TOWN OF GRIMSBY

PEACH KING CENTRE

EXPANSION & RENOVATION

August 15th 2023

mcCallumSather

project team

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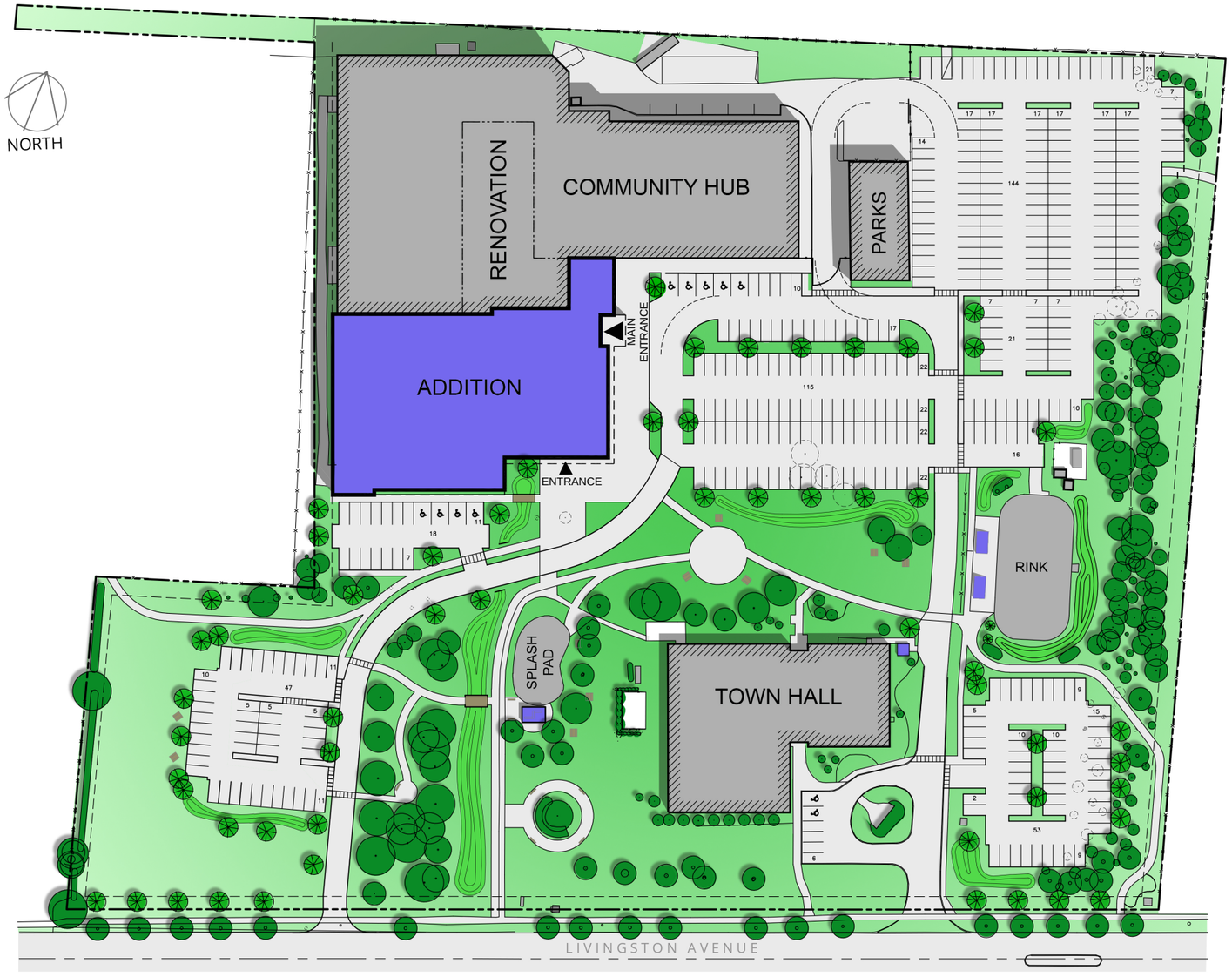

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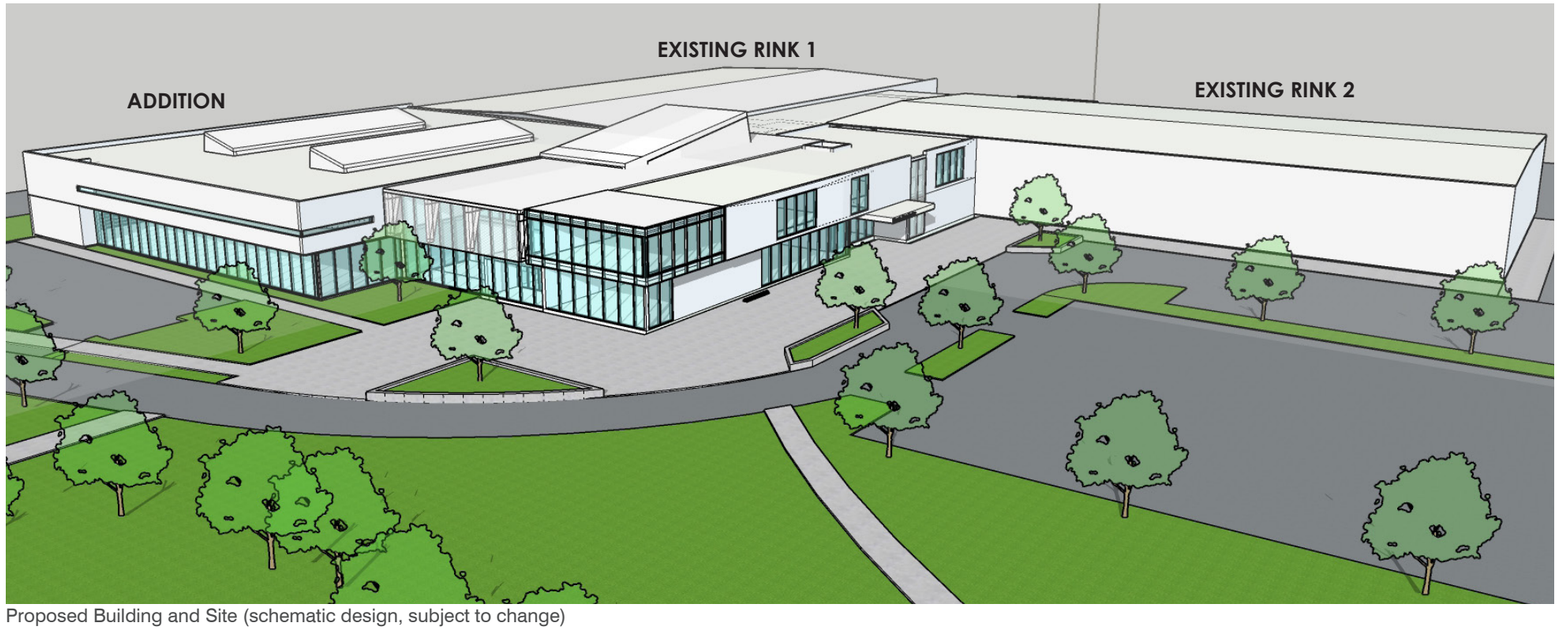
1.0 summary



Proposed Building and Site (schematic design, subject to change)

This document is a design brief which describes the new two storey addition to the existing Peach King Centre. This brief purpose is threefold: it is to be used as a basis of design for the design/build team, to provide the basis for costing analysis and budget validation, and finally to be used by the Town of Grimsby to evaluate the identified success criteria, which will allow the design team to proceed to the next stage of design.

The existing Peach King Centre in Grimsby is in need of an expansion to serve the current and forecasted population. The expanded facility will provide the community with a multitude of new and improved program space to maximize its potential as a recreational and cultural hub for the community.

The proposed renovation and expansion not only reimagines the Peach King Centre, but also proposes a more sustainable, functional, and exciting site design which consolidates parking areas and green spaces. The proposed site, including the existing Town Hall, envisions exciting & safe greenspaces that will also function as outdoor gathering spaces for the community.

The enclosed document includes drawings, specifications, diagrams and narratives that describe the proposed facility at the conclusion of Schematic Design, the first stage of the design process.

2.0 methodology

Site Analysis

The site is located at 162 Livingston Ave in Grimsby. The site adjacencies include residential neighbourhoods to the east and west and an active train line to the north. The site is shared with the town hall and the parks shop. The total site area is 56,148 m^2 with 281 m of street frontage on Livingston Ave. For zoning considerations of the site see the enclosed zoning review.

Stake Holder Conversations and Needs

The mcCallumSather team has and will continue to meet with various stakeholders of the proposed Peach King Centre expansion to better understand their current facilities short comings and the requirements for the success of the proposed facility. There is a need to improve opportunities for community recreation and address service gaps as identified in the Town's Parks, Recreation and Culture Master Plan. Expanding amenities within the Peach King Centre was identified in the Town's Strategic Priorities for 2019-2022 and 2023-2026. Below is a list of essential items identified by the Town for this project.

- Improve and expand indoor recreation space
- Optimize a suite of new programs and services for all citizens and foster greater community engagement
- Encourage and provide spaces for residents of all ages and fitness levels to attend and provide the opportunity to improve the quality of life
- Support vulnerable and underserved populations
- Address physical accessibility issues
- Create Community spaces that are accessible, inclusive and welcoming to all residents
- Design and incorporate energy and environmental sustainability measures
- Promote local economic development
- Create partnership and space use opportunities with local sport, culture and leisure partners
- Project to be on schedule and on budget

Functional Programme

The mcCallumSather (mCs) team developed an outline functional programme with prescribed space requirements to use as a starting point in developing the design options. The functional programme was reviewed and commented on by the Grimsby team to further refine the space requirements to successfully meet the stakeholders needs. Programme relationship diagrams were developed to determine the most critical program adjacencies for the optimal functioning of the facility.

Conceptual Site and Floor Plan Blocking

With the approved functional programme, the mCs team developed floor plan diagrams incorporating various program relationships, adjacencies, and architectural elements. The layout was reviewed and refined at the design meetings with the Grimsby team. Multiple iterations of site and building design options were presented, discussed and developed for refinement.

3.0 sustainability

mcCallumSather supports the decision by the Town of Grimsby to pursue this project as an addition to the existing building where services spaces and amenities can be shared in an established neighbourhood. Against a stand-alone building, the amount of resources consumed in product manufacturing including raw material extraction and transportation is reduced.

Providing the right amount of parking for the facility has been discussed with the project team and is subject to further validation through the Town of Grimsby. The desire is to limit parking expansion to meet average daily usage, with an agreed target of 420 spaces, to control the amount of hardscape on the property which allows more of the property area for active/programmed use, ad hoc use, wildlife habitat, open space and space for rain/stormwater to penetrate. Parking areas are to direct stormwater to bioswales that absorb, evaporate and filter the water before it enters the underground storm piping system, which will reduce infrastructure water volumes and flow rates. Plant species are to be native and drought tolerant without the need of an irrigation system. Shielded overhead leading will be dark sky friendly/compliant with no uplight and no light spillage beyond the property line. Bicycle parking is to be provided at building entrances and protected from weather. Also near entrances will be electric vehicle charging stations.
With the use of local structural steel and concrete for the structural system and floors, the consumption of raw materials can be reduced with the use of recycled content and reduced transportation. Carbon sequestration in heavy timber is also being pursued.
A high performance building envelope with a design that minimizes thermal bridges will work along side a high efficiency mechanical HVAC (Heating, Veniltation and Air Conditioning) system to provide comfortable indoor conditions while limiting the use/depletion of energy inputs for the various types/uses of spaces; from administartive offices to sport courts. Roofing systems will have a light coloured top surface to reflect incoming heat energy to prolong roof system material service life and reduce heat transmission into the building; reducing cooling loads on the HVAC system and saving carbon and energy costs. High mounted roof openings will allow hot, stale air to exit the building and be replaced with fresh air in high ceiling spaces such as the gymasium. Rain water from the roof is to be directed to landscaped areas for use and evaporation which serves to both reduce stormwater volumne on underground piping and to enhance the local microclimate with plant life and wildlife habitat.

Energy efficient lighting with daylight harvesting will provide good quality light levels throughout the various rooms based on the function of each room. Selective overhead/clerestory glazing will bring natural light deeper into the building and into large spaces to reduce the demand for lighting and reduce energy bills. Washrooms will be fitted with effective low-flow water use fixtures to reduce the use of potable water and the demand on sanitary infrastructure.

Systems and materials will be selected with performance, durability, safety and ease of maintenance in mind. Beyond the potential offgassing of products once a building is occupied, products such as sealants and paints are to be selected for low odours/vapours emitted during construction to protect those installing them. Protection of building materials during construction will further lead to providing a high quality indoor environment. Local products are preferred along with those with recycled content to reduce the consumption and transporation of extracted materials from the earth.

The performance of a building is directly tied to how it is operated. A comprehensive understanding of the various building systems is critial to realizing the intended system efficiencies. This responsibility will be shared by the users and Town facilities maintenance staff. A responsibility involving occupants will be a comprehensive waste diversion program with strategically placed recycling stations throughout the facility.

The building will be designed with future sustainability in mind including a reinforced roof structure to withstand the expected loading from roof mounted solar photovoltaic panels, which are currently part of a funding pursuit by the Town. Further, this pursuit seeks to make the building expansion net zero carbon certified, meaning the amount of carbon needed to construct and operate the building is offset by clean energy production.

4.0 regulatory requirements

Our design for the Peach King Centre facility adheres to the requirements set forth in the following documents. It is noted that the Ontario Building Code is not a retroactive document and there is no requirement to improve areas outside of our scope of work. The following regulations and standards have been and will continue to be considered by our complete team.

- Ontario Building Code
- Ontario Fire Code
- Town of Grimsby Zoning By-Law

Ontario Building Code

The project will be considered a major renovation required to conform to Part 3 of the Code with the area of work involving the complete demolition of the existing building. We do not foresee any challenges relating to the building code at this time. Further review will occur progressively as the project advances into subsequent phases (Design Development, Contract Documents). Noteworthy observations are listed below.

- Building Classification: A2 occupancy
- Construction: Noncombustible
- Fire Protection, addition: Sprinklered
- Fire Protection, renovation: Existing sprinklered and fire hose cabinets (West Pad)
- Fire Separations: 1-hour around gymnasium and exit stairs
  Existing 1-hour around West and East Pads

  Interconnected floor space compliant/exception

- Exits: Two (2) minimum per floor
  One exit leading through a Lobby
  No dead-end corridors
  45m maximum travel distance to egress door
- Washroom analysis: 22 new fixtures based on occupant load
  75 fixtures per female, 100 fixtures per males
  50:50 occupant ratio female:male

The anticipated occupant load for the building has been determined per the following table. (Note these values are subject to change during design development.)

Room	Occupancy	Notes
Existing East Pad	760	Per existing occupancy notice, combining Spectators in Bleachers, Spectators Standing and Ice Skating
Existing West Pad	986	Per existing occupancy notice, combining Spectators in Bleachers, Spectators Standing and Ice Skating
Crush/Viewing	101	1.85 m2/person* OBC 3.1.17.1
Waiting	20	1.85 m2/person* OBC 3.1.17.1
Pop-Up	101	1.85 m2/person* OBC 3.1.17.1
Flex Work	5	By design
Greeting	2	9.3 m2/person* OBC 3.1.17.1
Display Areas	10	By design
Seating Alcove	18	By design
Gymnasium	600	By design
Multipurpose Large	200	By design
Multipurpose Medium	66	By design
Youth	40	By design
Reflection	5	By design
Concession	2	By design
Fitness Studio	35	By design
Fitness Weights	250	Per existing occupancy notice (no dance)
Admin	16	By design
Boardroom	20	By design
Existing Workstations	5	By design

Total Occupants 3,242

* Based on functional programme area

The above analysis doesn't consider the existing washrooms built in 2003. They are understood to be directly associated with the East ice pad.

Zoning

- 10.5m visibility triangles at drive accesses
- 1 parking space /28m^2 Gross Floor Area (GFA) Office/Town Hall
- 1 parking space /10m^2 GFA Assembly/Community Hub/Recreation Centre
- Total parking target is 420 spaces, and is being studied with the town.
- 3.0m parking setback from street line
- 4.5m parking setback from residential properties
- 2.75m x 5.75m parking space at 90 degrees to drive aisle
- 6.0m drive aisle width for two-way traffic
- 1 accessible parking space /20 parking spaces
  -5% of 420 parking spaces = 21 accessible parking
- 4.5m x 5.75m accessible parking space
- Bicycle parking to be >=7% of parking spaces
  -7% of 420 parking spaces = 30 bicycle parking (29.4 rounded up)
- Zone = Institutional
- Permitted uses = Community Recreation Centre, Municipal Office, Retail store permitted as accessory within Rec. Centre max 10% of bldg. size, Special Event Use, Work Yards (site specific permission)
- Maximum Lot Coverage = 50%
- Minimum Front Yard = 4.5m
- Minimum Exterior Side Yard = 4.5m
- Minimum Interior Side Yard = 9m
- Minimum Rear Yard = 7.5m
- Maximum Height = 12m
- 3m landscape strip adjacent to street lines of residential zone

Barrier Free / AODA Accessability

Building exteriors/landscapes that fall within the current AODA regulations will be compliant including a suitably sloped exterior walk with tactile warning indicators at changes in elevation at steps.
The building addition will be fully compliant to the Ontario Building Code (OBC) including:

- sufficient exit widths
- emergency paths of travel that are clear, direct, and within the allowable travel distance
- doorways with adequate clearances both through the door and upon approach
- clear corridors free of obstructions
- level floors set to match the elevations of existing building

5.0 schedule & budget

Budget

The project construction budget has been confirmed at $29,346,000 plus furnishings, equipment, construction contingency and applicable taxes excluding soft costs (permit fees, third party costs, etc.). Through the Town, Turner & Townsend performed a order of magnitude cost estimation in May 2023 based on the scope of work identified in the Request For Proposal (RFP) and design input from mcCallumSather based on design meetings. The construction budget was subsequently increased to take advantage of the opportunity to increase the size of the gymnasium and include sustainability measures including increased insulation, improved glazing systems and support for future roof mounted energy generating equipment (solar photovoltaic array).

At this time geotechnical investigation, soil testing and an arborist report is in progress which will provide valuable information and recommendations into the design where assumptions have been made; satisfactory subgrade bearing capacity, reusable soils for construction, overall good tree health. Additional measures may be required once this information is provided. A designated substance report of the existing building has been provided. The design team has followed the understanding that existing infrastructure (storm, sanitary, electrical power) are adequate for the project. The next phase of design will look further into confirming that the demand can be met. As with any renovation project, there is always a risk of exposing unforeseen conditions that aren't available for review prior to construction beginning.

Schedule

This project is subject to Site Plan Control as a development to the property that affects building coverage. A pre-consultation meeting has been held with the Town and feedback received. A formal application is scheduled to be submitted mid-September with final approval expected Q1 2024. Subsequently a building permit will be pursued with the Town. Timelines for feedback on permit applications are variable based on the type of project, size of project, and work loads of plans examiners and therefore out of our control. We will work diligently to provide all required documentation at the time of the application submission and follow up with the Town regularly on the status of the permits.

It is the desire of the town to keep some programs occurring in the building during construction. These programs serve the community and bring in revenue. Due to the area of the existing building being consumed by the work, there will be a reduction in the quantity of washrooms available for use. Therefore the quantity of occupants in the building will be reduced. Further, the main entrance to the building is within the area of demolition and rebuild. A phasing strategy will need to be developed to address how people get in and out of the building safely and comfortably.

A Construction Manager is to be hired by the Town and join the project team in mid-September who will bring insight into the project schedule especially for the multiple tender packages and building permit process. To begin construction sooner, it is expected that multiple building permits will be applied for: foundations, structure, balance of building. This process does extend the overall timeline of approvals but a foundation permit application is processed quicker by the Building department than a permit application for foundations along with the rest of the building. An advantage of this process is also that construction may finish sooner in Q3 2025.

1.0 Central Entrance (New)

1.1 Lobby/Flex Space

1.2 Reflection Room

Total

2.0 Activity Areas

2.1 Gymnasium incl. Walking Track

2.3 Multi-Purpose Room (Large) incl Storage

2.4 Multi-Purpose Rooms (Medium)

2.5 Youth Area

2.6 Fitness Studio

Total

3.0 Administration

3.1 Offices (private)

3.2 Hot Desking Workstations

3.3 Adminstration Work Area

Total

4.0 Support

4.1 Concession

4.2 Change Rooms

4.3 Universal Washroom

4.4 Washrooms

4.5 Staff Unisex Washrooms

4.6 Janitorial Space

4.7 General Storage

4.8 Elevator

4.9 IT/Server

4.10 Sprinkler Room

5.0 Renovation

5.1 Select Change Rooms

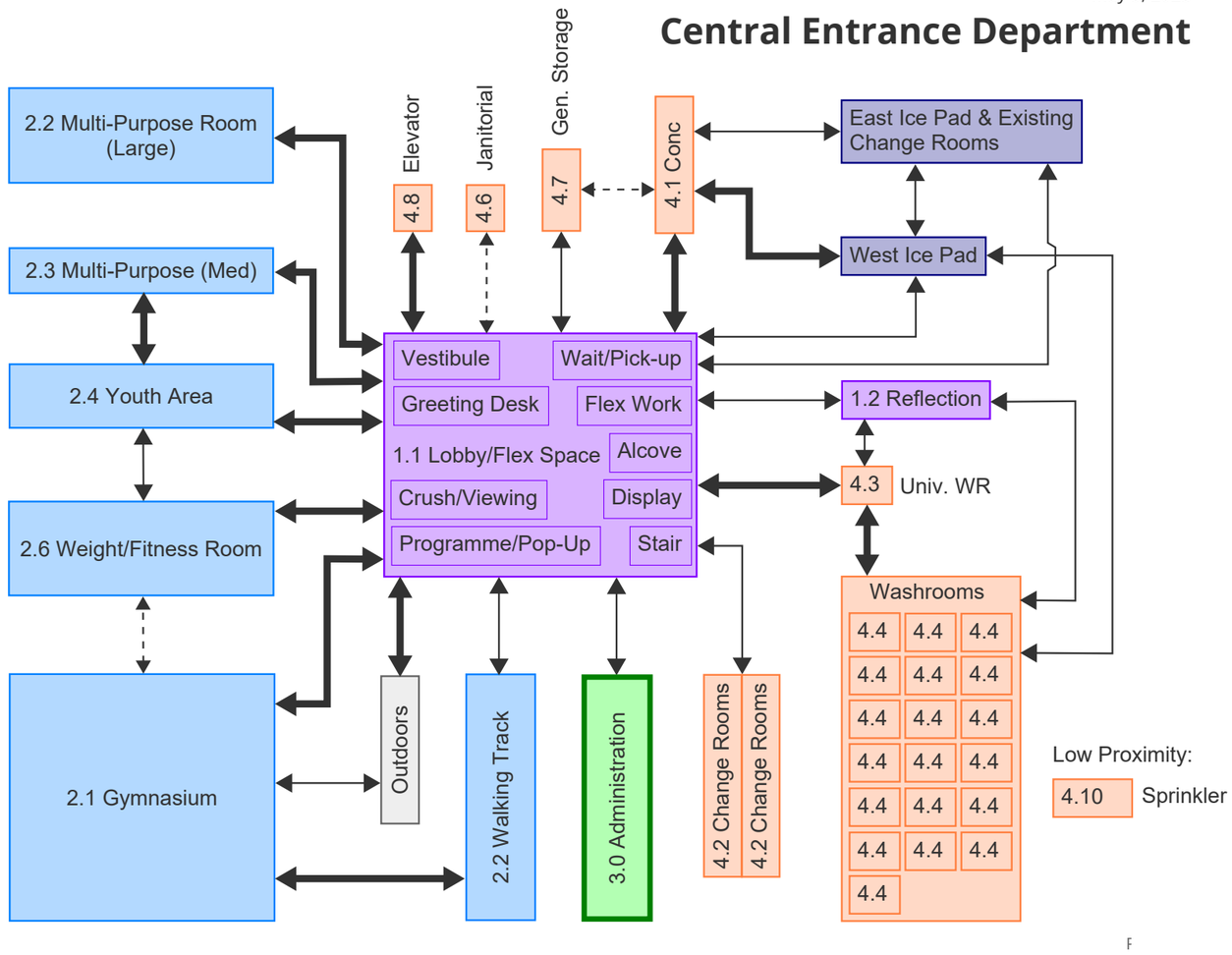
5.2 Fitness Centre

5.3 Select Service Rooms

Functional Programme Spatial Relationships

May 5, 2023

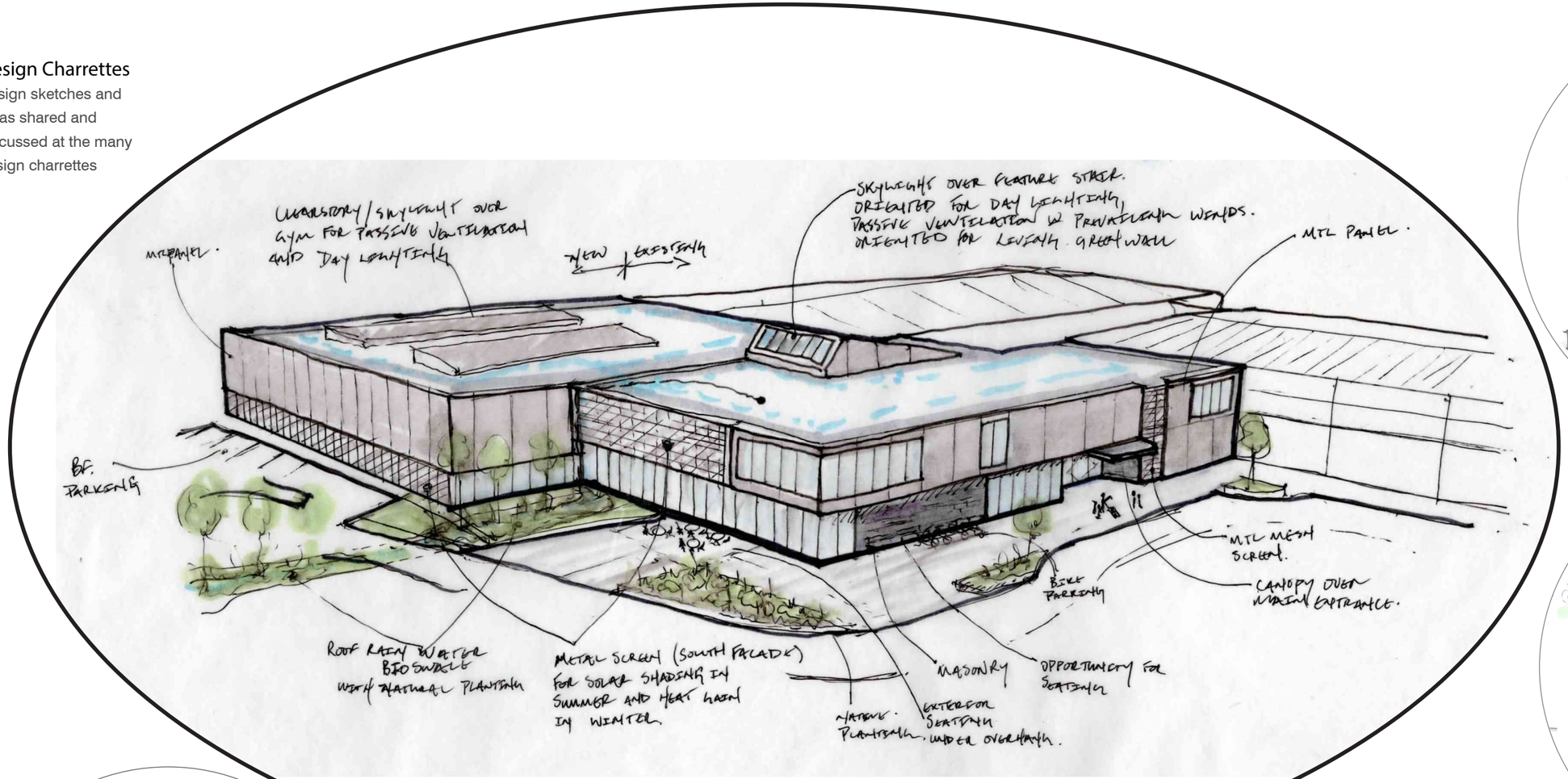
Central Entrance Department



functional programme

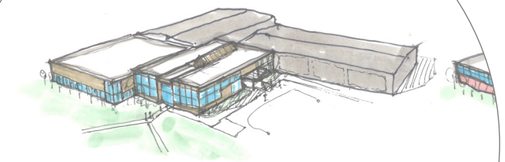
Design Charrettes

Design sketches and ideas shared and discussed at the many design charrettes



late schematic design sketch (subject to change)

previous design interation



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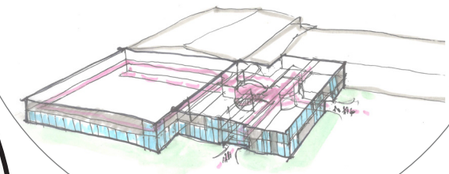

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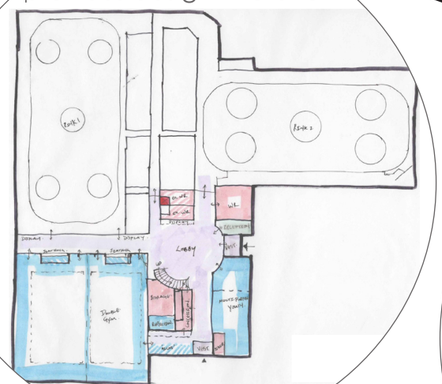

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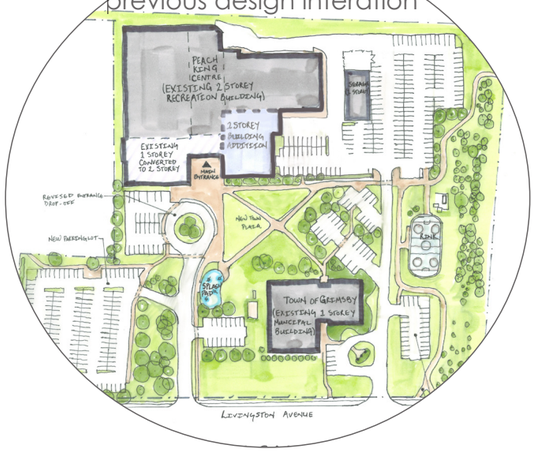

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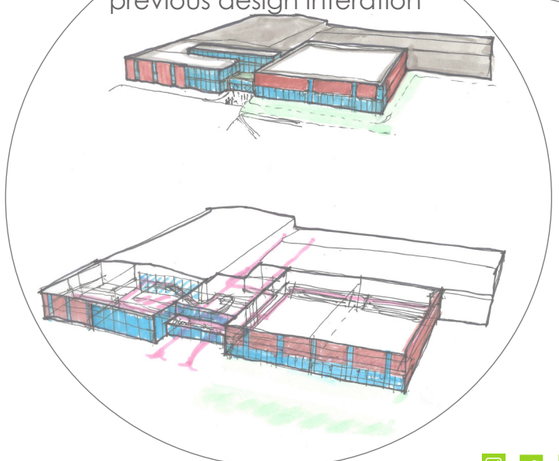


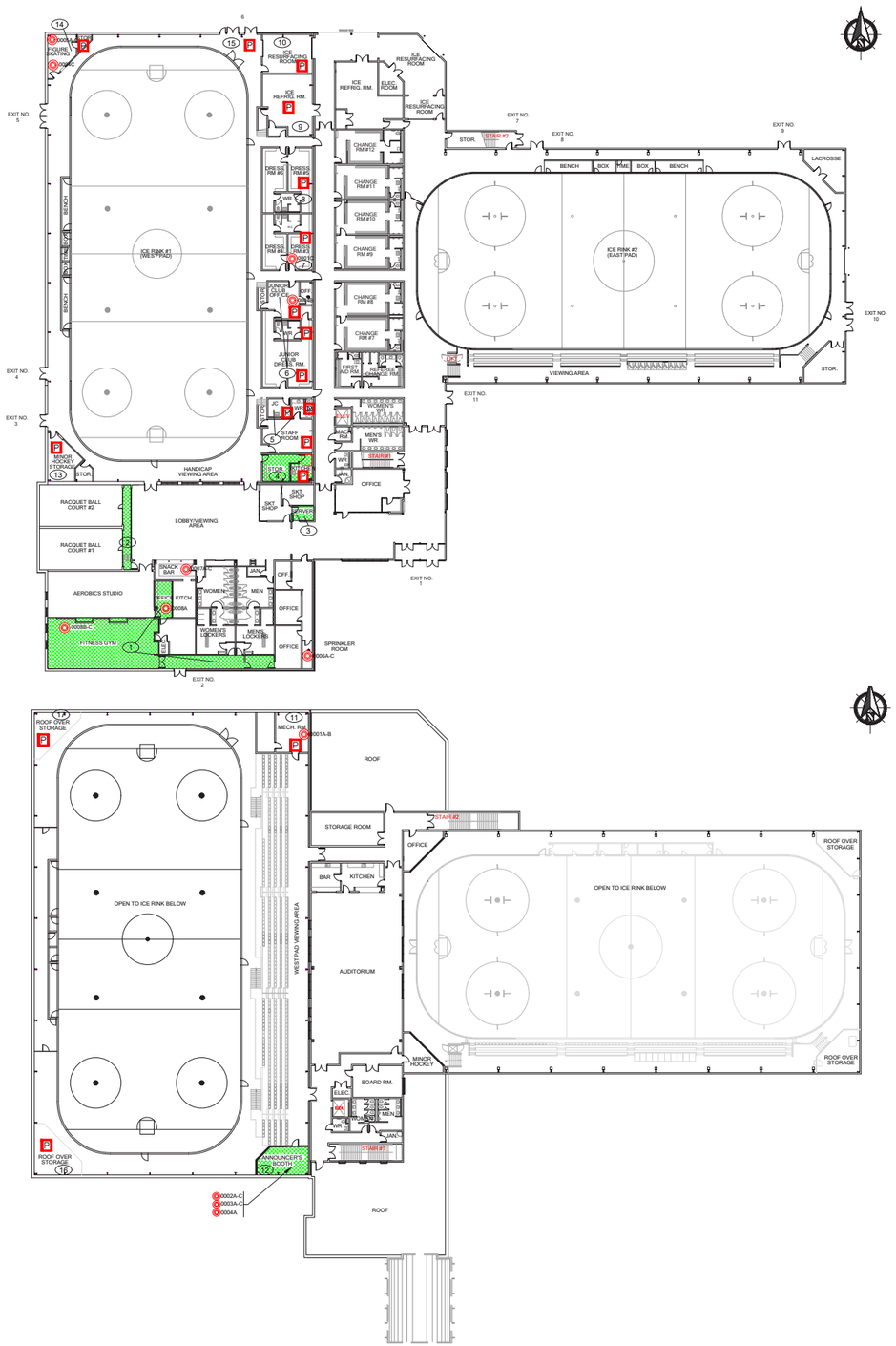
6.0 existing conditions

The Peach King Centre is a current recreation facility operated by the Town of Grimsby. The original building was constructed in 1984. In 2004 an addition was added to the east. The total floor area is 7,412 M². The building contains two ice rinks, an entrance lobby, a gymnasium, offices and storage rooms.

The design team conducted multiple onsite audits to verify existing conditions, take dimensions and take photographs.

Auditorium

Lobby



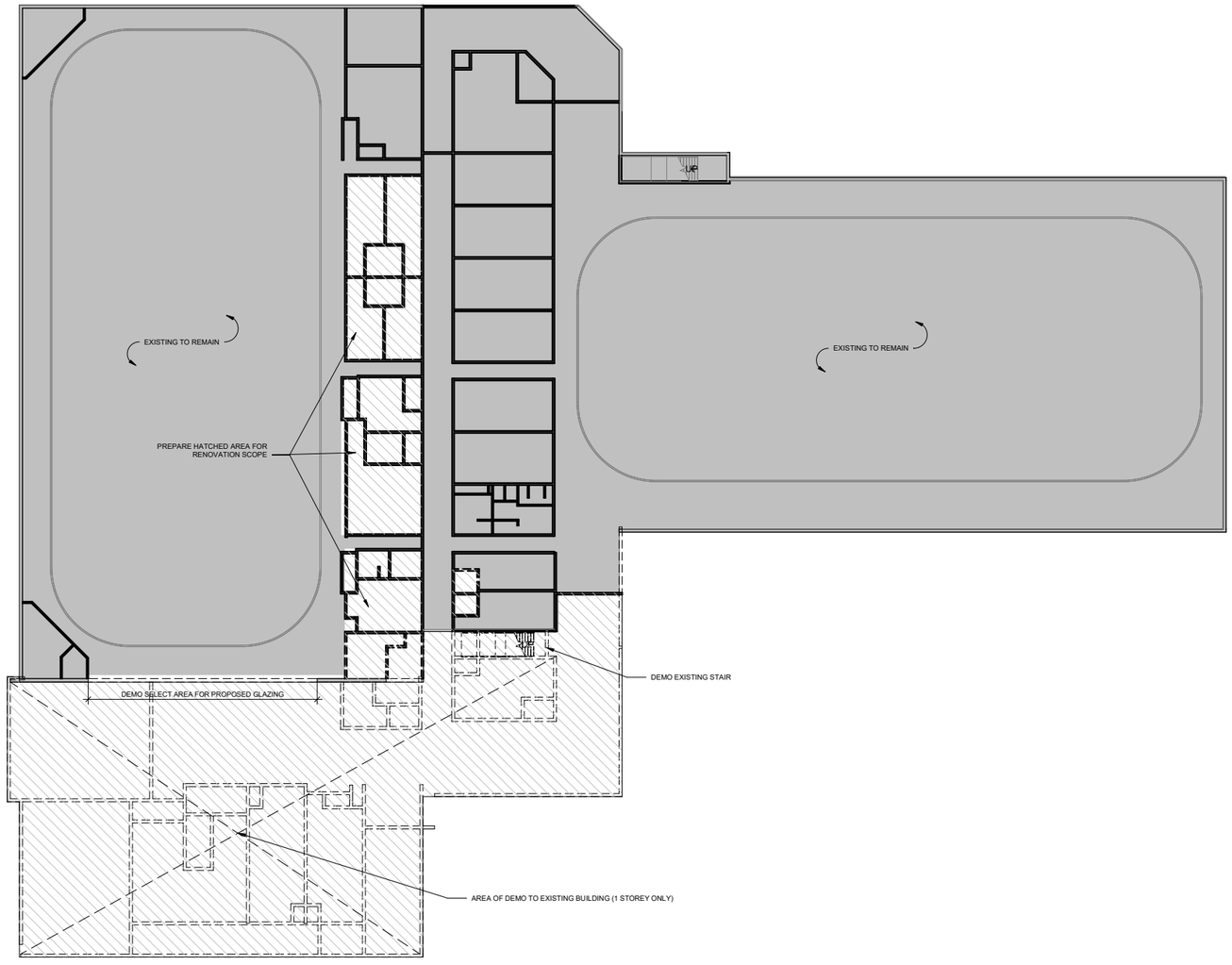
Viewing/lobby space

Main entrance

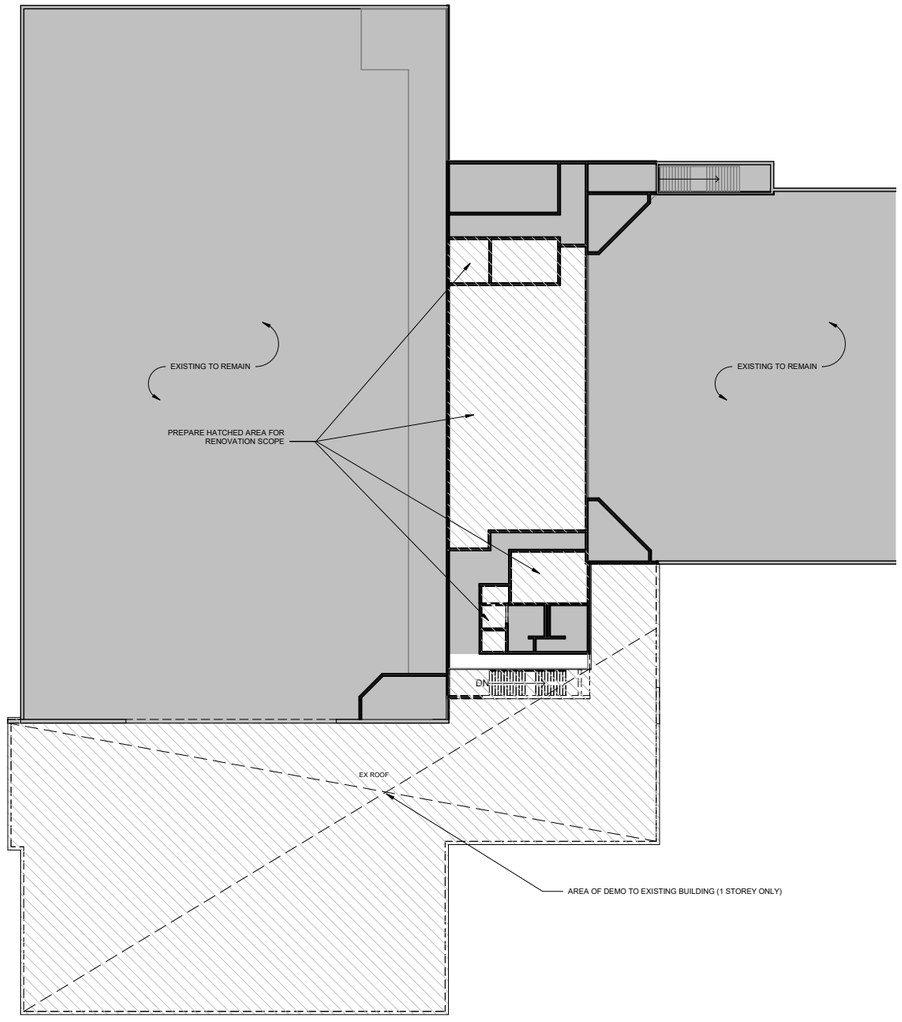
Exterior at main entrance

6.1 demolition

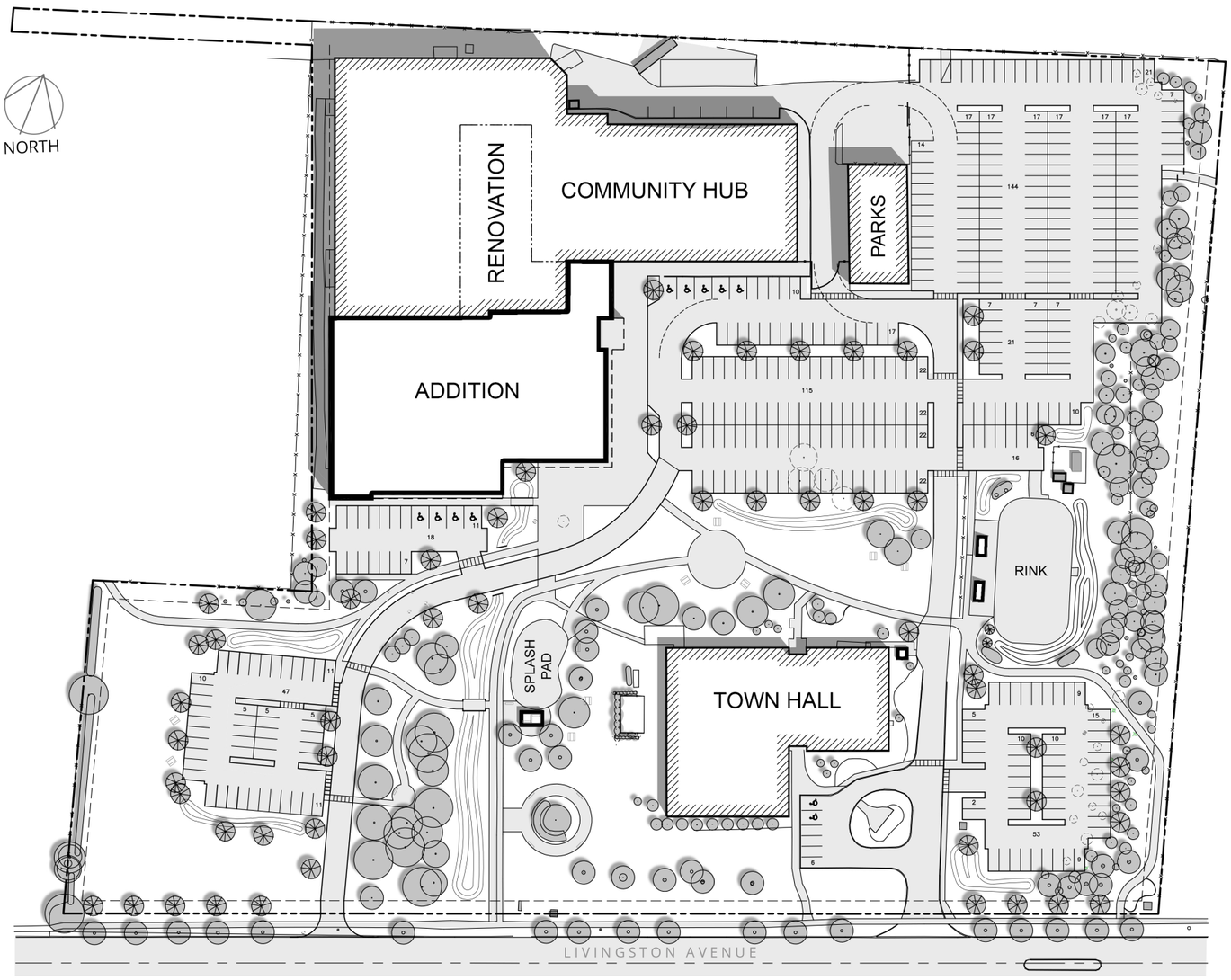
The demolition scope of the project includes removing select areas of the 1 storey building and existing stair. Areas to be renovated will also need to be made ready for the proposed work, which will include removing flooring, walls, ceilings, lighting and mechanical systems where applicable.



Level 1



Level 2



7.0 proposed site design

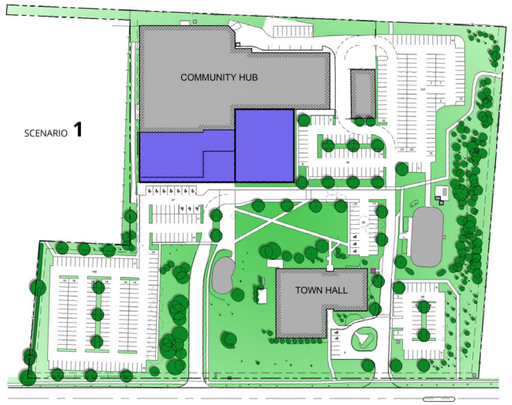
The property at 160 Livingston Avenue is home to several municipal buildings with various departments providing a range of services to the community, services which continue to grow today. From a Town Hall came an ice arena followed by expansions to both buildings along with the addition of a shops building for the parks department. Each building is unique in its design, in its placement in the site and how it is used. At the onset the project team took a holistic view of the property to consider how the site is laid out, how people and vehicles move through it and occupy it, and what are the opportunities to improve things.
Issues identified as having opportunities for enhancement were:

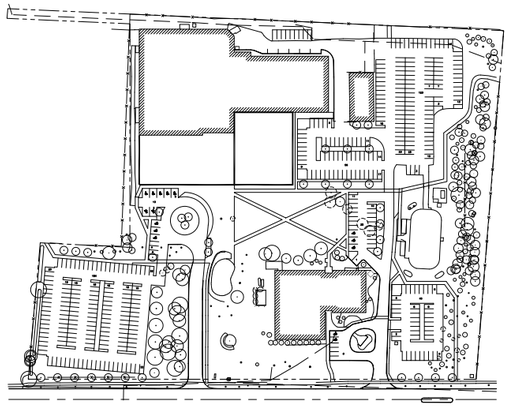
- Car centric design; the driveways and parking take charge and dominate
- Proximity of primary driveways to children play areas; the splash pad
- Arrangement/location of parking serving outdoor play spaces
- Proximity of washroom facilities for outdoor amenities
- Parking space quantities
- Activation and enjoyment of natural spaces
- Social and environmental connections

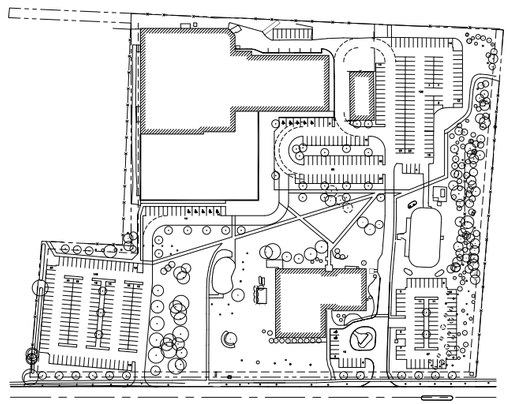
The journey taken during the initial stage of design went through many iterations, many tests looking to find the best solution to these various issues into an exciting, effective and plausible composition.

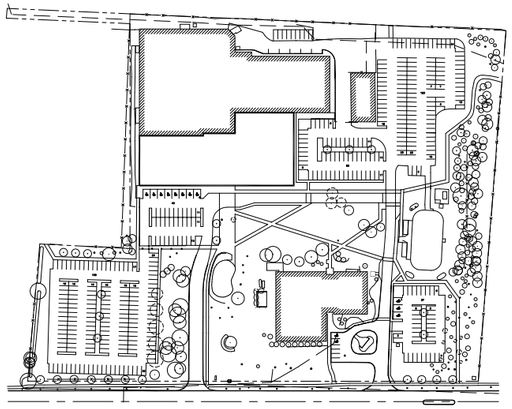
- Explore opportunities to maintain an open and green street face that connects to a north-south pedestrian green leading into the property. The procession is unique and solitude from the automobile where it runs alongside the Town Hall on one side with a large, planted area extending along the path on the other side with a grove of tall mature trees as the backdrop.
- Connect this green corridor to the campus green space which is the central node feeding the splash pad, community centre, town hall and outdoor rink; make one continuous network and push the vehicles out of this zone.
- Maintain an open green space and buffer to adjacent residential neighbours.
- Add density to the existing parking lot at the back north-east corner of the property, focusing on efficiency, to allow other parking areas to be of smaller scale and not dominate the site.
- Balance this approach of increased development in the north-east corner with protecting existing tree canopy, blending cut and fill areas that respond to the existing topography and drainage patterns; retain the existing wood sound wall to the eastern neighbours.
- Create connections from the sidewalk into the site and linking them to the central campus green space, community buildings and outdoor amenities including an enhanced node for community connectivity and viewing at the outdoor rink.
- Surround and weave within new parking area opportunities for plantings that utilize and filter rainwater, provide wildlife habitat and express texture and colour throughout the seasons.
- Provide a welcoming, large open space in front of the recreation building that flows and connects the east and south approaches allowing a variety of social gatherings and events.
- Channel rainwater from building roofs to landscaped areas that navigate along circulation routes and enhance the environment.

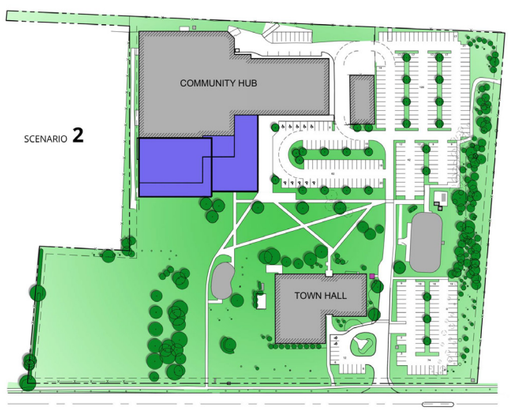
7.1 iterative design work

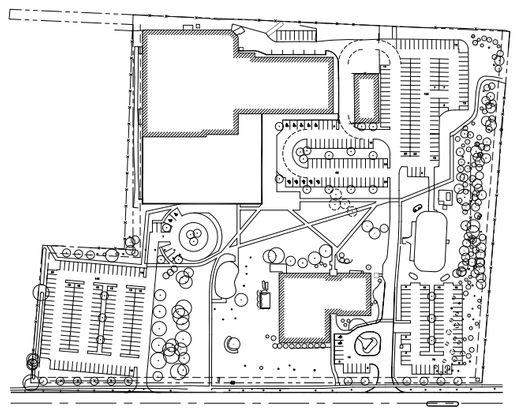


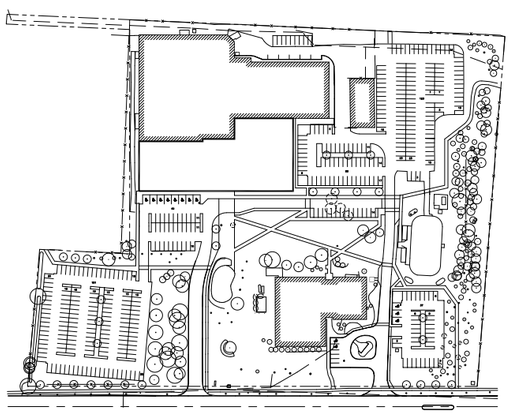


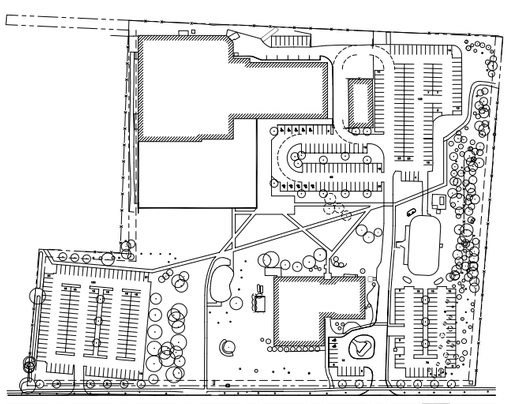












Site Configurations

Multiple site configurations were explored throughout the schematic design process. The design challenges included accommodating the additional required parking as well as consolidating green/pedestrian space and parking/vehicle space, to provide a beautiful, functional, safe and improved site design. The proposed solutions above were all evaluated and debated amongst the team for their opportunities and challenges. The final site design selected provided the most exciting opportunities, while also accommodating the functional requirements of parking and vehicular circulation.

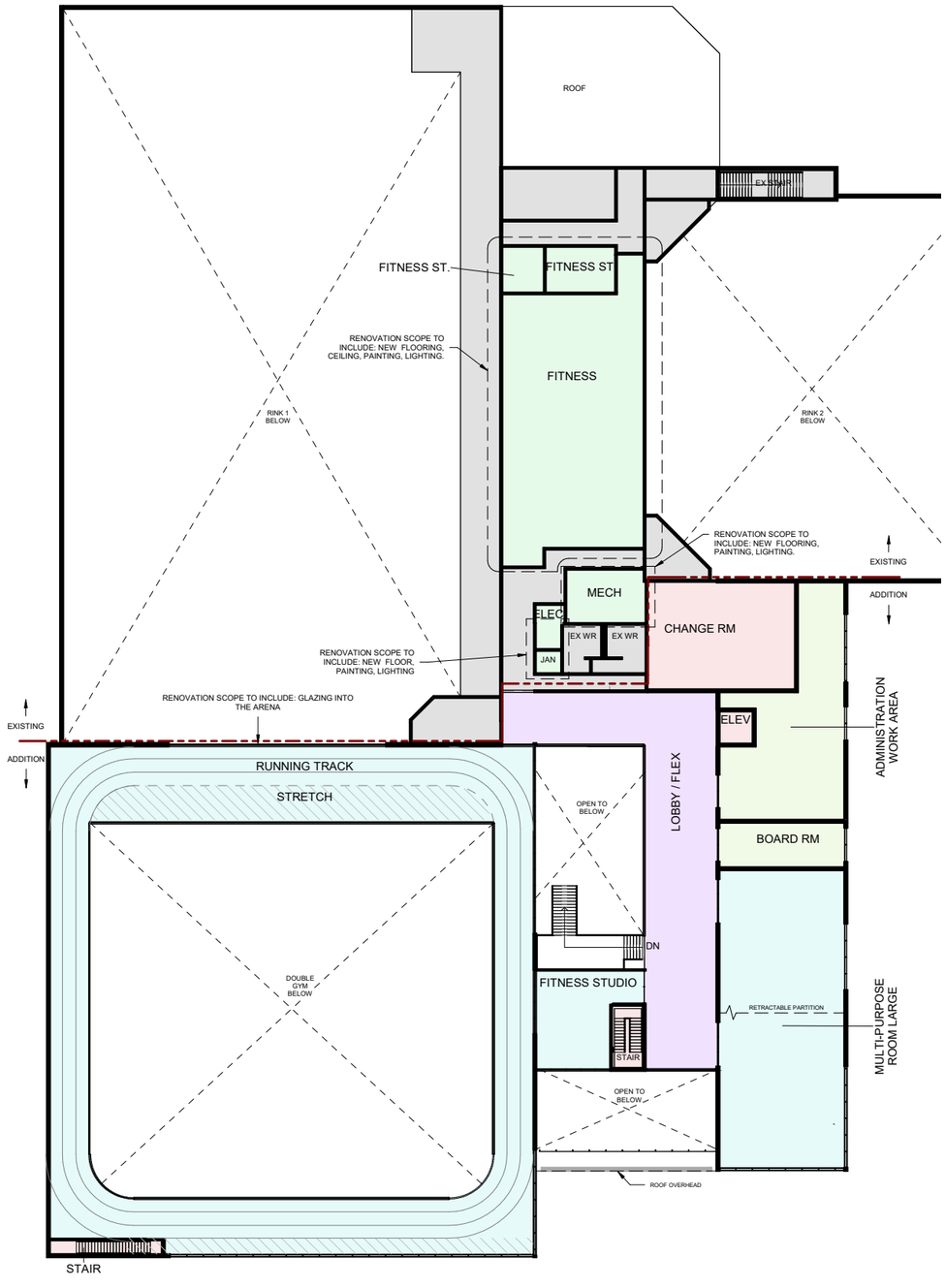
8.0 proposed building design ground floor plan

The Peach King Centre expansion is an exciting, dynamic, and intuitive recreation facility addition for the growing Grimsby community. The addition responds to the existing facilities circulation paths and reimagines the entrance and lobby to facilitate an intuitive guest experience. This is accomplished by designing a dynamic lobby that provides visual access to many of the offered programs with clear sightlines in order to navigate the facility easily. The architectural experience in this double storey space is enhanced with an exciting staircase that invites the occupants to the second floor, a clerestory to allow natural light and ventilation, and a green wall.

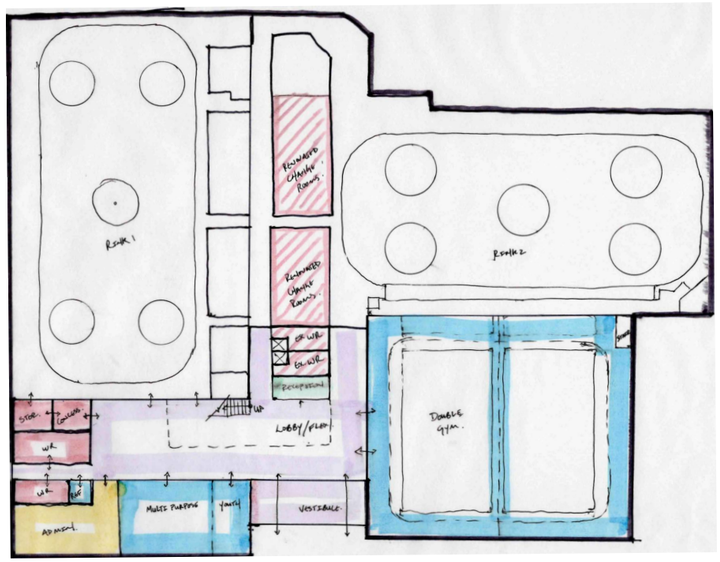
The proposed building design also responds to the major site improvements. With the bulk of parking now consolidated to the east side of the site, the main entrance is reoriented to the east to respond. A prioritization, and orientation of specific programs to the south facilitates southward views towards the consolidated greenspace, park and escarpment.

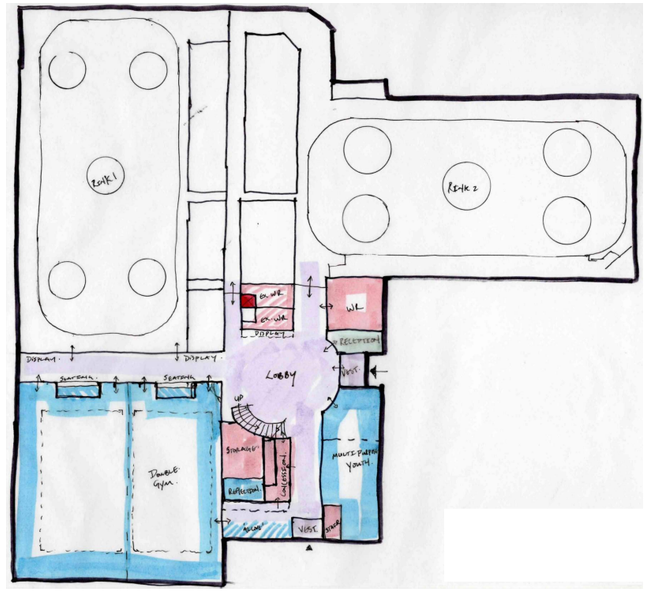
The design continues to provide the Peach King Arena with viewing and overflow space by maintaining the existing east/west circulation axis, while also providing visual and physical access to the gymnasium. A dynamic second storey running track encircles the perimeter of the gym and pierces into the lobby. A new elevator is proposed to accommodate the required size for an emergency stretcher. Select spaces within the existing facility will be renovated to enhance the architectural experience.

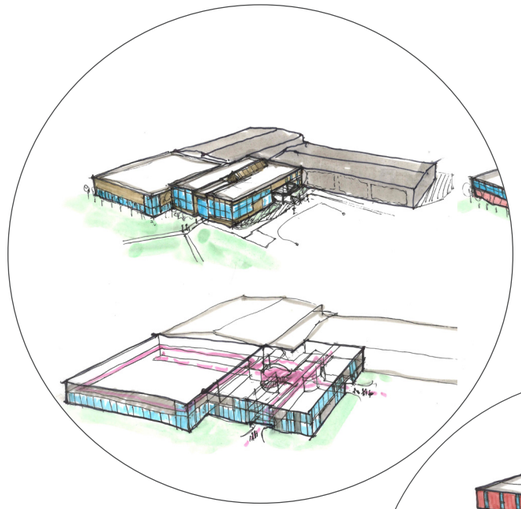
8.1 proposed second floor plan

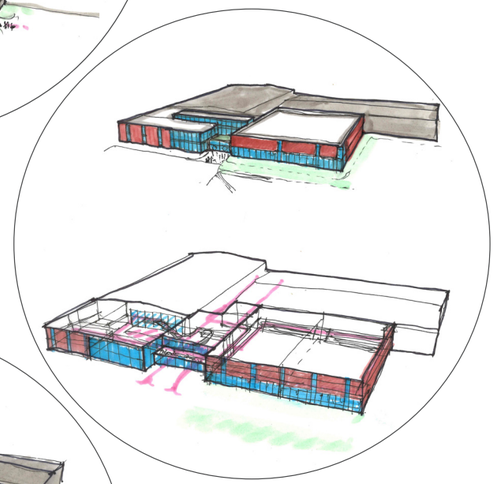


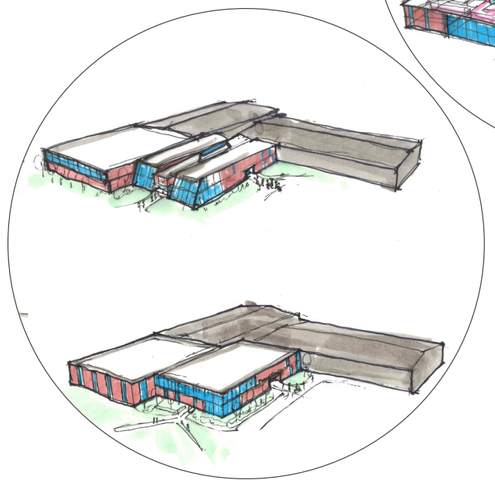
8.2 iterative design work

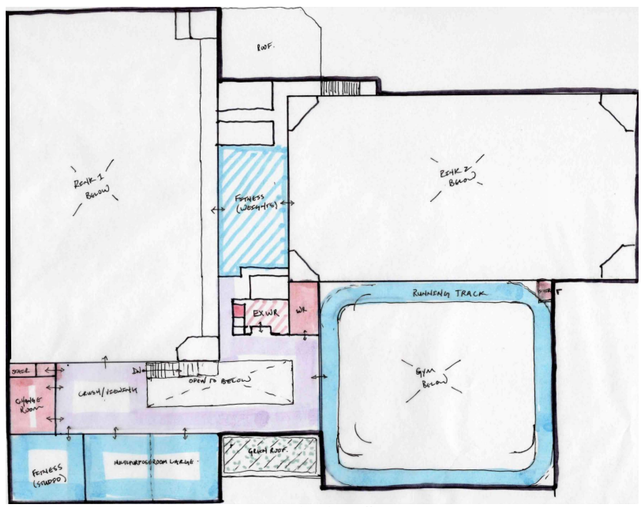


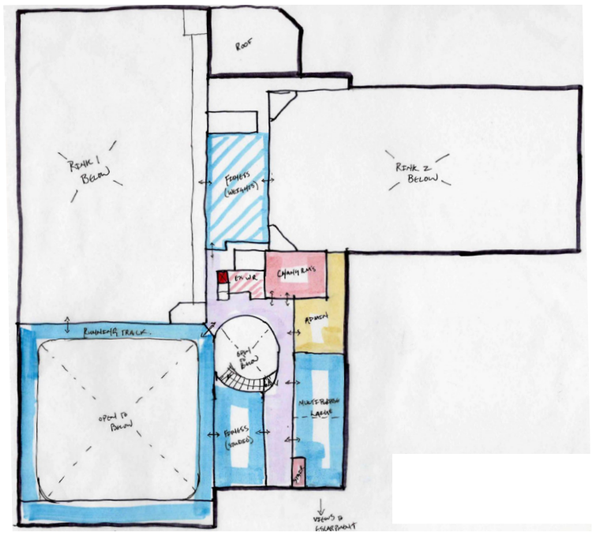






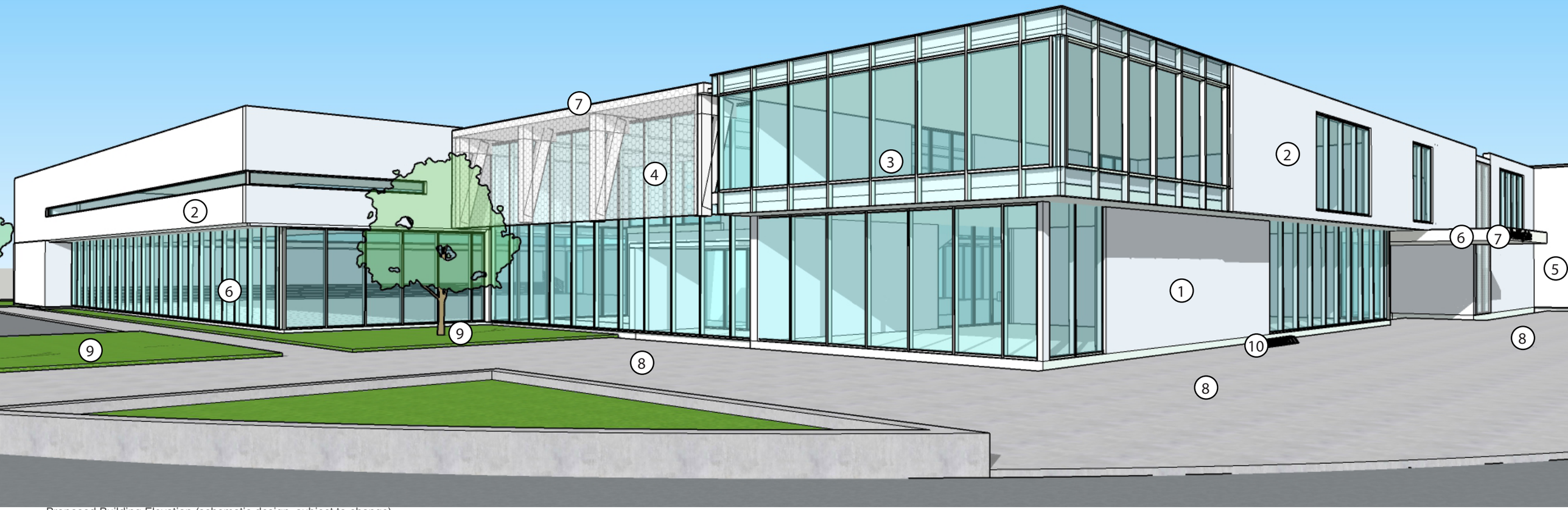




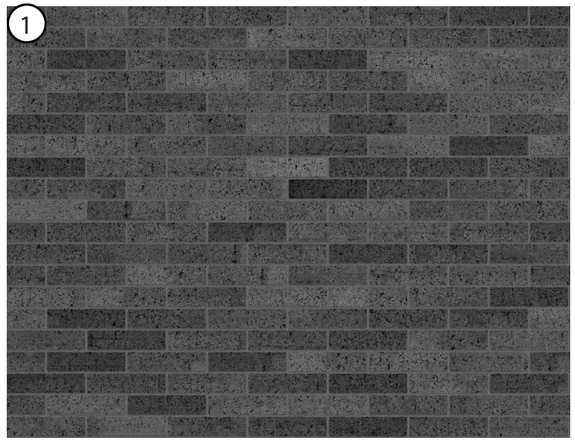


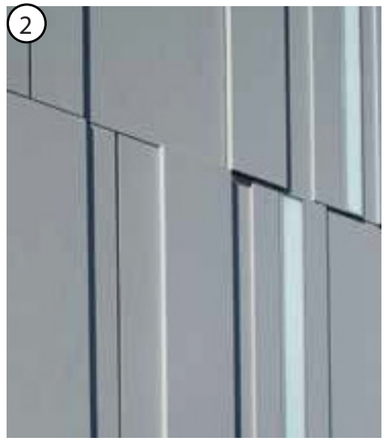
Building Configurations

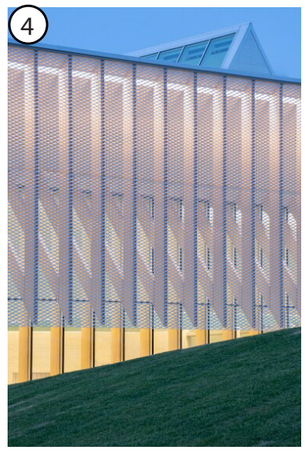
Multiple building configurations were explored throughout the schematic design phase. This included various options with the main entrance located on the south face and the gymnasium located south of rink 2.



Proposed Building Elevation (schematic design, subject to change)







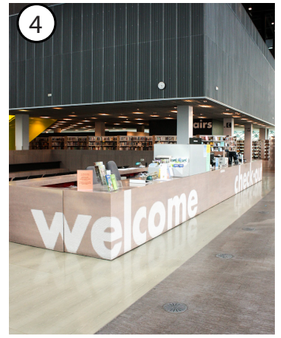
Legend:

1. Masonry
2. Metal Panel
3. Glazing
4. Metal Screen
5. Future Public Art Facade
6. Integrated Signage
7. Canopy / Structure Element
8. Landscape Plaza w/ Seating
9. Bio Swale Region
10. Bike Parking

8.3 elevations

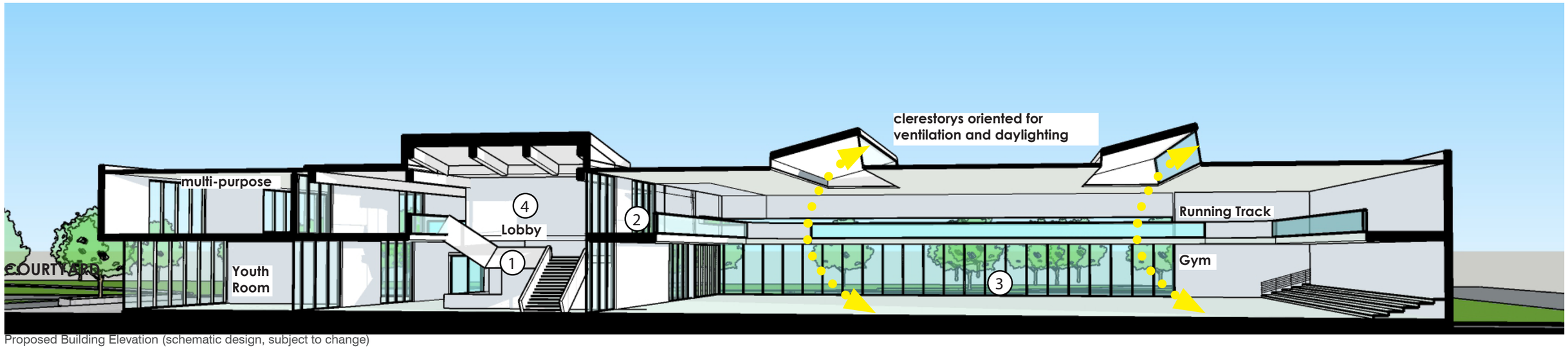
Cross Section North - South

Proposed Building Section (schematic design, subject to change)

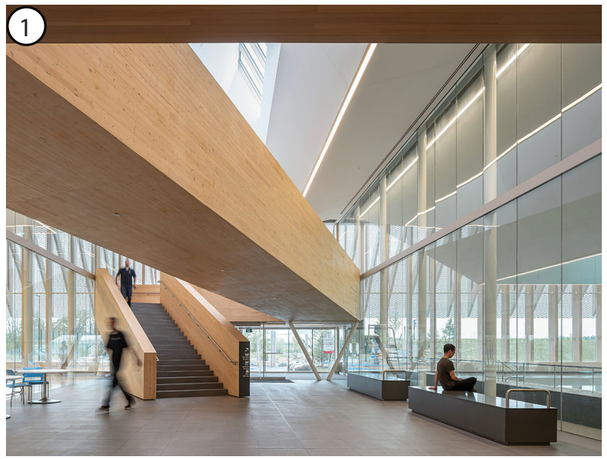


8.4 sections

Cross Section East-West



Proposed Building Elevation (schematic design, subject to change)



8.5 sections

9.0 preliminary interior finishes

The following is a generic high-level listing of interior finishes per room type.

1. Vestibule
- floors: foot grille
- walls: drywall & paint
- ceiling: gypsum board

2. Lobby/Flex/Seating/Viewing/Pick-up/Work:
- floors: polished concrete
- walls: drywall & pain, glass guard at 2nd level floor edge
- ceiling: exposed CLT deck, acoustic panels with drywall surrounds

3. Feature Staircase:
- floors: concrete with embedded colour contrasting visibility strip
- walls: living wall, glass guard, metal handrail
- ceiling: see Lobby Areas

4. Greeting:
- floors: carpet tile
- walls: drywall, acoustic insulation, & paint
- ceiling: acoustic panels
- cabinetry: commercial grade mdf service counter with solid surface top

5. Youth:
- floors: polished concrete
- walls: drywall & paint, aluminum framed glazed storefront (interior)
- ceiling: fibreglass acoustical suspended tiles with gypsum board

6. Multipurpose Rooms:
- floors: polished concrete
- walls: drywall & paint and movable acoustic partition (Large room only), alumi num framed glazed storefront (interior)
- ceiling: fibreglass acoustical suspended tiles
- cabinetry: commercial grade mdf kitchenette with solid surface countertops
- specialties: refrigerator and small appliances (e.g. microwave) are under sepa rate FF&E budget (by Owner)

7. Gymnasium:
- floors: sheet vinyl resilient athletic flooring, Gerflor Taraflex Sport M Plus; rubber at elevated running track
- walls: concrete block, regular and acoustic painted, metal framed ceramic glazed storefront
- ceiling: exposed acoustic metal deck with painted structure, ducts, piping and conduits
- specialties: roll up fabric dividing curtain, bleachers, retractable basketball backboards, audio-visual all under separate FF&E budget (by Owner)

8. Washrooms, Change rooms - New:
- floors: polished concrete, tile in showers
- walls: drywall, acoustic insulation & paint; tile in showers
- ceiling: fibreglass acoustical suspended tiles, drywall in showers

9. Storage, Janitorial, Sprinkler, Mechanical, Service/Exit Stairs:
- floors: sealed
- walls: drywall fire rated & paint
- ceiling: exposed painted

10. IT:
- floors: polished concrete
- walls: drywall & paint
- ceiling: fibreglass acoustical suspended tiles
- specialties: rack is under separate FF&E budget (by Owner)

11. Reflection:
- floors: carpet tile
- walls: drywall, acoustic insulation & paint
- ceiling: fibreglass acoustical suspended tiles clouds with exposed surrounding

12. Admin:
- floors: carpet tile
- walls: drywall, acoustic insulation & paint, aluminum framed glazed storefront
- ceiling: fibreglass acoustical suspended tiles clouds with drywall surrounds

13. Boardroom:
- floors: carpet tile
- walls: drywall, acoustic insulation & paint, aluminum framed glazed storefront
- ceiling: wood/acoustic ceiling panels

14. Fitness Studio:
- floors: sheet vinyl resilient athletic flooring, Gerflor Taraflex Comfort
- walls: drywall, acoustic insulation & paint, aluminum framed double glazed storefront
- ceiling: fibreglass acoustical suspended tiles

15. Fitness
- floors: sheet vinyl resilient athletic flooring, Gerflor Creation 70 and Powershock
- walls: existing concrete block, sprinkler protected glazing, aluminum framed glazed storefront, existing drywall
- ceiling: fibreglass acoustical suspended tiles

16. Elevator
- floors: tile
- walls: plastic laminate
- ceiling: metal panel

17. West Ice Pad Change Rooms - Renovation:
- floors: replacement rubber, replacement tile in washroom and showers
- walls: existing concrete block repainted, replacement tile in showers
- ceiling: existing exposed repainted, replacement drywall in showers painted
- fixtures: replacement wood boards of wall mounted benches, replacement water closet, sink and shower trim, toilet compartment with door to water closet

18. West Ice Pad Change Rooms, Referee – New/Conversion:
- floors: rubber, tile in washroom and showers
- walls: existing concrete block repainted, concrete block painted, tile in shower
- ceiling: existing exposed repainted, drywall in showers painted
- specialties: wall mounted wood bench, water closet, sink and shower

19. West Ice Pad South-East Corner Entry – Renovation:
- floors: stained existing concrete
- walls: existing concrete block repainted, metal framed ceramic glazed storefront
- ceiling: existing exposed repainted

20. Electrical Room – Renovation:
- floors: sealed concrete
- walls: existing concrete block repainted
- ceiling: existing exposed painted

21. Existing Women's Washroom Entry – Renovation:
- floors: tile
- walls: existing and new concrete block (re)painted
- ceiling: exposed painted

10.0 outline specification

Product, performance, and execution shall not be less than quality specified. No materials shall be sole sourced. Information below includes basis of design manufacturer/product.

Division 1 General Requirements
01 91 00 Commissioning
- By commissioning authority contracted by client

Division 2 Existing Conditions
02 41 00 Demolition
- Bulk & selective demolition as required to accommodate project objectives for all disciplines

02 82 00 Asbestos Remediation
- Removal/abatement of any asbestos-containing materials encountered as part of the work (& other hazardous materials).

Division 3 Concrete
03 20 00 Concrete Reinforcing
- As required

03 30 00 Cast-in-Place Concrete
- Slab-on-grade
- Strip footings
- Foundation walls

03 35 43 Polished Concrete
- Concrete densifier and enhancer

Division 4 Masonry
04 20 00 Unit Masonry
- Concrete block, 190mm thick min, metric modular, autoclaved
- Veneer brick, metric modular
- Stainless steel adjustable anchors
- Load bearing on thickened foundation wall of CMU

Division 5 Metals
05 10 00 Structural Metal Framing
- 150 mm steel studs, exterior and interior taller than 3m
- 90 mm steel studs, interior
- Double stud at wall mounted plumbing fixtures

Division 6 Wood, Plastics, & Composites
06 40 00 Architectural Woodwork
- Countertops: 13 mm solid surfacing, non-porous filled polymer through body colour
- Cabinets:
  -Medium Density Fiberboard: Commercial Grade, paint grade, FSC certified, ultra-low formaldehyde and no added formaldehyde
  -Plastic Laminate: High pressure on tops and doors; low pressure elsewhere

Division 7 Thermal & Moisture Protection
07 12 00 Waterproofing
- Elastomeric Waterproofing Polyurethane system, foundation walls, Sike Sikalastic 700

07 19 00 Air Vapour Barriers
- Air & Vapour Barrier: vapour impermeable, exterior walls, Blueskin SA
- Vapour Retarder: Under slabs on grade: Conform to ASTM E 1745, Classes A, B and C, Perminator, 15mil by W.R. Meadows Inc

07 20 00 Thermal Insulation
- Exterior continuous semi-rigid insulation, 150mm (6”) thick, R4.3/in., Rockwool Cavityrock
- Spray-in-place closed-cell insulation at exterior wall in specific areas such as soffits, envelope penetrations
- Exterior wall stud cavity semi-rigid insulation, 150mm (6”) thick, R4.2/in., Rockwool Roxul Safe 55
- Foundation wall Insulation, buried: 100mm (4”) thick, Dupont Styrofoam Perimate XPS
- Under Slab Rigid Insulation: High density expanded polystyrene insulation, 1 25mm (5”) thick, C-200 Owens Corning
- Sound Batt Insulation: Glass fibre with minimum 50% recycled content or mineral fibre batts, Rockwool
- Air/Vapour Barrier Membrane: SBS modified bitumen, self-adhering sheet membrane, 1.0 mm
- Through-wall Flashing Membrane: SBS modified bitumen, self-adhering sheet membrane, 1.0 mm

07 42 00 Aluminum Composite Panels
- 4mm aluminum composite panel, Kynar 500 finish, dry joint with reveal trim, galvanized z-girts, Sobotec SL-2000
- Thermally broken clips, ISO-Clip System by Northern Facades, A-Clip by ACS Composite Systems Inc., Knight MFI – S Series by Knight Wall Systems

07 46 00 Metal Soffit and Trim
- Prefinished metal panels, concealed fasteners, 22 gauge, VicWest AD300R

07 55 00 Protected Membrane Roofing
- Roof board: 16mm, exterior grade sheathing, DensDeck Prime
- Membrane: 2-ply modified bituminous, Suprema
- Insulation: Polyisocyanurate Board Insulation Type II, Class 1, Grade 2, HCFC-free, 228.5mm (9”) thick
- Air & Vapour Barrier: Self-adhering SBS rubberized asphalt laminated to a slip resistant, cross laminated polyethylene surface film
- Tapered insulation: Fibreboard high density asphalt impregnated to CAN/ULC-S706.1, minimum 25 mm (1”) thick
- Walkway Pavers & Gas Line Supports: 610 mm x 610 mm x 45 mm standard precast concrete pavers set on 560 mm x 560 mm x 25 mm pads.
- Cants: Asphalt impregnated wood fibreboard, preformed at 45° angle

07 60 00 Flashing and Sheet Metal
- Sheet Steel: ASTM A446 and CSSBI Publications No. 18-26, 0.71 mm (24 gauge) core thickness.
- Finish: Series 8000 precoating.
- Soffits: Z275 galvanized and finished with PPG Duranar XL coating
- Insect Screen: Metal mesh, prefinished in colour black.

07 72 00 Roof Hatch
- Thermally broken roof access hatch, aluminum, heavy duty stainless steel hinges, telescopic lift assistance and hold open, 915mm (36”) x 760mm (30”), 75mm (3”) insulation, manual operation, c/w ladder up post, Bilco E-series

07 84 00 Firestopping
- At all rated fire-separations (existing & new – where in areas of work) top-of-wall, penetrations through vertical assemblies

Division 8 Openings
08 11 00 Metal Doors and Frames
- Hot-dip galvanized, hollow-metal at fire-rated applications and service rooms
- Door Size: 1,015 x 2,135 mm (3’-4” x 7’-0”) minimum
- Interior non-rated doors: Resin impregnated Kraft honeycomb core.
- Interior fire-rated doors: Resin impregnated Kraft honeycomb core. Mineral core for temperature rise doors
- Exterior doors: Semi-rigid glass fibre insulation with stiffeners (R1.5, RSI 0.25)
- Thermally broken exterior frames

08 21 00 Solid Core Wood Flush Doors
- Interior, wood veneer face, FSC certified

08 41 13 Aluminum-Framed Entrances & Storefronts
- Aluminum framed storefront glazing system, exterior: FlushGlaze BF 3400 by Alumicor
- Aluminum framed entrance exterior doors: ThermaPorte 7700 – series T400B by Alumicor
- Aluminum framed storefront glazing system, interior vestibule: FlushGlaze 800 by Alumicor
- Aluminum framed vestibule interior doors: Series 500B by Alumicor

08 44 00 Curtain Wall
- Thermally broken stick-built curtain wall system with exterior capped or structural silicone joint and triple pane sealed glass units, Kawneer 1600UT

08 71 00 Door Hardware
- Typical heavy-duty hardware at new doors based on use & configuration
- Note all hardware to be appropriate for use in public environment
- Supply, installation, and keying by Contractor

08 81 00 Glass Glazing
- Interior glazing for screens and door-lites: 6 mm tempered
- Interior fire separation: Ceramic/fire-lite, 1-hour fire-resistance rating
- Interior guards: 12mm tempered
- Exterior glazing: triple pane, low-E coatings (2), argon filled, warm edge spacer, thermally broken units

08 88 10 Glass Guards
- Dry Glaze Taper-Loc System. B5s series heavy aluminum square shoe base c/w base shoe anchor bolts, brushed stainless steel cladding and end caps and top cap rails
- Glass mounted hand rail bracket: 316 Grade Stainless Steel (ss) by C.R. Laurence Company
- Handrail: 38mm (1.5”) dia. 316 grade brushed stainless steel
- Guardrail: 24mm (1”) x 50mm (2”) 316 grade brushed stainless steel

Division 9 Finishes
09 21 00 Plaster & Gypsum Board Assemblies
- Patch and repair existing gypsum board assemblies as required at connection to existing building
- 16 mm thick for partitions, 13 mm thick for ceilings, soffits, fascia

09 30 00 Tiling
- Ceramic tile, solid colour with 20% accent, floor to ceiling

09 51 00 Acoustical Ceilings
- Suspended T-bar grid system
- ACT lay-in, mineral fiber 25 mm x 610 mm x 1220 mm

09 55 00 Acoustic Wood Ceilings
- Suspended T-bar grid system

09 65 00 Rubber Flooring
- 10mm sheet rubber sports surface, low VOC, Robbins Durathon Elite Infield

09 65 60 Sheet Vinyl Resilient Athletic Flooring
- 7.5mm foam-backed sheet vinyl resilient athletic flooring, Gerflor Taraflex Sport M Plus

09 91 00 Painting
- At all new surfaces of walls/partitions, where exposed & within the area of work
- At existing surfaces extending up to doors either dividing corridors (1st floor) or up to end of corridor (2nd floor)
- Primer plus two coats

Division 10 Specialties
10 14 00 Signage
- As required for new rooms, by allowance

10 21 00 Compartments
- Phenolic core toilet/dressing compartments, ASI Group

10 22 00 Partitions
- Acoustic, manual operated folding panel partition, top supported, sound seals, STC 50, fabric finish, Corflex Inc. 5600 Ecological Omni-Directional Operable Partitions

10 28 00 Toilet, Bath, and Laundry Accessories
- Mirrors
- Soap dispensers
- Toilet tissue dispensers
- Robe hooks
- Hand dryers
- Sanitary tissue disposals
- Grab bars at Universal washrooms or stalls
- Mop holder

10 44 00 Fire Protection Specialties
- Fire extinguishers
- Sprinklers

10 50 00 Storage Specialties
- By Owner

Division 11 Equipment
11 24 00 Fall Protection System
- Roof anchors

All other equipment is by Owner, Not in Contract

Division 12 Furnishings
12 52 00 Window Treatments
- Roller blinds, 3%, manual or motorized or blackout, PVC free, Hunter Douglas Architectural

Window Coverings, RB 500
12 69 00 Foot Grille
- 10mm x 10mm x 25mm aluminum grid, recessed, Bolar BSA-4
- 50mm slab depression for catchment pan

All furniture is by Owner, Not in Contract

Division 14 Vertical Transportation
14 21 00 Elevator
- Electric traction, 1,361kg capacity, 0.75m/s speed, 2 floors/stops, front single door w/ 1067 clear opening, stretcher compatible cab approx. 2,000m x 1,600mm, KONE EcoSpace
- Control closet

11.0 landscape design

PEACH KING CENTRE

Landscape Design Concepts

OMC Landscape Architecture
270 Sherman Ave. N, Suite 315-MILL
www.omcla.ca | 905.681.7604

PEACH KING CENTRE

The natural heritage of Niagara Region is home to the richest woodlands, wetlands, savannas and prairies in Canada. We believe the City of Grimsby has an opportunity to create a landmark site that celebrates the history of the Niagara Region that also serves the diverse and growing community that calls the town home.

Our team has organized the design of the grounds at Peach King Centre to highlight this natural history, while creating a distinct, integrated, and welcoming green space in the centre of the site for visitor use, recreation, and play.

The landscape design strategy and layout for Peach King Centre reflects a combination of science and ecological design principles to create optimal growing conditions for native species in the region.

The following examples are presented with these principles of landscape restoration in mind.

Design Strategy

The sweeping paths across the site are designed to connect the three distinct activity areas of the property: the recreation centre, the municipal building, and the outdoor rink.

These two central path systems lead pedestrians through the site, opening up choreographed views that frame each of these distinct areas of the landscape. A series of secondary paths connect smaller nodes that are designed for passive use and rest. Together, this primary and secondary circulation network creates a safe, engaging space that can be used by visitors in a variety of different ways.

Planting

Each area of the site is integrated through a design and planting scheme that contributes to a sense of integrity across the landscape, making the site feel like one green space.

This ‘park’ design concept is achieved through careful consideration of the landscape topography in coordination with the a series of new, large native trees that provide shade, cool the site, and uptake excess water from the ground.

Working with this existing site topography, a series of landscape ‘basins’ have been shaped to capture surface runoff and to provide distinct zones for water absorption in the event of a storm. These stormwater management systems are integrated around parking lot surfaces where possible to maximize the efficient capture of storm water.

The biodiverse landscape will includie native trees and stormwater basins that are landscaped with wet meadow plants. This will attract birds, bees and butterflies, and contribute to the enhacement of nature in the larger Niagara Region.

As a whole, a robust landscape designed to support the new Peach King Centre will offer recreation opportunity for visitors, passive wildlife viewing, and a gathering space for visitors, residents, and the wider community.

PEACH KING

1. Stormwater Management

2. Shade Structure

3. Planting Design

4. Site Furniture

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Landscape Design Concepts

OMC LANDSCAPE ARCHITECTURE
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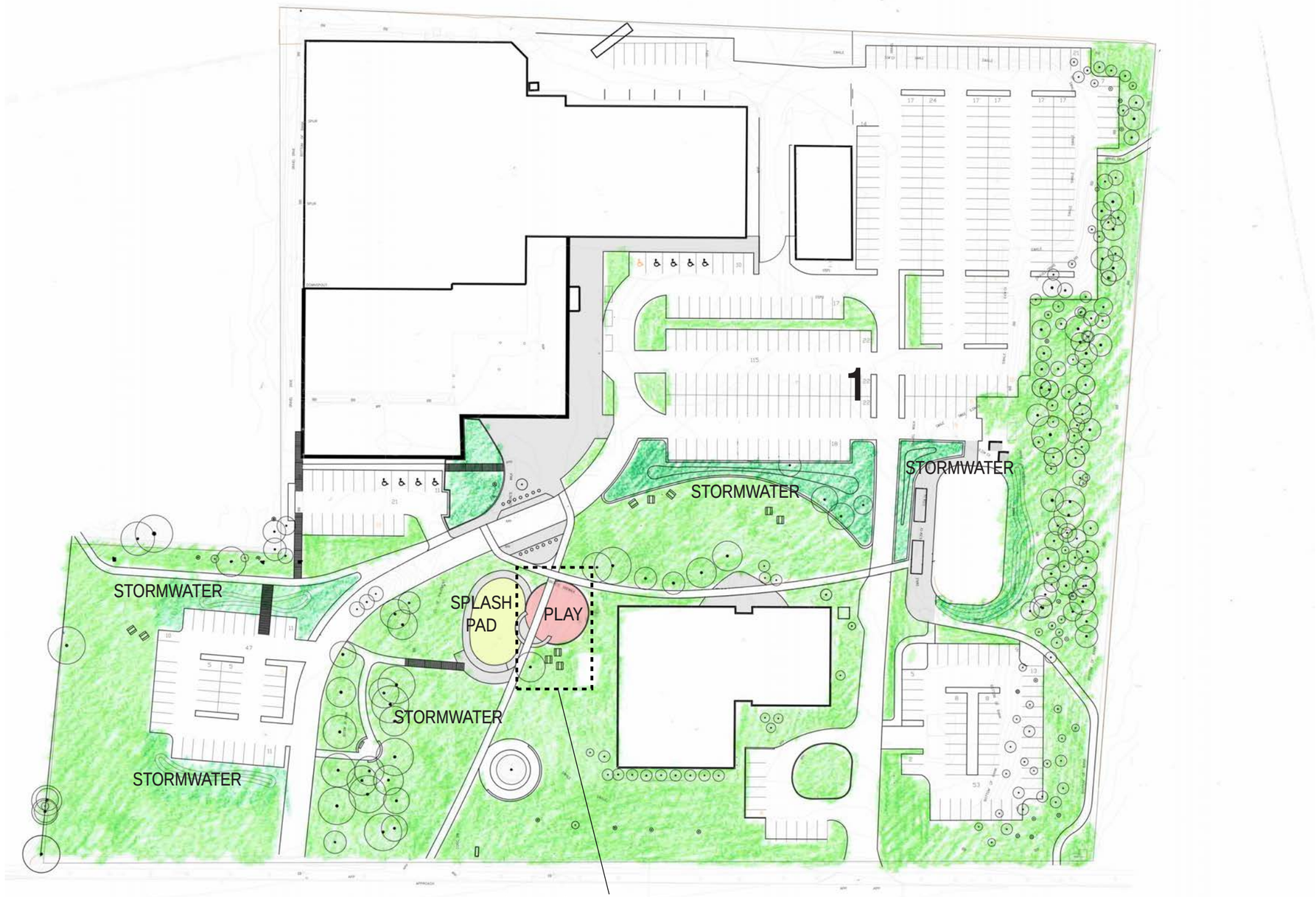
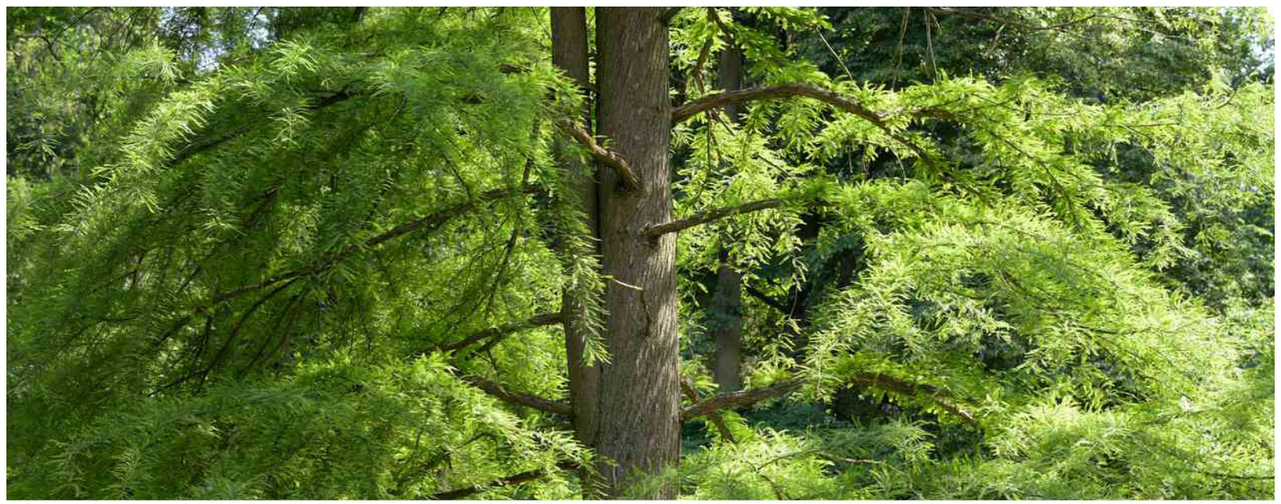
Landscape Design Concepts



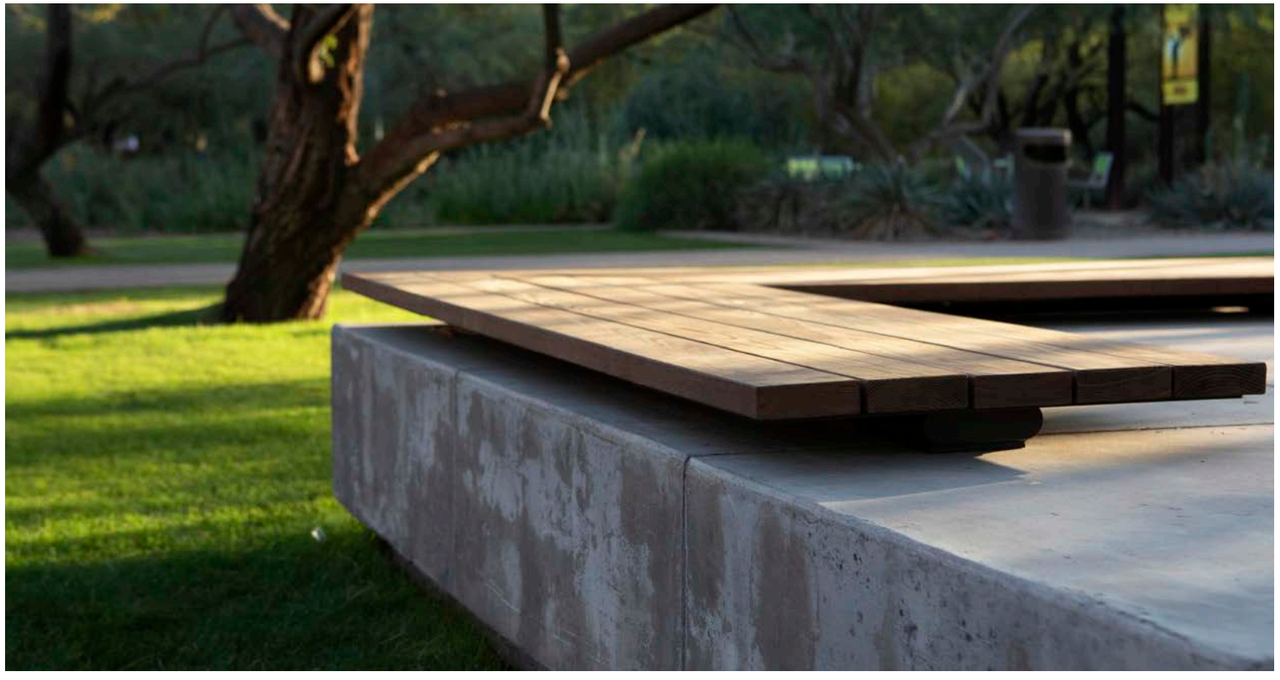
1 Landscape Design Concepts - Stormwater Management

OMC Landscape Architecture
270 Sherman Ave. N, Suite 315-MILL
www.omcla.ca | 905.681.7604

3 Landscape Design Concepts - Regional Native Planting



4 Landscape Design Concepts - Site Furniture



12.0 civil design

MTE Consultants
1016 Sutton Dr., Unit A, Burlington, ON L7L 6B8

To:	Adam McCaughan	**MTE File No.:**	53211-100
Company:	McCallumSather	**Date:**	July 18, 2023
Email:	adamm@mccallumsather.com	**From:**	George Berenyi
Phone:		**Project Name:**	Peach King Centre

Re: Civil Design Brief
Peach King Centre, Grimsby, Ontario

Introduction

MTE Consultants Inc. was retained by McCallum Sather to prepare a Civil Design Brief for the proposed expansion and renovation of the Peach King Centre located at 162 Livingstone Avenue in Grimsby, Ontario. The site is bounded by railways lines to the north, residential lands to the east and west. The existing facility currently includes two ice surfaces, viewing areas, concession and change room facilities, a small fitness centre, staff offices, splash pad and outdoor skating rink. The renovation will include a full size gymnasium, second floor walking track, new multi-use rooms, youth centre, rooftop leisure space, re-aligned parking expansion or spaces.

This Design Brief will discuss the serviceability of the proposed development with respect to the existing infrastructure surrounding the subject site. Grading constraints for the proposed development with respect to the existing infrastructure and surrounding topography will also be discussed.

This design brief should be read in conjunction with the existing topographic survey completed March 29, 2023 by AT McLaren and the proposed site plan overlay which are included.

Site Grading

Based on the topographic survey, centerline grades on Livingstone Avenue range from 91.11 at the west boundary and to 92.23 at the east boundary. In general, the site drains from south to north with grades ranging from 93.78 at the landscape berms in the southeast corner of the site to 89.38 in the northwest corner of the site. The existing facility has an FFE of approximately 90.34. The existing Town Hall FFE is approximately 91.36. There are also landscape berms located along the eastern boundary and adjacent to the western side of the main entrance. The southwest corner of the site is considered flat and is currently used for two soccer fields.

There do not appear to be significant grading challenges associated with the expansion. A soil management plan should be prepared for the excess soil generated from construction activities. The existing berms will need to be removed to accommodate the proposed re-development. Where possible, surface drainage should be directed to bio-swales prior to connection to available storm sewers.

Stormwater

Stormwater Management

The design details of the existing stormwater management system are currently limited. Based on the available information, the site has an existing stormceptor for quality control. The stormceptor is labelled as STC-19 on the attached drawing and is located at the northeast corner of the existing facility. During the design phase, the existing on-site controls will be reviewed and opportunities to incorporate Low Impact Development stormwater management techniques will be explored. Both quality and quantity controls are recommended to accommodate the proposed building and parking lot expansion.

Based on the survey, it is noted that there are 5 existing storm outlets for the site. Three storm outlets drain towards the north and outlet to the railway tracks. One storm outlet drains towards Livingstone Avenue and services the Town Hall building. One storm outlet drains towards Tami Crescent. In addition, there appears to be sheet flow from the existing landscaped berm along the west boundary that outlets toward the existing residential lands.

With respect to the new parking lots at the south-east and southwest corners of the site, some form of quality and quantity control will likely be required. Quantity controls can be provided through a combination of bioswales, surface and underground storage in order to control the peak stormwater flows to the capacity of the receiving systems. Quality control for new parking lots can be provided by combination of bioswales and an oil/grit separator (OGS).

It should be noted that the proposed parking lot expansion in the northeast corner will impact the existing swale. Additional storm sewers maybe required in this area to ensure adequate drainage is obtained. Bioswales have been proposed at various locations throughout the site. Where possible, rooftop drainage should be directed to the proposed bio-swales. The planting philosophy for the bio-swale will be coordinated with the landscape consultant to ensure that stormwater absorption from plants is maximized. The use of permeable pavement will also be explored during the design phase.

The project team has also noted that various culverts on the west side of the existing outdoor rink may need to be replaced. Other minor surface drainage improvements at this area will also be explored and implemented. A detailed stormwater management report will be prepared during the design stage.

Storm Sewer Servicing

The site has an extensive network of existing storm sewers and catch basins. Some localized areas of the storm sewer system will be impacted by the proposed building expansion. For example, the storm sewer located at the south side of the existing facility will be impacted. Existing storm sewers in this area will need removed and relocated to ensure adequate drainage is obtained.

Sanitary Servicing

There is an existing sanitary sewer located within an easement that is located along the north limit of the subject lands. The sanitary sewer within this easement is the sanitary outlet for the existing parks building. Further investigation is required to confirm the outlet from the existing main facility. It is likely that the sanitary sewer within the easement has a building service connection which acts as the main sanitary outlet for the facility. It is expected that the proposed building addition will be serviced internally by extension of the existing internal sanitary plumbing. Sanitary services to the Town Hall building are from Livingstone Avenue and will not be impacted.

Water Servicing

Proposed Water Servicing

The site has an extensive network of water services and mains running through the site. There appears to be three existing connections to the municipal system which creates a looped internal system. The connections to the existing system are located at Tami Crescent, Livingstone Avenue and at the north side of the property within an existing easement. The location and arrangement of meters, backflow preventers will need to be confirmed during the detailed design stage. It appears that a combined domestic and fire service is looped throughout the site.

There are two existing fire hydrants within the site. One of the existing fire hydrants will be impacted by the main facility expansion and will need to be relocated. In addition, the existing water services along the south face of the main facility will be impacted by the proposed building expansion. Watermain relocation will be required.

Water services for the Town Hall building will not be impacted by the proposed expansion and redevelopment.

Other Utility Services

Based on our review of the topographic survey and background information, it is expected that gas, hydro and telephone are all available to service the subject site. The project team's utility consultant should provide confirmation. Further co-ordination with utilities will be required at the detailed design stage by the project team's utility consultant.

Overall Findings/Summary

This report provides a summary of the available services associated with the Peach King Centre. Based on our findings we conclude that:

- Storm service can be provided by the existing on-site services.
- Sanitary service can be provided by extension of the internal sanitary plumbing system.
- Water service can be provided by the existing domestic and fire services.
- Grading and ESC controls should be designed to be consistent with the existing conditions at the Peach King Centre and the surrounding lands.

Next Steps & Recommendations

MTE recommends the following:

- A pre-consultation meeting be held with municipal staff to verify the findings of this memorandum.
- The site plan (and grading and servicing design) be advanced consistently with the previously approved civil drawings prepared for the Peach King Centre

We trust the information enclosed herein is satisfactory. Should you have any questions please do not hesitate to contact our office.

All of which is respectfully submitted,

MTE Consultants Inc.

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Project Manager
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GPB:saa

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13.0 structural design

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• Grimsby Peach King Centre – Addition & Renovation

Structural, Mechanical & Electrical Systems Basis of Design Report

EXP Project Number
ALL-22028376-A0

Prepared By:
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Date Submitted
June 18, 2023

TABLE OF CONTENTS

1.0 INTRODUCTION

The Town of Grimsby, in conjunction with mcCallumSather Architects and EXP, is undertaking a series of renovations to the municipal complex at 162 Livingston Avenue in Grimsby. These renovations include both significant changes to the landscaping of the site and an addition to the Peach King Community Centre, the latter of which is the most significant portion of the project and the focus of this design brief.

The Peach King Community Centre consists of two portions:

- One portion, constructed in 1984, which contains a two-storey ice rink/arena attached to a one-storey building containing community and fitness spaces
- A two-storey addition, constructed in 2003, which contains another ice rink/arena, a running track and additional community and fitness spaces

In addition to interior and exterior renovations, the one-storey portion, south of arena built in 1984, is planned for demolition, to be replaced with a new two-storey addition containing an additional two gymnasiums, an interior running track and additional community space. This brief encompasses the scope of these renovations in so far as they apply to the structural scope of work undertaken by EXP.

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2.0 GENERAL STRUCTURAL OVERVIEW

The proposed structure consists of two portions – an existing building and a new addition attached to the south face of the existing building. The existing building contains two arenas, one constructed in 1984 and another in 2003, and a variety of additional community space. The existing building is constructed from a mix of structural steel and masonry and sits on conventional concrete strip & isolated footings and reinforced concrete and masonry foundation walls. Part of the addition is to be constructed in the location of an existing one-storey portion of the 1984 structure. This demolition will encompass approximately the extents of the building shown with dashed lines in Figure 1 and will be replaced with the new addition as shown in Figure 2.

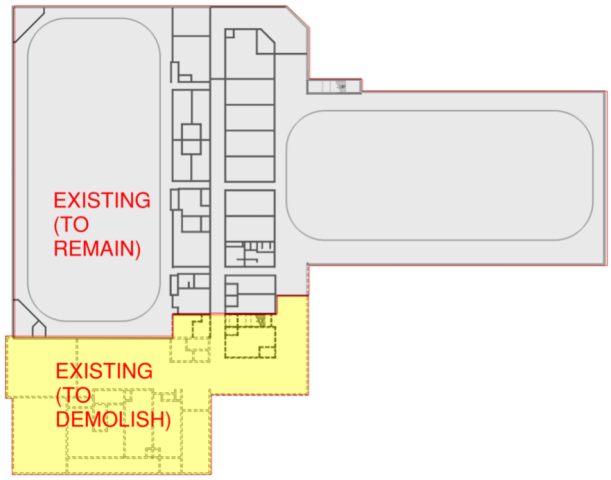

Figure 1 – Proposed Demolition Plan (Ground Floor)

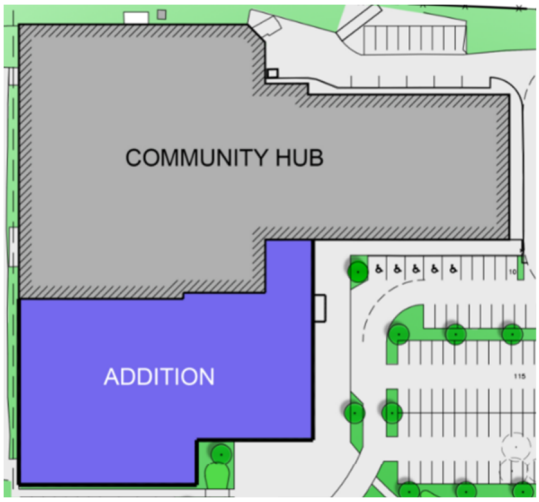

Figure 2 - Excerpt of Proposed Site Plan

Note: Dashed lines represent existing walls to be demolished for new addition

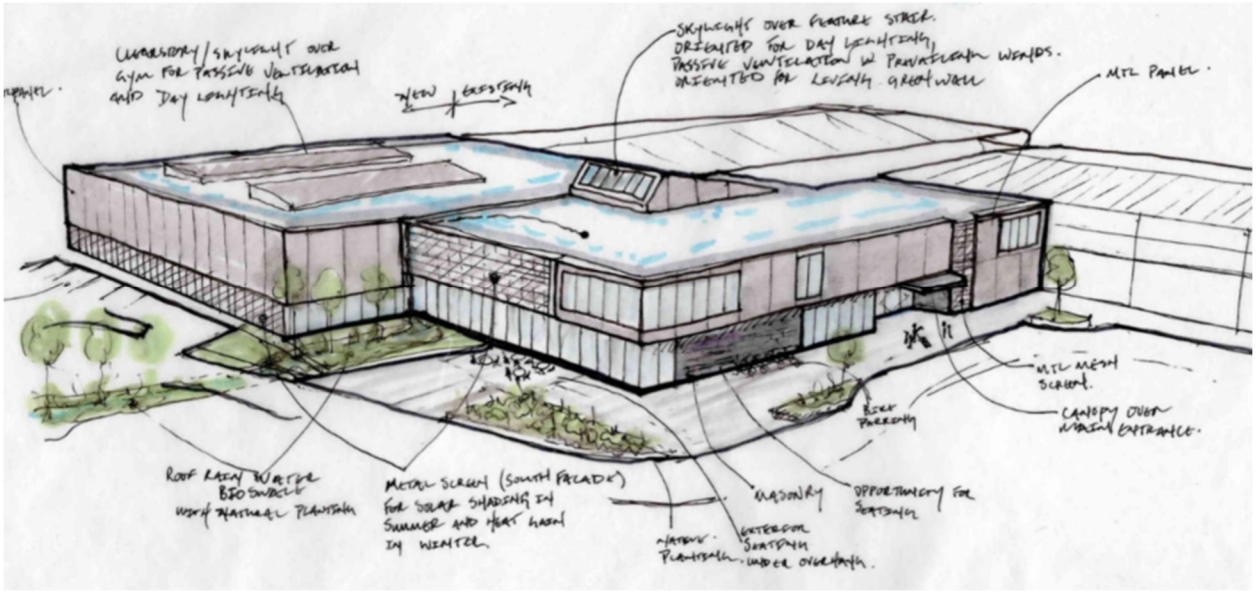

Figure 3: Architectural Concept for Addition

The proposed addition, shown in Figure 3, can be broken down into two segments – the west portion contains the double gymnasium and running track, and the east portion contains assorted community spaces. For each of these two sections, the proposed structure is as follows;

- The double gymnasium is to be constructed with structural steel and masonry, as follows:
    - Steel deck roofing supported by trusses and truss girders, as in Figure 4, supported in turn by steel columns. Alternatively, pre-engineered frames may be used instead of truss girders, as in Figure 5. The largest of these trusses will be approximately 2.5 metres (8'4") deep. A shallower depth truss is feasible with added premium of extra cost.
    - Between columns or pre-engineered frames, nonloadbearing masonry walls will be provided, minimum thickness is 1/30 of the total height
    - The running track around the perimeter of the gym's second storey and the moving partition between the two halves of the gym will be suspended from the roof trusses and columns (or pre-engineered frames, as applicable)
- The remainder of the building, consisting of mostly various community spaces, will be constructed from structural steel and masonry, mass timber, or a mix of both:
    - The roof framing will be steel OWSJ (trusses) with steel roofing deck, supported by masonry walls and steel framing. CLT roof panel also can be an option.
    - The second floor framing will be hollow core slabs or steel composite deck supported by steel framing and masonry walls

- Alternatively, a central portion of the building surrounding the lobbies may be constructed from mass timber, where the slab system is replaced with cross-laminated timber (CLT) floors and the steel framing and masonry walls replaced by CLT walls and glulam beams and columns. This would resemble Figure *6*.
- At the second storey multi-purpose room, a moving partition is planned and will be hung from the joists above

Figure 4: Truss System Including Truss Girders *(Brothersen & Holtermann, 2018)*

Figure 5: Gymnasium with Pre-Engineered Steel Frames *(Titan Steel Structures)*

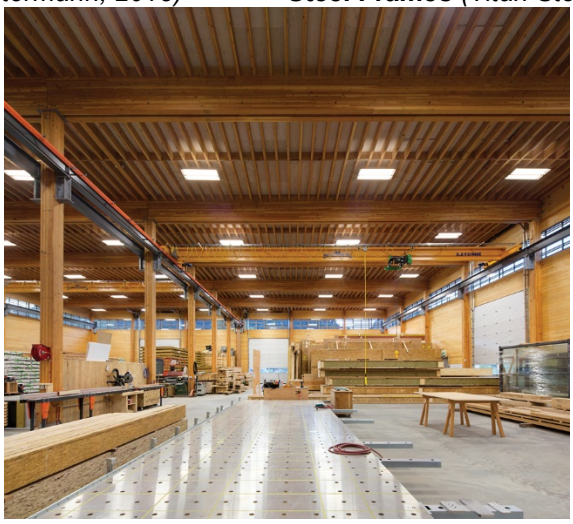

Figure 6 – Glulam Framing with CLT Wall Panels *(Canadian Architect)*

In either case, the foundations will be conventional reinforced concrete spread/strip footings with concrete foundation walls, plus slab-on-grade for the ground floor, subject to any geotechnical recommendations. Given the existing building, it is expected that the soil will be competent for this purpose, and that the foundations can be placed at approximately 4’ (1.2 m) deep as is this

depth is generally frost depth in this region. An expansion joint would be provided between the existing and new building to accommodate differential movement between the two halves, and new lintels, steel framing and openings will be provided as required at the interface per architectural requirements.

This conceptual design is indicated in the appendix, which contains annotated drawings. The yellow region indicated on the ground floor and second floor plans represents the region which is proposed for mass timber. These documents are illustrative and subject to change.

2.1 Codes & Standards

The design and construction of this addition is subject to the most recent version of the Ontario Building Code, the 2015 National Building Code of Canada and all relevant CSA Group standards. A non-exhaustive list of these standards is as follows: A23.1-14, A23.2-14, A23.3-14 govern the design and construction of concrete structures, S16-14 governs the design of steel structures, O86-14 governs the design of wood/timber structures, and S304-14 governs the design of masonry structures. For mass timber, the state-of-the-art also demands significant attention is also required of various publications by the Canadian Wood Council (CWC) and the American Wood Council (AWC).

2.2 Design Loads

The design loads for this project are as follows:

- Dead loads, imposed by the self-weight of materials and additional permanent loads, are estimated from the proposed architectural design, plus allowances for mechanical units, electrical services, lighting, etc.
- Live loads, imposed by movable loads such as people, furniture, etc., are according to the Ontario Building Code. For example, 4.8 kPa (100 pounds per square foot, PSF) for gymnasium, stairs, and other areas where people are likely to gather and 1 kPa for roofs.
- Snow loads, wind loads, and seismic (earthquake loads), are according to the Ontario Building Code
- Deflection limits for floors and roofs are determined by best practice, engineering judgment and building code recommendations

It is assumed that this building is of high importance since is a community centre, and the expected loads are amplified accordingly per the Ontario Building Code. Additional reinforcement/restraint of mechanical and electrical components may be required contingent on the geotechnical properties of the soil i.e. the seismic site classification.

2.3 List of Analysis and Design Software

- ETABS
- SAFE
- RAM Steel
- S-Concrete

2.4 List of Drafting Software

- AutoCAD
- Revit

2.5 Drawings

Read this document in conjunction with the architectural schematic drawings for pricing. See Appendix A for schematic structural drawing layout.

14.0 mechanical design

Peach King Centre

McCallum Sather Architects Inc.

Type of Document:
Mechanical Basis of Design Report

Project Name:
Peach King Centre

EXP Project Number:
ALL-22028376-A0

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1 INTRODUCTION

The Town of Grimsby is proposing to construct a 2-storey Addition to the existing Peach King Community Centre in Grimsby, Ontario. The proposed addition has a gross floor area of approximately 3,897 m^2.

The project will also include demolishing a portion of the existing building to accommodate the Addition.

This Mechanical Design Brief documents the proposed mechanical systems that are consistent with, and anticipated for, the proposed Addition.

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2 MECHANICAL SYSTEMS

2.1 Codes & Standards

The following Codes and Standards will be referenced as part of the mechanical design:

- Ontario Building Code - 2012
- Ontario Fire Code - 2015
- NFPA-13, Installation of Sprinkler Systems - 2007
- NFPA-10, Fire Extinguishers
- CSA B52-2005, Mechanical Refrigeration Code
- CSA B64.1 0-07 - Backflow Preventers
- ASHRAE Standard 62.1 - 2010, Acceptable Indoor Air Quality
- ASHRAE Standard 90.1 - 2010, Energy Efficiency for Buildings
- ASHRAE Standard 55 - 2010, Thermal Environmental Conditions for Human Occupancy

2.2 Design Conditions

Mechanical systems shall be designed in accordance with the "Basic" and "Prescriptive" standards set by ASHRAE 90.1, *Energy Efficient Design of New Buildings* and the *Model National Energy Code for Buildings (MNECB)*.

.1 *Outdoor Design Conditions*

Cooling: OBC 2.5% for Grimsby (30°C db/23°C wb)

Heating: OBC 1% for Grimsby (January) (-19°C).

Outdoor air ventilation rates shall be in accordance with the Ontario Building Code and ASHRAE Standard 62.1 and, generally, would be:

- Administration Offices: 5 CFM per person + 0.06 CFM/SF
- Gymnasium: 20 CFM per person + 0.18 CFM/SF
- Multipurpose Rooms: 20 CFM per person + 0.18 CFM/SF
- Lobby/Flex Space: 5.0 CFM per person + 0.06 CFM/SF
- Viewing Area: 5.0 CFM per person + 0.06 CFM/SF

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.2 *Indoor Design Conditions*

Area	Summer		Winter	
	Temperature	Rel. Humidity	Temperature	Rel. Humidity
Gymnasium/Multipurpose Rooms	24°C	60%	22°C	30%
Administration Areas	22°C	60%	22°C	30%

.3 *Seismic Bracing*

The Structural Engineer will confirm whether seismic bracing is required for the mechanical equipment for this project, based on geotechnical soil classification.

2.3 Demolition

Selected demolition of existing plumbing, HVAC and fire protection systems will be required to accommodate the demolition of the existing Viewing Area, Administration Offices, Washrooms and Community Hall.

2.4 Site Services

.1 *Sanitary*

Sanitary waste for the Addition will be collected internally and routed to the existing internal sanitary sewer of the existing building.

A grease interceptor will be provided to serve the Concession Area based on cooking information provided by the Design Team.

A sanitary sump pump will be provided to serve the elevator pit.

.2 *Storm Water*

Roof areas of the Addition will be drained by roof drains, and rain water leaders and connect to the existing main building storm sewer which will exit the Addition to the south in coordination with the civil site services plan.

Civil Engineer to advise whether flow control roof drains are to be incorporated for this project.

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A portion of the roof water will be discharged to the Plant Beds in coordination with the Civil Engineer and the stormwater drainage plan.

.3 *Domestic Water*

A new 50 mm cold water domestic water line will be extended from the existing building to serve the Addition including new washrooms, concession, changerooms, drinking fountains and multipurpose room sinks.

2.5 Plumbing

.1 *Plumbing Fixtures*

New plumbing fixtures will be provided to serve the Addition, as follows:

- Watercloset 4.8 L/flush
- Urinal (Low Flow 1.0 L/flush)
- Lavatory, complete with flow control aerator (1.9 L/minute)
- Kitchen Sink (1.9 L/minute)
- Janitor Sink (2.5 L/minute)
- Exterior Hose Bibbs (4)
- Hydration Stations (2)

Final plumbing fixture selection be coordinated with Owner input. Urinals, water closets amd lavatories will be complete with hands-free infrared controls.

Plumbing fixtures are to be barrier-free to meet OBC requirements.

An Emergency Eyewash Station will be provided in the Second Floor Mechanical Room.

.2 *Domestic Hot Water*

Domestic hot water will be generated by a 40 kW air source heat pump complete with heat exchanger, pump skid, storage tanks and controls. This systems will provide sufficient hot water capacity down to an ambient temperature of 0^{o}C. Below 0^{o}C, domestic hot water will be provided by a 50 kW electric water heater installed to meet the domestic hot water demand requirements. This electric water heater will also provide 100% redundancy for the air source heat pump, year-round. This equipment will be located in the Second Floor Mechanical Room.

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New hot water distribution piping will be provided to the Addition to accommodate the new plumbing fixtures.

Domestic hot water will be stored at 60°C. An electronic master mixing valve will be installed to provide tempered water at 45°C to the Addition.

A domestic hot water recirculation system complete with recirculation pump will be provided in the Addition to ensure hot water flow at all fixtures.

2.6 HVAC

.1 *Double Gymnasium*

The Double Gymnasium will be heated, cooled and ventilated by a packaged, roof mounted, heat pump heating/cooling unit. The unit will consist of the following:

- Economizer Section to allow the use of outside air for "free" cooling
- Filter section with MERV 14 cartridge filters
- 16,000 CFM supply fan complete with variable frequency drive (VFD)
- 40 Ton heat pump cooling section
- 100 kW electric auxiliary heating section.
- 50 kW electric humidifier

The unit will operate on a time-of-day schedule as programmed through the BAS.

A demand control ventilation control strategy using multiple CO_2 sensors will control fan speed and ventilation capacity of the rooftop unit to suit space occupancy.

Supply ductwork and supply grilles will be provided at high level to distribute air to the space.

.2 *Multipurpose, Lobby/Flex, Fitness, Administration*

The balance of the Addition will be heated and cooled by an air source, variable refrigerant flow (VRF) system consisting of the following:

- Multiple indoor, ceiling mounted VRF fan coil units complete MERV 8 filter, supply fan, refrigerant heating/cooling coil, ductwork and diffusers.
- Roof mounted VRF air cooled condensing units (70 Ton Capacity).

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- Refrigerant piping connecting the VRF fan coils to the roof mounted condensing units.
- Wall mounted temperature controllers

The VRF system will provide independent temperature control of each space to maximize comfort conditions and to reduce energy consumption for unoccupied areas.

A roof mounted Energy Recovery Ventilator (ERV-1) will provide ventilation to the VRF system to meet Code ventilation requirements.

ERV-1 will consist of the following:

- 5,000 CFM supply fan complete with VFD
- 5,000 CFM exhaust fan complete with VFD
- Energy recovery enthalpy wheel
- 15 Ton heat pump cooling section
- 40 kW electric heating section.

Distribution ductwork will be extended from the ERV to each VRF fan coil. Variable volume terminal units will be provided at each fan coil to control ventilation air volume to each space.

A demand control ventilation strategy complete with CO_2 sensors will be provided to control the ventilation capacity to each space to accommodate variable occupancy.

.3 *Concession*

A ~1500 CFM NFPA rated kitchen exhaust hood complete with fire suppression system will be provided to serve the Concession area.

A ~1500 CFM roof mounted NFPA rated exhaust fan will be provided to serve the exhaust hood.

16 gauge steel ductwork complete with duct fire wrap will be provided to connect the hood to the exhaust fan.

Final size of the exhaust hood and exhaust fan to be confirmed with Concession equipment contractor

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.4 *IT Room*

A 1 Ton VRF fan coil will be provided to cool the IT Room.

.5 *Washrooms and Changerooms*

The washrooms and changerooms will be ventilated by ERV-1 to meet Code ventilation requirements.

.6 *Fitness Weight Room (Existing Building)*

A new, 15 Ton, packaged, gas-fired heating/cooling unit, complete with duct distribution, will be provided to suit the Fitness/Weight Room.

.7 *Passive Ventilation*

Motorized louvres for intake air and relief air will be provided at low level in the Gymnasium and Seniors Area and at high level in the Clerestory and Skylight area to accommodate passive ventilation in each area.

2.7 Building Automation System

A new BAS system will be provided to monitor and control the mechanical systems serving the Addition.

Mechanical sequences of control and points list to be coordinated with the Owner.

Final BAS design including sequences of control to be determined in consultation of the Owner.

2.8 Fire Protection

A wet sprinkler system will be provided to serve the Addition.

The existing Sprinkler Room will be relocated to suit the Architectural Plans of the Addition. A temporary Sprinkler Room will be provided to suit Construction Phasing.

Fire extinguishers will be provided throughout the Addition to meet Fire Code requirements.

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15.0 electrical design

Peach King Centre

mcCallumSather

Type of Document:
Electrical Basis of Design Report

Project Name:
Peach King Centre

EXP Project Number:
ALL-22028376-A0

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1 INTRODUCTION

The Town of Grimsby is proposing to construct a 2-Storey Addition to the existing Peach King Community Centre in Grimsby, Ontario. The proposed addition has a gross floor area of approximately 3,987 m^2.

This Electrical Design Brief documents the proposed electrical systems that are consistent with, and anticipated for, the proposed Addition.

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2 Electrical SYSTEMS

2.1 Codes & Standards

The following Codes and Standards will be referenced as part of the electrical design:

- Ontario Building Code (OBC)
- ASHRAE 90.1
- Ontario Electrical Safety Code (OESC)
- CSA-C282, Emergency Electrical Power Supply for Buildings
- IES Recommended Practices and Guidelines
- Canadian Standards Association (CSA)
- Institute of Electrical and Electronic Engineers (IEEE)
- National Electrical Manufacturers Association (NEMA)
- National Fire Protection Association (NFPA)
- Occupational Health and Safety Act (OHSA)
- Technical Standards and Safety Authority (TSSA)
- Telecommunications Industry Association (TIA)
- Underwriters Laboratories of Canada (ULC)
- Material Safety Data Sheets by product manufacturers
- local utility inspection permits
- Codes, Standards, and Regulations of local governing authorities having jurisdiction
- Owner's standards. (i.e., Emergency Policy and sustainability Standards)

2.2 Design Conditions

Electrical power distribution and lighting systems shall be designed to conform with the requirements of ASHRAE 90.1 Energy Efficient Design of New Buildings.

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2.3 Selective Demolition

Where existing areas will be impacted, selected demolition of electrical systems will be specified. This may include devices on demising walls, lights, and other ceiling-mounted devices to terminate to source, make safe and update panel schedules as required.

2.4 Primary Power Supply

The existing main service feeds a Federal Pioneer 800 AMPS, 347/600V Switchgear Unit which appears to be from the original construction dating back to 1983/84. Hydro consumption data available at the time this report was prepared did not provide peak demand information. Spare electrical capacity of existing main service to be reviewed with the intention of confirming sufficient spare capacity available to service proposed renovation/addition.

A 500kVA, 27.6kV-347/600V utility-owned padmount transformer is located around the backside of the building at the north end of the property.

Peak demand of existing main service is to be reviewed in conjunction with proposed new loads to determine if sufficient spare capacity is available to avoid a service upgrade during the detailed design stage.

2.5 Power Distribution

120/208V branch circuit panelboards for lighting, receptacle and HVAC loads will be provided on each floor as necessary to distribute power while maintaining future flexibility for electrical energy monitoring as per ASHRAE 90.1 requirements.

A 600V, 200A feed from the main switchboard is preliminarily proposed to service loads in the new addition/renovated spaces. Fused disconnect switches to be provided to feed new 600V mechanical loads if necessary, with another fused switch feeding a step-down 600-120/208V dry type transformer which will serve 120/208V branch circuit panelboards. Exact sizing of 600V to service addition/renovated areas to be confirmed during detailed design stage.

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An electrical room shall be provided on the ground floor to house new 347/600V and 120/208V distribution equipment that shall service the addition/renovated areas. Approximate dimensions are 3.0m by 2.4m. 120/208V branch circuit panels will be located in either a mechanical or storage room on the second floor to service lighting, receptacle and mechanical loads in this space as necessary.

2.6 Transformers

Secondary transformers shall be three (3) phase, 60Hz, 600 volts, delta-connected primary, and 120/208 volts, wye-connected secondary. Transformers shall be ambient air cooled, ventilated and shall have provisions for floor mounting or wall mounting for sizes up to 75kVA. Transformers shall be listed by Underwriters Laboratories and comply with the latest NEMA and ANSI standards.

2.7 Receptacles

Receptacles will be provided throughout as required for equipment, housekeeping, maintenance and convenience purposes as required by applicable Codes and Standards. Housekeeping receptacles will be 20A, T-Slot outlets. Town of Grimsby to assist in confirming equipment requirements.

Three (3) 30A twistlock receptacles are proposed to be provided near central plaza. Weatherproof pedestal mounting enclosures to be provided, with exact locations and quantities to be confirmed during detailed design through coordination with the Town of Grimsby staff.

2.8 Barrier-Free Design

Electrical requirements that satisfy both the Ontario LTCHA, OBC, and the Town of Grimsby Barrier-Free guidelines shall be provided.

2.9 Electric Vehicle Charging Stations

A 120/208V branch circuit panelboard will be provided in the new ground floor electrical room to exclusively feed electric vehicle charging stations. Provision for two (2) dual-port Level 2 electric vehicle

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charging stations to service four public parking spaces near the Community Hub building, and four (4) dual-port Level 2 electric vehicle charging stations to service eight parking spaces in the south-east lot for Town Hall service vehicles and general public use (to be fed from Town Hall distribution).

2.10 Fire Alarm System

The existing fire alarm system is an Edwards EST Series system that shall be extended to service the new addition. Manual pull stations, smoke detectors and audible/visual signaling devices shall be added to the system to service the proposed addition/renovation areas. All existing annunciators and the passive graphic will be modified to reflect the new addition.

The existing building is serviced by a sprinkler system which is intended to be extended to cover the addition/renovation areas. Additional flow switches and supervised valves will be connected to the fire alarm system with initiating and supervisory zones being specified as necessary.

Further coordination with fire alarm system technicians will be required to determine if the fire alarm system will need to be upgraded to accommodate the proposed changes. To be determined during the detailed design stage.

2.11 Illumination & Controls

The lighting will be energized using a 120V power supply. All luminaires will utilize LED technology, and will be DLC certified. Colour temperatures and Colour Rendering Index (CRI) to be confirmed during detailed design stage. Lighting controls will be comprised of standard line voltage controls (i.e. toggle switches, occupancy sensor/power packs, etc.) and low voltage standalone/room-based controls (room controllers, LV wall-stations, 0-10V dimming) that will provide increased functionality as required to satisfy ASHRAE90.1 requirements. Lighting controls requirements to be confirmed with Owner.

Fixture types to be specified for interior lighting including but not limited to recessed linear fixtures, troffers, pendants, niche/cove fixtures, vanity, recessed downlights and sconces.

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A living wall is being considered for installation behind the feature stairs in the lobby. Electrical power provisions for irrigation and specialty lighting to be considered for this application; to be coordinated with architectural during detailed design stage.

Additional exterior fixtures to be specified for new parking areas and walking pathways. Pole mounted fixtures will be specified for revised parking areas and drive lanes to meet IES recommended illuminance targets. Poles to be specified to match heights of existing installations. Pole mounted (15'-0") lighting and wall packs will be specified for revised walking pathways to match and/or compliment existing installations. Voltages to match existing, and fixtures to be tied into existing control means serving current exterior lighting installations.

2.12 Emergency Lighting & Exit Signs

Emergency lighting and exit signs will be provided as required by, and in accordance with, the Ontario Building Code. Exit signs will be "green running man" pictogram type.

Existing emergency lighting system consists of Beghelli and Emergi-Lite battery packs with MR16 LED heads, and remote head units. New battery packs to be specified and circuited to panels serving new normal power lighting loads, with DC voltages to be confirmed to match existing installations.

2.13 Communications Cabling (Voice/Data)

The existing communications cabling serving the existing building will be modified to suit the new addition. The existing Main IT Room is scheduled to be demolished as part of the renovation works. A new main IT room has been provisioned for on the ground floor to the East of the proposed double gymnasium. Existing incoming communications services will be extended to the revised Main IT Room location. Due to the enlarged envelope of the building and the new Main IT Room location in it, a secondary IT rack will be considered to be installed in the existing Mezzanine Main Electrical Room due to limitations on length of run (100m) for communications cabling installations.

Backbone cabling in the building (fibre optic and copper), cabling racks, patch panels, horizontal cabling, jacks, and faceplates will be provided as required to accommodate the new building addition.

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Structured cabling, including raceway and box system, will be provided for all associated equipment and outlets (i.e., outlets plus wireless access points) at locations as determined by the owner. Wireless access point infrastructure will be provided throughout the entire addition/renovation space. EXP to coordinate with Town of Grimsby's IT Department to confirm structured cabling/equipment standards and layout requirements

A predominantly mesh-type cable tray will be used. J-hooks will also be provided where a lesser number of cables are routed in order to manage all communication cabling as well as cabling associated with other low-voltage systems.

2.14 Security Systems (i.e. Access Control/CCTV)

An empty raceway system will be provided for security devices and will consist of outlet boxes, cabinets, cover plates, conduits pull boxes, trays, sleeves, pull cords.

The system and device locations will be coordinated with Town of Grimsby's preferred vendor. Existing installations consist of security panel, door contacts, motion sensors and keypads.

2.15 Public Address/Overhead Paging & Audio-Visual Systems

An empty raceway system will be provided for PA and AV devices and will consist of outlet boxes, cabinets, cover plates, conduits pull boxes, trays, sleeves, pull cords.

The system and device locations will be coordinated with Town of Grimsby's preferred vendor.

2.16 Electrical Provisions for Equipment Supplied by Others

Empty conduit, power, and control wiring will be provided as required for various Owner supplied/installed equipment as well as equipment specified by other Divisions (i.e., laundry equipment, kitchen/food preparation equipment, resident lifts, tubs, elevators, power door operators, etc.).

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Town of Grimsby to provide a list of the equipment supplied by others.

2.17 Wiring for Mechanical Equipment

Motor starters, variable frequency drives, disconnect switches, and power wiring will be provided for all new mechanical equipment. Controls wiring such as LV BAS connections shall be by mechanical division.

2.18 Seismic Restraint

The Structural Engineer will confirm whether seismic restraint of electrical systems is required.

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