0.00	0 m2	$400.00	$0	$0.00		
A23 Roof Construction		0.56	3,485 m2	$350.00	$1,219,750	$197.66	**$1,742,500**	**7%**
A3 EXTERIOR ENCLOSURE						**$308.38**		
A31 Walls Below Grade		0.00	0 m2	$0.00	$0	$0.00		
A32 Walls Above Grade		0.29	1,800 m2	$500.00	$900,000	$145.84		
A33 Windows & Entrances		0.05	320 m2	$1,200.00	$384,000	$62.23		
A34 Roof Covering		0.56	3,485 m2	$175.00	$609,875	$98.83		
A35 Projections		0.00	25 m2	$365.00	$9,125	$1.48	**$1,903,000**	**8%**
B INTERIORS								
B1 PARTITIONS & DOORS						**$156.05**		
B11 Partitions		0.62	3,800 m2	$235.00	$893,000	$144.71		
B12 Doors		0.01	35 No	$2,000.00	$70,000	$11.34	**$963,000**	**4%**
B2 FINISHES						**$268.99**		
B21 Floor Finishes		1.00	6,171 m2	$145.00	$894,795	$145.00		
B22 Ceiling Finishes		1.00	6,171 m2	$65.00	$401,115	$65.00		
B23 Wall Finishes		1.69	10,400 m2	$35.00	$364,000	$58.99	**$1,659,900**	**7%**
B3 FITTINGS & EQUIPMENT						**$696.14**		
B31 Fittings & Fixtures		1.00	6,171 m2	$338.07	$2,086,245	$338.07		
B32 Equipment		1.00	6,171 m2	$358.07	$2,209,665	$358.07		
B33 Conveying Systems		0.00	0 stp	$0.00	$0	$0.00	**$4,295,900**	**18%**
C SERVICES								
C1 MECHANICAL						**$636.51**		
C11 Plumbing & Drainage		1.00	6,171 m2	$345.00	$1,433,993	$232.38		
C12 Fire Protection		1.00	6,171 m2	$40.00	$166,260	$26.94		
C13 H.V.A.C.		1.00	6,171 m2	$510.00	$2,119,815	$343.51		
C14 Controls		1.00	6,171 m2	$50.00	$207,825	$33.68	**$3,927,900**	**17%**
C2 ELECTRICAL						**$185.23**		
C21 Service & Distribution		1.00	6,171 m2	$125.00	$519,563	$84.19		
C22 Lighting, Devices & Heating		1.00	6,171 m2	$120.00	$498,780	$80.83		
C23 Systems & Ancillaries		1.00	6,171 m2	$30.00	$124,695	$20.21	**$1,143,000**	**5%**
NET BUILDING COST (Excluding Site)						$2,611.25	**$16,114,000**	**69%**
D SITE & ANCILLARY WORK								
D1 SITE WORK						**$0.00**		
D11 Site Development		0.00	0 m2	$0.00	$0	$0.00		
D12 Mechanical Site Services		0.00	0 m2	$0.00	$0	$0.00		
D13 Electrical Site Services		0.00	0 m2	$0.00	$0	$0.00	**$0**	**0%**
D2 ANCILLARY WORK						**$0.00**		
D21 Demolition		0.00	0 m2	$0.00	$0	$0.00		
D22 Alterations		0.00	0 m2	$0.00	$0	$0.00	**$0**	**0%**
NET BUILDING COST (Including Site)						$2,611.25	**$16,114,000**	
Z GENERAL REQUIREMENTS & ALLOWANCES								
Z1 GEN. REQ. DESIGN FEES & FEES	**21.1%**					**$550.97**		
Z11 General Requirements	17.6%				$2,836,064	$459.58		
Z12 Design Fees	0.0%		EXCLUDED		$0	$0.00		
Z13 Fees	3.5%				$563,990	$91.39	**$3,400,100**	**15%**
TOTAL CONSTRUCTION ESTIMATE (Excluding Allowances)							**$19,514,100**	**83%**
Z2 ALLOWANCES	**12.0%**					**$627.39**		
Z21 Design Contingency	12.0%				$2,341,692	$379.47		
Z22 Escalation Allowance	0.0%				$0	$0.00		
Z23 Phasing Allowance	0.0%				$0	$0.00	**$2,341,692**	
							$21,855,792	
Z24 Owners Change Order Cont.	7.0%				$1,529,905	$247.92	**$1,529,905**	**7%**
GOOD & SERVICES TAX	0.0%		EXCLUDED		$0	$0.00	**$0**	**0%**
TOTAL CONSTRUCTION ESTIMATE (Including Allowances)							**$23,385,697**	**100%**

		Cost/m2
GFA	**6,171 m2**	**$3,789.61**
GFA	**66,425 sf**	**$352.06**

ELEMENTAL COST SUMMARY

FUNCTIONAL/CONCEPTUAL COST ESTIMATE

Altus Group

			Cat:	N/A	
Project:	Aquatics Centre Study	Concept 2	File:	N/A	
Location:	Fort Saskatchewan, AB		Date:	February 23rd, 2015	
Owner/Client:	City of Fort Saskatchewan		Project Number:	12130.100040.000	
Architect:	BR2 Architecture		**Gross Floor Area:**	**6,171 m2**	

Element	Ratio to GFA	Elemental Quantity	Elemental Unit Rate	Elemental Amount	Cost/m2	Amount	
A SHELL							
A1 SUBSTRUCTURE					**$77.59**		
A11 Foundation	0.56	3,485 m2	$80.00	$278,800	$45.18		
A12 Basement Excavation	0.65	4,000 m3	$50.00	$200,000	$32.41	**$478,800**	**2%**
A2 STRUCTURE					**$290.15**		
A21 Lowest Floor Construction	0.56	3,485 m2	$150.00	$522,750	$84.71		
A22 Upper Floor Construction	0.02	120 m2	$400.00	$48,000	$7.78		
A23 Roof Construction	0.56	3,485 m2	$350.00	$1,219,750	$197.66	**$1,790,500**	**7%**
A3 EXTERIOR ENCLOSURE					**$340.44**		
A31 Walls Below Grade	0.00	0 m2	$0.00	$0	$0.00		
A32 Walls Above Grade	0.32	2,000 m2	$500.00	$1,000,000	$162.05		
A33 Windows & Entrances	0.06	400 m2	$1,200.00	$480,000	$77.78		
A34 Roof Covering	0.56	3,485 m2	$175.00	$609,875	$98.83		
A35 Projections	0.00	30 m2	$365.00	$10,950	$1.77	**$2,100,800**	**9%**
B INTERIORS							
B1 PARTITIONS & DOORS					**$143.98**		
B11 Partitions	0.57	3,500 m2	$235.00	$822,500	$133.28		
B12 Doors	0.01	33 No	$2,000.00	$66,000	$10.70	**$888,500**	**4%**
B2 FINISHES					**$266.72**		
B21 Floor Finishes	1.00	6,171 m2	$145.00	$894,795	$145.00		
B22 Ceiling Finishes	1.00	6,171 m2	$65.00	$401,115	$65.00		
B23 Wall Finishes	1.62	10,000 m2	$35.00	$350,000	$56.72	**$1,645,900**	**7%**
B3 FITTINGS & EQUIPMENT					**$696.14**		
B31 Fittings & Fixtures	1.00	6,171 m2	$338.07	$2,086,245	$338.07		
B32 Equipment	1.00	6,171 m2	$358.07	$2,209,665	$358.07		
B33 Conveying Systems	0.00	0 stp	$0.00	$0	$0.00	**$4,295,900**	**18%**
C SERVICES							
C1 MECHANICAL					**$655.05**		
C11 Plumbing & Drainage	1.00	6,171 m2	$345.00	$1,407,770	$228.13		
C12 Fire Protection	1.00	6,171 m2	$40.00	$180,999	$29.33		
C13 H.V.A.C.	1.00	6,171 m2	$510.00	$2,212,210	$358.48		
C14 Controls	1.00	6,171 m2	$50.00	$241,332	$39.11	**$4,042,300**	**17%**
C2 ELECTRICAL					**$198.80**		
C21 Service & Distribution	1.00	6,171 m2	$125.00	$542,997	$87.99		
C22 Lighting, Devices & Heating	1.00	6,171 m2	$120.00	$522,886	$84.73		
C23 Systems & Ancillaries	1.00	6,171 m2	$30.00	$160,888	$26.07	**$1,226,800**	**5%**
NET BUILDING COST (Excluding Site)					$2,668.85	**$16,469,500**	**69%**
D SITE & ANCILLARY WORK							
D1 SITE WORK					**$0.00**		
D11 Site Development	0.00	0 m2	$0.00	$0	$0.00		
D12 Mechanical Site Services	0.00	0 m2	$0.00	$0	$0.00		
D13 Electrical Site Services	0.00	0 m2	$0.00	$0	$0.00	**$0**	**0%**
D2 ANCILLARY WORK					**$0.00**		
D21 Demolition	0.00	0 m2	$0.00	$0	$0.00		
D22 Alterations	0.00	0 m2	$0.00	$0	$0.00	**$0**	**0%**
NET BUILDING COST (Including Site)					$2,668.85	**$16,469,500**	
Z GENERAL REQUIREMENTS & ALLOWANCES							
Z1 GEN. REQ. DESIGN FEES & FEES	**21.1%**				**$563.13**		
Z11 General Requirements	17.6%			$2,898,632	$469.72		
Z12 Design Fees	0.0%	EXCLUDED		$0	$0.00		
Z13 Fees	3.5%			$576,433	$93.41	**$3,475,100**	**15%**
TOTAL CONSTRUCTION ESTIMATE (Excluding Allowances)						**$19,944,600**	**83%**
Z2 ALLOWANCES	**12.0%**				**$641.23**		
Z21 Design Contingency	12.0%			$2,393,352	$387.84		
Z22 Escalation Allowance	0.0%			$0	$0.00		
Z23 Phasing Allowance	0.0%			$0	$0.00	**$2,393,352**	
						$22,337,952	
Z24 Owners Change Order Cont.	7.0%			$1,563,657	$253.39	**$1,563,657**	**7%**
GOOD & SERVICES TAX	0.0%	EXCLUDED		$0	$0.00	**$0**	**0%**
TOTAL CONSTRUCTION ESTIMATE (Including Allowances)						**$23,901,609**	**100%**

		Cost/m2
GFA	**6,171 m2**	**$3,873.21**
GFA	**66,425 sf**	**$359.83**

ELEMENTAL COST SUMMARY

FUNCTIONAL/CONCEPTUAL COST ESTIMATE

AltusGroup

			Cat:	N/A	
Project:	Aquatics Centre Study	Concept 3	File:	N/A	
Location:	Fort Saskatchewan, AB		Date:	February 23rd, 2015	
Owner/Client:	City of Fort Saskatchewan		Project Number:	12130.100040.000	
Architect:	BR2 Architecture		**Gross Floor Area:**	**4,552 m2**	

Element	Ratio to GFA	Elemental Quantity	Elemental Unit Rate	Elemental Amount	Cost/m2	Amount	
A SHELL							
A1 SUBSTRUCTURE					**$132.25**		
A11 Foundation	0.97	4,400 m2	$80.00	$352,000	$77.33		
A12 Basement Excavation	1.10	5,000 m3	$50.00	$250,000	$54.92	**$602,000**	**3%**
A2 STRUCTURE					**$496.66**		
A21 Lowest Floor Construction	0.97	4,400 m2	$150.00	$660,000	$144.99		
A22 Upper Floor Construction	0.03	152 m2	$400.00	$60,800	$13.36		
A23 Roof Construction	0.97	4,400 m2	$350.00	$1,540,000	$338.31	**$2,260,800**	**10%**
A3 EXTERIOR ENCLOSURE					**$529.77**		
A31 Walls Below Grade	0.00	0 m2	$0.00	$0	$0.00		
A32 Walls Above Grade	0.49	2,250 m2	$500.00	$1,125,000	$247.14		
A33 Windows & Entrances	0.09	400 m2	$1,200.00	$480,000	$105.45		
A34 Roof Covering	0.97	4,400 m2	$175.00	$770,000	$169.16		
A35 Projections	0.02	100 m2	$365.00	$36,500	$8.02	**$2,411,500**	**10%**
B INTERIORS							
B1 PARTITIONS & DOORS					**$228.47**		
B11 Partitions	0.88	4,000 m2	$235.00	$940,000	$206.50		
B12 Doors	0.01	50 No	$2,000.00	$100,000	$21.97	**$1,040,000**	**4%**
B2 FINISHES					**$286.64**		
B21 Floor Finishes	1.00	4,552 m2	$145.00	$660,040	$145.00		
B22 Ceiling Finishes	0.97	4,400 m2	$65.00	$286,000	$62.83		
B23 Wall Finishes	2.25	10,250 m2	$35.00	$358,750	$78.81	**$1,304,800**	**6%**
B3 FITTINGS & EQUIPMENT					**$869.05**		
B31 Fittings & Fixtures	1.00	4,552 m2	$424.53	$1,932,440	$424.53		
B32 Equipment	1.00	4,552 m2	$444.53	$2,023,480	$444.53		
B33 Conveying Systems	0.00	0 stp	$0.00	$0	$0.00	**$3,955,900**	**17%**
C SERVICES							
C1 MECHANICAL					**$945.00**		
C11 Plumbing & Drainage	1.00	4,552 m2	$345.00	$1,570,440	$345.00		
C12 Fire Protection	1.00	4,552 m2	$40.00	$182,080	$40.00		
C13 H.V.A.C.	1.00	4,552 m2	$510.00	$2,321,520	$510.00		
C14 Controls	1.00	4,552 m2	$50.00	$227,600	$50.00	**$4,301,600**	**18%**
C2 ELECTRICAL					**$275.00**		
C21 Service & Distribution	1.00	4,552 m2	$125.00	$569,000	$125.00		
C22 Lighting, Devices & Heating	1.00	4,552 m2	$120.00	$546,240	$120.00		
C23 Systems & Ancillaries	1.00	4,552 m2	$30.00	$136,560	$30.00	**$1,251,800**	**5%**
NET BUILDING COST (Excluding Site)					$3,762.83	**$17,128,400**	**73%**
D SITE & ANCILLARY WORK							
D1 SITE WORK					**$0.00**		
D11 Site Development	0.00	0 m2	$0.00	$0	$0.00		
D12 Mechanical Site Services	0.00	0 m2	$0.00	$0	$0.00		
D13 Electrical Site Services	0.00	0 m2	$0.00	$0	$0.00	**$0**	**0%**
D2 ANCILLARY WORK					**$0.00**		
D21 Demolition	0.00	0 m2	$0.00	$0	$0.00		
D22 Alterations	0.00	0 m2	$0.00	$0	$0.00	**$0**	**0%**
NET BUILDING COST (Including Site)					$3,762.83	**$17,128,400**	
Z GENERAL REQUIREMENTS & ALLOWANCES							
Z1 GEN. REQ. DESIGN FEES & FEES	**18.1%**				**$681.07**		
Z11 General Requirements	14.6%			$2,500,746	$549.37		
Z12 Design Fees	0.0%	EXCLUDED		$0	$0.00		
Z13 Fees	3.5%			$599,494	$131.70	**$3,100,200**	**13%**
TOTAL CONSTRUCTION ESTIMATE (Excluding Allowances)						**$20,228,600**	**86%**
Z2 ALLOWANCES	**10.0%**				**$713.24**		
Z21 Design Contingency	10.0%			$2,022,860	$444.39		
Z22 Escalation Allowance	0.0%			$0	$0.00		
Z23 Phasing Allowance	0.0%			$0	$0.00	**$2,022,860**	
						$22,251,460	
Z24 Owners Change Order Cont.	5.5%			$1,223,830	$268.86	**$1,223,830**	**5%**
GOOD & SERVICES TAX	0.0%	EXCLUDED		$0	$0.00	**$0**	**0%**
TOTAL CONSTRUCTION ESTIMATE (Including Allowances)						**$23,475,290**	**100%**

		Cost/m2
GFA	**4,552 m2**	**$5,157.14**
GFA	**48,998 sf**	**$479.11**

Appendix C - Drawings / Documents

Dow Centennial Centre – Strategic Master Plan			
Provided By: BR2 Architecture			
Number	**Name**	**Date Issued**	**Date Received**
	Conceptual Plans	Feb 2, 2015	Feb 13, 2015