THE CITY OF DAWSON
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NOTICE OF SPECIAL COMMITTEE OF THE WHOLE MEETING #CW21-12

This is to inform you a special meeting of City Council will be held as follows:

DATE OF MEETING: TUESDAY, May 18, 2021

PLACE OF MEETING: COUNCIL CHAMBERS, CITY OFFICE

TIME OF MEETING: 5:30 PM

PURPOSE OF MEETING:

1. Republic Architecture – Dawson City Recreation Centre Feasibility Study - DRAFT

DATE MEETING REQUESTED: May 13, 2021
MEETING REQUESTED BY: WAYNE POTOROKA, MAYOR

Original signed by: May 13, 2021
Cory Bellmore, CAO Date

Government of Yukon
Dawson City Recreation Centre Feasibility Study - DRAFT

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May 07, 2021

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1.0 Executive Summary

1.0 Executive Summary

1.1 Introduction

On behalf of the City of Dawson, the Yukon Government with the assistance of Colliers International, engaged Republic Architecture Inc. (RAI) in collaboration with SMS Consulting Engineers Ltd. (SMS), Scouten Engineering (SE), and Hanscomb Limited (Hanscomb) in the Summer of 2020 to develop a Functional Program and Feasibility Study including costing for a new recreation centre in the City of Dawson, YT.

Two separate building sites, one located in the historical overlay (Gold Rush) and one located in the outskirts of the city at the base of the mountain (Dome Road) were identified to the Consultant Team as potential sites.

In order to explore the potential recreational needs of the community, the design team produced three functional programs and test fit conceptual designs on each site responding to their respective environmental conditions. This exercise provides the CoD a total of six unique options of varying magnitudes of scale to choose from.

The Team was tasked with pushing the envelope, exploring traditional and non-traditional approaches to integrated building design and construction, technologies and energy efficiency to determine the affordability of the new recreational centre in a holistic manner, including analysis of increased capital spending on energy use reduction and feasibility analysis. The culmination of this data is presented in this document as a baseline for building construction, and the tools required to select the best recreation centre for the City of Dawson.

1.1.1 Feasibility Study Objective

This feasibility study will:

- Present regulations that may affect the design;
- Study the physical and cultural context of the building;
- Explore the two sites: Dome Road and Gold Rush;
- Provide three functional programs of varying scales;
- Test fit the three functional programs on each site, for a total of six design options;
- Recommend appropriate structural, mechanical, electrical, civil, and communications designs;
- Perform energy analysis on the six base options, and two other energy targets for each option for a total of eighteen energy models;
- Present the feasibility of the six proposed options;
- Present the report to the community and council to obtain feedback;
- Provide a recommendation of which option presents best value.

1.2 Methodology

This document represents the culmination and synthesis of all project information assembled and gathered from the CoD, YG and sourced by the consultant team over a period of six months.

The CoD provided RAI with a Pre-Planning Report that considered five potential sites for the new recreation centre. Council identified two of these sites; one at the bottom of Dome Road (town outskirts), and the other at Gold Rush Campground (urban), for further study. The intent of this Report is to consider and analyze these two sites for the development of three distinct building options at each location (for a total of six possible design options).

A Start-Up Meeting was conducted via Microsoft Teams on August 18th, 2020, to introduce the project and team members, review project scope and schedule, and define lines of communication.

A site analysis for the Dome Road and Gold Rush sites was developed from information gathered from the CoD, YG, virtual site review, as well as the Canadian Climate Normals, the National Building Code of Canada, and Google Earth. Topography, site accessibility, density, zoning, climate, geotechnical conditions, energy impact, and parking requirements are the key drivers reviewed. Qualitative aspects such as views and contextual influence were also considered.

A User Group Meeting was held with the Stakeholder group August 20th, 2020 to review a draft functional program and recreational facility needs that had been put forward as part of the previously completed reports provided by YG to the Consultant Team. During this meeting, Council Members identified discrepancies in facility needs. RAI synthesized the information gathered and produced a Draft Functional Space Program for review with the stakeholders. At a series of meetings in late August and September the stakeholders and RAI worked to prioritize amenities.

Three Functional Space Programs, with increasing levels of amenity spaces, were compiled from discussions with the CoD, information researched by the team, and precedent programming information gathered for buildings of similar typology. These functional space programs were used to establish building areas for the new recreation centre facility. The Functional Space Program table describing the three options can be found in Section 4 of this Report. Following approval of these functional space programs, the consultant team has assembled six conceptual design options for pricing, review and analysis. Large scale plans can be found in Appendix A of this Report.

Each design option was studied via a unique energy model to assess possible differences in energy consumption, utility costs, and emissions. The energy model considered three levels of energy performance for each of the six design options. Key metrics for the study include; solar access, envelope performance, HVAC performance, lighting and utility costs that are appropriate for a northern climate.

Class D level cost estimates were developed for each of the six design options so that capital costs could be analyzed with respect to the building program, impact of the site development, as well as relative to maintenance. Class D Cost Estimates prepared for each design option can be found in Section 5 and 6 of this Report. Recommended construction materials, assemblies, and equipment selections have been provided as a basis of design for costing.

A feasibility analysis was executed which considered capital costs, operational costs, expenses and sources of potential revenue.

Upon thorough review of all of the gathered information and analyses a consultant recommendation has been offered for review and consideration by the stakeholder group.

The consultant team also led community engagement sessions with the assistance of Colliers, YG and CoD to collect additional input and measure the reaction of the community to the site locations and design options.

1.3 Requirement for a new Recreation Centre

The City of Dawson (CoD) has identified several deficiencies with the existing Art and Margaret Fry Recreation Centre and has determined the facility cannot continue to serve the citizens of Dawson effectively. According to the City of Dawson Parks and Recreation Plan: "Unstable subsurface conditions have plagued AMFRC since the beginning; the building has deemed seismically unsound and in 2017 Council voted unanimously to build a new centre (as opposed to spending an estimated $19.5 million on repairs)."

It has also been noted that the existing pool, built twenty years ago, has recently undergone substantial upgrades, but is only usable for half the year, and has some ongoing maintenance issues.

Lastly, the Recreation Plan states there is an insufficient multipurpose space available in Dawson City.

A new facility at the very least can replace the Art and Margaret Fry Recreation Centre, find opportunities to combine resources and personnel into one facility and then take advantage of energy savings through efficient mechanical systems.

1.4 Review of Report Sections

The following list provides a brief overview of the sections of the report.

1. Section 2.0 - Stakeholder Engagement

   The community was provided the opportunity to engage in the design process following council review and approval of the design options. Three virtual engagement sessions were held to describe the intent behind each of the 6 design options. At the end of each presentation, all attendees were invited to participate by completing an online survey. There were 377 survey respondents and 136 additional comments.

   Some of the repeated themes we heard during the community engagement were:

   - Dome Road is the preferred site of the majority of residents.
   - Include a pool. This would allow for many efficiencies the current pool is suffering from: lack of maintenance, short season, high energy use, and would allow for shared human resources by utilizing staff for other programs during non-peak periods.
   - Curling lounge should be on the same floor as the ice surface and hold 100 people.
   - Only one gym is required.
   - A second space with sprung floors could be included instead of a second gym space.
   - Include an indoor playground or daycare.
   - Public laundromat and showers were requested many times for people living off grid and tourists.
   - Include as much spectator space as possible around the hockey rink especially.

2. Section 3.0 - Context

This section explores the demographics, existing recreation facilities, density and zoning, walkability, as well as the solar and wind effects within the greater context.

Demographics

In general, the population of the City of Dawson with the surrounding catchment areas is 2341 residents, with a mean age of 43 years old. The population is slowly growing and drawing attention from young adventure seekers.

The existing indoor recreation facilities are currently all found in the existing town site. There are no private facilities that would compete with this new recreation centre. The primary facilities relevant to the scope of this project is the Art and Margaret Fry Recreation Centre, the fitness centre along the Yukon River and the seasonal pool by Minto Park.

Density and Zoning

Zoning around the Gold Rush Site is currently residential and would need to be changed to accommodate the recreation centre. The property cannot accommodate the footprint of the facility along with the minimum parking capacity given in the CoD zoning bylaw. Zoning around the Dome Road Site is currently industrial and would not need to be changed. The site is large enough to accommodate parking capacity to suit the zoning bylaw.

Site Accessibility

A major difference between Gold Rush and Dome Road sites at a large scale is walkability. Gold Rush is situated close to the historical town site, and can be reached by many residents by foot. Dome Road, on the other hand would necessitate driving or the creation of an extended walking path from downtown or from the newest neighbourhoods.

Solar

Sun studies were created for the site to help orient the building in the most strategic way, enhance daylighting and to test for the viability of solar power. In both sites, it is best to place the ice facilities on the North and East sides of the sites where they will have the least amount of extra sun and benefit the least from natural daylighting. The rest of the amenities can be placed in the south and west sides where daylight and solar heat gain are welcome. Due to the size and energy demands of the facility, solar power is not recommended. The whole site would need to be covered in solar panels to have any meaningful effect on energy costs. The return on investment would be minimal.

Wind

Available wind data for the site comes from the Dawson Airport. Prevailing winds come from the South and East and a little from the North. Wind power is not recommended due to the frequency of wind on site. Designs should mitigate snow loads wherever possible.

3. Section 4.0 - Pre-Design

- Functional Programming

  RAI met with the City of Dawson and the Yukon Government who identified functional needs for the space and described how they envisioned the building to function for their community. Three functional program options were developed with increasing levels of amenity of wellness and leisure on each site, summarized with preliminary areas as follows:

  - Option 1 - 6,346 SM - a hockey rink, curling surfaces, and a multipurpose room, this option has been developed to replace and improve upon the amenities of the existing Art and Margaret Fry Recreation Centre.

  - Option 2 – 7,091 SM - adds fitness amenities to Option 1 (a full-sized gym, fitness centre, sauna, walking track, and other multipurpose space)

  - Option 3 - 8,593 SM - adds aquatics (lap pool, kiddie pool, steam room and hot tub) and a climbing wall to Option 2.

- Recommended Construction

  In order to compare only the sites and number of amenities, the following variables were kept constant throughout each option:

  - Civil: The pavement surface would be gravel, and number of parking spaces would need to be held to the same number to have an apples-to-apples comparison. While not initially held constant, the review of site costs in the feasibility study discusses removing parking from both sites to provide a more fairer comparison.

  - Architectural: The following recommendations for the envelope are focused on meeting reasonable energy efficiency requirements as well as the longevity and maintainability of the facility:

    - Exterior Walls: Prefabricated insulated concrete panels. (R-40)

    - Floors: Rigid insulation below the slab on grade. (R-20)

    - Roofs: Modified bitumen with polyiso insulation (R-62)

  - Structural: The structural design is a practical, cost-effective approach, using prefabricated building elements where possible to make optimal use of the short construction season:

    - Exterior Walls: Precast concrete load-bearing insulated panels

    - Load bearing Partitions: Concrete masonry units.

    - Foundation: Strip footings under cast-in-place grade beams with thickened slabs under interior walls.

    - Floors: Main floor consisting of reinforced concrete slab on grade ranging from 150 to 200mm in thickness. Second floor of composite Q-deck on steel framing.

    - Roofs: Steel frame roof structure supported on precast walls.

- Electrical: Modern technology will be employed for all electrical systems, with an emphasis on reliable and proven technologies that will be robust and easy to maintain.

- Mechanical: For each proposed option on each site, the Yukon Government requested three energy targets; 35%, 50% greater than NECB and a target recommended by the consultant balancing energy efficiency, operating and capital costs, and feasibility. Outline specifications within present iterations of each of the systems with operational intent. While some mechanical elements stay constant, some elements change as the options become larger in order to take advantage of energy efficiencies.

4. Sections 5.0 & 6.0 - Design Options

Six unique design options were developed between the two sites, with each option crafted to achieve optimal functional adjacency maximizing the potential of each site through orientation and proportion. Each design option also responds appropriately to its respective site, considering context and the surrounding environment. The Gold Rush options are shown in Section 5, followed by their adjusted FSPs and Class D costing. Dome Road options are shown in Section 6, also followed by their adjusted FSPs and Class D estimates.

5. Section 7.0 - Energy Analysis

Energy modeling was a key instrument in the analysis of the energy performance for the proposed options for the recreation centre in Dawson City. The project required three options for functional programs which resulted in three facilities ranging in size and function on two different sites. Each option was to be reviewed for an energy target 35% better than National Energy Code for buildings (NECB) 2017, second option of 50% better and a third option recommended by the consultant. This recommended option was the one that was priced and included the assemblies described in Section 4.0.

Findings show the facilities and sites are generally consistent in energy performance. The areas of discrepancy between the sites and options include:

- Window to wall ratio, which was a product of the functional plan and orientation.

- Addition of a pool in option 3, which is a large energy user.

- The ventilation requirements based on functional program arrangement.

Even with the variations above the overall energy use intensity for the same option on either site is minimal. There is no significant difference between the Gold Rush and Dome Road sites from an energy or greenhouse gas perspective, given systems and envelope are consistent.

The energy modeling allowed utility costs to be estimated based on the recommended designs that could be used to review the facilities for feasibility.

6. Section 8.0 - Feasibility Study

The class 'D' level project costs vary for each site and for each of the design options presented. Generally, the range of construction costs for the six options is between $38.3M (Gold Rush Option1) and $60.7M (Dome Road Option 3). These costs including site development, construction fees, and northern location factor, but exclude design, escalation and construction allowances as well as GST (if applicable).

The shift from Option 1 to Option 2 is not very dramatic. Option 2 averages $13 million more in capital costs, for little utility improvement compared with the existing fitness facility.

Dome road is the less expensive site when to develop when considering the cost per square meter. This is because of the reduced depth of excavation required for the building. Dome Road inevitably has more room for parking, but Gold Rush would need parking provided nearby.

In review of this data, it appears that the most cost-effective option would be Option 1. This option reflects lower capital costs combined with more amenities and more favourable revenue streams given the amenities it provides.

7. Section 9.0 - Conclusions

The recommended site is the bottom of Dome Road site as it is central to the community and catchment area when take as a whole. This site is larger, allowing more flexibility in design, outdoor recreation and parking. It is adjacent to existing outdoor recreation areas such as Crocus Field, the ski hill, as well as mountain biking trails up the Dome. Lastly, the extra costs to bring utilities to this larger site is somewhat offset by the amount of excavation required due to the absence of permafrost.

The recommended option is Option 1 as it provides the most important amenities in Dawson City right now. There is already a functioning fitness centre and a seasonal pool, but Option 1 can replace the ice facilities of the AMFRC with the addition a gym and a public lounge that could expand the availability of year-round recreation amenities. However, other amenities can be added in the future as funding becomes available. The existing pool and fitness centre have had injections of funds and the spaces should be utilized for the appropriate lifespan or reconsidered for alternate uses.

2.0
Stakeholder Engagement

2.0 Stakeholder Engagement

2.1 Engagement with the City of Dawson

Over the course of the project, RAI met with the CoD, YG and Colliers to discuss and present progress. The minutes of those meetings are included in Appendix F.

A Start-Up Meeting was conducted via Microsoft Teams on August 18th, 2020, to introduce the Project and Team Members, review project scope and schedule, and outline lines of communication.

A User Group Meeting held with the Stakeholder group August 20th, 2020 to review a draft functional program and recreational facility needs that had been put forward as part of the previously completed reports provided by YG to the Consultant Team. During this meeting, Council Members identified discrepancies in facility needs. RAI synthesized the information gathered and Produced a Draft Functional Space Program for review the Stakeholders. At a series of meetings in late August and September the Stakeholder and RAI worked to prioritize amenities.

After the Draft Feasibility report was submitted and reviewed by CoD, Colliers and YG, a meeting was held to give the council an opportunity to provide feedback.

2.2 Community Engagement

After the draft report was presented to council, CoD, YG, and Colliers, the community was consulted to provide valuable input based on the progress and findings in the draft report. The public engagement scope of work employed multiple strategies which included public meetings, community surveys and user group surveys; the goal of which was to inform the public of the process and invite feedback. The document prepared for council reviewing the community engagement can be found in Appendix I.

The different approaches included:

1. Public Meetings

Due to travel restrictions, the consultant team joined the three engagement sessions virtually. The public was invited to join in person at the council chambers with CoD and Colliers International or online via Zoom. Invitations for the engagement sessions were distributed by the CoD via their website. Two sets of boards were printed and displayed at the council chambers and AMFRC so community members could review the plans at their leisure. Printed surveys were also made available. A recording of the engagement session was posted online for community members to watch if they were not able to attend the engagement sessions live.

2. Surveys

Community Survey - A link to community surveys was made on the CoD website and advertised by CoD. The platform used was Survey Monkey. The results were received by RAI and have been included in Appendix C of this Report. The survey was available for the community to complete from the end of the first presentation through March 22, 2021.

User Groups - User Group surveys were sent directly via email from the CoD to recreation stakeholders.

3. Email

An email address was made available for anyone to send questions during the survey period. Community residents were invited to share questions, concerns or affirmation related to the results of the functional space program and feasibility study.

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3.0
Context


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GREATEST KLONDIKER CONTEST
PALACE GRAND THEATRE

3.0 Context

Located in the Yukon, Dawson City is situated in the Klondike Plateau eco-region. Originally a gold mining town, Dawson City had 40,000 residents at its peak and was granted city status in 1902. While residents are still involved in the mining industry, tourism has grown in importance. The Dawson Historical Complex is considered a historic site by the Government of Canada.

Looking North at Dawson City - From the public archives of Canada

Wikipedia - Dredge No. 4 Bucketline Sluice Dredge Located outside Dawson City. Gold Mining is a significant part of Dawson City's history

3.1 Demographics and Projected Growth

From 2011-2016, Dawson's population grew by 4%. By 2040, the community is projected to grow by 49.8% with a potential high-growth scenario of 74%. Dawson City's population in 2016 was 1,375, and a total of 2,341 residents if you include the peripheral rural areas.

Dawson's residential areas have relatively low population density. The densest areas are located within the historic town site, adjacent to the Gold Rush site. Approximately 40% of the population lives in newer residences outside the town boundaries in peripheral rural areas.

The population also sees seasonal growth through tourism and secondary residences. 11% of all dwellings are not primary residences. As recreational tourism is growing in popularity, this seasonal population may be expected to grow and should be considered in recreational planning.

Dawson has a relatively young population, with an average age of 39. While there is not a large population of seniors, the number of residents above age 60 is projected to grow. Compared to other Yukon communities, residents in Dawson have a higher cost of living and lower average income.

Compared to rest of Yukon, Dawson has:

- Smaller Aboriginal population;
- Significantly lower average household size;
- Lower income and higher cost of living.

Other information:

- Private dwellings - 756 (678 year-round – 11% of dwellings are not primary residences)
- Population density - 42.4 people/ km2
- Land area - 32.45 km2
- Average household size - 2 people
- Median total income - $41,984
- Majority of income - ranges between $10,000 – $59,999

3.2 Tourism

Tourism contributes significantly to the Yukon's economy and Dawson City promotes itself with its range of recreational activities, including hockey, curling, skiing and snowshoeing. Recreational tourism feeds into the local economy through tourist spending in restaurants, hotels, and shops within the surrounding area. In the Block Q Ladue Estate Planning Study, the Gold Rush site campground has visitors from May through September.

According to the 2018 Yukon Tourism report, the tourism sector of the Yukon is expected to grow on a year-round basis and the development of recreational facilities within Dawson has the opportunity to increase local sport tourism, and support existing winter recreation activities.

3.3 Tournaments

Council members requested information on whether Dawson City could host the Arctic Winter Games with the new recreation centre. Due to the sizes of the facilities being considered in this feasibility study, larger tournaments will be difficult to bid on. For instance, in order to host the Arctic Winter Games, you require: 4 curling sheets, 2 hockey arenas and 10,000 sf of storage. All options only have 1 hockey rink and 2 curling sheets.

Other events like the Annual Holiday Hockey Tournament, an all ages event that brings people to the AMFRC, the Novice Hockey Championships, the Top of the World Highland Games or the Dawson City Curling Bonspiel could continue to be held. Typically, these tournaments primarily support local and surrounding communities.

3.4 Recreation Trends

Recreation is constantly adapting and is sensitive to location. Dawson City is a northern environment where much of the year is cold and requires more indoor recreation options. Some of the following elements discuss current recreation trends and how they apply to this project.

1. COVID-19

   With a pandemic circulating the globe many wonder how recreation facilities will be affected. Gathering before or after recreation activities may be moved to the outdoors or discouraged altogether. Surfaces may need to be easily cleaned, and games may be broadcast so people can watch without visiting the facility.

2. Multiplexes

   Municipalities are opting towards multiplex centres that provide many diverse recreation opportunities. Not only is this efficient for facility management, but families can attend many different activities at once. This convenience draws in more participation and multi-purpose spaces can be used for a multitude of activities.

3. Anchor Tenants

   Finding a local business that would run programs out of the facility permanently can be helpful for funding and draw users to the building. Anchor tenants could be fitness facilities, libraries, or restaurants.

4. Green Building

   Building green continues to grow as a meaningful development tool. Integrating green design strategies decreases energy use costs over the life of the building, encourages durability, and can create positive experiences for recreation centre users by increasing daylight levels. Finding mutually beneficial green technologies will allow opportunities to multiply. For instance, placing windows on the south facade reduces heat loss from the north, while optimizing sources of daylight. This may lead to energy savings from fewer light fixtures.

5. Fitness Integration

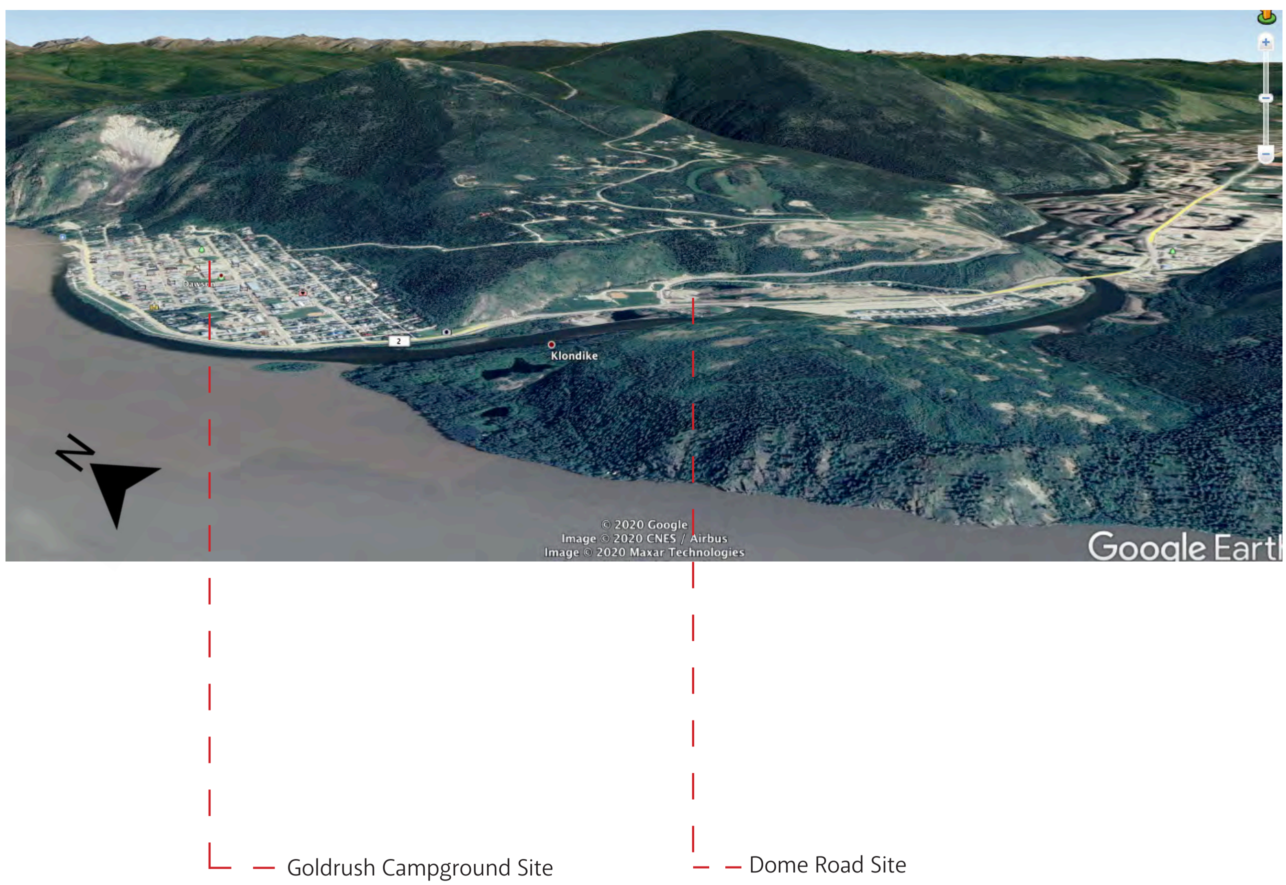
   Integrating fitness into daily activity for all ages, as well as for rehabilitation.

3.5 Topography

The general topography around Dawson City are round-shouldered hills, and the two sites included in this study are both flanked by Dome Mountain. This mountain towers over each site and blocks sunlight from the north and east. The dramatic topography surrounding each site provides ample opportunities for beautiful views. Historically, gold mining has had an effect on the topography of the area:

"Gold mining started in 1896 with the Bonanza (Rabbit) Creek discovery by George Carmack, Dawson Charlie and Skookum Jim Mason (Keish). The area's creeks were quickly staked and most of the thousands who arrived in the spring of 1898 for the Klondike Gold Rush found that there was very little opportunity to benefit directly from gold mining. Many instead became entrepreneurs to provide services to miners. Starting approximately 10 years later, large gold dredges began an industrial mining operation, scooping huge amounts of gold out of the creeks, and completely reworking the landscape, altering the locations of rivers and creeks and leaving tailing piles in their wake." - Wikipedia

The two sites - Google Earth



3.6 Existing Recreation Facilities

With knowledge of existing recreation facilities in the vicinity we can minimize overlap with existing services, and discover which types of recreation are under-served.

3.6.1 Outdoor Recreation Spaces

There are exterior opportunities for recreation throughout Dawson City in the form of fields, parks, dog parks, bike trails, a ski hill, baseball diamonds, soccer fields, and walking/hiking trails.

- Crocus Bluff - Includes a baseball diamond, soccer field, and connects to a nature trail with lookout point. The fields are located adjacent to the Dome Road site.
- Minto Park - Includes baseball diamonds, a playground, and tennis courts. The site is used annually for the Dawson City Music Festival and other events. The park is designated as a historic site.
- Waterfront Park - Contains a gazebo and picnic shelter. The park hosts a variety of events throughout the year.
- Robert Service School - Has a basketball court and a soccer field.
- Other outdoor amenities include extensive hiking/walking trails, an off-leash dog park, cross-country ski trails, and a golf course.

3.6.2 Indoor Recreation Spaces

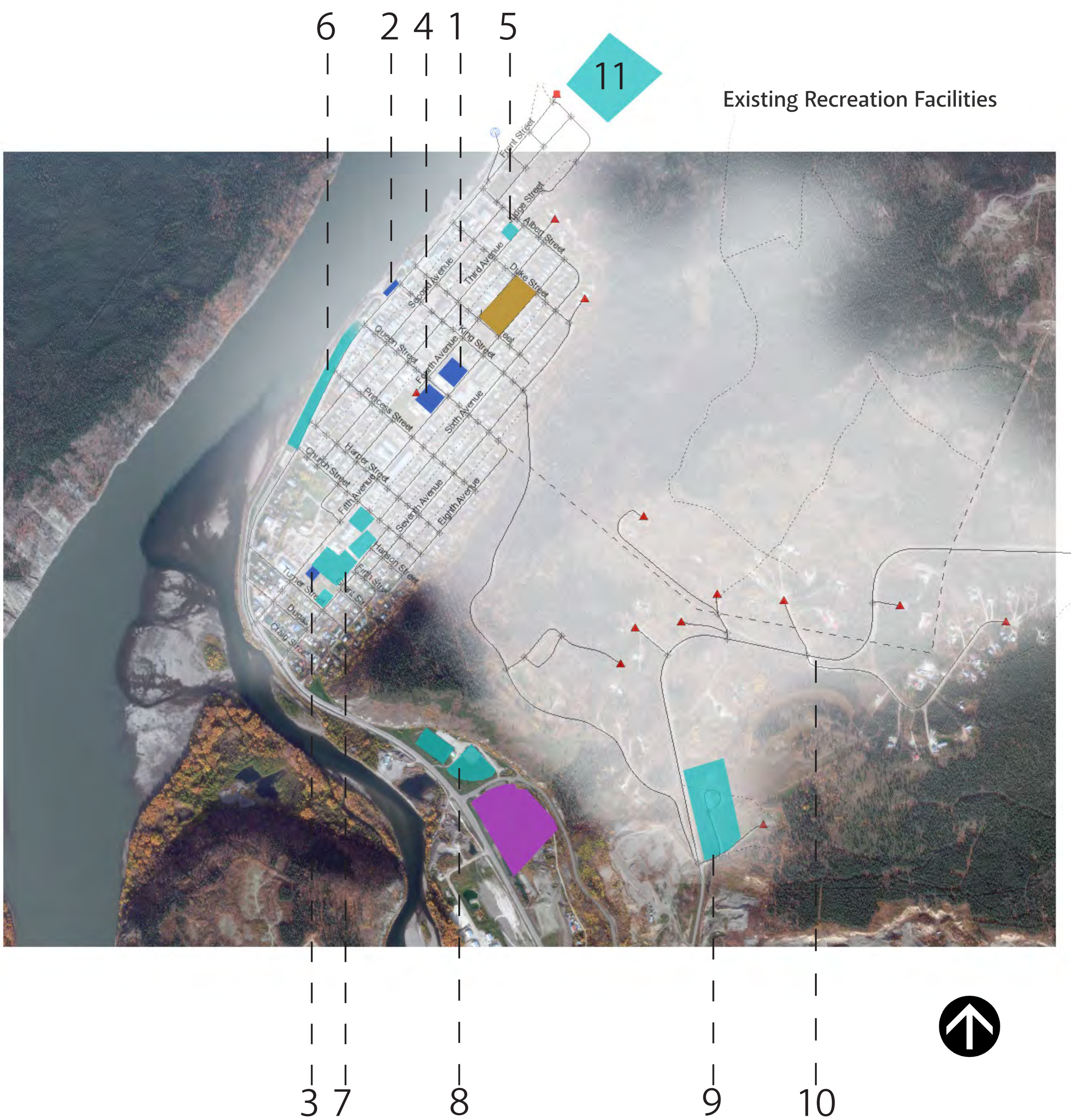
Most of the indoor recreation opportunities occur within Dawson City.

- Art and Margaret Fry Centre - The existing recreation facility includes a hockey rink, two curling sheets, a concession stand, seating, and offices that are currently used for storage. The facility is open from mid-November to mid-March, with some events in the off season. The Centre was built approximately twenty years ago and has unstable subsurface conditions. Part of the building was never completed and does not meet the needs of recreation programming for the community.
- Fitness Centre - The fitness centre has received continuous upgrades from 2015-2018. The facility offers various programs, such as yoga, kick-boxing, and badminton, and contains a variety of fitness equipment. If a new fitness centre is included in the new facility, the existing building will be put to another use.
- Pool - The pool has had significant upgrades over recent years to extend its life. The pool is open May to September and offers a variety of programming. The facility is approximately one kilometer from the existing Recreation Centre. If a new pool is included in the facility, this pool would be decommissioned.
- Gym/Multipurpose Space - The Robert Service School Gymnasium has been used for community recreation programming. It has been stated that there is not enough indoor recreation space that can be rented out. If a gym or multipurpose room is added to the facility, it will decrease the deficit currently experienced by Dawson City.

Indoor
1. Art & Margaret Fry Recreation Centre
2. Fitness Centre
3. Pool
4. Robert Service School Gymnasium

Outdoor
5. North end playground and community garden
6. Front Street Park
7. Minto Park
   - Baseball Diamond
   - Playground
   - Open Park
   - Tennis Courts
8. Crocus Park
   - Soccer Field
   - Baseball Diamond
   - Concession
9. Ski Hill
10. Mountain bike and cross-country ski trails
11. Off leash dog park

Existing Recreation Facilities



3.7 Site Accessibility

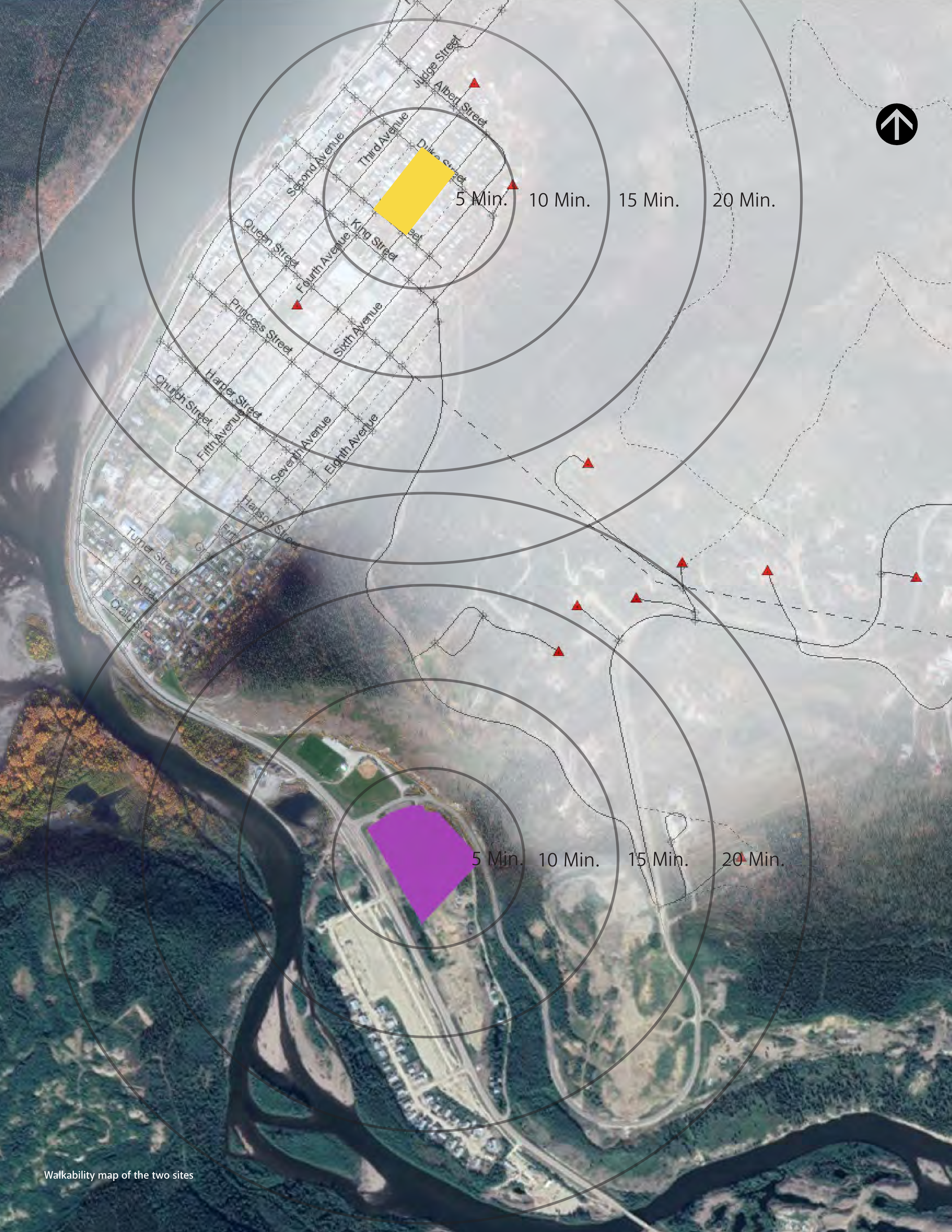
The Gold Rush site is situated just behind the commercial district. Access is very fast from this area. As well, there are many residential houses in the area. There will be little parking available around this site, and vehicles may be parked on residential streets or in nearby commercial parking zones.

The Dome Road site is large enough to accommodate as much parking as needed. There is a gravel foot trail running along the other side of the Klondike highway heading towards town. There are also trails running up and around Dome Mountain. Most people will have to drive or cycle to this site.

Several community members identified that the majority of ice rink users are choosing to drive a vehicle to the existing location for ease of transporting bulky equipment bags.

Given the climate of Dawson and the feedback from the community engagement, it is unlikely many would walk more than 10 minutes most of the year.

Regardless of how far people live or work from the new fitness facility, consideration should be given for how they are likely to arrive there. In a community that seems to prefer vehicular transportation, parking becomes a significant component in the decision-making process.



Walkability map of the two sites

3.8 Density and Zoning

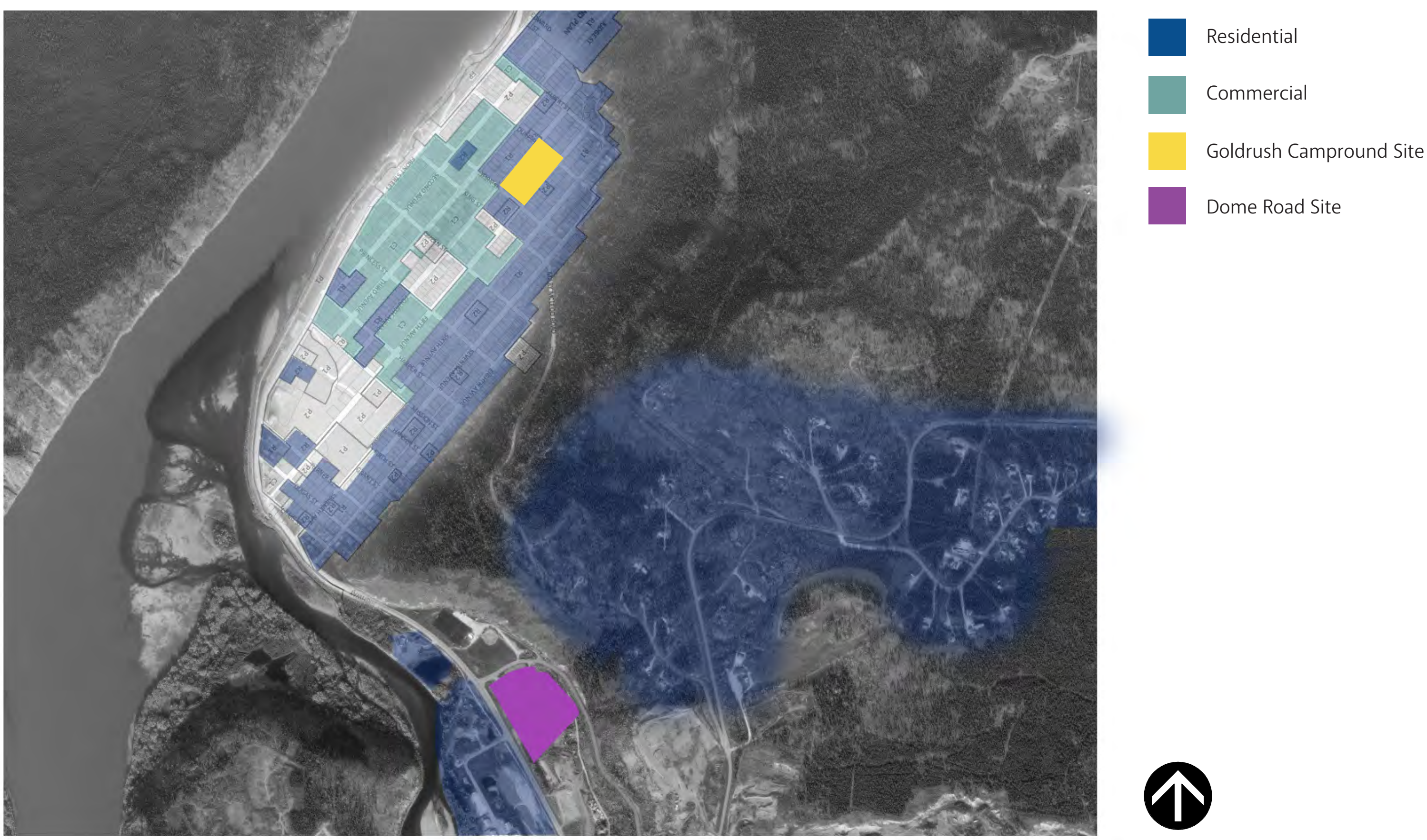
The Gold Rush site is located in a neighbourhood zoned as R1 Residential. Properties surrounding the site are primarily single-family homes. The site is currently being leased for the purpose of an RV campground that is operational during the summer months. This site is on the edge of the heritage district.

The Dome Road site sits next to the highway. Up the mountain, and across the highway is low density residential zoning called Country Residential. The current site is still under mine claims and is vacant.

Future subdivisions are planned along the Klondike Highway close to Dome Road and further east.

According the to City of Dawson By laws, all sides of the sites require 3.05 meters.

Intersections require 6.10 meters in either direction.



Zoning around the two sites

3.8.1 Parking Requirements

Parking is designed using the following guidelines:

- Government of Yukon (YG) Design Guidelines and Technical Standards,
    - Electrical outlets for vehicle heaters are required in the parking area.
    - Accessible parking must have year-round identifiable signage
    - Parking stalls are to have wheels stops when no curbs are provided.
    - Avoid large areas of parking
    - Do not exceed the minimum local parking requirements
    - Parking should be consistent with community vehicle use.
- The City of Dawson Zoning Bylaw No. 2018-19

  A car/truck parking stall dimension of 2.74 m x 6.10 m (9' x 20') has been considered for all the site layout options, and the quantity of parking will be calculated based on the following ratios:

    - Arena/Assembly: 1 stall / 8 seats
    - Recreational/Curling: 1 stall / 3.5 seats
    - Restaurant / Food: 1 / 8 seats
    - Office: 1 / 99.96 m^2

  Vehicle turning movement analysis for the access and parking lot was conducted out using a Pumper Fire Truck as the design vehicle, shown in the Gold Rush civil drawings.

The number of parking stalls will be calculated based on the occupancy which will change over the three options. Parking calculations take into consideration that multiple events could be occurring consecutively. Parking volume must accommodate these peak periods. The area available for parking on each of the sites has a significantly different footprint. The discrepancy makes an apples-to-apples comparison very difficult.

However, there may be avenues to for considering the exact amount of parking stalls required based on actual anticipated use during design development. If you were never to use the rink as a trade show, and the multipurpose room was only ever used for physical activity, the parking could be reduced substantially. The quantity of parking spots can be evaluated to address perceived overages or shortages of available parking in the next phase of design.

It must be noted there is opportunity to reduce off-street parking as per the City of Dawson zoning bylaws: "Where the requirements for parking space cannot be met, the owner and the City may enter into an agreement to provide cash in lieu of onsite parking."

3.9 Solar

Dawson City is located at 64 degrees north and experiences bright summers and dark winters. Twenty-four hours of sunlight are present from mid-May to mid-July with the azimuth of the sun reaching 48 degrees at its peak. In the winter, there is very little sunlight with the peak reached at four degrees off the horizon. The map below shows the path of sun in the winter versus the summer. The winter sun only covers a short part of the site before it sets again.

Due to the lack of daylight during the long winter, it is recommended that daylight is used very carefully in the planning of the building. Direct sunlight in spaces such as high-volume lobbies, reception, and recreation areas may improve the guest experience and make the most of daylight in common areas on cold winter days.

Spaces such as ice surfaces that do no need much sunlight will be placed in the North and East portions of the site. If windows are added in these spaces, they will be North facing and will not cause glare. Because these spaces are also not heated as much as the other spaces, there will be less heat lost through the envelope.

3.9.1 Solar Photovoltaic Potential

Solar photovoltaic panels were reviewed for suitability as an active design element for all six options. The preliminary solar exposure review can be found in Appendix J, but a review of solar potential on each site can be found below.

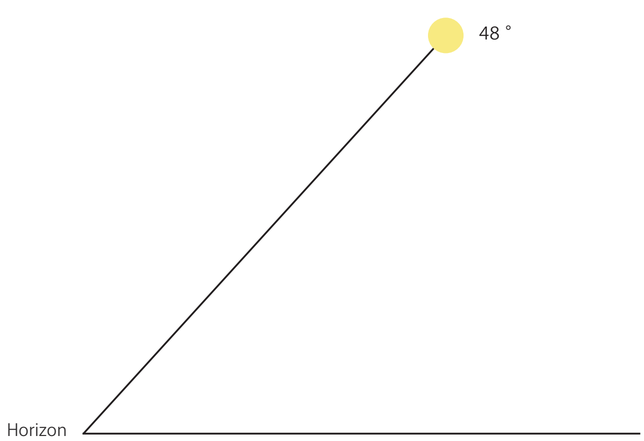
1. Gold Rush

Due to the position of the site with the bluffs to the East, South, and West the solar exposure is not significant for any of the proposed facilities at this location. Our preliminary solar study identified a maximum sun exposure of 335 hours annually on the West face and 393 hours on the South face of the facility. The roof exposure is comparable with both vertical faces. These values typically would not provide a good payback. For example, if 1,000sq.ft of solar panels were installed on the South face, roughly 3.93 kWh would be generated annually, which is only 0.000036% of the total energy required by the smallest of the proposed options. Even if this is scaled up ten times the energy production is minimal due to the low direct solar exposure.

2. Dome Road

Due to the position of the site and the bluffs to the East, South, and West, the solar exposure for the facility is not significant. Our preliminary solar study identified a maximum sun exposure of 363 hours annually on the West face and 367 hours on the South face of the facility. These values typically would not provide a good payback for the photovoltaic system. For example, if 1,000sqft of solar panels were installed on the South roughly 3.67 kWh would be generated annually which is only 0.000032% of the total energy produced by the smallest of the options. Even if this is scaled up ten times the energy production is minimal due to the low direct solar exposure.

The figure below illustrates the peak height of the sun at summer and winter solstice for the City of Dawson.

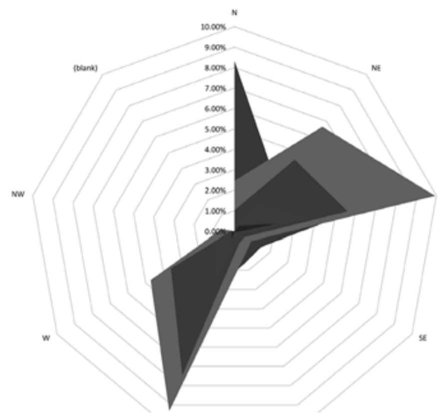


Height of sun at summer solstice

Height of sun at winter solstice

3.10 Wind

Wind data was only available from the airport, but the general source of wind is from the South and East. This tends to follow the pattern of valleys that exist in the area.



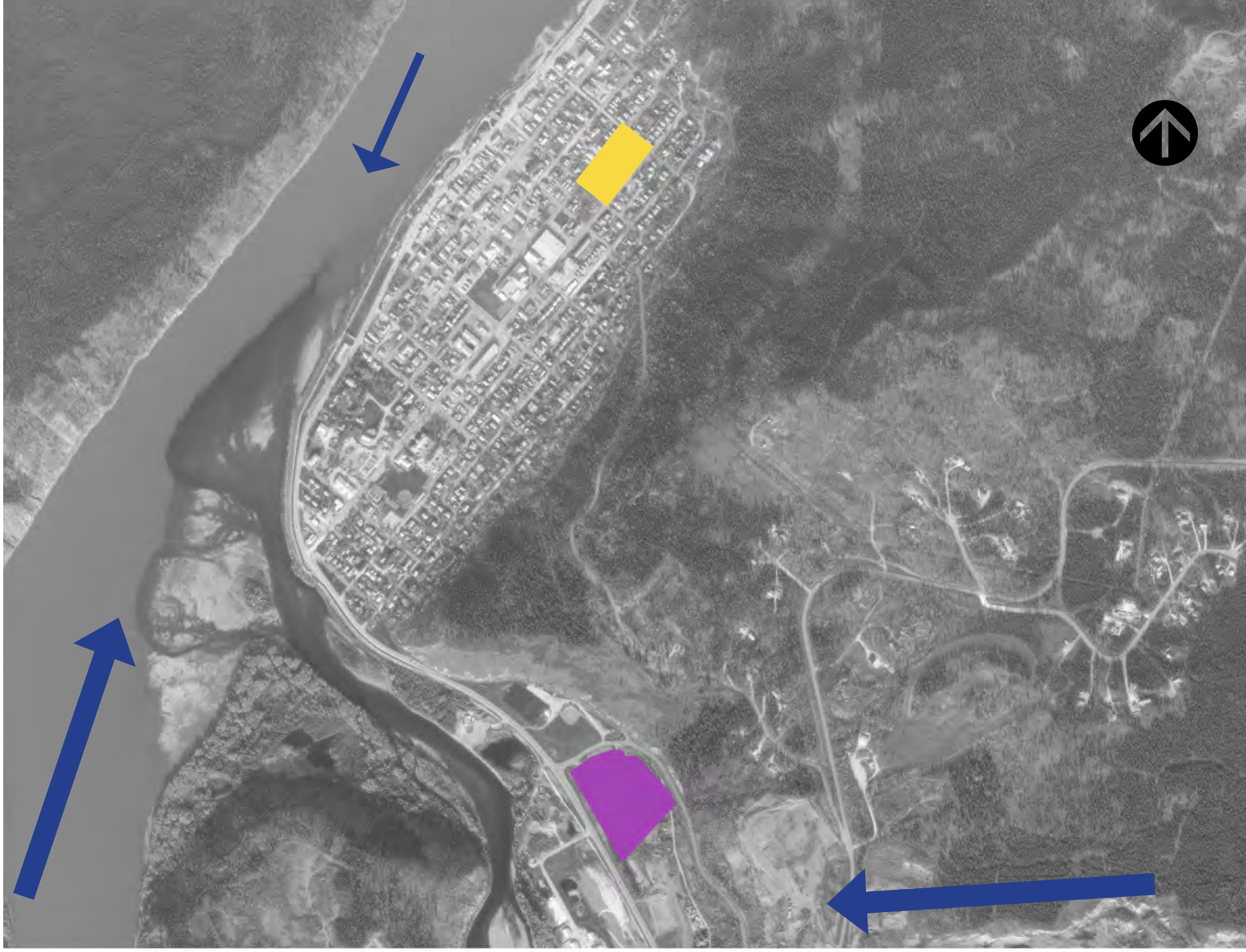
Wind Rose for Dawson City

Wind is an important consideration in snow drifting. The occurrence of hazardous winter ice and snow formations cannot be eliminated and can only be reduced in frequency or severity. Minimizing the amount of snow accumulation on the roof of a building, and the site in general, is of great importance in northern climates. Climate change is affecting northern climates more rapidly than southern climates. Canada's north is warming faster than the south, with the territories seeing an average temperature increase of 2.3C between 1948 and 2016. This rapid warming is causing increases in wind speeds and increased precipitation. Changes in temperatures and precipitation patterns are leading to denser, heavier, wetter snow, and causing greater loading on structures. Weather patterns are becoming less predictable and measures in design, from structure to building orientation, must consider current and future snow loads and changes in micro-climates. The design should attempt to orient the building in such a way that prevailing and storm winds will minimize snow drift. The least harmful snow loading is that which is naturally prevented from occurring.

The design of the roof should minimize or eliminate valleys, steps, dormers, and unnecessarily close projections from a parapet with a sleeper in close proximity. Unconditioned spaces such as overhangs can allow ice damming to form, which can cause damage to the roof finishes, leading to potential leaks. Wall thickness will dictate windowsill depth. The deeper the sill, the more surface area there is for snow to accumulate. The prevention of snow loads from falling and injuring building users is a crucial objective. For this reason, the location of primary entrances and service areas such as person doors and loading docks should be considered at the onset of design. If canopies are to be utilized at doors, these doors should be located facing the known direction of storm winds. Placement of the canopies in this way can help to reduce drifting snow coming down from the upper roof. To increase user comfort and help reduce energy loss, windscreens can be installed at entrances of this type. Where possible, fire exits should be located in such a way that snow cannot excessively drift in front of the doors. There are also gains to be had by placing doors on the leeward side of the building. This can decrease the amount of unnecessary snow drift, and also increase energy efficiency. In the upcoming design development stage, after an option is chosen, further review of these recommendations should be explored.

Second to preventing injury of building users is the protection of building systems, and the ability to efficiently maintain the building itself. Consideration should be given to the effect of snow loading on mechanical systems and the maintenance of those systems. Personnel must be able to safely access any rooftop equipment. Intakes and exhausts for rooftop equipment should be designed in such a way that prevailing winds will not be excessively detrimental to the operation of equipment. Sliding snow and ice can damage plumbing vents, lightning rods, and parapet walls.

Prevailing Winds overlayed on the two sites



3.10.1 Wind Power

Wind was analyzed as a renewable source for the facility options. The average wind speed and direction was used for estimating the energy that could be produced on the site. The average wind speed for Dawson City from environmental data is 1.2 m/s which is equivalent to 4.32 km/h and the prevailing direction is directly West. It is noted the maximum velocity in a typical year averaged 11.8m/s (42.48km/h) based on environmental data. Although gusts may exceed this velocity the wind speed is taken on a time interval that may miss some of the more extreme points, but the average would remain consistent. To estimate the amount of energy that could be produced by a wind turbine we reviewed a 200kW wind turbine. The 200kW wind turbine generates peak power at a wind velocity of 12m/s or 43.2km/h wind speed. The average wind for Dawson City is much lower so the generated power would be a fraction of the 200kW based on the performance curve of the specific generator. A simulation performed using IES (VE) software for wind design estimated a total of 200kWh generated by the wind turbine. This would account for 1.8% of the energy used by the smallest option, Option 1. The wind turbine has a 29m (95ft) blade diameter. The need to install the turbine at a distance from the facility poses a challenge. Smaller vertical-style turbines exist, but their power generation capacity is lower and produces roughly 5kW at peak power. To have a meaningful impact on energy usage, a larger wind turbine would be required. The size of turbine and the infrastructure required to support it for a tangible energy savings requires a significant investment that will likely not be recouped. Wind energy is not considered to be a viable option due to low average wind speeds and infrastructure requirements.

The average wind speed and direction was used for estimating the energy that could be produced on site. Specific wind data is not available for Dome Road, so the same values were used as the Gold Rush site, which is reflective of Dawson City as a whole. We do not expect a significant difference between the two sites. As a result, the same limited amount of energy could be generated but would rely on large wind turbines that may have logistical issues and be cost prohibitive.

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4.0
Pre-Design

4.0 Pre-Design

The following section starts with an architectural overview of the project. The three Functional Space Programs will be introduced and then the included amenities. A preliminary code review is followed by the civil, structural and mechanical and electrical design.

Civil discusses the two sites separately while structural talks about the geotechnical constraints of each site but settles on a single recommended option. Mechanical has similar designs for each option, with alterations as the facility becomes more complex.

Six distinct design options, three for the Gold Rush site and three for the Dome Road site were designed with the goal of providing different perspectives on the potential new Dawson City Recreation Complex.

4.1 Architectural

4.1.1 Functional Space Program

The following revised Functional Space Program (FSP) has been prepared to explore the construction of a new recreation centre in the community. The purpose of this FSP is to present a functional space program (in multiple options of scale) that will be turned into three distinct options specific to each site, for a total of six options.

RAI met with the City of Dawson and Government of Yukon Thursday, August 20th, 2020 to discuss their needs and wants for a new recreational facility. During this meeting, these stakeholders identified functional needs for the space and described how they envisioned the building would function for their community. Spaces were ranked to provide RAI with a starting point to develop FSPs based on a magnitude of scale.

A draft Functional Space Program was provided to the Government of Yukon on August 31st for review and input. On September 11th, a meeting was held with the Government of Yukon, City of Dawson representatives, Colliers and RAI to obtain feedback on the draft FSP.

Additional feedback was requested from the CoD, which was received via email September 17th, with follow up correspondence confirming existing storage on September 25th. The Revised FSP has been crafted to reflect all information received from the stakeholder group. The options are described below:

Option 1 - This option is considered to replace and improve upon the existing Art and Margaret Fry Recreation Centre. It is similar to the option recommended in the Pre-Planning Report dated November 2019. It is comprised of ice surfaces (hockey rink, curling surfaces) and gathering spaces (multi-purpose room, lounge, and canteen). Functions such as aquatics and other fitness amenities have been eliminated from this option and could be considered as future expansions. A dedicated walking track is not included, though there may be an opportunity for walking during low occupancy periods in the circulation and gathering spaces of the building by tracking their distances with distance markers incorporated into building circulation paths. An office area has been provided for up to 10 staff. CoD predictions for staff in this option would be: 12.5 FTE - 1 Manager, 1 Admin, 3 Programmers, 5 Operations, 2 Pool (pool would still be operating, but in separate building), .5 Custodian

Room Name	Option 1 Planning	Option 2 Planning	Option 3 Planning	Max Occupant Load	Notes
RECREATION AMENITIES					
Ice Rink (Hockey, Ringette, Skating)	1,874.0	1,874.0	1,874.0	800	
Ice Rink Viewing Area (unheated)	79.5	79.5	79.5	133	Include space heaters
Ice Rink Viewing Area (heated)			26.5	16	Could be combined with lobby
Team Dressing Rooms	240.0	240.0	240.0	-	
Ref Change Room	35.0	35.0	35.0	-	Includes first aid area
Skate Sharpening	15.0	15.0	15.0	-	
Zamboni Room	45.0	45.0	45.0	-	
Ice Plant/Mechanical Room	45.0	45.0	45.0	-	
Storage	60.0	60.0	60.0	1	Shared with curling rink
Curling Rink	856.0	856.0	856.0	35	
Changing Area/Lockers			15.0	-	
Lounge	75.0	75.0	75.0	79	
Multipurpose/Flex Space/Gym		762.0	762.0	800	
Multipurpose/Flex Space	500.0			342	
Gym Viewing Area			26.5	44	
Change Rooms	60.0	120.0	120.0	-	
Fitness Centre		140.0	140.0	61	
Change Rooms		40.0	40.0	-	Share with Fitness Centre if possible
Walking Track		250.0	250.0	50	walking track could be in circulation
Lap Pool			350.0	233	
Kiddie Pool			150.0	100	
Hot Tub/Jacuzzi			30.0	10	
Change Rooms			180.0	-	
Lifeguard/First Aid			12.0	1	
Pool Mechanical & Chemical Stor			325.0	-	
Steam Room			35.0	20	Gender inclusive
Sauna		35.0	35.0	10	Gender inclusive
Indoor Playground		85.0	85.0	20	
Climbing Wall			40.0	6	
Sub-Total	**3,884.5**	**4,756.5**	**5,946.5**		
COMMUNITY AMENITIES					
Common Lounge/Entry	75.0	75.0	75.0	20	Includes ticket counter
Canteen/Servery	63.0	63.0	63.0	66	Serves Curling & Common Lounge
Multi-use Party/Meeting Room		30.0	30.0	32	
Full Team Office	155.0	155.0	155.0	17	
Sub-Total	**293.0**	**323.0**	**323.0**		
LOGISTICS					
Washrooms	100.0	120.0	132.0	-	
Janitor Room	20.0	20.0	20.0	-	
Laundry Facilities	10.0	10.0	10.0	3	
Mechanical	227.5	227.5	227.5	-	
Electrical	42.0	42.0	42.0	-	
Telecom	31.5	31.5	31.5	-	
Elevator/Lift	12.0	12.0	12.0	-	
General Storage	80.0	130.0	130.0	3	Separated w/ lockable compartments
Sub-Total	**523.0**	**593.0**	**605.0**		
Net Total	**4,700.5**	**5,672.5**	**6,874.5**		
Gross Up (25%)	**1,645.2**	**1,418.1**	**1,718.6**		**Option 1 calculated at 35%**
GROSS TOTAL	**6,345.7**	**7,090.6**	**8,593.1**		

Option 2 - This option adds fitness amenities to the base model, such as a full-size gym, fitness centre, sauna, steam room, walking track, and another multi-purpose space. These services would attract even more users, including tourists, to the area. The existing fitness centre in the town would be re-purposed. Office space has been provided for all the staff. The walking track could be wrapped around the gym, or again, be incorporated into the greater circulation of the building. CoD predictions for staff in this option would be: 13.0 FTE - 1 Manager, 1 Admin, 3 Programmers, 5 Operations, 2 Pool (pool would still be operating, but in separate building), 1 Custodian.

Option 3 - This option adds aquatics (lap pool, kiddie pool, and hot tub) and a climbing wall to the facility. All spaces are sized to suit the anticipated community needs as defined during the programming meeting with Council and are outlined in the feasibility study reports. Some community members have requested leasable space or a daycare as a community need. CoD predictions for staff in this option would be: 15.0 FTE - 1 Manager, 1 Admin, 3 Programmers, 5 Operations, 4 Pool, 1 Custodian. Not all these people would require a desk in the staff office.

It should be noted this FSP was a launching point for discussing which amenities should be included in each option and their relative sizes. As the designs were test fit on their sites, the exact square footage of the spaces evolved to explore different combinations of spaces and building designs.

4.1.2 Descriptions of Identified Spaces

Through discussion with Council, studying Dawson City, and referencing previous reports, a variety of amenities were chosen to meet the needs of the residents. These amenities were grouped into three options of increasing size in the functional space program. The full list of amenities is provided below.

1. Ice Rink and Related Amenities

As a primary programmatic requirement, each of the design options include an ice rink with a gross area of approximately 1,874 m^2 that supports a standard/NHL Sized ice surface (26 x 61m [85 x 200ft]). The rink will primarily be used mainly for hockey, ringette, and skating events. Other possible supported uses may include trade shows, concerts, banquets/dinners, or other hard surface sporting events. Spectator seating shall consist of unheated viewing for a maximum of 133 occupants and heated viewing for a maximum of sixteen occupants. These are the spectator numbers used in the design; however community feedback was that the more seats the better. The rink itself is capped at a designed occupancy of 800 people for concerts or trade shows. Supporting spaces shall include four team dressing rooms, a referee dressing room, a Zamboni room, skate sharpening room, rink specific storage room, and an ice plant shared with the curling rink. Interior finishes for key spaces have been outlined as follows:

Ice Rink & Unheated Viewing Area

- Floors: Sealed concrete with rubber sport flooring pathways
- Walls: Prefinished wall system
- Ceilings: Exposed roof structure, paint finish, acoustic baffles

Team Dressing Rooms, Referee Change Room

- Floors: Rubber sport flooring
- Walls: Concrete block, paint finish
- Ceilings: Abuse resistant drywall, paint finish

Skate Sharpening

- Floors: Sealed concrete
- Walls: Concrete block, paint finish
- Ceilings: Drywall, paint finish

Zamboni Room, Ice Plant/Mechanical Room, Storage

- Floors: Sealed concrete
- Walls: Concrete block, paint finish
- Ceilings: Exposed structure above, paint finish

2. Curling Rink

A primary programmatic requirement, each of the design options include a curling rink with a gross area of approximately 856 m^2 that supports two standard curling sheets, each 4.6 x 45.7m (15ft x 150ft) in size. The curling rink will primarily be used mainly for curling events and has a designed occupancy of thirty-five. Spectating is supported via a 75 m^2 licensed lounge with seating for approximately 79. Community feedback was that the lounge should fit 100 people. A team changing area of 15 m^2 has also been included to support the rink. Interior finishes for the rink and lounge have been outlined as follows:

Curling Rink, Changing Area/Lockers

- Floors: Sealed concrete, rubber sport flooring walkways at perimeter and in change area
- Walls: Prefinished wall system
- Ceilings: Exposed structure and roof deck, paint finish, acoustic baffles

Curling Rink Lounge

- Floors: Carpet tile
- Walls: Drywall, paint finish
- Ceilings: Acoustic ceiling tile

3. Gym/Multi-purpose Flex Space

Each of the design options includes a gym that is intended to double as a flex space or multi-purpose room supporting an expanded range of activities and events. Two versions of this space exist; a smaller version incorporated into Option 1 with an area of 875 m^2 supporting a full-sized basketball court or two volleyball courts, banquet seating for 325, or trade show capacity of 72 booths, and a larger version compatible with Options 2 and 3 with an area of 1,216 m^2 supporting two full-sized basketball courts, two volleyball courts, banquet seating for 550 occupants, or trade show capacity of 104 booths. Maximum designed occupancy is set to 800 occupants. Both options include a divider curtain for increased flexibility, and locker/change rooms to support sporting functions. During community engagement, and review with council, only one gymnasium would be required for all options. Interior finishes for the gym/multipurpose flex space have been outlined as follows:

Multipurpose Flex Space/Gym

- Floors: Rubber sport flooring
- Walls: Concrete block, paint finish
- Ceilings: Exposed structure, paint finish

Walking/Running Track

- Flooring: Rubber sport flooring
- Walls: Concrete block, paint finish
- Ceiling: Exposed structure, paint finish

Change Rooms

- Floors: Resilient flooring
- Walls: Concrete block, paint finish
- Ceilings: Drywall, paint finish

4. Fitness Centre

Each of the design options is required to include a fitness centre with an area of 140 m^2 to 250 m^2. This is equal to or larger than the existing fitness centre. Based on industry standards, occupancy would be 61 occupants. The fitness centre is an open room designed to support various types of fitness equipment, including rowing machines, elliptical machines, stationary bikes, treadmills, and various weight lifting equipment. In the options with larger fitness areas, opportunities also exist to integrate an open floor area for group fitness classes, supporting yoga, pilates, and zumba. Based on these uses, interior finishes for the fitness centre have been outlined as follows:

- Flooring: Rubber sport flooring
- Walls: Concrete block, paint finish, plate mirrors
- Ceiling: Exposed structure, paint finish

5. Steam Room & Sauna

A separate steam room and sauna each have a footprint of 35m^2 with a maximum capacity of 20 occupants in the steam room and 10 occupants in the sauna. The location for these rooms within the facility should consider visibility for the purpose of supervision as well as proximity to similar building systems and finishes such as the aquatics area. It is anticipated that participants from other venues such as the ice rink or fitness area may also benefit from the therapeutic effects of the steam room and sauna, so placement within the facility should consider access from all amenity areas. Durable, low-maintenance materials are being considered:

- Floors: Poured epoxy coating, teak slat platform
- Walls: Seamless acrylic
- Ceilings: Seamless acrylic

6. Aquatics

The aquatics component of the FSP includes a lap pool with 4 lanes at 50m long, a hot tub/jacuzzi and a kiddie pool. Areas assigned to each of the pool areas has been replicated from the existing seasonal facility. A dedicated pool mechanical room has been included as it is a major component of the pool maintenance. Minimal viewing area has been allocated on the pool deck level. Large areas of glazing to the interior common areas of the facility are anticipated to provide views and seating for spectators. Interior finishes for the aquatics area have been outlined as follows:

Lap Pool, Kiddie Pool, Hot Tub/Jacuzzi

- Floors: Stained and stamped concrete with slip resistant finish
- Walls: Concrete with epoxy paint finish
- Ceilings: Exposed structure, epoxy paint finish

Change rooms

- Flooring: Resilient flooring
- Walls: Concrete block, paint finish
- Ceiling: Drywall, paint finish

Lifeguard/First Aid

- Floors: Stained and stamped concrete with slip resistant finish
- Walls: Drywall, paint finish
- Ceilings: Drywall, paint finish

Pool Mechanical & Chemical Storage

- Floors: Sealed concrete
- Walls: Concrete block, paint finish
- Ceilings: Exposed structure, paint finish

7. Indoor Playground

An indoor play area has been programmed to address the need in the community for children to actively play during inclement weather. A combination of climbing structure and open area for play objects can be tailored to suit a variety of age groups. Hard walls or architectural design features will provide a natural barrier to avoid having young children wander away from parental supervision. Finishes must be carefully considered to meet stringent guidelines for safety. Materials may include the following:

- Flooring: Rubber sport flooring
- Walls: Concrete block, paint finish
- Ceiling: Exposed structure, paint finish
- Play structure: Wood

8. Climbing Wall

The climbing wall is a feature that does not require a dedicated room, nor does it require a big footprint. A minimum of 3 climbers plus instructors and belayers is considered in the program area. A 2-storey high wall in the ice rink, multipurpose/gym, aquatics area or lobby can be adapted for this function. This is a feature that can be added to any of the options in the future should the appropriate infrastructure be accommodated in the wall construction at the start. Appropriate finishes are as follows:

- Flooring: Rubber sport flooring
- Walls: Painted plywood, prefabricated hand grips
- Ceiling: Exposed structure, paint finish

9. Common Lounge/Entry

The common lounge/entry serves multiple functions such as public gathering, casual eating, viewing area for venues, waiting area for parents, etc. It is also a circulation hub connecting the various amenities. A central information desk may also be located in this area. A variety of furnishings can be anticipated such as fixed tables and chairs, lounge seating and bleacher-style seating as needed to suit the building layout. Finishes should address foot traffic directly from outside as well as food spills and heavy traffic patterns.

- Flooring: Stamped and stained concrete with slip resistant finish
- Walls: Drywall, paint finish
- Ceiling: Exposed structure, paint finish

10. Canteen/Servery

The canteen/servery will be the primary food vendor for the facility. Food served in the common lounge, curling lounge and multi-use party/meeting room will be prepared in this kitchen. Commercial grade appliances such as walk-in cooler/freezer, dishwasher, deep fryer and grille would allow high volumes of food to be prepared safely and efficiently. Finishes will need to meet food handling requirements:

- Flooring: Resilient flooring, sealed seams
- Walls: Seamless acrylic
- Ceiling: Drywall, paint finish
- Other: Walk-in freezers, stainless steel commercial appliances

11. Multi-use Party/Meeting Room

This room will be available for bookings by community members for group events. Accommodation will be provided for meetings, parties and family gatherings, in addition to large group fitness or classroom functions. Flexible furnishings, audio/visual equipment and an abundance of power outlets will assist with a variety of needs.

- Flooring: Carpet
- Walls: Drywall, paint finish
- Ceiling: Acoustic ceiling tile

12. Staff Offices

The programmed floor area will allow all Dawson City recreation employees to be co-located in the new facility. A combination of unassigned workstation options for service personnel as well as assigned workstations for staff that work in the office throughout the day have been included in the layout. A small meeting room, staff kitchenette and photocopy area supplement the office function. Visibility into the facility is equally as important to exterior windows and views. These aspects will dictate the location of the offices within the new building. Typical office finishes are anticipated:

- Flooring: Carpet
- Walls: Drywall, paint finish
- Ceiling: Acoustic ceiling tile

13. Building Services

Washrooms will meet minimum building code requirements and will be gender inclusive. Storage areas will be distributed based on the various needs of the amenity spaces. A careful analysis of current storage needs and future growth were considered in the space allocation. Mechanical, electrical and telecom spaces will be placed to suit the equipment requirements identified by each discipline. Wherever possible, the rooms are placed in close proximity to the location of the services existing on each site. Laundry facilities are designed to suit the laundry requirements of the amenities offered in each design option. Commercial grade laundry machines will accommodate washing of cleaning supplies such as mops as well as towels that may be offered to facility patrons. Janitor rooms will be centrally located typically near washrooms. Finishes will suit the function of each space:

Washrooms

- Flooring: Stamped and stained concrete with slip resistant finish
- Walls: Concrete block, paint finish
- Ceiling: Drywall, paint finish

General Storage

- Flooring: Sealed concrete
- Walls: Concrete block, paint finish
- Ceiling: Exposed structure, paint finish

Mechanical, Electrical, Telecom

- Flooring: Concrete, sealed
- Walls: Concrete block, paint finish
- Ceiling: Exposed structure, paint finish

Laundry Facilities, Janitor Room

- Flooring: Resilient flooring
- Walls: Concrete block, paint finish

14. Unfinished Space

Unfinished space may be left over on the second floor to balance the double height amenities. There is a trade-off between having a second floor, or having extra exterior surface area. Further modeling should be done to explore such trade offs.

4.1.3 Preliminary Code Review

4.1.3.1 Building Classification

Because the building options come in different sizes, the same classifications cannot be used for all three. Initially, all options are considered to be Group A buildings, due to being assembly spaces. Rinks and pools have less dense occupancy and are considered Division 3, while the remaining spaces, such as the fitness centre, gymnasium, and office space would be considered Division 2. All the buildings will have both occupancies.

Gold Rush Options 1 and 3 and Dome Road Options 1 and 2 would have two major classifications:

3.2.2.24. Group A Division 2, up to 6 Storeys, Any Area Sprinklered - 1 hour
3.2.2.31. Group A Division 3, Up to 2 Storeys, Sprinklered - 1 hour

Gold Rush Option 2 and Dome Road Option 3 have the most stringent classification, due to having two storeys. The classification would be:

3.2.2.29. Group A Division 3, Any Height, Any Area, Sprinklered - 2 hour

In most designs the mechanical and electrical services are located in a penthouse above the first storey.

3.2.1.1. A rooftop enclosure used for no purpose other than for service to the building, shall not be considered as a storey in calculating building height.

The offices are a subsidiary space required for the rest of the building and will be treated the same as the rest of the facility.

Fire ratings between occupied spaces have not been resolved at this level of detail.

4.1.3.2 Occupancy

The occupancy of the building was calculated based on each occupied space. Some spaces had occupancies based on the NBC, such as the offices, some were based on designed occupancy, such as the ice rink, and some were based on standards such as the American College of Sports Medicine.

Option 1: 1643 occupants
Option 2: 2132 occupants
Option 3: 2542 occupants

4.1.3.3 Washrooms

The quantity of washrooms is based on the occupancy.

Option 1: 26 total (9 male, 17 female)
Option 2: 30 total (10 male, 20 female)
Option 3: 33 total (11 male, 22 female)

The design approach was to include gender-inclusive washroom facilities. As a result, there are allowances to reduce the number of washrooms. Universal toilet rooms have also been included to meet accessibility requirements.

4.1.3.4 Limiting Distance

The building code dictates that non-combustible exterior finishes be used on the Gold Rush site due to the proximity of the neighbouring houses. This means wood siding, for instance, could not be used. However, there are no restrictions on the amount of glazing allowed.

4.1.4 Universal Design

Universal access extends beyond providing a wheelchair accessible circulation path through the building. The key characteristic of this concept ensures that individuals who have any limitations such as visual impairment, reduced physical stamina, or those who are socially marginalized feel comfortable using all parts of the facility. Some design considerations incorporated into the schematic design options are:

- Optimal spectator views from standing or seated position with a seating configuration that allows people of various mobilities to sit together.
    - Ice Rink Example: Slightly elevated bleacher height above floor level to allow clear view above the ice rink boards
    - Common Lounge Example: Combination of loose and fixed seating to allow for flexibility to rearrange components to include a wheelchair or scooter
- Washroom facilities that address a variety of needs in readily accessible locations throughout the building. Gender inclusive washrooms allow caregivers to assist dependents of the opposite gender and individuals who are gender non-conforming to use the facility with dignity.
- Service counters that comfortably accommodate people in seated or standing position.
- Recreation amenities that allow people of various abilities to participate without obstacles.
    - Ice Rink Consideration: Team bench area to have ice surface without a threshold onto the rink surface for sledge hockey
    - Curling Rink Consideration: Ice level to be flush with the finished floor on the perimeter walking surface
- For 2-storey options, centrally located elevator to allow for ease of access between activity areas (using the elevator shouldn't reduce the quality of experience but rather encourage inclusivity)
- For most options the goal was to keep everything aside from service spaces on the main floor to avoid an elevator or lift as this technology requires specialized maintenance that is not readily available. There are two options that will have amenities on the second floor, one for each site to explore any potential benefits.
- Wherever possible, door-less entryways into amenity spaces provides freedom of movement and reduces high-touch surface contamination.

4.1.5 Envelope

To meet the requested sustainability targets some elements were kept the same. All the designs include the same wall, roof, floor, and window types so they can be easily compared in energy and cost.

By maintaining a simplistic building form, surface area is limited which reduces energy loss. For instance, multiple amenities included in this design require a two-storey volume. To mitigate the extra envelope surface area, mechanical rooms are situated on a penthouse. Service rooms on a second level fills in unused volume above single storey spaces, such as change rooms, and does not require access by an elevator. This allows building systems to service multiple amenity areas, resulting in a much more compact economical building form.

The following recommendations for envelope will contribute to meeting higher energy requirements. They were part of the recommended and priced options.

- Roof: Modified bitumen with polyiso insulation (R-62)
- Walls: Insulated concrete panels. (R-40) These prefabricated panels would be faster to construct in the short building season and are noncombustible.
- Floor: R-20 Rigid insulation below the slab on grade.
- The windows could be aluminum thermally broken frames.
    - R-value 7.1
    - U-value 0.8 SI units
    - SHGC 0.6

4.2 Civil

Telephone and Internet: Requested records of Telephone and Internet services for the existing site could not be found at the time of writing this report. It is understood that Yukon Government officials started conversations with the service provider (Northwestel). Information related to other building services was available and has been included in this analysis.

4.2.1 Gold Rush

The existing infrastructure information for the Gold Rush Campground includes reports prepared by various engineering consulting companies and old records from the Dawson City.

4.2.1.1 Contaminants

- Environmental Report: We were provided with two Environmental Site Assessment (ESA) reports for Phase-I and Phase-II prepared by Golder Associates Ltd and Tetra Tech respectively. Phase-I ESA identified two on-site Areas of Potential Environmental Concerns (APECs).

- Phase-II ESA report was to assess the soil and groundwater Potential Contaminants of Concern (PCOCs) in APECs 1 and 2, in accordance with the applicable Yukon Contaminated Sites Regulation (YCSR) standards. In the Phase-II report, it is recommended to conduct more groundwater monitoring, preferably during the spring season, as clear groundwater could not be sampled from any of the monitoring wells during the investigation. Also, additional soil sampling is recommended in the report.

4.2.1.2 Access:

- The site can be accessed from York Street as shown in the attached drawings.

- An analysis of the turning radius for all three site layout options was carried out using Pumper Fire Truck as the design vehicle. Vehicle maneuvering is presented in the attached drawings. As a result, it is determined that all the options have suitably dimensioned access and drive aisle for the emergency vehicle.

- Since the proposed recreation centre is in the proximity of the residential neighbourhood, a Traffic Impact Assessment (TIA) is required to determine the necessary upgrades for the existing road intersections and the impact of traffic on the day-to-day life of the people living in the neighbourhood.

4.2.1.3 Parking:

- Gold Rush site has limited space to accommodate the recreation centre parking requirements. For this reason, the number of parking stalls decreases with an increase in the size of the proposed building. As a result of this limitation, visitors will tend to park their vehicles on the adjacent roads, York Street, Duke Street, Fourth and Fifth Avenue. This will impact the traffic capacity of the existing road network and the residents of the neighbourhood may experience some discomfort.

- Snow cleaning activities during wintertime will require some space for snow storage. In the absence of a dedicated space, some of the parking stalls have been assigned for snow storage. This will further reduce the number of parking stalls available during the winter season.

- Parking lot to be gravel.

4.2.1.4 Sanitary Sewer:

- As per the WSP report "City of Dawson Drainage Basin D2 Sanitary Sewer Main Assessment" dated October 2019, there exists a 200 mm Ø sanitary gravity sewer main in the Fifth Avenue road right of way. The theoretical capacity of the existing sanitary sewer main is estimated at 50 l/sec (764 gpm) approximately.

- Sanitary service connection for the proposed recreation centre building can be provided at a location, as shown in the attached drawings for all three options.

- It is estimated the recreation centre will generate a peak flow of 7.2 l/s (110 gpm) for options 1 & 2 and 9.8 l/s (150 gpm) for option 3. The service connection will be an insulated 150 mm Ø inlet.

- The available capacity of the existing sanitary main should be confirmed in the design stage. A system re-modeling is recommended to determine if the additional flow generated can be serviced, or if upgrades are required to the existing sanitary sewer network.

- The pool can be emptied via the proposed 150mm Ø sanitary service connection to the existing sanitary main. No treatment of the pool water has been considered inside the building. Provisions for pre-treatment of the discharged water should be included in the design if this is required by local regulations.

4.2.1.5 Watermain:

- As per the Stantec report "City of Dawson Water Distribution System Model", there exists a 225 Ø water distribution main on Fifth Avenue.

- To serve the proposed building fire and water demands, a 150mm Ø service connection can be provided from the water main on Fifth Avenue at a location shown in the attached drawings.

- The proposed building is expected to have a peak demand of 38 l/s (500 gpm) for all the options and a 150 mm (6") Ø pipe with available pressure of 60 psi will be required to serve the proposed building's water and fire demands.

- An on-site fire hydrant has been considered in all the three site layout options for fire fighting purposes. The availability of required pressure for the fire hydrant needs to be confirmed with the City of Dawson at the design stage.

- A re-modeling of the existing water main network would be required to assess the availability of pressure and capacity in the existing system. This will help in determining any upgrades required to the existing system to serve the proposed development.

4.2.1.6 Stormwater:

- From the analysis of aerial photographs, it appears that the rainwater for the site is currently being managed by the existing roadside ditches. In the absence of a public storm sewer and the possibility of detaining water on-site on the Gold Rush site, it is recommended to provide on-site ditches and culverts, located within the building setback area.

- Ditches need to be provided with flow control devices designed suitably to restrict the stormwater discharge rate, equal to the pre-development discharge rate (5-year return period). On-site ditches will ultimately discharge to the existing roadside ditch at the lowest corner of the lot, in the intersection of Duke Street and Fifth Ave.

4.2.1.7 Site Grading:

- Site Topography: Based on the review of the site desktop survey, prepared by Underhill Geomatics Ltd., the East corner of the site is higher than the West corner, with an average gradient of 2.3%. An average groundwater depth of 2m from the ground surface has been determined based on the geotechnical observations.

- Based on the review of the desktop survey, we have estimated a finished grade elevation of 320 m for the proposed building. This needs to be confirmed at the detailed design stage following a completed field topographic survey with the location information of existing trees, poles, fire hydrant, existing ditch and culvert size and any other site-specific structures.

- To accommodate the building footprint on the sloping site with limited space, a retaining wall would be required along the North-east property line. The maximum height of the retaining wall would be close to 3 m tall on the North side and variable height on the East side of the lot.

- As per the Government of Yukon (YG) Design Guidelines and Technical Standards, site grading is to be sloped away from the building to a minimum of 4% for a distance of 2 m, and 2% for the gravelled surface. The slope in the parking lot and walkways should not be more than 5%. In the case of site grades in the landscape area are more than 25%, it must be provided with erosion control measures like seeding, planting, or washed river rocks.

- If the building is moved closer to the South of the site to avoid more of this slope, the retaining wall would be smaller, and there would be no parking available

4.2.1.8 Earthworks:

- Permafrost was encountered in one of the boreholes identified in the geotechnical report, in an area with no previous mining activity. The permafrost encountered is believed to contain excess ice in the form of ice-coated particles and randomly orientated ice inclusions. The amount of excess was visually estimated to be 10-15% by volume.

- Permafrost Cut Volume: as per the geotechnical report there exist non-visible permafrost to approximately 4.6 m below ground surface. The removal of that material will result in approximately 47,150 m3 of cut material. Due to the presence of frozen silt and organic matrix, the amount of material that may be re-used as backfill would require an on-site geotechnical engineer's recommendation.

- Fill Material: Assuming a grade elevation of 320 m, a volume of 45,000 m3 of engineered fill material would be required to replace the unsuitable on-site soil to provide a structurally sound subgrade.

- The excavation should extend from property line to property line in all directions, so that future performance of the site is acceptable (no soft spots, thaw depressions, or seasonal frost related movements).

- The excavation side slopes must be shored or shaped following the most recent edition of Occupational Health and Safety Regulations.

- If the excavation walls cannot be shaped or shored, they will need to be supported so adjacent streets and underground utilities aren’t compromised.

- The North West corner of the lot, in the intersection of Duke Street and Fifth Avenue, is approximately 3.0 m higher than the rest of the lot, therefore, it is anticipated that the total excavation depth will be around 7.5 m. In this area, a sheet pilings system should be installed to protect the roads and existing utilities from the excavation.

- The groundwater was found between 1.7 m and 2.2 m deep, higher than the bottom of the excavation. A dewatering system should be required to lower the water level during excavation and backfill work.

- The amount of ground material that has been identified to be removed, and then replaced with well compacted granular imported material, should not be underestimated. The work to prepare the ground alone will likely take up a significant amount of the construction season, which could have scheduling implications.

- Due to the extensive earthworks, rigorous measures should be put in place such as dust control, restricting construction activities to regular work hours, and on-going maintenance of roadways to and from the site used by what might by over 11,000 dump truck journeys of soil removal and import material.

4.2.1.9 Power and Telephone:

- In the absence of information related to existing power and telephone services, it has been assumed that an overhead/underground service connection can be provided to the site, as per consultation with the service provider at the design stage.

4.2.1.10 Additional Space Required:

- Space for Electrical Transformer and heat transfer equipment.
- In the case of building heating is by using fuel oil, a dedicated space for storage and related infrastructure would be required.
- Back up heating fuel is oil and dedicated space would have to be found. The tank is likely 12 feet tall and wide and 50 feet long. There are options for below grade tanks but we would recommend not going that route as they end up being environmental issues down the road. Overall, Gold Rush would have a difficult time fitting this tank on the site.

4.2.2 Civil Dome Road

Existing infrastructure information for the site includes reports prepared by various engineering consulting companies and old records from the City of Dawson.

4.2.2.1 Contaminants

Environmental Report: An Environmental Site Assessment (ESA) report for the Dome Road site was not available at the time of writing this report. A reference has been taken from the ESA report prepared by Golder Associates Ltd., for Area A and the surrounding area to support the future sale of Area A site. A review of the report indicates Chromium and Arsenic were identified as COC's in Area A.

4.2.2.2 Site Access:

- The site can be accessed from Dome Road as shown in the attached drawings. The access is situated at a different location for each option unlike in the Gold Rush site.
- An analysis of the turning radius for all three site layout options was carried out using Pumper Fire Truck as the design vehicle. As per the turning movements of the design vehicle, shown in the attached drawings, it appears that all the options have suitably dimensioned access and drive aisle for the emergency vehicle. If the building is required to be accessed by a larger, the turning radius should be revised accordingly.
- Since the proposed recreation centre is in the proximity of the Klondike Highway, a Traffic Impact Assessment (TIA) is required to determine the necessary upgrades in the nearby intersections, including turning lanes, intersection and traffic signals.

4.2.2.3 Parking:

- A total of 200, 280, and 377 parking stalls have been considered for the site layout Options 1, 2 and 3, respectively.
- Parking lot to be paved with gravel.

4.2.2.4 Sanitary Sewer:

- Available information on the Dome Road site includes as-builts received from the City of Dawson, and site reports prepared by Morrison Hershfield, WSP, Stantec, and Associate Engineering (AE). A review of these documents confirms an existing Lift Station (LS3) in the Northeast corner of the intersection of Klondike Highway and Dome Road. The LS3 details show a 200 mm Ø sanitary service outlet on the East side that can be used in the sewer design.

- As per the 2015 Stantec report, this lift station is not in use and piping is close to its service life, therefore some upgrading will be required, including the wet well.

- The proposed recreation centre is expected to generate peak flows of 7.8 l/s (120 gpm) for Option 1 and 2, and 9.8 l/s (150 gpm) for Option 3. A proposed service connection of 150mm Ø will suffice to serve the proposed recreation centre.

- Catchment area information of LS3 station could not be found in the information made available. It is recommended to re-model the existing 150 mm Ø sanitary force main in the Klondike Highway after including peak flows expected from the proposed recreation facility and any future developments from Area A, Area C and Area D adjacent to the Dome Road site.

4.2.2.5 Watermain:

- The Associated Engineering (AE) report, dated July 2020, records an existing 150 mm Ø water service line in the Dome Road site (Area F), which can be used to serve the building.

- The proposed building will generate a peak demand of 38 l/s (500 gpm) for all the options, and a 150 mm (6") Ø pipe with a pressure of 60 psi will be required to serve the proposed building's water and fire demands.

- An on-site fire hydrant has been considered in all the three site layout options for fire fighting purposes. The availability of required pressure for the fire hydrant needs to be confirmed with the City of Dawson at the design stage.

- A re-modeling of the existing water main network would be required to assess the availability of pressure and capacity in the existing system. This will help in determining any upgrades required to the existing system to serve the proposed development.

4.2.2.6 Stormwater:

- From the analysis of aerial photographs and the desktop survey, it is determined that rainwater for the site is currently managed partially by on-site local depressions and the ditch along the Klondike Highway.

- In the absence of a public storm sewer, the use of on-site ditches and culverts is recommended to carry and discharge the stormwater to the proposed detention pond on-site. Detention pond volume should be designed to accommodate a major (100-year) rainfall event. Outlet flow control devices to restrict the stormwater discharge rate equal to the pre-development discharge rates for minor (5-year) and major (100-year) rainfall events.

4.2.2.7 Site Grading:

- Site Topography: The site slopes were calculated using the desktop survey information prepared by Underhill Geomatics Ltd. The site is undulating, and the elevation varies throughout. Groundwater in the open excavations and river tailings were found in some locations on-site. From the desktop survey, the Klondike Highway crown has been established at 323.50 m, and the geotechnical report recorded the groundwater elevation at 6 m below that reference point, therefore the groundwater is estimated at 317.50 m.

- The preliminary finished grade elevation has been established at 322 m. This needs to be confirmed at the detailed design stage.

- Grades outside the building to be a minimum of 4% sloping away from the building for a minimum distance of 2 m and 2% for the gravelled surface.

- Parking lots and walkways to have grading slopes no greater than 5%.

- Areas with grading slopes of more than 25% must be provided with erosion control measures like seeding, planting, or washed river rocks.

4.2.2.8 Power and Telephone:

- In the absence of information related to existing power and telephone services, it has been assumed that an overhead/underground service connection can be provided to the site as per consultation with the service provider in the design stage.

4.2.2.9 Earthworks:

- Permafrost was not encountered during the geotechnical field evaluation.

- As per geotechnical recommendations, all unsuitable materials (fill, organics debris fine-grained soils) to be removed from the site, and the site will be leveled to a uniform elevation of 1.5 m above the existing groundwater elevation. Assuming 2.5 m of excavation depth, the volume of engineered backfill material is estimated at 34,250 m3, 46,450 m3 and 51,625 m3 for Options 1, 2 and 3, respectively.

4.2.2.10 Additional Space Required:

- Space for Electrical Transformer and heat transfer equipment.

- If the building is heated using fuel oil, a dedicated space for storage and related infrastructure would be required.

4.3 Structural

This section describes the conceptual structural design for the recreation centre options and the type of structural components that could be used. Schematic sketches are attached to this report for reference.

4.3.1 Overall Structural Engineering Design Philosophy

To allow for ease of comparison between the different sites used in this feasibility study, the same structural engineering design philosophy has been used throughout.

The structural design philosophy incorporated in this study focuses on a practical, cost-effective approach, taking advantage of the simple, regular form of the conceptual architectural building designs, and taking the opportunity to use prefabricated building elements where possible to suit the local climate and short construction season.

This approach has led to broadly scalable structural engineering designs. Many of the design concepts used for the smaller recreation centre options can be applied to the larger options; they just need to be applied over larger building areas.

The structural concepts can be tailored to suit more ambitious architectural designs such as greater variations in overall building height, larger amounts of glazed curtain wall, use of engineered wood components, or different layouts of the same spaces used in this study.

Should the architectural design develop into more complex forms incorporating circular or arched building shapes, the application of the fundamentals used in these conceptual structural designs should be done with great caution and should involve further structural engineering advice.

Different materials may be substituted into the design to serve both architectural and structural purposes. For instance, the use of engineered wood products like glulam elements, cross laminated timber panels, and large trusses fabricated from glulam and steel components for long span structures, have a proven effective structural performance and could substitute much of the steel structure included in the designs. The substitution of materials may result in cost implications as the outlined in this study primarily use steel and concrete components.

Prefabricated components may be used to minimize cost, maximize on-site construction efficiency, and maintain the project schedule. This approach requires closer coordination with fabricators and suppliers during the conceptual design and detailed design phases of a project. Other structural design options that differ from the relatively traditional approach used for this study may be undertaken. However, this may have cost implications that require careful evaluation.

4.3.2 Foundations

4.3.2.1 Geotechnical

Detailed geotechnical desktop studies were conducted by Tetra Tech on both proposed sites. The geotechnical reports provide recommendations for excavations and site preparation, as well as the soil parameters for foundation design and seismic considerations for the structural design of the building.

4.3.2.2 Gold Rush

The geotechnical evaluation for Gold Rush site # 704-ENG.WARC03386-65 by Tetra Tech outlines the findings of the subsoil conditions. Some highlights presented in the geotechnical report are as follows:

- The subsurface stratigraphy consists of granular fill overlaying frozen silt and organic material to approximately 4 m to 4.6 m below ground surface.
- Sand, gravel, and cobbles were encountered underlying the silt and organics until bedrock.
- Groundwater was encountered between 1.7 m and 2.2 m.
- Bedrock (Klondike Schist) was encountered at 14.0 m and 13.7 m below ground surface.

Suitable foundation options are identified as follows:

- Shallow foundations (strip and spread footings) after site preparation is complete, as follows:
    - Excavate the entire lot down to 4.6 m to remove the fill, frozen silts and loose material, and expose the underlying gravels;
    - Remove any visible ground ice at the top of the gravel layer;
    - If groundwater is encountered at the base of the excavation, use coarse tailings or rockfill to backfill;
    - Backfill installation using engineered fill pit run gravel, placed in lifts no thicker than 300 mm, and compacted to 98% of SPMDD;
    - Place a compacted 150 mm thick layer of 20 mm crushed immediately below the underside of the concrete foundations and floor slabs;
    - The elevation of the top of the building pad should be higher than the surrounding terrain to promote positive drainage away from the building foundations;
    - For foundation sizing a ULS bearing resistance of 400 kPa will be used. This will be achieved once site preparation is complete;
    - Foundation elements should not be cast directly onto or over seasonally frozen soils, and the soils under the foundation must not be allowed to freeze during construction.
- Deep foundations (rock-socket piles):
    - Grouted rock-socketed piles are considered as an alternative foundation at this site;

    - The piles are estimated to be 19 m long, including embedment of 3 m into the bedrock;

    - It will not be necessary to prepare the area under the building other than to ensure there is enough gravel surfacing for piling rig access.

- For seismic design, the site is considered as Site Class C.

- The gravel tailings are not considered frost susceptible. If the site is prepared following the recommendations, perimeter insulation will not be required.

4.3.2.3 Dome Road

The geotechnical evaluation for Dome Road site # 704-ENG.WARC03386-65 by Tetra Tech outlines the findings of the subsoil conditions.

Some highlights presented in the geotechnical report are as follows:

- The site is located on ancient alluvial deposits that have been subjected to mining operations in the past.

- Subsurface conditions around the site consisted of Klondike River tailings that are primarily cobbles and boulders.

- Bedrock was encountered between 10.1 m and 12.8 m.

Suitable foundation options are identified as follows:

- Shallow Foundations

    - The site is suitable for construction on shallow foundations, such as strip and spread footings or mat foundations.

    - All unsuitable material at surface (fill, organics, debris, fine-grained soils) will be removed from the site, and the site leveled to a uniform elevation 1.5 m above the existing ground water elevation.

    - The excavations should be backfilled using a pit run non-frost susceptible (NFS) gravel engineered fill, placed in lifts no thicker than 300 mm compacted to at least 98% SPMDD.

    - A compacted 150 mm thick layer of 20 mm crushed gravel should be placed immediately below the underside of the concrete foundations and floor slabs.

    - The final elevation of the foundation pad will be at least 300 mm higher than the surrounding terrain, to promote positive drainage away from the building foundations.

    - Tentatively, the site can be considered as Site Class D.

    - After site preparation, the foundation supporting strata is not considered frost susceptible and perimeter insulation will not be required.

    - A ULS bearing resistance of 400 kPa will be used for foundation design. This bearing capacity will be achieved once site preparation is complete.

- Deep Foundations

    - Site preparation for deep foundations with structural slabs does not need to be as extensive as that required for shallow foundations.

    - A deep foundation consisting of grouted rock-socketed steel pipe piles is also considered suitable for this site.

    - The piles are estimated to be 13 m long, including an embedment of 3 m into the bedrock.

    - If deep foundations are selected, the entire building, including hockey and curling rinks, could be supported on a structural slab or a slab-on-grade.

    - For seismic design, the site is considered as Site Class C.

4.3.3 Recommended Foundations

A shallow foundation will likely be more cost-effective than a deep foundation. Excavation of loose organic and unsuitable material is required to prepare the sites for both shallow and deep foundations. The additional work required for pile installation includes filling with grout and concrete, which will increase costs and likely make the deep foundation option cost prohibitive.

The shallow foundation option is the recommended solution for both sites. The parameters for shallow foundation design outlined in the geotechnical reports are similar for both sites. At the Gold Rush site, the excavation should be 4.6 m deep to remove frozen, loose and organic material. At the Dome Road site, the excavation should be 2.5 m, assuming the ground water level is 4.0 m below grade.

The bearing capacity for foundation design will be achieved once the site preparation is complete, with the configuration described below:

- The finish slab-on-grade elevation should be 300 mm higher than the grade elevation to promote positive drainage away from the building.

- The underside of foundation footings will be 1.0 m below finish grade.

- The slab-on-grade will be 150 mm thick in common areas, and 200 mm thick concrete slab on curling and hockey rink areas, on top of 150 mm thick of 20 mm crushed engineered base course.

- The slab-on-grade will be thickened under the internal walls to form embedded strip footings.

- The exterior walls will be supported on strip footings 700 mm wide under a continuous concrete beam. Refer to the foundation schematic sketches attached to this report.

4.3.4 Recommended Walls

- The perimeter walls will be assembled with precast insulated wall panels, complete with a cast in place crown concrete beam.
- The roof structure will be supported on precast walls, embedded in the foundation, be it a grade beam or a strip footing.
- The interior walls will be either structural walls or partitions.
    - The structural walls will be CMU and will be supported on strip footings.
    - The non-load bearing partitions walls could be CMU, wood or light gauge frame construction.

4.3.5 Recommended Floor Slabs

- The first floor will be a 150 mm concrete slab on grade, over a 150 mm layer of compacted crushed gravel, as recommended in the geotechnical report.
- In the curling rink and the hockey arena areas, the floor slab will be 200 mm thick.
- In the pool area, the floor and walls will be formed with 200 mm concrete slab.
- The second-floor slab will be assembled with trussed beams, supported on the structural CMU walls.
- A composite Q-deck slab will be installed on top of the supporting beams, with a steel deck thickness of 76 mm and a total slab thickness of 200 mm.
- The steel beams will also provide support to electrical conduits and fixtures, as well as mechanical ducting.

4.3.6 Recommended Roof Structure

- The roof will be a steel deck system supported on open web steel joists (OWSJ).
- The main roof beams will be supported on the structural perimeter walls and internal stand-alone HSS columns.
- The roof main beams will be truss structures and will span between 10 m in the common areas, and up to 30 m in the hockey arena and pool. The depth of the main roof beams is estimated between 600 mm and 800 mm for spans up to 16 m, and 1800 mm to 2000 mm for spans up to 30 m.
- When the OWSJ will span 6 m to 8 m approximately, it is estimated the depth of the trussed joists will be 400 mm to 500 mm, and will be supported on the main roof beams,

4.3.7 Lateral Loads Resisting System

- The lateral load resistance for transferring the wind or earthquake loads to the foundation will be on shear walls. The system should provide lateral stiffness, strength and ductility to the structure and carry gravity loads.

- The precast walls should be anchored to the foundation footings with mechanical fasteners or dowels. In any case, the anchoring system should be engineered by the manufacturer and the installation should be as per their recommendations.

- The foundation design and detailing should be executed in close coordination with the precast walls' manufacturer, as well as the roof structure supplier, to ensure the integrity of the whole system.

- The roof deck will be designed to resist the environmental and seismic loads as a rigid diaphragm, to ensure the horizontal loads are transferred uniformly to the supporting perimeter walls.

- Depending on the structural configuration, additional vertical bracing may be required to stiffen the lateral force resisting system, especially on the central spans, where intermediate steel columns will be located.

4.4 Mechanical

4.4.1 Northern Building Trends

With the advancement of technology and the introduction of better internet in northern communities the abundance of systems that can now be supported has increased. The use of passive design elements and resilience for buildings has become a larger consideration. Passive design elements are typically architectural in nature, which may include orientation to allow for the greatest solar gain and the viability of solar photovoltaic (PV) panels, or the analysis of prevailing winds to help locate entrances to the building and introduce wind energy to the project. The major trend for northern buildings is resilience. This is the process of analyzing the risks to a building should a power outage or catastrophic event occur. Resilience is a function of mechanical systems, redundancy, envelope properties and the ability for a building to survive these events without catastrophic damage. The mechanical systems for the proposed facility were reviewed for redundancy, flexibility and the ability to contribute to the building's overall resilience.

4.4.2 Proposed Mechanical System Assessment

Due to the remote nature of Dawson City and the extreme climate, maintenance is a large consideration in the proposed system selection. As a general rule, as energy efficiency targets increase the systems are required to be more complicated to achieve the required energy targets. The two competing narratives for energy efficiency and ease of maintenance were critical in the system selections.

Several versions of different systems were reviewed for ease of maintenance and energy efficiency. To simplify the approach high level reviews were performed for some of the systems types to remove them from review. Below is a list of abbreviations for system types reviewed.

Mechanical System Abbreviations

Abbreviation	
FB	Fuel Oil Boiler
EB	Electric Boiler
HRC	Heat Recovery Chiller
CAAHP	Central Air to Air Heat Pump
CWWHP	Central Water to Water Heat Pump
CWWHPG	Central Water to Water Heat Pump with Geothermal
VRF	Variable Refrigerant Flow
DWAHP	Distributed Water to Air Heat Pumps
CAV	Constant Air Volume
VAV	Variable Air Volume
HRV	Heat Recovery Ventilator
HEHRV	High Efficiency Heat Recovery Ventilator

Several combinations of the above systems are possible; the following assessment removes some of those combinations as options:

- Air-to-air heat pump systems typically work down to about -40°C. Given the design day temperature in Dawson City is -48°C the use of air to air heat pumps would not be a feasible option.

- Constant Volume Air Systems use a constant speed fan to deliver air through the facility. These systems are not common on larger systems as variable speed drives are an economical option. The constant air volume systems are not good selections when targeting high levels of energy efficiency.

- The facility has a high outdoor air requirement. The outdoor air requirement is driven by a number of the public spaces and sport play areas. With the ambient temperature and the large volume of outdoor air, standard efficiency heat recovery methods provide savings but would require defrost control which affects ventilation and overall efficiency. To provide the most efficient air side system, high efficiency heat recovery ventilators are considered necessary for the facility.

- Variable refrigerant flow systems were considered due to their high efficiency and flexibility. A challenge is that these systems are proprietary and maintenance personnel are not always available in a remote community. Variable refrigerant flow systems are good for smaller spaces but in large volume spaces like the gym, these systems often need to be connected to an air handler which further increases the cost of the system.

- Ground source heat exchanger systems are costly in remote northern communities. With the facility being heating dominant, geothermal fields lose capacity over years of operation as the wells can raise the temperature of the ground altering the operating parameters for the loops. In a severe case, the loop may eventually be unable to support the building. This system was reviewed in the energy model but is not feasible due to the cost and potential problems with an unbalanced load in the building.

- Biomass heating is considered to be an add on to any plant mentioned above. Biomass heating systems utilize waste by products from lumber, agriculture and other industries to be used as a fuel in a solid fuel burning boiler. In most cases, the waste product needs to be processed in order to be burnt efficiently and provide consistent output for the biomass system. The process typically involves palletising and drying the waste product. The source of the fuel is the largest concern with any biomass system. If the supply chain is steady, the biomass system can be used with reliability and offset the size of the main heating plant. If there is no supply chain, then the biomass system is used only when fuel is available and will offer only operating cost savings The biomass plant is a large piece of equipment and typically requires a significant amount of storage to accommodate the solid fuel (pellets). Within the facility, there is a sufficient amount of room within the mechanical spaces which could accommodate the boiler. Site storage may be required for the solid fuel which would be a challenge on the Gold Rush site.

With these systems removed, the evaluation matrix is simplified and provides valuable insight into the selection of the proposed mechanical system.

Evaluation Matrix of Mechanical Systems

Mechanical Systems	Ease of Maintenance	Potential Energy Efficiency	System Flexibility	Capital Cost	Operating Costs	Total
All Systems are based on a 1-5 scale. Points are relative.	1 = easy to maintain	1 = high efficiency	1 = most flexible	1 = lowest cost	1 = low operating costs	Lowest value is the proposed option
FB-HRC-VAV-HEHRV	2	4	4	2	4	16
EB-HRC-VAV-HEHRV	2	3	4	2	4	15
FB-CWWHP-VAV-HEHRV	2	3	2	3	2	12
EB-CWWHP-VAV-HEHRV	2	3	2	3	3	13
FB-CWWHPG-VAV-HEHRV	3	2	2	5	1	13
EB-CWWHPG-VAV-HEHRV	3	1	2	5	2	13
FB-DWAHP-VAV-HEHRV	5	3	1	3	2	14
EB-DWAHP-VAV-HEHRV	5	2	1	3	2	13

4.4.3 Outline Specification Introduction

4.4.3.1 General

The feasibility and concept planning has produced six different floor plans; three per proposed site. For each proposed floor plan, the Government of Yukon wanted to review three different energy targets; 35%, 50% and a target recommended by the consultant with a balance on energy efficiency, operating costs, capital costs and feasibility of the system. Eighteen different iterations of the proposed building were reviewed. To simplify the analysis of the systems for these targets the common elements that will not change site to site have been grouped, and differences for sites, floor plans, and energy targets have been separated. The outline specification is in narrative format to present the systems and describe operational intent. A Mechanical Plant Concept schematic can be found in Appendix H.

To differentiate the energy targets, the following nomenclature has been used:

Site	Floor Plan	Energy Target
Gold Rush (GR)	Option 1	(A) = 35% Better than NECB
Dome Road (DR)	Option 2	(B) =50% Better Than NECB
	Option 3	(C) = Recommended Option

4.4.4 Mechanical Elements Common to all Options

This section discusses mechanical elements shared by all options.

4.4.4.1 Insulation

.1 The following piping elements will be insulated:

- Hot water heating supply and return piping.
- Glycol heating supply and return piping.
- Chilled water supply and return piping.
- Domestic hot, cold and recirculation piping.
- All roof drainage piping.

.2 The following ductwork elements will be insulated:

- Supply ductwork on all air-conditioned systems.
- Outside air, and mixed air ductwork and plenums.
- Exhaust ductwork back 12′ from roof or wall.

.3 The following equipment will be insulated:

- Condensate receivers and deaerator.
- Water chillers.
- Chilled water pump casings.
- Domestic water softener.
- Domestic cold-water meter.
- Domestic hot water storage tanks.
- Heat exchangers.

.4 Insulation thicknesses shall meet prescriptive requirements of NECB.

4.4.4.2 Plumbing

- Main sanitary service will be 6" for each site and shall be located based on civil drawing
- The main water service to the facility will be 6" for each site and shall be located based on civil drawing.
- Storm drainage will be drained through internal roof drains and shall discharge to grade through side wall discharge outlets. All discharge outlets will be heat traced.
- Sanitary Drainage piping shall be fire resistance PVC type. Standard of Acceptance is IPEX XFR
- Storm drainage piping shall match requirements for sanitary drainage pipe.
- All domestic water piping shall be copper Type "L"
- Fixtures
    - Toilets – wall hung vitreous china with automatic flush valve toilets with infrared sensors on flush valve, battery powered.
    - Lavatory (counter mount) – below counter lavatory with overflow and 1.28gpf automatic infrared sensor, battery powered. Offset trap for barrier free
    - Lavatory (wall mount) – wall hung lavatory with overflow and 0.5gpm automatic infrared sensor, battery powered. Offset trap if barrier free
    - Shower – acrylic shower stalls with push button metered shower valve and 1.75gpm flow shower heat.
    - Barrier Free Shower - acrylic shower stalls meeting barrier free requirements with shower valve removable head and flexible hose. Shower valve to thermostatically balanced. 1.75gpm.
    - Mop sink – 24"x24" basin with stainless steel corner guards and wall protection. Mop hook and wall mount faucet with pail hook.
    - Drinking Fountains – refrigerated drinking fountains with infrared bottle filler and push button bubbler.
    - Emergency Eye Wash – wall-mount folding eyewash station with stainless steel bowl. Certified mixing valve with stainless steel wall cabinet. Three (3) estimated per site.
- Equipment
    - Floor Drain – Nickel bronze top with epoxy coated cast iron body and no-hub outlet.
    - Funnel Floor Drain – Nickel bronze oval funnel to with epoxy coated cast iron body.

- Roof Drainage – Conventional flow roof drainage
- Double Check Valve Assembly – low lead double isolation valve. Used for premise isolation. Duplex arrangement. Two (2) 3” backflow preventers.
- Reduce pressure backflow preventer – low lead bronze body. Locations:
    - Boiler Make-up Water – ¾”
    - Humidification Make-up water – 1”
    - Pool System – 2”
- Water hammer arrestors installed in accordance with Plumbing and Drainage Institute Guidelines.
- Electronic trap priming system. Multi-zone solenoid c/w timeclock. Assume four (4) per site.

4.4.4.3 Fire Protection

- The facilities will all be fully sprinklered. Fire water supply will come from the municipal main. The pressure and flow requirements are anticipated to be 500gpm @ 60psi.
- A booster pump shall be installed in all options and shall be capable of boosting the pressure by 20psi.
- A pressure maintenance pump shall be used to maintain the 20psi boost. The pump shall provide 20psi boost at a 2gpm flow rate.
- The pump shall have a fully automatic controller with voltage transformer to allow for soft start.
- The sprinkler piping shall all be sch. 40 black steel pipe and shall be installed in accordance with NFPA 13.
- Jointing for piping 1” and under shall be by threaded or welded connection. Piping over 1” shall be by grooved connection or welded.
- Sprinkler heads in sports areas will be equipped with wire cages.
- All sprinkler heads shall be chrome plated, semi recessed style heads.
- The curling rink, hockey rink and any overhangs will be supplied by a dry sprinkler system.
- All other zones shall be wet sprinkler zones.
- A total of four wet zones and two dry sprinkler zones for each floor plan are anticipated.

- The header shall be a 6″ header to match service size.
- Provide 6″ double check valve assembly on incoming water source.

4.4.4.4 Liquid Heat Transfer

- Piping Materials
    - Hydronic piping material to be sch. 40 black steel pipe with grooved connections for piping 2″ and up.
- Jointing
    - Thread connections for piping 2″ and under and grooved with rigid coupling for piping large than 2″
- Air Vents
    - Automatic air vents for all water systems and manual for any glycol systems
- Chemical Treatment
    - All glycol shall be pure propylene glycol and be mixed with inhibitors.
    - Condenser water system shall have a pulse pure system installed.
- Fuel Oil
    - Fuel oil piping shall be sch. 40 black steel pipe.
    - All fuel oil valves shall be rated for use in fuel oil systems
    - Any fuel oil feed appliance shall have a fusible link isolation valve.
- Steam Humidification
    - All piping shall be a cooper and connected to the air handler steam dispersion manifolds.
    - The steam humidification shall be fed from a softened water system.

4.4.4.5 Ice Plant

- The ice plant shall serve both the curling and hockey rink. The ice plant shall be a CO2 based refrigerant plant. The plant shall be equipped with heat recovery to serve the underfloor heating system for the rink and curling rink. Additional heat recovery will be rejected to the condenser water loop through a heat exchanger to be recovered for building heating.
- Heat rejection will be through the common cooling tower or geothermal field depending on energy target option.

- The CO2 plant shall run through a heat exchanger and the floor systems shall be brine feed through headers. The Hockey Rink header shall be two 6" mains with 1" nipples for the rink piping. The curling rink trench shall be 4" headers with 1" nipples for the slab piping. The piping spacing shall be 4" o/c

- The heating headers shall be 3" and shall be consistent between the hockey and curling rinks. The spacing shall be 24" o/c Heating lines shall be installed below the cold floor and insulation.

- In slab temperature sensors shall provide slab temperature readings to the ice plant control system.

- The ice plant controller shall be equipped with a read out for the supply and return glycol temperatures, slab temperatures and be equipped with pump and indication lights for status.

- There shall be duplex pumps for both the curling and hockey rink slabs as well as two simplex pumps for the under slab piping systems for both the curling and the hockey rink.

- The proposed hockey and curling season was modeled based on 7 months of operation.

4.4.4.6 Radiant Floor Systems

- Radiant floor systems shall be PEXa piping and will be either ½" or 5/8" piping embedded in the concrete. Each zone will have a stainless steel manifold and loop balancing.

4.4.4.7 HVAC

- All ductwork within the facility will follow SMACNA standard for ductwork construction. Standard ductwork shall be galvanized.

- General pressure category of 2" W.C. for all ductwork.

- All square elbows shall be equipped with turning vanes.

- All filtration shall be minimum MERV 8 unless noted to be higher.

- Fire dampers shall be dynamic style Type "B" fire dampers or dynamic Type "C".

- Duct Silencer shall be provided on all main air handling units. Fan coil units will be acoustically lined downstream and on terminal branches.

- All mechanical and electrical rooms will be provided with recirculation cooling systems using outdoor air. Provide one 2,000cfm fan for each mechanical space.

- Dawson City has indicated the new Zamboni will be an electric powered. As such general heat and ventilation is required in the Zamboni room but purge for CO or NO2 are not required.

4.4.5 Mechanical Elements Specific to Option 1

4.4.5.1 Insulation

- Refer to Common Elements

4.4.5.2 Plumbing

- The plumbing system will consist of domestic water service from the municipal water system. The service will be protected by a duplex double check valve assembly. Two separate hot water generating stations will be separated in the facility with two hot water tanks each (total of 4) to serve the washroom and change rooms. Each hot water generation point will be equipped with a master mixing valve to temper water for devices.

- Three hot water tanks will serve the hot water generation requirements for flooding the ice.

- Domestic Hot Water Tanks – 120 gallons, glassed line electric hot water tanks. 30kw Inconol heating elements. Total of seven.

- Hot water recirculation systems will be set up both heating systems serving the public areas.

- Sanitary drainage main will be a 6" main and will be connected throughout the facility to all plumbing fixture.

- Storm drainage system will be internal and will discharge water through the envelope.

- Duplex sump pump systems will be required for the two trench headers; one for the hockey rink and one for the curling rink.

- Storm drainage system is assumed to have 6, 6" outlets around the facility.

- Sump pumps shall be epoxy coated cast iron body with mechanical seals. 1HP, 50 feet of head, 100gpm - four total.

- Water Softener – Duplex Water Softener – 60gpm resin based with automatic backwash.

- 1,000 gallon domestic hot water storage tank with indirect heating coil shall be provided as a buffer and preheat for domestic cold hot water.

- Refer to Common Elements

4.4.5.3 Fire Protection

- Refer to Common Elements

4.4.5.4 Liquid Heat Transfer

- The fluid cooler shall be sized to reject full amount of heat from the ice plant and the main building system should it be required. The condenser water loop will be a heat injection loop where systems reject heat or draw heat and the temperature tolerances are controlled by the speed of the fan on the fluid cooler. The fan VFD shall be controlled on the differential temperature. The fluid cooler shall be capable of rejecting 4,080MBH at ambient conditions of 78.4°F Dry bulb and 64°F wet bulb.

- The central heating and cooling plant shall be a modular heat recovery water to water heat pump plant. The plant shall be an automatic reversing system with 6 pipes. The central plant shall be able to produce 3,000MBH of heating with a heating supply water temperature of 120°F and be capable of supplying a chilled water at 55°F. The modular system shall also include an additional module as a redundant section of the system. 5-50ton modules are anticipated.

- The condenser water loop temperature will be controlled by the fluid cooler and a boiler inject loop. In winter the loop shall be maintained between 60°F and 70°F. In summer the condenser water loop shall be maintained between 90°F and 80°F

- The boilers shall be 87% efficient fuel oil boilers and shall be in a triplex arrangement. The heating capacity of the boilers shall be 1,000MBH each and will be piped to inject into the condenser water loop.

- The fuel oil piping system shall be equipped with duplex supply pumps which connect to the fuel oil boilers. The storage tank shall be installed outdoors with an internal day tank which will be 50 gallons.

- The exterior fuel oil storage tank shall be 40,000 gallons

- A central fuel oil fired humidification system shall be installed within the facility. The humidification system shall provide clean steam to the ventilation unit humidification manifolds. Total number to match the number of HRVs for the facility. The total humidification load is expected to be 800lbs/hr of steam.

- The facility will have a total of 5,000 ft2 of in-floor radiant heat which will be supplied by the main heating system.

- All facility glazing shall have radiant heat provided along it. The radiant heating shall be low-temperature linear radiant systems at the base of the windows. All exterior wall will be equipped with radiant heating to cover off envelope losses.

- Ceiling or wall cabinet heaters shall be provided for all service spaces within the facility.

- Split A/C cooling will be provided for all electrical and IT rooms. Each room is anticipated to require 2-tons of cooling.

- The building load side hydronic loop shall operate on primary/secondary loop arrangement. The primary loop will circulate through the heating plant. All major pieces of equipment will be equipped with coil loops and three-way valves for control at the units. The primary circulating pumps shall be constant flow duplex in a duty/standby arrangement and are estimated to be 10HP each.

- Condenser water loop shall be a constant flow system with injection from heat recovery options as mentioned. The pumps shall be duplex in a standby/duty arrangement and are estimated to be 10HP.
- Secondary loops shall be provided for the in-floor loop and the radiant heating loop.
- Chilled water loop shall be supplied to all air handlers. The load side pumps shall be a duplex arrangement with standby/duty operation and are estimated to be 7.5HP. The chilled water loop will be in a primary arrangement only and shall be constant flow.
- The system shall be 50% propylene glycol for the source and load sides of the heating plant.
- The main heating and cooling loops shall be equipped with buffer tanks. The tanks will be approximately 400 gallons each.
- The condenser water loop shall be equipped with a thermal storage tank with an indirect connection which will be connected to the plumbing system. The storage tank shall act as both a thermal storage tank and a preheat for the domestic cold water. The tank shall be a pressure vessel and shall be 1,000 gallons.
- Refer to Common Elements

4.4.5.5 HVAC

- The facility will be served by two central ventilation units. One unit shall serve the hockey and curling rink and the second shall serve the remainder of the facility. The units shall be high efficiency reverse flow heat recovery ventilators.
- The HRV serving the hockey rink and curling rink shall be 15,000cfm of outdoor air and shall be equipped with a heating coil, humidification manifold and exhaust heater to defrost due to low return air temperature of the curling and hockey rinks.
- The second HRV shall be 14,000cfm of outdoor air and shall be equipped with a heating coil and humidification manifold.
- Ventilation air shall be ducted to the terminal units and air handlers serving specific spaces.
- A dedicated air handler shall serve the gym area. The unit shall be standard construction and shall be able to supply 7,200cfm of total air and able to enter economizer mode. The unit shall have a return fan, mixing section, filter section, heating coil, humidification manifold, cooling coil and supply fan. Both the supply and return fans shall be on VFD drives.
- All other spaces shall be provided by fan coil units Based on the current floor plans ten fan coil units are anticipated for the facility. The fan coil units shall be equipped with a filter section, supply fan, heating coil and cooling coil. The supply fan shall be equipped with a VFD drive. The total air requirements for the facility excluding the gym are 30,000cfm.

- Washrooms and change rooms will be exhausted through the building HRV.
- Dedicated exhaust fans will be required for the laundry, skate sharpening and canteen area and will be discharged directly outside.
- Each mechanical room shall be equipped with a recirculation system to cool the spaces with outdoor air. It is anticipated to require a 2,000cfm exhaust fan.
- The ice plant room will need to have a dedicated refrigerant exhaust system. The system shall be controlled on refrigeration detection system for high concentrations of CO_2.
- The Zamboni will be electric and therefor no dedicated ventilation will be required for the Zamboni rooms.
- Provide dedicated dehumidification units for the hockey and curling rinks. The hockey rink shall have two units capable of 100lb/hr moisture removal and the curling rink shall have one unit capable of 100lbs/hr moisture removal.
- Refer to Common Elements.

4.4.5.6 Controls

- The control system shall be a complete DDC control system for the facility and shall be connected to all mechanical components.
- The control system shall have a central operator workstation and shall have the ability to be connected to from remote locations.
- Operators will receive alarm notifications to mobile devices.
- The control system shall trend data for a minimum of 1 year.
- The ice plant shall be connected to the control system.
- The preliminary design is assumed to require 800 points for full operation.

4.4.5.7 Alternate Energy Targets - Option 1

Alternate energy option A and B are similar in structure but contained the following changes over the proposed options.

.1 Option A (35% Better)

- The main central heating plant would be modified from a 6-pipe heat recovery system to a 4 pipe heat pump system of the same capacity.

.2 Option B (50% better)

- The main central plant would remain the same
- The fluid cooler arrangement would be removed in its entirety and replaced with a geo-exchange system (geothermal). The geo-exchanger will consist of approximately 170 bore holes at 400ft deep.
- A duplex arrangement of 20HP pumps shall be used for circulating the geo-exchange system through a plate heat exchanger.
- The number of required control points would increase by approximately 100

4.4.6 Mechanical Elements Specific to Option 2

4.4.6.1 Insulation

- Refer to Common Elements

4.4.6.2 Plumbing

- The plumbing system will consist of domestic water service from the municipal water system. The service will be protected by a duplex double check valve assembly. Two separate hot water generating stations will be separated in the facility with two hot water tanks each (total of four) to serve the washroom and change rooms. Each hot water generation point will be equipped with a master mixing valve to temper water for devices.

- Three hot water tanks will serve the hot water generation requirements for flooding the ice.

- Domestic Hot Water Tanks – 120 gallons, glassed line electric hot water tanks. 30kw Inconol heating elements. Total of seven.

- Hot water recirculation systems will be set up both heating systems serving the public areas.

- Sanitary drainage main will be a 6” main and will be connected throughout the facility to all plumbing fixture.

- Storm drainage system will be internal and will discharge water through the envelope.

- Duplex sump pump systems will be required for the two trench headers; one for the hockey rink and one for the curling rink.

- Storm drainage system is assumed to have eight, 6” outlets around the facility.

- Sump pumps shall be epoxy coated cast iron body with mechanical seals. 1HP, 50 feet of head, 100gpm - four (4) total.

- Water Softener – Duplex Water Softener – 60gpm resin based with automatic backwash.

- 1,000 gallon domestic hot water storage tank with indirect heating coil shall be provided as a buffer and preheat for domestic cold hot water.

- Refer to Common Elements

4.4.6.3 Fire Protection

- Refer to Common Elements

4.4.6.4 Liquid Heat Transfer

- The fluid cooler shall be sized to reject full amount of heat from the ice plant and the main building system should it be required. The condenser water loop will be a heat injection loop where systems reject heat or draw heat and the temperature tolerances are controlled by the speed of the fan on the fluid cooler. The fan VFD shall be controlled on the differential temperature. The fluid cooler shall be capable of rejecting 4,500MBH at ambient conditions of 78.4°F Dry bulb and 64°F wet bulb.

- The central heating and cooling plant shall be a modular heat recovery water to water heat pump plant. The plant shall be an automatic reversing system with six pipes. The central plant shall be able to produce 3,200MBH of heating with a heating supply water temperature of 120°F and be capable of supplying chilled water at 55°F. The modular system shall also include an additional module as a redundant section of the system. Five 50 ton modules are anticipated.

- The condenser water loop temperature will be controlled by the fluid cooler and a boiler inject loop. In winter the loop shall be maintained between 60°F and 70°F. In summer the condenser water loop shall be maintained between 90°F and 80°F

- The boilers shall be 87% efficient fuel oil boilers and shall be in a triplex arrangement. The heating capacity of the boilers shall be 1,000MBH each and will be piped to inject into the condenser water loop.

- The fuel oil piping system shall be equipped with duplex supply pumps which connect to the fuel oil boilers. The storage tank shall be installed outdoors with an internal day tank which will be 50 gallons.

- The exterior fuel oil storage tank shall be 40,000 gallons

- A central fuel oil fired humidification system shall be installed within the facility. The humidification system shall provide clean steam to the ventilation unit humidification manifolds. Total number to match the number of HRVs for the facility. The total humidification load is expected to be 800lbs/hr of steam.

- The facility will have a total of 8,500 ft2 of in-floor radiant heat which will be supplied by the main heating system.

- All facility glazing shall have radiant heat provided along it. The radiant heating shall be low-temperature linear radiant systems at the base of the windows. All exterior wall will be equipped with radiant heating to cover off envelope losses.

- Ceiling or wall cabinet heaters shall be provided for all service spaces within the facility.

- Split A/C cooling will be provided for all electrical and IT rooms. Each room is anticipated to require 2-tons of cooling.

- The building load side hydronic loop shall operate on primary/secondary loop arrangement. The primary loop will circulate through the heating plant. All major pieces of equipment will be equipped with coil loops and three-way valves for control at the units. The primary circulating pumps shall be constant flow duplex in a duty/standby arrangement and are estimated to be 10HP each.

- Condenser water loop shall be a constant flow system with injection from heat recovery options as mentioned. The pumps shall be duplex in a standby/duty arrangement and are estimated to be 10HP.

- Secondary loops shall be provided for the in-floor loop and the radiant heating loop.

- Chilled water loop shall be supplied to all air handlers. The load side pumps shall be a duplex arrangement with standby/duty operation and are estimated to be 7.5HP. The chilled water loop will be in a primary arrangement only and shall be constant flow.

- The system shall be 50% propylene glycol for the source and load sides of the heating plant.

- The main heating and cooling loops shall be equipped with buffer tanks. The tanks will be approximately 400 gallons each.

- The condenser water loop shall be equipped with a thermal storage tank with an indirect connection which will be connected to the plumbing system. The storage tank shall act as both a thermal storage tank and a preheat for the domestic cold water. The tank shall be a pressure vessel and shall be 1,000 gallons.

- Refer to Common Elements

4.4.6.5 HVAC

- The facility will be served by two central ventilation units. One unit shall serve the hockey and curling rink and the second shall serve the remainder of the facility. The units shall be high efficiency reverse flow heat recovery ventilators.

- The HRV serving the hockey rink and curling rink shall be 15,000cfm of outdoor air and shall be equipped with a heating coil, humidification manifold and exhaust heater to defrost due to low return air temperature of the curling and hockey rinks.

- The second HRV shall be 15,000cfm of outdoor air and shall be equipped with a heating coil and humidification manifold.

- Ventilation air shall be ducted to the terminal units and air handlers serving specific spaces.

- A dedicated air handler shall serve the gym area. The unit shall be standard construction and shall be able to supply 17,800cfm of total air and able to enter economizer mode. The unit shall have a return fan, mixing section, filter section, heating coil, humidification manifold, cooling coil and supply fan. Both the supply and return fans shall be on VFD drives.

- All other spaces shall be provided by fan coil units. Based on the current floor plans we anticipate twelve fan coil units for the facility. The fan coil units shall be equipped with a filter section, supply fan, heating coil and cooling coil. The supply fan shall be equipped with a VFD drive. The total air requirements for the facility excluding the gym are 42,000cfm.

- Washrooms and change rooms will be exhausted through the building HRV.
- Dedicated exhaust fans will be required for the laundry, skate sharpening and canteen area and will be discharged directly outside.
- Each mechanical room shall be equipped with a recirculation system to cool the spaces with outdoor air. It is anticipated to require a 2,000cfm exhaust fan.
- The ice plant room will need to have a dedicated refrigerant exhaust system. The system shall be controlled on refrigeration detection system for high concentrations of CO_2.
- The Zamboni will be electric and therefor no dedicated ventilation will be required for the Zamboni rooms.
- Provide dedicated dehumidification units for the hockey and curling rinks. The hockey rink shall have two units capable of 100lb/hr moisture removal and the curling rink shall have one unit capable of 100lbs/hr moisture removal.
- Refer to Common Elements

4.4.6.6 Controls

- The control system shall be a complete DDC control system for the facility and shall be connected to all mechanical components.
- The control system shall have a central operator workstation and shall have the ability to be connected to from remote locations.
- Operators will receive alarm notifications to mobile devices.
- The control system shall trend data for a minimum of one year.
- The ice plant shall be connected to the control system.
- The preliminary design is assumed to require 1,000 points for full operation.

4.4.6.7 Alternate Energy Targets - Option 2

Alternate energy option A and B are similar in structure but contained the following changes over the proposed options.

.1 Option A (35% Better)

- The main central heating plant would be modified from a 6-pipe heat recovery system to a four pipe heat pump system of the same capacity.

.2 Option B (50% better)

- The main central plant would remain the same
- The fluid cooler arrangement would be removed in its entirety and replaced with a geo-exchange system (geothermal). The geo-exchanger will consist of approximately 180 bore holes at 400ft deep.
- A duplex arrangement of 20HP pumps shall be used for circulating the geo-exchange system through a plate heat exchanger.
- The number of required control points would increase by approximately one hundred.

4.4.7 Mechanical Elements Specific to Option 3

4.4.7.1 Insulation

- Refer to Common Elements

4.4.7.2 Plumbing

- The plumbing system will consist of domestic water service from the municipal water system. The service will be protected by a duplex double check valve assembly. Three separate hot water generating stations will be separated in the facility with two hot water tanks each (total of six) to serve the washroom and change rooms. Each hot water generation point will be equipped with a master mixing valve to temper water for devices.

- Three hot water tanks will serve the hot water generation requirements for flooding the ice.

- Domestic Hot Water Tanks – 120 gallons, glassed line electric hot water tanks. 30kw Inconol heating elements. Total of nine.

- Hot water recirculation systems will be set up both heating systems serving the public areas.

- Sanitary drainage main will be a 6" main and will be connected throughout the facility to all plumbing fixture.

- Storm drainage system will be internal and will discharge water through the envelope.

- Duplex sump pump systems will be required for the two trench headers; one for the hockey rink and one for the curling rink. An additional duplex set of pumps shall be required for the pool drain down.

- Storm drainage system is assumed to have ten, 6" outlets around the facility.

- Sump pumps shall be epoxy coated cast iron body with mechanical seals. 1HP, 50 feet of head, 100gpm - Six total.

- Water Softener – Triplex Water Softener – 60gpm resin based with automatic backwash.

- 1,000 gallon domestic hot water storage tank with indirect heating coil shall be provided as a buffer and preheat for domestic cold hot water.

- Refer to Common Elements

4.4.7.3 Fire Protection

- Refer to Common Elements

4.4.7.4 Liquid Heat Transfer

- The fluid cooler shall be sized to reject full amount of heat from the ice plant and the main building system should it be required. The condenser water loop will be a heat injection loop where systems reject heat or draw heat and the temperature tolerances are controlled by the speed of the fan on the fluid cooler. The fan VFD shall be controlled on the differential temperature. The fluid cooler shall be capable of rejecting 5,000MBH at ambient conditions of 78.4°F Dry bulb and 64°F wet bulb.

- Liquid heat transfer shall be a modular heat recovery water to water heat pump plant. The plant shall be an automatic reversing system with six pipes. The central plant shall be able to produce 3,800MBH of heating with a heating supply water temperature of 120°F and be capable of supplying a chilled water at 55°F. The modular system shall also include an additional module as a redundant section of the system. We anticipate six 50 ton modules.

- The condenser water loop temperature will be controlled by the fluid cooler and a boiler inject loop. In winter the loop shall be maintained between 60°F and 70°F. In summer the condenser water loop shall be maintained between 90°F and 80°F

- The boilers shall be 87% efficient fuel oil boilers. The boilers will be configured in a four boiler arrangement. The heating capacity of the boilers shall be 1,000MBH each and will be piped to inject into the condenser water loop.

- The fuel oil piping system shall be equipped with duplex supply pumps which connect to the fuel oil boilers. The storage tank shall be installed outdoors with an internal day tank which will be 50 gallons.

- The exterior fuel oil storage tank shall be 50,000 gallons

- A central fuel oil fired humidification system shall be installed within the facility. The humidification system shall provide clean steam to the ventilation unit humidification manifolds. Total number to match the number of HRVs for the facility. The total humidification load is expected to be 1,100lbs/hr of steam.

- The facility will have a total of 3,500 ft2 of in-floor radiant heat which will be supplied by the main heating system.

- All facility glazing shall have radiant heat provided along it. The radiant heating shall be low-temperature linear radiant systems at the base of the windows. All exterior wall will be equipped with radiant heating to cover off envelope losses.

- Ceiling or wall cabinet heaters shall be provided for all service spaces within the facility.

- Split A/C cooling will be provided for all electrical and IT rooms. Each room is anticipated to require 2-tons of cooling.

- The building load side hydronic loop shall operate on primary/secondary loop arrangement. The primary loop will circulate through the heating plant. All major pieces of equipment will be equipped with coil loops and three-way valves for control at the units. The primary circulating pumps shall be constant flow duplex in a duty/standby arrangement and are estimated to be 15HP each.

- Condenser water loop shall be a constant flow system with injection from heat recovery options as mentioned. The pumps shall be duplex in a standby/duty arrangement and are estimated to be 20HP.

- Secondary loops shall be provided for the in-floor loop and the radiant heating loop.

- Chilled water loop shall be supplied to all air handlers. The load side pumps shall be a duplex arrangement with standby/duty operation and are estimated to be 10HP. The chilled water loop will be in a primary arrangement only and shall be constant flow.

- The system shall be 50% propylene glycol for the source and load sides of the heating plant.

- The main heating and cooling loops shall be equipped with buffer tanks. The tanks will be approximately 400 gallons each.

- The condenser water loop shall be equipped with a thermal storage tank with an indirect connection which will be connected to the plumbing system. The storage tank shall act as both a thermal storage tank and a preheat for the domestic cold water. The tank shall be a pressure vessel and shall be 1,000 gallons.

- All piping in the pool area will be non-ferrous or stainless steel.

- A dedicated steam generator system shall be provided for the steam room.

- The heat rejection from the dehumidification in the pool room shall be discharged to the condenser water loop for heat recovery.

- Refer to Common Elements

4.4.7.5 HVAC

- The facility will be served by two central ventilation units. One unit shall serve the hockey and curling rink and the second shall serve the remainder of the facility. The units shall be high efficiency reverse flow heat recovery ventilators.

- The HRV serving the hockey rink and curling rink shall be 15,000cfm of outdoor air and shall be equipped with a heating coil, humidification manifold and exhaust heater to defrost due to low return air temperature of the curling and hockey rinks.

- The second HRV shall be 19,000cfm of outdoor air and shall be equipped with a heating coil and humidification manifold.

- Ventilation air shall be ducted to the terminal units and air handlers serving specific spaces.

- A dedicated air handler shall serve the gym area. The unit shall be standard construction and shall be able to supply 17,200cfm of total air and able to enter economizer mode. The unit shall have a return fan, mixing section, filter section, heating coil, humidification manifold, cooling coil and supply fan. Both the supply and return fans shall be on VFD drives.

- All other spaces shall be provided by fan coil units. Based on the current floor plans eighteen fan coil units are anticipated for the facility. The fan coil units shall be equipped with a filter section, suppl fan, heating coil and cooling coil. The supply fan shall be equipped with a VFD drive. The total air requirements for the facility excluding the gym are 50,000cfm.

- Washrooms and change rooms will be exhausted through the building HRV.

- Dedicated exhaust fans will be required for the laundry, skate sharpening and canteen area and will be discharged directly outside.

- Each mechanical room shall be equipped with a recirculation system to cool the spaces with outdoor air. It is anticipated to require a 2,000cfm exhaust fan.

- The ice plant room will need to have a dedicated refrigerant exhaust system. The system shall be controlled on refrigeration detection system for high concentrations of CO2.

- The Zamboni will be electric and therefor no dedicated ventilation will be required for the Zamboni rooms.

- Provide dedicated dehumidification units for the hockey and curling rinks. The hockey rink shall have two units capable of 100lbs/hr moisture removal and the curling rink shall have one unit capable of 100lbs/hr moisture removal.

- All ductwork in the pool area shall be stainless steel.

- A dedicated dehumidification system shall be provided for the pool area. The dehumidification system shall be a packaged dehumidification unit with a return fan, outdoor air intake with heat recovery, exhaust air flow with heat recovery loop, refrigerated cooling coil, hot gas by-pass reheats, Pool water preheat and supply fan. The unit shall reject all unused heat to the heat recovery loop. The unit shall be 10,000cfm and introduce 2,500cfm of outdoor air. The unit shall be capable of removing 250lbs/hr of moisture.

- Refer to Common Elements

4.4.7.6 Controls

- The control system shall be a complete DDC control system for the facility and shall be connected to all mechanical components.

- The control system shall have a central operator workstation and shall have the ability to be connected to from remote locations.

- Operators will receive alarm notifications to mobile devices.

- The control system shall trend data for a minimum of one year.

- The ice plant shall be connected to the control system.

- The preliminary design is assumed to require 1,500 points for full operation.

4.4.7.7 Alternate Energy Targets - Option 3

Alternate energy option A and B are similar in structure but contained the following changes over the proposed options.

.1 Option A (35% Better)

- The main central heating plant would be modified from a 6-pipe heat recovery system to a four pipe heat pump system of the same capacity.

.2 Option B (50% better)

- The main central plant would remain the same
- The fluid cooler arrangement would be removed in its entirety and replaced with a geo-exchange system (geothermal). The geo-exchanger will consist of approximately 210 bore holes at 400ft deep.
- A duplex arrangement of 30HP pumps shall be used for circulating the geo-exchange system through a plate heat exchanger.
- The number of required control points would increase by approximately 100

4.5 Electrical

4.5.1 Energy Savings

Energy efficient LED light fixtures will be used for all exterior and interior lighting. Further energy savings will be realized by lighting controls with daylight harvesting, occupancy sensors and automation of exterior lighting on/off cycle.

Electrical metering will be provided to inform the building operator of energy consumption.

Parking lot receptacles will cycle on and off to reduce energy consumption.

4.5.2 Technology

Modern technology will be employed for all electrical systems, with an emphasis on reliable and proven technologies that will be robust and easy to maintain. Refer to the electrical outline specification for further details.

4.5.3 Electrical Outline Specification and Design Narrative

The electrical design will be coordinated with the architectural, structural, landscape, and mechanical design to ensure the design intents of all disciplines are accomplished.

4.5.3.1 General Electrical Design Summary

- As noted in previous sections of this report, a new recreation centre will be constructed to support the needs of the community. Two possible sites have been proposed, each with 3 different options for building size/layout.
- A new electrical service for the facility will be provided as discussed in 4.5.3.2. Site Services.
- Lighting in the building will be provided by LED fixtures. The interior lighting design will be in collaboration with the architectural and interior design team. Energy efficient lighting that combines practicality, low energy use and long life, in aesthetically pleasing enclosures will be utilized.
- In the event of power outages, all areas of egress will be equipped with DC remote heads powered by battery banks.
- Receptacles and power connections will be located in all rooms as required to suit the room's intended purpose.
- Mechanical equipment connections will be provided, with connections to MCCs or CDPs as required.
- A security/intrusion system will be provided for the building.

- CAT6 Voice and Data Cabling Systems, and Closed-Circuit Television System will be provided for the building.

- All horizontal data cabling will be provided by the Electrical Contractor.

- Wireless Access Points (WAPs) will be provided for WiFi internet access in certain areas.

- A new Fire Alarm System will be provided.

- A card access system will be provided as discussed in the subsequent section of this report, Card Access System.

- A public address (PA) system is not required for the building.

- Provide and install three standalone sound systems in the hockey rink, gym and swimming pool.

4.5.3.2 Site Services

1. Site Power and Communications:

    - Electrical service will be provided by the local utility, Yukon Energy. At this preliminary stage, the utility service details are not defined (utility transformer size and location). Yukon Energy reported that either site would be serviced by an overhead line to a pad mounted utility transformer near the building. Some upgrades to the local utility grid would likely be required at both sites. Yukon Energy was not able to report on which site would be preferred or more economical to service. Once the scope is better defined (location and size of building, heating source) and a service application is submitted, they will perform a study and have more information to provide to the project team.

    - Electrical Contractor shall provide underground secondary service conductors (in PVC ducts) from the utility transformer to the building. Utility metering provisions shall be provided as required by the utility.

    - Provide a service ground at exterior of building where the main service ducts enter the building.

    - Provide a source ground at the new Yukon Energy transformer location.

    - Source and service grounds to consist of three driven 19mm diameter copper clad ground rods. Each rod will be six meters in length. Connect each ground rod using #2/0 AWG bare copper conductor.

    - Ten parking stalls nearest to the building will be equipped with weatherproof 120 volt receptacles for car block heater power.

- Provide two new 4” PVC ducts to the property line and include in contract the provision of a new 12 strand fibre optic backbone cable and 50 pair CAT 3 copper backbone cables by the local telecom utility (NorthwestTel) to the main IT room/telephone demarcation point. Requirements to be confirmed with telecom utility. NorthwesTel reported that the Dome Road site would receive both fibre optic and copper telephone services from existing infrastructure along the Klondike Highway. The Gold Rush site does not currently have fibre optic service, but it could be provided from three blocks away at the Central Office. The local telephone infrastructure is near capacity so would likely require an upgrade from several blocks away.

- Provide a new 2” PVC duct to the property line and include in contract provision of new cable television service. Requirements to be confirmed with cable telecom utility.

2. Site Lighting

    - Site lighting light fixtures will be mounted on all sides of the building to illuminate the perimeter and all entry/exit doors, loading areas, etc. Pole mounted light fixtures will be provided to illuminate the parking lot and roadways within the site. Street lighting or modification to existing street lighting on public roads surrounding the building is not included.

3. Site Signage

    - Power will be provided to exterior building signage at the main entrance.

4.5.3.3 Distribution

- Main Power Distribution

- A 347/600V/3Ø//4W main distribution service entrance switchboard with an LSIG main breaker, customer metering, TVSS surge suppression and feeder breaker sections will be provided in the main electrical room. Breakers to be moulded case type.

- Main distribution switchboard to be rated to support all loads plus future capacity. At this preliminary stage we assume the following required bus ampacity:

    - For building Option 1 (Dome Road and Gold Rush): 2000 amp rated bus with 50 kAIC short circuit rating (applicable to switchboard and all breakers).

    - For building Option 2 (Dome Road and Gold Rush): 2500 amp rated bus with 50 kAIC short circuit rating (applicable to switchboard and all breakers).

    - For building Option 3 (Dome Road and Gold Rush): 3000 amp rated bus with 65 kAIC short circuit rating (applicable to switchboard and all breakers).

- The main distribution will feed 600 volt CDPs and panel boards, motor control centre (MCC), transformers, elevator, ice plant, large HVAC equipment.
- A 400A/600V/3 Ø/4W/50kAIC MCC will be provided to feed miscellaneous motors and other loads.
- 120/208V branch circuit panel boards will be provided throughout the facility to minimize voltage drop at the various loads and provide capacity for future loads.
- A Transient Voltage Surge Suppression will be installed on the main distribution and sub-distributions.
- The large mechanical loads (>0.75hp) will be connected at 600 volt, 3 Phase.
- Digital metering (voltage, current, power and waveform capture) to be provided on main distribution and all CDP type panel boards.
- Dry-type transformers will be supplied to provide 120V and 208V power to panel boards.
- Transformers to be 600V delta primary / 120/208V, wye connected secondary, 60 Hz, copper windings.
- Acceptable manufacturers of distribution equipment:
    - Cutler-Hammer
    - Schneider Electric
    - Siemens Canada

4.5.3.4 Wires, Cables and Conduits

- Conductors in conduits to be solid copper #10 AWG and smaller and stranded #8 AWG and larger. Insulation cross link polyethylene RW-90 (RWU-90 underground) 90°C, minimum 600V as required.
- Armoured cables to be solid copper #10 AWG and smaller and stranded #8 AWG and larger. Insulation cross link polyethylene (XLPE) AC-90, 600V as required. Cable to be utilized for luminaire drop connections and receptacles in metal stud walls only.
- Armoured cables (Teck) to be solid copper #10 AWG and smaller and stranded #8 AWG and larger. Insulation cross link polyethylene (RW-90) 90°C, 1000V, FT4 flame rating as required. Cable to be utilized for large feeders and mechanical equipment connection for vibration isolation and weatherproofing as required (Watertight flex conduits can also be utilized).

- Colour coded wires shall be as follows:
    - Phase A - red — Neutral - white
    - Phase B - black — Ground - green
    - Phase C - blue — Isolated Ground - green and orange trace
- All branch circuits will be copper RW90 in conduit and will be sized to conform to the latest Canadian Electrical Code (min #12 AWG).
- Insulated grounding conductors shall have a green finish and shall be used only as a grounding conductor. A ground shall be provided in all conduits.
- Identify wiring with permanent indelible identifying markings, either numbered or colored plastic tapes, on both ends of phase conductors of feeders and branch circuit wiring.
- Code with plastic tape or paint at points where conduit or cable enters wall, ceiling, or floor, and at 15m intervals.
- Colours: 25mm wide prime colour and 20mm wide auxiliary colour.

	Prime	Auxiliary
Up to 250 V	yellow	
Up to 600 V	yellow	green
Telephone	green	
Other Communication Systems	green	blue
Fire alarm	red	
Security Systems	red	yellow
Control	blue	

- Electrical metallic tubing (EMT) conduits with watertight fittings where exposed to sprinkler spray shall be used for all cable raceways for panel and branch circuit feeds.
- Rigid PVC conduits will be installed for underground conduits leaving the building for electrical service, main telephone service, main fibre optic cable service, cable TV service and remote mechanical equipment.

4.5.3.5 Receptacles and Power Outlets:

- Provide a quadraplex (two duplexes) receptacle at each work-station or office desk.
- Provide four regular duplex receptacles in each meeting room.
- Provide ceiling mounted TVSS duplex receptacles on dedicated circuits for overhead projectors.
- Provide duplex receptacles on dedicated circuits for vending machines, fridges, dishwashers, coffee makers, microwaves, photocopiers.
- Provide duplex receptacles on dedicated circuits at 36” intervals along work counters, boardroom counters, coffee stations.

- Provide convenience receptacles in all other rooms, corridors and stairs in the building. Connect up to six general use convenience receptacles to a circuit.

- Provide GFI receptacles at all washroom vanity sinks.

- Provide power and control wiring for handicap door operators (high and low mounted pushbuttons) at main entrance, washrooms, gym, and any other doors required by architectural.

- Provide duplex receptacles on dedicated circuits for each LAN rack. Connect to UPS power in the Server Room.

- Provide eight exterior split fed weather-proof receptacles on the exterior of the Building to support building and site maintenance.

- Wire and connect motorized curtain dividers (assumed quantity two) complete with associated pushbuttons.

- If retractable motorized bleachers will be used, provide power and control wiring.

- Provide power and control wiring for four full sized overhead doors (two for Zamboni Room, one for loading dock and one for Ice Plant Room.

- Wiring shall be RW90 installed in EMT conduit inside building and RWU90 in rigid PVC conduit where underground.

- All branch circuit wiring will be RW90 Copper.

- Type “BX” cable may be used for drops from outlet boxes to individual lighting fixtures and for branch circuit wiring in steel stud partitions; all home runs to panels shall be in conduit.

- Provide 120V (dedicated) to LCD TV locations located around the facility.

- Provide weather-proof receptacles on roof near all mechanical equipment that will be required to be serviced from the roof.

4.5.3.6 Mechanical Equipment Power Connections:

- All mechanical equipment shall be wired and connected.

- Refer to Mechanical Equipment Schedules in Appendix D for a list of assumed mechanical loads for each building option.

- Provide 120V connections to hand dryers.

- Motor connections shall include manual starters, magnetic starters and VFDs. Provide all interlock wiring and disconnect switches as required.

- Wire and connect float switches, pressure switches, alternators, alarms, etc. for sump pumps, and circulation pumps.

- Include motor starters, disconnects, conduit, wire, fittings, interlocks, outlet boxes, junction boxes, and all associated equipment required to provide power wiring for mechanical equipment, unless otherwise indicated.

- Provide 120V power supply for all DDC control panels and control transformers.

- All equipment mounted on the exterior of the building shall be weatherproof.

4.5.3.7 Interior Lighting and Control

- All lighting in the facility is to be supplied with LED fixtures. This will reduce energy consumption and eliminate maintenance costs associated with re-lamping.

- Lighting levels will be designed to the midrange of the Illumination Engineering Society (IES) recommended levels as indicated in the table below:

Location	Target Light Levels (Lux)	Description
Offices	300-500 Lux	Recessed or suspended LED fixtures - dimmable in areas with natural light, particularly in the atrium.
Hockey Rink	500-750 Lux	LED highbay fixtures (wet location rated).
Curling Rink	300-500 Lux	LED highbay fixtures (wet location rated).
Back of House Areas (janitor closets, storage, electrical, mechanical rooms)	300-500 Lux	Surface mounted LED strip lights, or other fixtures suitable to the location.
Swimming Pool	300-400 Lux	Wet location rated LED wall or ceiling mounted fixtures with low glare diffusers.
Corridors	200 Lux	Combination of decorative and regular Recessed or Surface LED fixtures.
Washrooms	200 Lux	Recessed LED troffers or pot lights with decorative LED vanity lights mounted above or beside mirrors at sink locations.
Kitchen	550 Lux	Recessed 1x4 LED fixtures with gasketted lenses, suitable for use in food preparation areas.
Meeting Rooms	300-500 Lux	LED dimmable fixtures around the perimeter, with recessed or suspended decorative linear LED dimmable fixtures above the table.
Entry vestibules	200 Lux	Recessed LED pot lights
Site Lighting	10-30 Lux	Surface mounted wall packs and pole mounted lights rated for cold weather (-40 deg Celsius C is widely available)

- Lighting control will be provided by a low voltage control system in larger areas (ice rinks, atrium/common areas, gym, etc.) and occupancy sensors, dimmers and line voltage switches in smaller rooms. Daylight harvesting will be used in areas with natural light to reduce power consumption.

- Individual rooms will have local dimming/switching via toggle switches and/or occupancy sensors dependent on use and occupancy.

- In all corridors and common areas approximately 20% of lighting fixtures will be wired as unswitched “night lights” fed from normal power.

- Lighting in the hockey rink, curling rink, gym, etc. will be connected to the lighting control system. In event of fire alarm, all lighting in these areas will be turned on to 100% brightness to aid in egress from the building.

- A low voltage relay control system will be utilized to control all public area lights. Exterior lights will be controlled with daylight sensors and day timers.

- Accent and display lighting will be utilized to emphasize special architectural features. We propose to illuminate these with surface or recessed Light Emitting Diode (LED) sources in a colour temperature and light pattern to suit the desired effect.

- Light fixtures will be selected to have a rated lamp life of 50,000 hours or more.

- Lighting control system acceptable manufacturers: Cooper, Douglas.

4.5.3.8 Exit and Emergency Lighting

- LED type exit lighting (green pictogram) will be provided along all exit corridors and at all exit doors.

- Emergency lights will be provided to achieve an average of 10lux (min) on all paths of egress.

- DC emergency lighting battery banks will be provided with minimum 1 hour capacity and remote DC double LED lamp emergency lights. Corridors, stairwells, public washrooms and electrical/telecom/mechanical rooms will be provided with emergency lighting, in accordance with the National Building Code.

4.5.3.9 Exterior Lighting and Control

- Site lighting will be provided by a combination of LED “wall pack” light fixtures on the building and pole mounted site lights to illuminate the parking lot, roadways and all entrance/exit doors. Wall packs will be powered by 120 volts and pole mounted lights will be powered at 208 or 347 volts to reduce voltage drop.

- All walls of the exterior of the building will be illuminated by the LED wall packs above doors and at intermediate locations to illuminate perimeter of building and walkways along building.

- Site lighting will be controlled via a low voltage relay panel, photocell and astronomical time clock.

- Allow for eight new double-sided pole mounted (20′ pole) LED fixtures provided at parking lot and entrance.

- Provide LED pathway lighting along walkway from parking lot to main entrance and along walking path to the building.

- Four new 120V circuits (with weatherproof disconnects)) for exterior signage. Provide a 2″ duct to each remote location as required. Provide Cat 6 data connection to all signage.

4.5.3.10 Voice and Data Systems

- Refer to "Site Services" for new fibre optic backbone and Cat 3 telephone backbone to the building. Provide new 4′x8′ plywood backboard, with two TVSS duplex receptacles, lightning arrestor and BIX block for demarcation connection in main IT room.

- It is assumed that all "passive" network equipment (racks, patch panels, UPS units, etc.) to be provided by the electrical contractor and "active" equipment (servers, switches, etc.) will be provided by the owner.

- Provide new rack in IT room complete with copper and fibre patch panels as required.

- A second telecommunication rack (wall mounted) will be provided in the secondary data room. The main telecommunication rack in the main telecom/IT room will be interconnected with the secondary rack via a 6 strand fibre optic cable and a 25 pair Cat 6 cable. Terminate Cat 6 cable in BIX block.

- Provide a 2KVA UPS for the new floor mounted rack.

- Provide a 500VA UPS for the new wall mounted rack.

- A basket cable tray system will be installed in the ceiling space to route voice/data cabling through the building. J-hooks will be installed to route cables from cable tray to conduits stubs through main floor into rooms as required.

- Each office or workstation will be provided with two CAT6 data drops (1-telephone, 1-data).

- All other occupied rooms (not including rooms such as washrooms and storage rooms) will be provided with one CAT6 data drop.

- CAT 6 cable drops will be provided for network printers, photocopiers, and fax machines.

- 2-CAT 6 cable drops shall be provided to the reception desk for the telephone switchboard.

- One (1) ceiling mounted CAT 6 cable drop will be provided for overhead projectors.

- The entire system shall be tested (25-year cable warranty) and test results submitted with the Operating Manuals.

- Provide wireless LAN access points to accommodate wireless network access throughout building. Provide CAT6 cable connection to Wireless LAN access points. It can be assumed that one access point will cover a radius of 40 feet.

- All CAT6 cables will be terminated in data outlets and patch panels and will be FT6 insulated.

4.5.3.11 Fire Alarm System

- A new stand-alone single stage addressable fire alarm system shall be provided, and all devices connected as required.

- During a fire alarm the following functions will be activated automatically:

- Horn/strobes will sound.

- Auxiliary function relays to operate: fan shutdown.

- All door hold open devices to release.

- Required kitchen equipment to shut down via contactors and fire alarm system relay.

- An alarm to be transmitted to the Fire Department or central reporting agency via an automatic voice dialer.

- During an alarm the LED correlated with the zone (building area) in which the alarm occurred shall illuminate. The alarm LED shall not go out until manual station or device that activated the alarm is reset.

- The new main fire alarm control panel will be located in the building front entrance lobby.

- A remote annunciator will be located at an alternate entrance.

- Pull stations shall be located at every "means of egress" door leading to the building exterior.

- Automatic heat detectors either fixed temperature or rate of rise units shall be installed in shipping / receiving, mechanical rooms and in the elevator pit.

- Automatic smoke detectors will be installed in all corridors, lobbies, storage rooms, janitor rooms, lounges, at the top of stairs and at the top of the elevator shaft.

- Magnetic door hold open devices will be connected to the fire alarm system to ensure that doors release and close upon fire alarm system activation.

- Alarm signal devices shall be horn/strobes, recessed or surface mounted depending on the area.

- Install all wiring in EMT conduit system.

- The manufacturer shall verify devices added to the system. Test reports shall be submitted to the Authority Having Jurisdiction and be inserted in the maintenance manuals.

- Relays and monitoring modules to be provided at a convenient location near the fire alarm panel.

- Provide programming, testing and verification inspection report upon completion of installation.

- Approved manufacturers are:

    - Simplex

    - Edwards/GE

    - Notifier

    - Siemens

4.5.3.12 Card Access System

- Card access system to be provided. Card readers to have key backup.

- Install all wiring in EMT conduit system.

- Assume eight card access doors will be required including two weatherproof card readers for exterior doors and six interior doors.

- Means of security is to be electric strike.

- Locate control panel in new IT room on main floor.

4.5.3.13 Intrusion/Security System

- Provide security system complete with the following:

- Monitored control panel

- Door contacts on all exterior doors, IT room and Facility Manager's office

- Motion sensors throughout building

- Siren horns throughout building

- Key pad at main entrance

- Security system to be integrated with card access system and CCTV system.

4.5.3.14 Closed Circuit Television (CCTV) System

- Provide an IP based Closed Circuit Television (CCTV) System.
- Provide new digital video recorder (DVR) in the main IT room. The facility manager's computer will be able to access the CCTV camera live images and recordings. The system is to be complete with sequential switchers.
- Provide new interior fixed cameras and exterior fixed cameras.
- Approved manufacturers are:
    - Axis
    - Panasonic
    - Pelco

4.5.3.15 Cable TV (CATV)

- Provide empty conduit for new cable TV services as described in previous "Site Services" section.
- Provide cable TV (CATV) connections to LCD TVs located around the facility (assume six locations).

4.5.3.16 Audio/Visual Systems

- Electrical Contractor to provide and connect all equipment for new audio systems in the following locations:
    - Hockey rink,
    - Gym/Multipurpose Room,
    - Swimming pool (note that swimming pool is only applicable for Option 3 for Dome Road or Gold Rush locations).
- Include cost for audio system commissioning from equipment supplier.
- Electrical Contractor to provide power, data and required infrastructure for future AV equipment in meeting rooms (assume ceiling mounted projector, electric screen, input plate with USB and HDMI, ceiling mounted speakers).

4.5.3.17 General Electrical Requirements

- All transformers feeding non-linear loads (feeding office areas) are to be K-4 type, with NEMA 3R enclosures and will be installed on concrete housekeeping pads if floor mounted. Exterior transformers to be NEMA 4.

- Firestopping of electrical cables, conduits, trays, passing through fire barriers shall conform to local codes and inspection authorities
- Mounting heights in accordance with Accessibility Standards.
- All electrical equipment and wiring withing the hockey rink, curling rink and swimming pool to be rated for wet locations.
- Color outlet box covers to color designated and show circuit numbers in black felt marker on inside of covers.
- Install grounding connections to typical equipment included in, but not necessarily limited to following list: service equipment, transformers, frames of motors, motor control centres, starters, control panels, building steel work, panels, outdoor lighting.

4.5.3.18 Provide the following:

- Shop drawings as requested for all equipment and systems.
- Short circuit, coordination and arc flash study. Provide arc flash stickers for all major distributions or electrical equipment.
- Three copies of Operations and Maintenance manuals.
- Testing and reports for all testing and systems' verification.
- Record drawings.
- Spare parts where specified.
- 1 year warranty; plus extended warranties for key items as specified.
- On-site training of Owner's representatives.

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5.0

Gold Rush Design Options

5.0 Gold Rush Design Options

The following pages introduce the Gold Rush site in general and end with the three test fit options on the site. Also included are the FSPs adjusted for the exact changes as a result of the test fits, as well as a breakdown of the building costs, extrapolated from Hanscomb's four Class D cost estimates. Larger images of the plans and potential elevations are found in Appendix A. It is important to note the three-dimensional designs of these buildings were only created to complete the structural and energy analyses, and should not be considered final designs.

5.1 Gold Rush

The Gold Rush campground site sits in an urban setting, surrounded by houses and adjacent to the historic downtown area. It has a gentle slope and sits at an angle to the cardinal directions. The North and East side slope up towards Dome Mountain. The following elements pertain only to the Gold Rush site.

Being a smaller site building orientation and arrangement are limited. Parking also reduces as the building gets larger. The current mechanical design suggests back up fuel tanks, however this would take up more space than desired.


Aerial view of the Gold Rush site

5.1.1 Zoning

The site is currently zoned R1 - Residential, and a variance will have to be made to change the zoning to P2 Institutional. There is a maximum building height of 10.67m.

Due to the size of the site, parking will be limited.

5.1.2 Views

The Gold Rush site has a changing 360-degree view. The North and East views face Dome Mountain, the South faces the heritage district downtown and the West faces the Yukon River. The immediate building site is surrounded by single-storey homes.

Photo from Wikimedia Commons - View up 3rd Street looking North

5.1.3 Design Guidelines

The Gold Rush site is located within the Residential Heritage Management area, adjacent to the Downtown Heritage Management Area. General guidelines for these areas require new infill buildings to adopt the 'Dawson Style.'

General design guidelines for architectural conservation and infill recommend that new infill be designed with similar massing, scale, and form to adjacent historic structures, while maintaining characteristics of a contemporary building. The 'Dawson Style' is considered to be a contemporary interpretation of traditional architectural design and should not mimic or become a caricature of the historic Gold Rush Style.

More specifically, these guidelines recommend the following:

- Commercial Buildings to have vertically placed rectangular store front, with single storey steep gable roof building behind
- Commercial Buildings to be set no more than 2' above street level and as close to grade as possible
- Property setbacks should be uniform with adjacent historic buildings
- New infill that occupies multiple lots: front yard setbacks over the site should have minor variations within range of established historic buildings
- Massing, scale, and rhythm of facade should be similar to historic structures within the district
- Acceptable siding to include horizontal wood or fibre cement planks
- Heritage District: Residential Heritage Area
- Character Area: North End Character Area
- Heritage Guidelines: Dawson Style (required, if not replication of former historic structure)

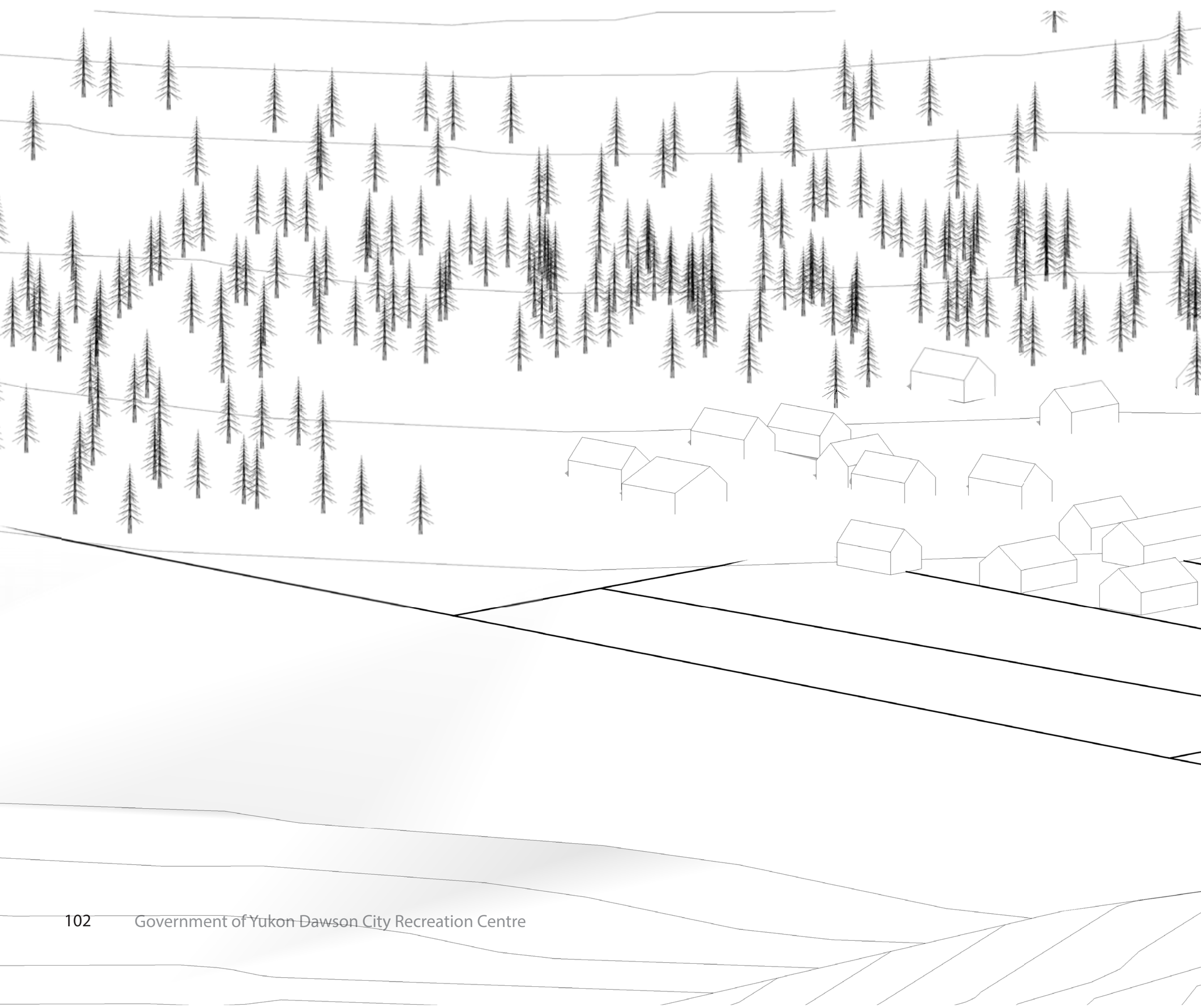
This site is also located in a residential district. The surrounding houses are single family homes lining the streets. Special attention would have to be paid to not overwhelming the scale of these one and two storey homes.

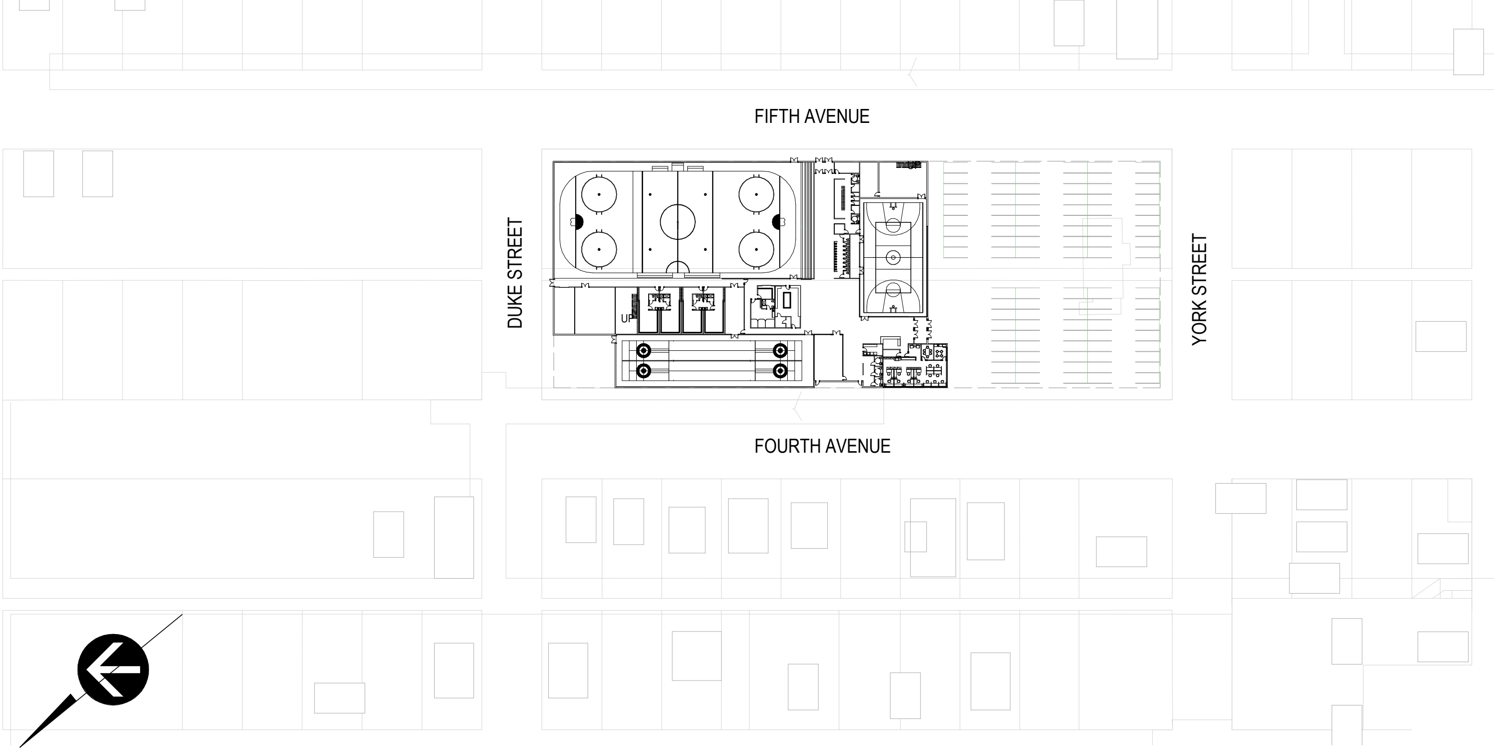
Photo from Wikimedia Commons

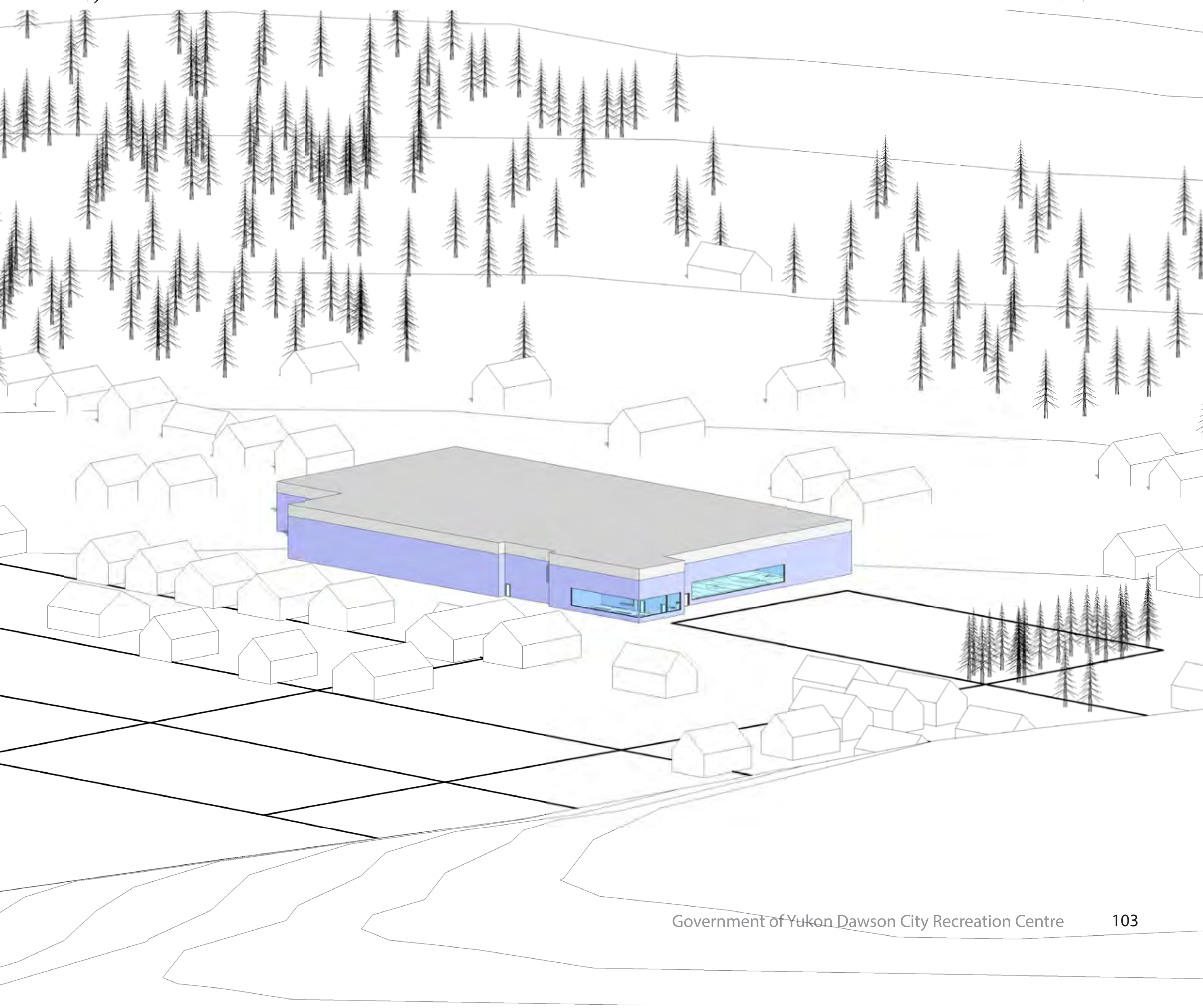
Still from Bill Morrison's Dawson City: Frozen in Time

5.2 Gold Rush Option 1

- Area: 6174 m² (including penthouse areas)
- Ice Rink
- Curling
- Multipurpose space
- Total Construction Estimate: $50,902,900
- Parking Stalls: 99




FIFTH AVENUE
DUKE STREET
YORK STREET
FOURTH AVENUE



5.2.1 Gold Rush Option 1 - Building Description

The compact planning of Option 1 fits perfectly within the constraints of the Gold Rush site.

Primary entry points to the building are on the South next to the parking lot and on the East facing the street with secondary street access from the West side. This option incorporates 99 parking spaces.

The offset alignment of the skating and curling spaces allows for a loading area at the “back” of the building for deliveries and service personnel access.

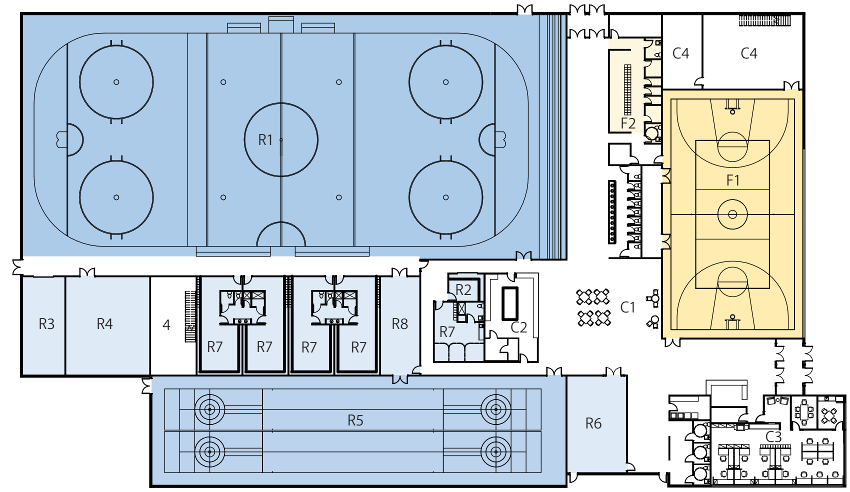
Optimal natural light is provided to the Office located on the Southwest corner of the building. Views to the entry and parking lot allow for casual observation of activity in and adjacent to the building.

The Common Lounge area is centrally located in the facility with views to the major amenity spaces and direct access to the Canteen/Servery.

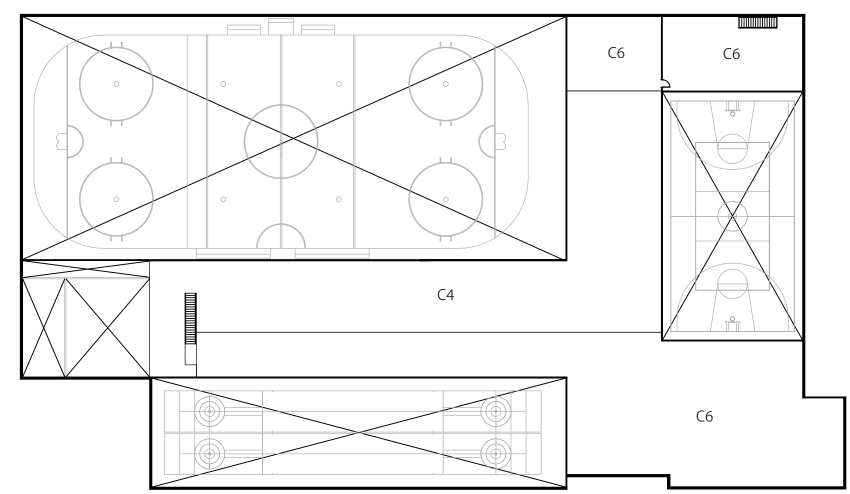
Shared support spaces for the Ice Rink and Curling Rink have two access points for efficient function of each space. The Curling Rink Lounge has a visual connection down the curling sheets but also to the Common Lounge area.

Dedicated mechanical space has been strategically placed next to the Multi-purpose/Gym to address the unique HVAC requirements of the space for site services to be connected as close as possible to the existing service connection points. Support spaces such as General Storage and Shower & Change rooms can be accessed directly from the Gym space.

Gold Rush Option 1 - Floor Plans



MAIN FLOOR PLAN



SECOND FLOOR PLAN

COMMON AMENITIES	ICE	FITNESS	AQUATICS
C1 Common Lounge	R1 Ice Rink	F1 Gymnasium	
C2 Canteen	R2 Skate Sharpening	F2 Change Room	
C3 Office	R3 Zamboni		
C4 Mechanical / Electrical	R4 Ice Plant		
C5 Storage	R5 Curling Rink		
C6 Potential Unfinished Area	R6 Curling Lounge		
	R7 Change Room		
	R8 Rink Storage		

Gold Rush Option 1 – Functional Space Program

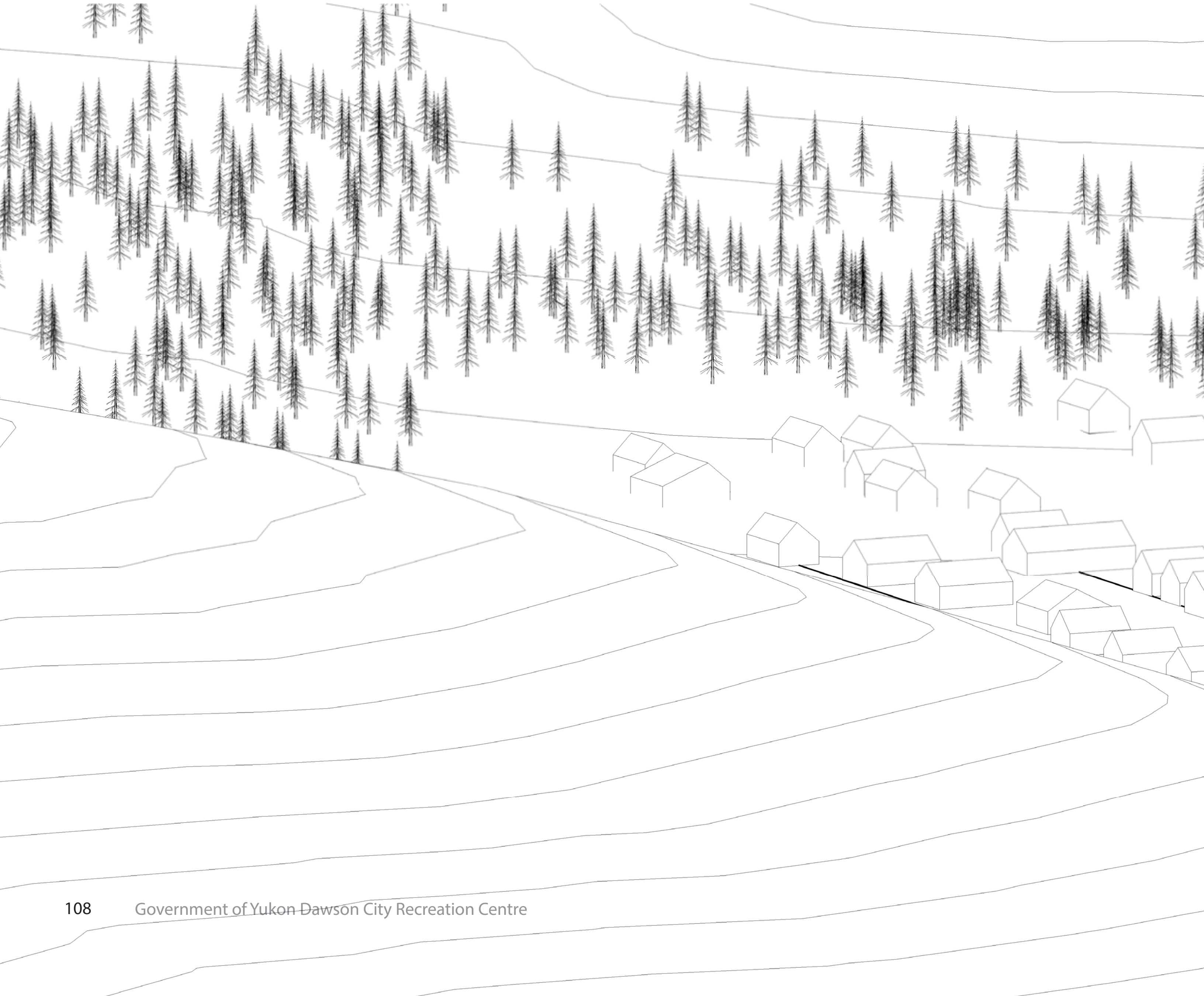
Room Name	Option 1 Approved FSP	Option 1 Gold Rush Actual	Notes
RECREATION AMENITIES			
Ice Rink (Hockey, Ringette, Skating)	1,874.0	1,957.1	Increased area includes circulation
Ice Rink Viewing Area (unheated)	79.5	97.7	
Ice Rink Viewing Area (heated)	-	-	
Team Dressing Rooms	240.0	263.0	
Ref Change Room	35.0	43.2	
Skate Sharpening	15.0	14.2	
Zamboni Room	45.0	60.7	
Ice Plant/Mechanical Room	45.0	120.2	SMS recommends area increase to accommodate equipment
Storage	60.0	55.9	
Curling Rink	856.0	662.6	Circulation around sheets has been reduced to minimum requirement
Changing Area/Lockers	-	-	
Lounge	75.0	84.2	
Multipurpose/Flex Space/Gym	-	-	
Multipurpose/Flex Space	500.0	510.0	
Gym Viewing Area	-	-	
Change Rooms	60.0	89.1	
Fitness Centre	-	-	
Change Rooms	-	-	
Walking Track	-	-	
Lap Pool	-	-	
Kiddie Pool	-	-	
Hot Tub/Jacuzzi	-	-	
Change Rooms	-	-	
Lifeguard/First Aid	-	-	
Pool Mechanical & Chemical Stor	-	-	
Steam Room	-	-	
Sauna	-	-	
Indoor Playground	-	-	
Climbing Wall	-	-	
Sub-Total	**3,884.5**	**3,957.9**	
COMMUNITY AMENITIES			
Common Lounge/Entry	75.0	75.0	Area around seating is included in gross up below
Canteen/Servery	63.0	68.9	
Multi-use Party/Meeting Room	-	-	
Full Team Office	155.0	149.8	
Sub-Total	**293.0**	**293.7**	
LOGISTICS			
Washrooms	100.0	68.9	
Janitor Room	20.0	6.3	Additional janitor rooms should be considered in future planning
Laundry Facilities	10.0	14.2	
Mechanical	227.5	802.9	Area can be reduced significantly in later design phases
Electrical	42.0	40.9	
Telecom	31.5	incl. above	
Elevator/Lift	12.0	-	
General Storage	80.0	50.1	Consideration can be given to storing items in oversized mechanical area
Sub-Total	**523.0**	**983.3**	
Net Total	**4,700.5**	**5,234.9**	
Gross Up (35%)	**1,645.2**	**760.3**	
USABLE AREA	**6,345.7**	**5,995.2**	

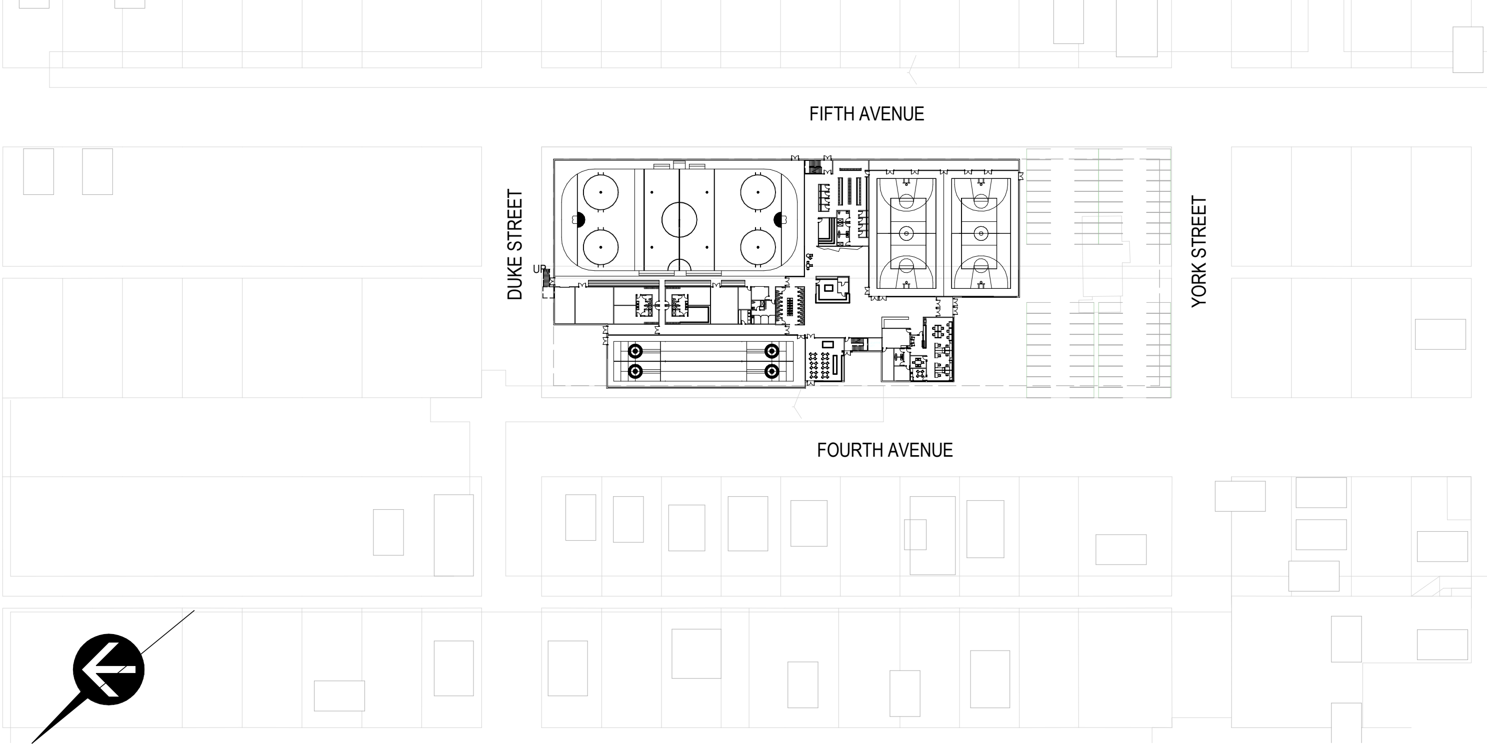
Gold Rush Option 1 - Cost Estimate

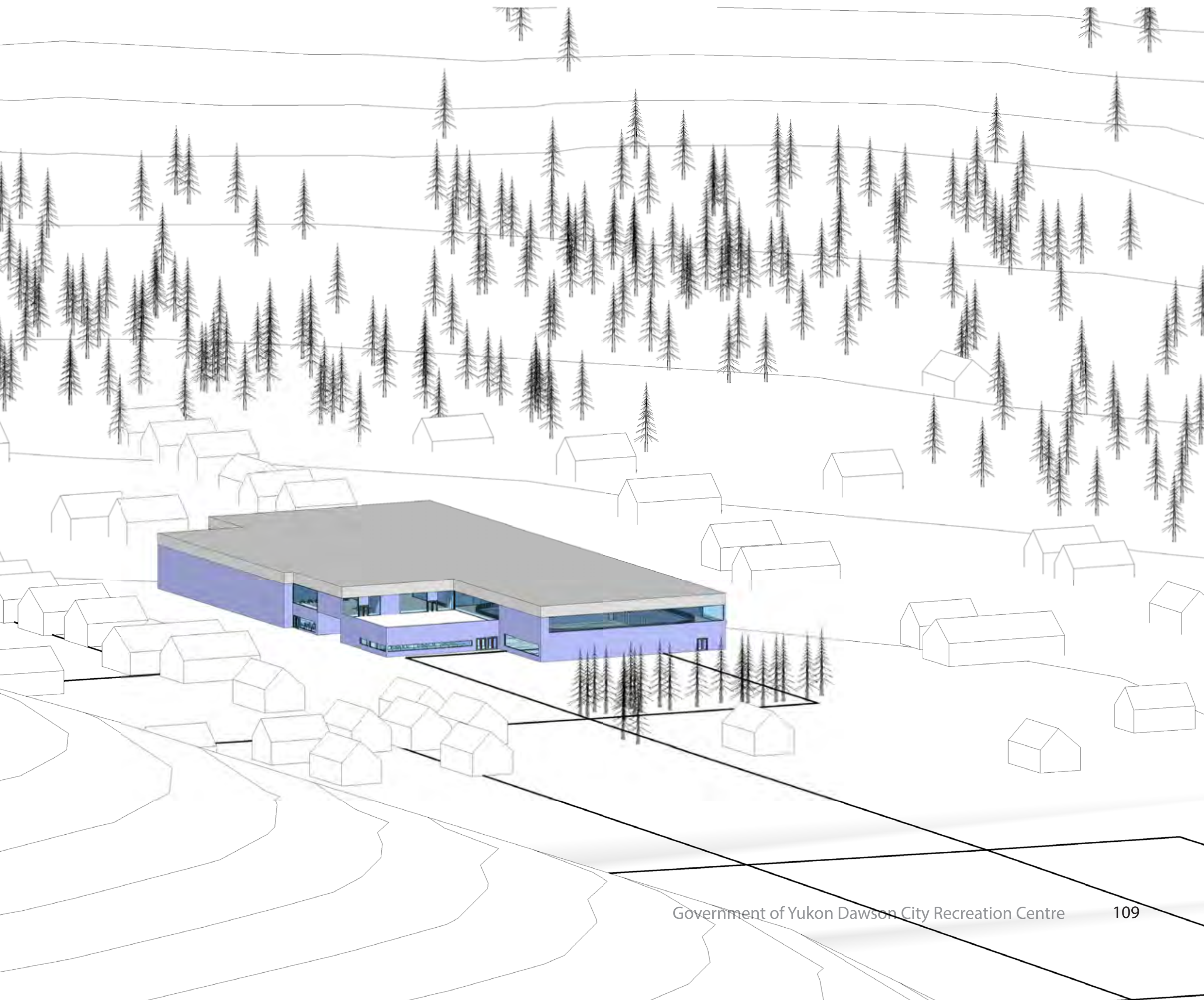
Element	Elemental Cost			Elemental Amount		Rate per m2
	Quantity		Unit Rate	Sub-Total	Total	Sub-Total
A SHELL	6,174	m2			**13,757,600**	
A1 SUBSTRUCTURE					5,747,600	
A11 Foundations	5,324	m2	517.25	2,753,800		446.03
A12 Bulk Excavation/Fill	30,284	m3	76.57	2,318,800		375.57
A13 Special Condititions	1	sum	675,000.00	675,000		109.33
A2 STRUCTURE					4,445,600	
A21 Lowest Floor Construction	5,324	m2	181.23	964,900		156.28
A22 Upper Floor Construction	850	m2	650.00	552,500		89.49
A23 Roof Construction	5,324	m2	550.00	2,928,200		474.28
A3 EXTERIOR ENCLOSRUE					3,564,400	
A31 Walls Below Grade	0	m2	0.00	0		0.00
A32 Walls Above Grade	2,858	m2	600.00	1,714,800		277.75
A33 Windows & Entrances	91	m2	1,480.22	134,700		21.82
A34 Roof Coverings	5,324	m2	275.00	1,464,100		237.14
A35 Projections	6,174	m2	40.63	250,800		40.62
B INTERIORS	6,174	m2			**2,175,800**	
B1 PARTITIONS & DOORS					951,200	
B11 Partitions	3,443	m2	221.38	762,200		123.45
B12 Doors	78	No	2,423.53	189,000		30.61
B2 FINISHES					744,300	
B32 Floor Finishes	6,174	m2	42.98	265,400		42.99
B22 Ceiling Finishes	6,174	m2	53.36	329,400		53.35
B23 Wall Finishes	9,270	m2	16.13	149,500		24.21
B3 FITTINGS & EQUIPMENT					480,300	
B31 Fittings & Fixtures	6,174	m2	65.21	402,600		65.21
B32 Equipment	6,174	m2	12.59	77,700		12.59
B33 Elevators	1	No		0		0.00
C SERVICES	6,174	m2			**7,818,300**	
C1 MECHANICAL					5,655,500	
C11 Plumbing & Drainage	6,174	m2	146.53	904,700		146.53
C12 Fire Protection	6,174	m2	45.48	280,800		45.48
C13 HVAC	6,174	m2	662.98	4,093,200		662.97
C14 Controls	6,174	m2	61.03	376,800		61.03
C2 ELECTRICAL					2,162,800	
C21 Service & Distribution	6,174	m2	98.18	606,200		98.19
C22 Lighting, Devices & Heating	6,174	m2	157.46	972,200		157.47
C23 Systems & Ancilliaries	6,174	m2	94.65	584,400		94.66
NET BUILDING COST - EXCLUDING SITE	6,174	m2			**23,751,700**	3,847.05
D SITE WORK					1,212,800	
D11 Site Development	4,956	m2	143.82	712,800		
D12 Mechanical Site Services	1	sum	220,000.00	220,000		
D13 Electrical Site Services	1	sum	280,000.00	280,000		
D14 Demolition	0			0		
D15 Alterations	0			0		
NET BUILDING COST - INCLUDING SITE					**24,964,500**	4,043.49
Z1 GENERAL CONDITIONS					13,358,800	
Z10 Location Factor (Dawson, YT)	38%			9,486,500		
Z11 General Conditions	8%			2,756,100		
Z12 Fee	3%			1,116,200		
NET BUILDING COST - EXCLUDING ALLOWANCES					**38,323,300**	6,207.21
Z2 ALLOWANCES					12,579,600	
Z21 Design & Pricing Allowance	15%			5,748,500		
Z22 Escalation Allowance	5%			2,203,600		
Z23 Construction allowance	10%			4,627,500		
TOTAL CONSTRUCTION ESTIMATE - INCLUDING ALLOWANCES					**50,902,900**	8,244.72
VALUE ADDED TAX (GST/HST)	0	%		0	0	
TOTAL CONSTRUCTION ESTIMATE					**50,902,900**	8,244.72

5.3 Gold Rush Option 2

- Area: 8112 m² over two floors
- Ice Rink
- Curling
- Fitness Centre
- Gymnasium
- Total Construction Estimate: $63,365,000
- Parking Stalls: 72




FIFTH AVENUE
DUKE STREET
UP
YORK STREET
FOURTH AVENUE



5.3.1 Gold Rush Option 2 - Building Description

This option has many similarities to Option 1 with similar placement of the Ice Rink, Curling Rink, Multi-purpose/Gymnasium and Office. Highlights of this option include a second floor roof deck and visual connections between the two floor levels. There are two entries, one at the parking lot and one on the West side.

The large Multipurpose/Gymnasium allows for views outside and visibility from the interior viewing area. A cantilevered Walk/Running Track optimizes the footprint of the space. Generous Shower & Change Room facilities can be utilized by several of the amenity areas. Access to the Sauna is provided with close proximity to the Shower & Change Rooms and encourages use by participants in other recreational activities.

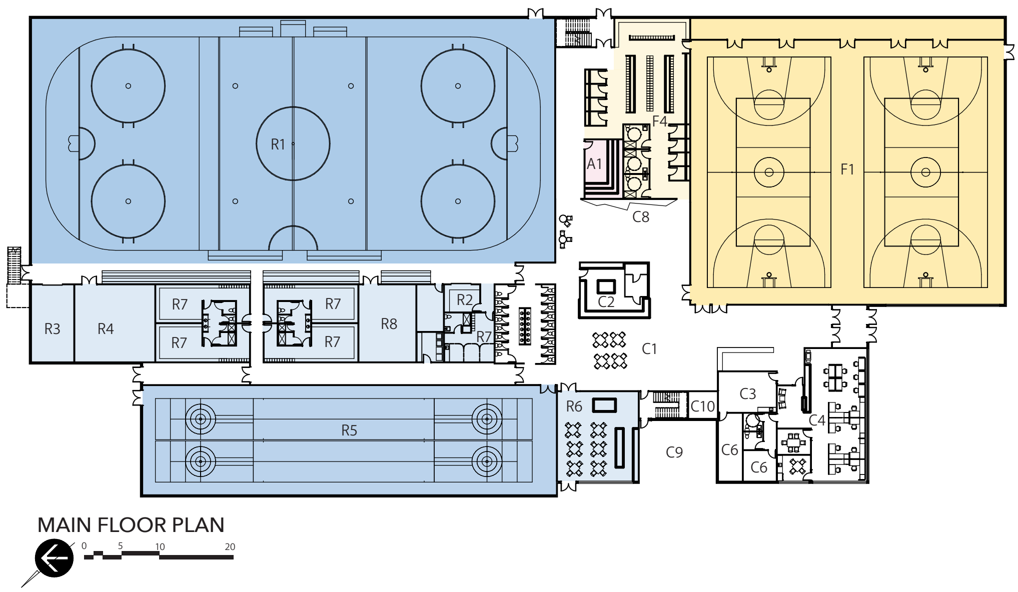
Visual access to the Canteen/Servery is provided at both floor levels and encourages spectators and participants to linger with refreshments.

Separate staff washrooms are a key feature of the Office in this option. Close proximity of the Multi-use Party/Meeting Room with access to a General Storage area complements the function of the Office.

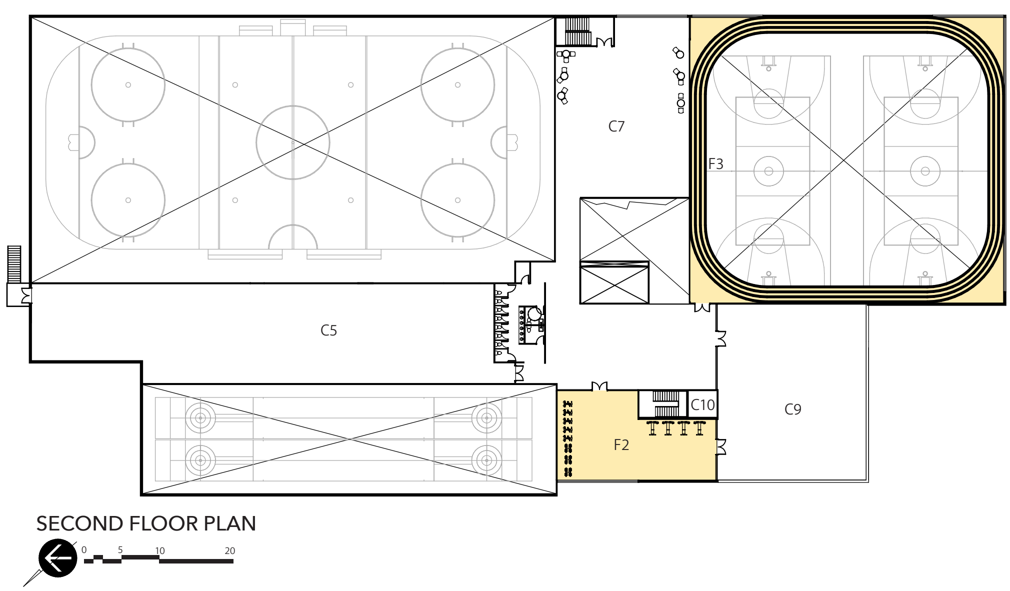
The Fitness Centre on the second floor has a direct connection to the rooftop deck and to an open lounge area for group classes.

The second level Common Lounge and Indoor Playground allows for views into the major amenity spaces.

Gold Rush Option 2 - Floor Plans



MAIN FLOOR PLAN



SECOND FLOOR PLAN

COMMON AMENITIES	ICE	FITNESS	AQUATICS
C1 Common Lounge	R1 Ice Rink	F1 Gymnasium	A1 Sauna
C2 Canteen	R2 Skate Sharpening	F2 Fitness Centre	
C3 Multi Use Meeting Room	R3 Zamboni	F3 Walking Track	
C4 Office	R4 Ice Plant	F4 Change Room	
C5 Mechanical / Electrical	R5 Curling Rink		
C6 Storage	R6 Curling Lounge		
C7 Indoor Playground	R7 Change Room		
C8 Climbing Wall	R8 Rink Storage		
C9 Outdoor Patio			
C10 Elevator			

Gold Rush Option 2 - Functional Space Program

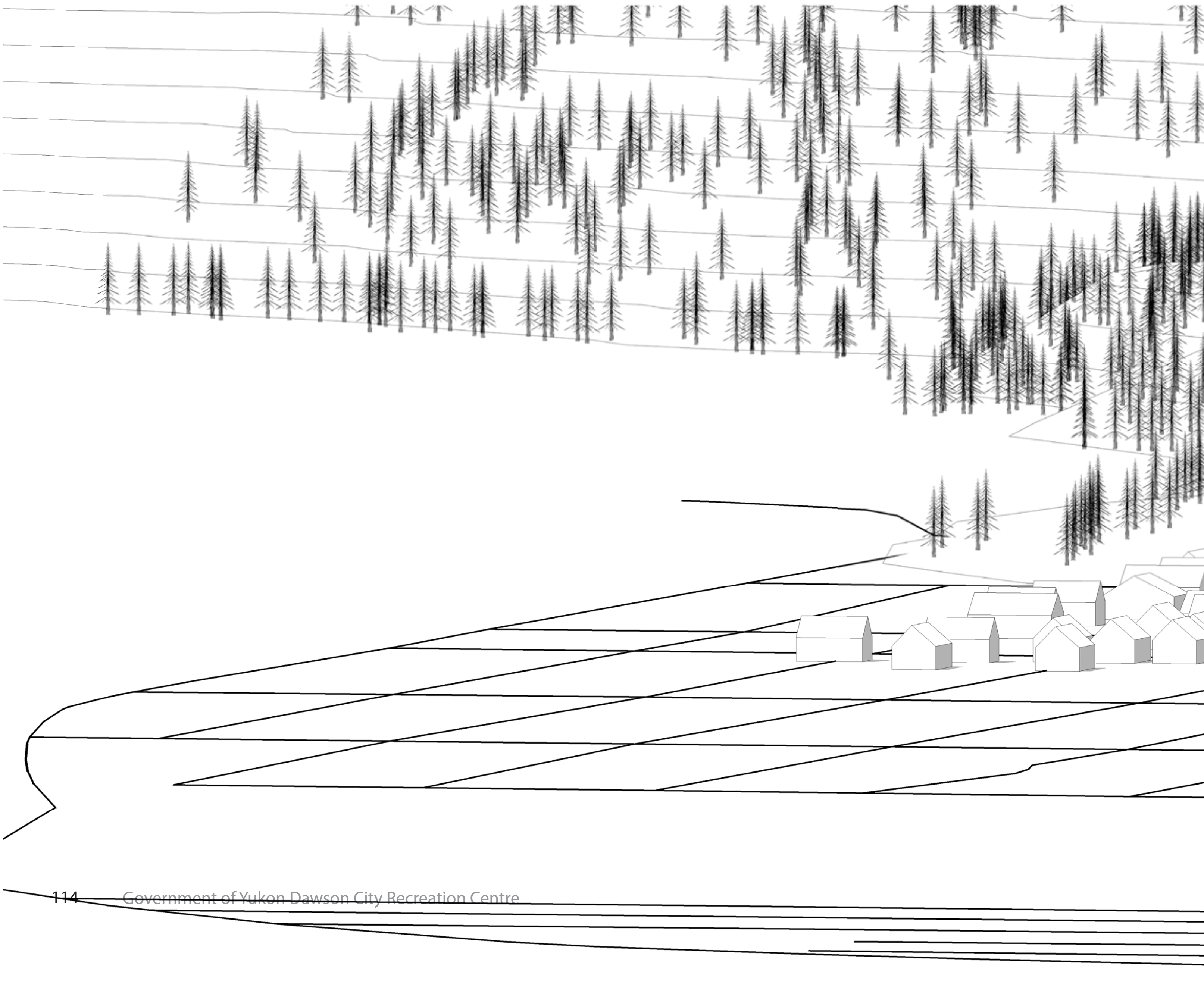
Room Name	Option 2 Approved FSP	Option 2 Gold Rush Actual	Notes
RECREATION AMENITIES			
Ice Rink (Hockey, Ringette, Skating)	1,874.0	1,921.9	Increased area includes circulation
Ice Rink Viewing Area (unheated)	79.5	83.6	
Ice Rink Viewing Area (heated)	-	-	
Team Dressing Rooms	240.0	227.9	
Ref Change Room	35.0	35.4	
Skate Sharpening	15.0	14.2	
Zamboni Room	45.0	47.4	
Ice Plant/Mechanical Room	45.0	90.2	SMS recommends area increase to accommodate equipment
Storage	60.0	64.2	Shared with curling rink
Curling Rink	856.0	664.0	Circulation around sheets has been reduced to minimum requirement
Changing Area/Lockers	-	-	
Lounge	75.0	105.8	Increased area to suit architectural building features
Multipurpose/Flex Space/Gym	762.0	1,216.0	Area can be reduced in future design phases
Multipurpose/Flex Space	-	-	
Gym Viewing Area	-	-	
Change Rooms	120.0	220.7	Area can be reduced in future design phases
Fitness Centre	140.0	175.2	
Change Rooms	40.0	incl. above	
Walking Track	250.0	287.3	
Lap Pool	-	-	
Kiddie Pool	-	-	
Hot Tub/Jacuzzi	-	-	
Change Rooms	-	-	
Lifeguard/First Aid	-	-	
Pool Mechanical & Chemical Stor	-	-	
Steam Room	-	-	
Sauna	35.0	32.0	
Indoor Playground	85.0	110.4	Area can be reduced in future design phases
Climbing Wall	-	70.2	Included as a value-added feature
Sub-Total	**4,756.5**	**5,366.4**	
COMMUNITY AMENITIES			
Common Lounge/Entry	75.0	75.0	
Canteen/Servery	63.0	54.1	
Multi-use Party/Meeting Room	30.0	35.0	
Full Team Office	155.0	159.9	
Sub-Total	**323.0**	**324.0**	
LOGISTICS			
Washrooms	120.0	135.5	
Janitor Room	20.0	37.0	Area can be reduced in future design phases
Laundry Facilities	10.0	11.2	
Mechanical	227.5	647.6	Area can be reduced in future design phases
Electrical	42.0	incl. above	
Telecom	31.5	incl. above	
Elevator/Lift	12.0	11.2	
General Storage	130.0	118.8	
Sub-Total	**593.0**	**961.3**	
Net Total	**5,672.5**	**6,651.7**	
Gross Up (25%)	**1,418.1**	**1,111.3**	
USABLE AREA	**7,090.6**	**7,863.4**	

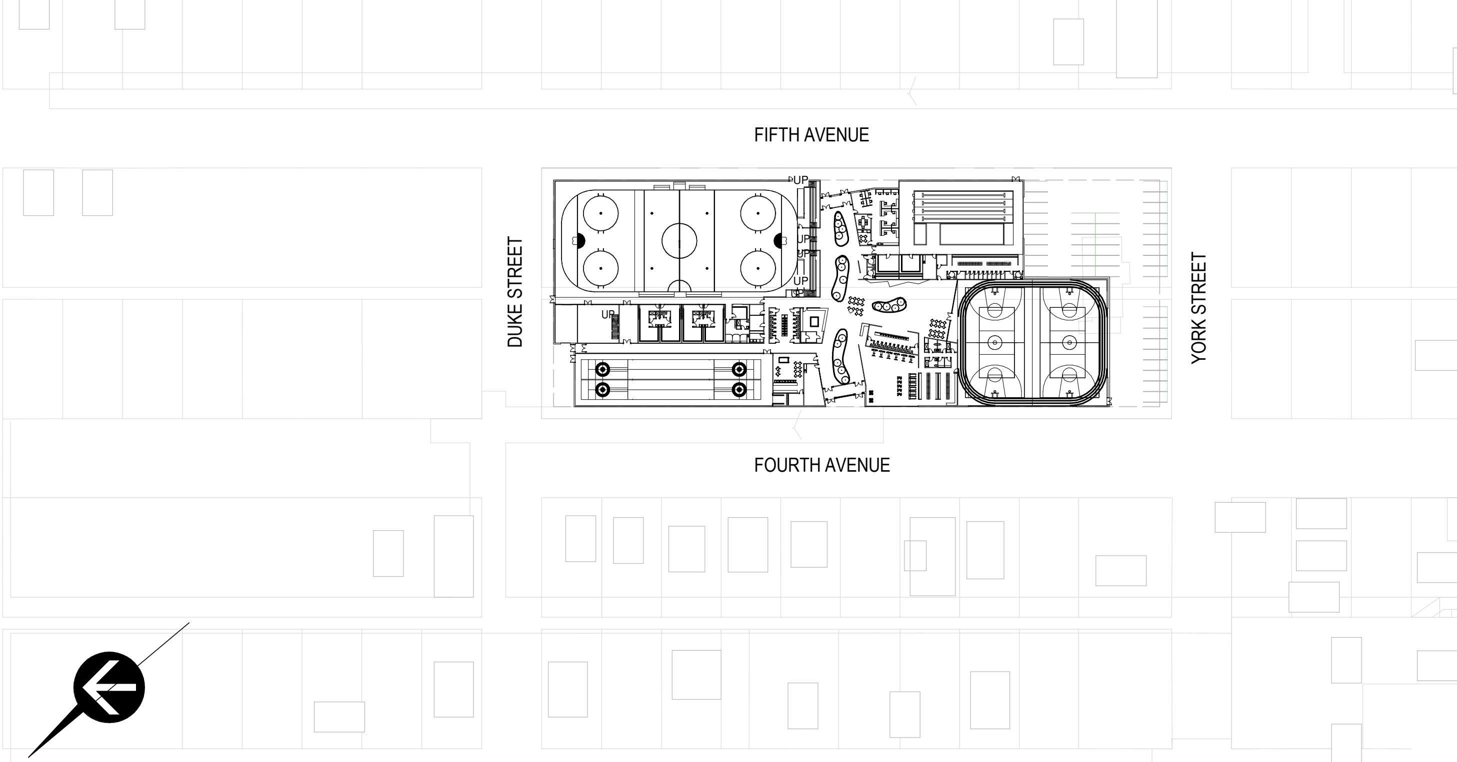
Gold Rush Option 2 - Cost Estimate

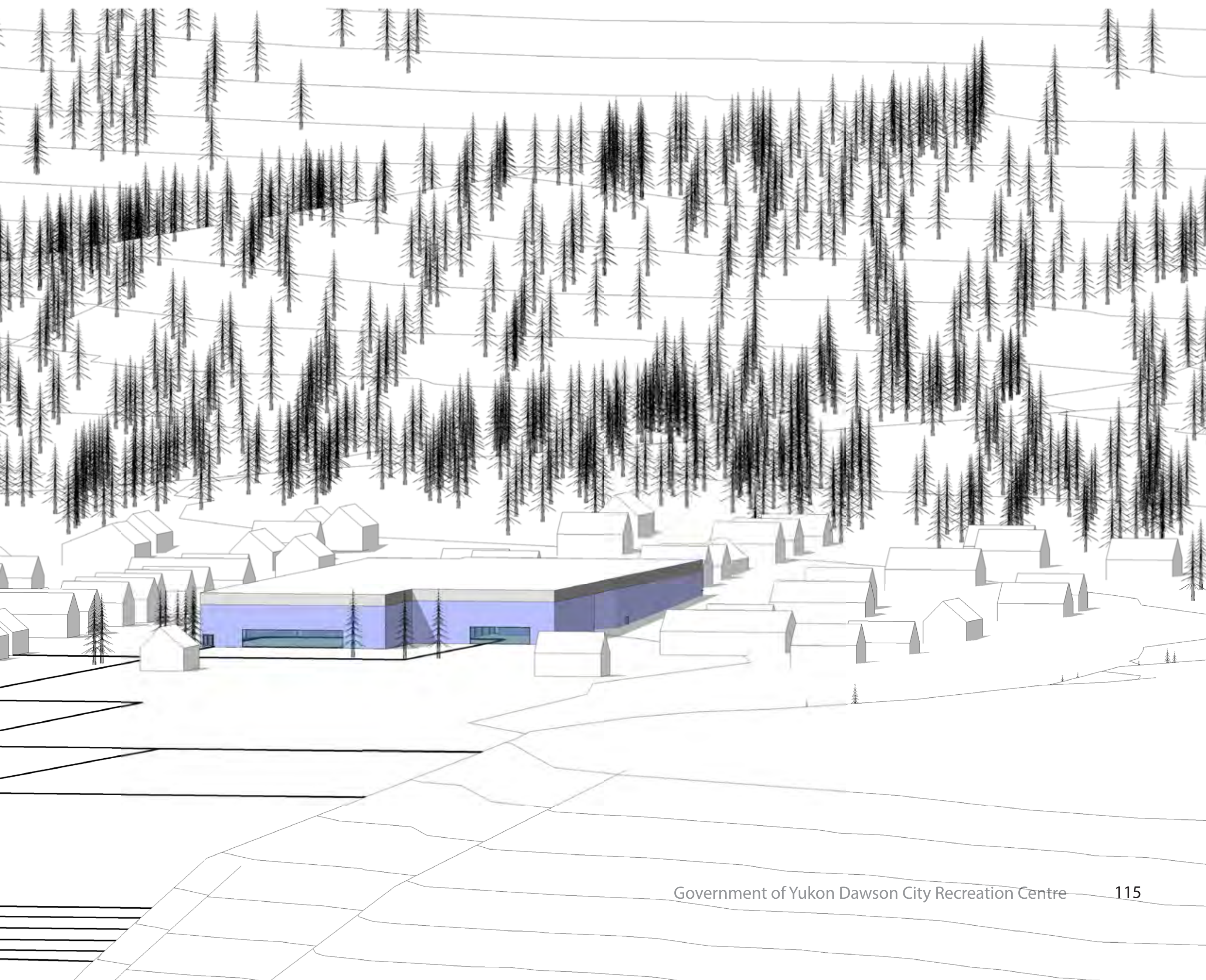
Element	Elemental Cost			Elemental Amount		Rate per m2
	Quantity		Unit Rate	Sub-Total	Total	Sub-Total
A SHELL	8,112	m2			**17,007,400**	
A1 SUBSTRUCTURE					6,349,200	
A11 Foundations	6,186	m2	516.31	3,193,900		393.73
A12 Bulk Excavation/Fill	33,105	m3	74.17	2,455,300		302.68
A13 Special Condititions	1	sum	700,000.00	700,000		86.29
A2 STRUCTURE					5,766,300	
A21 Lowest Floor Construction	6,186	m2	179.87	1,112,700		137.17
A22 Upper Floor Construction	1,925	m2	650.03	1,251,300		154.25
A23 Roof Construction	6,186	m2	550.00	3,402,300		419.42
A3 EXTERIOR ENCLOSRUE					4,891,900	
A31 Walls Below Grade	0	m2	0.00	0		0.00
A32 Walls Above Grade	3,848	m2	600.00	2,308,800		284.62
A33 Windows & Entrances	414	m2	1,377.60	570,300		70.30
A34 Roof Coverings	6,186	m2	275.01	1,701,200		209.71
A35 Projections	8,112	m2	38.41	311,600		38.41
B INTERIORS	8,112	m2			**3,282,500**	
B1 PARTITIONS & DOORS					1,205,800	
B11 Partitions	4,247	m2	221.29	939,800		115.85
B12 Doors	110	No	2,418.31	266,000		32.79
B2 FINISHES					1,162,400	
B32 Floor Finishes	8,112	m2	63.22	512,800		63.21
B22 Ceiling Finishes	8,112	m2	56.53	458,600		56.53
B23 Wall Finishes	11,467	m2	16.66	191,000		23.55
B3 FITTINGS & EQUIPMENT					914,300	
B31 Fittings & Fixtures	8,112	m2	81.12	658,000		81.11
B32 Equipment	8,112	m2	16.18	131,300		16.19
B33 Elevators	1	No	125,000.00	125,000		15.41
C SERVICES	8,112	m2			**9,601,400**	
C1 MECHANICAL					6,824,000	
C11 Plumbing & Drainage	8,112	m2	130.00	1,054,600		130.00
C12 Fire Protection	8,112	m2	42.73	346,600		42.73
C13 HVAC	8,112	m2	608.49	4,936,100		608.49
C14 Controls	8,112	m2	60.00	486,700		60.00
C2 ELECTRICAL					2,777,400	
C21 Service & Distribution	8,112	m2	96.29	781,100		96.29
C22 Lighting, Devices & Heating	8,112	m2	154.80	1,255,700		154.80
C23 Systems & Ancilliaries	8,112	m2	91.30	740,600		91.30
NET BUILDING COST - EXCLUDING SITE	8,112	m2			**29,891,300**	3,684.82
D SITE WORK					1,185,000	
D11 Site Development	4,094	m2	138.00	565,000		
D12 Mechanical Site Services	1	sum	280,000.00	280,000		
D13 Electrical Site Services	1	sum	340,000.00	340,000		
D14 Demolition	0			0		
D15 Alterations	0			0		
NET BUILDING COST - INCLUDING SITE					**31,076,300**	3,830.90
Z1 GENERAL CONDITIONS					16,629,300	
Z10 Location Factor (Dawson, YT)	38%			11,809,000		
Z11 General Conditions	8%			3,430,800		
Z12 Fee	3%			1,389,500		
NET BUILDING COST - EXCLUDING ALLOWANCES					**47,705,600**	5,880.87
Z2 ALLOWANCES					15,659,400	
Z21 Design & Pricing Allowance	15%			7,155,800		
Z22 Escalation Allowance	5%			2,743,100		
Z23 Construction allowance	10%			5,760,500		
TOTAL CONSTRUCTION ESTIMATE - INCLUDING ALLOWANCES					**63,365,000**	7,811.27
VALUE ADDED TAX (GST/HST)	0	%		0	0	
TOTAL CONSTRUCTION ESTIMATE					**63,365,000**	7,811.27

5.4 Gold Rush Option 3

- Area: 8,700 m² (including penthouse area)
- Ice Rink
- Curling Rink
- Fitness Centre
- Gymnasium
- Aquatics
- Total Construction Estimate: $73,332,600
- Parking Stalls: 39




FIFTH AVENUE
DUKE STREET
YORK STREET
FOURTH AVENUE



5.4.1 Gold Rush Option 3 - Building Description

This option is a refreshing and playful approach to an indoor park concept with organic forms and large areas for planting. The entrances are on the East and West sides, away from the minimal available parking.

Amenity areas flow one into another to encourage participation in a variety of recreational activities. This option is intentionally kept to a single floor aside from the utility spaces to reduce the vertical circulation requirements.

A centrally located Canteen/Servery provides convenient access to the public viewing areas and to the Curling Rink Lounge.

Viewing areas for the Ice Rink have been carefully planned to allow for universal access to heated and unheated zones. Ice Rink support areas are similar to other options.

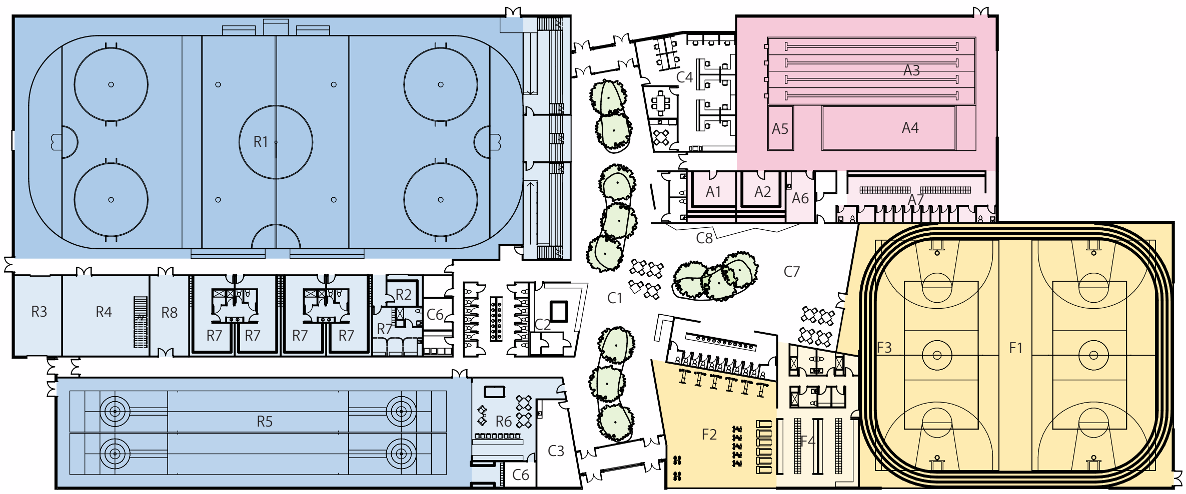
The Curling Rink includes a generous Lounge with dedicated storage as well as a Changing Area with lockers and benches.

The Multipurpose/Gymnasium and the Fitness Centre are co-located to share support areas such as storage and Shower & Change rooms. The Walking/Running Track is at main floor level at the perimeter of the sport courts.

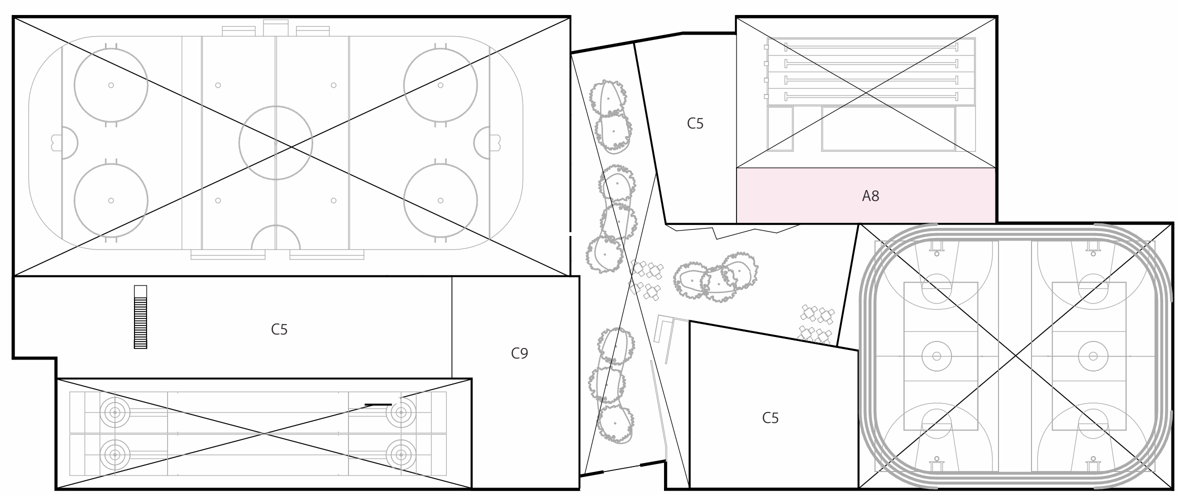
Indoor Playground and Climbing Wall spaces form part of the indoor park concept. Portable barriers could assist to provide safety during peak use periods.

The Pool space has opportunities for glazing and views from two directions, South and East. The Sauna and Steam Room share this space however are located in such a way to encourage use by participants from all recreational activities.

Gold Rush Option 3 – Floor Plans



MAIN FLOOR PLAN



SECOND FLOOR PLAN

COMMON AMENITIES	ICE	FITNESS	AQUATICS
C1 Common Lounge	R1 Ice Rink	F1 Gymnasium	A1 Sauna
C2 Canteen	R2 Skate Sharpening	F2 Fitness Centre	A2 Steam Room
C3 Multi Use Meeting Room	R3 Zamboni	F3 Walking Track	A3 Lap Pool
C4 Office	R4 Ice Plant	F4 Change Room	A4 Kiddie Pool
C5 Mechanical / Electrical	R5 Curling Rink		A5 Hot Tub
C6 Storage	R6 Curling Lounge		A6 Lifeguard / First Aid
C7 Indoor Playground	R7 Change Room		A7 Change Room
C8 Climbing Wall	R8 Rink Storage		A8 Pool Mechanical
C9 Potential Unfinished Area			

Gold Rush Option 3 - Functional Space Program

Room Name	Option 3 Approved FSP	Option 3 Gold Rush Actual	Notes
RECREATION AMENITIES			
Ice Rink (Hockey, Ringette, Skating)	1,874.0	1,909.5	Increased area includes circulation
Ice Rink Viewing Area (unheated)	79.5	133.4	Area increased to suit architectural building features
Ice Rink Viewing Area (heated)	26.5	31.5	
Team Dressing Rooms	240.0	213.4	
Ref Change Room	35.0	35.4	
Skate Sharpening	15.0	15.9	
Zamboni Room	45.0	55.3	
Ice Plant/Mechanical Room	45.0	101.9	SMS recommends area increase to accommodate equipment
Storage	60.0	45.6	Shared with curling rink
Curling Rink	856.0	662.6	Circulation around sheets has been reduced to minimum requirement
Changing Area/Lockers	15.0	11.7	
Lounge	75.0	75.0	
Multipurpose/Flex Space/Gym	762.0	1,227.8	Area can be reduced in future design phases, includes walking track area
Multipurpose/Flex Space	-	-	
Gym Viewing Area	26.5	30.8	
Change Rooms	120.0	162.0	
Fitness Centre	140.0	197.9	Area increased to suit architectural building features
Change Rooms	40.0	incl. above	
Walking Track	250.0	incl. above	
Lap Pool	350.0	344.5	
Kiddie Pool	150.0	166.7	
Hot Tub/Jacuzzi	30.0	36.3	
Change Rooms	180.0	126.8	Area can be increased in future design phases
Lifeguard/First Aid	12.0	13.9	
Pool Mechanical & Chemical Stor	325.0	611.8	Area can be reduced in future design phases
Steam Room	35.0	35.4	
Sauna	35.0	35.4	
Indoor Playground	85.0	89.6	
Climbing Wall	40.0	59.4	Area can be reduced in future design phases
Sub-Total	**5,946.5**	**6,429.5**	
COMMUNITY AMENITIES			
Common Lounge/Entry	75.0	75.0	
Canteen/Servery	63.0	57.0	
Multi-use Party/Meeting Room	30.0	46.6	Area increased to suit architectural building features
Full Team Office	155.0	152.3	
Sub-Total	**323.0**	**330.9**	
LOGISTICS			
Washrooms	132.0	161.9	Area can be reduced in future design phases
Janitor Room	20.0	15.4	
Laundry Facilities	10.0	10.5	
Mechanical	227.5	1,012.9	Area can be reduced in future design phases
Electrical	42.0	incl. above	
Telecom	31.5	incl. above	
Elevator/Lift	12.0	-	
General Storage	130.0	25.1	Consideration can be given to storing items in oversized mechanical area
Sub-Total	**605.0**	**1,225.8**	
Net Total	**6,874.5**	**7,986.2**	
Gross Up (25%)	**1,718.6**	**344.2**	
USABLE AREA	**8,593.1**	**8,330.4**	

Gold Rush Option 3 - Cost Estimate

Element	Elemental Cost			Elemental Amount		Rate per m2
	Quantity		Unit Rate	Sub-Total	Total	Sub-Total
A SHELL	8,700	m2			**19,304,100**	
A1 SUBSTRUCTURE					7,408,000	
A11 Foundations	7,440	m2	516.39	3,841,900		441.60
A12 Bulk Excavation/Fill	38,456	m3	74.14	2,851,100		327.71
A13 Special Condititions	1	sum	715,000.00	715,000		82.18
A2 STRUCTURE					6,246,600	
A21 Lowest Floor Construction	7,440	m2	179.52	1,335,600		153.52
A22 Upper Floor Construction	1,260	m2	650.02	819,000		94.14
A23 Roof Construction	7,440	m2	550.00	4,092,000		470.34
A3 EXTERIOR ENCLOSRUE					5,649,500	
A31 Walls Below Grade	0	m2	0.00	0		0.00
A32 Walls Above Grade	3,780	m2	600.00	2,268,000		260.69
A33 Windows & Entrances	745	m2	1,385.04	1,031,900		118.61
A34 Roof Coverings	7,440	m2	275.01	2,046,100		235.18
A35 Projections	8,700	m2	34.88	303,500		34.89
B INTERIORS	8,700	m2			**3,686,800**	
B1 PARTITIONS & DOORS					1,460,600	
B11 Partitions	5,398	m2	221.30	1,194,600		137.31
B12 Doors	110	No	2,418.31	266,000		30.57
B2 FINISHES					1,309,400	
B32 Floor Finishes	8,700	m2	67.57	587,900		67.57
B22 Ceiling Finishes	8,700	m2	54.55	474,600		54.55
B23 Wall Finishes	14,575	m2	16.94	246,900		28.38
B3 FITTINGS & EQUIPMENT					916,800	
B31 Fittings & Fixtures	8,700	m2	79.87	694,900		79.87
B32 Equipment	8,700	m2	11.14	96,900		11.14
B33 Elevators	1	No	125,000.00	125,000		14.37
C SERVICES	8,700	m2			**10,939,100**	
C1 MECHANICAL					7,977,300	
C11 Plumbing & Drainage	8,700	m2	178.00	1,548,600		178.00
C12 Fire Protection	8,700	m2	42.28	367,800		42.28
C13 HVAC	8,700	m2	604.64	5,260,400		604.64
C14 Controls	8,700	m2	92.01	800,500		92.01
C2 ELECTRICAL					2,961,800	
C21 Service & Distribution	8,700	m2	93.62	814,500		93.62
C22 Lighting, Devices & Heating	8,700	m2	154.80	1,346,800		154.80
C23 Systems & Ancilliaries	8,700	m2	92.01	800,500		92.01
NET BUILDING COST - EXCLUDING SITE	8,700	m2			**33,930,000**	3,900.00
D SITE WORK					1,053,900	
D11 Site Development	2,840	m2	138.00	391,900		
D12 Mechanical Site Services	1	sum	300,000.00	300,000		
D13 Electrical Site Services	1	sum	362,000.00	362,000		
D14 Demolition	0			0		
D15 Alterations	0			0		
NET BUILDING COST - INCLUDING SITE					**34,983,900**	4,021.14
Z1 GENERAL CONDITIONS					18,720,300	
Z10 Location Factor (Dawson, YT)	38%			13,293,900		
Z11 General Conditions	8%			3,862,200		
Z12 Fee	3%			1,564,200		
NET BUILDING COST - EXCLUDING ALLOWANCES					**53,704,200**	6,172.90
Z2 ALLOWANCES					17,628,400	
Z21 Design & Pricing Allowance	15%			8,055,600		
Z22 Escalation Allowance	5%			3,088,000		
Z23 Construction allowance	10%			6,484,800		
TOTAL CONSTRUCTION ESTIMATE - INCLUDING ALLOWANCES					**71,332,600**	8,199.15
VALUE ADDED TAX (GST/HST)	0	%		0	0	
TOTAL CONSTRUCTION ESTIMATE					**71,332,600**	8,199.15

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6.0

Dome Road Design Options

6.0 Dome Road Design Options

The following pages introduce the Dome Road site in general and end with the three test fit options on the site. Also included are the FSPs adjusted for the exact changes as a result of the test fits, as well as a breakdown of the building costs, extrapolated from Hanscomb's four Class D cost estimates. Larger images of the plans and elevations created for the purpose of energy modeling are found in Appendix A. It is important to note the three dimensional designs of these buildings were only created to complete the structural and energy analyses, and should not be considered final designs.

6.1 Dome Road

The Dome Road site is surrounded by lower density residential and highways. It is a much larger site and is a brownfield site from gold mining. It isn't as easy to reach on foot, but there is enough room on this site for ample parking.

6.1.1 Views

Embraced by Dome Mountain on the North, the South facing windows are greeted by a low mountain range across the Klondike River.

Aerial view of the Dome Road site

6.1.2 Design Guidelines

The Dome Road site is located in the Valley, Confluence, and Bowl Heritage Area, which does not require heritage guidelines to be adopted, however following the ‘Dawson Style’ or “good contemporary style” is recommended. New buildings in this area should not be designed to imitate the Gold Rush Style.

Existing natural and historic landscape features that are deemed valuable to the community are to be protected.

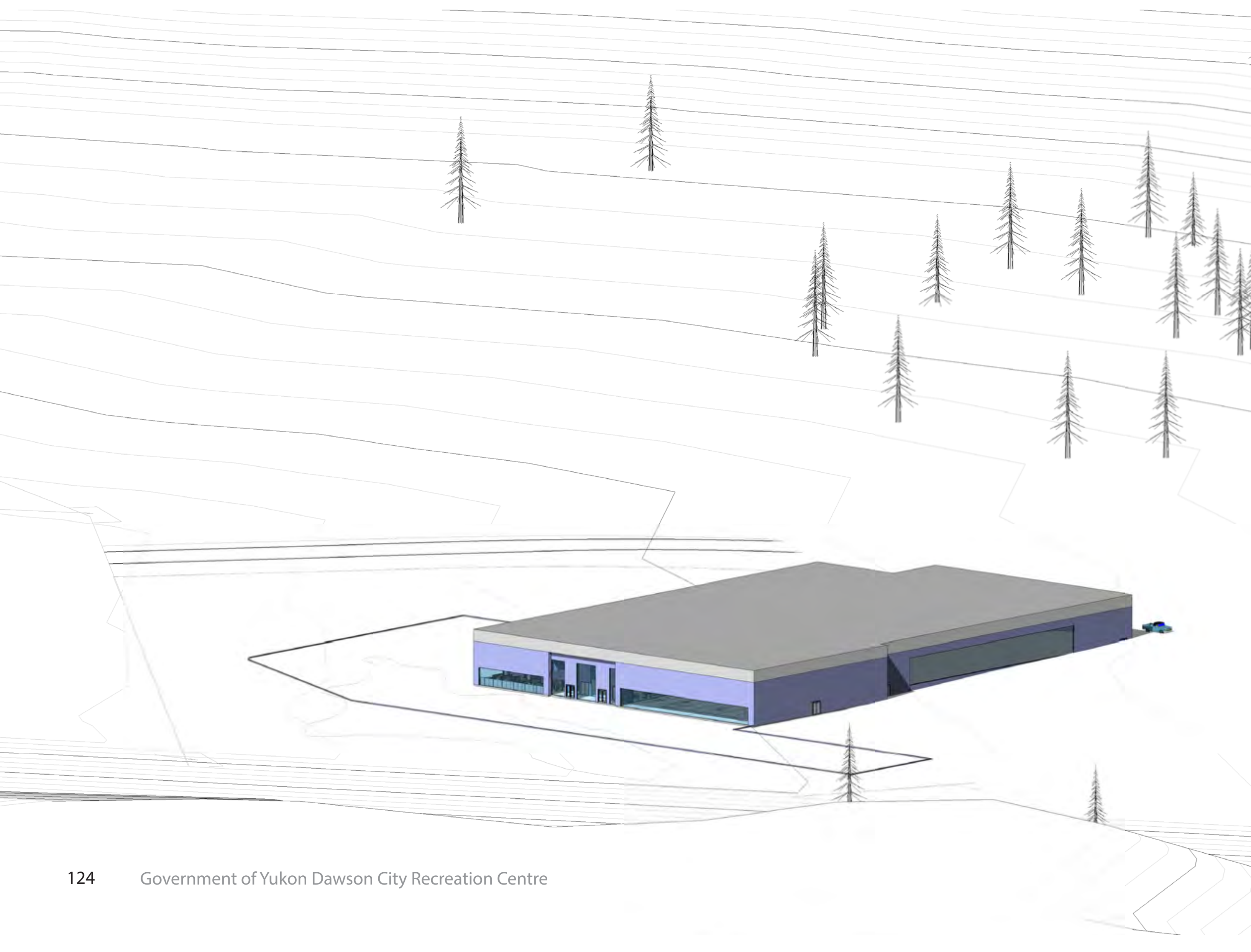
6.1.3 Zoning

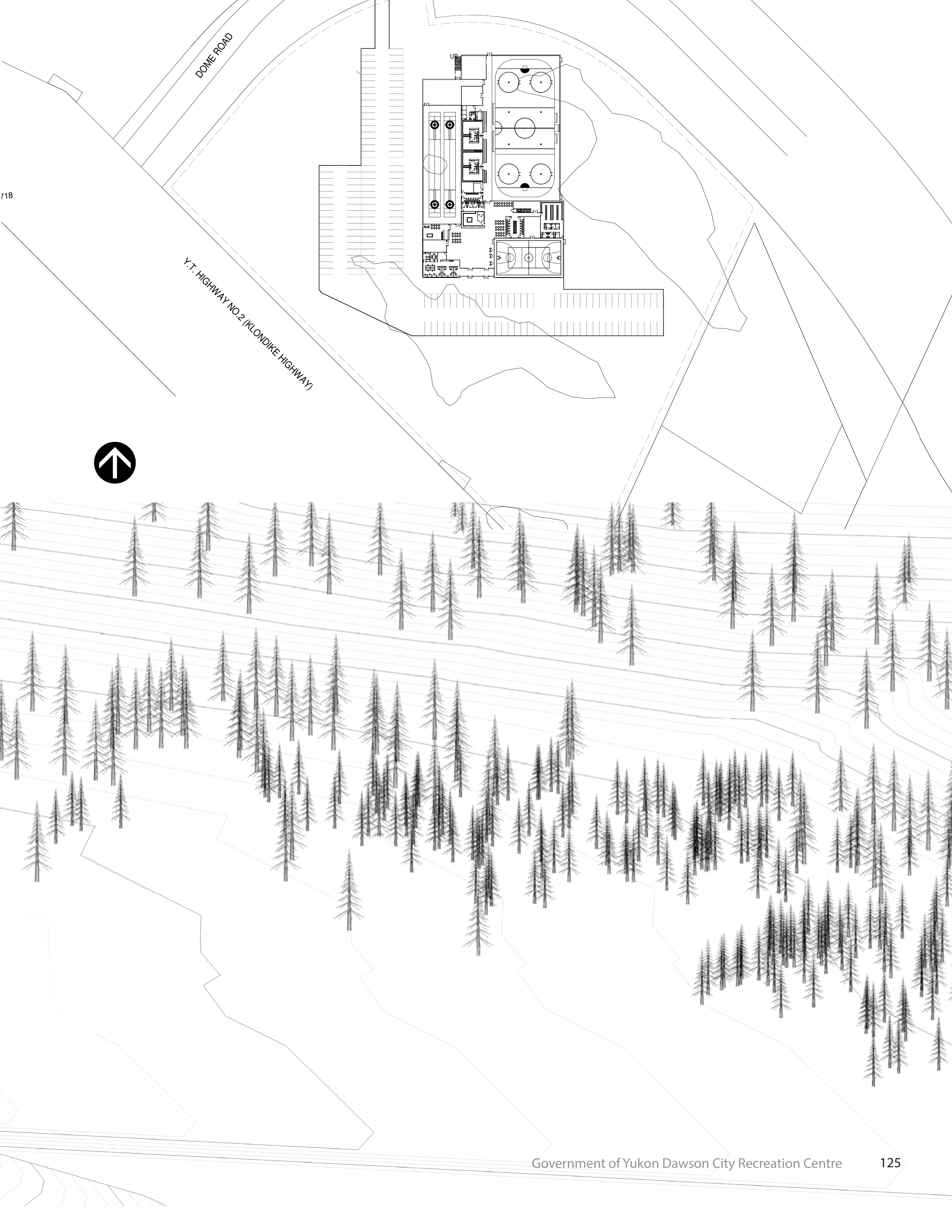
This site is currently zoned P2 Institutional and would not need any variances. Due to the size of the site, the parking required for zoning can easily be met.

View of Dome Road facing North - From Pre-Planning Report

6.2 Dome Road Option 1

- Area: 6590 m^2 (including penthouse areas)
- Ice Rink
- Curling Rink
- Multi-purpose Space
- Total Construction Estimate: $54,109,400
- Parking Stalls: 193




DOME ROAD
UP
718
Y.T. HIGHWAY NO.2 (KLONDIKE HIGHWAY)

6.2.1 Dome Road Option 1 - Building Description

This option provides a compact building footprint characterized by aligning the long linear forms of the Ice Rink and Curling Rink with common services located in between.

While there is a fair degree of southern glazing, a large window is offered to the ice rink that looks east towards the far mountains. Spectators can enjoy the game while also taking in the beauty of the surrounding environment. As it is east facing on this site, glare is not a concern.

The entry vestibule serves as a large mudroom where patrons can leave soiled outdoor footwear and transition to clean athletic gear. As patrons continue into the building, the Common Lounge provides a focal point, forming the majority of the circulation between amenities and allowing heated seating areas with views into each of the major recreation spaces.

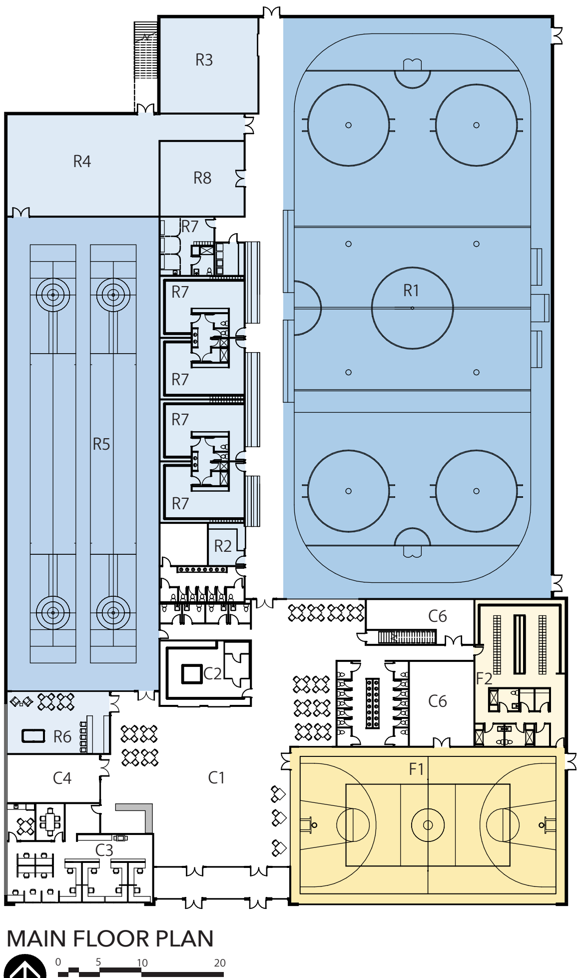
The Curling Rink Lounge provides great views down the rink sheets. The lounge is in close proximity to the Canteen/Servery for food service options.

The Ice Rink features separate public washroom facilities and several sections of viewing bleachers.

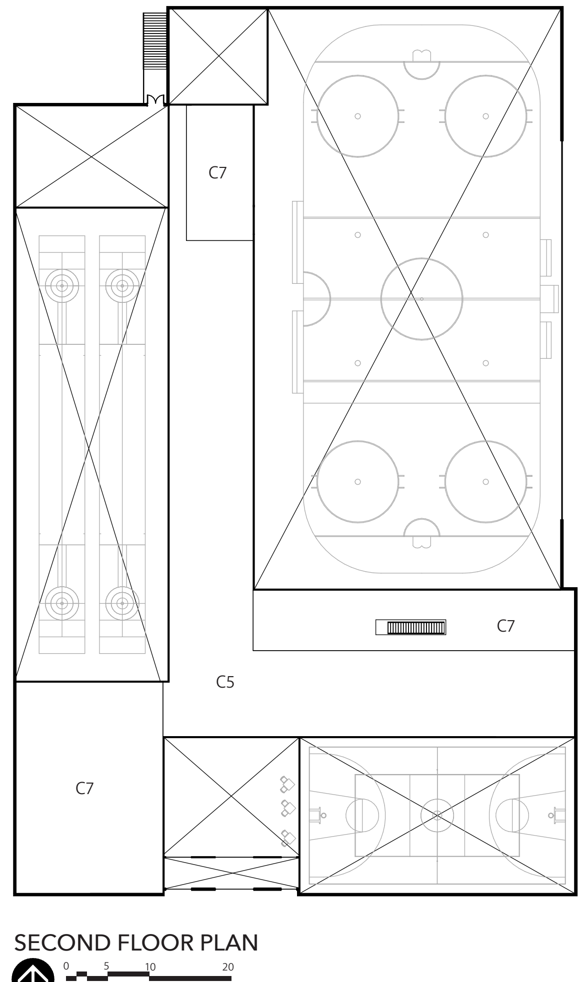
The Multipurpose/Gym is directly accessible from the Common Lounge and has generous storage and shower/change rooms with convenient direct access. Should the community require a larger gym facility in the future, the space could be expanded to the South.

The Office area adjacent to the entry allows for effective supervision and client service and maximized daylighting into the workstation area.

Dome Road Option 1 - Floor Plans



MAIN FLOOR PLAN



SECOND FLOOR PLAN

COMMON AMENITIES	ICE	FITNESS	AQUATICS
C1 Common Lounge	R1 Ice Rink	F1 Gymnasium	
C2 Canteen	R2 Skate Sharpening	F2 Change Room	
C3 Office	R3 Zamboni		
C4 Indoor Playground	R4 Ice Plant		
C5 Mechanical / Electrical	R5 Curling Rink		
C6 Storage	R6 Curling Lounge		
C7 Potential Unfinished Area	R7 Change Room		
	R8 Rink Storage		

Dome Road Option 1 - Functional Space Program

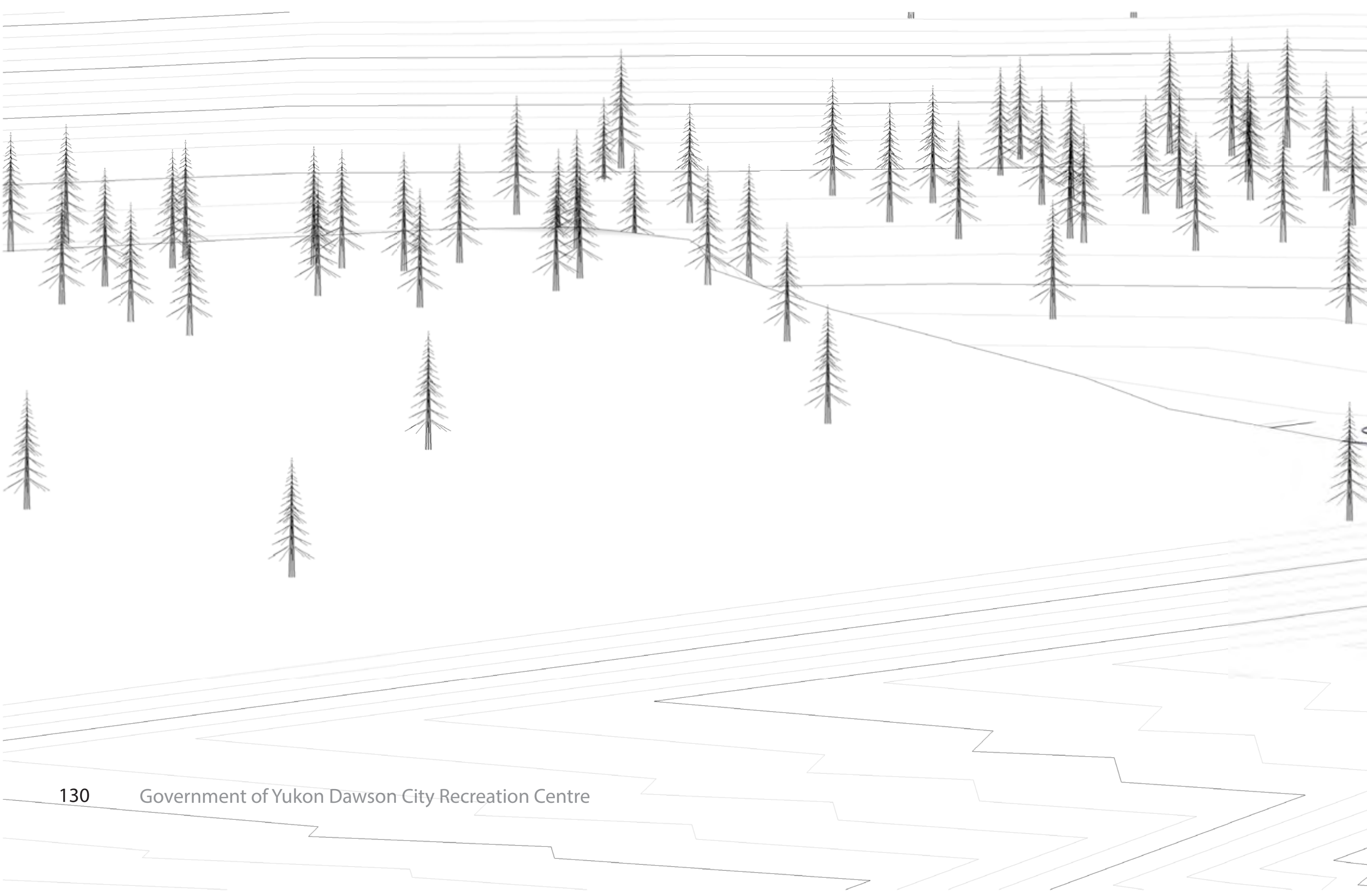
Room Name	Option 1 Approved FSP	Option 1 Dome Road Actual	Notes
RECREATION AMENITIES			
Ice Rink (Hockey, Ringette, Skating)	1,874.0	2,041.5	Increased area includes circulation
Ice Rink Viewing Area (unheated)	79.5	74.6	
Ice Rink Viewing Area (heated)	-	-	
Team Dressing Rooms	240.0	244.7	
Ref Change Room	35.0	36.6	
Skate Sharpening	15.0	17.9	
Zamboni Room	45.0	111.3	Increased area to suit architectural building features
Ice Plant/Mechanical Room	45.0	209.8	SMS recommends area increase to accommodate equipment
Storage	60.0	76.4	
Curling Rink	856.0	858.2	
Changing Area/Lockers	-	-	
Lounge	75.0	75.0	
Multipurpose/Flex Space/Gym	-	-	
Multipurpose/Flex Space	500.0	510.0	
Gym Viewing Area	-	-	
Change Rooms	60.0	156.8	Increased area to suit architectural building features
Fitness Centre	-	-	
Change Rooms	-	-	
Walking Track	-	-	
Lap Pool	-	-	
Kiddie Pool	-	-	
Hot Tub/Jacuzzi	-	-	
Change Rooms	-	-	
Lifeguard/First Aid	-	-	
Pool Mechanical & Chemical Stor	-	-	
Steam Room	-	-	
Sauna	-	-	
Indoor Playground	-	52.5	Included as a value-added feature
Climbing Wall	-	-	
Sub-Total	**3,884.5**	**4,465.3**	
COMMUNITY AMENITIES			
Common Lounge/Entry	75.0	75.0	
Canteen/Servery	63.0	68.6	
Multi-use Party/Meeting Room	-	-	
Full Team Office	155.0	152.8	
Sub-Total	**293.0**	**296.4**	
LOGISTICS			
Washrooms	100.0	145.0	Additional washroom stalls can be reduced in future design phases
Janitor Room	20.0	23.5	
Laundry Facilities	10.0	11.2	
Mechanical	227.5	873.4	Area can be reduced significantly in later design phases
Electrical	42.0	incl. above	
Telecom	31.5	incl. above	
Elevator/Lift	12.0	-	
General Storage	80.0	108.4	
Sub-Total	**523.0**	**1,161.5**	
Net Total	**4,700.5**	**5,923.2**	
Gross Up (35%)	**1,645.2**	**604.2**	
USABLE AREA	**6,345.7**	**6,527.4**	

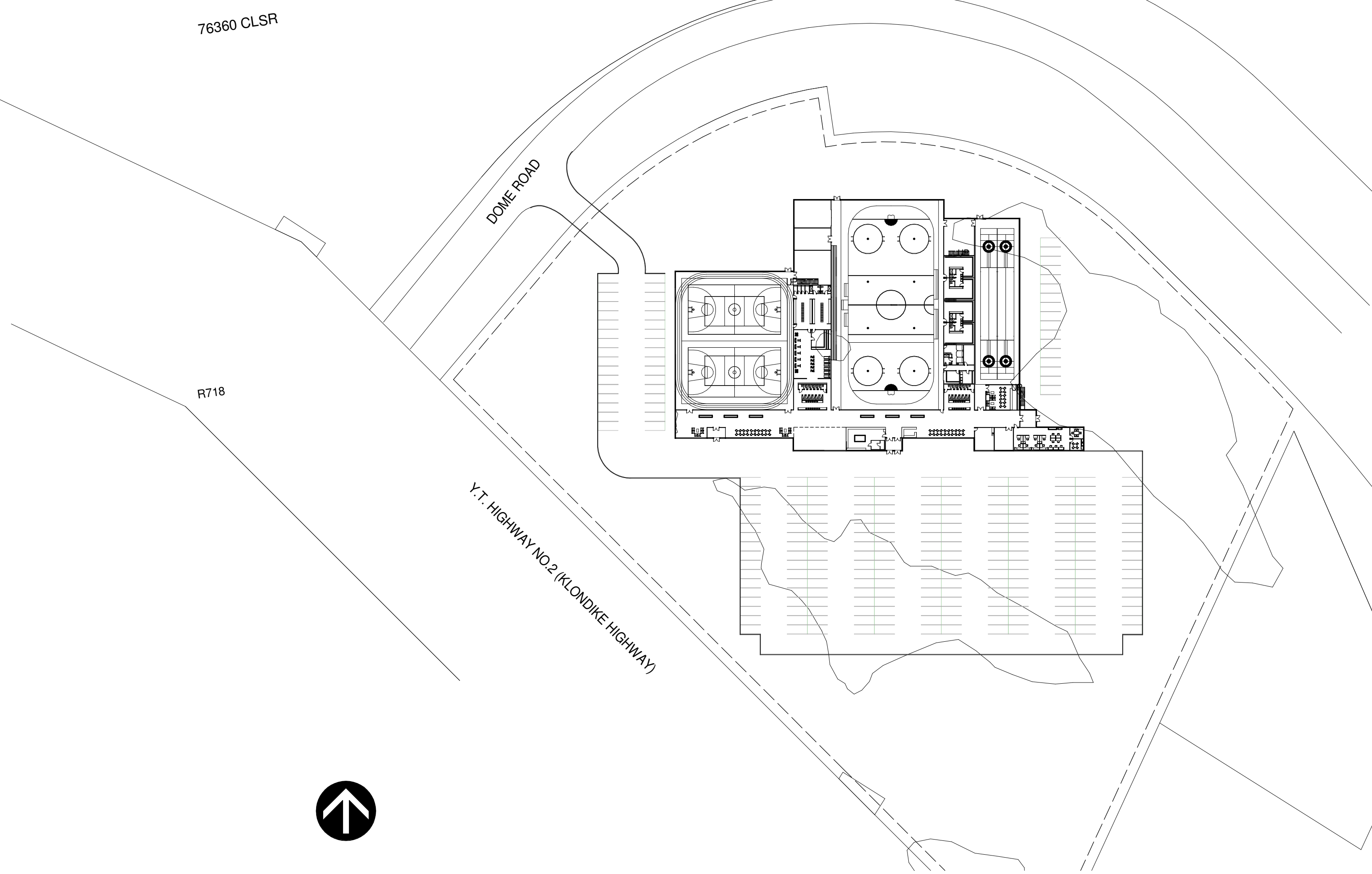
Dome Road Option 1 - Cost Estimate

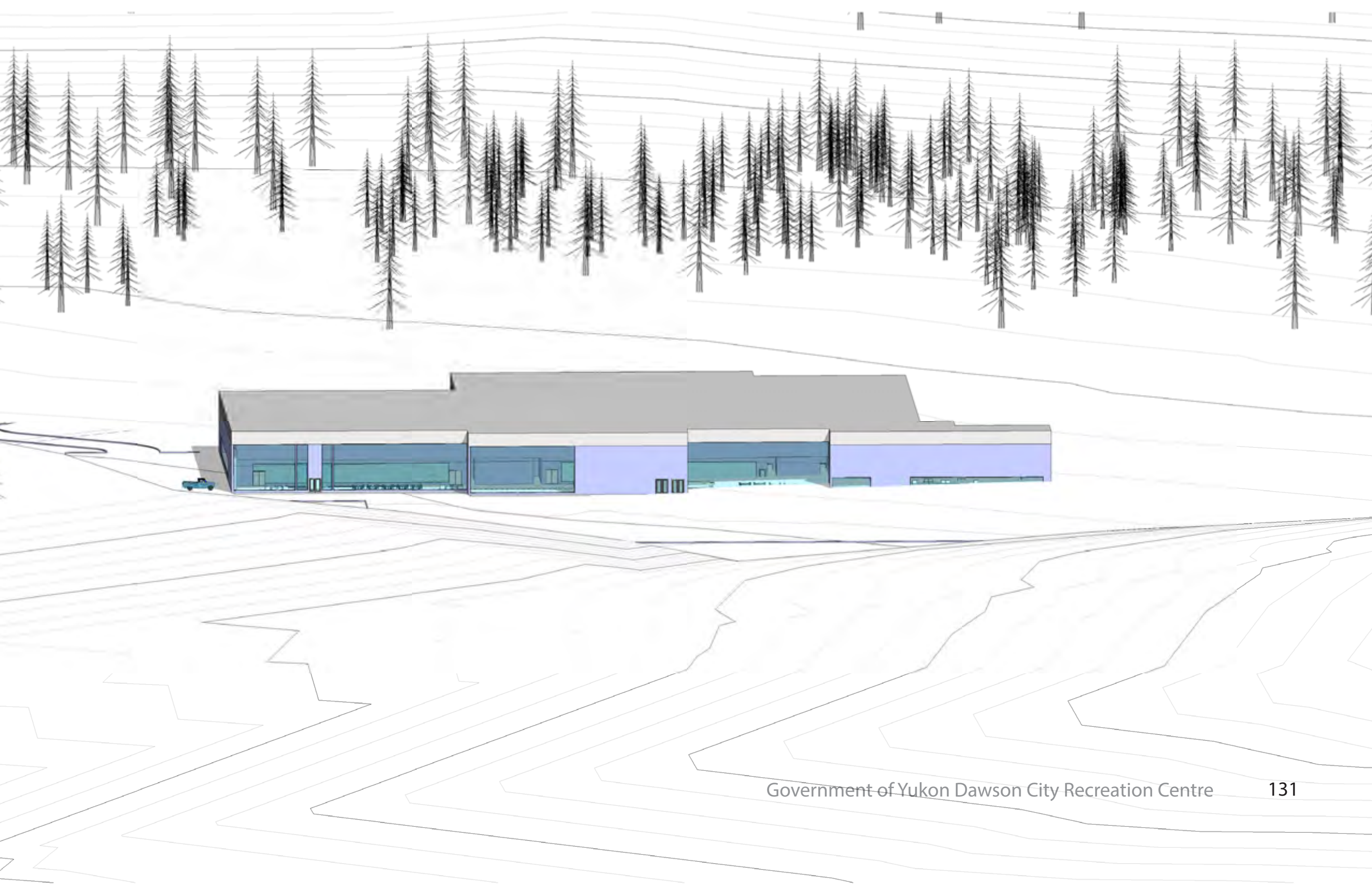
Element	Elemental Cost			Elemental Amount		Rate per m2
	Quantity		Unit Rate	Sub-Total	Total	Sub-Total
A SHELL	6,590	m2			**13,072,900**	
A1 SUBSTRUCTURE					4,608,700	
A11 Foundations	5,720	m2	516.04	2,951,700		447.91
A12 Bulk Excavation/Fill	18,970	m3	74.17	1,407,000		213.51
A13 Special Condititions	1	sum	250,000.00	250,000		37.94
A2 STRUCTURE					4,755,600	
A21 Lowest Floor Construction	5,720	m2	182.52	1,044,000		158.42
A22 Upper Floor Construction	870	m2	650.00	565,500		85.81
A23 Roof Construction	5,720	m2	550.01	3,146,100		477.41
A3 EXTERIOR ENCLOSRUE					3,708,600	
A31 Walls Below Grade	0	m2	0.00	0		0.00
A32 Walls Above Grade	2,858	m2	600.00	1,714,800		260.21
A33 Windows & Entrances	91	m2	1,491.21	135,700		20.59
A34 Roof Coverings	5,720	m2	275.01	1,573,100		238.71
A35 Projections	6,590	m2	43.25	285,000		43.25
B INTERIORS	6,590	m2			**2,428,100**	
B1 PARTITIONS & DOORS					969,300	
B11 Partitions	3,465	m2	221.21	766,500		116.31
B12 Doors	83	No	2,442.86	202,800		30.77
B2 FINISHES					816,400	
B32 Floor Finishes	6,590	m2	44.46	293,000		44.46
B22 Ceiling Finishes	6,590	m2	56.69	373,600		56.69
B23 Wall Finishes	9,355	m2	16.01	149,800		22.73
B3 FITTINGS & EQUIPMENT					642,400	
B31 Fittings & Fixtures	6,590	m2	81.77	538,900		81.78
B32 Equipment	6,590	m2	15.71	103,500		15.71
B33 Elevators	1	No		0		0.00
C SERVICES	6,590	m2			**8,203,200**	
C1 MECHANICAL					5,934,000	
C11 Plumbing & Drainage	6,590	m2	144.04	949,200		144.04
C12 Fire Protection	6,590	m2	44.71	294,600		44.70
C13 HVAC	6,590	m2	651.72	4,294,800		651.71
C14 Controls	6,590	m2	60.00	395,400		60.00
C2 ELECTRICAL					2,269,200	
C21 Service & Distribution	6,590	m2	96.51	636,000		96.51
C22 Lighting, Devices & Heating	6,590	m2	154.78	1,020,000		154.78
C23 Systems & Ancilliaries	6,590	m2	93.05	613,200		93.05
NET BUILDING COST - EXCLUDING SITE	6,590	m2			**23,704,200**	3,597.00
D SITE WORK					2,832,900	
D11 Site Development	27,330	m2	81.70	2,232,900		
D12 Mechanical Site Services	1	sum	280,000.00	280,000		
D13 Electrical Site Services	1	sum	320,000.00	320,000		
D14 Demolition	0			0		
D15 Alterations	0			0		
NET BUILDING COST - INCLUDING SITE					**26,537,100**	4,026.87
Z1 GENERAL CONDITIONS					14,200,300	
Z10 Location Factor (Dawson, YT)	38%			10,084,100		
Z11 General Conditions	8%			2,929,700		
Z12 Fee	3%			1,186,500		
NET BUILDING COST - EXCLUDING ALLOWANCES					**40,737,400**	6,181.70
Z2 ALLOWANCES					13,372,000	
Z21 Design & Pricing Allowance	15%			6,110,600		
Z22 Escalation Allowance	5%			2,342,400		
Z23 Construction allowance	10%			4,919,000		
TOTAL CONSTRUCTION ESTIMATE - INCLUDING ALLOWANCES					**54,109,400**	8,210.83
VALUE ADDED TAX (GST/HST)	0	%		0	0	
TOTAL CONSTRUCTION ESTIMATE					**54,109,400**	8,210.83

6.3 Dome Road Option 2

- Area: 7918 m^2 (including penthouse areas)
- Ice Rink
- Curling Rink
- Fitness
- Total Construction Estimate: $64,875,900
- Parking Stalls: 269




76360 CLSR
DOME ROAD
R718
Y.T. HIGHWAY NO.2 (KLONDIKE HIGHWAY)



6.3.1 Dome Road Option 2 - Building Description

The design concept for Dome Road Option 2 spreads the amenities side by side, connecting them with a linear circulation zone that provides community gathering, viewing areas with significant sightlines into amenities, and allows light to flow in from the south and reach all the spaces. The expansive windows on the south are paired with glazing on the interior walls to the amenities, allowing both views and light in. All amenity areas are on the ground floor level with utility spaces above the support spaces between the large amenity areas.

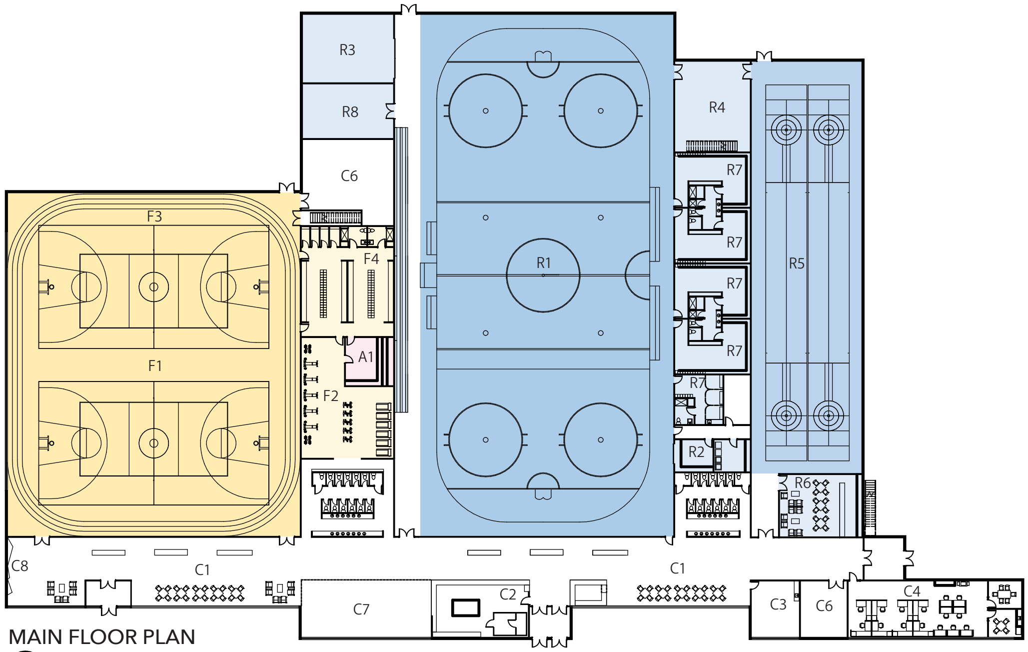
The Common Lounge floor area is spread out along the circulation spine highlighted by the climbing wall at one end with the Indoor Playground and Canteen/Servery centrally located in the space. The Office and Multi-purpose Party/Meeting Room are located at the opposite end of the circulation area providing some acoustic separation from the hub of activity.

The Ice Rink has centrally located viewing bleachers to provide optimal views from all seats. Ice Plant/ Mechanical space can be directly accessed from the Ice Rink and from the Curling Rink.

The Curling Rink Lounge provides the best viewing area of the activity in the Curling Rink.

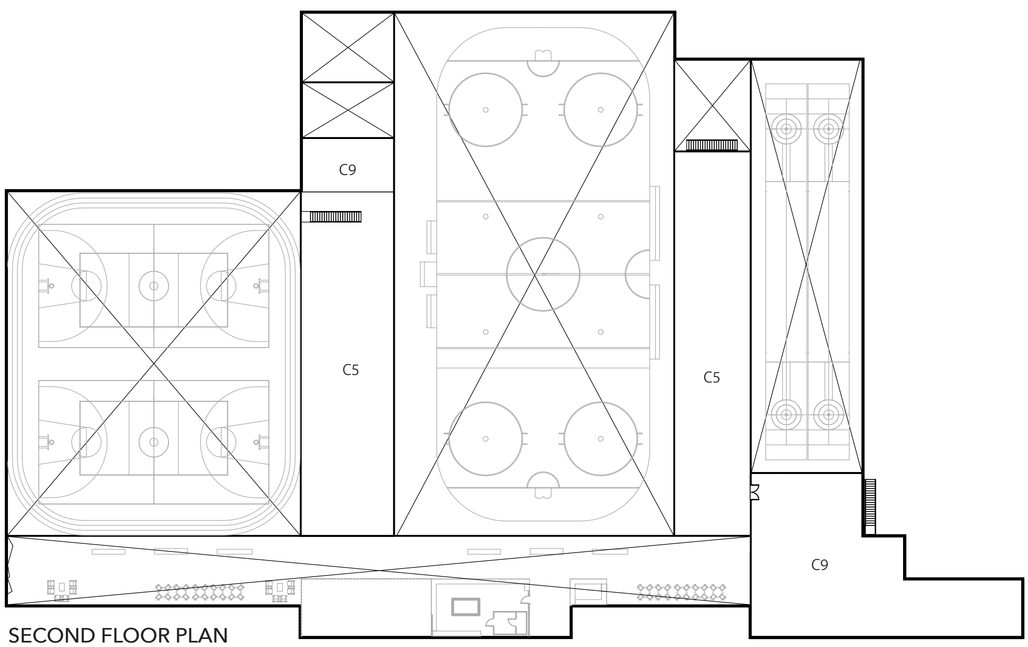
Expansive windows offer daylight and views into the Gym, which is sized to allow the Walking/Running Track to occupy the perimeter. General Storage, Change & Shower Rooms and the Fitness Centre are directly adjacent to the Gymnasium for ease of access. Glazing allows views from the Fitness Centre into the Gymnasium. The Sauna can be accessed from the Fitness Centre or from the Shower & Change Rooms.

Dome Road Option 2 - Floor Plans



MAIN FLOOR PLAN

0 5 10 20



SECOND FLOOR PLAN

0 5 10 20

COMMON AMENITIES

- C1 Common Lounge
- C2 Canteen
- C3 Multi Use Meeting Room
- C4 Office
- C5 Mechanical / Electrical
- C6 Storage
- C7 Indoor Playground
- C8 Climbing Wall
- C9 Potential Unfinished Area

ICE

- R1 Ice Rink
- R2 Skate Sharpening
- R3 Zamboni
- R4 Ice Plant
- R5 Curling Rink
- R6 Curling Lounge
- R7 Change Room
- R8 Rink Storage

FITNESS

- F1 Gymnasium
- F2 Fitness Centre
- F3 Walking Track
- F4 Change Room

AQUATICS

- A1 Sauna

Dome Road Option 2 - Functional Space Program

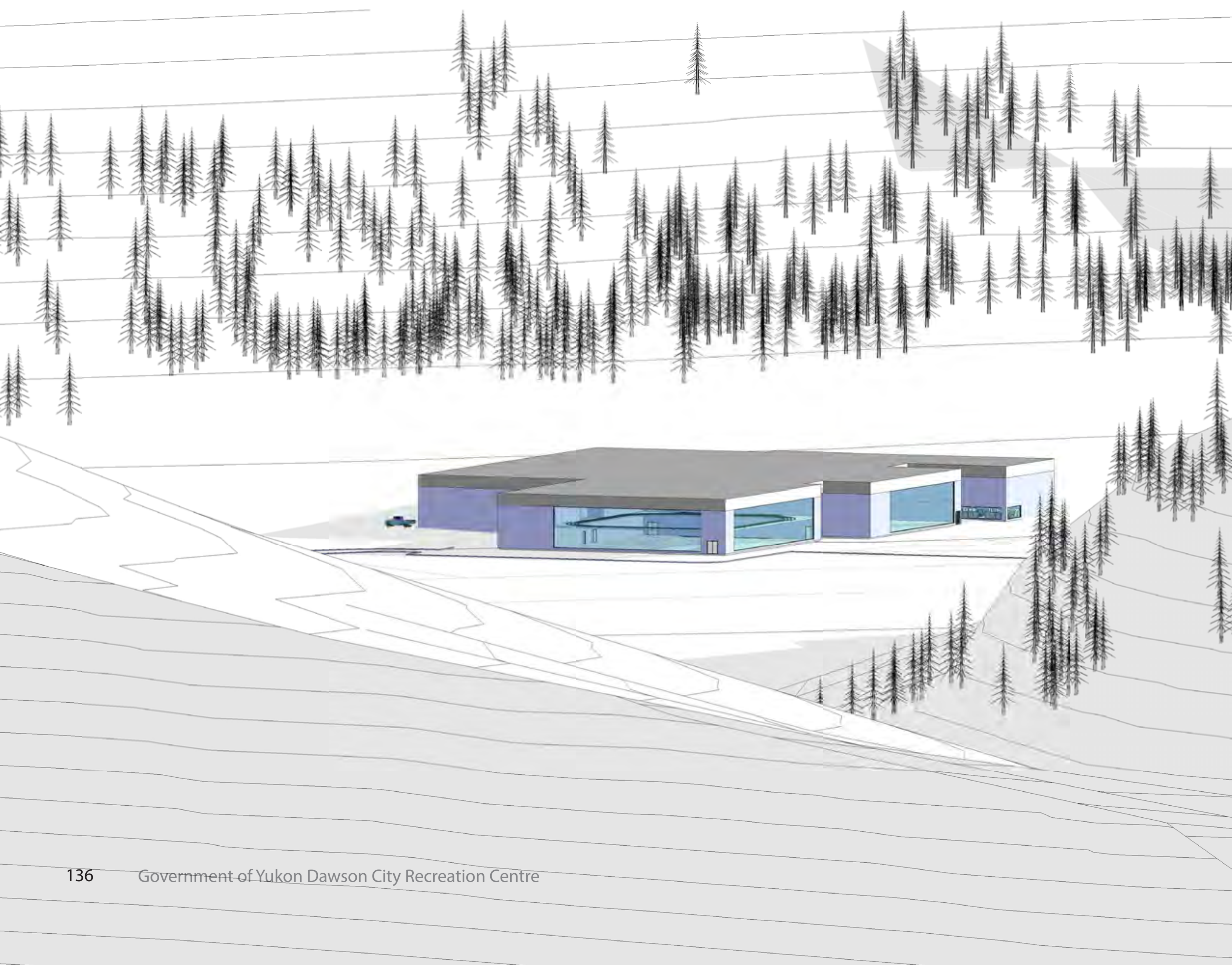
Room Name	Option 2 Approved FSP	Option 2 Dome Road Actual	Notes
RECREATION AMENITIES			
Ice Rink (Hockey, Ringette, Skating)	1,874.0	2,052.4	Increased area includes circulation
Ice Rink Viewing Area (unheated)	79.5	99.9	
Ice Rink Viewing Area (heated)	-	64.9	Included as a value-added feature
Team Dressing Rooms	240.0	244.7	
Ref Change Room	35.0	34.8	
Skate Sharpening	15.0	17.9	
Zamboni Room	45.0	92.1	Increased area to suit architectural building features
Ice Plant/Mechanical Room	45.0	88.3	SMS recommends area increase to accommodate equipment
Storage	60.0	73.3	Shared with curling rink
Curling Rink	856.0	695.4	Circulation around sheets has been reduced to minimum requirement
Changing Area/Lockers	-	-	
Lounge	75.0	76.0	
Multipurpose/Flex Space/Gym	762.0	1,485.0	Area can be reduced in future design phases, includes walking track area
Multipurpose/Flex Space	-	-	
Gym Viewing Area	-	61.6	Included as a value-added feature
Change Rooms	120.0	150.7	
Fitness Centre	140.0	128.6	
Change Rooms	40.0	incl. above	
Walking Track	250.0	incl. above	
Lap Pool	-	-	
Kiddie Pool	-	-	
Hot Tub/Jacuzzi	-	-	
Change Rooms	-	-	
Lifeguard/First Aid	-	-	
Pool Mechanical & Chemical Stor	-	-	
Steam Room	-	-	
Sauna	35.0	33.6	
Indoor Playground	85.0	110.6	Area can be reduced in future design phases
Climbing Wall		26.6	Included as a value-added feature
Sub-Total	**4,756.5**	**5,536.4**	
COMMUNITY AMENITIES			
Common Lounge/Entry	75.0	75.0	
Canteen/Servery	63.0	83.8	
Multi-use Party/Meeting Room	30.0	39.4	
Full Team Office	155.0	143.5	
Sub-Total	**323.0**	**341.7**	
LOGISTICS			
Washrooms	120.0	136.3	
Janitor Room	20.0	19.2	
Laundry Facilities	10.0	17.2	Area increased to suit architectural building features
Mechanical	227.5	901.8	Area can be reduced in future design phases
Electrical	42.0	incl. above	
Telecom	31.5	incl. above	
Elevator/Lift	12.0	-	
General Storage	130.0	140.6	
Sub-Total	**593.0**	**1,215.1**	
Net Total	**5,672.5**	**7,093.2**	
Gross Up (25%)	**1,418.1**	**704.2**	
USABLE AREA	**7,090.6**	**7,797.4**	

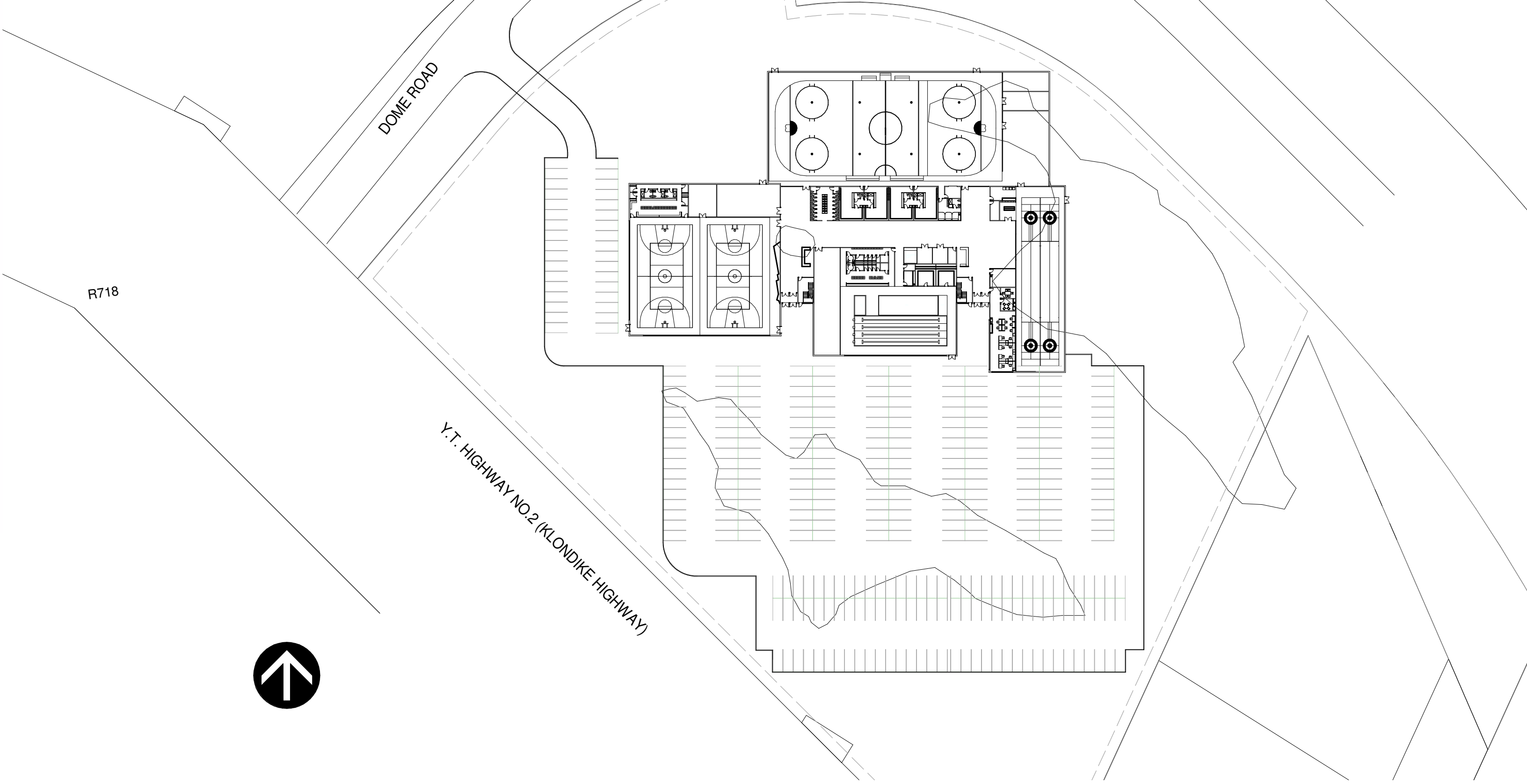
Dome Road Option 2 - Cost Estimate

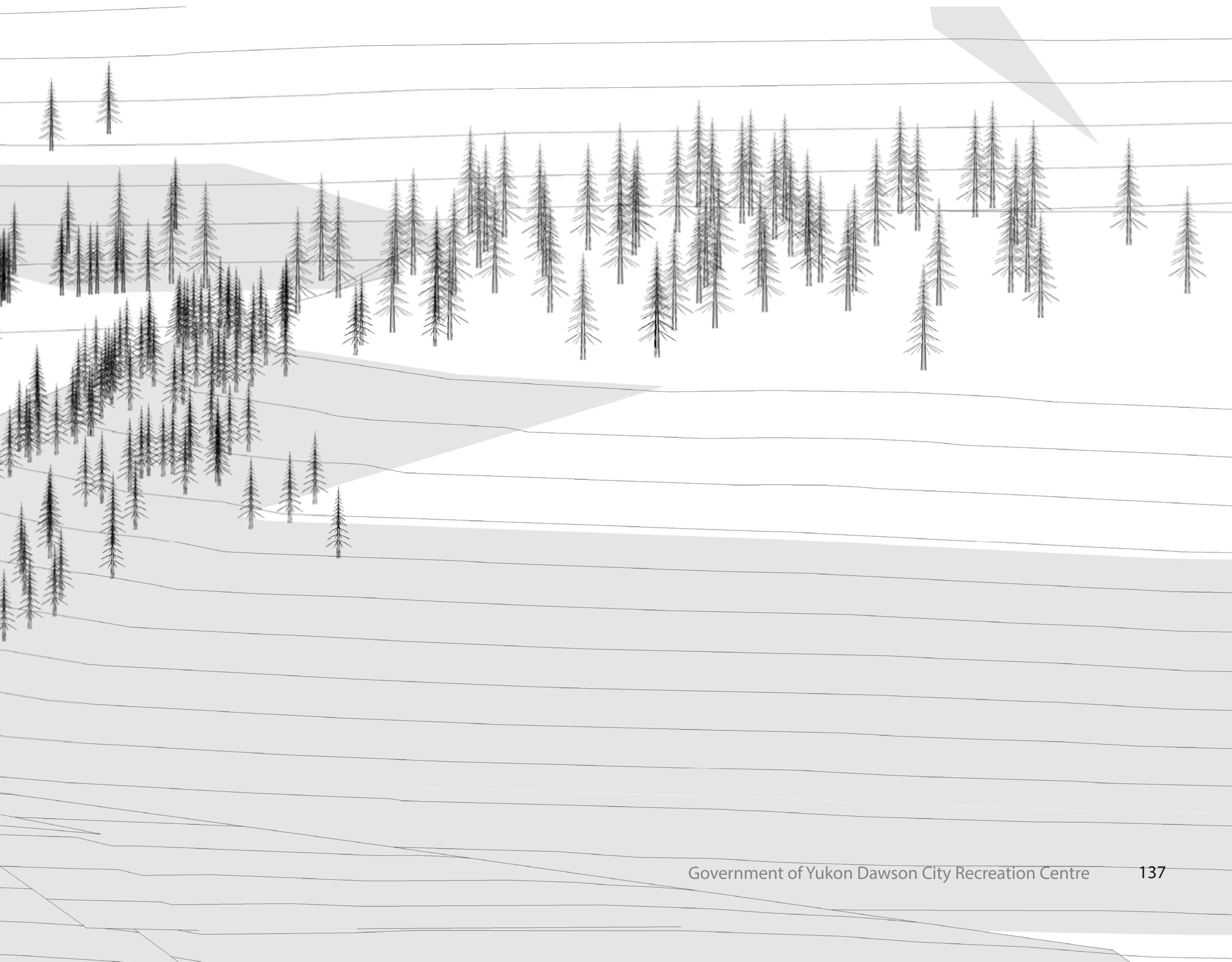
Element	Elemental Cost			Elemental Amount		Rate per m2
	Quantity		Unit Rate	Sub-Total	Total	Sub-Total
A SHELL	7,918	m2			**16,499,800**	
A1 SUBSTRUCTURE					5,669,300	
A11 Foundations	7,018	m2	516.31	3,623,500		457.63
A12 Bulk Excavation/Fill	23,538	m3	74.17	1,745,800		220.48
A13 Special Condititions	1	sum	300,000.00	300,000		37.89
A2 STRUCTURE					5,707,200	
A21 Lowest Floor Construction	7,018	m2	179.87	1,262,300		159.42
A22 Upper Floor Construction	900	m2	650.03	585,000		73.88
A23 Roof Construction	7,018	m2	550.00	3,859,900		487.48
A3 EXTERIOR ENCLOSRUE					5,123,300	
A31 Walls Below Grade	0	m2	0.00	0		0.00
A32 Walls Above Grade	3,848	m2	600.00	2,308,800		291.59
A33 Windows & Entrances	442	m2	1,377.60	608,900		76.90
A34 Roof Coverings	7,018	m2	275.01	1,930,000		243.75
A35 Projections	7,918	m2	34.81	275,600		34.81
B INTERIORS	7,918	m2			**2,938,400**	
B1 PARTITIONS & DOORS					1,048,900	
B11 Partitions	3,800	m2	221.29	840,900		106.20
B12 Doors	86	No	2,418.31	208,000		26.27
B2 FINISHES					1,119,100	
B32 Floor Finishes	7,918	m2	63.22	500,600		63.22
B22 Ceiling Finishes	7,918	m2	56.53	447,600		56.53
B23 Wall Finishes	10,260	m2	16.66	170,900		21.58
B3 FITTINGS & EQUIPMENT					770,400	
B31 Fittings & Fixtures	7,918	m2	81.12	642,300		81.12
B32 Equipment	7,918	m2	16.18	128,100		16.18
B33 Elevators	1	No		0		0.00
C SERVICES	7,918	m2			**9,330,500**	
C1 MECHANICAL					6,619,500	
C11 Plumbing & Drainage	7,918	m2	124.79	988,100		124.79
C12 Fire Protection	7,918	m2	42.73	338,300		42.73
C13 HVAC	7,918	m2	608.49	4,818,000		608.49
C14 Controls	7,918	m2	60.00	475,100		60.00
C2 ELECTRICAL					2,711,000	
C21 Service & Distribution	7,918	m2	96.29	762,400		96.29
C22 Lighting, Devices & Heating	7,918	m2	154.80	1,225,700		154.80
C23 Systems & Ancilliaries	7,918	m2	91.30	722,900		91.30
NET BUILDING COST - EXCLUDING SITE	7,918	m2			**28,768,700**	3,633.33
D SITE WORK					3,048,600	
D11 Site Development	26,032	m2	91.68	2,386,600		
D12 Mechanical Site Services	1	sum	300,000.00	300,000		
D13 Electrical Site Services	1	sum	362,000.00	362,000		
D14 Demolition	0			0		
D15 Alterations	0			0		
NET BUILDING COST - INCLUDING SITE					**31,817,300**	4,018.35
Z1 GENERAL CONDITIONS					17,025,800	
Z10 Location Factor (Dawson, YT)	38%			12,090,600		
Z11 General Conditions	8%			3,512,600		
Z12 Fee	3%			1,422,600		
NET BUILDING COST - EXCLUDING ALLOWANCES					**48,843,100**	6,168.62
Z2 ALLOWANCES					16,032,800	
Z21 Design & Pricing Allowance	15%			7,326,500		
Z22 Escalation Allowance	5%			2,808,500		
Z23 Construction allowance	10%			5,897,800		
TOTAL CONSTRUCTION ESTIMATE - INCLUDING ALLOWANCES					**64,875,900**	8,193.47
VALUE ADDED TAX (GST/HST)	0	%		0	0	
TOTAL CONSTRUCTION ESTIMATE					**64,875,900**	8,193.47

6.4 Dome Road Option 3

- Main floor 10,363 m^2 (including penthouse areas)
- Ice Rink
- Curling Rink
- Fitness Centre
- Gymnasium
- Aquatics
- Total Construction Estimate: $80,583,400
- Parking Stalls: 322




DOME ROAD
R718
Y.T. HIGHWAY NO.2 (KLONDIKE HIGHWAY)



6.4.1 Dome Road Option 3 - Building Description

The primary design goal of Option 3 is to provide optimal viewing areas into each major amenity area from a community hub on the second floor. The four large recreation areas on the ground floor (Ice Rink, Multipurpose/Gymnasium, Pool and Curling Rink) are placed around a central core dictated by the second floor footprint. The Canteen/Servery's central location allows convenient access to food services by all patrons of the facility. The 2-storey volumes of the major amenity areas with tall windows draw natural light into the interior areas of the building. Two main entry points to the facility encourage views into the various activity spaces encouraging users to explore all recreation options.

Views into the Ice Rink are provided from each entry point. Optimized views from upper level viewing areas, both heated and unheated, provide a variety of seating choices for spectators.

The Curling Rink has a conveniently located locker area with benches for changing footwear at the entrance. Optimal views of the curling sheets are provided from the second floor Lounge as well as from Common Lounge spaces.

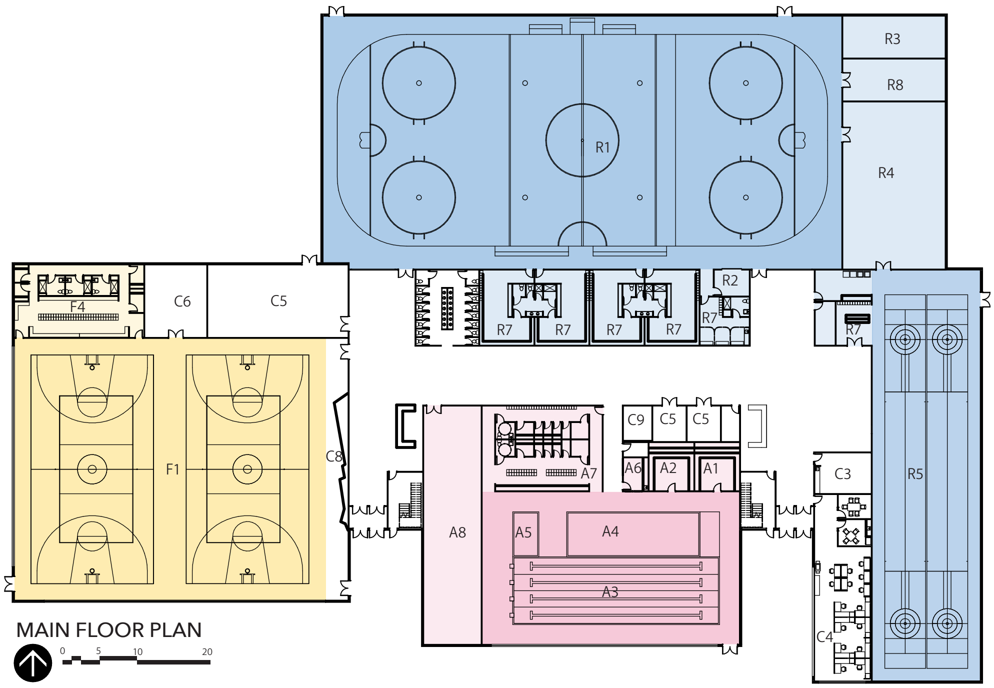
The Indoor Playground is open to the Common Lounge areas with vantage points overlooking the Pool.

The Office area is located just inside one entry point with opportunity for natural light and views.

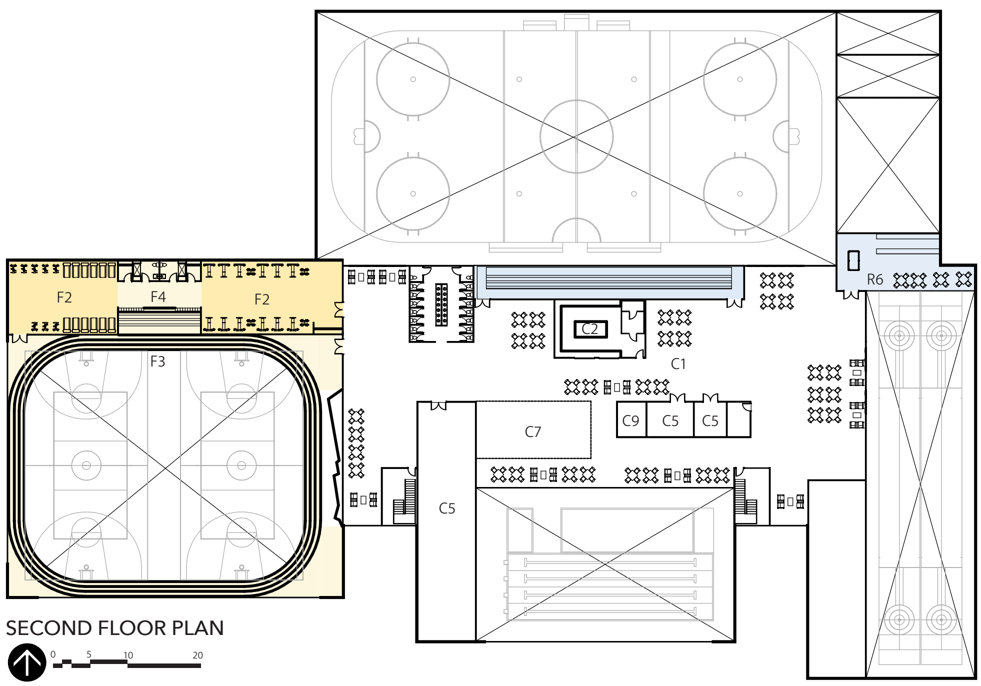
The Multipurpose/Gymnasium is directly adjacent to the General Storage, Climbing Wall, and Shower & Change Rooms with visual connection to the Walking/Running Track cantilevered above. The Fitness Centre has separate zones for cardio and weight training. Direct access to the Walking/Running Track allows more options for cardio workouts.

The Pool features southern exposure with tall windows. A Steam Room and Sauna are located near the entry of the pool area to encourage all users to enjoy these amenities. Showers & Change Rooms are available for individuals and families to provide maximized flexibility.

Dome Road Option 3 - Floor Plans



MAIN FLOOR PLAN



SECOND FLOOR PLAN

COMMON AMENITIES

- C1 Common Lounge
- C2 Canteen
- C3 Multi Use Meeting Room
- C4 Office
- C5 Mechanical / Electrical
- C6 Storage
- C7 Indoor Playground
- C8 Climbing Wall
- C9 Elevator

ICE

- R1 Ice Rink
- R2 Skate Sharpening
- R3 Zamboni
- R4 Ice Plant
- R5 Curling Rink
- R6 Curling Lounge
- R7 Change Room
- R8 Rink Storage

FITNESS

- F1 Gymnasium
- F2 Fitness Centre
- F3 Walking Track
- F4 Change Room

AQUATICS

- A1 Sauna
- A2 Steam Room
- A3 Lap Pool
- A4 Kiddie Pool
- A5 Hot Tub
- A6 Lifeguard / First Aid
- A7 Change Room
- A8 Pool Mechanical

Dome Road Option 3 - Functional Space Program

Room Name	Option 3 Approved FSP	Option 3 Dome Road Actual	Notes
RECREATION AMENITIES			
Ice Rink (Hockey, Ringette, Skating)	1,874.0	1,967.8	Increased area includes circulation
Ice Rink Viewing Area (unheated)	79.5	155.8	Area increased to suit architectural building features
Ice Rink Viewing Area (heated)	26.5	91.9	Area increased to suit architectural building features
Team Dressing Rooms	240.0	246.6	
Ref Change Room	35.0	35.4	
Skate Sharpening	15.0	14.7	
Zamboni Room	45.0	63.8	Area increased to suit architectural building features
Ice Plant/Mechanical Room	45.0	255.0	SMS recommends area increase to accommodate equipment
Storage	60.0	63.8	Shared with curling rink
Curling Rink	856.0	662.6	Circulation around sheets has been reduced to minimum requirement
Changing Area/Lockers	15.0	23.3	
Lounge	75.0	100.1	Area increased to suit architectural building features
Multipurpose/Flex Space/Gym	762.0	1,257.5	Area can be reduced in future phases
Multipurpose/Flex Space	-	-	
Gym Viewing Area	26.5	28.0	
Change Rooms	120.0	139.0	
Fitness Centre	140.0	307.4	Area can be reduced in future phases
Change Rooms	40.0	23.0	
Walking Track	250.0	220.0	
Lap Pool	350.0	344.5	
Kiddie Pool	150.0	166.7	
Hot Tub/Jacuzzi	30.0	36.3	
Change Rooms	180.0	156.2	
Lifeguard/First Aid	12.0	12.0	
Pool Mechanical & Chemical Stor	325.0	204.2	Area can be increased in future phases
Steam Room	35.0	31.9	
Sauna	35.0	31.9	
Indoor Playground	85.0	98.0	Area can be reduced in future phases
Climbing Wall	40.0	48.1	
Sub-Total	**5,946.5**	**6,785.5**	
COMMUNITY AMENITIES			
Common Lounge/Entry	75.0	75.0	
Canteen/Servery	63.0	77.0	
Multi-use Party/Meeting Room	30.0	33.8	
Full Team Office	155.0	157.3	
Sub-Total	**323.0**	**343.1**	
LOGISTICS			
Washrooms	132.0	141.6	
Janitor Room	20.0	38.6	
Laundry Facilities	10.0	21.5	Area increased to suit architectural building features
Mechanical	227.5	354.7	
Electrical	42.0	40.7	
Telecom	31.5	33.4	
Elevator/Lift	12.0	14.7	
General Storage	130.0	66.9	Area can be increased in future phases
Sub-Total	**605.0**	**712.1**	
Net Total	**6,874.5**	**7,840.7**	
Gross Up (25%)	**1,718.6**	**2,147.2**	
USABLE AREA	**8,593.1**	**9,987.9**	

Dome Road Option 3 - Cost Estimate

Element	Elemental Cost			Elemental Amount		Rate per m2
	Quantity		Unit Rate	Sub-Total	Total	Sub-Total
A SHELL	10,363	m2			**19,314,100**	
A1 SUBSTRUCTURE					6,117,600	
A11 Foundations	7,537	m2	516.39	3,892,000		375.57
A12 Bulk Excavation/Fill	25,299	m3	74.14	1,875,600		180.99
A13 Special Condititions	1	sum	350,000.00	350,000		33.77
A2 STRUCTURE					7,335,400	
A21 Lowest Floor Construction	7,537	m2	179.52	1,353,000		130.56
A22 Upper Floor Construction	2,826	m2	650.02	1,837,000		177.27
A23 Roof Construction	7,537	m2	550.00	4,145,400		400.02
A3 EXTERIOR ENCLOSRUE					5,861,100	
A31 Walls Below Grade	165	m2	400.00	66,000		6.37
A32 Walls Above Grade	3,780	m2	600.00	2,268,000		218.86
A33 Windows & Entrances	789	m2	1,385.04	1,092,800		105.45
A34 Roof Coverings	7,537	m2	275.01	2,072,800		200.02
A35 Projections	10,363	m2	34.88	361,500		34.88
B INTERIORS	10,363	m2			**3,969,600**	
B1 PARTITIONS & DOORS					1,413,000	
B11 Partitions	4,877	m2	221.30	1,079,300		104.15
B12 Doors	138	No	2,418.31	333,700		32.20
B2 FINISHES					1,488,500	
B32 Floor Finishes	10,363	m2	67.57	700,200		67.57
B22 Ceiling Finishes	10,363	m2	54.55	565,300		54.55
B23 Wall Finishes	13,167	m2	16.94	223,000		21.52
B3 FITTINGS & EQUIPMENT					1,068,100	
B31 Fittings & Fixtures	10,363	m2	79.87	827,700		79.87
B32 Equipment	10,363	m2	11.14	115,400		11.14
B33 Elevators	1	No	125,000.00	125,000		12.06
C SERVICES	10,363	m2			**13,124,500**	
C1 MECHANICAL					9,580,300	
C11 Plumbing & Drainage	10,363	m2	206.55	2,140,500		206.55
C12 Fire Protection	10,363	m2	42.28	438,100		42.28
C13 HVAC	10,363	m2	604.64	6,265,900		604.64
C14 Controls	10,363	m2	71.00	735,800		71.00
C2 ELECTRICAL					3,544,200	
C21 Service & Distribution	10,363	m2	95.19	986,500		95.19
C22 Lighting, Devices & Heating	10,363	m2	154.80	1,604,200		154.80
C23 Systems & Ancilliaries	10,363	m2	92.01	953,500		92.01
NET BUILDING COST - EXCLUDING SITE	10,363	m2			36,408,200	3,513.29
D SITE WORK					3,112,500	
D11 Site Development	25,513	m2	93.62	2,388,500		
D12 Mechanical Site Services	1	sum	320,000.00	320,000		
D13 Electrical Site Services	1	sum	404,000.00	404,000		
D14 Demolition	0			0		
D15 Alterations	0			0		
NET BUILDING COST - INCLUDING SITE					39,520,700	3,813.64
Z1 GENERAL CONDITIONS					21,148,100	
Z10 Location Factor (Dawson, YT)	38%			15,017,900		
Z11 General Conditions	8%			4,363,100		
Z12 Fee	3%			1,767,100		
NET BUILDING COST - EXCLUDING ALLOWANCES					60,668,800	5,854.37
Z2 ALLOWANCES					19,914,600	
Z21 Design & Pricing Allowance	15%			9,100,300		
Z22 Escalation Allowance	5%			3,488,500		
Z23 Construction allowance	10%			7,325,800		
TOTAL CONSTRUCTION ESTIMATE - INCLUDING ALLOWANCES					**80,583,400**	7,776.07
VALUE ADDED TAX (GST/HST)	0	%		0	0	
TOTAL CONSTRUCTION ESTIMATE					80,583,400	7,776.07

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7.0 Energy Modeling

7.0 Energy Modeling

7.1 Energy Modeling Methodology

- Energy modeling was a key instrument in the analysis of the energy performance for the proposed options for the recreation centre in Dawson City. The project required three options for functional programs which resulted in three facilities ranging in size and function on two different sites. Each option was to be reviewed for an energy target 35% better than National Energy Code for buildings (NECB) 2017, second option of 50% better and a third option recommended by the consultant. The energy modeling process was threefold. The first step was using IES (VE) 2019 energy modeling software to develop a sun cast study for the proposed sites with a template building. The purpose of the sun cast study was to analyze passive design elements that may optimize building orientation and the ability to use renewable energy sources such as Solar Photovoltaic (PV) for the facility.

- EcoMatrix was used to optimize the envelope performance and estimate the level of mechanical and electrical system savings required to achieve the proposed energy targets. EcoMatrix can run millions of iterations of different envelope insulation values, window to wall ratios, glazing performances, roof insulation valves, shading devices, mechanical systems and electrical lightings systems. A sample of the input dashboard for EcoMatrix can be seen below.

Figure 1: Dashboard with 1.3 million iterations.

- A consultant team meeting was held to confirm the different component performance levels that would be reviewed for the project. For windows, the reviewed options range from less than NECB requirements to leading edge technologies for windows. Feasible construction types for the facility given the northern location were reviewed.

- EcoMatrix analysis resulted in 1.3 million iterations of the building energy performance.

- The models for EcoMatrix are prepared in IES to ensure geometry is accurate to the proposed options. From the EcoMatrix analysis two scenarios were reviewed.

    - In the first scenario, the mechanical and electrical systems were held constant, to have no impact on building energy usage. This scenario was used to optimize the envelope and observe the impact of the specific components related to overall energy.

    - The second scenario utilized the findings of the envelope optimization and further introduced the mechanical system and lighting options. Mechanical systems cannot be modeled discretely in EcoMatrix and therefore a representative coefficient of performance or energy efficiency is used to approximate the mechanical systems. The coefficient of performance is based on the actual proposed mechanical system and its seasonal efficiency. The lighting power density also cannot be discretely modeled for all spaces and therefore, a facility wide weighted average for the lighting power density is applied based on typical space usage types.

    - Filtering of variables is done to limit the number of iterations that meet the energy targets and follow feasible construction requirements which the team believes to be important for the facility. Through the second scenario, energy estimates were developed for comparison with NECB, enabling the team to predict which options align with proposed energy targets.

- The third step in the process was to utilize IES (VE) 2019 to model the buildings using the envelope performance from EcoMatrix analysis but modeling the actual mechanical and electrical systems. In the third step, plug loads, domestic hot water heating power and mechanical equipment energy use could be included in the model for more accurate energy representation. All eighteen cases were modeled (two sites, three options per site and three energy targets per building type) in a compliance model to refine the proposed energy use for comparison to NECB baseline requirements.

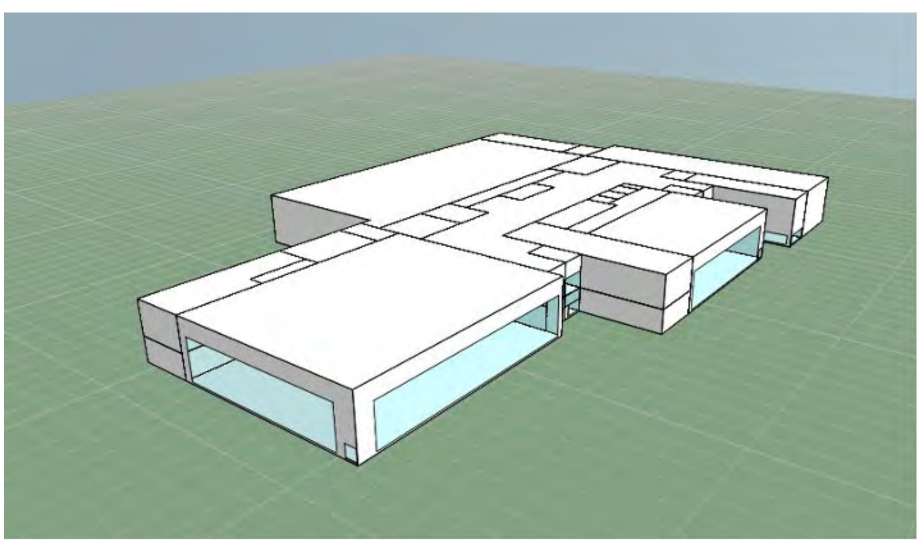


Figure 2: Dome Road - Option 3 - Isometric view from IES (VE) 2019

1. Disclaimer

It should be noted that energy modeling at preliminary stages of will have limitations and should be used as an indicative tool rather than a specific design element. Some limitations and assumptions required to perform conceptual energy modeling include:

1. Occupancy is estimated based on typical occupancy densities from ASHRAE 62.1. Actual occupancies may differ in design.

2. Design changes from conceptual phase to detailed design can drastically change the loads for the facility and the performance of the system. The condition taken is a snapshot in time.

3. System development level does not allow for discrete modeling of energy performance and efficiency of the system. Rated data for the equipment is used as opposed to specific operating condition data.

4. All baseline case scenarios are based on the corresponding NECB system type. The baseline cases assume that the fuel source is the same between the baseline system and the proposed i.e. an all electric system will have an all electric baseline comparison. If the fuel source is changed the results can change significantly as the baseline comparison may be more energy efficient.

5. Window to wall ratios can have a significant impact on the facility and therefore changes to design or envelope elements can also cause drastic changes in the results.

6. Occupancy schedules are estimations. For the purposes of this exercise it was assumed the facility would operate from 7:00am to 10:00pm.

7.2 Analysis

1. Solar Access

The sun-cast study (Appendix J) was performed for both sites using a reference building. The reference building was a square and orientated to align all faces perpendicular to direction (North wall is 90° to North direction), to observe maximum sun-exposure. The facility was modeled as 6 m tall. The sun-cast study demonstrated the profile of the sun as it passes the building daily, and annually. The results of the sun-cast study were the total number of hours the faces and roof of the facility see solar exposure.

The sun-cast results showed limited solar exposure on both sites.

2. Envelope Performance

- Through the EcoMatrix envelope performance optimization it became clear that proprietary and expensive technologies for windows and envelope construction yielded marginal energy savings over a properly constructed envelope that slightly exceeded the performance of NECB. The following describes the optimized and recommended envelope.

- Optimized Envelope

    - From our optimization, we established a proposed envelope for all sites. This envelope was optimized for constructability, cost and performance. The final option selected was R40 walls, R62 roof, R20 under slab insulation, triple panel thermally broken windows with three layers of low-E costing and two argon sealed spaces and no shading elements to allow for solar gain when possible. The window to wall ratio varies for the different options based on functional design but are typically in the range of 10-20%.

- To go any further in energy efficiency on the envelope option showed only a 4% increase in energy savings.

    - The most efficient possible envelope would utilize quadruple pane windows, R62 roof, R40 walls (limitation of most panel systems) and R20 below slab insulation. The capital cost of this envelope compared to the proposed envelope system, is expected to be significantly higher.

3. HVAC Performance

- Once the envelope was optimized and the building orientation decided, the models were transferred into a compliance model which discretely modeled the HVAC system.

- Due to the preliminary nature of the design and the inputs, modeling assumptions had to be made to generate a compliance model. Many mechanical systems were evaluated, and Option C was ultimately recommended. Option C includes a water-to-water heat recovery heat pump central plant with boiler back up and a common fluid cooler for the Ice Plant and the building heat rejection requirements. Included in the mechanical model was hot water generation, which is a significant proportion of the energy use for the building.

4. Energy Performance Targets

The following chart identifies the relative energy performance expectations for each site, option and energy target. Each option was modeled four times: NECB baseline, 35% better performance, 50% better performance, and finally the recommended energy goal for each option.

Option	Energy Option	Energy Use Intensity (EUI) (kWh/m2/yr)	% Savings to NECB
Gold Rush Option 1	NECB Baseline	206	
	35% Better (A)	138	33%
	50% Better (B)	115	44%
	Recommended (C)	132	36%
Gold Rush Option 2	NECB Baseline	219	
	35% Better (A)	140	36%
	50% Better (B)	114	48%
	Recommended (C)	132	40%
Gold Rush Option 3	NECB Baseline	221	
	35% Better (A)	151	32%
	50% Better (B)	132	40%
	Recommended (C)	132	34%
Dome Road Option 1	NECB Baseline	220	
	35% Better (A)	143	35%
	50% Better (B)	117	47%
	Recommended (C)	136	38%
Dome Road Option 2	NECB Baseline	181	
	35% Better (A)	127	30%
	50% Better (B)	106	41%
	Recommended (C)	121	33%
Dome Road Option 3	NECB Baseline	229	
	35% Better (A)	154	33%
	50% Better (B)	135	44%
	Recommended (C)	147	36%

- Energy Performance Takeaways:
    - The challenges of obtaining the 50% target
        - Several factors make a 50% energy savings difficult to achieve. One of these factors is building occupancy schedule. Depending on the building occupancy schedule, outdoor air delivered to the building represents a significant load. Renewable resources can typically be used to "fill the gap" between envelope, mechanical system efficiency, and target efficiency, but in this instance, renewable resources are not a viable option because a 50% energy target will be operationally driven. Further refinement through design detailing may show estimated energy to increase or decrease.
    - Due to the conceptual nature of the designs further iteration on Options A and B were not performed. For energy target A, with modifications to system components energy and more discrete modeling of elements, 35% energy savings may be achieved.
    - It should be noted one of the largest energy uses in the facility is the outdoor air. The type of occupancy requires significant amounts of outdoor air that needs to be heated. The large variation in EUI between NECB and the proposed options are due to heat recovery efficiency. NECB requires minimum 50% heat recovery, whereas the proposed options will use heat recovery systems that are more efficient and operate over the required 50% baseline option.

5. Operational Costs

Operational costs were reviewed for the 18 different options and compared to the six NECB baselines. Utility rates were received from Yukon Energy for General Service – Government – Municipal. It was assumed the City of Dawson would fall under this category. It should be noted power in Dawson City is provided primarily by hydro electric power. Due to the remote nature of Dawson City, there is an emergency generator plant that starts if there are any issues on the main service into town. In discussions with local utility representatives the number of times the emergency generators are used in a year is typically zero to five and they are typically not lengthy run times. For this reason, the hydro rates were used in our calculations for GHG emissions.

It should also be noted the electrical demand for the facility is estimated and the number would require further detailed design to finalize for each option. The rates can be found on the Yukon Energy website and are included in the Appendices. The fuel oil costs were provided by AFD Petroleum in Dawson City. They provided a rate for automatic fill option which includes a delivery charge and a cost of fuel. The rates for the fuel were $0.9999 per litre and included delivery fee and carbon tax.

The variances seen for the operational cost elements shown in the chart are largely due to site and facility specific layouts that affect the energy use and cost.

Option	Energy Option	Estimated Electricity Cost	Estimated Fuel Oil Cost	Estimated Operational Cost	% Cost Savings
Gold Rush Option 1	NECB Baseline	$170,556.99	$37,137.27	$207,694.26	N/A
	35% Better (A)	$162,774.86	$14,670.54	$177,445.40	14.56%
	50% Better (B)	$127,040.34	$7,734.67	$134,775.01	35.11%
	Recommended (C)	$138,175.44	$11,188.83	$149,364.27	28.08%
Gold Rush Option 2	NECB Baseline	$176,688.58	$50,748.46	$227,437.04	N/A
	35% Better (A)	$143,411.02	$18,626.29	$162,037.31	28.76%
	50% Better (B)	$130,131.68	$9,820.24	$139,951.91	38.47%
	Recommended (C)	$142,166.50	$14,205.77	$156,372.28	31.25%
Gold Rush Option 3	NECB Baseline	$232,151.37	$47,459.34	$279,610.71	N/A
	35% Better (A)	$189,116.27	$17,439.13	$206,555.40	26.13%
	50% Better (B)	$178,683.00	$9,194.34	$187,877.34	32.81%
	Recommended (C)	$187,914.40	$13,300.36	$201,214.76	28.04%
Dome Road Option 1	NECB Baseline	$177,266.84	$47,001.76	$224,268.60	N/A
	35% Better (A)	$144,698.73	$16,979.45	$161,678.18	27.91%
	50% Better (B)	$131,451.55	$8,951.98	$140,403.53	37.39%
	Recommended (C)	$143,622.78	$12,949.77	$156,572.56	30.19%
Dome Road Option 2	NECB Baseline	$179,251.47	$42,504.41	$221,755.88	N/A
	35% Better (A)	$150,489.26	$19,191.68	$169,680.94	23.48%
	50% Better (B)	$140,209.81	$9,128.19	$149,338.00	32.66%
	Recommended (C)	$149,203.57	$14,636.99	$163,840.56	26.12%
Dome Road Option 3	NECB Baseline	$250,939.79	$42,504.41	$293,444.19	N/A
	35% Better (A)	$205,959.18	$21,738.77	$227,697.95	22.41%
	50% Better (B)	$194,447.77	$11,851.36	$206,299.13	29.70%
	Recommended (C)	$204,468.83	$16,579.58	$221,048.41	24.67%

6. Greenhouse Gas Emissions

Greenhouse Gas (GHG) emissions were calculated in accordance with the Climate Registry and the Canadian Federal Government Scope 2 Greenhouse Gas Emission Reporting requirements. All green house gas emissions are based on the theoretical energy consumption from the energy model simulations and are calculated on site energy based on the generating source. The electricity is generated via Hydro Electric with generator back-up. For the purpose of the greenhouse gas emission calculations hydro-electric power has been determined to operate primarily. Part of the heating capacity of the building is generated through fuel oil while the remainder would be electric.

The resulting GHG Reductions are presented in the following chart:

Option	Energy Option	GHG Electricity (tCO2e)	GHG Fuel Oil (tCO2e)	Total GHG (tCO2e)	% GHG Reduction
Gold Rush Option 1	NECB Baseline	12.92	101.09	114.01	N/A
	35% Better (A)	12.20	39.93	52.13	54.28%
	50% Better (B)	8.86	21.05	29.92	73.76%
	Recommended (C)	9.90	30.46	40.36	64.60%
Gold Rush Option 2	NECB Baseline	13.49	138.14	151.63	N/A
	35% Better (A)	10.39	50.70	61.09	59.71%
	50% Better (B)	9.15	26.73	35.88	76.34%
	Recommended (C)	10.27	38.67	48.94	67.72%
Gold Rush Option 3	NECB Baseline	18.67	129.19	147.85	N/A
	35% Better (A)	14.65	47.47	62.12	57.98%
	50% Better (B)	13.68	25.03	38.71	73.82%
	Recommended (C)	14.54	36.20	50.74	65.68%
Dome Road Option 1	NECB Baseline	13.55	127.94	141.49	N/A
	35% Better (A)	10.51	46.22	56.73	59.91%
	50% Better (B)	9.27	24.37	33.64	76.22%
	Recommended (C)	10.41	35.25	45.66	67.73%
Dome Road Option 2	NECB Baseline	13.73	115.70	129.43	N/A
	35% Better (A)	11.05	52.24	63.29	51.10%
	50% Better (B)	10.09	24.85	34.94	73.01%
	Recommended (C)	10.93	39.84	50.77	60.77%
Dome Road Option 3	NECB Baseline	20.42	115.70	136.12	N/A
	35% Better (A)	16.22	59.17	75.40	44.61%
	50% Better (B)	15.15	32.26	47.41	65.17%
	Recommended (C)	16.09	45.13	61.22	55.03%

- From observations of the chart above there is a direct correlation between fuel oil use and the GHG emission savings. According to City of Dawson Representatives most facilities have fuel oil as a reliable source for heating and one that can be serviced locally. For this reason, fuel oil was included as the back-up heating option. If boilers were converted to electric, there would be a total reduction in GHG, however, the fuel source (electric) would also be changed for the NECB baseline and the resulting percent of GHG reduction would decrease.

7.3 Energy Use by Option

The proposed operational costs are based on utility costs only. Maintenance costs can vary drastically and are a function of equipment age and experience of local trades. Maintenance costs have been excluded from the report.

1. Gold Rush Option 1

- The proposed operational costs for Option 1C are $149,365.27, which is a savings of 28.08% over the Option 1 NECB compliant building.

- The proposed energy use for the Option 1 building following NECB requirements is 1,476,988 ekWh which equates to an Energy Use Intensity (EUI) of 206 ekWh/m2/yr. Option 1C achieved a total energy use of 945,619 ekWh and an EUI of 132 ekWh/m2/yr for a proposed savings of 36% compared to NECB baseline.

- GHG Emissions for Option 1C were 40.36 tonnes of CO_2 equivalent which is a 64.60% reduction over the Option 1 NECB compliant building.

2. Gold Rush Option 2

- The proposed operational costs for Option 2C are $156,372.28, which is a savings of 31.25% over the Option 2 NECB compliant building.

- The proposed energy use for the Option 2 building following NECB requirements is 1,671,315 ekWh which equates to an Energy Use Intensity (EUI) of 219 ekWh/m2/yr. Option 2C achieved a total energy use of 1,009,158 ekWh and an EUI of 132 ekWh/m2/yr for a proposed savings of 40% compared to NECB baseline.

- GHG Emissions for Option 2C were 48.94 tonnes of CO_2 equivalent which is a 67.72% reduction over the Option 2 NECB compliant building.

3. Gold Rush Option 3

- The proposed operational costs for Option 3C are $201,214.76, which is a savings of 28.04% over the Option 3 NECB compliant building.

- The proposed energy use for the Option 3 building following NECB requirements is 2,067,160 ekWh which equates to an Energy Use Intensity (EUI) of 221 ekWh/m2/yr. Option 3C achieved a total energy use of 1,355,141 ekWh and an EUI of 145 ekWh/m2/yr for a proposed savings of 34% compared to NECB baseline.

- GHG Emissions for Option 3C were 50.74 tonnes of CO_2 equivalent which is a 65.68% reduction over the Option 3 NECB compliant building.

4. Dome Road Option 1

- The proposed operational costs for Option 1C are $156,572.56, which is a savings of 30.19% over a NECB compliant building
- The proposed energy use for the Option 1 building following NECB requirements is 1,635,445 ekWh which equates to an Energy Use Intensity (EUI) of 220 ekWh/m2/yr. Option 1C achieved a total energy use of 1,006,950 ekWh and an EUI of 136 ekWh/m2/yr for a proposed savings of 38% compared to NECB baseline.
- GHG Emissions for Option 1C were 45.66 tonnes of CO2 equivalent which is a 67.73% reduction over the Option 1 NECB compliant building.

5. Dome Road Option 2

- The proposed operational costs for Option 2C are $163,840.56, which is a savings of 26.12% over a NECB compliant building
- The proposed energy use for the Option 2 building following NECB requirements is 1,602,423ekWh which equates to an Energy Use Intensity (EUI) of 181 ekWh/m2/yr. Option 2C achieved a total energy use of 1,068,525 ekWh and an EUI of 121 ekWh/m2/yr for a proposed savings of 33% compared to NECB baseline.
- GHG Emissions for Option 2C were 50.77 tonnes of CO2 equivalent which is a 60.77% reduction over the Option 2 NECB compliant building.

6. Dome Road Option 3

- The proposed operational costs for Option 3C are $221,04841, which is a savings of 24.67% over a NECB compliant building
- The proposed energy use for the Option 3 building following NECB requirements is 2,159,875 ekWh which equates to an Energy Use Intensity (EUI) of 229 ekWh/m2/yr. Option 3C achieved a total energy use of 1,519,199 ekWh and an EUI of 147 ekWh/m2/yr for a proposed savings of 36% compared to NECB baseline.
- GHG Emissions for Option 3C were 61.22 tonnes of CO2 equivalent which is a 55.03% reduction over the Option 3 NECB compliant building.

7.4 Energy Conclusions

- The facilities and sites are consistent in energy performance. The envelope properties used are the same and the mechanical system was consistent from option to option and between the sites for the different energy targets. The mechanical system changes from the 35% target to the 50% target but would stay consistent between the corresponding options on each site.

- The areas of discrepancy between the sites included:

    - Window to wall ratio, which was a product of the functional plan and orientation.

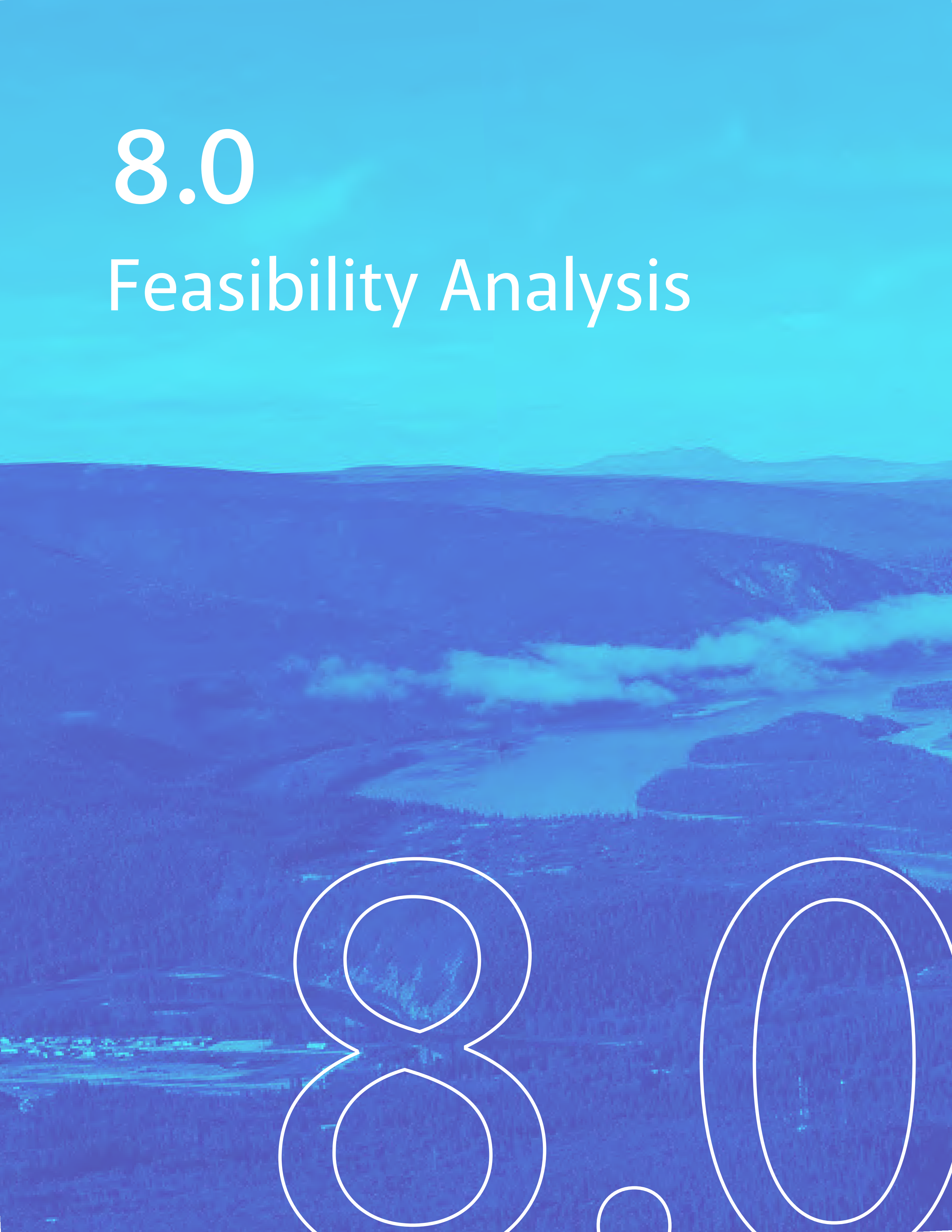
    - The modification from Option 1 and 2 to 3 adds the pool, which is a large energy user.

    - Total outdoor air. The square foot size of the facilities is consistent between options and sites, but the ventilation required based on arrangement and the ability to share outdoor between areas that require supply air and those that require exhaust air can drastically increase the overall outdoor air.

    - The differences mentioned above account for the site to site variation energy performance seen between Dome Road and Gold Rush. It is believed that through detailed design some of these variations could be aligned to reduce the energy impact

    - Even with the variations above the overall energy use intensity for the same option on either site is minimal. From the energy modeling assessment, there is no significant difference between the Gold Rush and Dome Road sites from an energy or GHG perspective, given systems and envelope are consistent.

8.0
Feasibility Analysis



8.0 Feasibility Analysis

8.1 Overview

Capital Costs	Option 1 $50.9M - $54.1M	Option 2 $63.3M - $64.9M	Option 3 $71.3M - $80.6M
O&M			
Current Facilities	$706,096	$706,096	$706,096
New Facilities	$795,095	$816,642	$987,612
Additional	-$88,999	-$110,546	-$281,516
Utilities			
Current Facilities	$282,866	$282,866	$282,866
New Facilities	$210,344	$206,874	$211,000
Savings	$72,522	$75,992	$71,866
Revenue			
Current Facilities	$221,212	$221,212	$221,212
New Facilities	$241,130	$257,714	$274,210
New Revenue	$19,918	$36,502	$52,998
Yearly Expenses	**$3,441**	**$1,948**	**-$156,652**

The City of Dawson currently runs the Art and Margaret Fry Recreation Centre (AMFRC), a fitness centre along the Yukon River, and the seasonal pool at Minto Park, therefore these existing facilities need to be taken into account when calculating feasibility. The chart above compares the existing operations and maintenance, utilities and revenue of the three potential program options combined with whichever existing facilities remain. While this information will be further detailed in the sections below, they are summarized in the chart above. Some of the takeaways from this chart are:

Option 1 replaces the AMFRC and adds a small gymnasium, but the existing fitness centre and seasonal aquatic centre remain. This option has the least amount of capital cost, an overall similar level of yearly expenses while gaining the use of a new small gymnasium. The additional salary required due to adding the new gym is offset by the reduction in utilities gained from replacing the AMFRC with a more energy efficient building and the potential for new revenue opportunities.

Option 2 adds a fitness centre and increases the size of the gymnasium. It replaces the existing fitness centre but the existing seasonal pool still remains. This option has similar overall yearly expenses as existing but gains a large gym and a sauna. In this case, however, the capital cost is more significant. There are minimal energy savings, but they are offset by the addition of more custodial duties. Overall, this could be considered a lateral move from the first option, for about 10 million extra capital investment.

Option 3 replaces the seasonal pool by adding a year-round pool in the facility. This is the only option with an expected increase in yearly expenditures. This is due to amount of new staff and maintenance required to run a pool full-time. While there are great opportunities to take advantage of energy sharing in a full multiplex, it is not enough to compensate for being open twelve months of the year.

In the subsection "Analysis of Utility Costs," it is explained how the existing situation is compared to energy efficient facilities. If the new facility was built to the minimum standards, the NECB, the utility charges would be similar to the existing facilities, and every option would end up with a larger yearly expenditure than currently.

8.2 Analysis of Building Capital Costs

The capital cost estimates were completed to a Class 'D' level and are expected to be accurate to +/- 20-30%. Hanscomb Limited provided estimates for Gold Rush Option 1, Dome Road Options 1, 2 and 3, including their accompanying site costs. Estimates compiled by Hanscomb Limited have been included in Appendix G.

To further explore the capital costs for the four options and to provide an estimate for the remaining two, our team extrapolated the unit costs provided in Hanscomb's estimates and applied them the remaining two options. These estimates are included at the end of each respective design in Sections 5 and 6. The costing does not account for project phasing; if the City of Dawson decides to implement project phasing the cost estimates should be updated accordingly.

The following is a breakdown of all the capital costs, for each design option:

	Option	Capital Cost		General Conditions	Allowances	Total Capital Costs	Capital Cost/ m2
		Site	Building				
Gold Rush	1	$1,212,800	$23,751,700	$13,358,800	$12,579,600	$50,902,900	$8,245
	2	$1,185,000	$29,891,300	$16,629,330	$15,659,400	$63,365,030	$10,263
	3	$1,053,900	$33,930,000	$18,720,300	$17,628,400	$71,332,600	$11,554
Dome Road	1	$2,832,900	$23,704,200	$14,200,300	$13,372,000	$54,109,400	$8,764
	2	$3,048,600	$28,768,700	$17,025,800	$16,032,800	$64,875,900	$10,508
	3	$3,112,500	$36,408,200	$21,148,100	$19,914,600	$80,583,400	$13,052

The capital costs for the building alone, does not vary much between sites. Option 1 in Gold Rush and Dome Road are almost exactly the same. Dome Road Option 2 is less expensive than Gold Rush, and what projects the Dome Road building costs for Option 3 ahead of Gold Rush is the amount of extra floor space and envelope which came from taking advantage of the site's extra space. It is challenging at this level of design to speculate on whether the historical design guidelines would add to the costs at the Gold Rush site. These differences could be mitigated in design development.

Minor differences, however, add up when you multiply general conditions and allowances to arrive at the total capital costs. Included in General Conditions are Location Factor, General Requirements and Fees. General Requirements and Fee cover the General Contractor's indirect costs which may include but not be limited to supervision, site set up, temporary utilities, equipment, utilities, clean up, etc. as covered in Division 1 General Conditions of the contract documents. The location factor used for Dawson City is 38%. Allowances are added for unknowns that could occur during construction.

The capital cost increase as the functional program grows appear to be incremental and correspond to the increased size and amenities provided in each of the buildings. There are no major jumps in cost increase especially since the largest expense appears to come from the ice surfaces. It is interesting to note the capital cost per square metre does not change much from option to option as the site and support space costs are shared over more amenities.

The capital costs related to site preparation will be discussed in the next sub-section.

8.3 Analysis of Site Costs

Site Development Analysis for Option 1

Site Cost	Dome Road	Gold Rush
Excavation	$1,407,000	$2,318,800
Site development	$2,235,500	$716,200
Mechanical	$280,000	$220,000
Electrical	$320,000	$280,000
Total	**$4,242,500**	**$3,535,000**

Site Development Analysis Excluding Parking Costs for Option 1

Site Cost	Dome Road	Gold Rush
Excavation	$1,407,000	$2,318,800
Mechanical	$280,000	$220,000
Electrical	$320,000	$280,000
Total	**$2,007,000**	**$2,818,800**

To compare the two sites fairly, excavation was extracted from the building costs (under foundations) and placed in the table above. In the first example we compare Dome Road and Gold Rush Option 1. As you can see in the first line, excavation at Dome Road is significantly less expensive than Gold Rush for the same footprint. The amount of excavation at Gold Rush far exceeds the amount at Dome Road due to the presence of permafrost. This is a significant cost increase for building at Gold Rush.

It is unfair to compare parking costs directly between the two sites. While Dome Road can fit all the required parking, Gold Rush is constrained by the size of the site. In the proposed designs, we show as much parking as can fit on Gold Rush, but realistically the City of Dawson would need to source additional parking nearby. Since these costs are not currently estimated, we have removed it from the second table for a better apples-to-apples comparison. It should be noted, however, the amount of excavation for the parking area would be higher than at Dome Road, so each parking stall would be more expensive at Gold Rush.

Bringing utilities to Dome Road is slightly more expensive than at Gold Rush because the site is larger and is reflected in the estimate.

8.4 Analysis of Utility Costs

Following the energy analysis, yearly utility costs of the building design options were shown based on expected energy use multiplied by utility rates. That data is summarized as follows:

Utility Costs

	Option	Electricity	Fuel Oil	Total	Utility Cost/ m2
Existing	-	$118,475	$164,391	$282,866	-
Gold Rush	1	$138,175	$11,189	$149,364	$24.19
	2	$142,167	$14,206	$156,372	$25.33
	3	$187,914	$13,300	$201,215	$32.59
Dome Road	1	$143,623	$12,950	$156,573	$25.36
	2	$149,204	$14,637	$163,841	$26.54
	3	$204,469	$16,580	$221,048	$35.80

The most important thing to note is the existing total utility costs are higher than even Dome Road Option 3. This is largely due to the fact that the options are designed to be more energy efficient. If the goal is just NECB the utility charges would only be slightly higher at $293,444 for Dome Road Option 3. This is only slightly higher than the existing conditions, but you are gaining a whole new gym and a year-round pool. You may also notice that fuel oil is drastically reduced in these options, focusing on electricity as the main fuel source. Fuel will be mainly used as a backup.

In general, Option 1 starts with significant energy costs per square foot due to the ice surfaces. The addition of the fitness and larger gymnasium in Option 2 does not increase those costs per square metre in a dramatic way. The addition of aquatics drives the utility rates up, but because of efficiencies that are found through mechanical systems such as energy sharing, the rise in utility costs is mitigated from what it would be with a standalone pool.

Overall utility costs are estimated to be higher for the options presented for the Dome Road site. This can be attributed to larger building footprints and increased parking area requiring more site lighting, both factors due to the flexibility and opportunity afforded by a larger, less restrictive site.

8.5 Analysis of O & M Costs

Operational and maintenance costs include human resources, administrative, as well as ongoing maintenance costs. These expenses have been estimated and are based on expenses provided by the CoD from 2018 and 2019. As the functions are similar across both sites, these are presented by Option only.

The largest expense within this category is salaries. The rest only make up one third of the remaining costs. In every case, it is expected the O & M costs will increase over current budget figures.

Option 1 - CoD projects they would add 1 full time equivalent (FTE) Programming personnel. The salary here is estimated based on the existing two salaries. Also, with the addition of a new small gym/multipurpose room, there will be extra cleaning and maintenance expenses that do not currently exist.

Option 2 - It is expected the custodial staff would increase from 0.5-FTE to 1-FTE. This reflects a smaller rise in expenses. Otherwise, effort expended at the current fitness centre is shifted to this facility.

Option 3 - Due to hosting a year-round pool instead of seasonal, this option has an increase in aquatics staff from 2-FTE to 3-FTE. There will also be additional chemicals, cleaning and maintenance.

In all cases, the proposed O&M expenses rise from existing primarily due to the addition of new staff, but also costs related to running the new gym and a year-round pool.

O & M Analysis

		Salary	Other	Total Yearly O&M Expenses
Existing	-	$447,896	$258,200	$706,096
Option	1	$536,895	$258,200	$795,095
	2	$547,178	$269,464	$816,642
	3	$662,576	$325,036	$987,612

8.6 Analysis of Potential Revenue

To assist in offsetting capital and operation costs, revenue streams have been identified with the CoD. While other may be explored, the CoD provided 2019 revenue from: Green space, pool, fitness, and ice. Green space was not accounted for in order to focus on the amenities outlined within the scope of this project.

The major revenue streams came from:

Aquatics - Public swim, swimming lessons, merchandise, swim club, rentals, training funding

Fitness - Fitness passes

Skating - Public skating, ice fees, rec centre programs, facility rental, merchandise

Curling club - Lease

It is important to note these estimated revenues are based on the reported revenues of existing facilities in Dawson City the new project would replace. It may be possible to seek increases in revenue for those same services due to now being offered in a facility with greater amenities. As well, there could be further potential revenue streams not noted here, such as advertising or naming rights, and additional rental opportunities. The City of Dawson has noted that it is not their intention to charge facility fees for individual users.

In the chart below, revenue is divided by option and amenity.

Estimated Revenue

		Ice	Programming	Fitness Centre	Aquatics	Total Revenue
Existing	-	$91,022	$65,842	$47,852	$16,496	$221,212
Option	1	$97,772	$79,010	$47,852	$16,496	$241,130
	2	$97,772	$85,594	$57,852	$16,496	$257,714
	3	$97,772	$85,594	$57,852	$32,992	$274,210

Option 1 - The current rink is currently underutilized, mostly being used during the day and is only open for six months of the year. This option has been designed for seven months of the year, but also adds a small gymnasium. The additional time the rink is open could lead to more revenue from free skating and merchandise. The small gymnasium increases programming in the town and could be a significant revenue generator.

Option 2 - In this option, there is opportunity for the same revenue growth with the larger gymnasium and the ice facilities, but also more revenue may be generated from the fitness centre by grouping it in this facility. More community members will likely be interested in taking advantage of the additional space and amenities such as the sauna and walking track.

Option 3 - Adds a year-round pool, which would double the current revenue of the seasonal pool.

8.7 Summary of Costs and Revenue Analysis

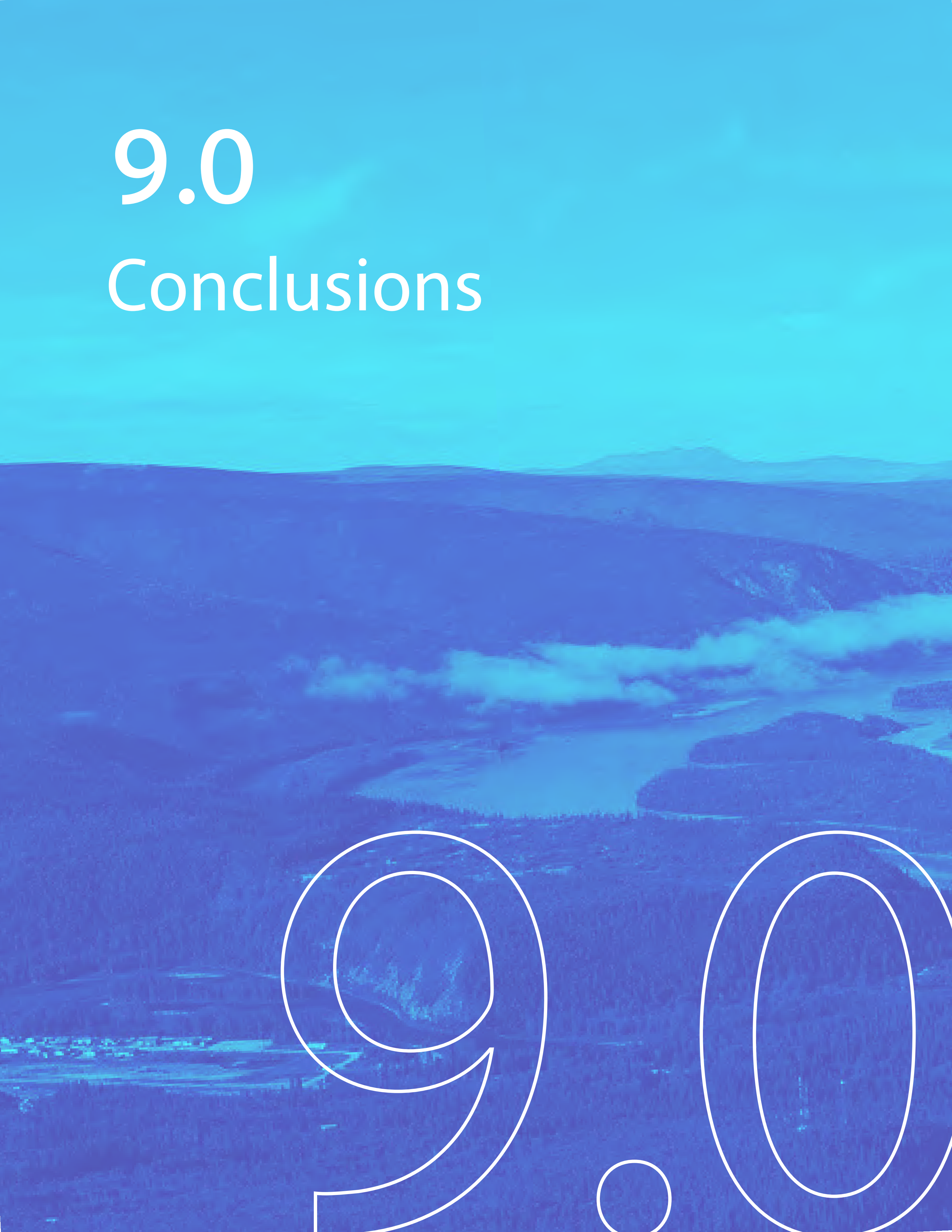
Options 1 and 2 are designed to be better than the NECB, thus reducing utility costs. This, along with finding avenues of increased revenue streams there is potential to offset increased O & M costs of the building.

The shift in capital costs from Option 1 to Option 2 is not very dramatic. Option 2 averages $13 million more in capital costs, for little utility improvement.

Dome road is the less expensive site when removing parking from the calculations. This is because of the reduced amount of excavation required for the building. Dome Road inevitably has more room for parking, but Gold Rush would need parking provided nearby.

In review of this data, it appears that the most cost-effective option would be Option 1. This option reflects lower capital costs combined with more amenities and more favourable revenue streams given the amenities it provides. It can provide these amenities at lower costs to operate relative to Option 3.

9.0
Conclusions



9.0 Conclusions

To ensure a holistic approach for the recommended option for the new recreation facility, a decision matrix was used. RAI met with Colliers and YG to discuss the use of the matrix, and how to determine criteria.

This evaluation matrix allows the consultant team and user groups to determine their preferred option by rating a list of key drivers. These drivers were identified based on the original RFP, stakeholder consultation, existing reports, capital costs, and feasibility analysis. This process mitigates bias in the decision-making process by separating a large decision into multiple small ones. Two decisions needed to be made:

1. Which site is objectively better,

2. Which option is appropriate for the community.

9.1 Recommended Site

Dome Road heavily outweighed Gold Rush for a variety of reasons. It has enough space to grow the facility, whether that be recreation fields, parking or future expansions. There is no permafrost known to be in the ground and there are fewer design restrictions. Perhaps most importantly, it was the most chosen site from the community engagement survey. Whether the residents who completed the survey lived in the historic town site or the outlying subdivisions, the Dome Road site was preferred consistently.

Dome Road's only major drawback is its distance from the town centre making it less easy to walk to this facility. However, many residents in the community engagement sessions identified they expect to drive to these facilities.

Site Evaluation Matrix

Driver	Rank (9 to 1)	Weight (1 to 5)	R x W	Dome Road			Gold Rush		
				Low 1	Med. 2	High 3	Low 1	Med. 2	High 3
Space (room to grow, daylight)	9	5	45			135	45		
Site Development (Geotech)	8	5	40		80		40		
Design freedom	7	3	21			63	21		
Demand from public survey	6	3	18			54		36	
Walkability (from school)	5	3	15	15					45
Proximity to other amenities	4	2	8		16				24
Parking	3	4	12			36	12		
Services connection	2	2	4	4					12
Stormwater management	1	1	1		2		1		
				19	98	288	119	36	81
			Total	**405**			**236**		

9.2 Recommended Option

In order to make a less biased decision on options, a second matrix was created using a similar methodology. The CoD, Colliers and YG identified *Minimize Construction Cost* as their most important driver for the facility, as a result, Option 1 jumps to the forefront.

Aside from capital construction costs, Option 1 reduces operations and maintenance costs, as well as utilities which were also deemed important. By adding a small gym to the AMFRC Option 1 includes a multipurpose element as well, albeit not as much as the other two options would. At the end of the day, Options 2 and 3 both require additional costs that are not justified by the needs of the community at this time.

Options Evaluation Matrix

Driver	Rank (8 to 1)	Weight (1 to 5)	R x W	Option 1			Option 2			Option 3		
				Low 1	Med. 2	High 3	Low 1	Med. 2	High 3	Low 1	Med. 2	High 3
Flexibility	7	5	35		70			70			70	
Minimize O & M cost	6	4	24			72		48		24		
Minimize utilities	5	3	15			45			45		30	
Multipurpose	4	4	16	16				32				48
Ability to amalgamate facilities	3	3	9	9				18				27
Demand from public survey	2	2	4	4				8				12
Inclusion of leasable space	1	2	2	2				4				6
				31	70	237	0	260	45	64	100	93
			Total	**338**			**305**			**257**		

9.3 Next Steps

RAI recommends the CoD consider moving forward in the request for funding of a new recreation centre based on Option 1 located on the Dome Road site. Once funding is secured, detailed design development can take place to refine the building design, including building systems and site development.

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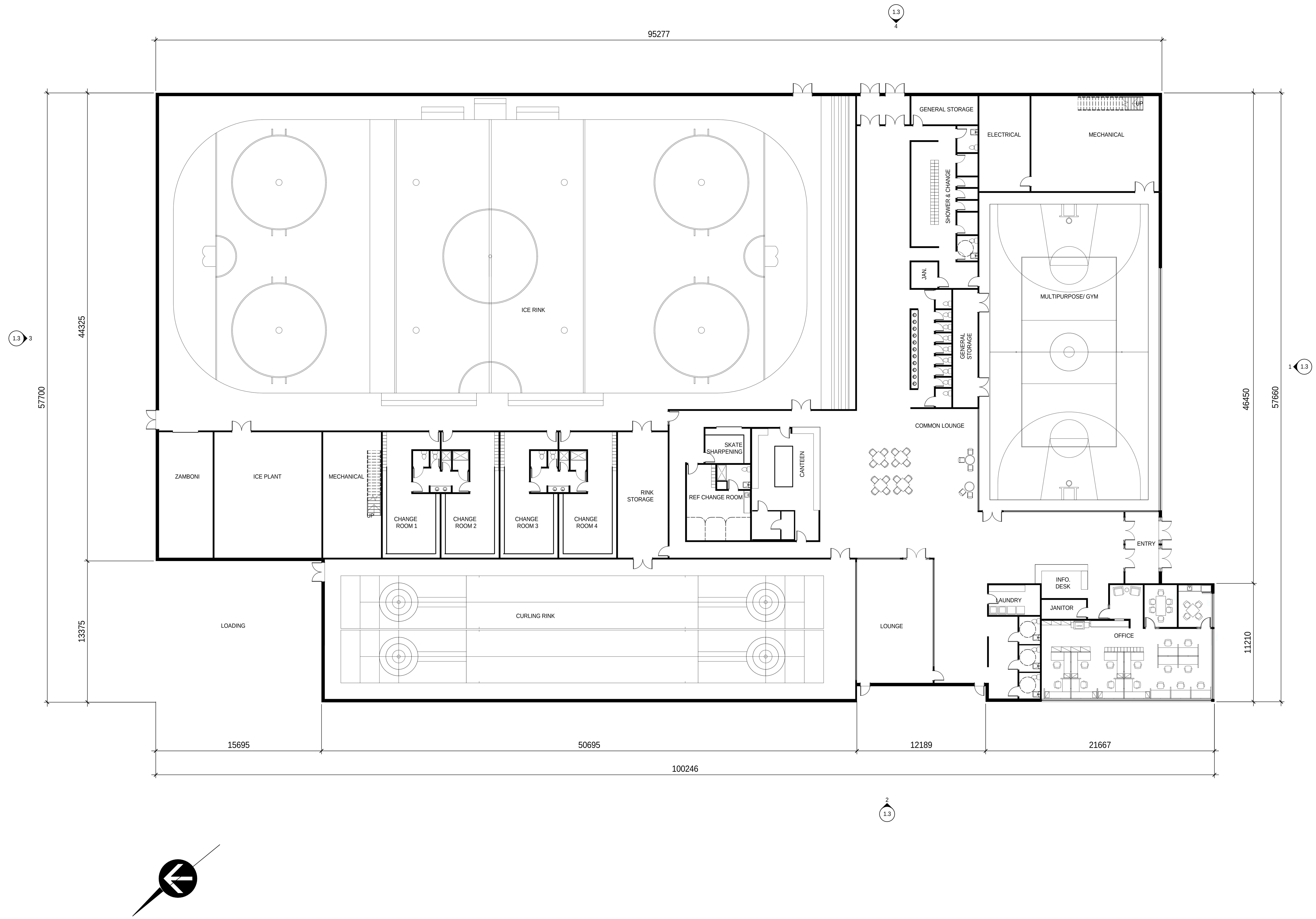
Appendices

Appendix A

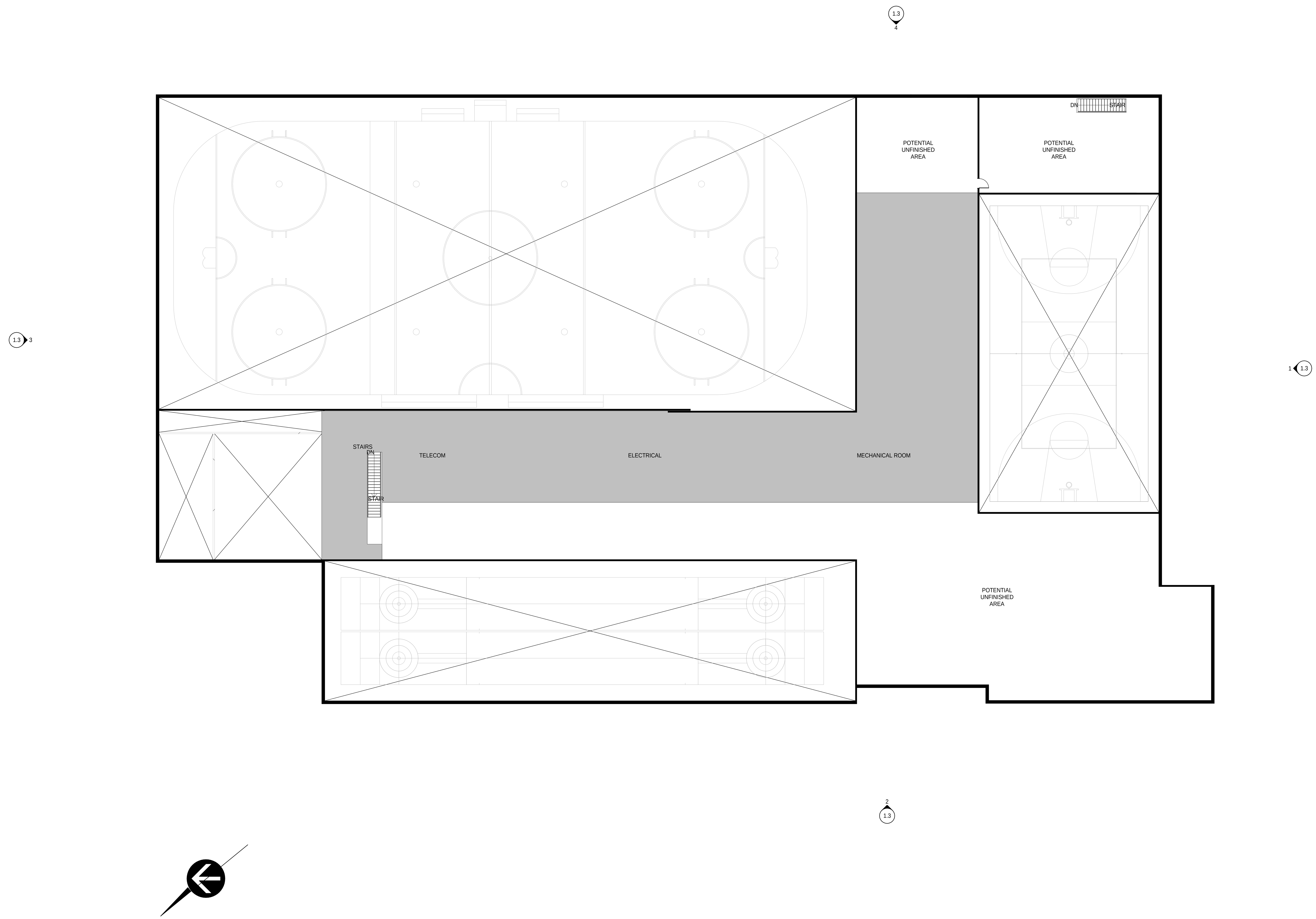
Architectural Drawings

GOLDRUSH OPTION 1
SITE



GOLDRUSH OPTION 1
MAIN FLOOR PLAN 1:200

REPUBLIC ARCHITECTURE INC
385 St. Mary Avenue
Winnipeg, MB R3C 0N1
T 204 989 0102
F 204 989 0094
www.republicarchitecture.ca



GOLDRUSH OPTION 1
SECOND FLOOR PLAN 1:200

REPUBLIC ARCHITECTURE INC
385 St. Mary Avenue
Winnipeg, MB R3C 0N1
T 204 989 0102
F 204 989 0094
www.republicarchitecture.ca

1 SOUTH ELEVATION - GOLDRUSH OPTION 1
1 : 200

2 WEST ELEVATION - GOLDRUSH OPTION 1
1 : 200

3 NORTH ELEVATION - GOLDRUSH OPTION 1
1 : 200

4 EAST ELEVATION - GOLDRUSH OPTION 1
1 : 200

GOLDRUSH OPTION 1
ELEVATIONS

REPUBLIC
ARCHITECTURE
INC
385 St. Mary Avenue
Winnipeg, MB R3C 0N1
T 204 989 0102
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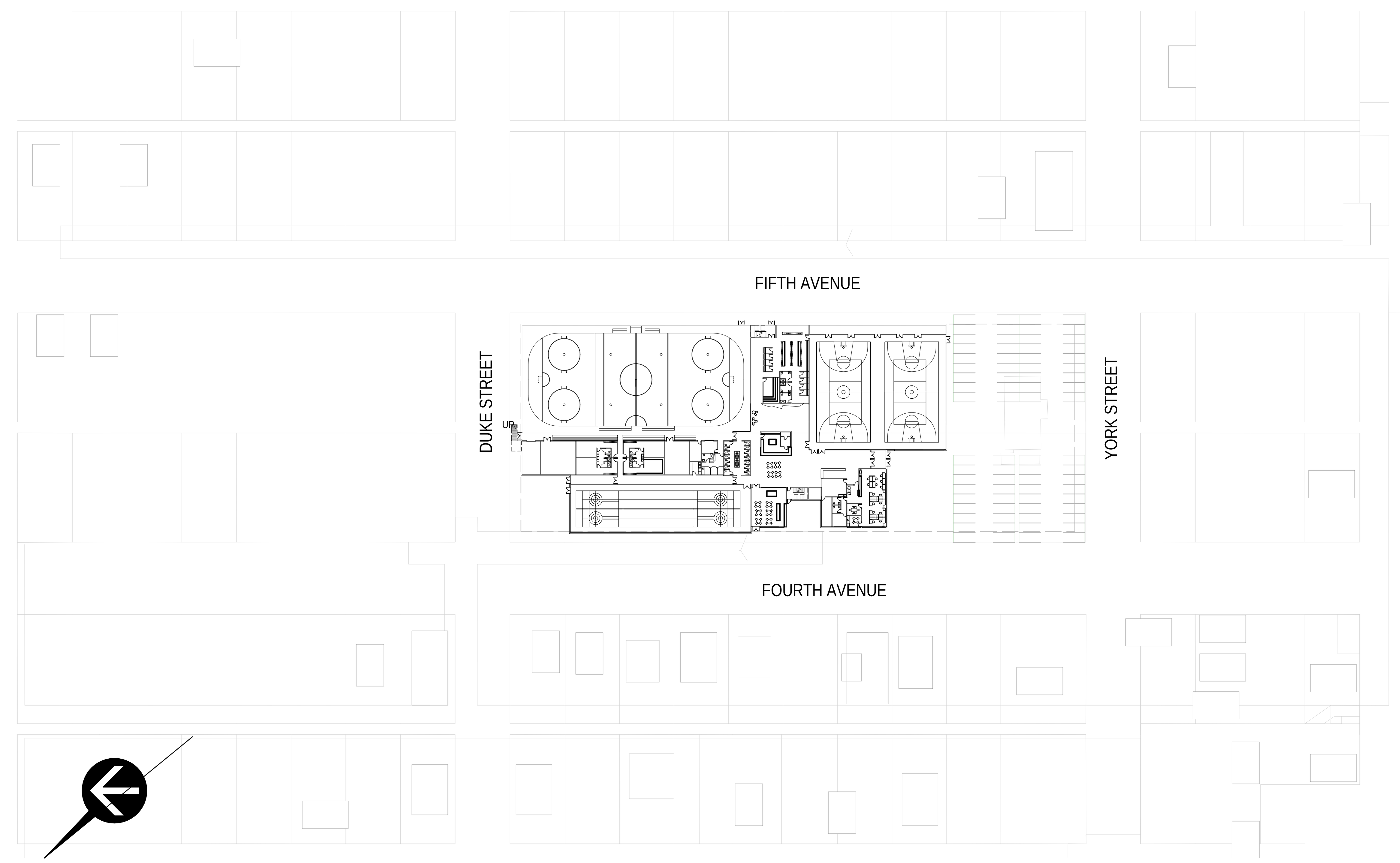
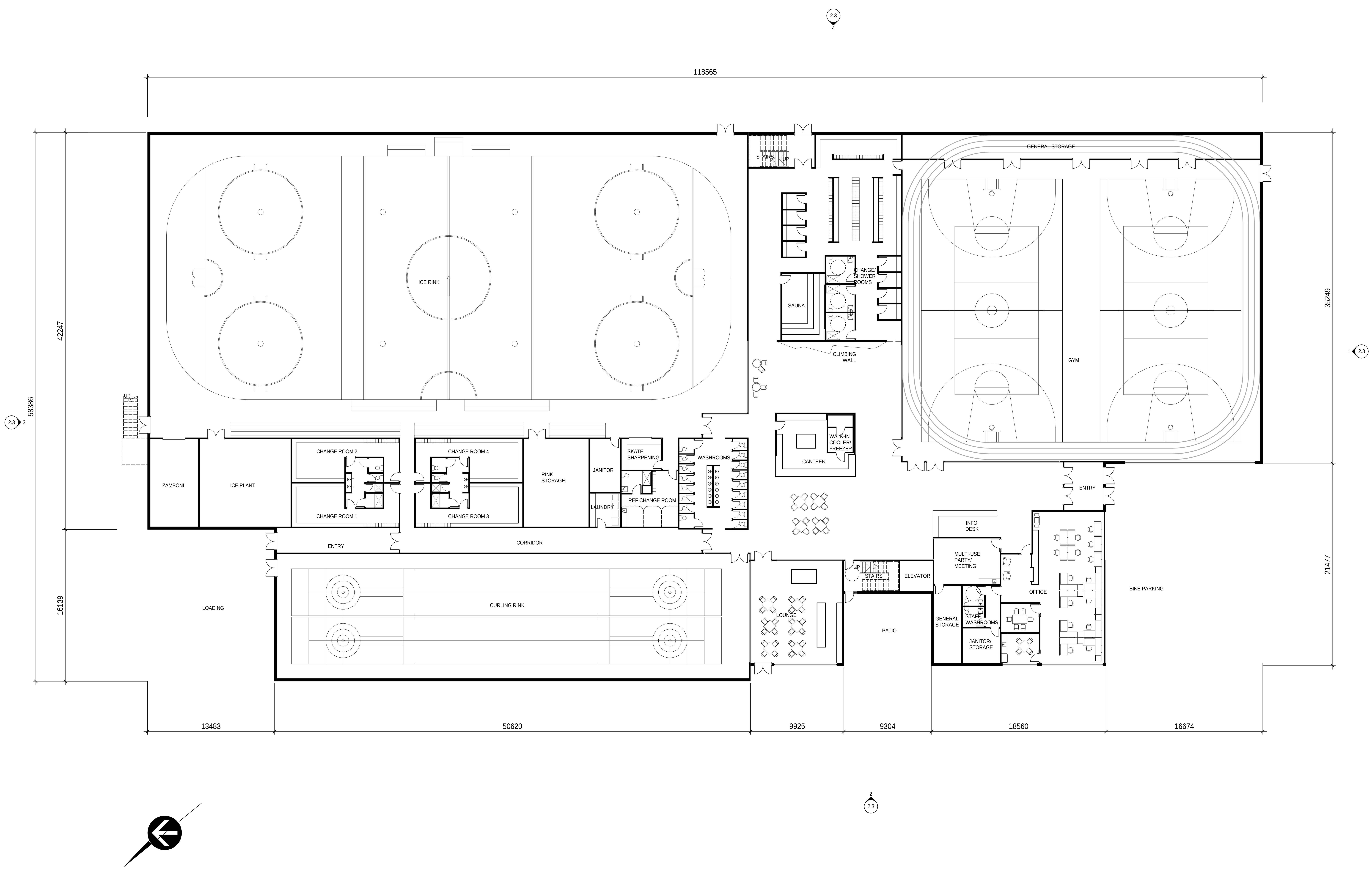
www.republicarchitecture.ca

GOLDRUSH OPTION 2
SITE





GOLDRUSH OPTION 2
MAIN FLOOR PLAN 1:200

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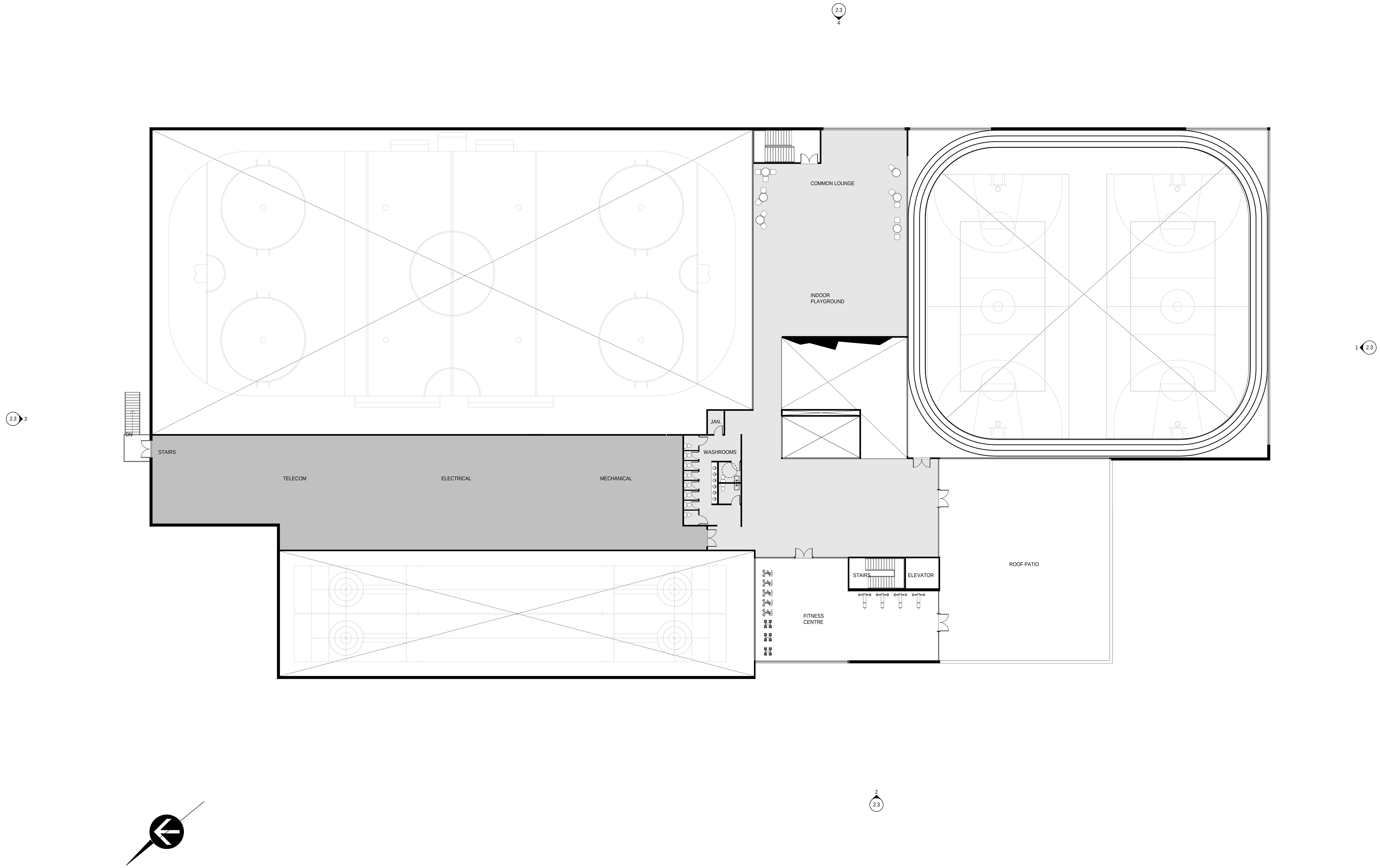

GOLDRUSH OPTION 2
SECOND FLOOR PLAN 1:200

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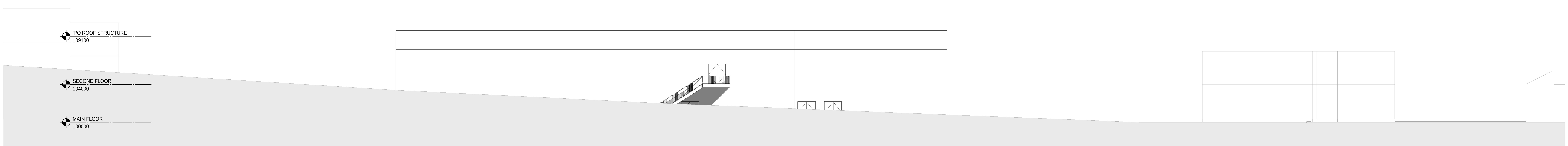
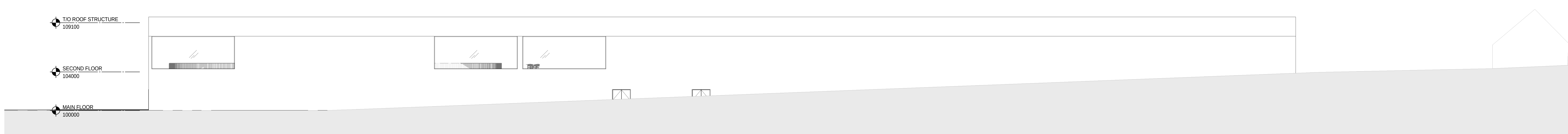
1 SOUTH ELEVATION - GOLDRUSH OPTION 2
1 : 200

2 WEST ELEVATION - GOLDRUSH OPTION 2
1 : 200



3 NORTH ELEVATION - GOLDRUSH OPTION 2
1 : 200



4 EAST ELEVATION - GOLDRUSH OPTION 2
1 : 200

GOLDRUSH OPTION 2
ELEVATIONS

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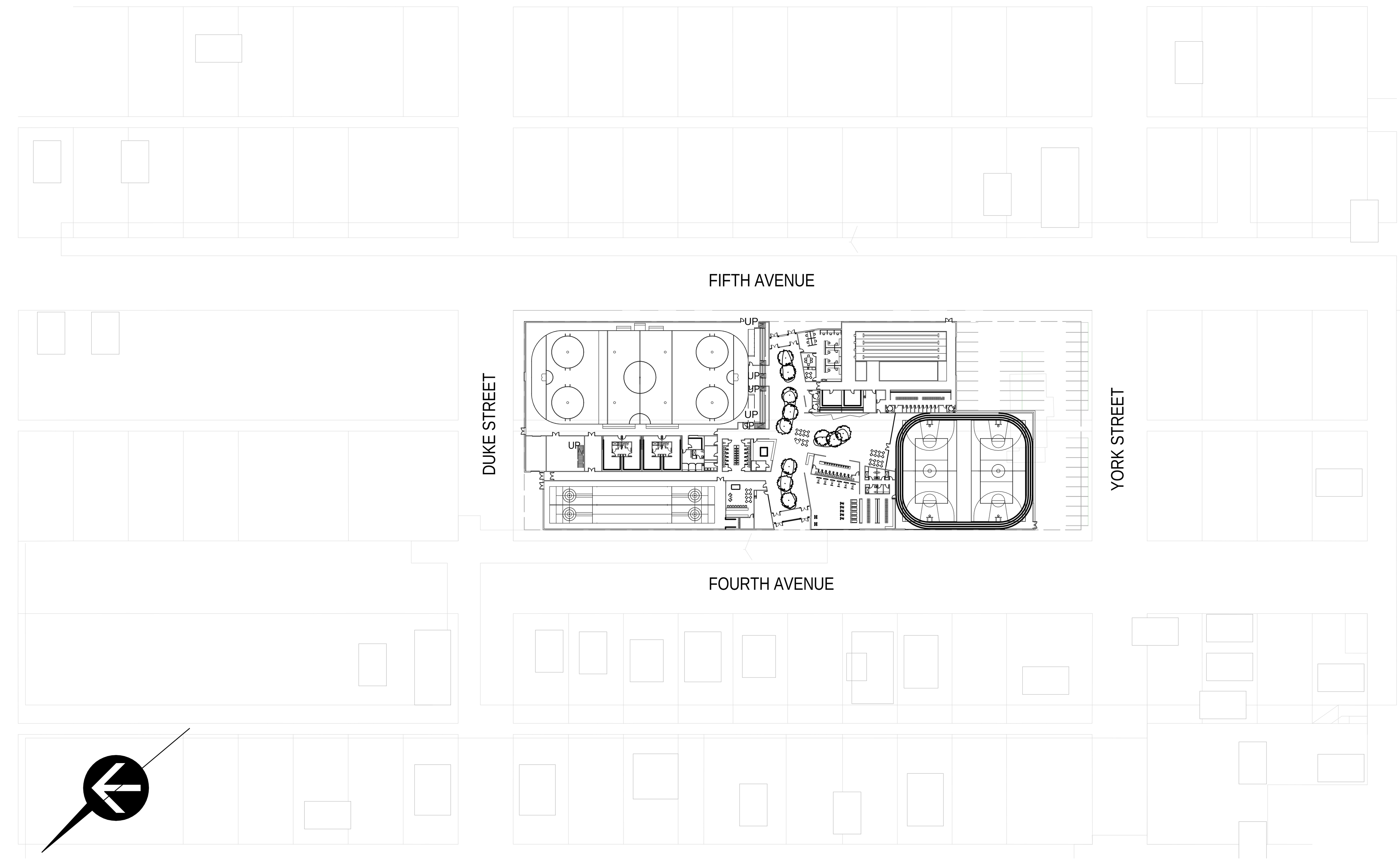
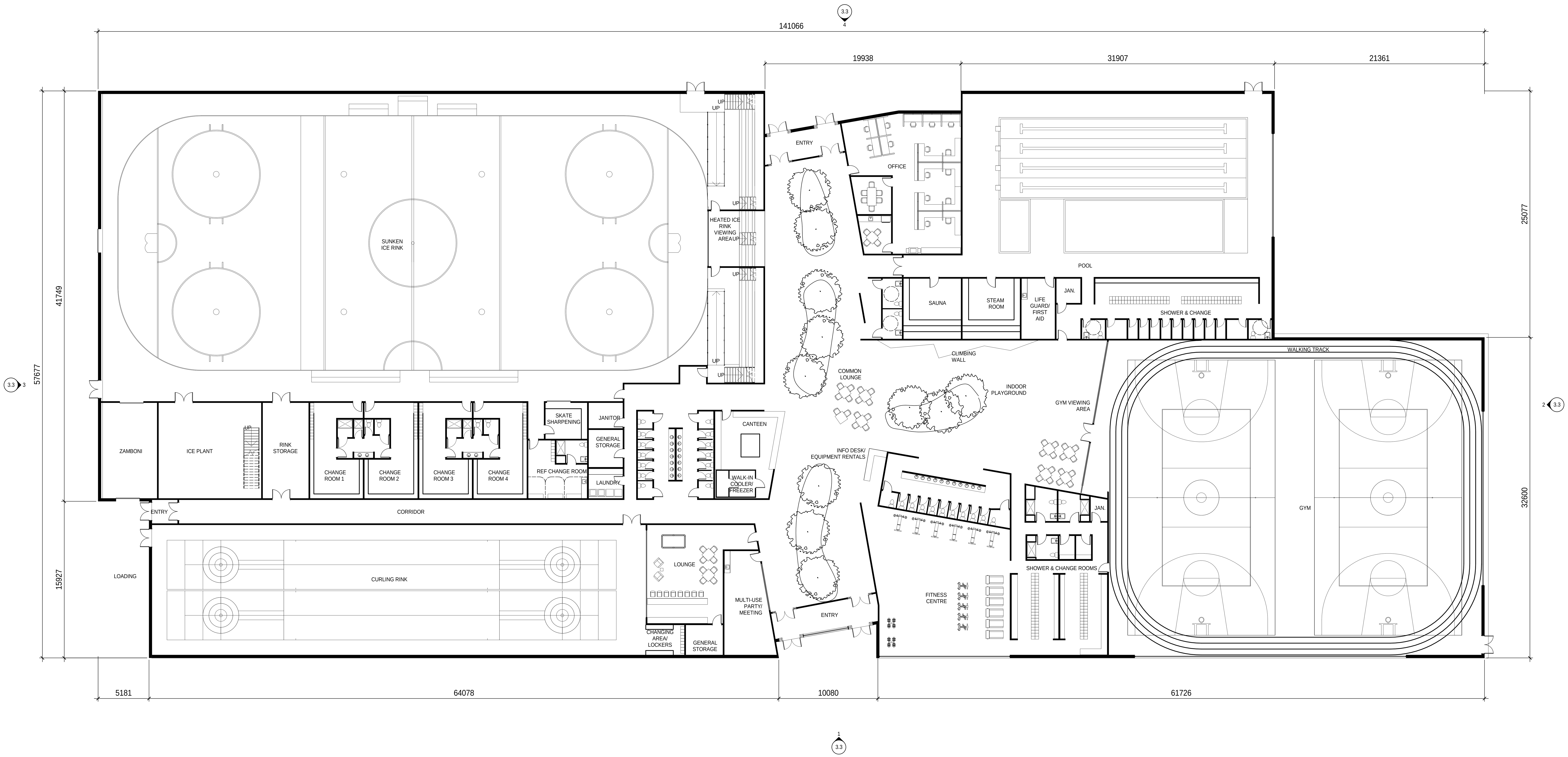
GOLDRUSH OPTION 3
SITE





GOLDRUSH OPTION 3
MAIN FLOOR 1:200

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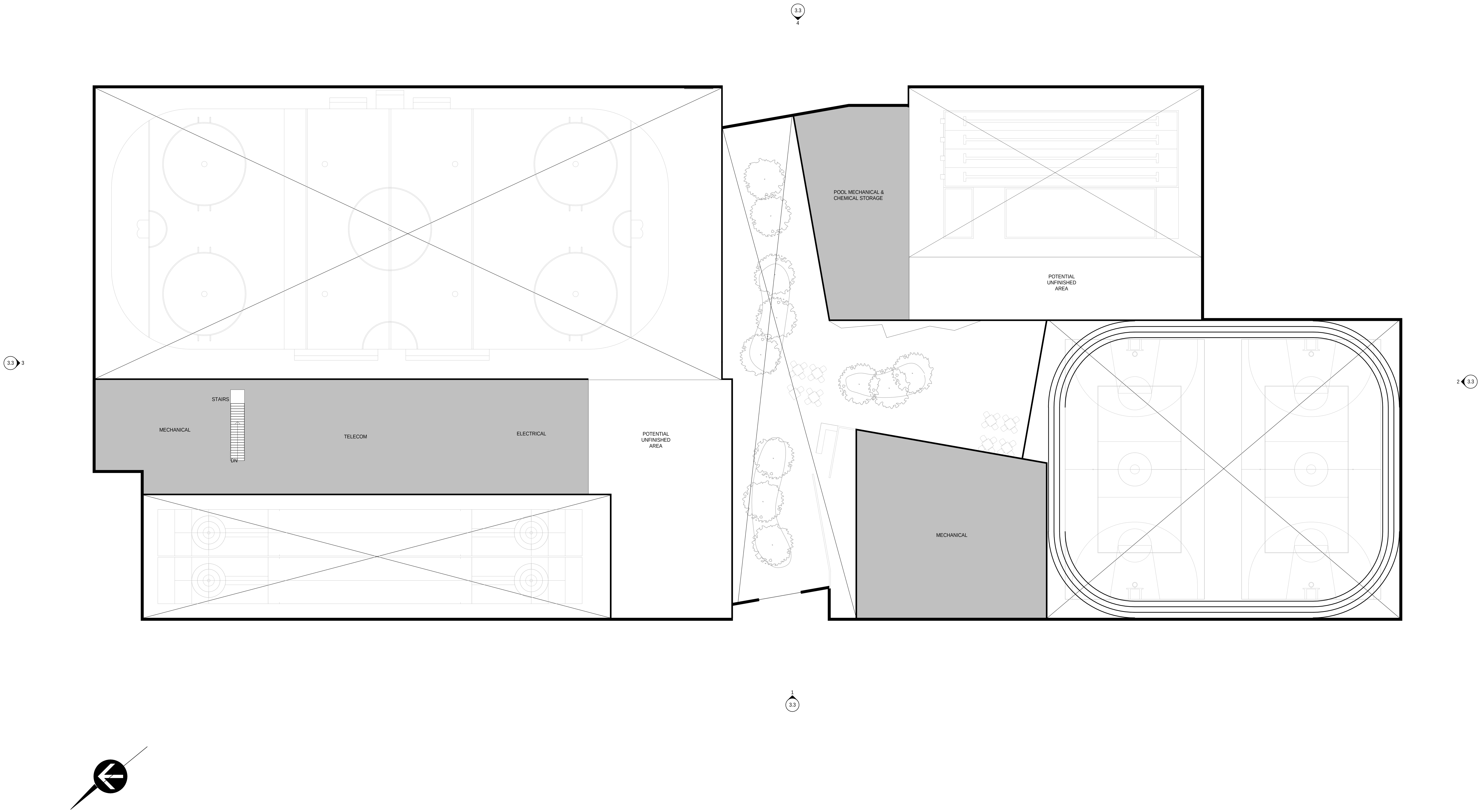

GOLDRUSH OPTION 3
SECOND FLOOR PLAN 1:200

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2 SOUTH ELEVATION - GOLDRUSH OPTION 3
1 : 200

1 WEST ELEVATION - GOLDRUSH OPTION 3
1 : 200

3 NORTH ELEVATION - GOLDRUSH OPTION 3
1 : 200

4 EAST ELEVATION - GOLDRUSH OPTION 3
1 : 200

GOLDRUSH OPTION 3
ELEVATIONS

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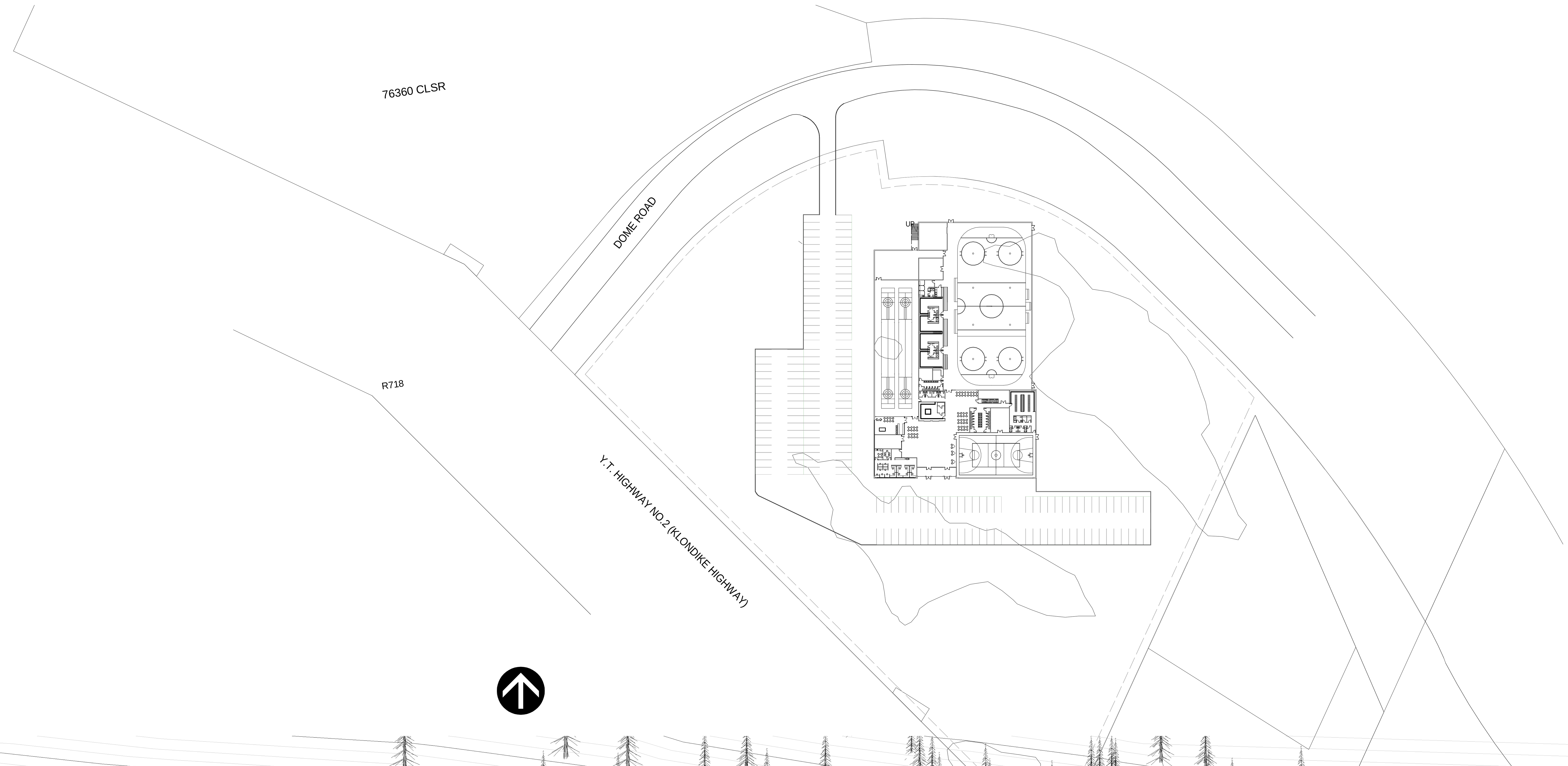
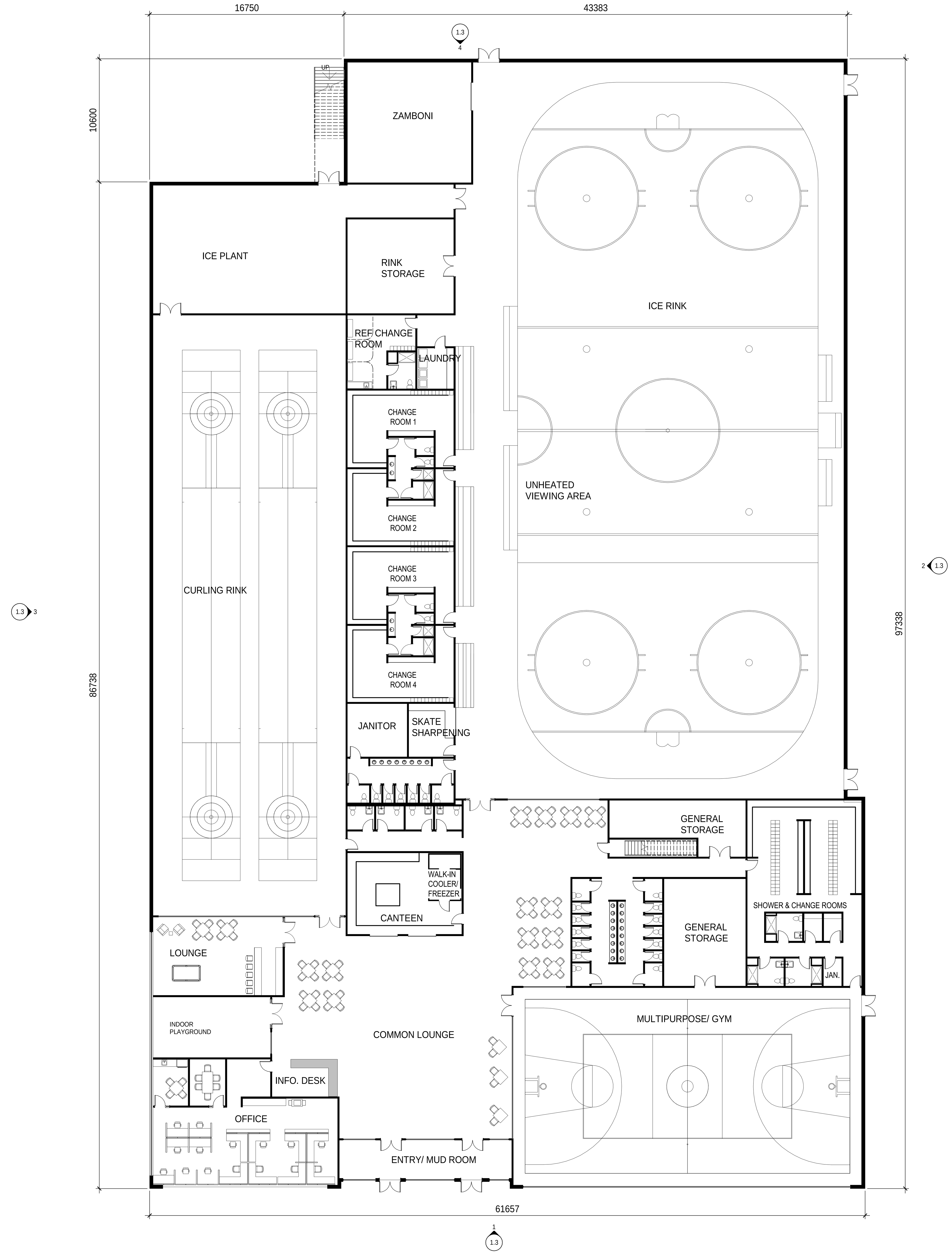
DOME ROAD OPTION 1
SITE





DOME ROAD OPTION 1
MAIN FLOOR PLAN 1:200

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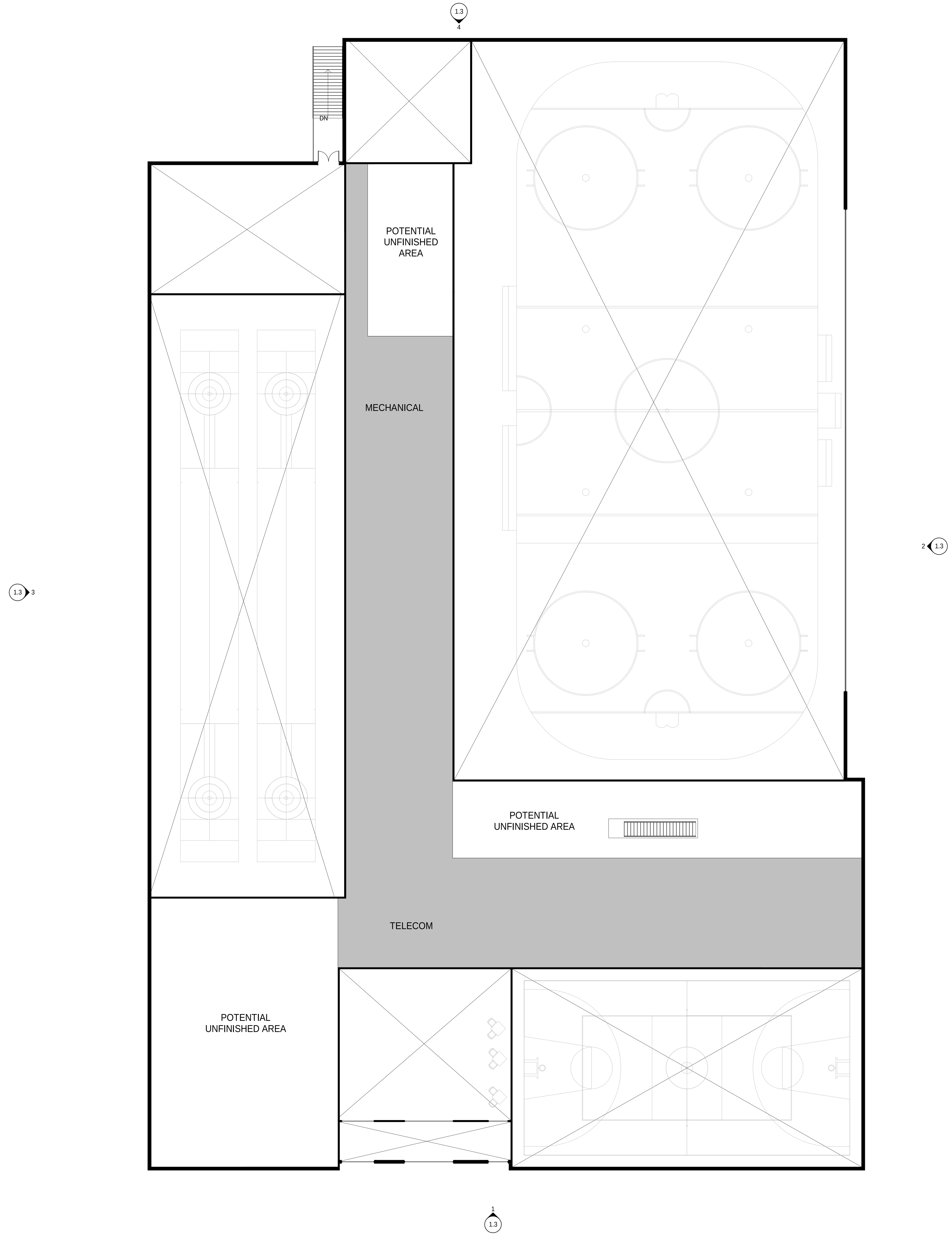

DOME ROAD OPTION 1
SECOND FLOOR PLAN 1:200

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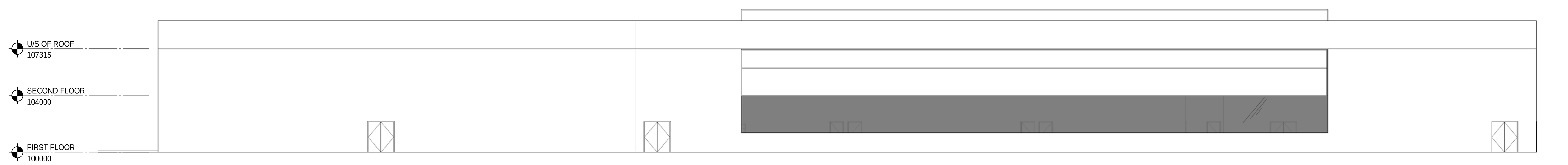
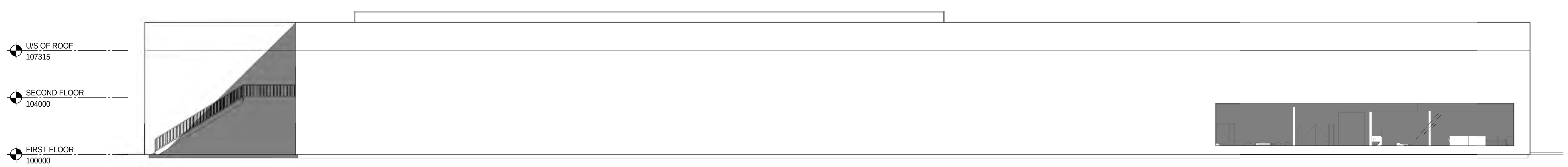
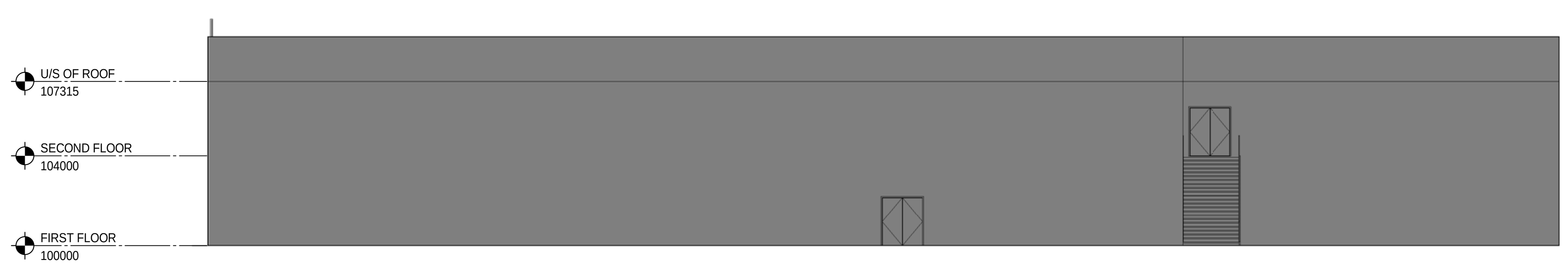
1 SOUTH ELEVATION - OPTION 1
1 : 200



2 EAST ELEVATION - OPTION 1
1 : 200



3 WEST ELEVATION - OPTION 1
1 : 200



4 NORTH ELEVATION - OPTION 1
1 : 200

DOME ROAD OPTION 1
ELEVATIONS

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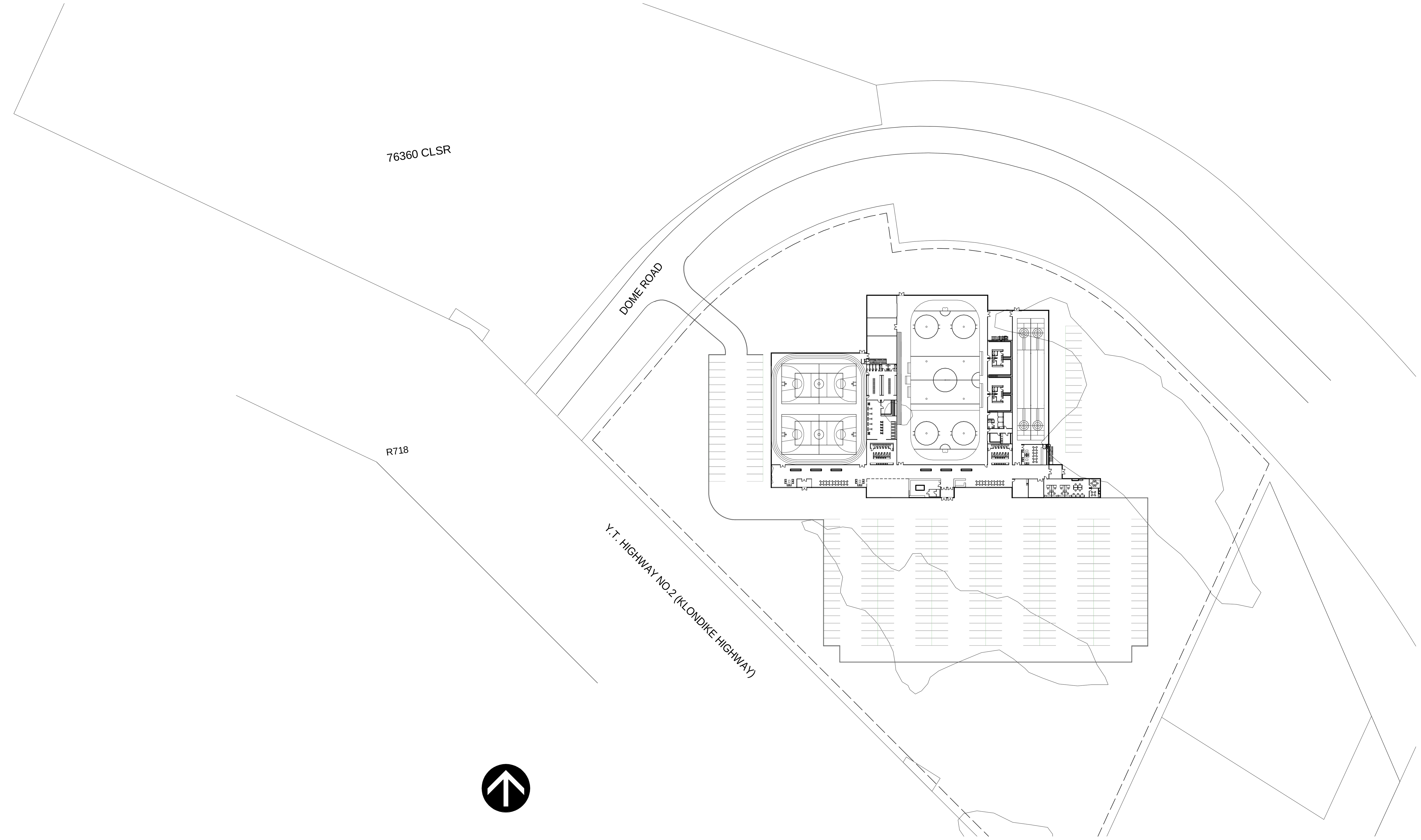
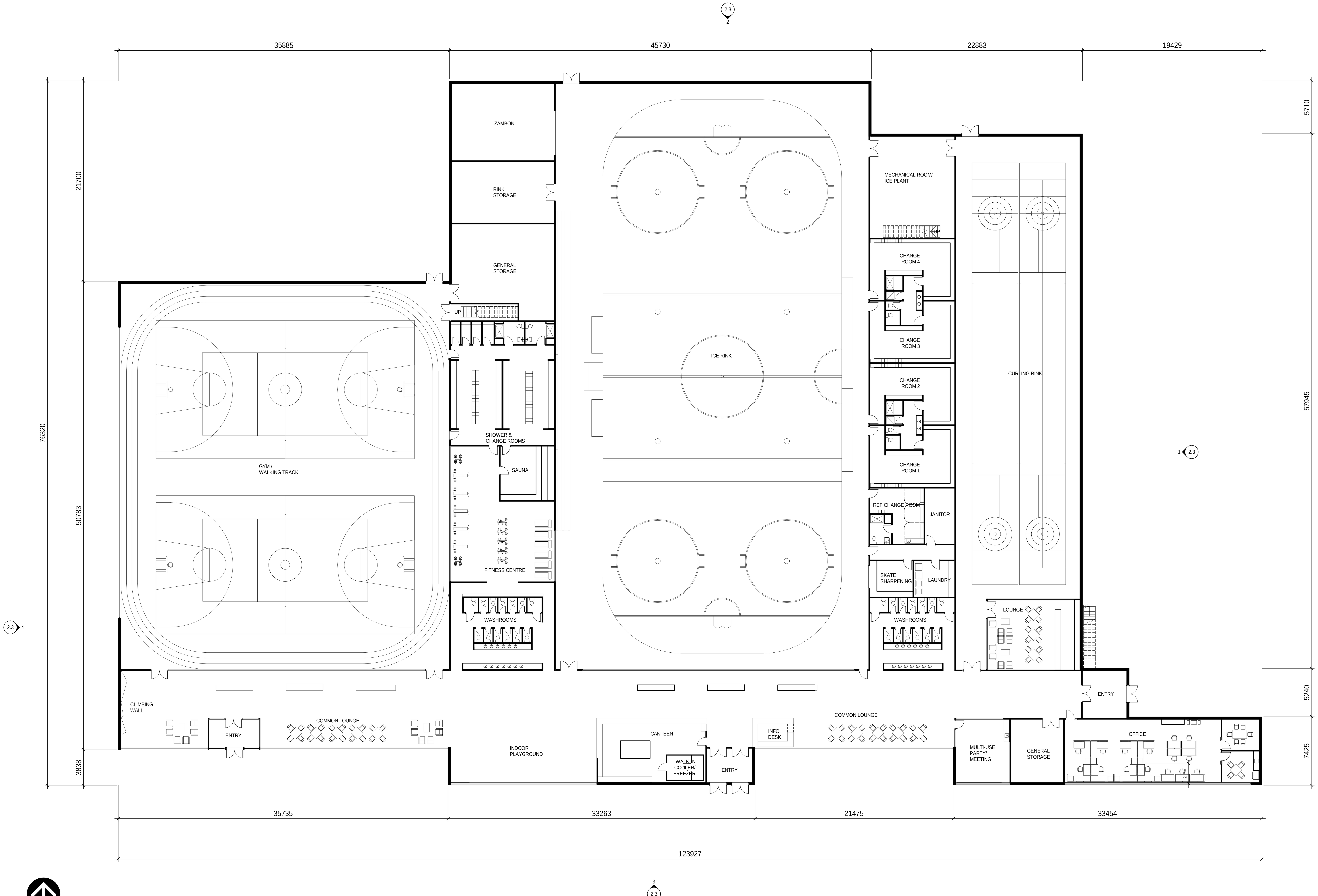
DOME ROAD OPTION 2
SITE





DOME ROAD OPTION 2

MAIN FLOOR PLAN 1:200

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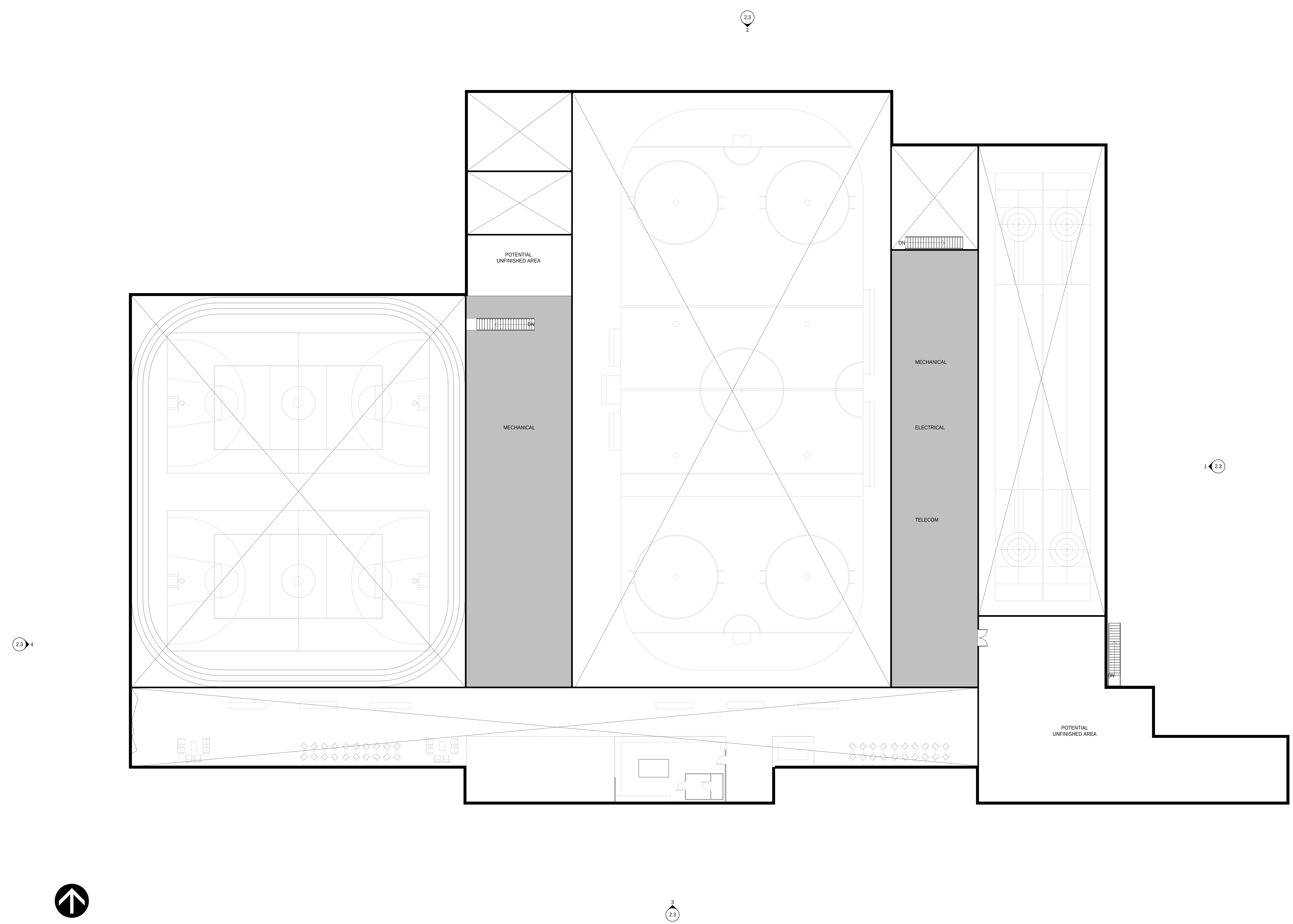

DOME ROAD OPTION 2
SECOND FLOOR PLAN 1:200

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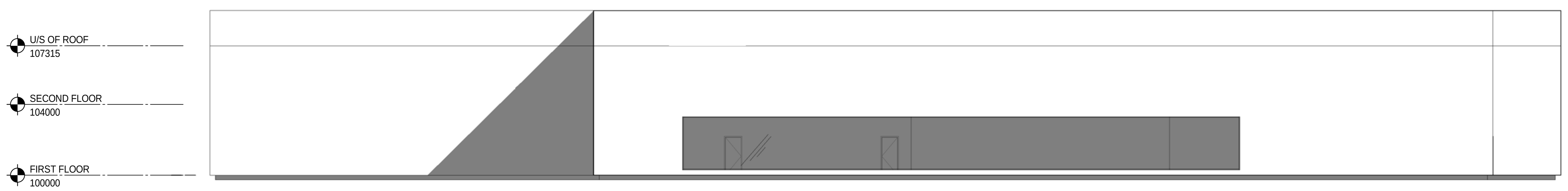
3 SOUTH ELEVATION - OPTION 2
1 : 200



4 WEST ELEVATION - OPTION 2
1 : 200

1 EAST ELEVATION - OPTION 2
1 : 200

2 NORTH ELEVATION - OPTION 2
1 : 200

DOME ROAD OPTION 2
ELEVATIONS

total - window/wall ratio: 11%
total wall - 3848 sm
total window - 414 sm

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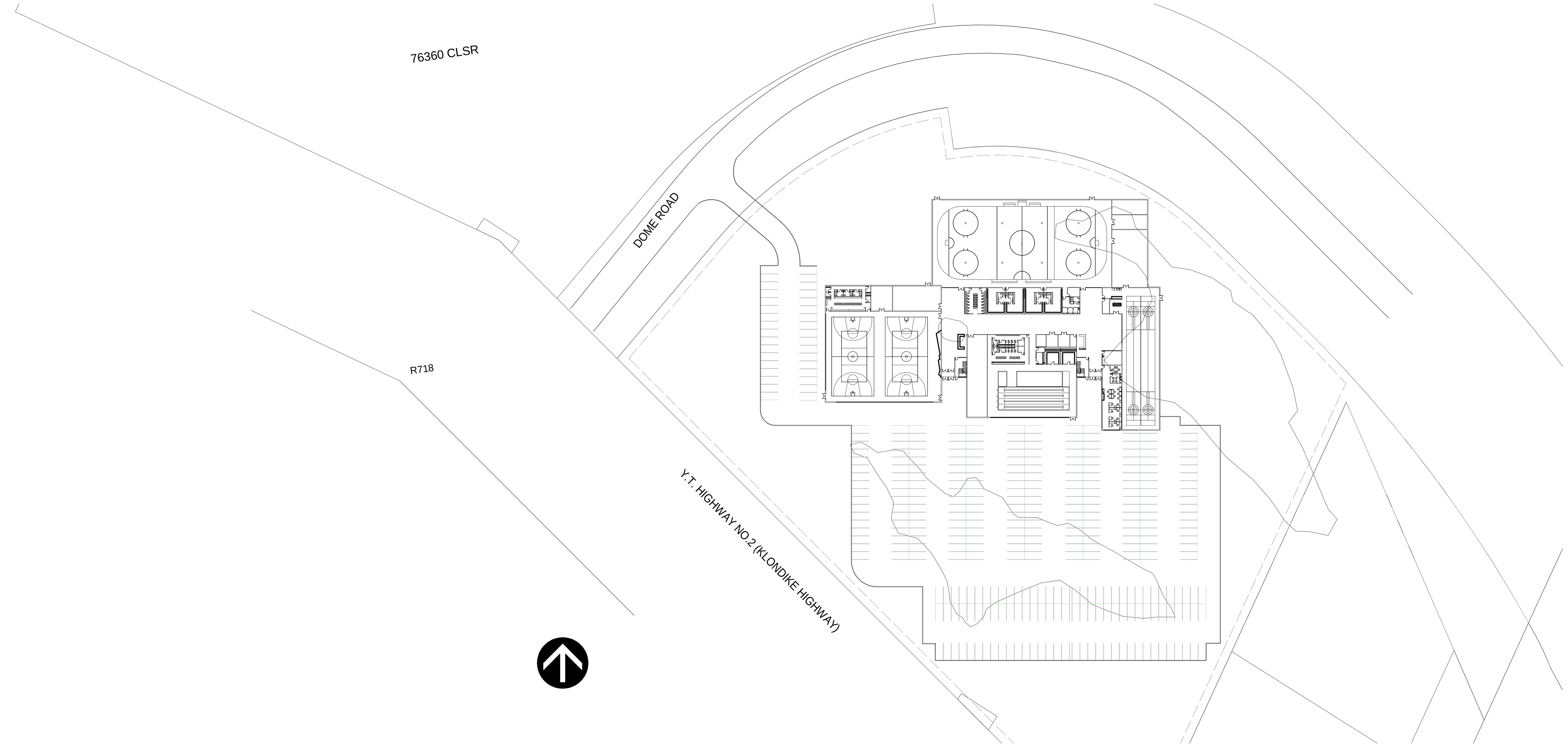
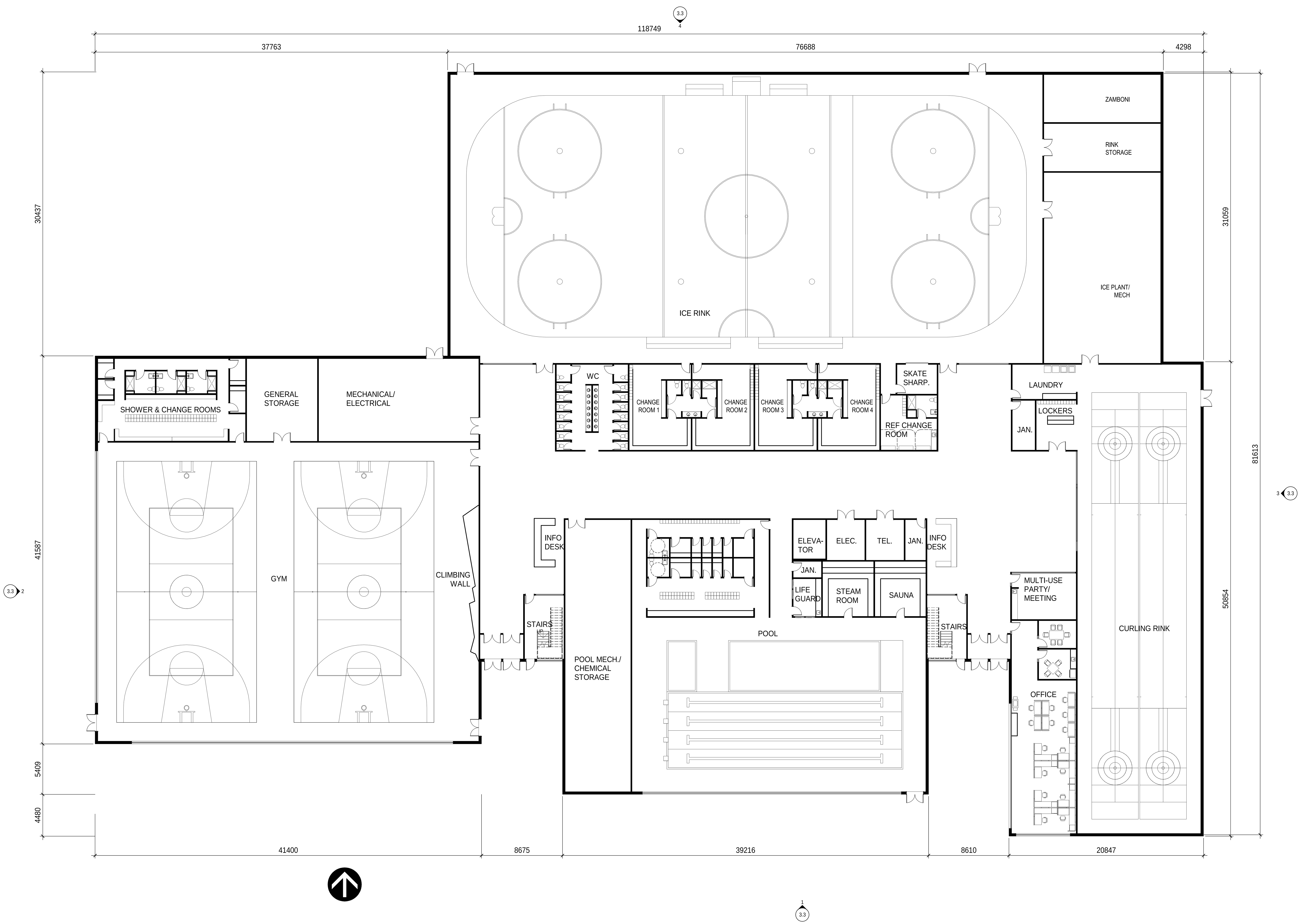
DOME ROAD OPTION 3
SITE





DOME ROAD OPTION 3
MAIN FLOOR PLAN 1:200

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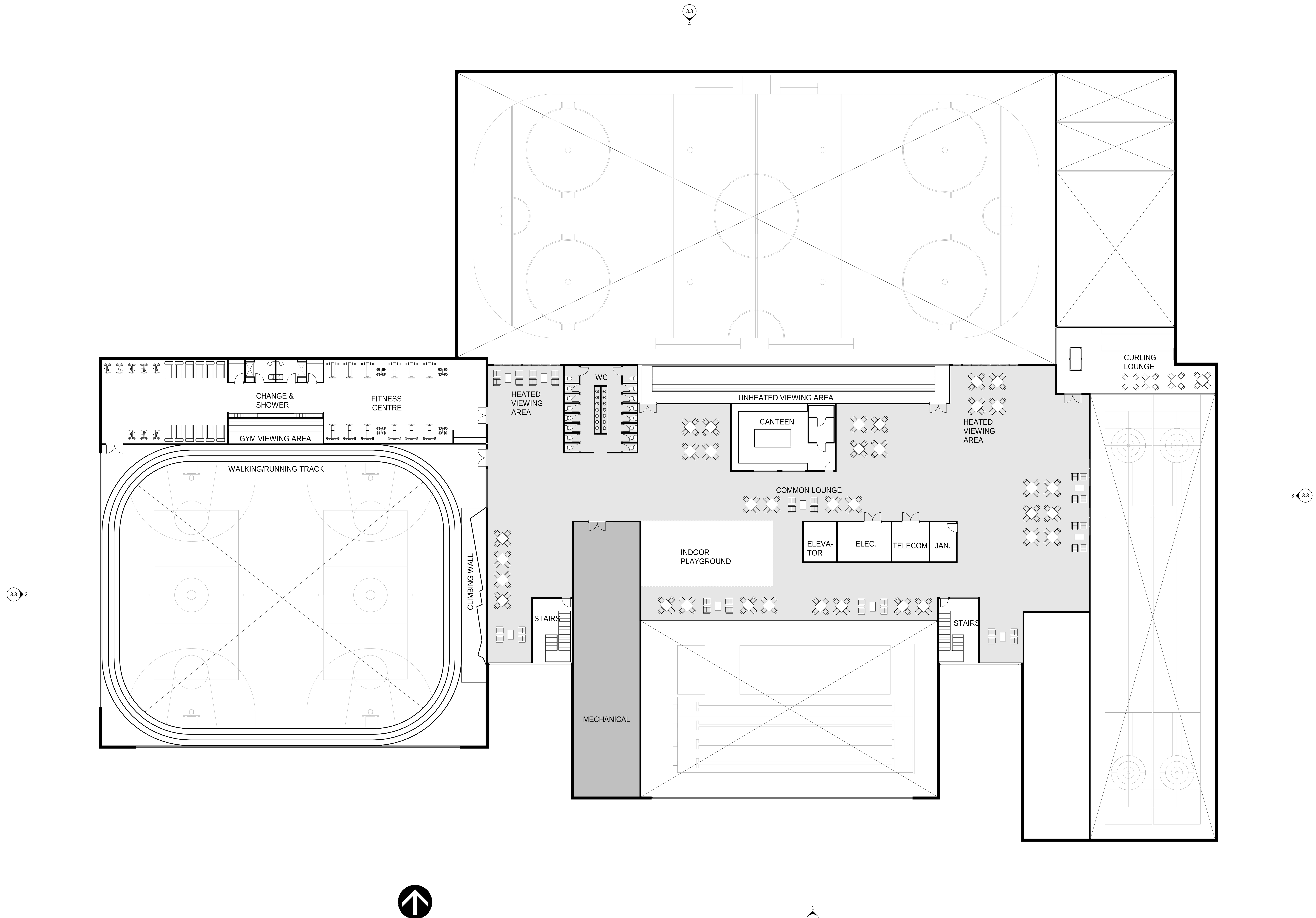

DOME ROAD OPTION 3
SECOND FLOOR PLAN 1:200

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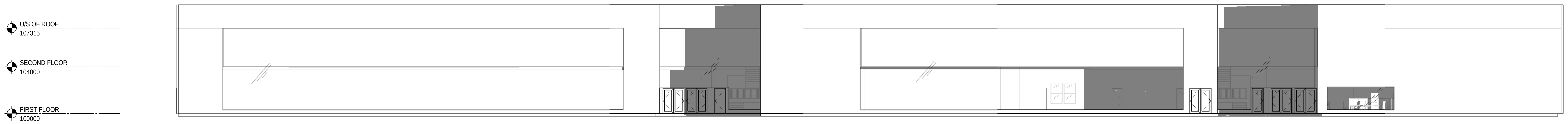

1 SOUTH ELEVATION - OPTION 3
1 : 200

2 WEST ELEVATION - OPTION 3
1 : 200

3 EAST ELEVATION - OPTION 3
1 : 200

4 NORTH ELEVATION - OPTION 3
1 : 200

DOME ROAD OPTION 3
ELEVATIONS

total - window/wall ratio: 20%
total wall - 3780 sm
total window - 745 sm

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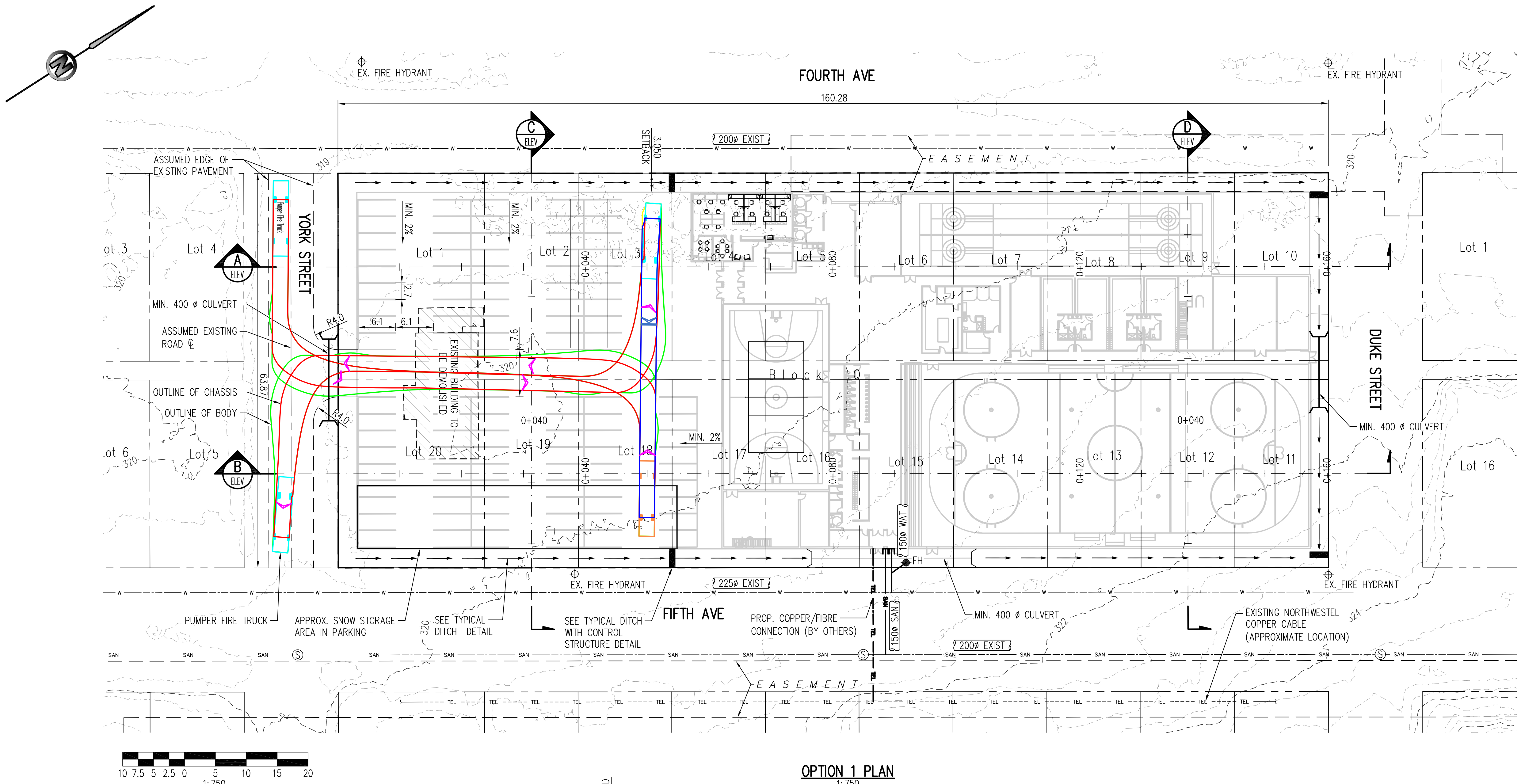
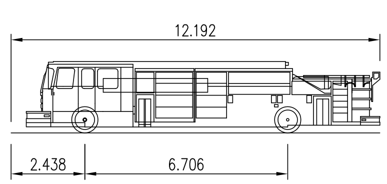
Appendix B
Civil Drawings

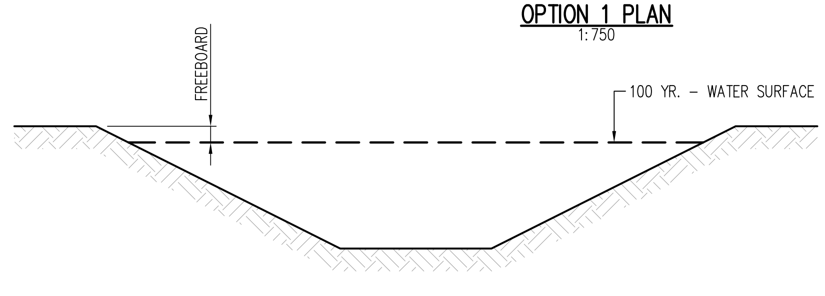


OPTION 1 PLAN
1:750

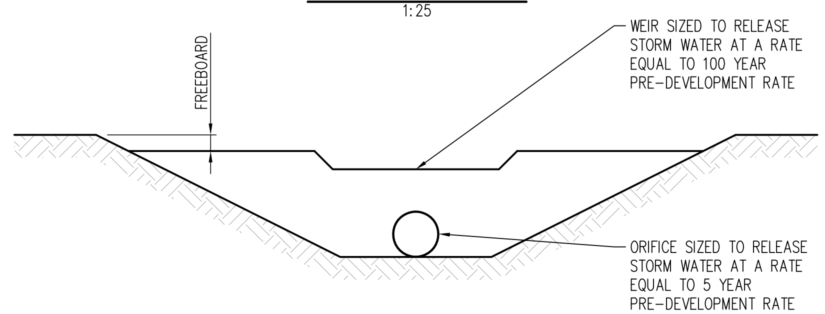


PUMPER FIRE TRUCK:

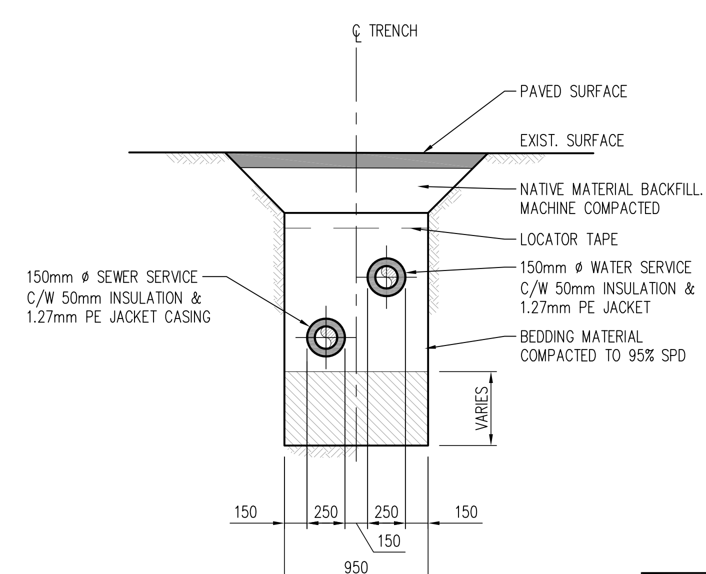
OVERALL LENGTH	12.192m
OVERALL WIDTH	2.489m
OVERALL BODY HEIGHT	2.361m
MIN. BODY GROUND CLEARANCE	0.200m
TRACK WIDTH	2.489m
LOCK-TO-LOCK TIME	5.00s
MAX WHEEL ANGLE	45.00°



TYPICAL DITCH DETAIL
1:25



TYPICAL DITCH WITH CONTROL STRUCTURE DETAIL
1:25



TYPICAL TRENCH DETAIL
1:50

ISSUED FOR REVIEW

LEGEND

PROPERTY LINE - EXIST	
PROPERTY LINE - PROP	
SANITARY - EXIST	SAN
SANITARY - PROP	SAN
WATER - EXIST	W
WATER - PROP	W
DITCH - PROP	
CULVERT - PROP	
HYDRANT - EXIST	
HYDRANT - PROP	FH
CONTOURS - EXIST	
MAJOR 2m	
MINOR 0.5m	
TELEPHONE/CABLE - EXIST	TEL
TELEPHONE/CABLE - PROP	TEL

REFERENCE DRAWINGS

DWG No.	REV	PROJECT No.	PRODUCED BY
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1	21.01.15	JE	AK	AK	REVISED SITE LAYOUT
0	20.12.22	JE	AK	AK	ISSUED WITH REPORT

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GOLD RUSH - CIVIL
OPTION 1 PLAN

PROJECT No.	DRAWING No.	REV
1442-03	GR OPT-1	1

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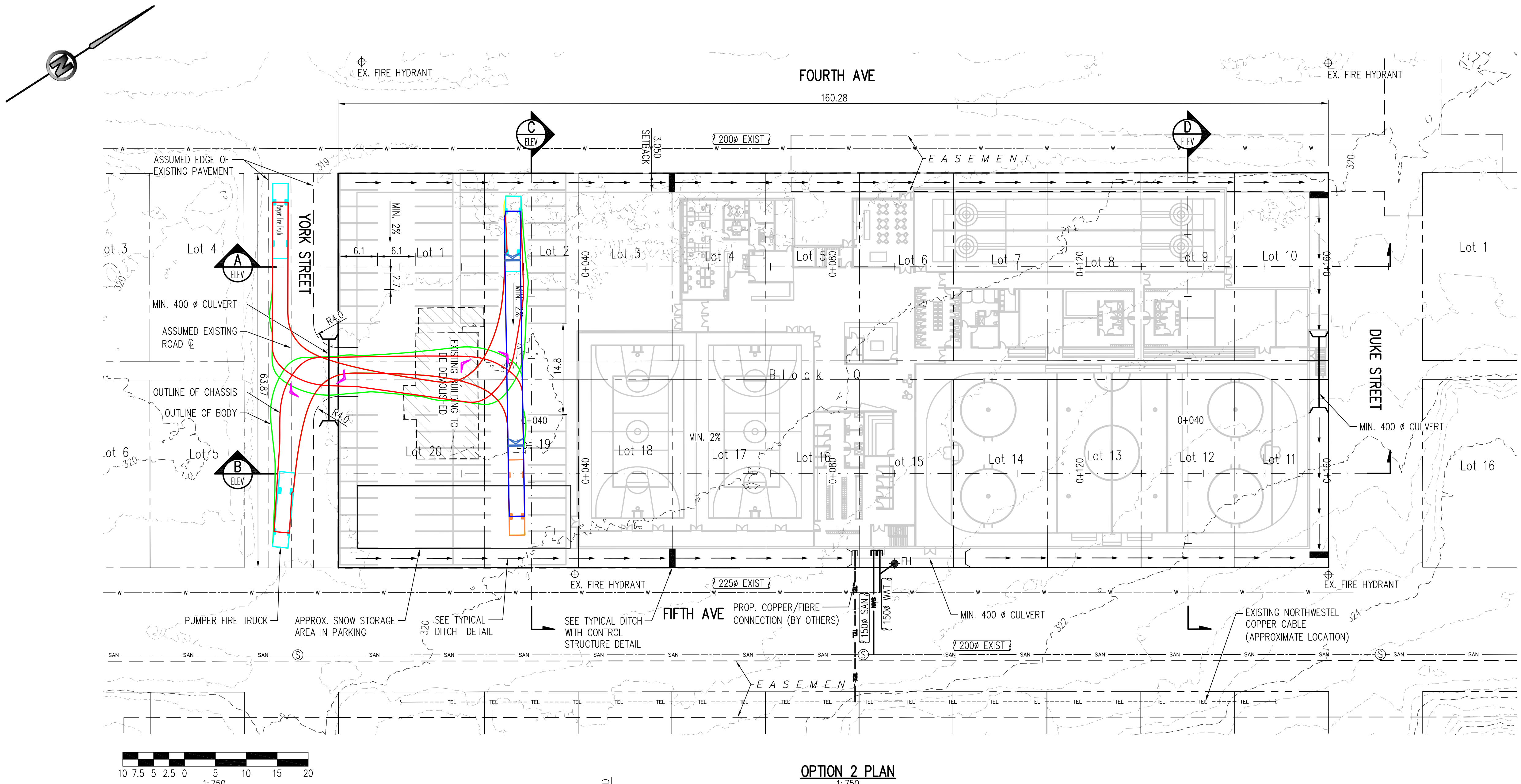
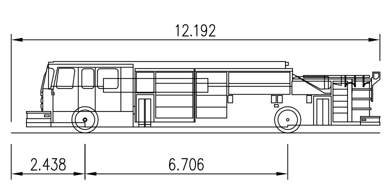


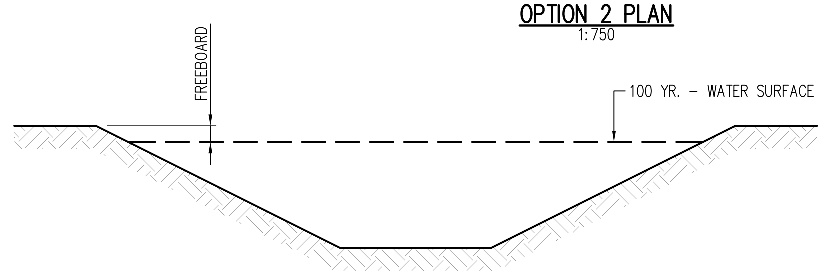
OPTION 2 PLAN

1:750



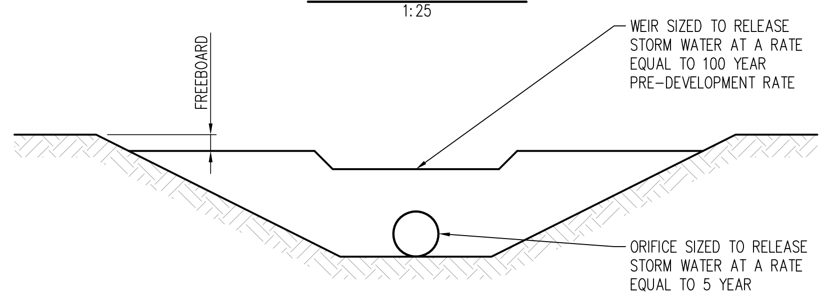
PUMPER FIRE TRUCK:

OVERALL LENGTH	12.192m
OVERALL WIDTH	2.489m
OVERALL BODY HEIGHT	2.361m
MIN. BODY GROUND CLEARANCE	0.200m
TRACK WIDTH	2.489m
LOCK-TO-LOCK TIME	5.00s
MAX WHEEL ANGLE	45.00°



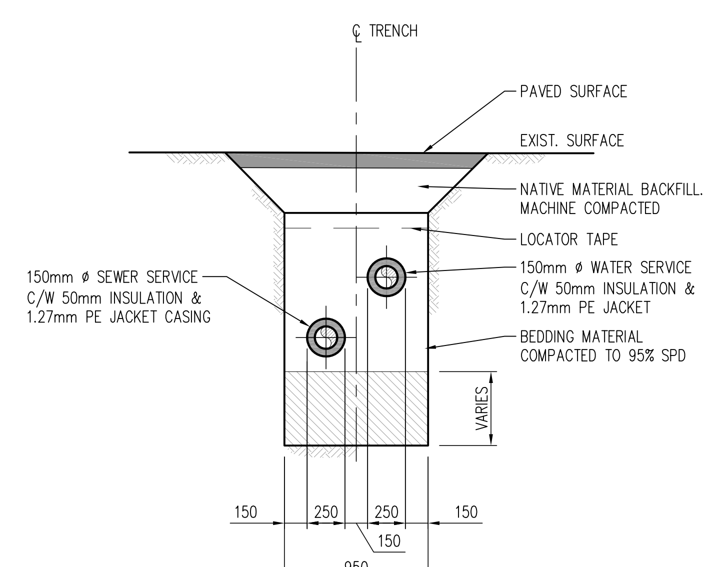
TYPICAL DITCH DETAIL

1:25



TYPICAL DITCH WITH CONTROL STRUCTURE DETAIL

1:25



TYPICAL TRENCH DETAIL

1:50

ISSUED FOR REVIEW

LEGEND

- PROPERTY LINE – EXIST
- PROPERTY LINE – PROP
- SANITARY – EXIST
- SANITARY – PROP
- WATER – EXIST
- WATER – PROP
- DITCH – PROP
- CULVERT – PROP
- HYDRANT – EXIST
- HYDRANT – PROP
- CONTOURS – EXIST
  - MAJOR 2m
  - MINOR 0.5m
- TELEPHONE/CABLE – EXIST
- TELEPHONE/CABLE – PROP

REFERENCE DRAWINGS

DWG No.	REV	PROJECT No.	PRODUCED BY
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0	20.12.22	JE	AK	AK	ISSUED WITH REPORT

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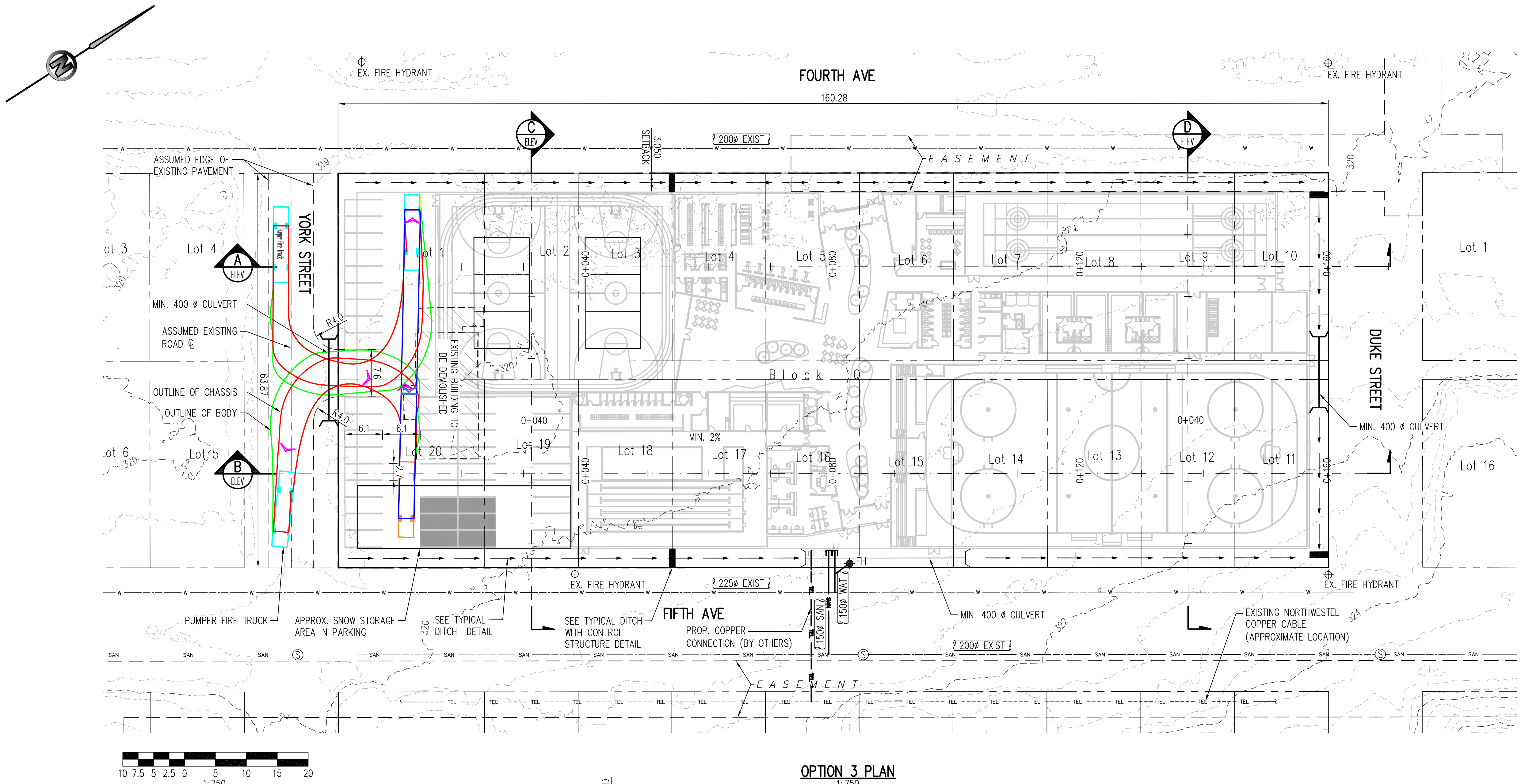
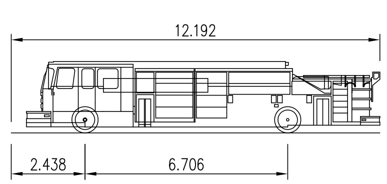
GOLD RUSH - CIVIL OPTION 2 PLAN

PROJECT No.	DRAWING No.	REV
1442-03	GR OPT-2	1



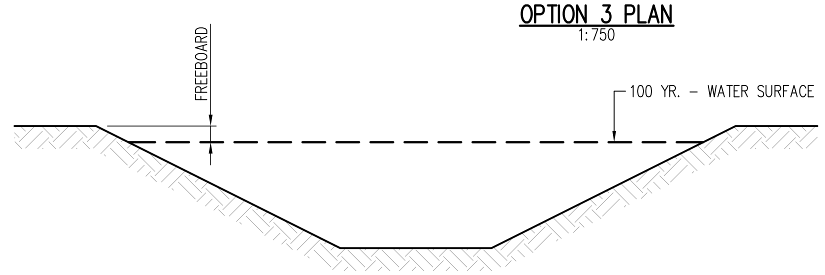
OPTION 3 PLAN

1:750



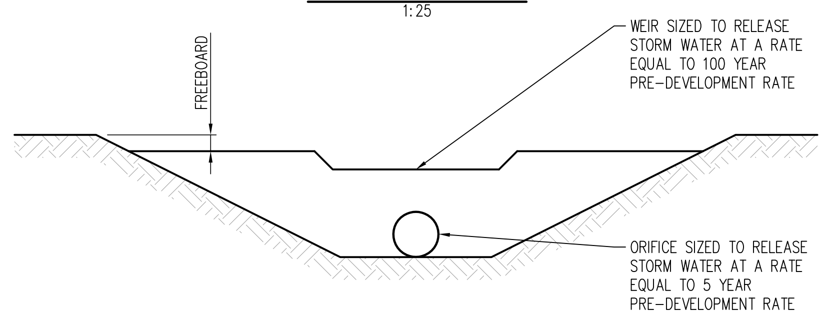
PUMPER FIRE TRUCK:

OVERALL LENGTH	12.192m
OVERALL WIDTH	2.489m
OVERALL BODY HEIGHT	2.361m
MIN. BODY GROUND CLEARANCE	0.200m
TRACK WIDTH	2.489m
LOCK-TO-LOCK TIME	5.00s
MAX WHEEL ANGLE	45.00°



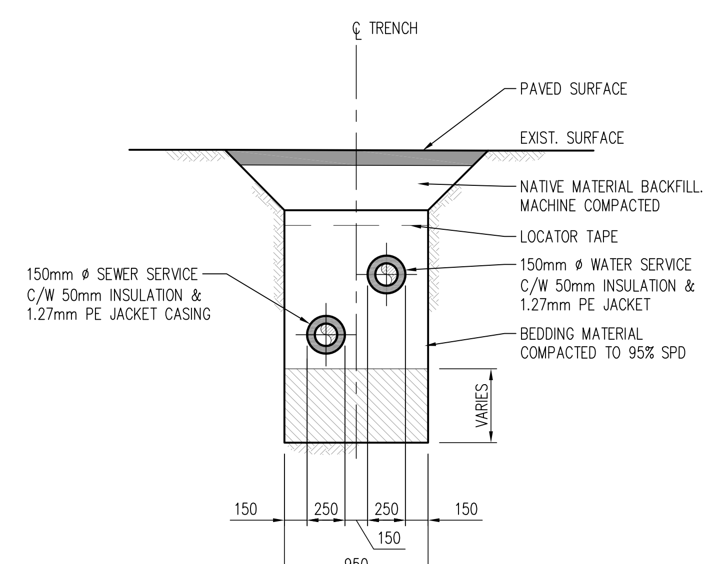
TYPICAL DITCH DETAIL

1:25



TYPICAL DITCH WITH CONTROL STRUCTURE DETAIL

1:25



TYPICAL TRENCH DETAIL

1:50

ISSUED FOR REVIEW

LEGEND

- PROPERTY LINE – EXIST
- PROPERTY LINE – PROP
- SANITARY – EXIST
- SANITARY – PROP
- WATER – EXIST
- WATER – PROP
- DITCH – PROP
- CULVERT – PROP
- HYDRANT – EXIST
- HYDRANT – PROP
- CONTOURS – EXIST
  - MAJOR 2m
  - MINOR 0.5m
- TELEPHONE/CABLE – EXIST
- TELEPHONE/CABLE – PROP

REFERENCE DRAWINGS

DWG No.	REV	PROJECT No.	PRODUCED BY
-	-	-	-

DRAWING REVISIONS

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1	21.01.15	JE	AK	AK	REVISED SITE LAYOUT
0	20.12.22	JE	AK	AK	ISSUED WITH REPORT

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GOLD RUSH - CIVIL
OPTION 3 PLAN

PROJECT No.	DRAWING No.	REV
1442-03	GR OPT-3	1

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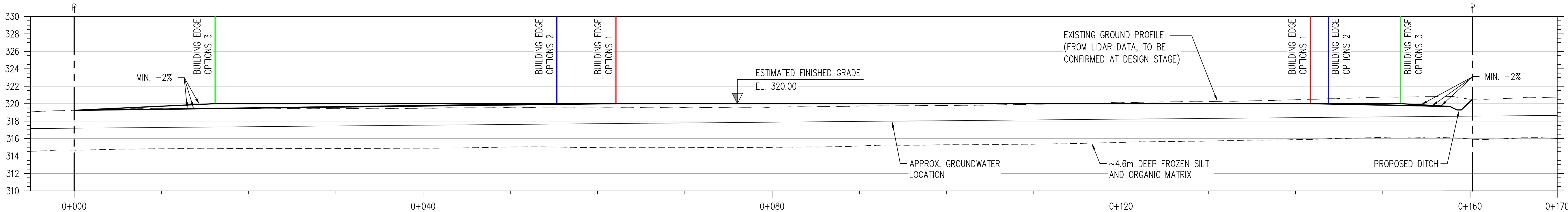
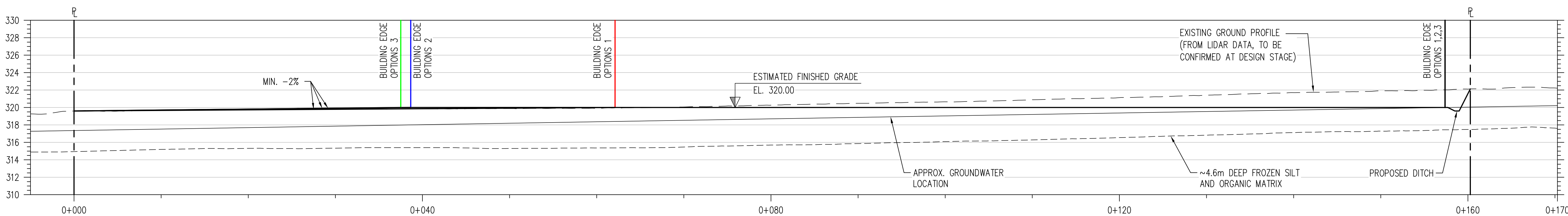
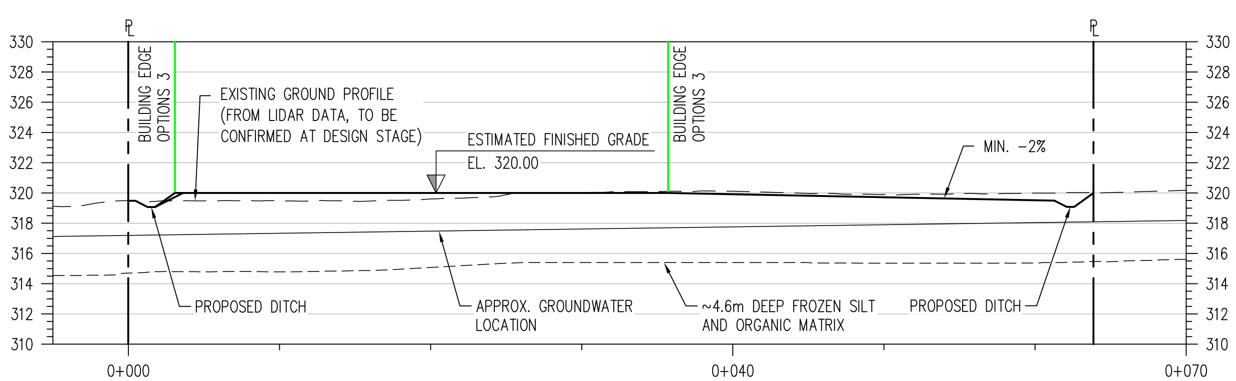


SECTION A
1:500 OPT



SECTION B
1:500 OPT



SECTION C
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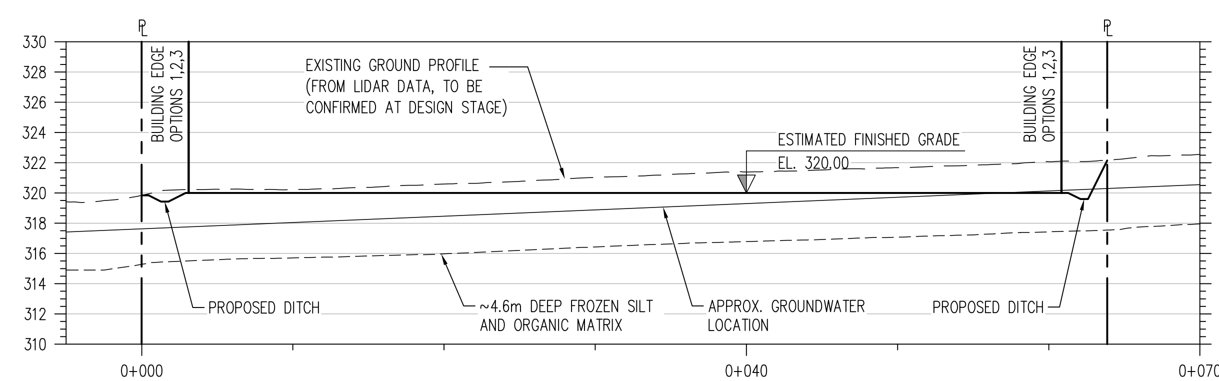

SECTION D
1:500 OPT

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GOLD RUSH - CIVIL SECTIONS

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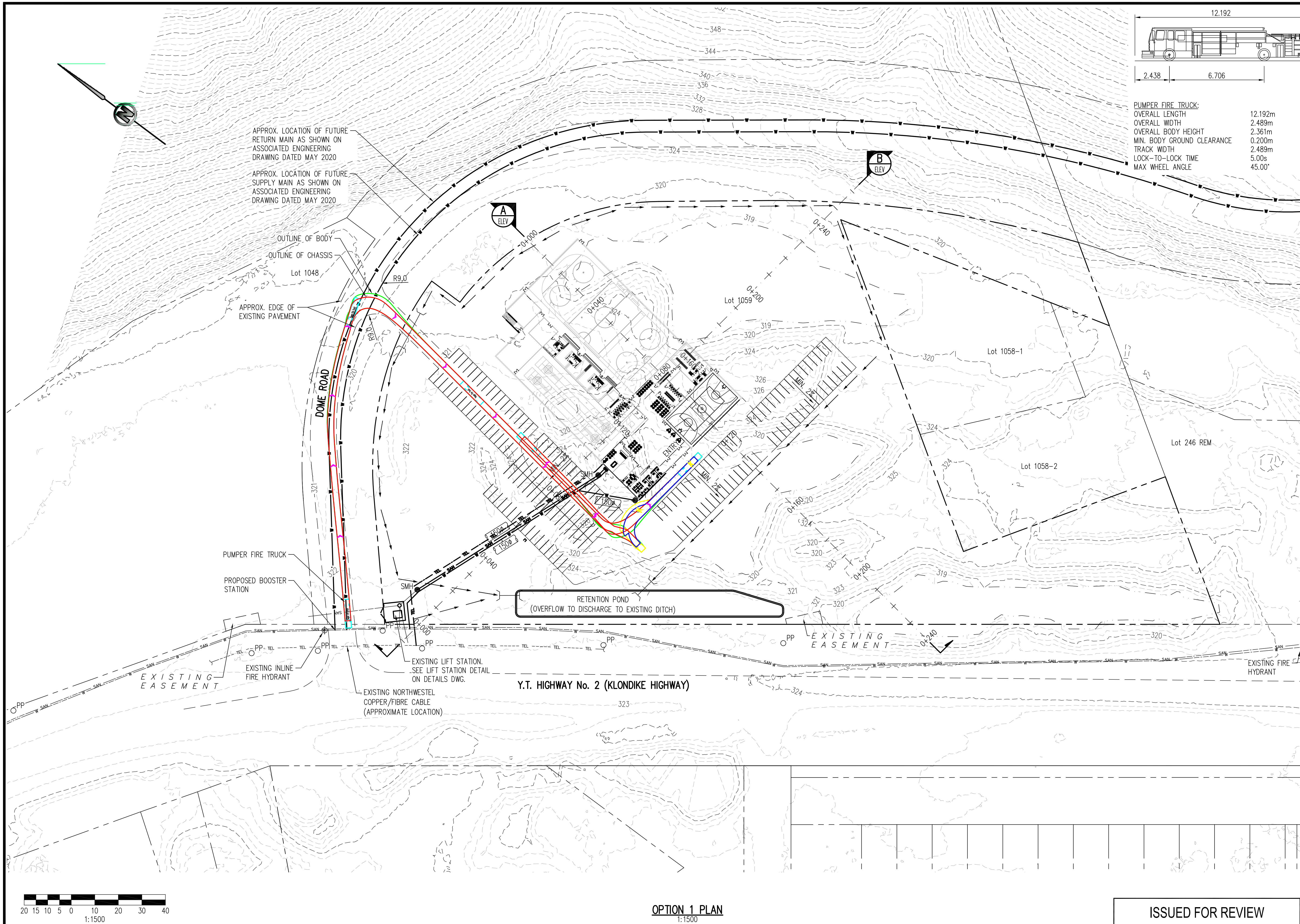
1442-03	GR ELEV	1

DISCARD ALL PREVIOUS REVISIONS LAST UPDATED: 15.01.21 FILE NAME: 1442-03 [DV] Gold Rush.dwg



OPTION 1 PLAN
1:1500

ISSUED FOR REVIEW

LEGEND

PROPERTY LINE - EXIST	
PROPERTY LINE - PROP	
SANITARY - EXIST	SAN
SANITARY - PROP	SAN
WATER - EXIST	W
WATER - PROP	
DITCH - PROP	
CULVERT - PROP	
CONTOURS - EXIST	
MAJOR 2m	
MINOR 0.5m	
HYDRANT - EXIST	FH
HYDRANT - PROP	
POWER POLE - EXIST	PP
SANITARY MANHOLE - PROP	SMH
TELEPHONE/CABLE - EXIST	TEL
TELEPHONE/CABLE - PROP	TEL

REFERENCE DRAWINGS

DWG No.	REV	PROJECT No.	PRODUCED BY
-	-	-	-

DRAWING REVISIONS

REV	DATE	DRW	DES	APP	REVISION
1	21.01.15	JE	AK	AK	REVISED SITE LAYOUT
0	20.12.22	JE	AK	AK	ISSUED WITH REPORT

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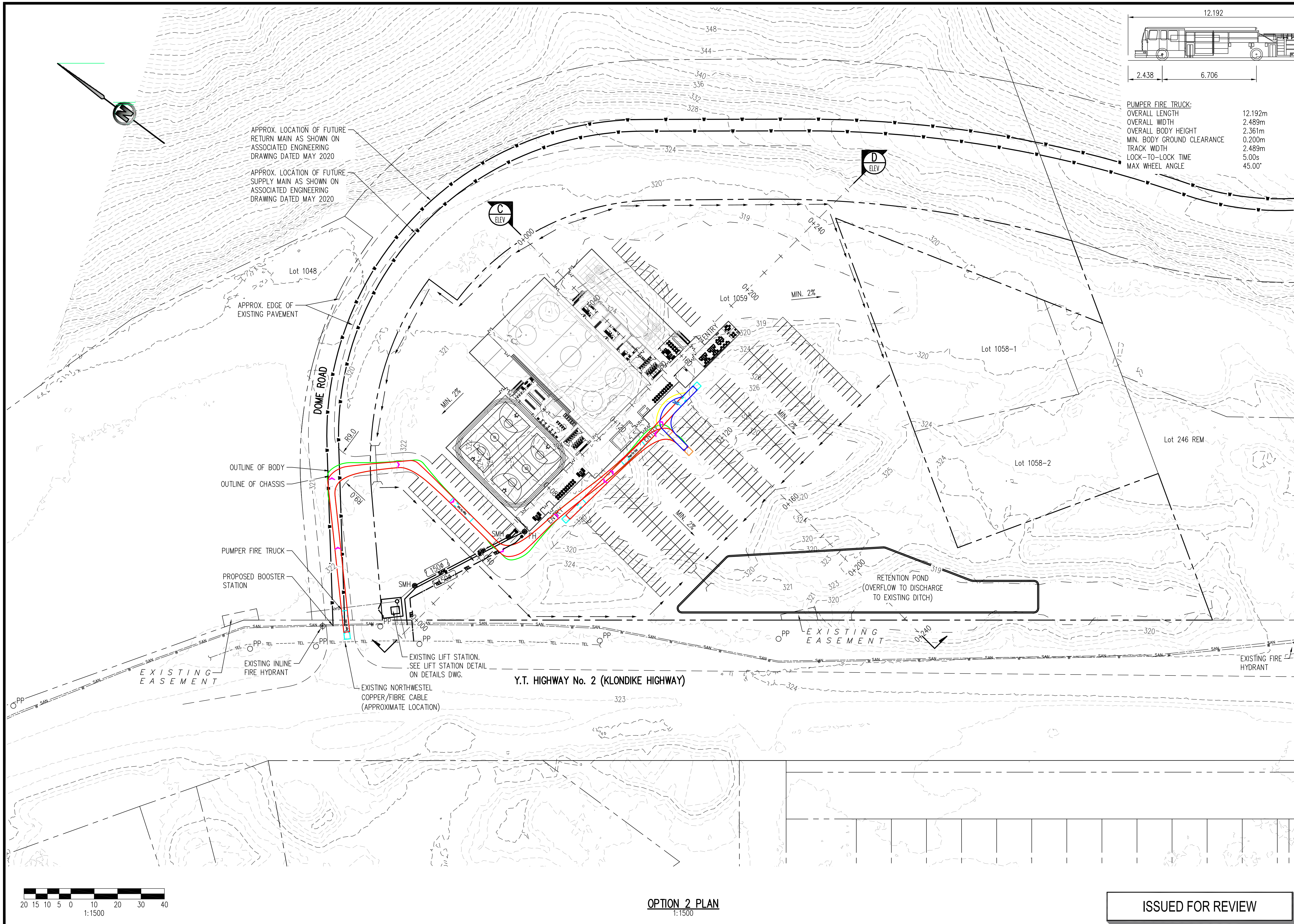
DAWSON CITY RECREATION CENTRE FUNCTIONAL PROGRAM + FEASIBILITY STUDY

DOME ROAD - CIVIL OPTION 1 PLAN

PROJECT No.	DRAWING No.	REV
1442-03	DR OPT-1	1

DISCARD ALL PREVIOUS REVISIONS LAST UPDATED: 15.01.21 FILE NAME: 1442-03 [CR] Dome Road.dwg



OPTION 2 PLAN
1:1500

ISSUED FOR REVIEW

LEGEND

- PROPERTY LINE – EXIST
- PROPERTY LINE – PROP
- SANITARY – EXIST
- SANITARY – PROP
- WATER – EXIST
- WATER – PROP
- DITCH – PROP
- CULVERT – PROP
- CONTOURS – EXIST
  - MAJOR 2m
  - MINOR 0.5m
- HYDRANT – EXIST
- HYDRANT – PROP
- POWER POLE – EXIST
- SANITARY MANHOLE – PROP
- TELEPHONE/CABLE – EXIST
- TELEPHONE/CABLE – PROP

REFERENCE DRAWINGS

DWG No.	REV	PROJECT No.	PRODUCED BY
-	-	-	-

DRAWING REVISIONS

REV	DATE	DRW	DES	APP	REVISION
1	21.01.15	JE	AK	AK	REVISED SITE LAYOUT
0	20.12.22	JE	AK	AK	ISSUED WITH REPORT

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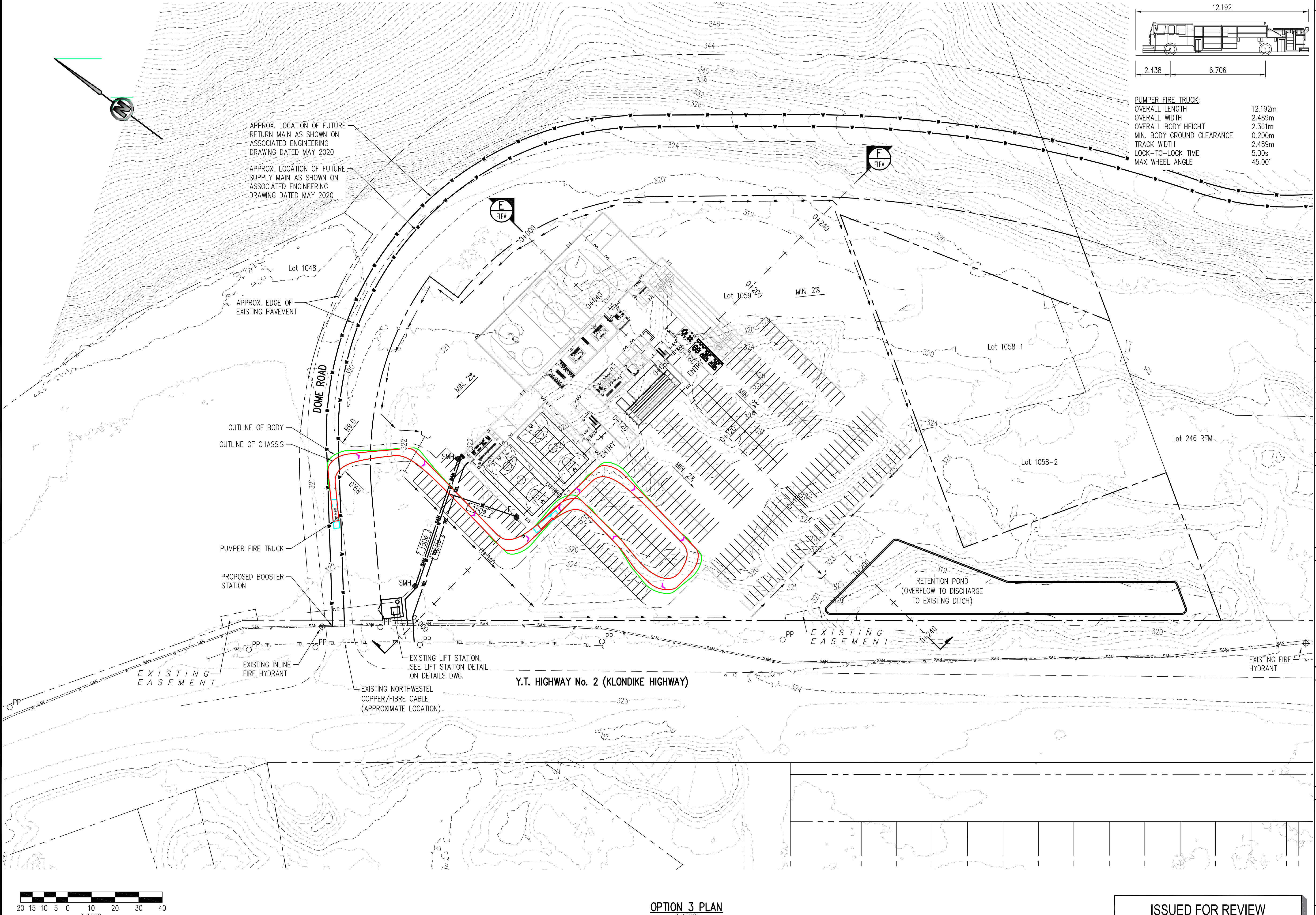
DOME ROAD - CIVIL
OPTION 2 PLAN

PROJECT No.	DRAWING No.	REV
1442-03	DR OPT-2	1



OPTION 3 PLAN
1:1500

LEGEND

PROPERTY LINE - EXIST	
PROPERTY LINE - PROP	
SANITARY - EXIST	SAN
SANITARY - PROP	SAN
WATER - EXIST	W
WATER - PROP	
DITCH - PROP	
CULVERT - PROP	
CONTOURS - EXIST	
MAJOR 2m	
MINOR 0.5m	
HYDRANT - EXIST	FH
HYDRANT - PROP	
POWER POLE - EXIST	PP
SANITARY MANHOLE - PROP	SMH
TELEPHONE/CABLE - EXIST	TEL
TELEPHONE/CABLE - PROP	TEL

REFERENCE DRAWINGS

DWG No.	REV	PROJECT No.	PRODUCED BY
-	-	-	-

DRAWING REVISIONS

REV	DATE	DRW	DES	APP	REVISION
1	21.01.15	JE	AK	AK	REVISED SITE LAYOUT
0	20.12.22	JE	AK	AK	ISSUED WITH REPORT

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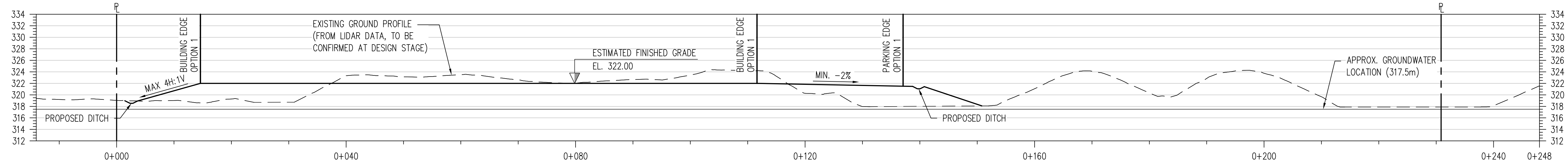
DOME ROAD - CIVIL OPTION 3 PLAN

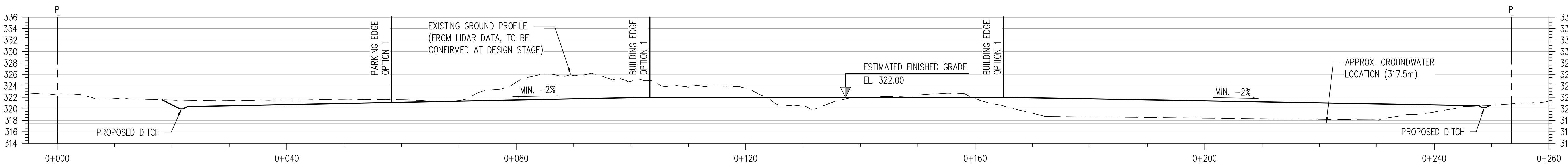
ISSUED FOR REVIEW

PROJECT No.	DRAWING No.	REV
1442-03	DR OPT-3	1

DISCARD ALL PREVIOUS REVISIONS LAST UPDATED: 15.01.21 FILE NAME: 1442-03 [CH] Dome Road.dwg



SECTION A
1:750 OPT



SECTION B
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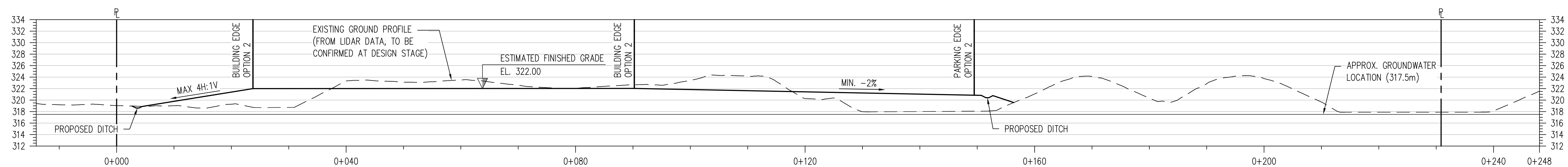
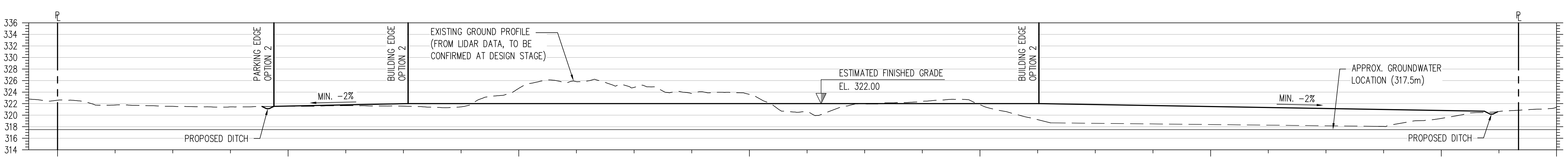


SECTION C
1:750 OPT



SECTION D
1:750 OPT

ISSUED FOR REVIEW

DRAWING NOTES

REFERENCE DRAWINGS

DWG No.	REV	PROJECT No.	PRODUCED BY
-	-	-	-

DRAWING REVISIONS

REV	DATE	DRW	DES	APP	REVISION
1	21.01.15	JE	AK	AK	REVISED SITE LAYOUT
0	20.12.22	JE	AK	AK	ISSUED WITH REPORT

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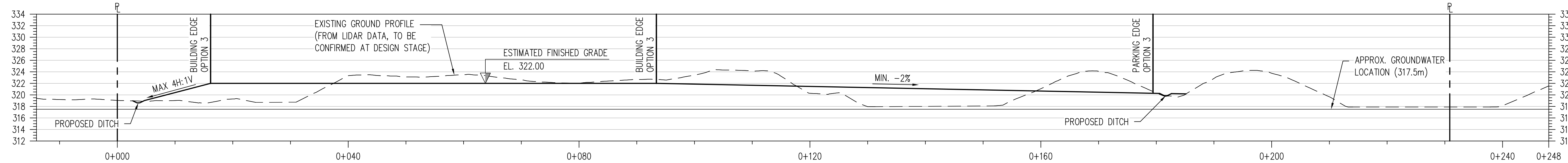
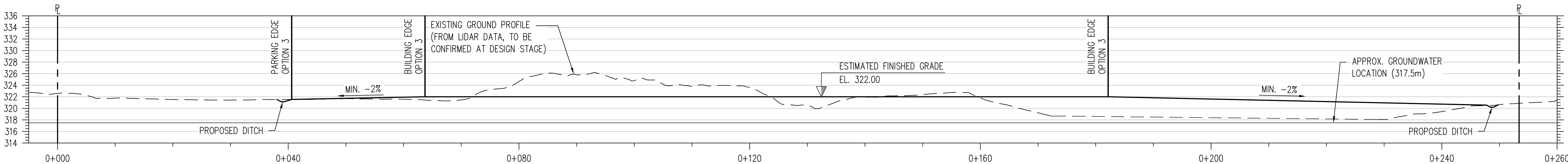
DOME ROAD - CIVIL SECTIONS

PROJECT No.	DRAWING No.	REV
1442-03	DR ELEV 1	1

FILE NAME: 1442-03 [CIV] Dome Road.dwg LAST UPDATED: 15.01.21 DISCARD ALL PREVIOUS REVISIONS



SECTION E
1:750 OPT



SECTION F
1:750 OPT

ISSUED FOR REVIEW

DRAWING NOTES

REFERENCE DRAWINGS

DWG No.	REV	PROJECT No.	PRODUCED BY
-	-	-	-

DRAWING REVISIONS

REV	DATE	DRW	DES	APP	REVISION
1	21.01.15	JE	AK	AK	REVISED SITE LAYOUT
0	20.12.22	JE	AK	AK	ISSUED WITH REPORT

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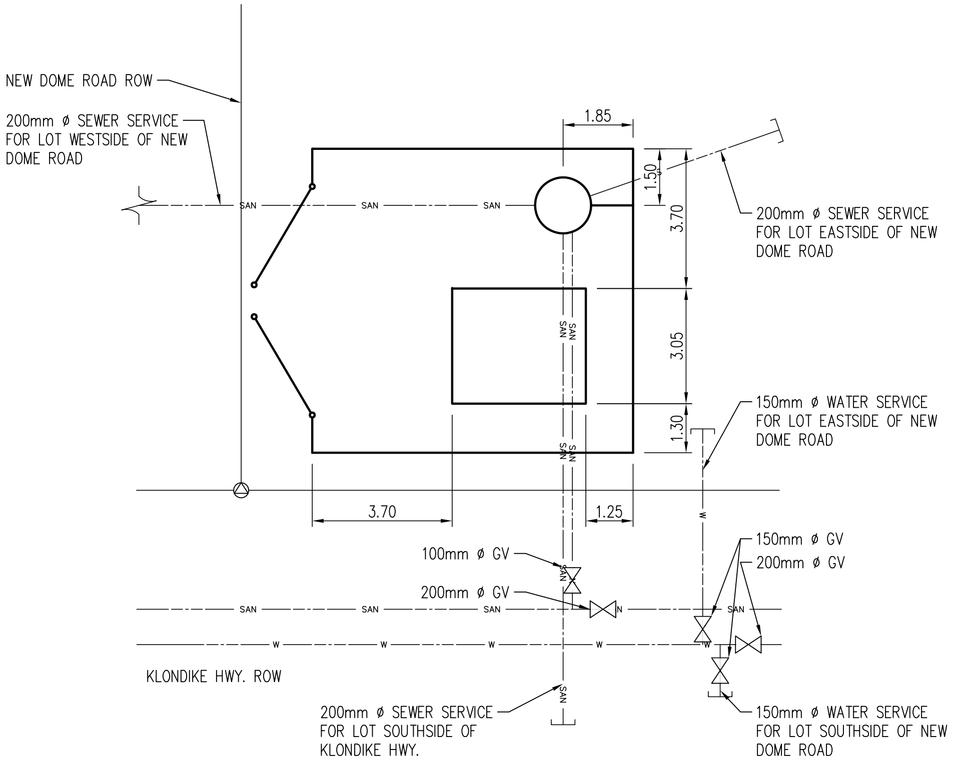
DOME ROAD - CIVIL SECTIONS

PROJECT No.	DRAWING No.	REV
1442-03	DR ELEV 2	1

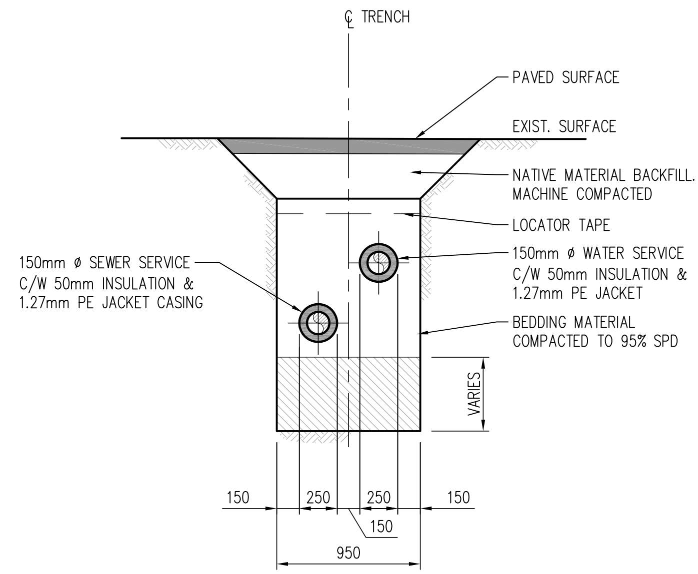
DISCARD ALL PREVIOUS REVISIONS LAST UPDATED: 15.01.21 FILE NAME: 1442-03 [DV] Dome Road.dwg



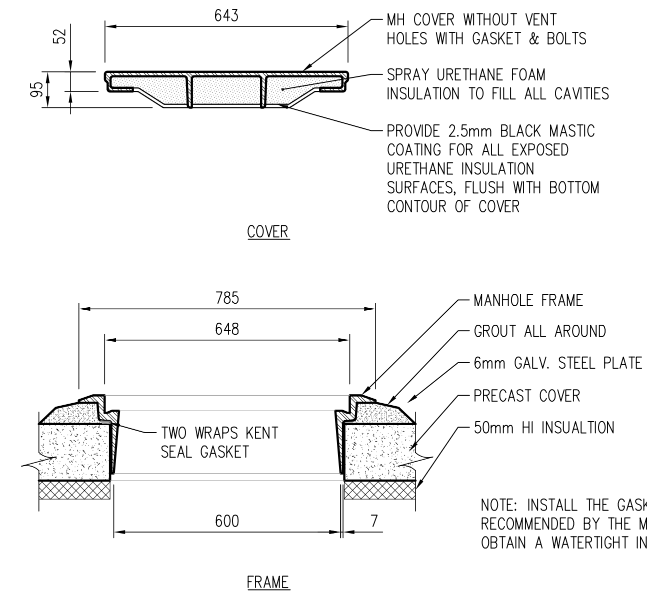
LIFT STATION DETAIL
1:200

INVERT ELEVATIONS		
SITE	SEWER @ LIFT STA.	SEWER @ PL.
1. EASTSIDE OF NEW DOME ROAD	318.080	318.140
2. WESTSIDE OF NEW DOME ROAD	318.052	318.232
3. SOUTHSIDE OF KLONDIKE HWY.	318.083	318.148*

* = SEWER SERVICE DID NOT CROSS HIGHWAY

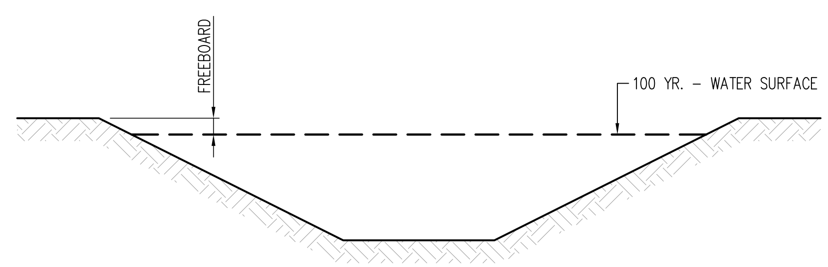


TYPICAL TRENCH DETAIL
1:50



NOTE: INSTALL THE GASKET AND BOLTS AS RECOMMENDED BY THE MANUFACTURER TO OBTAIN A WATERTIGHT INSTALLATION.

TYPICAL MANHOLE COVER DETAIL
1:20



TYPICAL DITCH DETAIL
1:25

ISSUED FOR REVIEW

DRAWING NOTES

REFERENCE DRAWINGS

DWG No.	REV	PROJECT No.	PRODUCED BY
-	-	-	-

DRAWING REVISIONS

REV	DATE	DRW	DES	APP	REVISION
1	21.01.15	JE	AK	AK	REVISED SITE LAYOUT
0	20.12.22	JE	AK	AK	ISSUED WITH REPORT

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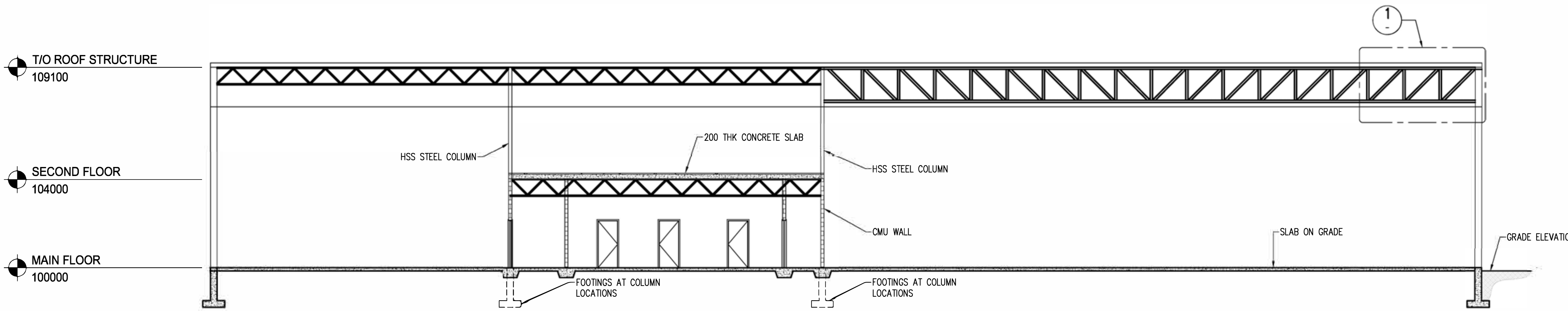
DOME ROAD - CIVIL DETAILS

PROJECT No.	DRAWING No.	REV
1442-03	DR DETAILS	1

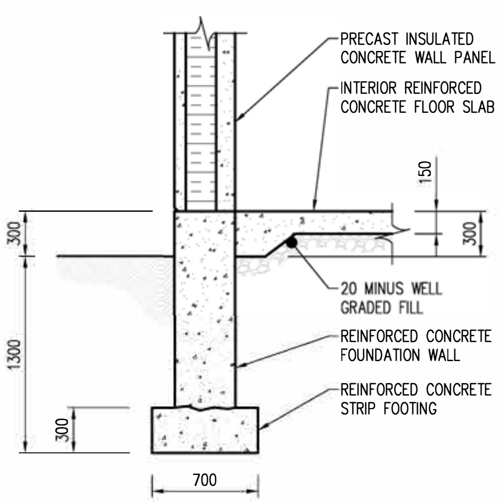
DISCARD ALL PREVIOUS REVISIONS   LAST UPDATED: 15.01.21   FILE NAME: 1442-03 [CIV] Dome Road.dwg

Appendix C

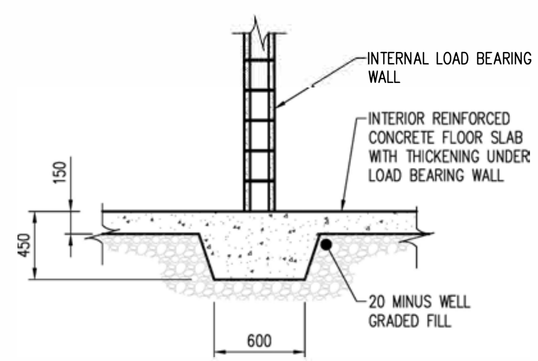
Structural Drawings



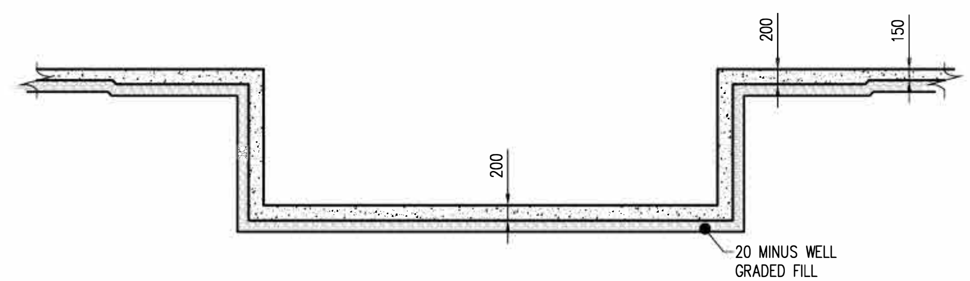
GENERAL BUILDING SECTION
1:200



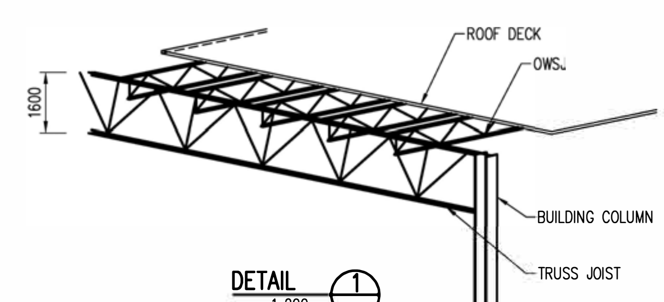
TYPICAL EXTERIOR FOUNDATION DETAIL
1:50



TYPICAL INTERIOR FOUNDATION DETAIL
1:50



TYPICAL POOL SECTION
1:200



DETAIL 1 -
1:200

ISSUED WITH REPORT

DRAWING NOTES

LEGEND

REFERENCE DRAWINGS

DWG No.	REV	PROJECT No.	PRODUCED BY
-	-	-	-

DRAWING REVISIONS

REV	DATE	DRW	DES	APP	REVISION
A	20.11.18	CH	HC	HC	ISSUED FOR DISCUSSION

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STRUCTURAL SECTION AND DETAILS

PROJECT No.	DRAWING No.	REV
1442-03	S-101	A

Appendix D

Motor & Equipment Schedules

MECHANICAL EQUIPMENT - ELECTRICAL DATA

PROJECT: DRCR - Feasibility Study - Dome Road - Option 1 **PROJECT #** 20-222-01

EQUIPMENT			STARTER									
NO.	NAME	LOCATION	**HP** (KW) [FLA]	VOLTS PHASE	TYPE: ON/ OFF	TYPE: HOA	TYPE: VFD	TYPE: VFD WITH BYPASS	BY	LOCATION	STARTER TO EQUIP WIRING BY	REMARKS
	Hockey Rink		60kW Elec Heat	600V								
HRV-1	Heat Recovery		20HP x2	3Ø								Packaged Unit
	Ventilation Unit		[104 FLA]									
	Common Area			600V								
HRV-2	Heat Recovery		20HP x2	3Ø								Packaged Unit
	Ventilation Unit		[46 FLA]									
				600V								
AHU-1	Gym Air Handler		15HP x2	3Ø								Packaged Unit
			[36 FLA]									
				600V								
AHU-2	Common Area Air		15HP x2	3Ø								Packaged Unit
	Handler		[36 FLA]									
	Main Floor			208V								
FC-1-##	Miscellaneous Space		0.5HP each	1Ø								
x10	Fan Coils											
			5HP	600V								
DH-1	Hockey Rink Dehumidifier		FLA24	3Ø								
	Hockey Rink Dehumidifier		5HP	600V								
DH-2			FLA24	3Ø								
			5HP	600V								
DH-3	Curling Rink Dehumidifier		FLA24	3Ø								
				600V								
Ice Plant	Ice Plant		105kW	3Ø								
Ice Plant				600V								
Pumps	Pumps for Ice Plant		15Hp	3Ø								
X8			each									
Ice Plant				600V								
Secondary Pumps	Pumps for Ice Plant		5HP each	3Ø								
x2												
				600V								
WWHP	Water to Water Heat		290kW	3Ø								
	Pump Central Plant											
	Fuel Oil		15A	120V								
B-1	Back Up Boiler			1Ø								
				600V								
FL-1	Fluid Cooler		50HP	3Ø								
			motor									
H-1				600V								
to	Electric Humidifer		96.2 FLA	3Ø								
H-3	(total of 3)		each									
				600V								
P-#	Main Hydronic Pumps		20HP	3Ø								
x6			each									
				600V								
P-#	Secondary Hydronic		3HP	3Ø								
x6	Pumps		each									
HWT-1				600V								
to	Domestic Hot Water		30kW	3Ø								
HWT-7	Tanks		each									
				208V								
SP-#	Sump Pumps		1hp	1Ø								
x5			each									
AC-1				600V								
to	Air Curtains		30kW	3Ø								
AC-2			each									
Miscellaneous				208V								
Exhaust	Exhaust Fans		1HP	3Ø								
x4			each									
IT Room				208V								
Cooling	Split AC		10FLA	1Ø								
x1												

MECHANICAL EQUIPMENT - ELECTRICAL DATA

PROJECT: DRCR - Feasibility Study - Dome Road - Option 2 **PROJECT #** 20-222-01

EQUIPMENT			STARTER									
NO.	NAME	LOCATION	HP (KW) [FLA]	VOLTS PHASE	TYPE: ON/ OFF	TYPE: HOA	TYPE: VFD	TYPE: VFD WITH BYPASS	BY	LOCATION	STARTER TO EQUIP WIRING BY	REMARKS
	Hockey Rink		60kW Elec Heat	600V								
HRV-1	Heat Recovery		20HP x2	3Ø								Packaged Unit
	Ventilation Unit		[104 FLA]									
	Common Area			600V								
HRV-2	Heat Recovery		20HP x2	3Ø								Packaged Unit
	Ventilation Unit		[46 FLA]									
				600V								
AHU-1	Gym Air Handler		15HP x2	3Ø								Packaged Unit
			[36 FLA]									
				600V								
AHU-2	Common Area Air		15HP x2	3Ø								Packaged Unit
	Handler		[36 FLA]									
				600V								
AHU-3	Fitness Area AHU		5HP	3Ø								Packaged Unit
	Main Floor			208V								
FC-1-##	Miscellaneous Space		0.5HP each	1Ø								
x10	Fan Coils											
	Hockey Rink Dehumidifier		5HP	600V								
DH-1			FLA24	3Ø								
	Hockey Rink Dehumidifier		5HP	600V								
DH-2			FLA24	3Ø								
	Curling Rink Dehumidifer		5HP	600V								
DH-3			FLA24	3Ø								
				600V								
Ice Plant	Ice Plant		105kW	3Ø								
Ice Plant				600V								
Pumps	Pumps for Ice Plant		15Hp	3Ø								
X8			each									
Ice Plant				600V								
econdary Pump	Pumps for Ice Plant		5HP each	3Ø								
x2												
				600V								
WWHP	Water to Water Heat		300kW	3Ø								
	Pump Central Plant											
	Fuel Oil		15A	120V								
B-1	Back Up Boiler			1Ø								
				600V								
FL-1	Fluid Cooler		50HP	3Ø								
			motor									
H-1				600V								
to	Electric Humidifer		96.2 FLA	3Ø								
H-3	(total of 3)		each									
				600V								
P-#	Main Hydronic Pumps		20HP	3Ø								
x6			each									
				600V								
P-#	Secondary Hydronic		3HP	3Ø								
x6	Pumps		each									
HWT-1				600V								
to	Domestic Hot Water		30kW	3Ø								
HWT-7	Tanks		each									
				208V								
SP-#	Sump Pumps		1hp	1Ø								
x5			each									
AC-1				600V								
to	Air Curtains		30kW	3Ø								
AC-2			each									
Miscellaneous				208V								
Exhaust	Exhaust Fans		1HP	3Ø								
x6			each									
IT Room				208V								
Cooling	Split AC		10FLA	1Ø								
x2												

MECHANICAL EQUIPMENT - ELECTRICAL DATA

PROJECT: DRCR - Feasibility Study - Dome Road - Option 3 **PROJECT #** 20-222-01

EQUIPMENT			STARTER											
NO.	NAME	LOCATION	HP (KW) [FLA]	VOLTS PHASE	TYPE: ON/ OFF	TYPE: HOA	TYPE: VFD	TYPE: VFD WITH BYPASS	BY	LOCATION	STARTER TO EQUIP WIRING BY	EMERG POWER	FIRE ALARM SHUT DOWN	REMARKS
	Hockey Rink		60kW Elec Heat	600V										
HRV-1	Heat Recovery		20HP x2	3Ø										Packaged Unit
	Ventilation Unit		[104 FLA]											
	Common Area			600V										
HRV-2	Heat Recovery		20HP x2	3Ø										Packaged Unit
	Ventilation Unit		[46 FLA]											
	Pool			600V										
HRV-3	Heat Recovery		15HP x2	3Ø										Packaged Unit
	Ventilation Unit		[36 FLA]											
				600V										
AHU-1	Gym Air Handler		15HP x2	3Ø										Packaged Unit
			[36 FLA]											
				600V										
AHU-2	Common Area Air		15HP x2	3Ø										Packaged Unit
	Handler		[36 FLA]											
				600V										
AHU-3	Fitness Area AHU		5HP	3Ø										Packaged Unit
				600V										
AHU-4	Second Floor		10HP x2	3Ø										Packaged Unit
	Common Area AHU													
	Main Floor			208V										
FC-1-##	Miscellaneous Space		0.5HP each	1Ø										
x10	Fan Coils													
	Second Floor			208V										
FC-2-##	Miscellaneous Space		0.5HP each	1Ø										
x4	Fan Coils													
	Pool Dehumidifier		10HP Motor	600V										
DH-1			FLA 30A	3Ø										
	Pool Dehumidifier		10HP Motor	600V										
DH-2			FLA 30A	3Ø										
	Hockey Rink Dehumidifier		5HP	600V										
DH-3			FLA24	3Ø										
	Hockey Rink Dehumidifier		5HP	600V										
DH-4			FLA24	3Ø										
	Curling Rink Dehumidifer		5HP	600V										
DH-5			FLA24	3Ø										
				600V										
Ice Plant	Ice Plant		105kW	3Ø										
Ice Plant				600V										
Pumps	Pumps for Ice Plant		15Hp	3Ø										
X8			each											
Ice Plant				600V										
econdary Pump	Pumps for Ice Plant		5HP each	3Ø										
x2														
				600V										
WWHP	Water to Water Heat		350kW	3Ø										
	Pump Central Plant													
	Fuel Oil		15A	120V										
B-1	Back Up Boiler			1Ø										
				600V										
FL-1	Fluid Cooler		50HP	3Ø										
			motor											
H-1				600V										
to	Electric Humidifer		96.2 FLA	3Ø										
H-4	(total of 4)		each											
				600V										
P-#	Main Hydronic Pumps		20HP	3Ø										
x6			each											
				600V										
P-#	Secondary Hydronic		3HP	3Ø										
x6	Pumps		each											
HWT-1				600V										
to	Domestic Hot Water		30kW	3Ø										
HWT-9	Tanks		each											
				208V										
SP-#	Sump Pumps		1hp	1Ø										
x7			each											
AC-1				600V										
to	Air Curtains		30kW	3Ø										
AC-4			each											
				600V										
PH-1	Pool Heater		250kW	3Ø										
				600V										
Pool Pumps	Pool Pumps		5HP	3Ø										
x4			each											
Miscellaneous				208V										
Exhaust	Exhaust Fans		1HP	3Ø										
x6			each											
IT Room				208V										
Cooling	Split AC		10FLA	1Ø										
x2														

MECHANICAL EQUIPMENT - ELECTRICAL DATA

PROJECT: DRCR - Feasibility Study - Gold Rush - Option 1 **PROJECT #** 20-222-01

EQUIPMENT			STARTER									
			HP	VOLTS	TYPE						STARTER	
NO.	NAME	LOCATION	(KW)	PHASE	ON/ OFF	HOA	VFD	VFD WITH BYPASS	BY	LOCATION	TO EQUIP	REMARKS
			[FLA]								WIRING BY	
	Hockey Rink		60kW Elec Heat	600V								
HRV-1	Heat Recovery		20HP x2	3Ø								Packaged Unit
	Ventilation Unit		[104 FLA]									
	Common Area			600V								
HRV-2	Heat Recovery		20HP x2	3Ø								Packaged Unit
	Ventilation Unit		[46 FLA]									
				600V								
AHU-1	Gym Air Handler		15HP x2	3Ø								Packaged Unit
			[36 FLA]									
				600V								
AHU-2	Common Area Air		15HP x2	3Ø								Packaged Unit
	Handler		[36 FLA]									
	Main Floor			208V								
FC-1-##	Miscellaneous Space		0.5HP each	1Ø								
x10	Fan Coils											
	Hockey Rink Dehumidifier		5HP	600V								
DH-1			FLA24	3Ø								
	Hockey Rink Dehumidifier		5HP	600V								
DH-2			FLA24	3Ø								
	Curling Rink Dehumidifer		5HP	600V								
DH-3			FLA24	3Ø								
				600V								
Ice Plant	Ice Plant		105kW	3Ø								
Ice Plant				600V								
Pumps	Pumps for Ice Plant		15Hp	3Ø								
X8			each									
Ice Plant				600V								
Secondary Pump	Pumps for Ice Plant		5HP each	3Ø								
x2												
				600V								
WWHP	Water to Water Heat		250kW	3Ø								
	Pump Central Plant											
	Fuel Oil		15A	120V								
B-1	Back Up Boiler			1Ø								
				600V								
FL-1	Fluid Cooler		50HP	3Ø								
			motor									
H-1				600V								
to	Electric Humidifer		96.2 FLA	3Ø								
H-2	(total of 2)		each									
				600V								
P-#	Main Hydronic Pumps		20HP	3Ø								
x6			each									
				600V								
P-#	Secondary Hydronic		3HP	3Ø								
x6	Pumps		each									
HWT-1				600V								
to	Domestic Hot Water		30kW	3Ø								
HWT-7	Tanks		each									
				208V								
SP-#	Sump Pumps		1hp	1Ø								
x5			each									
AC-1				600V								
to	Air Curtains		30kW	3Ø								
AC-4			each									
Miscellaneous				208V								
Exhaust	Exhaust Fans		1HP	3Ø								
x6			each									
IT Room				208V								
Cooling	Split AC		10FLA	1Ø								
x1												

MECHANICAL EQUIPMENT - ELECTRICAL DATA

PROJECT: DRCR - Feasibility Study - Gold Rush - Option 2 **PROJECT #** 20-222-01

EQUIPMENT			STARTER									
NO.	NAME	LOCATION	HP (KW) [FLA]	VOLTS PHASE	TYPE: ON/ OFF	TYPE: HOA	TYPE: VFD	TYPE: VFD WITH BYPASS	BY	LOCATION	STARTER TO EQUIP WIRING BY	REMARKS
	Hockey Rink		60kW Elec Heat	600V								
HRV-1	Heat Recovery		20HP x2	3Ø								Packaged Unit
	Ventilation Unit		[104 FLA]									
	Common Area			600V								
HRV-2	Heat Recovery		20HP x2	3Ø								Packaged Unit
	Ventilation Unit		[46 FLA]									
				600V								
AHU-1	Gym Air Handler		15HP x2	3Ø								Packaged Unit
			[36 FLA]									
				600V								
AHU-2	Common Area Air		15HP x2	3Ø								Packaged Unit
	Handler		[36 FLA]									
				600V								
AHU-3	Fitness Area AHU		5HP	3Ø								Packaged Unit
				600V								
AHU-4	Second Floor		10HP x2	3Ø								Packaged Unit
	Common Area AHU											
	Main Floor			208V								
FC-1-##	Miscellaneous Space		0.5HP	1Ø								
x10	Fan Coils		each									
	Second Floor			208V								
FC-2-##	Miscellaneous Space		0.5HP	1Ø								
x4	Fan Coils		each									
	Hockey Rink Dehumidifier		5HP	600V								
DH-1			FLA24	3Ø								
	Hockey Rink Dehumidifier		5HP	600V								
DH-2			FLA24	3Ø								
	Curling Rink Dehumidifer		5HP	600V								
DH-3			FLA24	3Ø								
				600V								
Ice Plant	Ice Plant		105kW	3Ø								
Ice Plant				600V								
Pumps	Pumps for Ice Plant		15Hp	3Ø								
X8			each									
Ice Plant				600V								
econdary Pump	Pumps for Ice Plant		5HP each	3Ø								
x2												
				600V								
WWHP	Water to Water Heat		280kW	3Ø								
	Pump Central Plant											
	Fuel Oil		15A	120V								
B-1	Back Up Boiler			1Ø								
				600V								
FL-1	Fluid Cooler		50HP	3Ø								
			motor									
H-1				600V								
to	Electric Humidifer		96.2 FLA	3Ø								
H-3	(total of 3)		each									
				600V								
P-#	Main Hydronic Pumps		20HP	3Ø								
x6			each									
				600V								
P-#	Secondary Hydronic		3HP	3Ø								
x6	Pumps		each									
HWT-1				600V								
to	Domestic Hot Water		30kW	3Ø								
HWT-7	Tanks		each									
				208V								
SP-#	Sump Pumps		1hp	1Ø								
x5			each									
AC-1				600V								
to	Air Curtains		30kW	3Ø								
AC-2			each									
Miscellaneous				208V								
Exhaust	Exhaust Fans		1HP	3Ø								
x6			each									
IT Room				208V								
Cooling	Split AC		10FLA	1Ø								
x2												

MECHANICAL EQUIPMENT - ELECTRICAL DATA

PROJECT: DRCR - Feasibility Study - Gold Rush - Option 3 **PROJECT #** 20-222-01

EQUIPMENT			STARTER									
			HP	VOLTS	TYPE						STARTER	
NO.	NAME	LOCATION	(KW)	PHASE	ON/	HOA	VFD	VFD WITH BYPASS	BY	LOCATION	TO EQUIP	REMARKS
			[FLA]		OFF						WIRING BY	
	Hockey Rink		60kW Elec Heat	600V								
HRV-1	Heat Recovery		20HP x2	3Ø								Packaged Unit
	Ventilation Unit		[104 FLA]									
	Common Area			600V								
HRV-2	Heat Recovery		20HP x2	3Ø								Packaged Unit
	Ventilation Unit		[46 FLA]									
	Pool			600V								
HRV-3	Heat Recovery		15HP x2	3Ø								Packaged Unit
	Ventilation Unit		[36 FLA]									
				600V								
AHU-1	Gym Air Handler		15HP x2	3Ø								Packaged Unit
			[36 FLA]									
				600V								
AHU-2	Common Area Air		15HP x2	3Ø								Packaged Unit
	Handler		[36 FLA]									
				600V								
AHU-3	Fitness Area AHU		5HP	3Ø								Packaged Unit
	Main Floor			208V								
FC-1-##	Miscellaneous Space		0.5HP	1Ø								
x10	Fan Coils		each									
	Pool Dehumidifier		10HP Motor	600V								
DH-1			FLA 30A	3Ø								
	Pool Dehumidifier		10HP Motor	600V								
DH-2			FLA 30A	3Ø								
	Hockey Rink Dehumidifier		5HP	600V								
DH-3			FLA24	3Ø								
	Hockey Rink Dehumidifier		5HP	600V								
DH-4			FLA24	3Ø								
	Curling Rink Dehumidifer		5HP	600V								
DH-5			FLA24	3Ø								
				600V								
Ice Plant	Ice Plant		105kW	3Ø								
Ice Plant				600V								
Pumps	Pumps for Ice Plant		15Hp	3Ø								
X8			each									
Ice Plant				600V								
Secondary Pump	Pumps for Ice Plant		5HP each	3Ø								
x2												
				600V								
WWHP	Water to Water Heat		350kW	3Ø								
	Pump Central Plant											
	Fuel Oil		15A	120V								
B-1	Back Up Boiler											
				600V								
FL-1	Fluid Cooler		50HP	3Ø								
			motor									
H-1				600V								
to	Electric Humidifer		96.2 FLA	3Ø								
H-4	(total of 4)		each									
				600V								
P-#	Main Hydronic Pumps		20HP	3Ø								
x6			each									
				600V								
P-#	Secondary Hydronic		3HP	3Ø								
x6	Pumps		each									
HWT-1				600V								
to	Domestic Hot Water		30kW	3Ø								
HWT-9	Tanks		each									
				208V								
SP-#	Sump Pumps		1hp	1Ø								
x9			each									
AC-1				600V								
to	Air Curtains		30kW	3Ø								
AC-4			each									
				600V								
PH-1	Pool Heater		250kW	3Ø								
				600V								
Pool Pumps	Pool Pumps		5HP	3Ø								
x4			each									
Miscellaneous				208V								
Exhaust	Exhaust Fans		1HP	3Ø								
x8			each									
IT Room				208V								
Cooling	Split AC		10FLA	1Ø								
x2												

Appendix E
Utility Rates

RATE SCHEDULE 2170
GENERAL SERVICE
HYDRO, GOVERNMENT - MUNICIPAL

AVAILABLE: In Carcross, Carmacks, Champagne, Dawson, Elsa, Faro, Haines Junction, Johnson's Crossing, Keno, Marsh Lake, Mayo, Pelly Crossing, Stewart Crossing, Ross River, Tagish, Teslin and Whitehorse.

APPLICABLE: To any use of electric energy not inconsistent with safe and adequate service to all non - government customers of the Company, except as more favorable options may apply.

RATE: Charges for service in any one billing month shall be the sum of the following:

(a) Demand Charge

All kW of billing demand	$7.39 / kW

(b) Energy charge

For the first 2,000 kW.h	10.00 ¢/kW.h
Between 2,001 - 15,000 kW.h	12.88 ¢/kW.h
Between 15,001 - 20,000 kW.h	15.68 ¢/kW.h
For energy in excess of 20,000 kW.h	12.86 ¢/kW.h

MINIMUM MONTHLY BILL: Shall be the Demand Charge but not less than $36.95.

BILLING DEMAND: The billing demand may be estimated or measured and will be the greater of the following:

(a) The highest metered demand during the billing period.

(b) The highest metered demand during the 12 months ending with the current billing month, excluding the months April through September.

(c) The estimated demand.

(d) 5 kilowatts.

Rate Schedule 2170 (Continued)

POWER FACTOR:

The foregoing rate is designed on the assumption that the customer will maintain a power factor of 90 percent or better during the period of his peak load. In those cases in which, by estimate or test, such power factor is not maintained, the customer's demand will be measured in kV.A and for the purposes of application of the foregoing rate, one kV.A shall be taken as one kW.

RATE MODIFICATIONS APPLICABLE:

For customers who have small constant loads, and whose monthly energy requirements can be estimated closely, see Rider B. For fuel adjustment Rider, see Rider F.

TERMS AND CONDITIONS OF SERVICE:

The Company's Terms and Conditions of Service approved by the Yukon Utilities Board form part of this rate schedule and apply to the Company and every customer supplied with electric service by the Company in the Yukon and British Columbia. Copies of the Terms and Conditions of Service are available for inspection in the offices of the Company during normal working hours.

Appendix F
Minutes

REPUBLIC ARCHITECTURE INC

385 St. Mary Ave.
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Shane Solomon MAA SAA AAA OAA

Start-Up Meeting Minutes

Dawson City Recreation Centre
Functional Program & Feasibility Study
YG Tender No.: 2020/21-3017
Republic Project Number: 499
Reason for Meeting: Start-Up Meeting
Client: Yukon Government

Project Address:
City of Dawson, Yukon

Meeting Date and Time: Wednesday, August 19th, 2020, 11:00 CST (09:00 PST)
Meeting Location: via MS Teams

In Attendance:

Name	Role	Email
Jackie Burgess	Yukon Government (YG) Community Services, Infrastructure Development Branch, Project Manager	jakie.burgess@gov.yk.ca
Cory Bellmore	Cityy of Dawson (CoD), CAO	cao@cityofdawson.ca
Paul Robitaille	City of Dawson (CoD), Recreation Manager	recmanager@cityofdawson.ca
Kyle Humphreys	Colliers Project Leaders (CPL), Third Party Project Manager, City of Dawson	Kyle.humphreys@colliersprojectleaders.com
Jan Rawling	Colliers Project Leaders (CPL), Third Party Assistant Project Manager, City of Dawson	jan.rawling@colliersprojectleaders.com
Mélanie Gagnon	Republic Architecture Inc. (RAI), Project Manager	melanie@republicarchitecture.ca
Evan Hunter	Republic Architecture Inc. (RAI), Lead Architect	evan@republicarchitecture.ca
Rachael Alpern	Republic Architecture Inc. (RAI), Architect/Recreation Planner	rachael@republicarchitecture.ca
Ron Prociuk	Republic Architecture Inc. (RAI), Architect	r.prociuk@republicarchitecture.ca
Jen Reynolds	Republic Architecture Inc. (RAI), Architect/Functional Programmer	jen@republicarchitecture.ca
Tricia Schilling	Republic Architecture Inc. (RAI), Professional Interior Designer/Public Consultation Facilitator	tricia@republicarchitecture.ca
Heather Wagner	Republic Architecture Inc. (RAI), Professional Interior Designer	heather@republicarchitecture.ca
Claire Spearman	Republic Architecture Inc. (RAI), Architectural Intern	c.spearman@republicarchitecture.ca
Ken King	Hanscomb Limited (HA) Manager	kking@hanscomb.com
Dave Scouten	Scouten Engineering (SE), Senior Civil Engineer	dscouten@scoutenengineering.com
Jorge Castillo	Scouten Engineering (SE), Senior Civil Engineer	jcastillo@scoutenengineering.com
Ben Crimp	Scouten Engineering (SE), Senior Structural Engineer	bcrimp@scoutenengineering.com
Kyle Nelson	Scouten Engineering (SE), Senior Design Technologist	knelson@scoutenengineering.com

Gavin Stewart	SMS Engineering (SMS), Mechanical Engineer	gstewart@smseng.com
Valour Kane	SMS Engineering (SMS), Electrical Engineer	vkane@smseng.com
Anup Rathi	SMS Engineering (SMS), Building Energy Simulation Specialist	arathi@smseng.com

Distribution:

In attendance		
Chris Ott	SMS Engineering (SMS), Principal In Charge	cott@smseng.com

Item	Description	Action by
1.1	ROUND TABLE INTRODUCTIONS 1) Client Team and Consultant Team were introduced. Refer to attendee list for details.	
1.2	COMMUNICATIONS AND ROLES 1) Lines of Communication: all communication between Client and Consultant to be done via Client Team Project Manager (J.Burgess) and Consultant Team Project Manager (M.Gagnon). 2) Communication with Third Party Stakeholder: when information is required from Stakeholders, CPL Project Manager (K.Humphreys) should be included on correspondence. 3) Access to Information Request can be sent via email. 1) email provided 07//27 as a request for additional information from CoD (site information, financial information). This information should be delivered in short order. 2) CoD Parks and Recreation Study: Final Draft to be utilized for the purposes of this project. CoD to provide, and confirm what pieces are still evolving (June 2020 version). 3) YG will provide survey drawings sourced online, and is working on doing a more detailed geotechnical investigation of both sites. This information will be provided once it becomes available. Estimated time for receipt is end of September.	Info Info In
1.3	PROJECT OVERVIEW 1) Consultant Team has been engaged three (3) functional space programs to be used on one of two sites (Gold Rush Campground and Dome Road site). FSPs are to be of varying scales. 2) Test Fit Options and energy efficiency studies are to be done for each option, on each site. 3) Cost estimates are to be provided for each option. 4) Draft FSP and Feasibility Study Report to be prepared for Stakeholder and Council review. Feedback will be provided for incorporation into a Final Report. 5) During review period, RAI will undertake a community consultation session. To determine the best approach to this session, RAI will submit a public consultation plan for review and input by the CoD stakeholders for input and approval. Given current (and future) Covid-19 public health measures, this could take on multiple forms (in person or virtual), or a combination of online surveys and an in person session. 6) Final FSP and Feasibility Study Report to be prepared that include changes and modifications as pre review comments included from Client Group.	RAI

	7) Community Engagement Plan: CoD advised that there will be a very engaged Council on this project, and it would serve best to get the Community Engagement Plan in for review sooner rather than later	
2.4	SCHEMATIC DESIGN STAKEHOLDER INPUT RAI has worked with HDK to provide preliminary Schematic Design options for review and input by the Stakeholder group. A package was provided 09/08 in advance of the meeting to facilitate conversation. Various options were identified for layout, furnishings, technology and access to power (document provided attached for reference). 1) All options include removal of the tiered seating. UM expressed concerns about noise of demolition. RAI has been working with LDA on this. Removal of the tiers was not flagged as a concern at this point. Provisions can be built into the construction contract that would ensure that loud work is done after hours to not disturb other activities in the building. 2) Furnishings: 1. loose tables and chairs have been proposed for the spaces. Tables which nest and can be stored in the corner are the preference. UM expressed concern over quality of some, and there may be a preference in manufacturer. J.Bouchard will provide. 2. Seating options to explore include seating (on casters) that can nest or stack. Chairs with arms were shown, but armless chairs would be preferred. Teknion would work for this. RAI will investigate and provide alternates with Design Development submission. 3. A standing height peninsula was also provided in an option with stools, however UM indicated the preference would be to remove this. 4. While different options for room orientation were provided, this will be primarily dictated by the technology option selected. Three options were presented: Option 1: Large monitors on multiple walls (no primary focus) - Large monitors (72 – 84”), used for presentation of common material and/or group collaboration - Would allow for reconfigurable tables to be located closer to monitors and used for group activities Option 2: Video wall & monitors (short main focus, West wall as teaching wall) - Use of LCD/LED monitors in lieu of projector. This was selected as a projector drop and screen would be lower than the seating height which would not be ideal for those seated closer to the screen. - Short throw projectors were briefly explored, but there is concerns over image quality. Option 3: Projection screen and monitors (long main focus, North wall as teaching wall) - Similar to existing set up; - Displays can be added to side walls and used for presentation (if re-orienting of room is desired), or simply roughed-in. 5. AV closet would not be required, but an AV rack (potentially built-into millwork or a wall) would be required. 6. Two options have been put forth for distribution of power. A diagram was provided that illustrates the possibility for flush mounted power (and USB if desired). UM indicated that cost may become a factor in method of distribution of power. Will be discussed again at a later date. 7. UM indicated that technology will be the main driver for the project.	Info Info Info/UM RAI RAI Info RAI/HDK Info/HDK/ RAI Info Info

	8. ISD indicated they though that the video wall was a good approach for the West wall, however CATL was concerned that this technology has not been used in teaching spaces on campus yet, and there may be some usability issues. 9. ISD/CATL would like to see an option with short throw projectors on the West wall. 10. UM would like to have technology options updated so Option 2 has two short throw projectors rather than array. The three options will then be presented to the Learning Centre for their review and input. 11. RAI/HDK inquired if there was a space on campus that has been used (tested) by multiple instructors that is performing in a manner that is satisfactory (or better). CATL & ISD indicated there is no such space at the moment. 12. Revisions to the preliminary SD presentation should consider the following regarding technology: - Ease of use, - Compatibility with software platforms already used on campus (and future) - Perhaps consider rough-ins only for perimeter displays if budget becomes an issue. 13. Other comments from UM related to the options presented included: 1. Desire to include writing surface at the front. RAI inquired if this should be built into the wall cladding (ie: Walltalkers or paint), or in module style. UM indicated they have not had success with Walltakers or paint. Modular style preferred. 2. RAI inquired if whiteboard could be covered by a screen, or if it should remain visible (off to the side). Preference is off to the side. No need for it to be integrated into the display – old school whiteboard is the preference. 3. Lecture capture: still being discussed on UM side. Will advise shortly. 4. ISD requested a centralized location for orchestrating presentations. 5. Will an audio voice lift be required due to room size? This will be re-visited one room orientation is decided.	Info/HDK/ RAI RAI/HDK Info HDK/RAI Info RAI UM HDK/RAI UM
2.5	SCHEDULE REVIEW 1) RAI had provided a revised project schedule, however the request for modifications to take back to the Learning Centre will change this slightly. The following is being suggested for the immediate next steps on the project: - HDK to review the feasibility of using short throw projection on the West wall and provide some options to RAI by 09/21. - RAI will incorporate these into a revised preliminary schematic design package for distribution, review and input by the Learning Centre. Comments from Um should be provided by 10/02. 2) Written feedback and direction was requested from UM. Following receipt, consultant team will continue with Schematic Design phase. 3) Revised schedule will be distributed after receipt of feedback.	Info Info/UM Info/RAI
2.6	NEXT MEETING Next meeting would be beneficial after feedback from Learning Centre. October 5th or 6th are proposed. J.Bouchard to confirm availability.	Info/UM

END OF MINUTES

REPUBLIC ARCHITECTURE INC

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Shane Solomon MAA SAA AAA OAA

Draft FSP Review Meeting Minutes

Dawson City Recreation Centre
Functional Program & Feasibility Study
YG Tender No.: 2020/21-3017
Republic Project Number: 499
Reason for Meeting: FSP Review Meeting
Client: Yukon Government

Project Address:
City of Dawson, Yukon

Meeting Date and Time: Friday, September 11th, 2020, 11:00 CST (10:30PST)
Meeting Location: via MS Teams

In Attendance:

Name	Role	Email
Jackie Burgess	Yukon Government (YG) Community Services, Infrastructure Development Branch, Project Manager	jakie.burgess@gov.yk.ca
Cory Bellmore	Cityy of Dawson (CoD), CAO	cao@cityofdawson.ca
Paul Robitaille	City of Dawson (CoD), Recreation Manager	recmanager@cityofdawson.ca
Mélanie Gagnon	Republic Architecture Inc. (RAI), Project Manager	melanie@republicarchitecture.ca
Evan Hunter	Republic Architecture Inc. (RAI), Lead Architect	evan@republicarchitecture.ca
Rachael Alpern	Republic Architecture Inc. (RAI), Architect/Recreation Planner	rachael@republicarchitecture.ca
Jen Reynolds	Republic Architecture Inc. (RAI), Architect/Functional Programmer	jen@republicarchitecture.ca
Tricia Schilling	Republic Architecture Inc. (RAI), Professional Interior Designer/Public Consultation Facilitator	tricia@republicarchitecture.ca
Ron Prociuk	Republic Architecture Inc. (RAI), Architect	r.prociuk@republicarchitecture.ca
Heather Wagner	Republic Architecture Inc. (RAI), Professional Interior Designer	heather@republicarchitecture.ca
Claire Spearman	Republic Architecture Inc. (RAI), Architectural Intern	c.spearman@republicarchitecture.ca

Distribution:

In attendance		

Item	Description	Action by
1.1	OVERVIEW OF DRAFT FSP	
	1) RAI Advised that three FSPs were prepared to reflect the discussions held during the Programming Meeting with Council.	Info
	2) Differences between each Option, but the intent was to scale up when going from Option 1 to Option 3.	Info

	3) C.Bellmore and P.Robitaille (CoD) confirmed they will represent the Clients during the design phases. 4) CoD advised that Public Consultation should not be a 'dreaming phase'. RAI clarified that public consultation will be for input on Schematic Options prepared by RAI during the Feasibility Phase, but noted that content for this presentation will first be 'filtered' by CoD.	Info Info
1.2	COMMENTS ON FSP BY CoD 1) Laundry, rentable kitchen and library should be removed. 2) Rec Offices could stay in existing facility. 3) Pool discussion: smaller lane pool in option. Would the expectation be that the current (seasonal) pool be closed, and the new four season pool be used? Current pool still works for seasonal use, not sure how much use it would get if we had it for all seasons. 4) Include all-season pool for Option 3 only. RAI will explore the options for having the pool be a potential addition in Option 2. 5) Pool should be in-between lap pool and AC option. 6) Option 1 should be to replace what is not working 7) Indoor playground: have movable equipment, that is used in a designated space for a few hours a day - try to have more multi-functional rooms rather than designated spaces. 8) Flexibility is really important. 9) RAI requested that CoD go through an exercise of: 1) Identifying which spaces were not required (and strike through them if they were not) 2) Take the spaces, and identify each by Option – ie: if they belong in Option 1, 2 or 3. It will automatically be assumed that spaces from Option 1 be carried to subsequent options. 3) Add additional notes if you feel we missed something 10) Leasable Spaces: business case for the Rec Centre: will there be a fee/use, annual fee? Leasable spaces were intended to be more of a revenue stream, to offset operational costs of a larger facility. CoD asked if RAI could provide a list for generally used services that would be using leasable space in a rec centre. CoD would like to see if there is already spaces leased out in the community. Fear is that a room might site empty, given there are current spaces in Dawson that are sitting empty. 11) RAI inquired if there is a senior's living centre in the community where an accountant could lease a small space? CoD indicated there was a centre, but no leasable spaces within. CoD noted that there are office vacancies in town, and no need for a share co-working space in the community. 12) Whitehorse has a shared makerspace, and there seems to potentially be a desire for makerspace. 13) Gymnasium viewing: area not required inside – could just be outside room (via glass) viewing. 14) Meeting Room: don't see use for two meeting rooms, just one. 15) Offices: base level need to include a lunchroom of some sort to unionized staff. Need a place to congregate, eat lunch, small kitchenette. Could this lunchroom be multi-purposed or does it need to be dedicated? CoD indicated that it should likely be dedicated. 16) Walking Track: assuming it is overlapping with another space. RAI indicated this is correct (not dedicated space).	 Info Info Info Info Info Info Info/RAI Info Info CoD Info/RAI Info Info Info Info Info Info

	17) CoD has concerns about elevator/lift. Is it possible to have a building that is one level. Concerns with elevators and lack of service technicians. Building footprint could be effected if the building were more compact than sprawled. RAI will explore options, and how they relate to having vertical transportation, energy efficacy and O&M. 18) YG inquired on adding a steam room/sauna to Option 2. CoD expressed some concerns with costs, monitoring, but would not be opposed to it. RAI will investigate and provide their recommendation. 19) YG expressed that at the end of the day, they would like to see all three options be feasible. No idea what YG will support, but want to make sure that the options provided can be supported.	Info Info/RAI Info
1.3	SCHEDULE 1) CoD exercise, collection of photos and responses to questions sent 08/18 to be received by 09/18. 2) RAI will work on revised FSP following receipt of outstanding information.	 CoD Info

END OF MINUTES

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Shane Solomon MAA SAA AAA OAA

Draft Report Presentation Minutes

Dawson City Recreation Centre
Functional Program & Feasibility Study
YG Tender No.: 2020/21-3017
Republic Project Number: 499
Reason for Meeting: Presentation of Draft Feasibility Study
Client: Yukon Government

Project Address:
City of Dawson, Yukon

Meeting Date and Time: Wednesday, February 10th, 2021, 6:15PM CST (5:15PM MST)
Meeting Location: via Zoom

In Attendance:

Name	Role	Email
Jackie Burgess	Yukon Government (YG) Community Services, Infrastructure Development Branch, Project Manager	jackie.burgess@gov.yk.ca
Kyle Humphries	Colliers Project Leaders, Project Manager	
Kirstie Devries	City of Dawson (CoD), Dawson Community Advisor	
Wayne Potoroka	City of Dawson (CoD), Mayor	
Stephen Johnson	City of Dawson (CoD), City Councillor	
Bill Kendrick	City of Dawson (CoD), City Councillor	
Molly Shore	City of Dawson (CoD), City Councillor	
Natasha Ayoub	City of Dawson (CoD), City Councillor	
Paul Robitaille	City of Dawson (CoD), Recreation Manager	
Mélanie Gagnon	Republic Architecture Inc. (RAI), Project Manager	melanie@republicarchitecture.ca
Evan Hunter	Republic Architecture Inc. (RAI), Lead Architect	evan@republicarchitecture.ca
Rachael Alpern	Republic Architecture Inc. (RAI), Architect/Recreation Planner	rachael@republicarchitecture.ca
Jen Reynolds	Republic Architecture Inc. (RAI), Architect/Functional Programmer	jen@republicarchitecture.ca
Tricia Schilling	Republic Architecture Inc. (RAI), Professional Interior Designer/Public Consultation Facilitator	tricia@republicarchitecture.ca
Ron Prociuk	Republic Architecture Inc. (RAI), Architect	r.prociuk@republicarchitecture.ca
Claire Spearman	Republic Architecture Inc. (RAI), Architectural Intern	c.spearman@republicarchitecture.ca

Distribution:

In attendance		

Item	Description	Action by
1.1	PRESENTATION BY RAI	

	1) Welcome/Meeting Objectives 2) RAI reviewed highlights from the Draft Feasibility Study, including: - Functional Space Program - Review of concept options - Energy analysis - Costing - Feasibility analysis - Draft Recommendations	Info Info
1.2	COMMENTS ON PRESENTATION BY CoD and YG 1) COD: Clarify what it intended by 'unfinished space' on plans and what non-public uses are envisioned for these spaces. 2) CoD: The area of the fitness centres should be compared to the existing facilities. 3) CoD: Number of parking stalls was included for DR site, but parking numbers were not provided on for the GR site (5.2.2) 4) CoD: Clarify the purpose and location of entrances into GR3. RAI: Entrances respond to active transportation connections, rather than the parking lot. 5) CoD: Section 5.3.1.3 indicates upgrades needed to the site, the city administration should give a sense of the scope of upgrades require to this area. CoD to discuss internally. 6) CoD: Clarify why office space in options 2 and options 3 have different amounts of occupants. RAI: additional programming staff may be required for option 3, which includes aquatics. 7) CoD: Parking amount on DR3 appears excessive and are more than would be needed. Site costs could be reduced with parking reduction. RAI: Zoning requirements ask for this amount of parking. There is potential to save money by reducing the amount of parking. 8) CoD: 7.1 Feasibiliy: cost to demolish existing building on site is not included, this building is owned by the GR campground and their responsibility to remove or sell. 9) CoD: DR option 2 is only marginally less cost effective than GR2. DR2 should be further considered as a feasible recommendation. RAI: Recommendations are preliminary and based on RAI's weighted elements, that may be ranked differently than the CoD would. This also does not factor in feedback from the community, which may also change the recommendation moving forward. RAI and CoD will need to develop a weighted scale to further develop recommendations. 10) CoD: General Conditions and Allowances should be further clarified within the report. 11) CoD: GR sites, does the development go right to property line? Geotechnical engineers have discussed the need for additional space between the building and property line for excavation. CoD to send geotechnical report to RAI. 12) CoD: Geotechnical suggests that site preparation for GR was significantly more than the DR site. RAI: GR is more expensive, however a smaller square footage is developed, DR has more cost associated with increased parking, retention pond, and bringing utilities to site. 13) CoD advised that the estimate of annual administrative costs are currently much higher than what is shown for option 1. CoD to share yearly expenses for recreation centre, fitness centre, and pool with RAI. 14) CoD: Dimensions on plans would be helpful. 15) CoD: 2.5.2 Site accessibility: Studies should be done to more accurately show accessibility to the Dome Road site. Most of the region is closer to DR. However,	Info Info Info Info Info Info Info Info Info Info/RAI Info YG Info CoD Info Info

		more pedestrian crosswalks may be needed on DR.RAI to further develop site access studies. Two additional drawings to be included: one with DR at the center, one with GR at the center. 16) CoD: 2.3.1. Preliminary solar study: Given that solar energy is not feasible, why is orientation prioritized? Numbers shown in report are incorrect and solar energy is used in the area, (water treatment plant, solar farm). RAI to revise report accordingly to reflect energy modelling. 17) CoD: 4.3.2.3 Washrooms: RAI to confirm total washroom counts are accurate. 18) CoD: Report cost estimates: differences between areas and configurations on different sites makes it difficult to compare sites themselves. RAI advised that they were asked to give 3 different options for each site. Sites are different and can accommodate buildings differently: orientation, lot size. Building performance and site specific requirements were prioritized. 19) CoD: Cost estimation: there inconsistencies between RAI's Building Areas and Hanscomb's Building Areas. RAI will work with Hanscomb to address these, but costs identified in report proper show accurate areas and associated costs. 20) CoD 4.5.5.7: Alternate energy target option B requires 170 bore holes at 400ft deep, however the Klondike river flows below DR site and this system may not be possible. 21) CoD: 5.2.1.2: Parking cannot be paved in any option, ensure no paving is shown. RAI to update report to remove paving in costing. 22) CoD: 5.2.1.7: excavated fill cannot be reused. 23) CoD: 5.2.1.10 vs. 5.7.5.4 and 5.7.5.6: was this extra space shown on the drawings? RAI to confirm. 24) CoD 7.1 Feasibility analysis: recreation complex on GR site will mean lost revenue to the city from RV park. Downtown businesses will lose up to $2.4M in revenue. 25) CoD: Costing: Confirm that lines Z10, Z11, Z12 are calculated correctly. RAI: location factor is a real cost and applies to the general conditions and fees. 26) CoD Councilors (Johnson) to send further questions via email. 27) CoD: nomenclature for options on both sites should be clarified and distinct so it is clear they are not to be directly compared. 28) CoD: Phasing should also be considered for the DR site. 29) CoD: Electricity is indicated in the report to be used for heating, where does this comment come from? Inconsistent recommendation for energy sources throughout the report. RAI: Mechanical was recommending fuel because it is common, Civil suggests electrical. CoD: The city would like to see biomass suggested as an option, and is interested in energy options that combat climate change. 30) CoD: Solar PV is incorrectly labelled as a passive system in the report. RAI to correct. 31) CoD: Small windows in winter time will not provide heat, but only light. Passive design elements should consider climate more thoroughly. Report should show a difference in options between energy potential in passive design/window placement. 32) CoD: Higher site costs in DR may not be accurate: site is closer to electric, sewer, and source fill. 33) CoD: Insulation with long lifespan will pay back over its lifetime. Design should not be limited to R40 insulation in walls. More insulation is preferred.	 RAI RAI Info Info Info Info Info Info/RAI Info Info CoD Info Info/RAI All RAI RAI Info Info

	34) CoD: Gymnasium space is critical, happy to see all options include it. Current facilities are oversubscribed, currently being used for vaccine clinics which make recreation programs not possible.	Info
	35) CoD: Two gyms will not be needed in the facility, in any of the options.	Info
	36) CoD: Demographics: population: residents in peripheral areas is closer to 800. Peripheral area counts are based on driver's license and health cards. The report should read 2300 residents TOTAL (Town residents + residents in peripheral areas). RAI to revise this in the report.	Info/RAI
	37) CoD: Solar path analysis unclear, RAI to revise/explain diagrams for clarity.	RAI
	38) CoD: Report needs to be further consider the geotechnical reports. RAI to ensure report is updated with the latest geotechnical information and clarify the depths of excavation.	RAI
	39) CoD: Excavated ground will not be re-useable due to permafrost.	Info
	40) CoD: Cost estimates are close to previous estimates for other facilities.	Info
	41) CoD: DR3 curling rink and ice rink are on the exterior of the building and warm areas are internal, however, other designs, especially DR2, cold areas and warm areas are interspersed. Possible energy savings through wrapping warm spaces.	Info
	42) CoD: costs of current facilities of arena, pool, fitness centre should be included in the report within context section of report.	Info
	43) CoD Climbing wall – was included in option 2 but was not listed in another area of the report. RAI to clarify this in report.	Info/RAI
	44) CoD: Public will want to compare GR1 with DR1. It would be helpful to have a list/clarification of the differences between the comparable options.	Info
	45) CoD: General conditions: these should be revisited for GR to acknowledge the difficulties of building within town, within a residential area. These numbers may not be reflective of reality.	Info
	46) CoD: Solar potential is closer to 1000 kilowatt hours per year. Emission reduction initiatives should be further developed, potential future development of PV use. PV power is relied upon by many locals. DR site may have more potential for PV.	Info
	47) CoD: Any additional costs to factor in residential location and historic factor of the GR site should be considered in the report.	Info
	48) YG: Suggested that GR site be called something different because of the history connected to the site name.	Info
	49) YG: to better compare sites, bring parking on DR closer to what is possible on GR, and then show additional parking to meet zoning requirements as an extra.	Info
	50) Recommendation & Ranking: weighted values used to develop the final recommendation are to be further discussed with council. Meeting or email correspondence to be scheduled by RAI with YG and CoD council.	All
1.3	Community Engagement	
	1) CoD: Would like community engagement to happen quickly and expects similar questions to what council asked.	Info
	2) CoD: Clarifications within the report/presentation should be made before community engagement. Potential to rename options to further differentiate (particular in terms of cost comparisons). RAI noted clarifications will be made with final report submission.	Info

END OF MINUTES

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Shane Solomon MAA SAA AAA OAA

Design Meeting 03 Minutes

Dawson City Recreation Centre
Functional Program & Feasibility Study
YG Tender No.: 2020/21-3017
Republic Project Number: 499
Reason for Meeting: Design Meeting 03 – Review of Community Engagement Findings
Client: Yukon Government

Project Address:
City of Dawson, Yukon

Meeting Date and Time: Tuesday, April 20th, 2021, 13:00 CST (11:00PST)
Meeting Location: via MS Teams

In Attendance:

Name	Role	Email
Micheal Ukrainetz	Yukon Government (YG) Community Services, Infrastructure Development Branch, Project Manager	Micheal.Ukrainetz@yukon.ca
Cory Bellmore	City of Dawson (CoD), CAO	cao@cityofdawson.ca
Paul Robitaille	City of Dawson (CoD), Recreation Manager	recmanager@cityofdawson.ca
Kyle Humphreys	Colliers Project Leaders (CPL), Project Manager	Kyle.humphreys@colliersprojectleaders.com
Mélanie Gagnon	Republic Architecture Inc. (RAI), Project Manager	melanie@republicarchitecture.ca
Evan Hunter	Republic Architecture Inc. (RAI), Lead Architect	evan@republicarchitecture.ca
Rachael Alpern	Republic Architecture Inc. (RAI), Architect/Recreation Planner	rachael@republicarchitecture.ca
Tricia Schilling	Republic Architecture Inc. (RAI), Professional Interior Designer/Public Consultation Facilitator	tricia@republicarchitecture.ca
Ron Prociuk	Republic Architecture Inc. (RAI), Architect	r.prociuk@republicarchitecture.ca
Claire Spearman	Republic Architecture Inc. (RAI), Architectural Intern	c.spearman@republicarchitecture.ca

Distribution:

In attendance		
Jorge Castillo	Scouten Engineering (SE), Senior Structural Engineer	jcastillo@scoutenengineering.com
Anuj Kumar	Scouten Engineering (SE), Senior Civil Engineer	akumar@scoutenengineering.com
Gavin Stewart	SMS Engineering (SMS), Mechanical Engineer	gstewart@smseng.com
Valour Kane	SMS Engineering (SMS), Electrical Engineer	vkane@smseng.com
Anup Rathi	SMS Engineering (SMS), Building Energy Simulation Specialist	arathi@smseng.com

Item	Description	Action by
3.1	INTRODUCTIONS 1) Round table introductions	Info

3.2	REVIEW OF COMMENTS FROM YG CoD ON COMMUNITY ENGAGMENT PIECE 1) Comments on the community engagement findings summary were minimal and discussed. CoD identified they had expected deeper analysis of the data. RAI noted the intent of this small document was to provide the findings and identify patterns in responses. As previously identified by CoD, the community was engaged for feedback to ensure transparency, and make them feel like they were informing the process. This data will be used to help inform the final recommendation. 2) RAI noted that while community survey participation was fairly high, the number of User Group Surveys received was less than ideal. However, CoD noted many of the key players likely did the general survey and/or participated in the community engagement sessions. 3) Word cloud was discussed. CPL and CoD inquired how the word cloud had been developed. RAI explained the process of having the generated cloud and then filtering it by hand to identify phrases/sentence fragments that would be relevant to the exercise. Further filtering to remove further words such as “great” or “another” in certain contexts was not recommended as this would have minimal effect on the word cloud, but also conveys a sense of interest. 4) Additional feedback received that featured prominently was the desire for flexibility of the facility over the lifespan, including multiple uses of spaces.	Info/RAI Info Info Info
3.3	DISCUSSION ABOUT DRIVERS FOR RECOMMENDED OPTION 1) More consolidated feedback from the stakeholders would be beneficial to help inform the recommendation being prepared by RAI for the Report. A matrix has been developed with key drivers for the project with low, medium, and high ratings for each option. 2) Matrix was reviewed with CoD/YG, and RAI requested matrix be completed by stakeholder group, upon careful examination of drivers. Matrix to be completed and returned to RAI 04/27. CoD/YG/Colliers to rank the drivers in order of importance, and add weights if required.	Info/CoD/YG CoD/YG
3.4	SCHEDULE UPDATE 1) YG and CoD have requested that the Final Feasibility Study be provided earlier than the proposed schedule. RAI can accommodate the following submissions, provided review period identified in the schedule is respected: - Final Feasibility Study (Draft Submission for Client Comments): 05/07 - Final Feasibility Study: 05/28 2) If draft submission is received 05/07, materials would be included for 05/11 COA meeting. CoD requested that RAI be available to address questions from Council at a special meeting, potentially 05/18 at 19:15CST/17:15PST. RAI will confirm availability by 04/30.	Info Info/RAI
3.5	ROUND TABLE 1) Stakeholders would like to know how energy efficient measures included were factored into the building and inquired if reducing capital costs by reducing insulation or efficiency of systems) would impact capital costs. RAI will review with SMS modelling and advise, however the options provided in the Draft Feasibility Study were based on best practice scenario, balancing capital costs and operational costs. 2) Connectivity of the Dome Road site to the City of Dawson: currently Millennium Trail along the Klondike Hwy. Not cleared in the winter but gets tramped down by pedestrian traffic.	RAI/SMS Info

	3) Clarification on employee FTEs was requested by RAI so financial feasibility can be completed. CoD to provide this by 04/27. Fitness centre is run by a card system, and no employees are usually on site except for during a brief time during COVID. The new facility may be organized differently. 4) CoD offered to provide the number of FTE employees expected for each option.	Info CoD

END OF MINUTES

Appendix G

Cost Estimates

CLASS 'D' ESTIMATE

DAWSON CITY RECREATIONAL CENTRE
NEW CONSTRUCTION
DOME ROAD 1, DAWSON CITY, YT

Prepared for:
Republic Architecture Inc.

January 28, 2021

Hanscomb
Quantity Surveyors - Since 1957

January 28, 2021 Ref # P2000592

Republic Architecture Inc.
385 St. Mary Avenue
Winnipeg, Manitoba R3C 0N1
T: 204-989-0102
E: s.schmidtke@republicarchitecture.ca

Attn: Sandra Schmidtke

Re: Dawson City Recreational Centre , New Construction, Dome Road 1, Dawson City, YT

Dear Ms. Sandra:

Please find attached our Class 'D' Estimate for the Dawson City Recreational Centre , New Construction in Dome Road 1, Dawson City, YT.

This Class 'D' Estimate is intended to provide a realistic allocation of direct construction costs and is a determination of fair market value. Pricing shown reflects probable construction costs obtainable in the Dome Road 1, Dawson City, YT area on the effective date of this report and is not a prediction of low bid. Pricing assumes competitive bidding for every portion of the work.

Hanscomb has prepared this estimate(s) in accordance with generally accepted principles and practices. Our general assumptions are included in Section 3 of this report and any exclusions are identified in Section 1.6. For quality assurance, this estimate has been reviewed by the designated Team Lead as signed below and Hanscomb staff are available and pleased to discuss the contents of this report with any interested party.

Requests for modifications of any apparent errors or omissions to this document must be made to Hanscomb within ten (10) days of receipt of this estimate. Otherwise, it will be understood that the contents have been concurred with and accepted.

We trust our estimate is complete and comprehensive and provides the necessary information to allow for informed capital decisions for moving this project forward. Please do not hesitate to contact us if you have any questions or require additional information.

Yours truly,

Hanscomb Limited
Team Lead

Indu Elapatha
PQS(F), MRICS
Senior Cost Consultant

Hanscomb Limited
Principal / Estimate Reviewer

Ken King
PQS, MRICS, AScT
Manager

Hanscomb
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Appendices

1. INTRODUCTION

1.1 PURPOSE

This Class 'D' Estimate is intended to provide a realistic allocation of direct construction costs for the Dawson City Recreational Centre , New Construction, located in Dome Road 1, Dawson City, YT, with the exception of the items listed in 1.6 Exclusions.

1.2 DESCRIPTION

The Dawson City Recreational Centre , New Construction located in Dome Road 1, Dawson City, YT is comprised of the following key elements:

The project is a new construction of 2-storey Recreational Centre Facility with 3 Options:

Option 1: Dome Road 1, Dawson City, YT
This option is to provide a compact building footprint characterized by the long linear forms of the Ice Rink and Curling Rink with a total gross floor area of 7,477 m2

Option 2: Dome Road 1, Dawson City, YT
This option is to provide a linear circulation zone that provides community gathering and viewing areas with sight line to amenity areas with a total gross floor area of 8,807m2.

Option 3: Dome Road 1, Dawson City, YT
This option is to provide an optimal viewing area into each major amenity area from community hub on the second floor with a total gross floor area of 10,545 m2.

In addition, this report also includes the estimate for Option 1 building in Goldrush location.
Option 1: Goldrush 1, Dawson City, YT
This option is the same design concept as the Option 1 in Dome Road 1 with a total gross floor area of 7,350 m2

1.3 METHODOLOGY

Hanscomb has prepared this estimate(s) in accordance with generally accepted principles and practices. Hanscomb staff are available to discuss its contents with any interested party.

From the documentation and information provided, quantities of all major elements were assessed or measured where possible and priced at rates considered competitive for a project of this type under a stipulated sum form of contract in Dome Road 1, Dawson City, YT.

Pricing shown reflects probable construction costs obtainable in the Dome Road 1, Dawson City, YT area on the effective date of this report. This estimate is a determination of fair market value for the construction of this project. It is not a prediction of low bid. Pricing assumes competitive bidding for every portion of the work.

1.4 SPECIFICATIONS

For building components and systems where specifications and design details are not available, quality standards have been established based on discussions with the design team.

1. INTRODUCTION

1.5 ESTIMATE CLASSIFICATION AND COST PREDICTABILITY

Estimates are defined and classified based on the stage of a project's development and the level of information available at the time of the milestone estimate.

> *This Class 'D' Estimate is considered to have an expected degree of accuracy of* +/- 20-30%. *In other words, bid results might vary by this amount if the construction budget were set at this milestone estimate.*

At the initial stages of a contemplated project, the cost accuracy of the estimate is low as there may be little or no information available to inform a first high-level concept estimate or order of magnitude estimate. As a project nears design completion and is ready to be released to market for tender, the level of accuracy of the estimate is high as the detail is generally extensive and typically represents the information on which contractors will bid.

Milestone cost estimates or "checks" are recommended as the project design develops to keep track of scope and budget. Early detection of potential budget overruns will allow for remedial action before design and scope are locked in. The number of milestone estimates will depend on a project's size and schedule and cost predictability will improve as the design advances.

According to the Canadian Joint Federal Government/Industry Cost Predictability Taskforce, industry standards for estimate classification and cost estimate accuracy may be summarized as follows:

COST ESTIMATE CLASSIFICATION SYSTEM						
AACE	Class 5	Class 4	Class 3		Class 2	Class 1
DND			Indicative		Substantive	
RAIC	OME	Sketch Design	Design Develop		Contract Documents	Tender Documents
GOC	OME	**D**	**C**	← **B** →		**A**
Design Documentation % Complete		**12.5%**	**25.0%**		**95.0%**	**100.0%**
Cost Estimate Accuracy (+/-%)	**+/- 30%**	**+/- 20-30%**	**+/- 15-20%**		**+/- 10-15%**	**+/- 5-10%**

Legend

AACE	Association for the Advancement of Cost Engineering
DND	Department of National Defence
GOC	Government of Canada
RAIC	Royal Architectural Institute of Canada
OME	Order of Magnitude Estimate

While the classification categories differ from one authority to the next, the overarching principle for cost predictability remains the same – as the level of detail and design development increases, so does the level of accuracy of the estimate.

1. INTRODUCTION

1.6 EXCLUSIONS

This Class 'D' Estimate does not provide for the following, if required:

- Cost of contaminated soil removal
- Cost of hazardous material (e.g. asbestos, lead, PCB, etc.) removal
- Special Foundation design that includes rock anchoring, piling, concrete shoring, etc.
- Geotechnical soil improvement other than removal of unsuitable material and replace with structural fill
- Main Facility Equipment – Zamboni, Fitness, Sauna and Pool Equipment
- Escalation contingency beyond that identified in this estimate
- Financing costs
- Loose furniture, furnishings and equipment
- Winter Construction (Concrete foundation and masonry heating & hoarding)
- Value-added tax (e.g. Harmonized Sales Tax, Goods and Services Tax, or other)
- Premiums associated with Public-Private Partnership procurement model
- Soft Costs
- Unexpected labour unavailability and productivity disruptions leading to delays and added costs
- Supply chain disruptions leading to delays and added costs

2. DOCUMENTATION

This Class 'D' Estimate has been prepared from the documentation included in Appendix AA of this report.

All of the above documentation was received from Republic Architecture Inc. and was supplemented with information gathered in meeting(s) and telephone conversations with the design team, as applicable.

Design changes and/or additions made subsequent to this issuance of the documentation noted above have not been incorporated in this report.

3. COST CONSIDERATIONS

3.1 COST BASE

All costs are estimated on the basis of competitive bids (a minimum of 4 general contractor bids and at least 4 subcontractor bids for each trade) being received in January 2020 from general contractors and all major subcontractors and suppliers based on a stipulated sum form of contract. If these conditions are not met, bids received could be expected to exceed this estimate.

3.2 UNIT RATES

The unit rates in the preparation of this Class 'D' Estimate include labour and material, equipment, subcontractor's overheads and profit. Union contractors are assumed to perform the work with the fair wage policy in effect.

3.3 GENERAL REQUIREMENTS AND FEE

General Requirements and Fee cover the General Contractor's indirect costs which may include but not be limited to supervision, site set up, temporary utilities, equipment, utilities, clean up, etc. as covered in Division 1 General Conditions of the Contract Documents. It also includes the contractor's fees and should not be confused with Design or Consultant fees which are excluded from the Construction Costs and carried separately in the Owner's Total Project Costs.

3.4 DESIGN AND PRICING ALLOWANCE

An allowance of 15.0% has been included to cover design and pricing unknowns. This allowance is not intended to cover any program space modifications but rather to provide some flexibility for the designers and cost planners during the remaining contract document stages.

It is expected that this allowance amount will be absorbed into the base construction costs as the design advances. The amount by which this allowance is reduced corresponds to an increase in accuracy and detailed design information. Hanscomb recommends that careful consideration be made at each milestone estimate to maintain adequate contingency for this allowance.

As a project nears completion of design, Hanscomb recommends retaining some contingency for this allowance for the final coordination of documents.

3.5 ESCALATION ALLOWANCE

All costs are based on January 2020 dollars. An allowance of 5% per annum has been made for construction cost escalation that may occur between January 2020 and the anticipated bid date for the project. Escalation during construction is included in the unit rates.

For escalation, the budgeted amount will typically decline as the time to award nears. Forecasting escalation requires careful assessment of a continually changing construction market which at best is difficult to predict. The escalation rate should be monitored.

3. COST CONSIDERATIONS

3.6 CONSTRUCTION ALLOWANCE

An allowance of 10.0% has been made to cover construction (post contract) unknowns. This allowance, also known as the Post Contract Contingency (PCC), is intended to cover costs for change orders during construction that are not foreseeable. It is not intended to cover scope changes to the contract. The amount carried in a budget for this allowance is typically set at the initial planning stage and should be based on the complexity of the project and the probability of unknowns and retained risks.

3.7 CASH ALLOWANCE

Cash allowances are intended to allow the contractor to include in the bid price the cost for work that is difficult to fully scope at the time of tendering based on factors that are beyond the Owner and Prime Consultant's control. Cash allowances attempt to reduce the risks by dedicating a set amount for use against a certain cost that cannot yet be detailed. The Contractor is obligated to work as best as possible within the limitations of the Cash Allowance.

Examples of Cash Allowances include hardware, inspection and testing, site conditions, replacement of existing elements during demolition for renovation, hazardous materials abatement, signage, etc.

Any Cash Allowances if applicable are included either in the details of this estimate under the appropriate discipline or at the summary level.

3.8 TAXES

No provision has been made for the Goods and Services Tax. It is recommended that the owner make separate provision for GST in the project budget.

3.9 SCHEDULE

Pricing assumes a standard schedule of work appropriate to the size and scope of this project. Premiums for off-hour work, working in an operational facility, accelerated schedule, etc., if applicable, are identified separately in the body of the estimate.

3.10 STATEMENT OF PROBABLE COSTS

Hanscomb has no control over the cost of labour and materials, the contractor's method of determining prices, or competitive bidding and market conditions. This opinion of probable cost of construction is made on the basis of experience, qualifications and best judgment of the professional consultant familiar with the construction industry. Hanscomb cannot and does not guarantee that proposals, bids or actual construction costs will not vary from this or subsequent cost estimates.

3. COST CONSIDERATIONS

3.11 ONGOING COST CONTROL

Hanscomb recommends that the Owner and design team carefully review this document, including line item description, unit prices, clarifications, exclusions, inclusions and assumptions, contingencies, escalation, and mark-ups. If the project is over budget, or if there are unresolved budgeting issues, alternative systems/schemes should be evaluated before proceeding into the next design phase.

It is recommended that a final updated estimate at the end of the design stage be produced by Hanscomb using Bid Documents to determine overall cost changes which may have occurred since the preparation of this estimate. The final updated estimate will address changes and additions to the documents, as well as addenda issued during the bidding process. Hanscomb cannot reconcile bid results to any estimate not produced from bid documents including all addenda.

This estimate does not constitute an offer to undertake the work, nor is any guarantee given that an offer, to undertake the work at the estimate(s) price, will subsequently be submitted by a construction contractor. Unless explicitly stated otherwise, it is assumed that competitive bids will be sought when tender documents have been completed. Any significant deviation between bids received and a pre-tender estimate prepared by Hanscomb from the same tender documents, should be evaluated to establish the possible cause(s).

3.12 COVID-19 CLASS A ESTIMATE STATEMENT

If this project is expected to be tendered in the near future and because risks related to COVID-19 are a currently known but unquantifiable project risk at this time and therefore may not support a claim under any force majeure contract clause, Hanscomb expects general contractors to include in their bids an allowance for COVID-19 risk unless that risk is mitigated in the bid documents. Inclusion of an allowance for risk related to COVID-19 will increase the overall cost of the project, in some cases materially.

Hanscomb believes inclusion of these risks in bids could impact normal competitive market conditions resulting in a bid price increase by a minimum of 5 to 10% or in extreme situations as much as 10 to 20%.

We encourage building owners and Architect & Engineering teams to address this situation by providing clear directives to the bidders on risk mitigation for COVID-19 within the tender documents.

Items related to COVID-19 that may be included in bidders' risk allowances:

- Reduced site productivity due to:
  - lack of availability of labour for sickness and other reasons,
  - delays related to recruiting or unavailability of replacement workers,
  - social/physical distancing requirements,
  - site shutdowns due to outbreaks among site workers,
  - government mandated industry shutdowns,
  - delays in delivery of materials and equipment to the site,
  - unavailability of materials due to factory closure or shipping interruption,
  - delays related to acquiring substitutions for unavailable materials,
- Effect of reduced site productivity on project schedule,
- Effect of project schedule delays on overheads.

If any or all of these risks are encountered the completion date for the project will be delayed.

4. GROSS FLOOR AND SITE DEVELOPED AREAS

Gross Floor Area

	Dome Road 1			Goldrush
Description	**Option 1 (m2)**	**Option 2 (m2)**	**Option 3 (m2)**	**Option 1 (m2)**
Main Floor	5,687	7,026	7,582	5,300
Second Floor	1,790	1,781	2,963	2,050
Total Gross Floor Area	**7,477**	**8,807**	**10,545**	**7,350**
Site Developed Area				
Description	**Option 1**	**Option 2**	**Option 3**	**Option 3**
Total Site Area	33,050	33,050	33,050	10,280
Building Footprint	-5,687	-7,026	-7,582	-5,300
Total Site Developed Area	**27,363**	**26,024**	**25,468**	**4,980**

Site Developed Area is the area of the site less the foot-print area of the building.

The above areas have been measured in accordance with the Canadian Institute of Quantity Surveyors' Method of Buildings by Area and Volume.

5. CONSTRUCTION COST ESTIMATE SUMMARY

Cost Element	Percent	OPTION 1 Amount	Dome Road 1 OPTION 2 Amount	OPTION 3 Amount	Goldrush OPTION 1 Amount
New Construction		$25,665,900	$30,609,100	$36,679,700	$26,213,200
Site Development		$2,835,500	$3,048,000	$3,108,300	$1,216,200
Sub-total		**$28,501,400**	**$33,657,100**	**$39,788,000**	**$27,429,400**
Location Factor (Dawson City, YT)	38.0%	$10,830,500	$12,789,700	$15,119,400	$10,423,200
General Requirements	8.0%	$3,146,600	$3,715,700	$4,392,600	$3,028,200
Fee	3.0%	$1,274,400	$1,504,900	$1,779,000	$1,226,400
Sub-total		**$43,752,900**	**$51,667,400**	**$61,079,000**	**$42,107,200**
Design and Pricing Allowance	15.0%	$6,562,900	$7,750,100	$9,161,900	$6,316,100
Escalation Allowance	5.0%	$2,515,800	$2,970,900	$3,512,000	$2,421,200
Construction Allowance	10.0%	$5,283,200	$6,238,800	$7,375,300	$5,084,500
Total Construction Cost		**$58,114,800**	**$68,627,200**	**$81,128,200**	**$55,929,000**
Goods and Services Tax (GST)		Excluded	Excluded	Excluded	Excluded
Total Construction Cost		**$58,114,800**	**$68,627,200**	**$81,128,200**	**$55,929,000**

6. UNDERSTANDING THE ELEMENTAL COST SUMMARY

The cost information prepared and presented by Quantity Surveyors is organized in a form referred to by Quantity Surveyors as an 'Elemental Cost Summary'. In this format, the more 'intuitive' elements (e.g. foundations, exterior cladding, plumbing, etc.) of a building are evaluated rather than materials or trades. Quantity Surveyors track this information consistently from project to project to benchmark not just the overall unit rate of a building type but also rates and ratios for key elements. Below are some of the key features on the Elementary Cost Summary you will find on page A-1 of this estimate:

Building components are summarized as elements 'A2 Structure' and then sub-elements 'A23 Roof Construction'. This allows review of Roof Construction costs whether it is steel, concrete or wood - something difficult with a trade summary.

Ratio to GFA evaluates design efficiency and highlights outliers. It is arrived at by dividing the parametric quantity of a sub-element (i.e. overall exterior wall area) by the building gross floor area (GFA). A ratio greater than 0.600 for 'A32 Walls Above Grade' is considered high and may be due to articulation, courtyard design or high floor to floor heights.

The 'Unit Rate' is the blended rate of a sub-element's costs divided by its parametric quantity and allows a review of its reasonableness relative to bench-marks. A rate of $559/m2 indicates a good quality exterior wall cladding.

The last column expresses the cost of each element as a percentage of total construction cost. At 18.7% of total construction costs, mechanical and electrical systems are considered basic.

The 'Rate per SF' (m^2) column converts costs for each element or sub-element to a $/SF (m^2) of GFA for comparison to benchmark rates. A rate of $217/m^2 indicates basic electrical design.

General Requirements & Fee cover General Contractor's overheads (site set up, supervision, etc.) and contractor's expenses. Fee is not for Consultants.

Allowances are critical for estimates. Design & pricing compensates for a lack of detail early in design; escalation considers changes to labour & material; construction allowance is for unforeseen conditions; and, cash allowances offer flexibility for items difficult to detail at bid.

SAMPLE ELEMENTAL SUMMARY

Project :
:
Location :
Owner :
Consultant :

Report date : 18 Jul 2017
Page No. : A - 1
Bldg Type : 420
C.T. Index : 0.0
GFA : 1,582 m2

Element	Ratio to GFA	Elemental Cost Quantity	Unit Rate	Elemental Amount Sub-Total	Elemental Amount Total	Rate per m2 Sub-Total	Rate per m2 Total	%
A SHELL		1,582 m2			1,829,900		1,156.70	35.6
A1 SUBSTRUCTURE					250,000		158.03	4.9
A11 Foundations	1.000	1,582 m2	158.03	250,000		158.03		
A12 Basement Excavation	0.001	1 Nil	0.00	0		0.00		
A13 Special Conditions	0.001	1 Sum	0.00	0		0.00		
A2 STRUCTURE					468,800		296.33	9.1
A21 Lowest Floor Construction	1.000	1,582 m2	64.92	102,700		64.92		
A23 Roof Construction		1 Nil	0.00	0		0.00		
A23 Roof Construction	1.013	1,602 m2	228.53	366,100		231.42		
A3 EXTERIOR ENCLOSURE					1,111,100		702.34	21.6
A31 Walls Below Grade	0.001	1 Nil	0.00	0		0.00		
A32 Walls Above Grade		1,096 m2	**559.22**	612,900		387.42		
A33 Windows & Entrances	0.003	4 Lvs	3,275.00	13,100		8.28		
A34 Roof Coverings	1.013	1,602 m2	220.22	352,800		223.01		
A35 Projections	1.000	1,582 m2	83.63	132,300		83.63		
B INTERIORS		1,582 m2			1,033,400		653.22	20.1
B1 PARTITIONS & DOORS					382,900		242.04	7.4
B11 Partitions	1.504	2,380 m2	105.29	250,600		158.41		
B12 Doors	0.038	60 Lvs	2,205.00	132,300		83.63		
B2 FINISHES					398,400		251.83	7.7
B21 Floor Finishes	1.000	1,582 m2	75.35	119,200		75.35		
B22 Ceiling Finishes	1.000	1,582 m2	91.28	144,400		91.28		
B23 Wall Finishes	2.314	3,660 m2	36.83	134,800		85.21		
B3 FITTINGS & EQUIPMENT					252,100		159.36	4.9
B31 Fittings & Fixtures	1.000	1,582 m2	159.36	252,100		159.36		
B32 Equipment	1.000	1,582 m2	0.00	0		0.00		
B33 Elevators	0.001	1 Nil	0.00	0		0.00		
B34 Escalators	0.001	1 Nil	0.00	0		0.00		
C SERVICES		1,582 m2			964,400		609.61	**18.7**
C1 MECHANICAL					621,100		392.60	12.1
C11 Plumbing & Drainage	1.000	1,582 m2	145.26	229,800		145.26		
C12 Fire Protection	1.000	1,582 m2	31.04	49,100		31.04		
C13 HVAC	1.000	1,582 m2	170.35	269,500		170.35		
C14 Controls	1.000	1,582 m2	45.95	72,700		45.95		
C2 ELECTRICAL					343,300		**217.00**	6.7
C21 Service & Distribution	1.000	1,582 m2	42.54	67,300		42.54		
C22 Lighting, Devices & Heating	1.000	1,582 m2	116.81	184,800		116.81		
C23 Systems & Ancillaries	1.000	1,582 m2	57.65	91,200		57.65		
NET BUILDING COST - EXCLUDING SITE				$	3,827,700		2,419.53	74.4
D SITE & ANCILLARY WORK		1,582 m2			799,800		505.56	15.5
D1 SITE WORK					799,800		505.56	15.5
D11 Site Development	6.541	10,348 m2	48.71	504,100		318.65		
D12 Mechanical Site Services	0.001	1 Sum	167,400.00	167,400		105.82		
D13 Electrical Site Services	0.001	1 Sum	128,300.00	128,300		81.10		
D2 ANCILLARY WORK					0		0.00	0.0
D21 Demolitions	0.001	1 Nil	0.00	0		0.00		
D22 Alterations	0.001	1 Nil	0.00	0		0.00		
NET BUILDING COST - INCLUDING SITE				$	4,627,500		2,925.09	89.9
Z1 GENERAL REQUIREMENTS & FEE		**8.0%**			520,100		328.76	10.1
Z11 General Requirements				370,200		234.01		
Z12 Fee		**3.0%**		149,900		94.75		
TOTAL CONSTRUCTION ESTIMATE - EXCLUDING ALLOWANCES				$	5,147,600		3,253.86	100.0
Z2 ALLOWANCES		**10.0%**			930,500		588.18	
Z21 Design & Pricing Allowance		**2.5%**		514,800		325.41		
Z22 Escalation Allowance		**3.0%**		141,600		89.51		
Z23 Construction Allowance				174,100		110.05		
Z24 Cash Allowances		**1 Sum**	100,000.00	100,000		63.21		
TOTAL CONSTRUCTION ESTIMATE - INCLUDING ALLOWANCES				$	6,078,100		3,842.04	
VALUE ADDED TAX (GST/HST)					0		0.00	
Value Added Tax (GST/HST)		0.0 %		0		0.00		
TOTAL CONSTRUCTION ESTIMATE				$	6,078,100	$	3,842.04	

J2351 -Z1 CLASS C ESTIMATE Hanscomb

The power of the Elemental Cost Summary lies in the ability to compare costs with similar building types as well as alternatives without losing sight of the cost associated with that element of the building. By using this format consistently across all projects, Quantity Surveyors can better understand why the 'roof covering' element may be more on this project, if it's fulfilling the same function as a similar project.

Appendix
A - Detailed Elemental Estimate
OPTION 1 – Dome Road 1

Project	: **Dawson City Recreation Centre**		Report date	: 27 Jan 2021
	: **New Construction - OPTION 1**		Page No.	: 1
Location	: **Dome Road 1, Dawson City, YT**	**ELEMENTAL COST SUMMARY**	Bldg Type	: 550
Owner	: **Government of Yukon**		C.T. Index	: 0.0
Consultant	: **Republic Architecture Inc.**		GFA	: 7,477 m2

Element	Ratio	Elemental Cost		Elemental Amount		Rate per m2		%
	to GFA	Quantity	Unit rate	Sub-Total	Total	Sub-Total	Total	
A SHELL		7,477 m2			13,658,900		1,826.79	31.2
A1 SUBSTRUCTURE					4,591,700		614.11	10.5
A11 Foundations	0.761	5,687 m2	516.04	2,934,700		392.50		
A12 Bulk Excavation / Fill	2.537	18,970 m3	74.17	1,407,000		188.18		
A13 Special Conditions	0.000	1 Sum	250,000.00	250,000		33.44		
A2 STRUCTURE					5,329,400		712.77	12.2
A21 Lowest Floor Construction	0.761	5,687 m2	182.52	1,038,000		138.83		
A22 Upper Floor Construction	0.239	1,790 m2	650.00	1,163,500		155.61		
A23 Roof Construction	0.761	5,687 m2	550.01	3,127,900		418.34		
A3 EXTERIOR ENCLOSURE					3,737,800		499.91	8.5
A31 Walls Below Grade				0		0.00		
A32 Walls Above Grade	0.382	2,858 m2	600.00	1,714,800		229.34		
A33 Windows & Entrances	0.012	91 m2	1,491.21	135,700		18.15		
A34 Roof Coverings	0.761	5,687 m2	275.00	1,563,900		209.16		
A35 Projections	1.000	7,477 m2	43.25	323,400		43.25		
B INTERIORS		7,477 m2			2,699,600		361.05	6.2
B1 PARTITIONS & DOORS					1,040,300		139.13	2.4
B11 Partitions	0.536	4,007 m2	221.21	886,400		118.55		
B12 Doors	0.008	63 No	2,442.86	153,900		20.58		
B2 FINISHES					930,400		124.43	2.1
B21 Floor Finishes	1.000	7,477 m2	44.46	332,400		44.46		
B22 Ceiling Finishes	1.000	7,477 m2	56.69	423,900		56.69		
B23 Wall Finishes	1.454	10,872 m2	16.01	174,100		23.28		
B3 FITTINGS & EQUIPMENT					728,900		97.49	1.7
B31 Fittings & Fixtures	1.000	7,477 m2	81.77	611,400		81.77		
B32 Equipment	1.000	7,477 m2	15.71	117,500		15.71		
B33 Elevators				0		0.00		
B34 Escalators				0		0.00		
C SERVICES		7,477 m2			9,307,400		1,244.80	21.3
C1 MECHANICAL					6,732,800		900.47	15.4
C11 Plumbing & Drainage	1.000	7,477 m2	144.04	1,077,000		144.04		
C12 Fire Protection	1.000	7,477 m2	44.71	334,300		44.71		
C13 HVAC	1.000	7,477 m2	651.72	4,872,900		651.72		
C14 Controls	1.000	7,477 m2	60.00	448,600		60.00		
C2 ELECTRICAL					2,574,600		344.34	5.9
C21 Service & Distribution	1.000	7,477 m2	96.51	721,600		96.51		
C22 Lighting, Devices & Heating	1.000	7,477 m2	154.78	1,157,300		154.78		
C23 Systems & Ancillaries	1.000	7,477 m2	93.05	695,700		93.05		
NET BUILDING COST - EXCLUDING SITE				$	**25,665,900**		3,432.65	58.7
D SITE & ANCILLARY WORK		7,477 m2			2,835,500		379.23	6.5
D1 SITE WORK					2,835,500		379.23	6.5
D11 Site Development	3.660	27,363 m2	81.70	2,235,500		298.98		
D12 Mechanical Site Services	0.000	1 Sum	280,000.00	280,000		37.45		
D13 Electrical Site Services	0.000	1 Sum	320,000.00	320,000		42.80		
D2 ANCILLARY WORK					0		0.00	0.0
D21 Demolitions				0		0.00		
D22 Alterations				0		0.00		
NET BUILDING COST - INCLUDING SITE				$	**28,501,400**		3,811.88	65.1
Z1 GENERAL REQUIREMENTS & FEE					15,251,500		2,039.79	34.9
Z10 Location Factor (Dawson, YT)		38.0 %		10,830,500		1,448.51		
Z11 General Requirements		8.0 %		3,146,600		420.84		
Z12 Fee		3.0 %		1,274,400		170.44		
TOTAL CONSTRUCTION ESTIMATE - EXCLUDING ALLOWANCES				$	**43,752,900**		5,851.67	100.0
Z2 ALLOWANCES					14,361,900		1,920.81	
Z21 Design & Pricing Allowance		15.0 %		6,562,900		877.75		
Z22 Escalation Allowance		5.0 %		2,515,800		336.47		
Z23 Construction Allowance		10.0 %		5,283,200		706.59		
TOTAL CONSTRUCTION ESTIMATE - INCLUDING ALLOWANCES				$	**58,114,800**		7,772.48	
_ **VALUE ADDED TAX (GST/HST)**					0		0.00	
__ Value Added Tax (GST/HST)		0.0 %		0		0.00		
TOTAL CONSTRUCTION ESTIMATE				$	**58,114,800**	$	**7,772.48**	

CLASS 'D' ESTIMATE

Hanscomb

Appendix
A - Detailed Elemental Estimate
OPTION 2 – Dome Road 1

Project	: **Dawson City Recreation Centre**		Report date : 27 Jan 2021
	: **New Construction - OPTION 2**		Page No. : 1
Location	: **Dome Road 1, Dawson City, YT**	**ELEMENTAL COST SUMMARY**	Bldg Type : 550
Owner	: **Government of Yukon**		C.T. Index : 0.0
Consultant	: **Republic Architecture Inc.**		GFA : 8,807 m2

Element	Ratio	Elemental Cost		Elemental Amount		Rate per m2		%
	to GFA	Quantity	Unit rate	Sub-Total	Total	Sub-Total	Total	
A SHELL		8,807 m2			17,147,400		1,947.02	33.2
A1 SUBSTRUCTURE					5,673,400		644.19	11.0
A11 Foundations	0.798	7,026 m2	516.31	3,627,600		411.90		
A12 Bulk Excavation / Fill	2.673	23,538 m3	74.17	1,745,800		198.23		
A13 Special Conditions	0.000	1 Sum	300,000.00	300,000		34.06		
A2 STRUCTURE					6,285,800		713.73	12.2
A21 Lowest Floor Construction	0.798	7,026 m2	179.87	1,263,800		143.50		
A22 Upper Floor Construction	0.202	1,781 m2	650.03	1,157,700		131.45		
A23 Roof Construction	0.798	7,026 m2	550.00	3,864,300		438.78		
A3 EXTERIOR ENCLOSURE					5,188,200		589.10	10.0
A31 Walls Below Grade				0		0.00		
A32 Walls Above Grade	0.437	3,848 m2	600.00	2,308,800		262.16		
A33 Windows & Entrances	0.050	442 m2	1,377.60	608,900		69.14		
A34 Roof Coverings	0.798	7,026 m2	275.01	1,932,200		219.39		
A35 Projections	1.000	8,807 m2	38.41	338,300		38.41		
B INTERIORS		8,807 m2			3,083,600		350.13	6.0
B1 PARTITIONS & DOORS					985,400		111.89	1.9
B11 Partitions	0.418	3,677 m2	221.29	813,700		92.39		
B12 Doors	0.008	71 No	2,418.31	171,700		19.50		
B2 FINISHES					1,241,300		140.94	2.4
B21 Floor Finishes	1.000	8,807 m2	63.22	556,800		63.22		
B22 Ceiling Finishes	1.000	8,807 m2	56.53	497,900		56.53		
B23 Wall Finishes	1.272	11,202 m2	16.66	186,600		21.19		
B3 FITTINGS & EQUIPMENT					856,900		97.30	1.7
B31 Fittings & Fixtures	1.000	8,807 m2	81.12	714,400		81.12		
B32 Equipment	1.000	8,807 m2	16.18	142,500		16.18		
B33 Elevators				0		0.00		
B34 Escalators				0		0.00		
C SERVICES		8,807 m2			10,378,100		1,178.39	20.1
C1 MECHANICAL					7,362,700		836.01	14.3
C11 Plumbing & Drainage	1.000	8,807 m2	124.79	1,099,000		124.79		
C12 Fire Protection	1.000	8,807 m2	42.73	376,300		42.73		
C13 HVAC	1.000	8,807 m2	608.49	5,359,000		608.49		
C14 Controls	1.000	8,807 m2	60.00	528,400		60.00		
C2 ELECTRICAL					3,015,400		342.39	5.8
C21 Service & Distribution	1.000	8,807 m2	96.29	848,000		96.29		
C22 Lighting, Devices & Heating	1.000	8,807 m2	154.80	1,363,300		154.80		
C23 Systems & Ancillaries	1.000	8,807 m2	91.30	804,100		91.30		
NET BUILDING COST - EXCLUDING SITE				**$**	**30,609,100**		3,475.54	59.2
D SITE & ANCILLARY WORK		8,807 m2			3,048,000		346.09	5.9
D1 SITE WORK					3,048,000		346.09	5.9
D11 Site Development	2.955	26,024 m2	91.68	2,386,000		270.92		
D12 Mechanical Site Services	0.000	1 Sum	300,000.00	300,000		34.06		
D13 Electrical Site Services	0.000	1 Sum	362,000.00	362,000		41.10		
D2 ANCILLARY WORK					0		0.00	0.0
D21 Demolitions				0		0.00		
D22 Alterations				0		0.00		
NET BUILDING COST - INCLUDING SITE				**$**	**33,657,100**		3,821.63	65.1
Z1 GENERAL REQUIREMENTS & FEE					18,010,300		2,045.00	34.9
Z10 Location Factor (Dawson, YT)		38.0 %		12,789,700		1,452.22		
Z11 General Requirements		8.0 %		3,715,700		421.90		
Z12 Fee		3.0 %		1,504,900		170.88		
TOTAL CONSTRUCTION ESTIMATE - EXCLUDING ALLOWANCES				**$**	**51,667,400**		5,866.63	100.0
Z2 ALLOWANCES					16,959,800		1,925.72	
Z21 Design & Pricing Allowance		15.0 %		7,750,100		879.99		
Z22 Escalation Allowance		5.0 %		2,970,900		337.33		
Z23 Construction Allowance		10.0 %		6,238,800		708.39		
TOTAL CONSTRUCTION ESTIMATE - INCLUDING ALLOWANCES				**$**	**68,627,200**		7,792.35	
_ VALUE ADDED TAX (GST/HST)					0		0.00	
__ Value Added Tax (GST/HST)		0.0 %		0		0.00		
TOTAL CONSTRUCTION ESTIMATE				**$**	**68,627,200**	**$**	**7,792.35**	

Appendix
A - Detailed Elemental Estimate
OPTION 3 – Dome Road 1

Project	: **Dawson City Recreation Centre**	Report date	: 27 Jan 2021
	: **New Construction - OPTION 3**	Page No.	: 1
Location	: **Dome Road 1, Dawson City, YT** **ELEMENTAL COST SUMMARY**	Bldg Type	: 550
Owner	: **Government of Yukon**	C.T. Index	: 0.0
Consultant	: **Republic Architecture Inc.**	GFA	: 10,545 m2

Element	Ratio to GFA	Elemental Cost		Elemental Amount		Rate per m2		%
		Quantity	Unit rate	Sub-Total	Total	Sub-Total	Total	
A SHELL		10,545 m2			19,477,800		1,847.11	31.9
A1 SUBSTRUCTURE					6,140,900		582.35	10.1
A11 Foundations	0.719	7,582 m2	516.39	3,915,300		371.29		
A12 Bulk Excavation / Fill	2.399	25,299 m3	74.14	1,875,600		177.87		
A13 Special Conditions	0.000	1 Sum	350,000.00	350,000		33.19		
A2 STRUCTURE					7,457,200		707.18	12.2
A21 Lowest Floor Construction	0.719	7,582 m2	179.52	1,361,100		129.08		
A22 Upper Floor Construction	0.281	2,963 m2	650.02	1,926,000		182.65		
A23 Roof Construction	0.719	7,582 m2	550.00	4,170,100		395.46		
A3 EXTERIOR ENCLOSURE					5,879,700		557.58	9.6
A31 Walls Below Grade	0.016	165 m2	400.00	66,000		6.26		
A32 Walls Above Grade	0.358	3,780 m2	600.00	2,268,000		215.08		
A33 Windows & Entrances	0.075	789 m2	1,385.04	1,092,800		103.63		
A34 Roof Coverings	0.719	7,582 m2	275.01	2,085,100		197.73		
A35 Projections	1.000	10,545 m2	34.88	367,800		34.88		
B INTERIORS		10,545 m2			3,847,000		364.82	6.3
B1 PARTITIONS & DOORS					1,246,100		118.17	2.0
B11 Partitions	0.460	4,855 m2	221.30	1,074,400		101.89		
B12 Doors	0.007	71 No	2,418.31	171,700		16.28		
B2 FINISHES					1,516,200		143.78	2.5
B21 Floor Finishes	1.000	10,545 m2	67.57	712,500		67.57		
B22 Ceiling Finishes	1.000	10,545 m2	54.55	575,200		54.55		
B23 Wall Finishes	1.279	13,488 m2	16.94	228,500		21.67		
B3 FITTINGS & EQUIPMENT					1,084,700		102.86	1.8
B31 Fittings & Fixtures	1.000	10,545 m2	79.87	842,200		79.87		
B32 Equipment	1.000	10,545 m2	11.14	117,500		11.14		
B33 Elevators	0.000	1 No	125,000.00	125,000		11.85		
B34 Escalators				0		0.00		
C SERVICES		10,545 m2			13,354,900		1,266.47	21.9
C1 MECHANICAL					9,748,500		924.47	16.0
C11 Plumbing & Drainage	1.000	10,545 m2	206.55	2,178,100		206.55		
C12 Fire Protection	1.000	10,545 m2	42.28	445,800		42.28		
C13 HVAC	1.000	10,545 m2	604.64	6,375,900		604.64		
C14 Controls	1.000	10,545 m2	71.00	748,700		71.00		
C2 ELECTRICAL					3,606,400		342.00	5.9
C21 Service & Distribution	1.000	10,545 m2	95.19	1,003,800		95.19		
C22 Lighting, Devices & Heating	1.000	10,545 m2	154.80	1,632,400		154.80		
C23 Systems & Ancillaries	1.000	10,545 m2	92.01	970,200		92.01		
NET BUILDING COST - EXCLUDING SITE				**$**	**36,679,700**		3,478.40	60.1
D SITE & ANCILLARY WORK		10,545 m2			3,108,300		294.77	5.1
D1 SITE WORK					3,108,300		294.77	5.1
D11 Site Development	2.415	25,468 m2	93.62	2,384,300		226.11		
D12 Mechanical Site Services	0.000	1 Sum	320,000.00	320,000		30.35		
D13 Electrical Site Services	0.000	1 Sum	404,000.00	404,000		38.31		
D2 ANCILLARY WORK					0		0.00	0.0
D21 Demolitions				0		0.00		
D22 Alterations				0		0.00		
NET BUILDING COST - INCLUDING SITE				**$**	**39,788,000**		3,773.16	65.1
Z1 GENERAL REQUIREMENTS & FEE					21,291,000		2,019.06	34.9
Z10 Location Factor (Dawson, YT)		38.0 %		15,119,400		1,433.80		
Z11 General Requirements		8.0 %		4,392,600		416.56		
Z12 Fee		3.0 %		1,779,000		168.71		
TOTAL CONSTRUCTION ESTIMATE - EXCLUDING ALLOWANCES				**$**	**61,079,000**		5,792.22	100.0
Z2 ALLOWANCES					20,049,200		1,901.30	
Z21 Design & Pricing Allowance		15.0 %		9,161,900		868.84		
Z22 Escalation Allowance		5.0 %		3,512,000		333.05		
Z23 Construction Allowance		10.0 %		7,375,300		699.41		
TOTAL CONSTRUCTION ESTIMATE - INCLUDING ALLOWANCES				**$**	**81,128,200**		7,693.52	
_ VALUE ADDED TAX (GST/HST)					0		0.00	
__ Value Added Tax (GST/HST)		0.0 %		0		0.00		
TOTAL CONSTRUCTION ESTIMATE				**$**	**81,128,200**	**$**	**7,693.52**	

CLASS 'D' ESTIMATE

Hanscomb

Appendix
A - Detailed Elemental Estimate
OPTION 1 - Goldrush

Project	: **Dawson City Recreation Centre**		Report date	:	28 Jan 2021
	: **New Construction - OPTION 1**		Page No.	:	1
Location	: **Goldrush, Dawson City, YT**	**ELEMENTAL COST SUMMARY**	Bldg Type	:	550
Owner	: **Government of Yukon**		C.T. Index	:	0.0
Consultant	: **Republic Architecture Inc.**		GFA	:	7,350 m2

Element	Ratio	Elemental Cost		Elemental Amount		Rate per m2		%
	to GFA	Quantity	Unit rate	Sub-Total	Total	Sub-Total	Total	
A SHELL		7,350 m2			14,548,800		1,979.43	34.6
A1 SUBSTRUCTURE					5,735,200		780.30	13.6
A11 Foundations	0.721	5,300 m2	517.25	2,741,400		372.98		
A12 Bulk Excavation / Fill	4.120	30,284 m3	76.57	2,318,800		315.48		
A13 Special Conditions	0.000	1 Sum	675,000.00	675,000		91.84		
A2 STRUCTURE					5,208,000		708.57	12.4
A21 Lowest Floor Construction	0.721	5,300 m2	181.23	960,500		130.68		
A22 Upper Floor Construction	0.279	2,050 m2	650.00	1,332,500		181.29		
A23 Roof Construction	0.721	5,300 m2	550.00	2,915,000		396.60		
A3 EXTERIOR ENCLOSURE					3,605,600		490.56	8.6
A31 Walls Below Grade				0		0.00		
A32 Walls Above Grade	0.389	2,858 m2	600.00	1,714,800		233.31		
A33 Windows & Entrances	0.012	91 m2	1,480.22	134,700		18.33		
A34 Roof Coverings	0.721	5,300 m2	275.00	1,457,500		198.30		
A35 Projections	1.000	7,350 m2	40.63	298,600		40.63		
B INTERIORS		7,350 m2			2,357,000		320.68	5.6
B1 PARTITIONS & DOORS					920,800		125.28	2.2
B11 Partitions	0.465	3,415 m2	221.38	756,000		102.86		
B12 Doors	0.009	68 No	2,423.53	164,800		22.42		
B2 FINISHES					864,400		117.61	2.1
B21 Floor Finishes	1.000	7,350 m2	42.98	315,900		42.98		
B22 Ceiling Finishes	1.000	7,350 m2	53.36	392,200		53.36		
B23 Wall Finishes	1.318	9,688 m2	16.13	156,300		21.27		
B3 FITTINGS & EQUIPMENT					571,800		77.80	1.4
B31 Fittings & Fixtures	1.000	7,350 m2	65.21	479,300		65.21		
B32 Equipment	1.000	7,350 m2	12.59	92,500		12.59		
B33 Elevators				0		0.00		
B34 Escalators				0		0.00		
C SERVICES		7,350 m2			9,307,400		1,266.31	22.1
C1 MECHANICAL					6,732,800		916.03	16.0
C11 Plumbing & Drainage	1.000	7,350 m2	146.53	1,077,000		146.53		
C12 Fire Protection	1.000	7,350 m2	45.48	334,300		45.48		
C13 HVAC	1.000	7,350 m2	662.98	4,872,900		662.98		
C14 Controls	1.000	7,350 m2	61.03	448,600		61.03		
C2 ELECTRICAL					2,574,600		350.29	6.1
C21 Service & Distribution	1.000	7,350 m2	98.18	721,600		98.18		
C22 Lighting, Devices & Heating	1.000	7,350 m2	157.46	1,157,300		157.46		
C23 Systems & Ancillaries	1.000	7,350 m2	94.65	695,700		94.65		
NET BUILDING COST - EXCLUDING SITE				**$**	**26,213,200**		3,566.42	62.3
D SITE & ANCILLARY WORK		7,350 m2			1,216,200		165.47	2.9
D1 SITE WORK					1,216,200		165.47	2.9
D11 Site Development	0.678	4,980 m2	143.82	716,200		97.44		
D12 Mechanical Site Services	0.000	1 Sum	220,000.00	220,000		29.93		
D13 Electrical Site Services	0.000	1 Sum	280,000.00	280,000		38.10		
D2 ANCILLARY WORK					0		0.00	0.0
D21 Demolitions				0		0.00		
D22 Alterations				0		0.00		
NET BUILDING COST - INCLUDING SITE				**$**	**27,429,400**		3,731.89	65.1
Z1 GENERAL REQUIREMENTS & FEE					14,677,800		1,996.98	34.9
Z10 Location Factor (Dawson, YT)		38.0 %		10,423,200		1,418.12		
Z11 General Requirements		8.0 %		3,028,200		412.00		
Z12 Fee		3.0 %		1,226,400		166.86		
TOTAL CONSTRUCTION ESTIMATE - EXCLUDING ALLOWANCES				**$**	**42,107,200**		5,728.87	100.0
Z2 ALLOWANCES					13,821,800		1,880.52	
Z21 Design & Pricing Allowance		15.0 %		6,316,100		859.33		
Z22 Escalation Allowance		5.0 %		2,421,200		329.41		
Z23 Construction Allowance		10.0 %		5,084,500		691.77		
TOTAL CONSTRUCTION ESTIMATE - INCLUDING ALLOWANCES				**$**	**55,929,000**		7,609.39	
_ VALUE ADDED TAX (GST/HST)					0		0.00	
__ Value Added Tax (GST/HST)		0.0 %		0		0.00		
TOTAL CONSTRUCTION ESTIMATE				**$**	**55,929,000**	**$**	**7,609.39**	

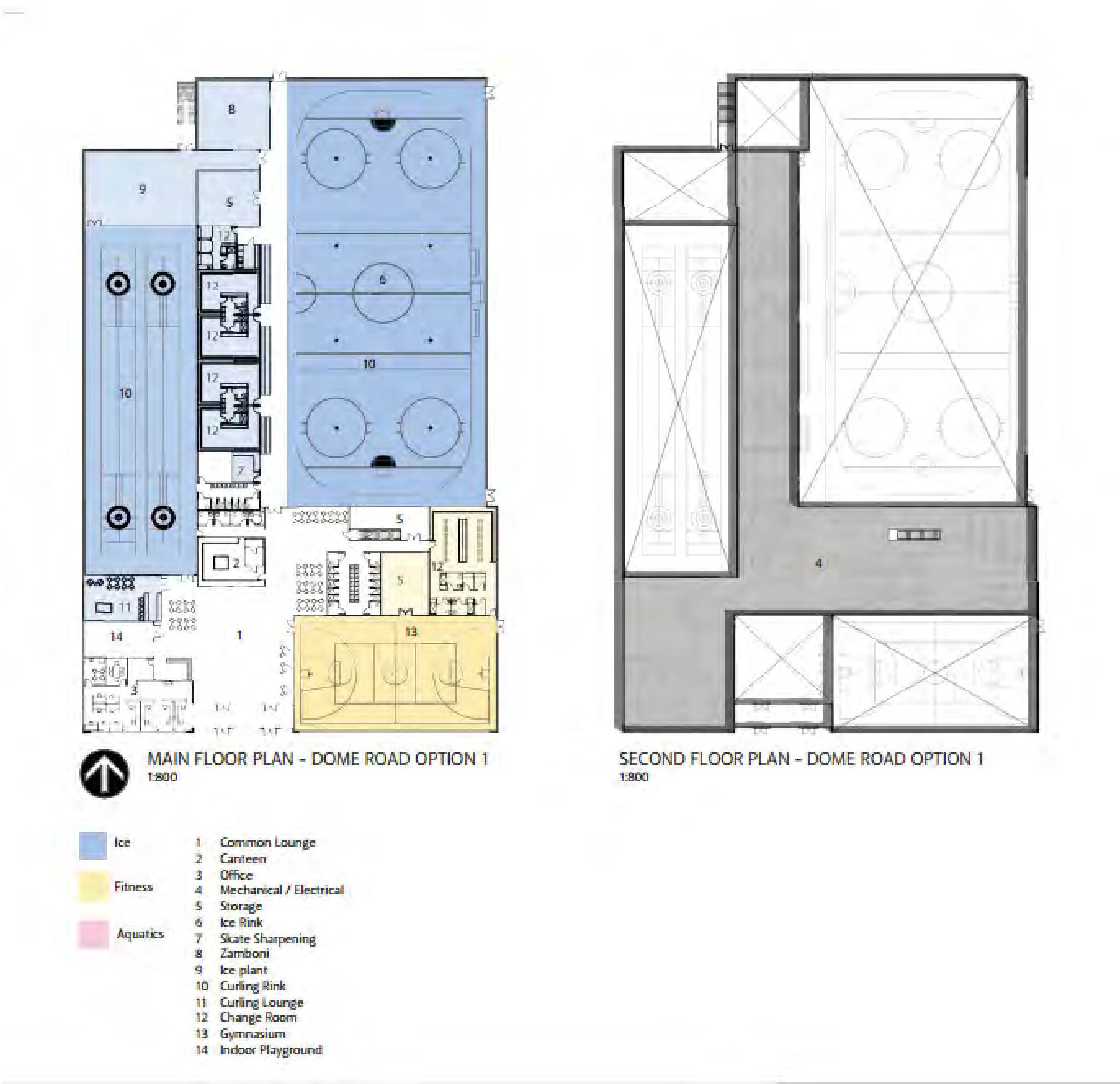
Appendix AA
Documents and Drawings List

DOCUMENTS AND DRAWING LIST

DOCUMENTS

Number	Title	Dated	Received
	Feasibility Study Report (106 pages)	Dec 23, 2020	Dec 23, 2020
	Reports and Standard (4 pdf files)		Dec 23, 2020
	Site Information (8 files)		Dec 23, 2020
	DCRC – RFP (190 pages)	May 2020	May 2020

Appendix AB
Representative Drawings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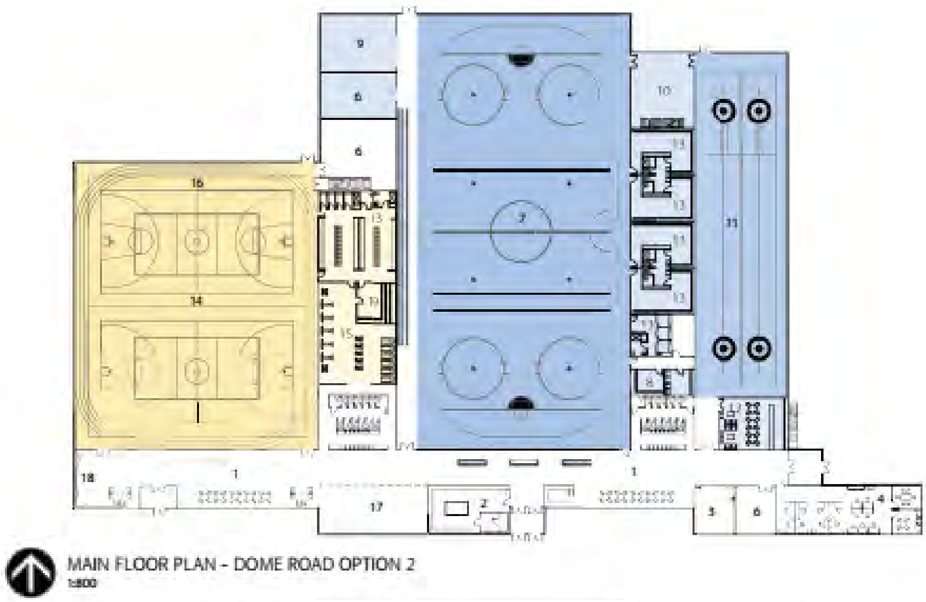
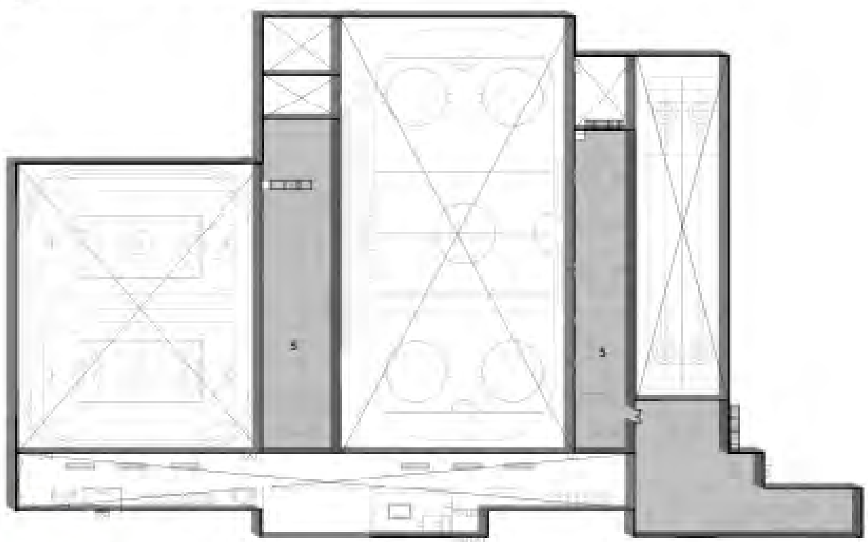
1:800
SECOND FLOOR PLAN - DOME ROAD OPTION 1
1:800
Ice
Fitness
Aquatics
1 Common Lounge
2 Canteen
3 Office
4 Mechanical / Electrical
5 Storage
6 Ice Rink
7 Skate Sharpening
8 Zamboni
9 Ice plant
10 Curling Rink
11 Curling Lounge
12 Change Room
13 Gymnasium
14 Indoor Playground



MAIN FLOOR PLAN - DOME ROAD OPTION 2
1:800

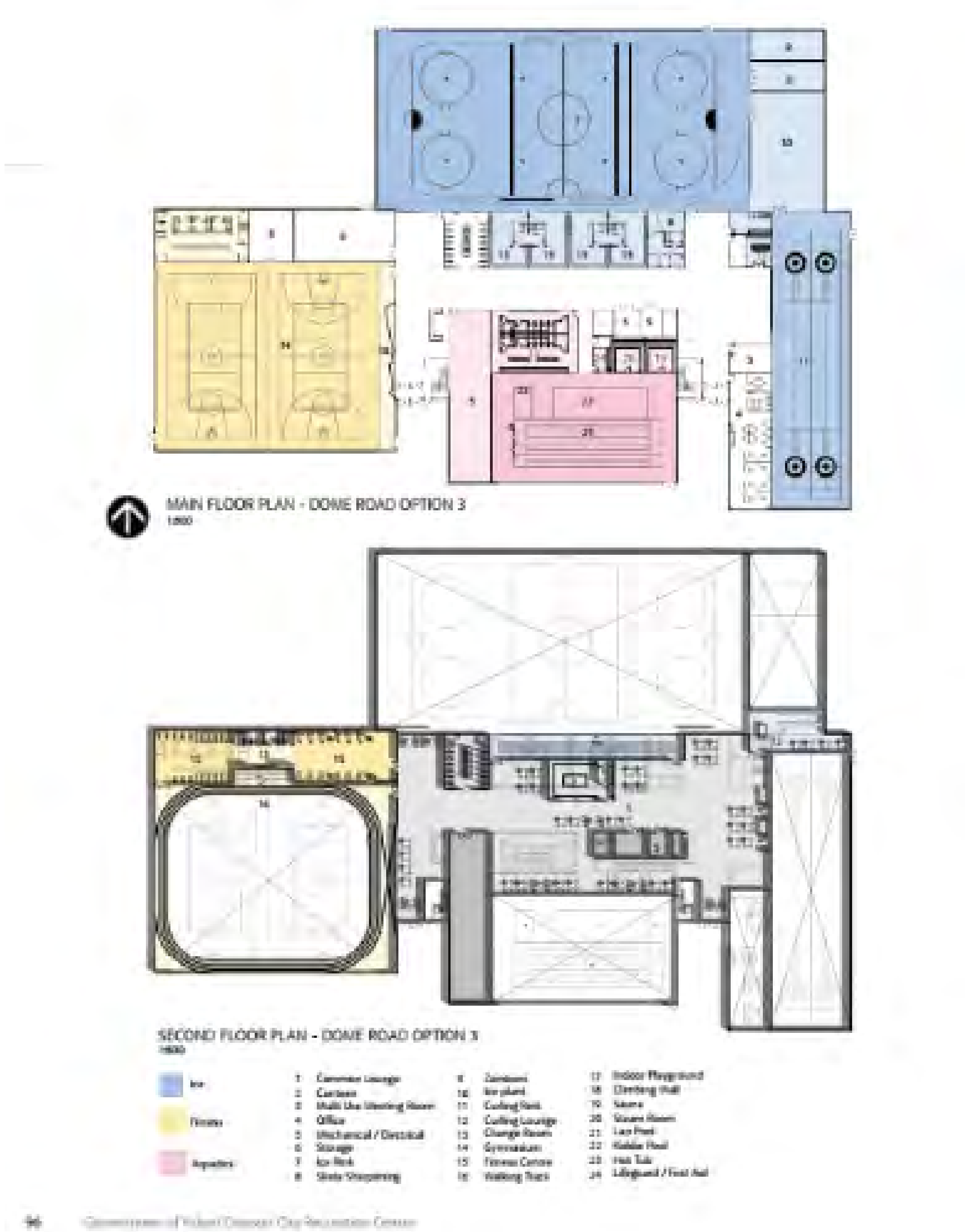


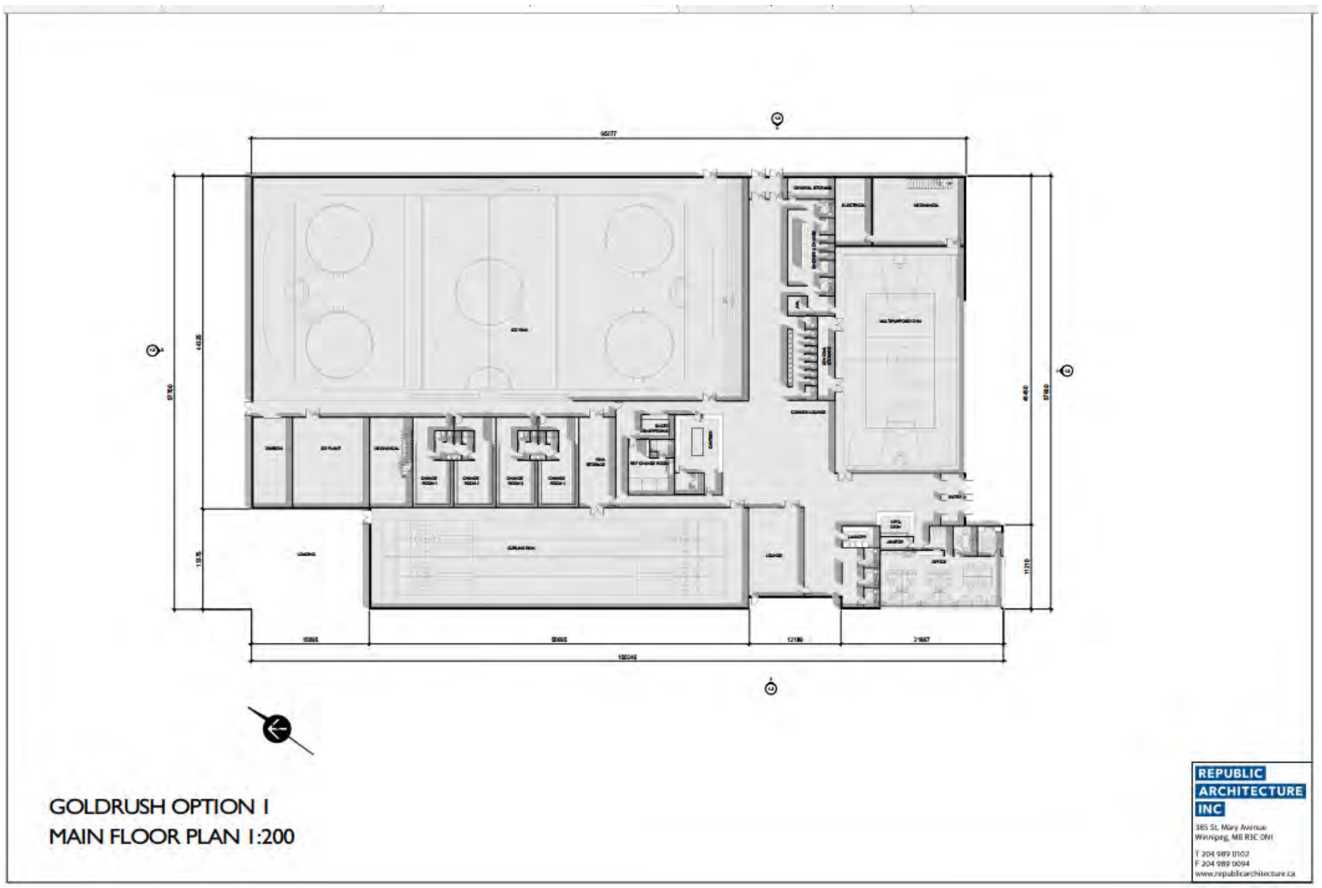
SECOND FLOOR PLAN - DOME ROAD OPTION 2
1:800

Ice
Fitness
Aquatics

1 Common Lounge
2 Canteen
3 Multi Use Meeting Room
4 Office
5 Mechanical / Electrical
6 Storage
7 Ice Rink
8 Skate Sharpening
9 Zamboni
10 Ice plant
11 Curling Rink
12 Curling Lounge
13 Change Room
14 Gymnasium
15 Fitness Centre
16 Walking Track
17 Indoor Playground
18 Climbing Wall
19 Sauna

92 Government of Yukon Dawson City Recreation Centre


MAIN FLOOR PLAN - DOME ROAD OPTION 3
SECOND FLOOR PLAN - DOME ROAD OPTION 3
Ice
Fitness
Aquatics
1 Common Lounge
2 Canteen
3 Multi Use Meeting Room
4 Office
5 Mechanical / Electrical
6 Storage
7 Ice Rink
8 Skate Sharpening
9 Zamboni
10 Ice plant
11 Curling Rink
12 Curling Lounge
13 Change Room
14 Gymnasium
15 Fitness Centre
16 Walking Track
17 Indoor Playground
18 Climbing Wall
19 Sauna
20 Steam Room
21 Lap Pool
22 Kiddie Pool
23 Hot Tub
24 Lifeguard / First Aid


GOLDRUSH OPTION 1
MAIN FLOOR PLAN 1:200
REPUBLIC
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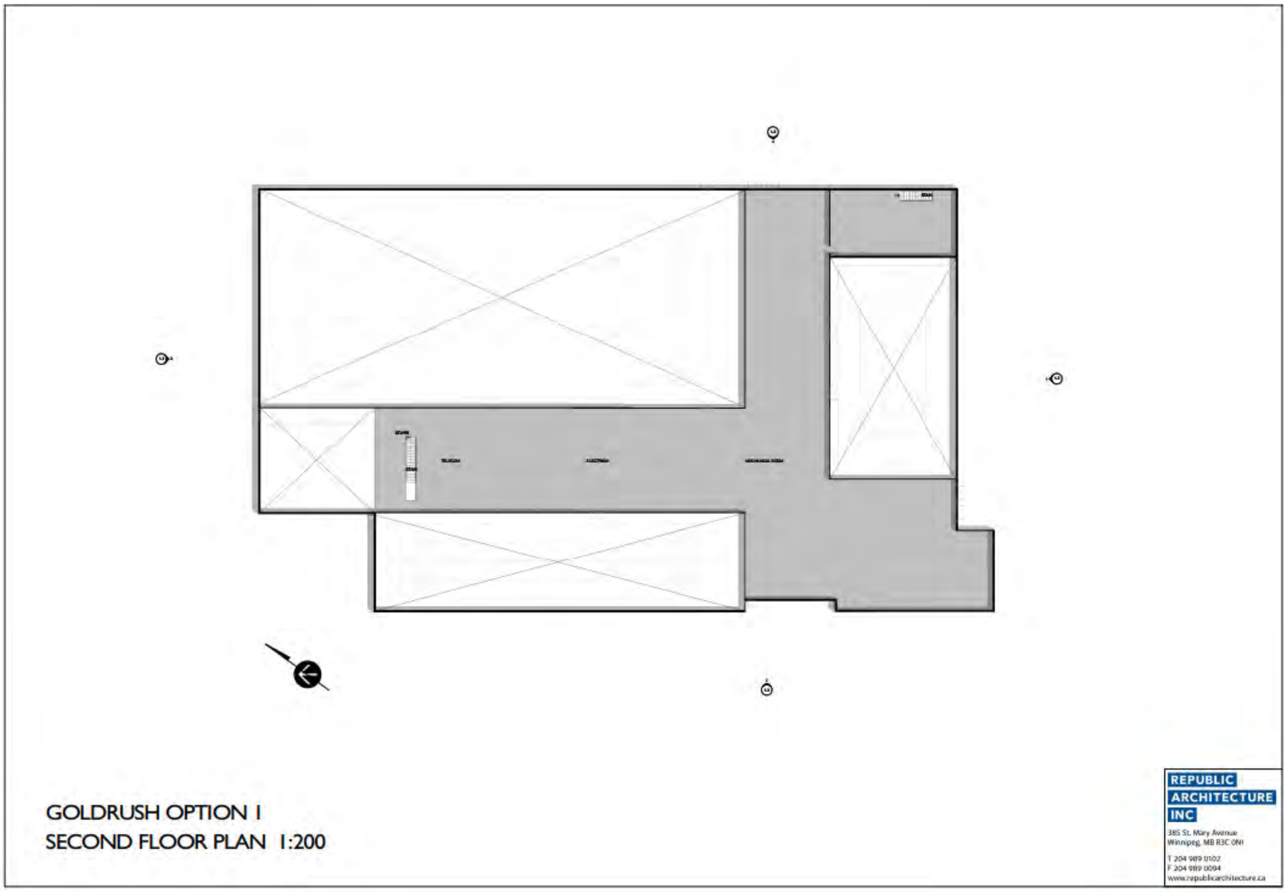
INC


GOLDRUSH OPTION 1
SECOND FLOOR PLAN 1:200
REPUBLIC
ARCHITECTURE
INC

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Our growing team of trusted professionals and experts consists of quantity surveyors, cost consultants, project monitors, schedulers and value specialists, skilled in a remarkable variety of project sectors including but not limited to transportation, civil infrastructure, education, healthcare, residential, and commercial. Hanscomb takes pride in the multi-disciplinary character of the company and the ability of its people to bring together, in a team, the professional and practical skills of the very diverse field of quantity surveying.

Our nationwide network of offices and worldwide associates allows for the easy exchange of information, skills and resources ensuring we stay abreast of the latest in design, construction practices and trends. With offices located coast to coast, Hanscomb has the local experience and worldwide presence to keep your projects on track.

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- Construction cost estimates
- Replacement cost estimates

Scheduling

Value Management

Financial Analysis
- Life cycle costing
- Operations and maintenance
- Cost / benefit analysis
- Feasibility studies

Applied Research
- Construction price indexing
- Risk and gap analysis
- Cost publications

Project Loan Monitoring

Project Management

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From east to west, our leadership team is here to serve you. We collaborate on many projects nationally and internationally and are available to assist you.
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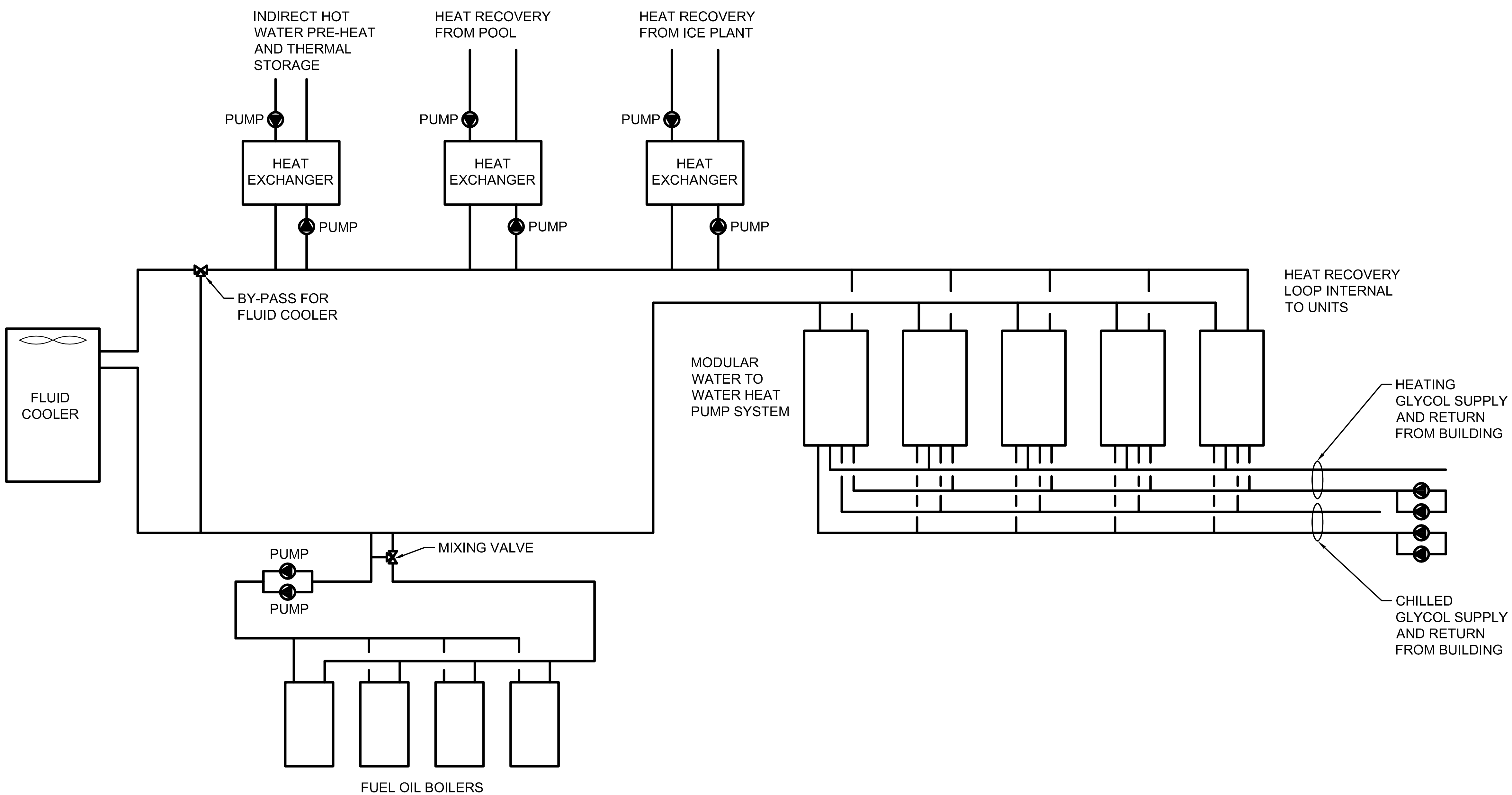
Appendix H

Mechanical Plant Concept Schematic



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LAYOUT: M1 LAST SAVED BY: gbaul DATE PLOTTED: January 18, 2021 8:50:00 AM

770 Bradford Street
Winnipeg, Canada
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SMS ENGINEERING

Project Title
DAWSON CITY RECREATION CENTRE FEASIBILITY STUDY
WINNIPEG MANITOBA

Drawing Title
CONCEPT HYDRONIC SYSTEM SCHEMATIC - ENERGY TARGET C

Drawn By	Checked By	Approved By
GB	GS	GB
Scale: NTS	Date: JAN. 18, 2021	Project No.: 20-222-01
Revision Number: 0	Drawing Number: M1	Sheet Order: 1 OF 1

Appendix I

Community Engagement Document

Government of Yukon
Dawson City Recreation Centre
Community Engagement Report

April 12, 2021

REPUBLIC
ARCHITECTURE
INC

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Winnipeg, MB, R3C 0N1
T (204) 989 0102   F (204) 989 0094
www.republicarchitecture.ca

Table of Contents

1.0 Introduction

The City of Dawson (CoD) has identified several deficiencies with the existing Art and Margaret Fry Recreation Centre and has determined the facility cannot continue to serve the citizens of Dawson effectively. Republic Architecture Inc. (RAI) were engaged by the Yukon Government (YG), on behalf of the CoD in the Summer of 2020 to develop a Functional Program and Feasibility Study for a new recreation centre in the City of Dawson, YT.

A draft of the feasibility study was submitted for review by YG and CoD on February 3rd, 2021 and presented to Council on February 10th, 2021. As part of the feasibility study, a Community Engagement Plan was submitted. In a follow up meeting with CoD and YG this plan was revised to take into account travel restrictions.

The goal of this document is to consolidate feedback received from the Dawson residents for city council review. Council may determine a preference of pursuing one or a few of the Concept Design options upon review of the feedback.

2.0 Methodology

The public engagement scope of work employed multiple strategies which included public meetings, community surveys and user group surveys; the goal of which was to inform the public of the process and invite feedback. The different approaches included:

1) Public Meetings

    Due to travel restrictions, three engagement sessions were held virtually, but the public was also allowed to join in person at the council chambers with CoD and Colliers International. Invitations for the engagement sessions were distributed by the CoD via their website. Two sets of boards were printed and displayed at the council chambers and AMFRC so community members could look at the plans at their leisure. Printed surveys were also made available. A recording of the engagement session was posted online for community members to watch if they were not able to attend the engagement sessions live.

2) Surveys
    - a. Community Survey
        - i. A link to community surveys was made on the CoD website and advertised by CoD. The platform used was Survey Monkey. The results were received by RAI and have been included in Appendix C of this Report. The survey was available for the community to complete from the end of the first presentation through March 22, 2021.
    - b. User Groups
        - i. User Group surveys were sent directly via email from the CoD to recreation stakeholders.

3) Email

    An email address was made available for anyone to send questions during the survey period.

The following sections review each engagement strategy and the feedback received from the community.

3.0 Engagement Sessions

Three engagement sessions were held virtually via Zoom. Participants were able to attend in person at the council chambers or join virtually.

The sessions began with an introduction from CoD, followed by a 50-minute presentation by Republic Architecture Inc. (RAI), and concluded with an hour of Q&A by those in attendance. City staff and the design team answered as many questions as possible, but some of the more technical questions needed to be sent to the subconsultants for review.

The outline for the Engagement Sessions is as per below:

- Introductions
- Functional Space Program
- Gold Rush Design Concepts
    - a. Context
    - b. Site Review
    - c. Option 1
    - d. Option 2
    - e. Option 3
- Dome Road Design Concepts
    - a. Context
    - b. Site Review
    - c. Option 1
    - d. Option 2
    - e. Option 3
- Construction Cost Overview
- Feasibility Analysis
- Introduction to surveys
- Q&A

Each of the sessions are summarized on the following pages.

Session One: Sunday March 07th at 2 pm MST

Attendees:
- Six team members from RAI
- Representatives from City of Dawson
- Representative from Yukon Government
- Three community members participated in person and six virtually

This session was recorded and uploaded to the CoD website.

The following is a summary of the questions and comments made during this session:

- **Site:**
    - Walkability
        - Have there been studies done for new trails, paths, bike paths to the Dome Road site? Response: The CoD is already looking at better connectivity.
        - The Dome Road site is closer to existing and planned subdivisions.
        - It may be difficult for seniors to walk to the Dome Road site.
    - Parking
        - If Gold Rush Option 3 is chosen, would there be opportunities for more parking made nearby for tournaments or bigger events? Response: The existing parking area for the Art & Margaret Fry center could be considered.
    - A participant at the session advised that there is a petition to not use the Gold Rush site signed by 250 community members. This individual requested that the petition should be considered when weighing options.

- **Geotechnical:**
    - A recent version of the geotechnical report had been released and community members wanted to make sure the content had been included. The report mentions that preparation work on the Gold Rush site would be more expensive. Response: Yes, the report was used in the analysis. The cost variation is largely a result of the difference in surface area of each site.
    - There are many problems with buildings in the townsite due to permafrost.

- **Energy:**
    - What energy sources would be used for the building? Response: Electricity with fuel oil back up.
    - Are there plans for a back-up generator? Response: Back fuel to be oil.
    - Are there green alternatives incorporated into the design such as solar panels, geothermal energy to offset energy costs? Response: the green alternatives incorporated into the design include high R-value walls roof and foundation as well as orienting the building as thoughtfully as possible towards the sun and careful incorporation of windows. This building typology uses a large degree of energy and using solar power would only provide a small amount of the power even if a football field of solar panels was incorporated

- **Amenities:**
    - Curling:
        - Dome Road Option 3 has the curling lounge on the second floor. Community member felt this was a bit of a challenge for use.
    - Pool
        - Is it possible to add a pool in future phases? Response: Phasing of the project is a definite consideration.
        - Do other similar jurisdictions have pools? Response: CoD said no.
        - Is the proposed pool the same size as the existing? Response: Yes, the shape is different, but the area is the same.
        - What is the expected lifespan and maintenance requirements of our existing pool? Response: this is not within the scope of this project, but what we have heard so far is that it is fairly new but is still plagued with issues.

- Gymnasium
  - Will a retractable wall be made available? Response: Various products are readily available to divide up the gym space for concurrent functions.
- Canteen:
  - Does the canteen need a commercial kitchen? Response: Current facility has two kitchens, new plans could consolidate into one.
- Hockey Rink
  - What are the expected months the rink would be open? Response: It is anticipated that the rink would have a similar season to the current facility (October to April).

- **Cost Estimate:**
  - Is site preparation work included? Response: Yes
  - What is a realistic budget for the recreation centre? (for CoD) Response: If the facility was being built in a more urban location, the budget figures are average.

- **Maintenance:**
  - Had the CoD taken into consideration the skilled labour necessary to maintain this facility? Response: This question will be considered in more detail by CoD.

Session Two: Monday March 08th 5 pm MST

Attendees:
- Six team members from Republic Architecture Inc.
- Representatives from City of Dawson
- Representative from Yukon Government
- Three community members participated in person, and eight virtually

This session was also recorded and uploaded to the CoD website.

The following is a summary of the questions and comments made during this session:

- **Site:**
  - Walkability
    - Has consideration been given to safe walking access or public transit? Response: CoD to consider potential opportunities.
    - How are the planned neighbourhood developments on the Dome Road affecting considerations about walkable access? Response: Future expansion of residential areas should be considered in final location decisions.
  - Parking
    - What are the parking counts for each site?

    Response:
    - Parking count for Gold Rush Site options:
      - GR1 = 100
      - GR2 = 72
      - GR3 = 39
    - Parking count for Dome Road Site options:
      - DR1 = 193
      - DR2 = 269
      - DR3 = 322

- **Energy:**
  - Has consideration been given to a boiler option for heating? Response: Yes these have been considered. When the final draft is out you will be able to see the thought process behind the mechanical equipment.

- **Amenities:**
  - Canteen:
    - Will there be a commercial kitchen? Response: Yes, the canteen layout considers a commercial dishwashing system, walk-in cooler and freezer, deep fryer and grille.

- **Costs:**
  - I'm also curious about how the numerous west Dawson and Sunnydale residents (such as myself) will be factored in to paying the long-term costs of the facilities? Response: CoD will provide feedback as decisions are made.

Session Three: Tuesday March 09th 7:30 pm MST

Attendees

- Six team members from Republic Architecture Inc.
- Representatives from City of Dawson
- Representative from Yukon Government
- Eight community members participated in person, and fifteen virtually

This session was not recorded.

The following is a summary of the questions and comments made during this session:

- **Site:**
  - Walkability
    - Dawson has a driving culture. Assumption that more people would walk to the Gold Rush site does not reflect reality.
    - Should consider future housing development at the Dome Road and C4 as well.
  - Parking
    - How was the reduced need for parking on the Gold Rush site reached? Response: The site restricts available parking area and would require a zoning variance to approve the reduction. Additional parking options should be considered for this site.
    - How did you consider the current parking and traffic uses for the existing facilities: school, rec centre, gym, parks? Response: A traffic study should be included in the next step of the project.
    - Concern that Gold Rush site won't meet parking needs
    - Potential changes to roadways in town.
    - Have the type of vehicles parked been taken into consideration (high percentage of large vehicles (trucks)? Response: Parking spots as shown are adequate for large vehicles, but do not consider motorhomes or RVs.
  - Dome Road:
    - Location will be closer to residents in the future.
    - Road entrance to facility may not be appropriate location, entrance off highway preferred.
    - Also, are there current active placer claim holders on the proposed Dome property, and if so, how does the City plan to deal with them responsibly? Response: CoD to provide feedback at a later date.
  - Gold Rush
    - Concern over whether this is the best economic use of the Gold Rush campground.
    - I am concerned with the Gold Rush property being considered for several reasons, including that it is currently an operating business that provides economic benefits to Dawson.
  - How did you look at potential changes in land use over time: population projections and new housing developments? Response: Alternate uses of the land were not part of the study.

- **Amenities:**
  - Pool:
    - Was there research in options in costs depending on the design for the aquatic space. For example, if it was a shallow lap pool it would lower the maintenance costs and chemicals. Response: Alternate designs have not been considered at this phase. CoD may want to explore this in future phases.

  - Hockey Rink:
    - Is this regulation NHL size? Response: Yes.

  - Storage:
    - Short on storage in existing facilities. Should double storage amount.

- Indoor Playground:
  - The indoor playground appears very small given the need for a warm, dry space for the community's kids – what is the footprint and age expectation for the play area? Response: The programmed area may restrict the activity to elementary school-aged children. Most options allow for expansion for additional age groups. It should also be noted that as the design process continues, the users for this space will become more defined.

- Daycare:
  - Has there been any discussion in absorbing/including a daycare facility in the recreation centre? A huge gap in community service lies in adequate, reliable and safe community space for childcare; given the struggle to find an adequate space, and with the assumption of population growth come 2040, has there been consideration to including a daycare in order to accommodate this growth and tremendous gap? Response: A daycare facility was not considered in this study. However, should the community see a need to include a daycare centre, this could be explored in future phases.

- **Cost Estimate:**
  - Do you have an estimate of how much revenue could be generated by leasing spaces in the new facility (ie. restaurant) or the city revenue benefits for selling or utilizing the existing rec facilities? Response: Alternate revenue streams have not been included in the study.
  - Could Dawson's tax base support facility O&M for each of these options? Response: RAI would need to know how feasible the current numbers are. CoD to provide RAI with this information for incorporation into final Feasibility Report.

- **Maintenance:**
  - Have they been fully considered as feasible? Can the city afford it moving forward? Doubt towards the feasibility operations and maintenance costs. Response: The design is still in very early stages. CoD will need to consider all financial implications before moving forward to next phase of the project.

- **Existing facilities:**
  - What will be done with the current fitness centre and arena? Response: CoD to consider alternate uses.

- **Other:**
  - When will the decision be made on the final site? Response: CoD to provide updates through decision-making process.
  - How much did RAI look at other northern settings to develop these plans? What was referenced? Response: Yes, several other facilities were considered, both in Canadian regions and in other norther regions.
  - Do you have estimates for how many people can be in the building at a time for the three option sizes? Response: Maximum capacities for each option will be documented in the final report.

4.0 Emails

An email address, dawsonreccentre@republicarchitecture.ca was created so community members could send additional questions to the consultant team throughout the engagement period. Email included as Appendix E of this Report.

Only one email was sent to this email address. The community member was concerned the Dome Road site would force everyone to have to drive and should be removed from consideration. This individual also felt Gold Rush site, and the current site, are not ideal because of permafrost issues. Based on the Stantec report, they felt the Minto site would be the best as:

- It is already a recreation nexus, with the tennis courts, playground, pool etc.
- There is adequate space for any option.
- It is conveniently situated by the district heating plant.
- It is within easy walking distance of the town centre.
- It would be close to the existing pool.

5.0 User Group Survey

A "User Groups and Programmers" survey was created with the intention of gathering feedback from the recreation organizations to know which amenities they would make use of, which options they prefer, and an opportunity to provide recommendations on the designs.

The survey was distributed by the CoD Recreation Manager to over twenty groups. Only two user group survey was returned from soccer/futbal [sic] organization and Robert Service School. Completed surveys included as Appendix D of this Report.

<u>Robert Service School</u>
Amenities they would use:

- Weight room
- Pool
- Rock wall
- Ice rink

Their preferred options in order of most preferred to least preferred:

1. Dome Road Option 1
2. Dome Road Option 2
3. Dome Road Option 3
4. Gold Rush Option 2
5. Gold Rush Option 1
6. Gold Rush Option 3

<u>Soccer/futbal [sic] Group</u>
Amenities they would use:

- 2 basketball courts
- Change rooms
- Hot tub
- Football field
- Fitness centre
- Parking

Amenities they would like added:

- Ancillary room for dance/ping pong

Their preferred options in order of most preferred to least:

1. Dome Road Option 1
2. Dome Road Option 2
3. Dome Road Option 3
4. Gold Rush Option 3

Overall, they prefer the Dome Road site because of its proximity to other fields and trails, it is easier to build on, it will be closer to future development

Team building activities

- Refreshments
- Weights
- Hot tub

Priorities

- Views of the gym for parents

6.0 Other Feedback

The Curling Club and Dawson Recreation reached out directly to the CoD to share the following comments via a formal letter, included as Appendix E of this Report.

Curling Club

- Two sheets of artificial curling ice on a concrete slab with proper drainage
- A secure curling ice maintenance room, with proper controls to modify ice temperature, curling water treatment system, and storage for ice making and maintenance equipment
- Two storage rooms for facility, specifically for club use only.
- Curling Lounge with capacity for 100 people
- Curling Change Area with benches and lockers

Dawson Recreation Board

- Recommend the Dome Road site with preference given to Option 1 or 2. This is based on affordability, ground conditions, room to grow in the future and the features of the concept plans presented.
- Local building expertise be consulted throughout project
- Consultation and inclusion of First Nation Community be a priority throughout project
- No phases should be considered in building of facility
- Building should be single story
- Storage needs to be much larger and include enough space for user groups and City of Dawson
- Indoor walking feature be included
- Stands be revised to accommodate approximately 100 people and be accessible
- Should Dome Road site be chosen, Heat Pumps should be investigated

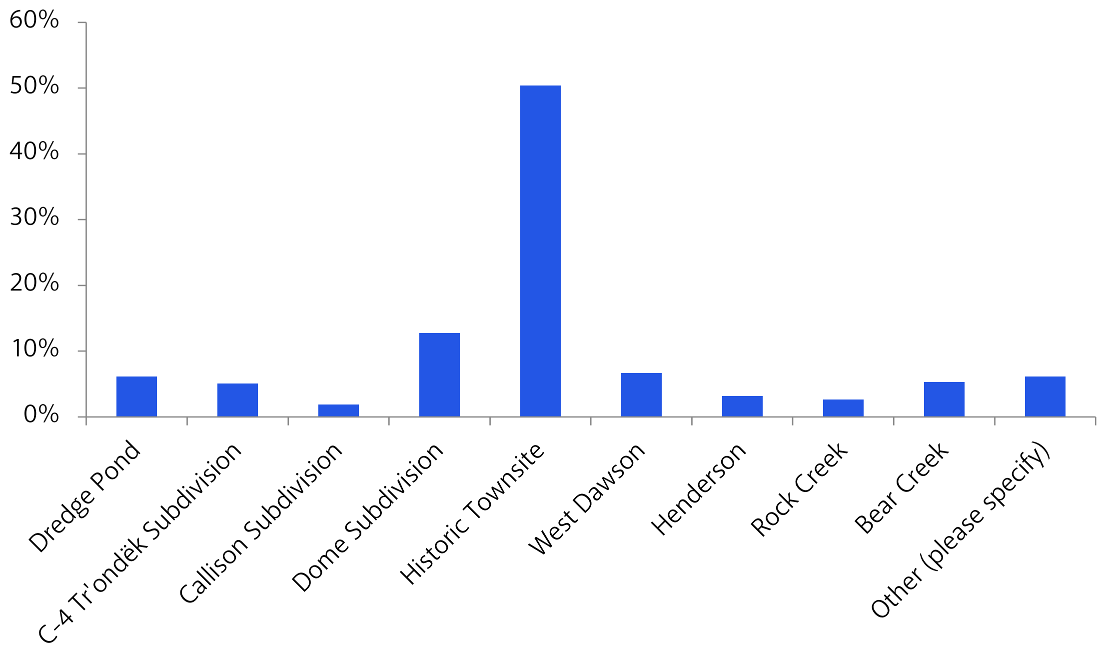
7.0 Community Survey

The survey period opened following the first engagement session on March 07th and was closed midnight, March 22nd 2021.

Most of the surveys were completed via Survey Monkey online, an additional eight (8) were completed by community members on paper and forwarded to RAI by the CoD. These were manually input into Survey Monkey by RAI so that the responses would be included in the data presented. A total of 377 survey responses were submitted, for a total of 16% of the population. This is an outstanding number of responses, as 5-10% is usually the goal in large scale community engagement.

What follows is a summary of the questions and our analysis.

Question 1 – In which neighbourhood do you reside?

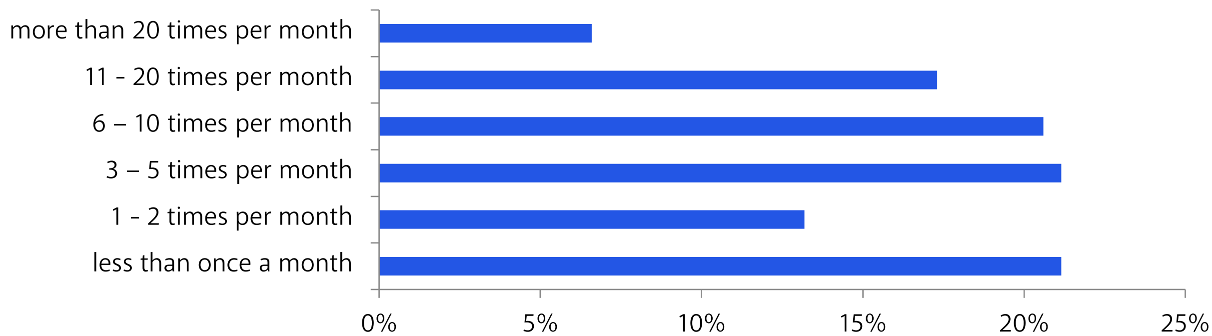


This question was used to make sure responses were received from all over the catchment area. About 50% of the respondents were from the Historic Townsite and the remaining were from the outlying subdivisions.

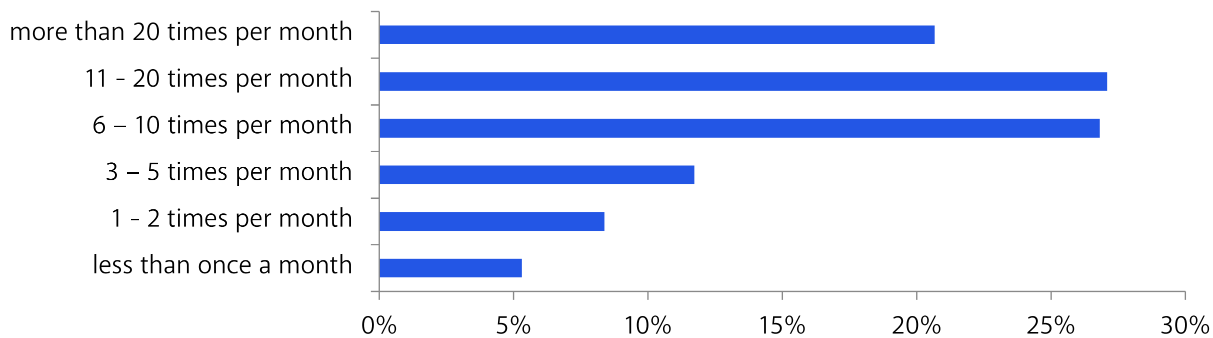
It is important to note, this question was cross-referenced with the other questions to see if where people lived affected their responses, and across the board, there was no statistically significant pull towards either site or option.

Questions 2, 3, & 4 - Based on my personal interests in the amenities currently shown in the list above, I expect to use the facility:

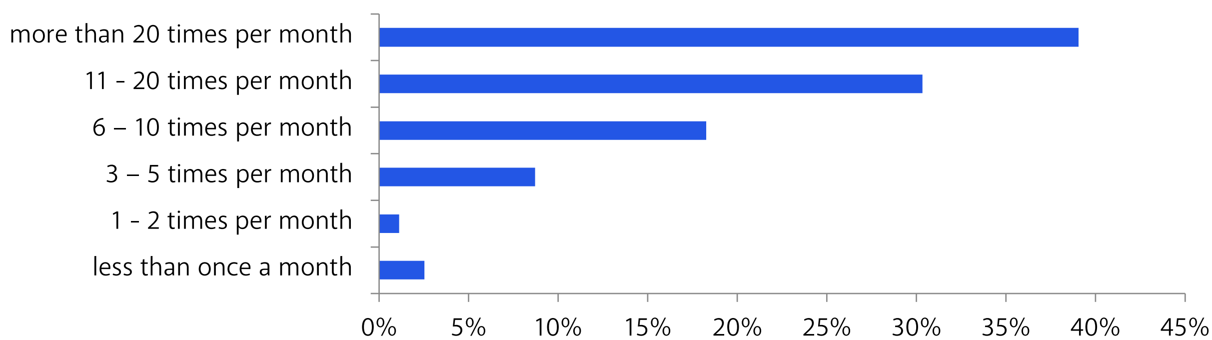
Q2 - Option 1



Q3 - Option 2

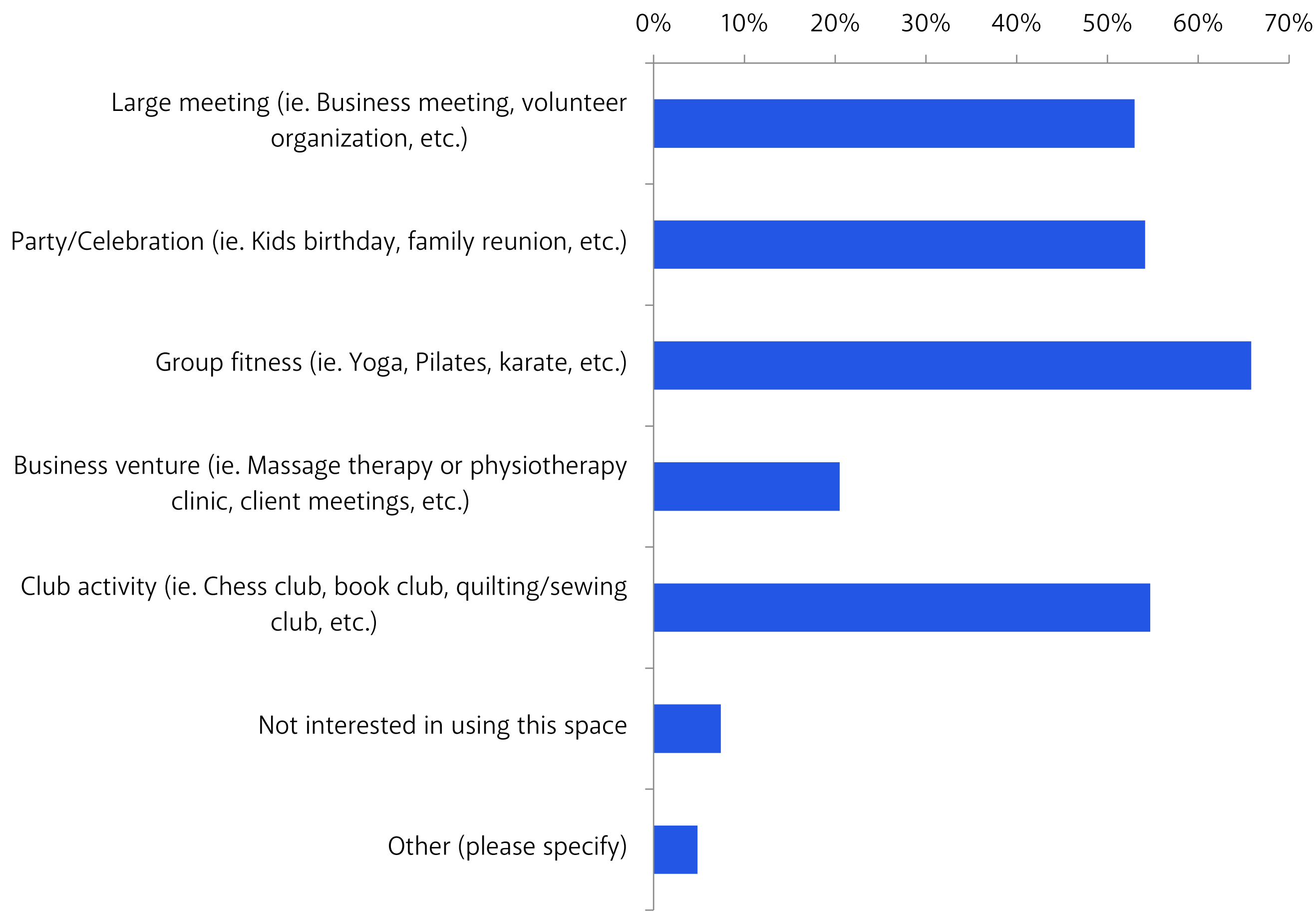


Q4 - Option 3



Community members were asked to estimate how much they would use the facility based on the amenities provided. Readily evident from the bar charts above, the more amenities that included, the more frequently respondents will use the facility.

Question 5 - What kind of event would you use a multipurpose room for? (select all that apply):

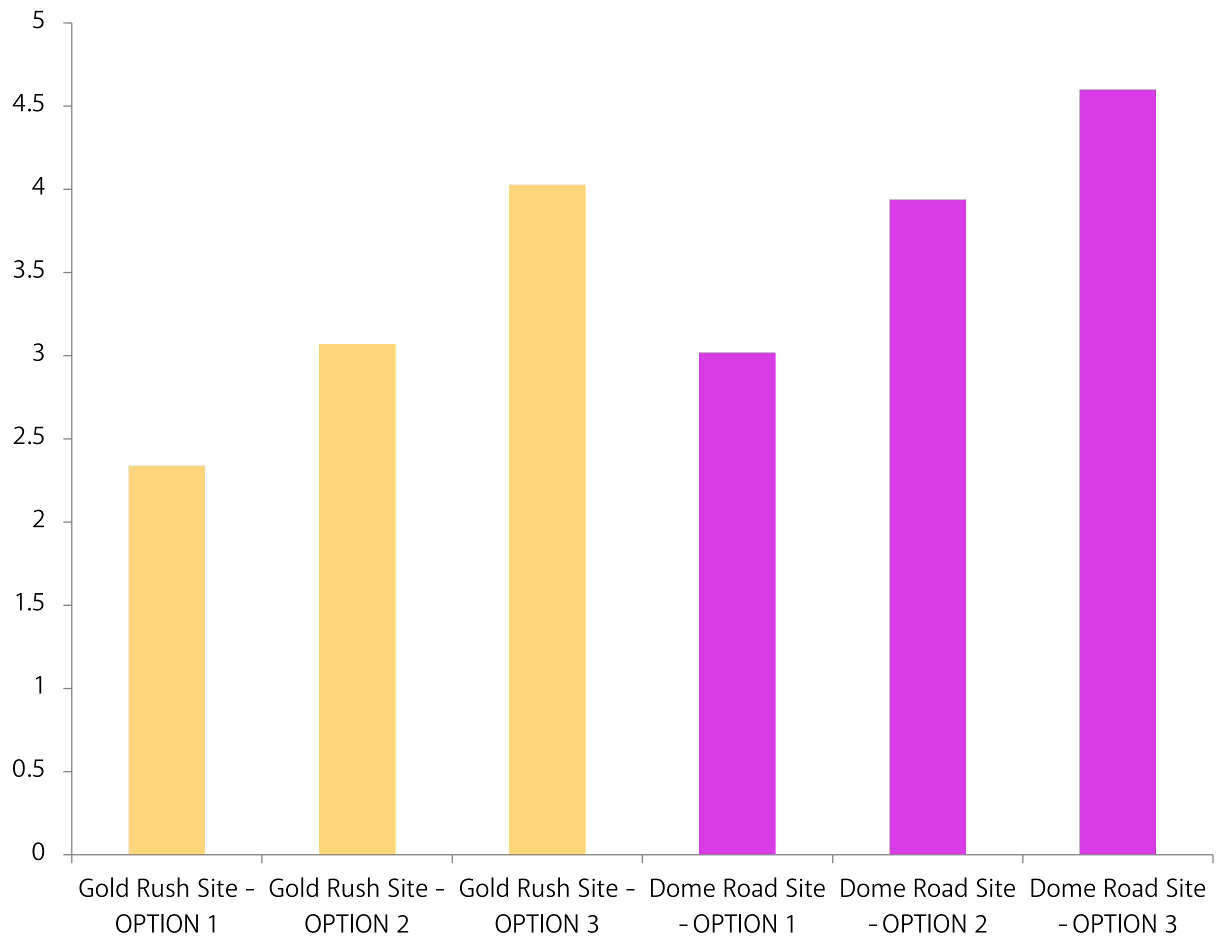


Other:

- Spin Class
- Rollerskating
- Gaming
- Flex space during large tournaments
- Children's programming
- Workshop
- Sport Gear Swaps, Ski Waxing and Ski Repair Clinics, Coaching Courses
- Playgroup for stay-at-home parents
- Music Shows
- Recycling Depot
- Gym
- Art classes
- Table tennis
- Dance Studio
- Indoor playspace

The majority of survey respondents felt they would use the space primarily for large meetings, parties, clubs, with the largest majority focused on group fitness.

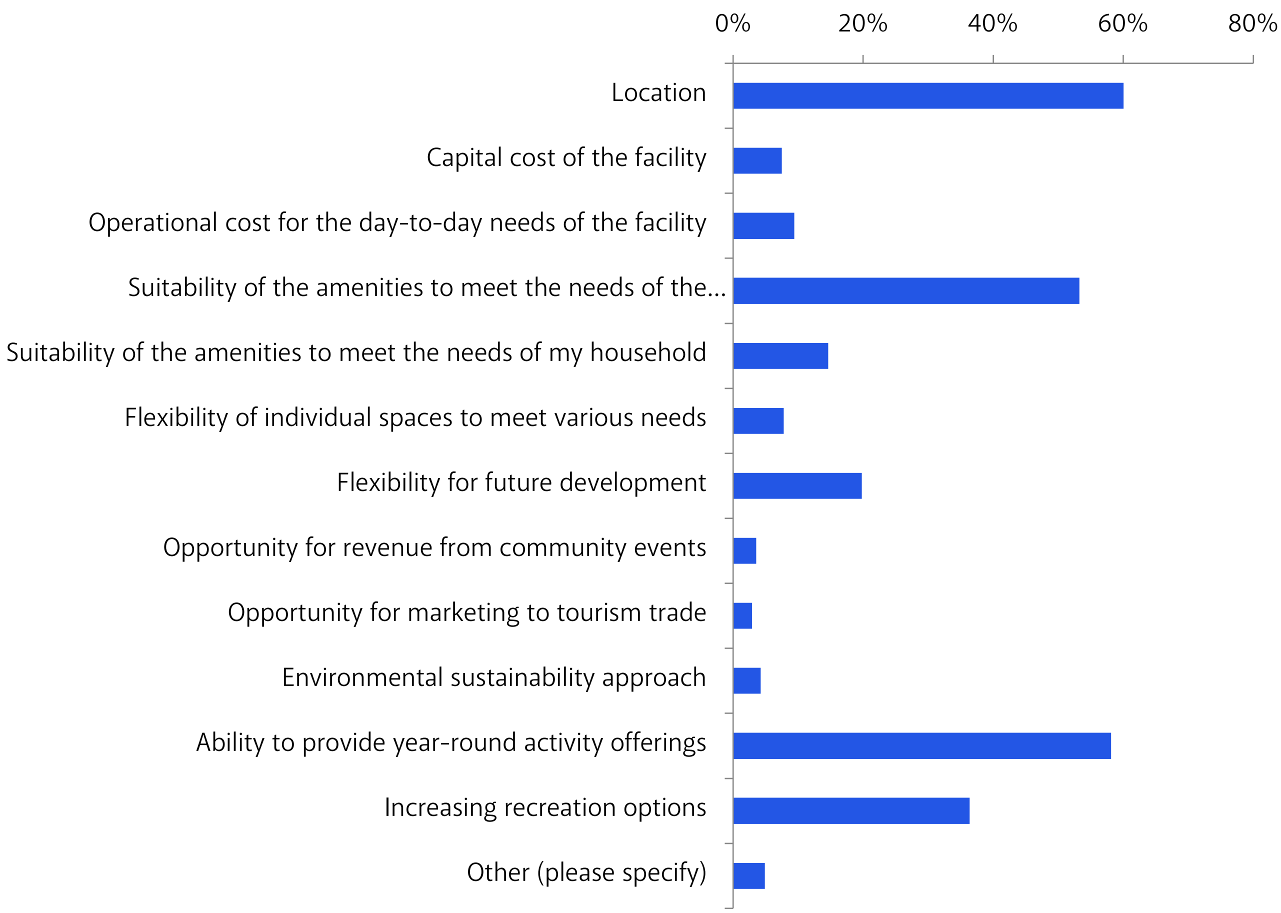
Question 6 - Please rank the schematic design options shown above (indicate 1 through 6 below) where 1 is the preferred option, 6 is the less preferred option.



In almost every age group and neighbourhood, respondents chose the Dome Road site for each option before the Gold Rush site. However, it is clear from this graph, the number of amenities is more important than site. In every instance, the Gold Rush site was chosen right after the Dome Road version of each option.

Overall, the most popular option was Dome Road Option 3, followed closely by Gold Rush Option 3. The least popular option was Gold Rush Option 1.

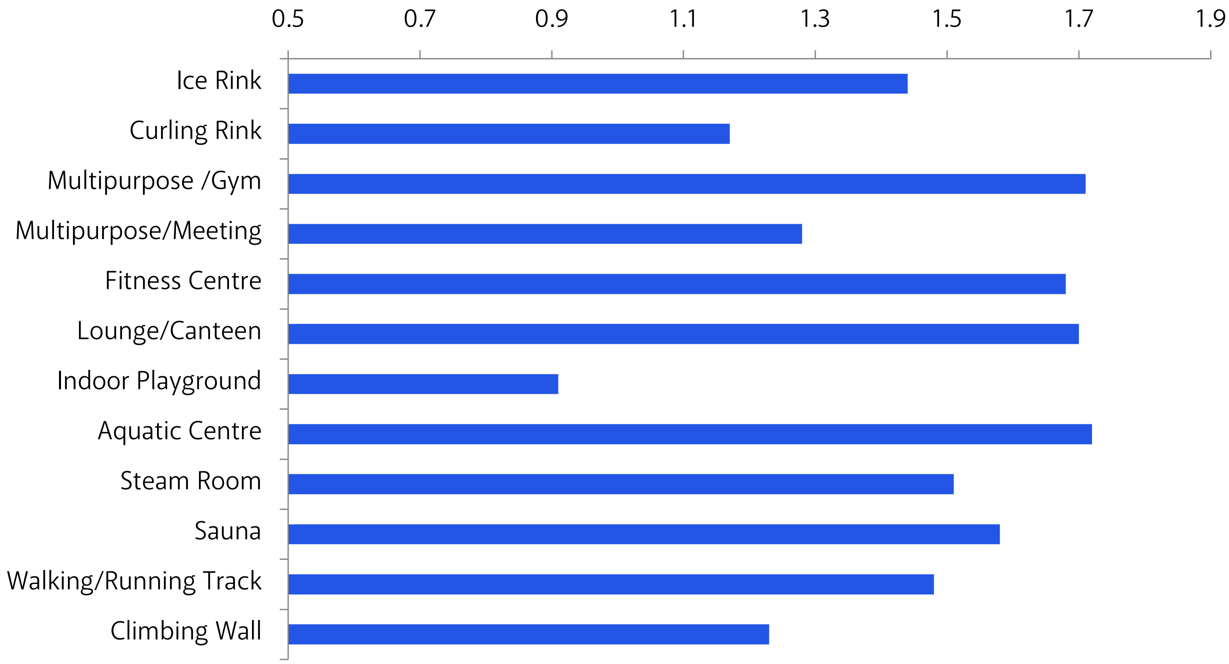
Question 7 - My rankings are primarily based on (select up to 3):



"Location", "Ability to provide year-round activity", and "Suitability of the amenities to meet the needs of the community" were the biggest factors in ranking options.

"Increasing recreation options" and "Flexibility for future development" were next in importance.

Question 8 - I would make use of the following spaces (indicate yes, no, or maybe for each space):

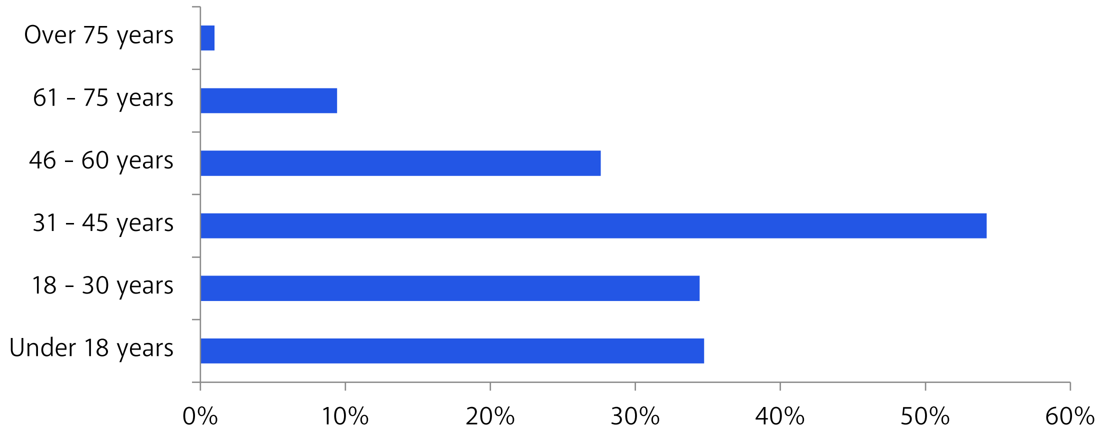


While the weighted average for each of the amenities are not equal, it is clear all the listed amenities are of interest to the community.

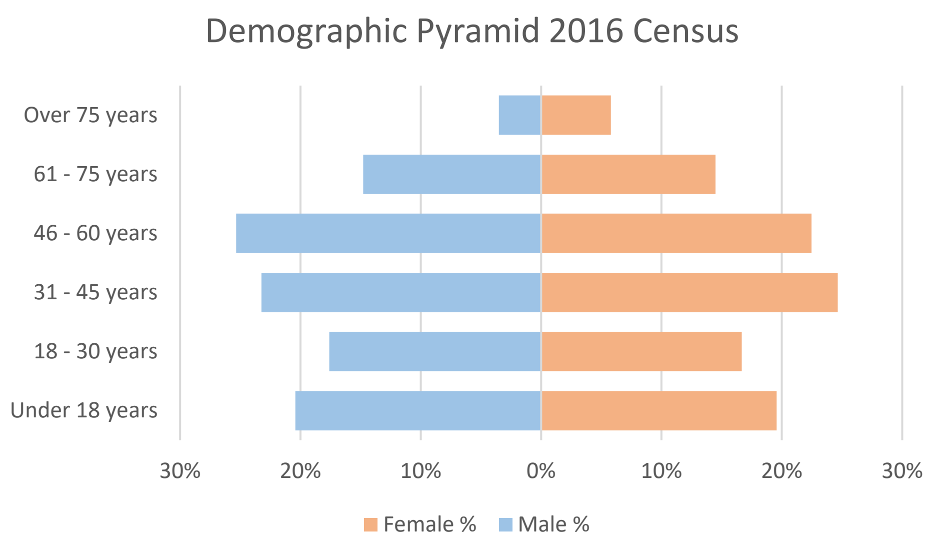
Even the indoor playground, the least chosen amenity, may appear less important, however the community members who voted for it represent many family members who would use the space but only submitted one survey.

The aquatic centre had the most votes, followed by the gym, lounge/canteen, and then fitness centre.

Question 9 - Please indicate the age groups represented in your household:



In Question 9, we asked for household age to double check responses reflect existing population demographics. As you can see in the demographic pyramid below, the respondent diversity generally matches the age groups from the 2016 census. Notably the bar graph is widest for middle age residents.



We compared age groups against their answers for each question. Age group did not have any significant effect on answers in the survey. The only exception was the two 75-year-old households did appear to prefer Option 1 before anything else. This may indicate a conservative perspective or concern for financing the project.

Question 10 - Please provide additional thoughts and comments below:

Out of the 377 surveys, 136 people left additional comments. The word cloud above was created to help illustrate the key interests expressed by the community. The more frequent the word was used in the comments, the larger it appears in the cloud. The approach for creating this word cloud was to input the full sentences from the comments into a word cloud generator. Then the words that lacked context were deleted. Some words were retained such as "great" or "another" as they give a sense of importance of a new facility.

The major takeaways from the comments are:

1. Aquatics

   a. "Pool" was the most frequently used term in the comments. More specifically, Pool was mentioned eighty-eight (88) times, swimming forty-two (42) times and aquatics twenty-one (21) times. Almost every single mention was in reference to a desire to include aquatic facilities in the project.

      i. Many respondents feel like this would be very helpful to train youth as this town has many waterways which could be dangerous.

      ii. It would provide therapeutic opportunities for seniors.

   b. Respondents expressed concerns related to current issues with the maintenance of the pool. They also identified concern with how the new pool will be better maintained.

2. Ice Rink

The major comment was that as much seating as possible should be included for spectators. The plans did not convey the amount of seating they were hoping to see. One comment suggested there should be bleachers behind the player's benches as that is how it currently is and is how the parents interact with their children.

3.Curling

a. The lounge should be on the same floor as the rink.
b. Lounge should have capacity for 100 people.

4. Gymnasium

a. Most comments suggested that two gyms would not be needed.
b. Gym was mentioned twenty-seven (27) times.

5. Indoor Playground

a. Best if closed in.
b. Mentioned fifteen (15) times in the comments.

6. Climbing Wall

a. There is a lot of support for this.
b. Suggest not to put it in the public area.

7. Suggested Amenities

a. Laundromat and showers should be included for public use. This was mentioned quite a few times.
b. There should be rooms that could be rented for professionals such physiotherapists or massage therapists.
c. Bowling was mentioned twice.
d. Squash/racquetball courts was mentioned six separate times.
e. Daycare was requested three (3) separate times.
f. A room for gymnastics, yoga, dance with a sprung floor was mentioned five separate times.

8. Feasibility

Many residents expressed curiosity how this building would be funded and what burden they would need to bear.

9. Site Choice

a. Gold Rush
 i. Received positive feedback five (5) times. The themes that prevailed for this site are:
  1. Walkability for youth and seniors
  2. Avoiding private interest groups effect on the site decision.
 ii. Received negative feedback twenty-seven (27) times. The themes that prevailed against the site are:
  1. Traffic overwhelming the area.
  2. The lack of room available for parking.
  3. Affecting the peaceful housing surrounding the site.
  4. The loss of the campground which brings tourists and revenue to the city.
  5. The unstable ground conditions found on the site.
b. Dome Road
 i. Received positive feedback seventeen (17) times. The themes that prevailed for this site are:
  1. Central to community as a whole if taking into account all subdivisions.
  2. More room for parking.
  3. Close to Crocus fields and biking/skiing trails.
  4. Room for growth.
  5. Visible at entrance to town.
 ii. Received negative feedback one (1) time for not being easily accessible by foot.

8.0 Summary of What We Heard

The following is a summary of the major takeaways from the community engagement period.

1) Dome Road is the preferred site
    a. Walkability is an issue that will need to be resolved and/or investigated further by the CoD.
    b. Because this site is larger and requires more infrastructure (ie. entry roads, stormwater retention) some effort should be applied to reducing costs.

2) Include a pool. This would allow for many efficiencies the current pool is suffering from: lack of maintenance, short season, high energy use, and would allow for shared human resources.

3) Curling lounge should be on the same floor as the ice surface.

4) Only one gym is required.
    A second space with sprung floors could be included instead of a second gym space.

5) Include an indoor playground or daycare.

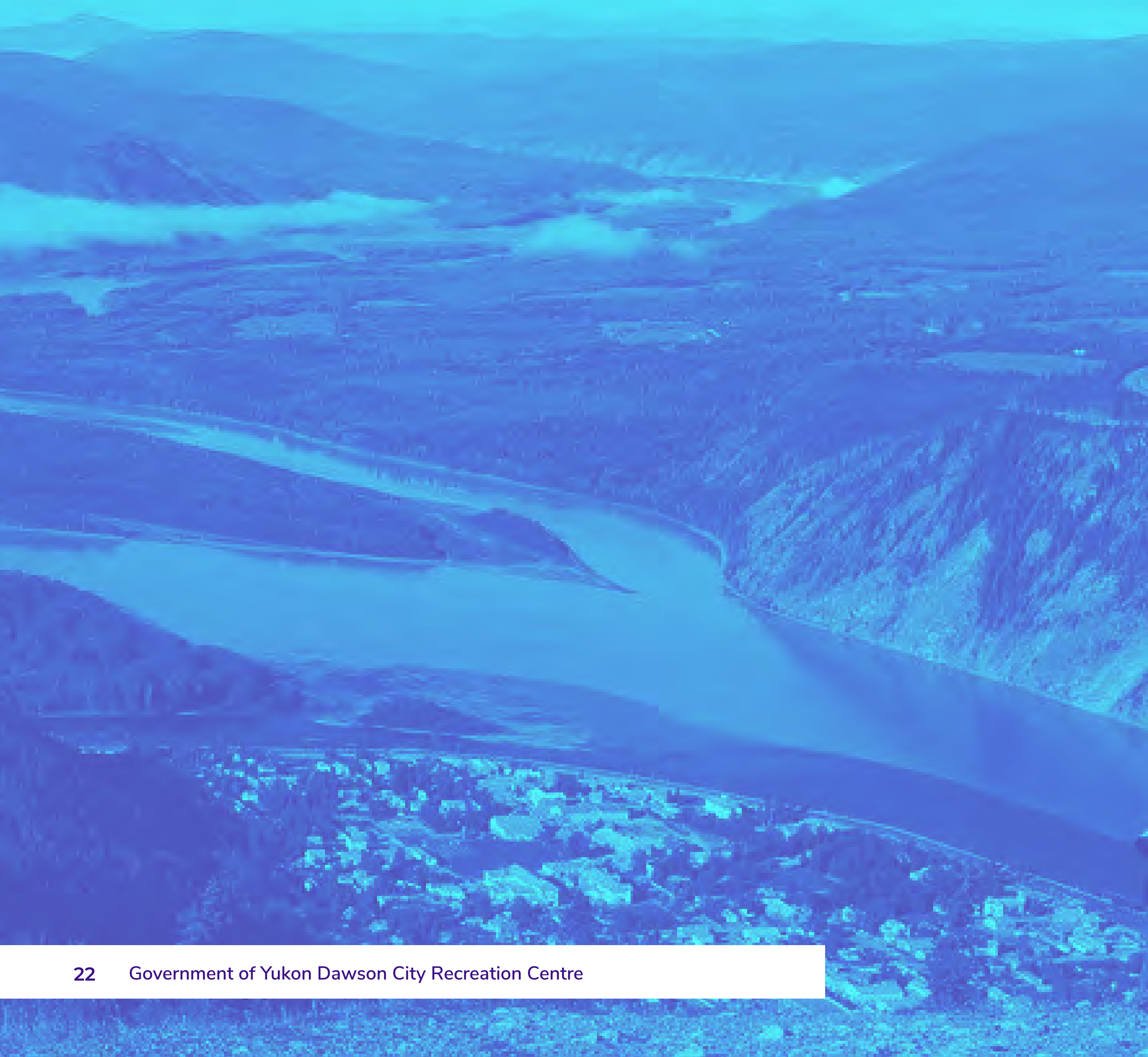
6) Public laundromat and showers were requested many times for people living off grid and tourists.

7) Include as much spectator space as possible around the hockey rink especially.

9.0 Next Steps

Dawson City Council will review this document summarizing input from the Dawson community. Council may determine a preference of one or a few of the options upon review of this feedback. As per the project schedule (attached in Appendix F), Council has two (2) weeks to review this information and share their conclusions and preferences with Republic Architecture Inc. This preference shall be document in the final feasibility report.

Appendices



(Community Engagement)

Appendix A Presentation

Dawson City Recreation Centre Functional Program + Feasibility Study

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Community Engagement Session
March 8, 2021

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REPUBLIC ARCHITECTURE INC

THE CITY OF DAWSON Y.T. INCORPORATED JAN. 9, 1902

Yukon

Today's Presentation By:

Mélanie Gagnon, BEnvD, LEED AP ID+C
Project Manager

Tricia Schilling, PIDIM, IDC
Interior Designer / Public Consultation Specialist

Rachael Alpern, MAA, LEED AP
Architect / Recreation Planner

Ron Prociuk, MAA, Intl. Assoc. AIA
Architect

Evan Hunter, MAA, MRAIC, CAHP, LEED AP
Architect

Claire Spearman, M.Arch
Architectural Intern / Facility Planner

Dawson City Recreation Centre Functional Program + Feasibility Study

–

COMMUNITY ENGAGEMENT SESSION
March 8, 2021

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REPUBLIC ARCHITECTURE INC

Yukon

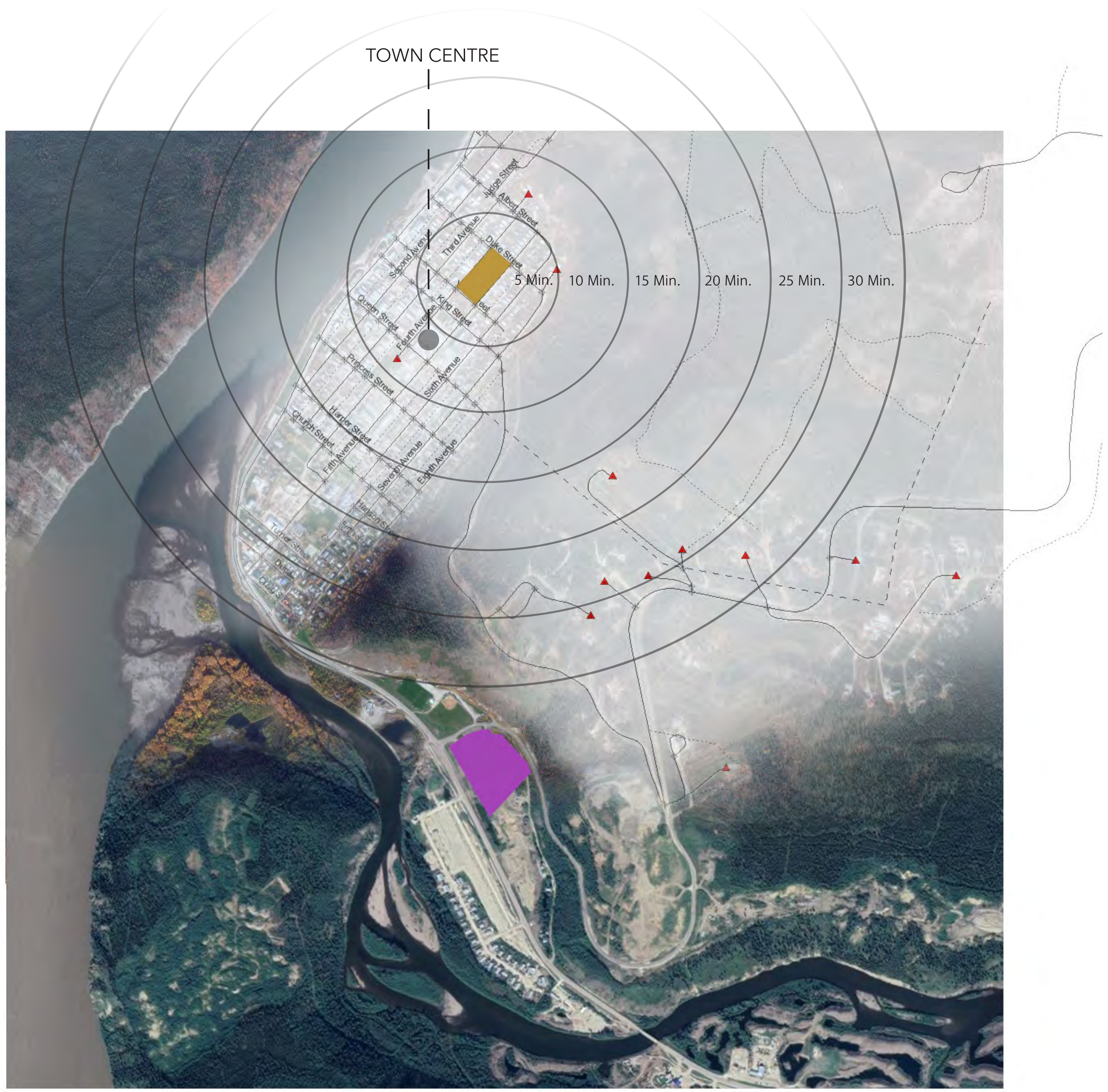
Functional Space Program

		Option 1	Option 2	Option 3
Ice	**Ice Rink (Hockey, Ringette, Skating)**	1,874.0	1,874.0	1,874.0
	Ice Rink Viewing Area (unheated)	79.5	79.5	79.5
	Ice Rink Viewing Area (heated)			26.5
	Team Dressing Rooms	240.0	240.0	240.0
	Ref Change Room	35.0	35.0	35.0
	Skate Sharpening	15.0	15.0	15.0
	Zamboni Room	45.0	45.0	45.0
	Ice Plant/Mechanical Room	45.0	45.0	45.0
	Storage	60.0	60.0	60.0
	Curling Rink	856.0	856.0	856.0
	Changing Area/Lockers			15.0
	Lounge	75.0	75.0	75.0
Fitness	**Multipurpose/Flex Space/Gym**	500.0	762.0	762.0
	Gym Viewing Area			26.5
	Change Rooms	60.0	120.0	120.0
	Fitness Centre		140.0	140.0
	Change Rooms		40.0	40.0
	Walking Track		250.0	250.0
Aquatics	**Lap Pool**			350.0
	Kiddie Pool			150.0
	Hot Tub/Jacuzzi			30.0
	Change Rooms			180.0
	Lifeguard/First Aid			12.0
	Pool Mechanical & Chemical Stor			325.0
	Steam Room			35.0
	Sauna		35.0	35.0
Common Amenities	Common Lounge/Entry	75.0	75.0	75.0
	Canteen/Servery	63.0	63.0	63.0
	Multi-use Party/Meeting Room		30.0	30.0
	Full Team Office	155.0	155.0	155.0
	Indoor Playground		85.0	85.0
	Climbing Wall			40.0
	Gross Total:	6,346 m^2	7,091 m^2	8,593 m^2

Functional Space Program

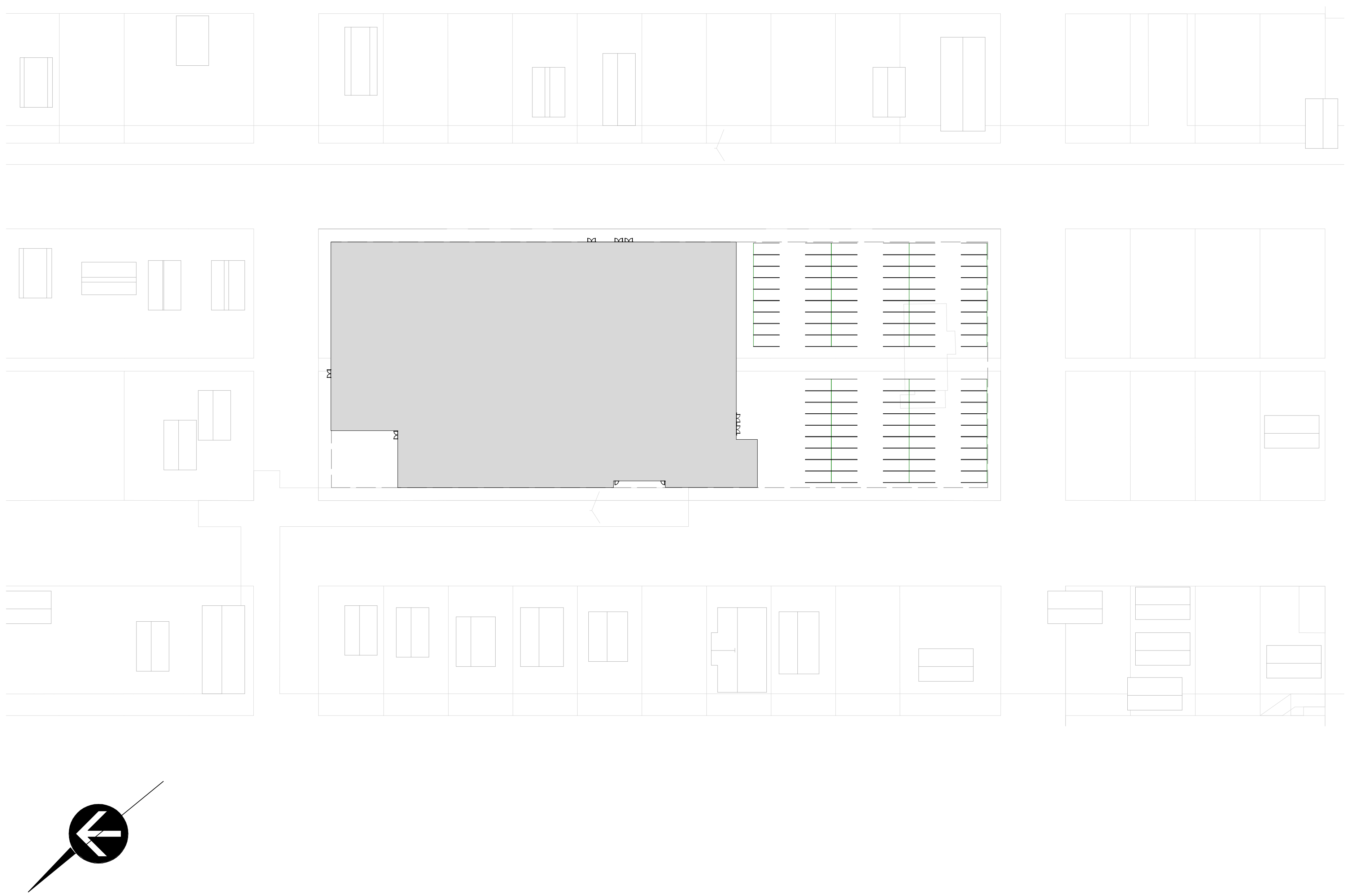
REPUBLIC ARCHITECTURE INC

Conceptual Design Options
Gold Rush



REPUBLIC ARCHITECTURE INC

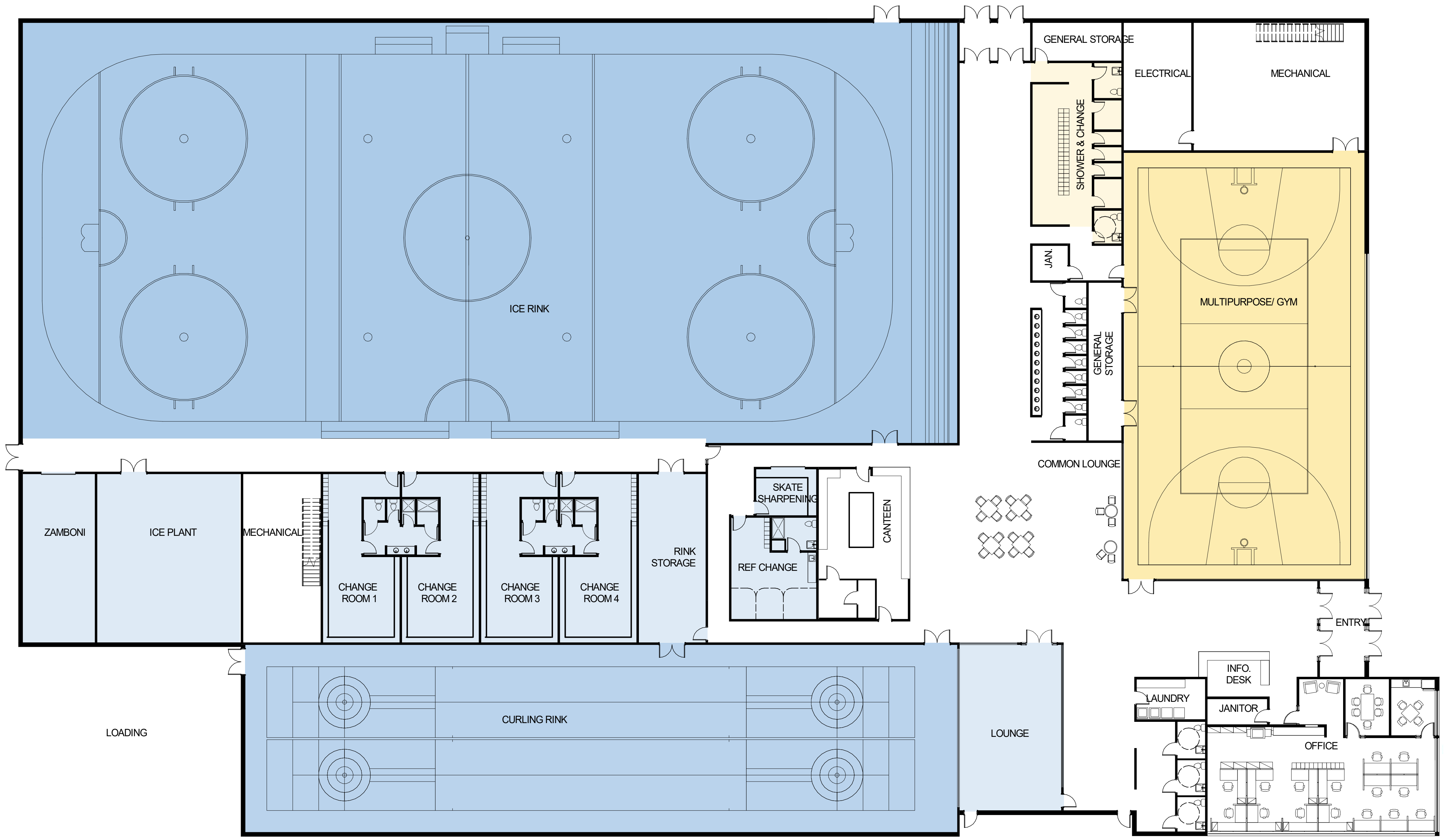
Context & Walkability



Gold Rush Option 1

Site Plan

REPUBLIC ARCHITECTURE INC



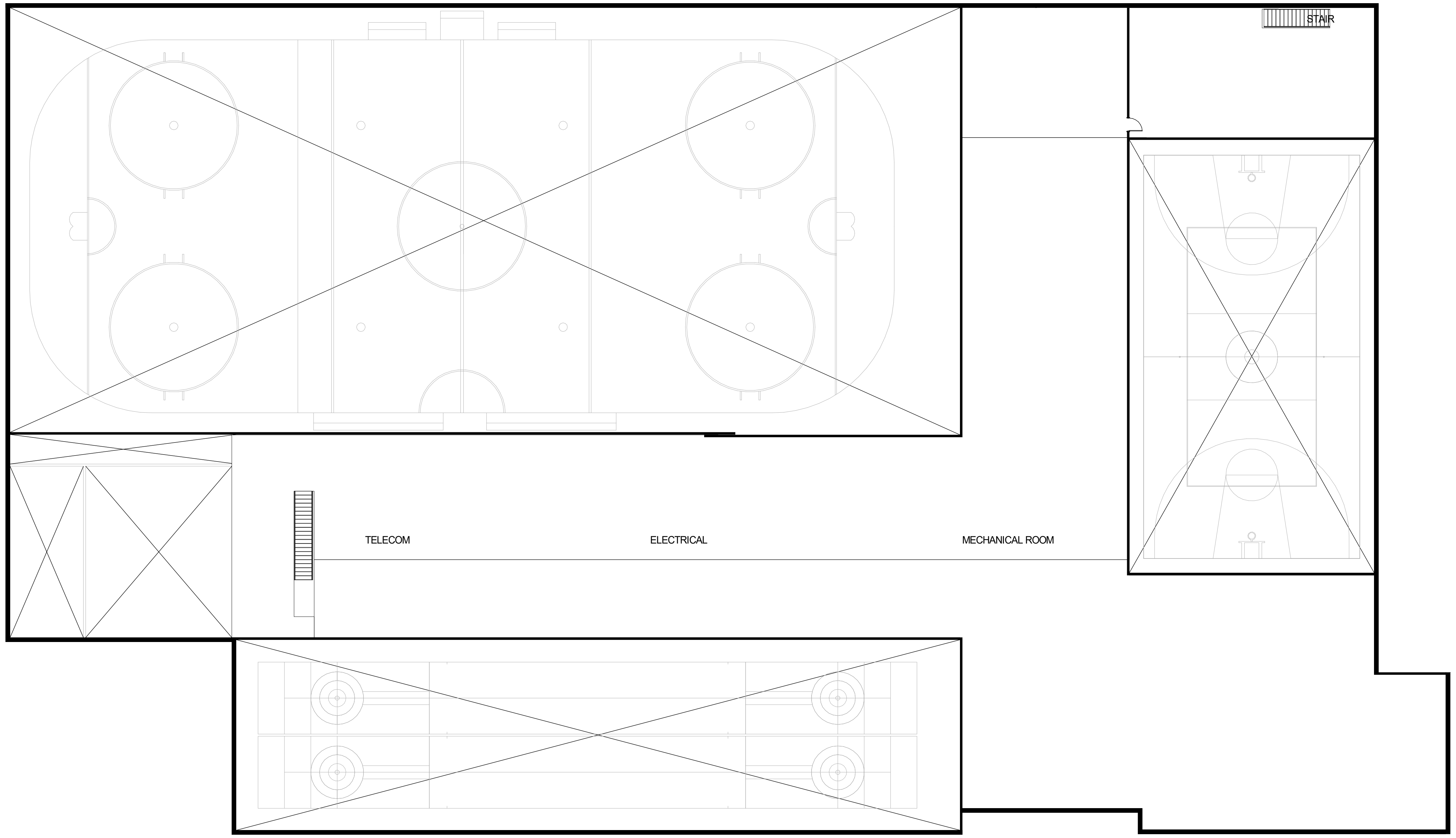
- Area: 6,174 m^2
- All amenities on main floor

Amenities Include:

- Ice Rink
- Curling Rink
- Multi-purpose Space

Gold Rush Option 1

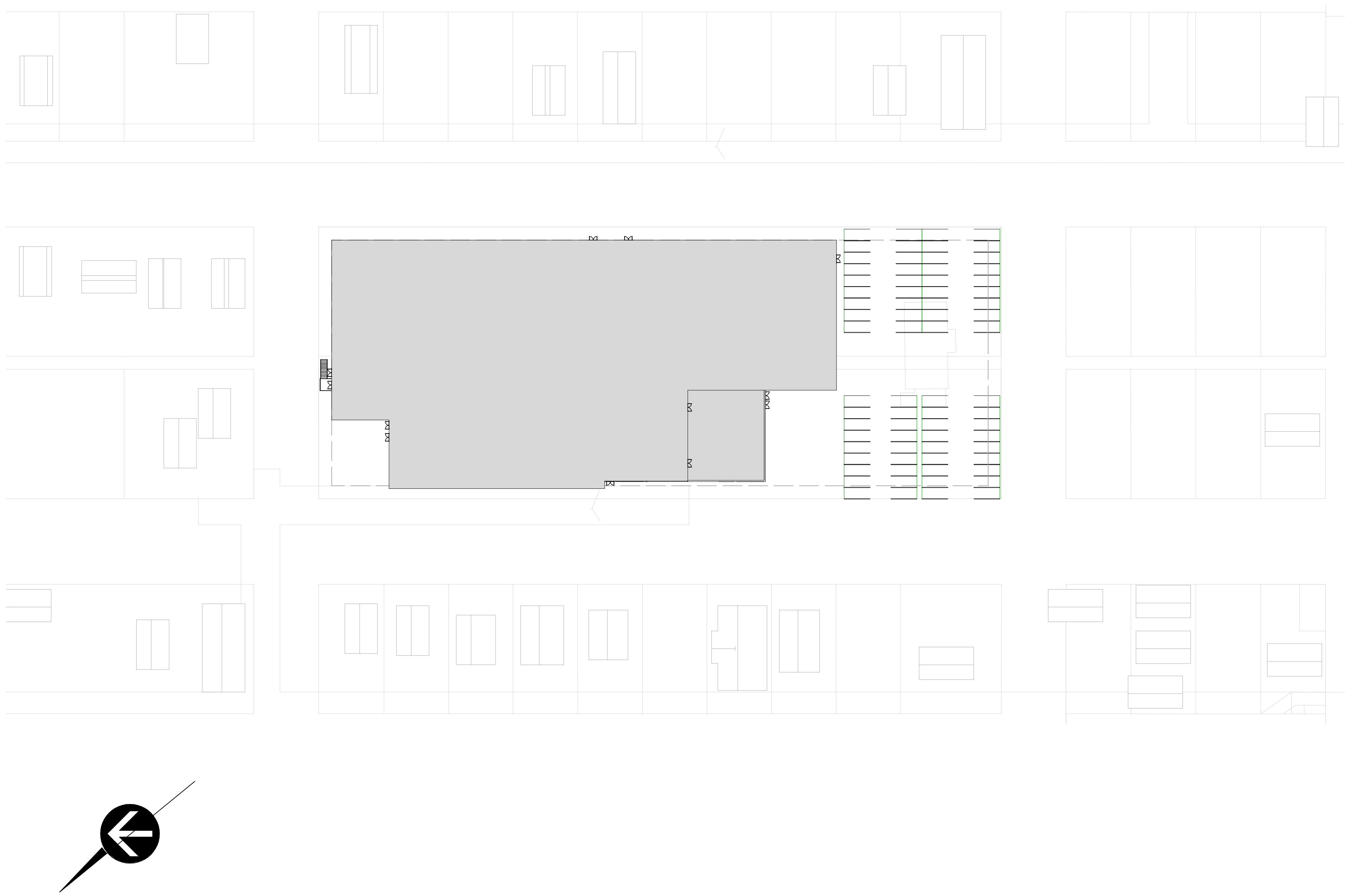
Main Floor Plan



Gold Rush Option 1

Second Floor Plan

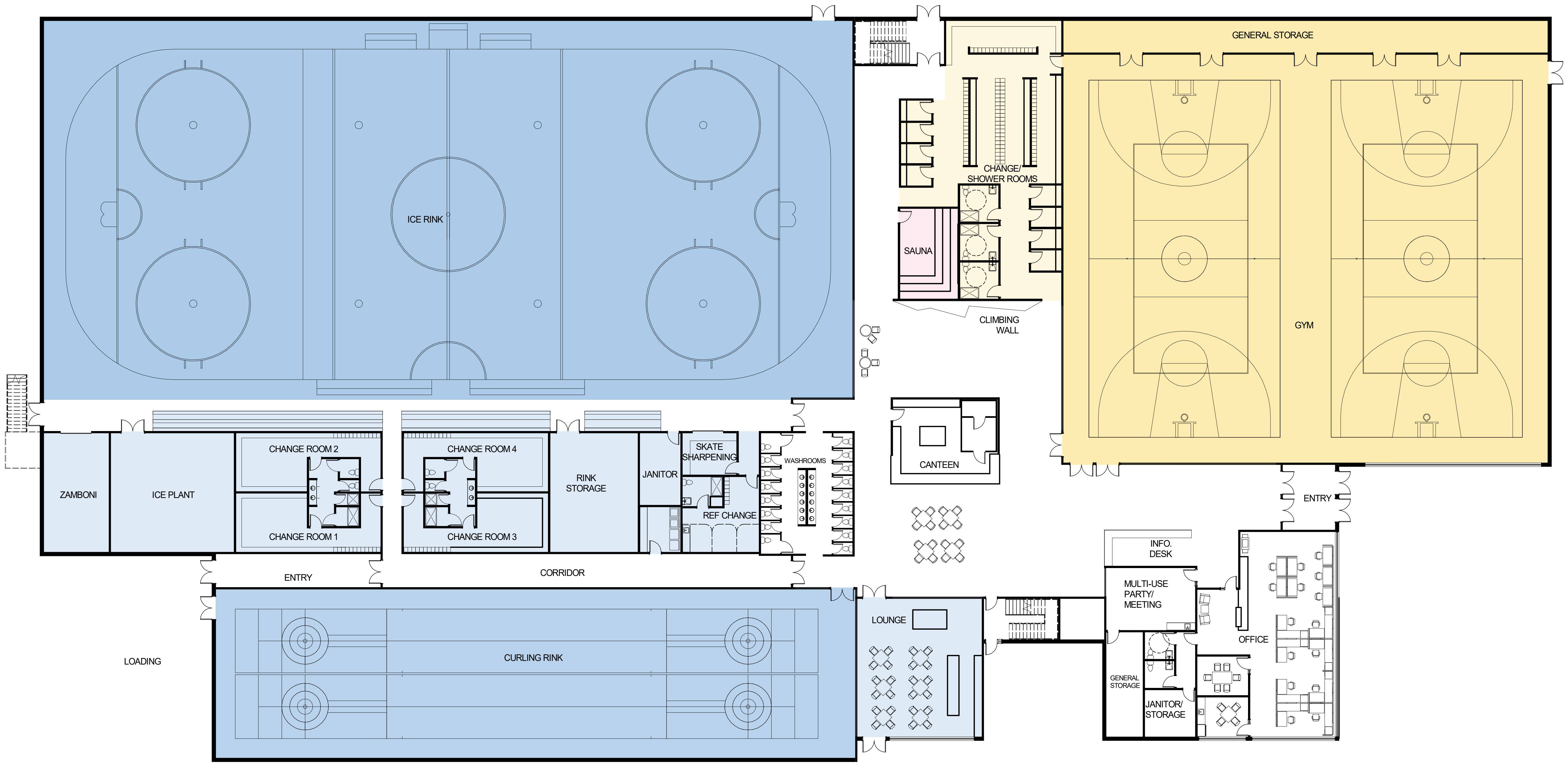
REPUBLIC ARCHITECTURE INC



Gold Rush Option 2

Site Plan

REPUBLIC ARCHITECTURE INC



- Area: 8,112 m²
- Two storeys

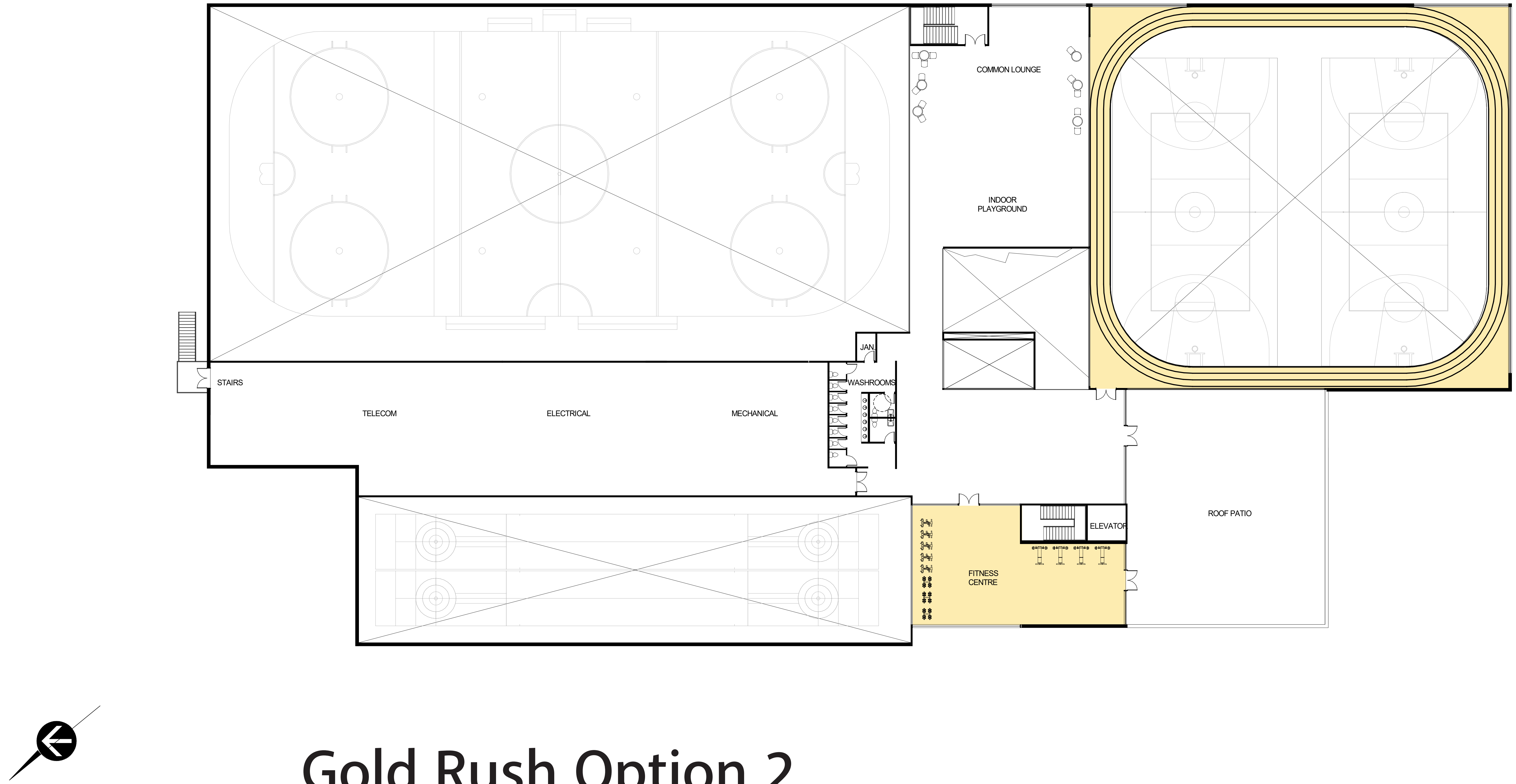
Amenities Include:

- Ice Rink
- Curling Rink
- Fitness Centre
- Gymnasium

REPUBLIC ARCHITECTURE INC

Gold Rush Option 2

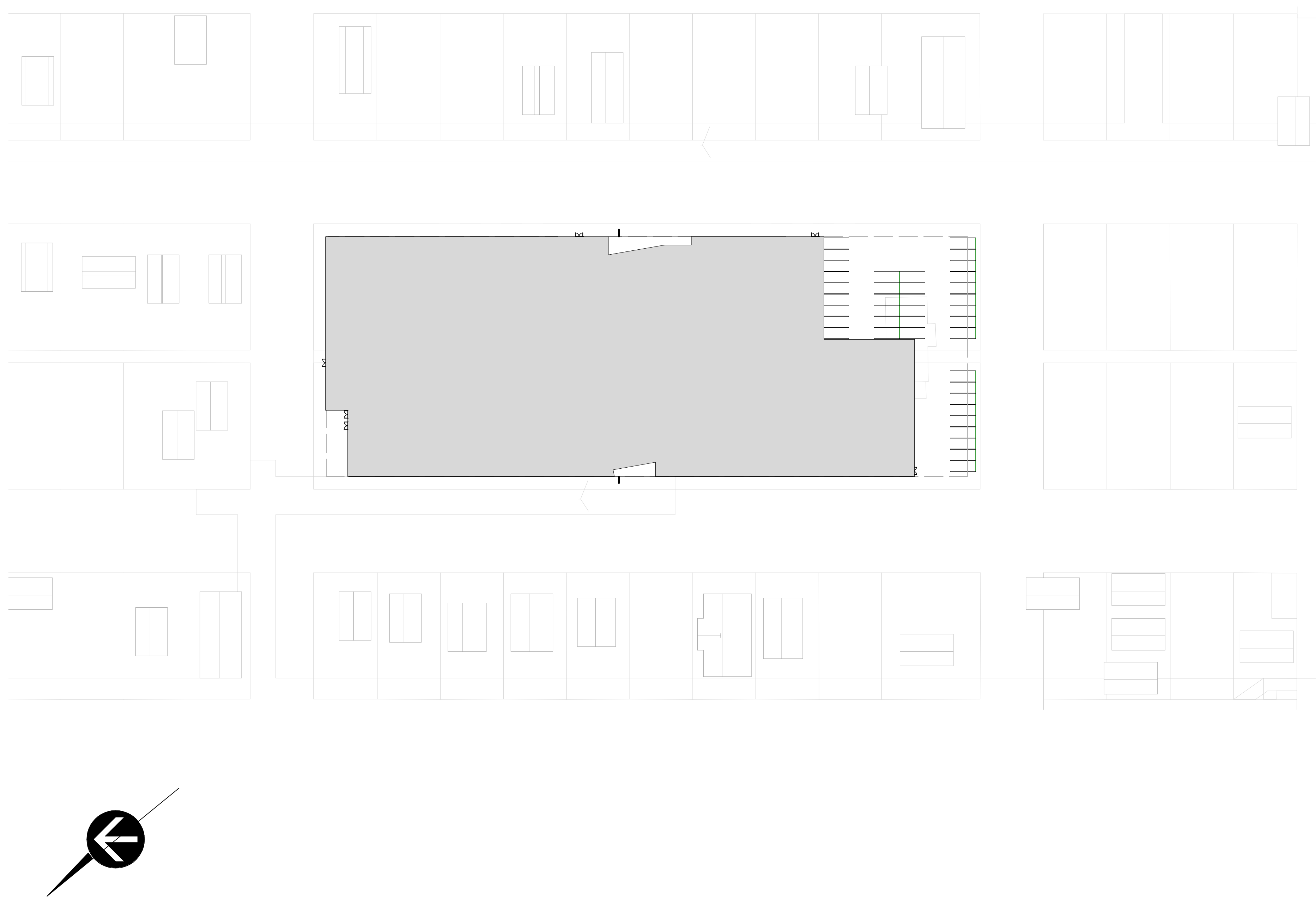
Main Floor Plan



Gold Rush Option 2

Second Floor Plan

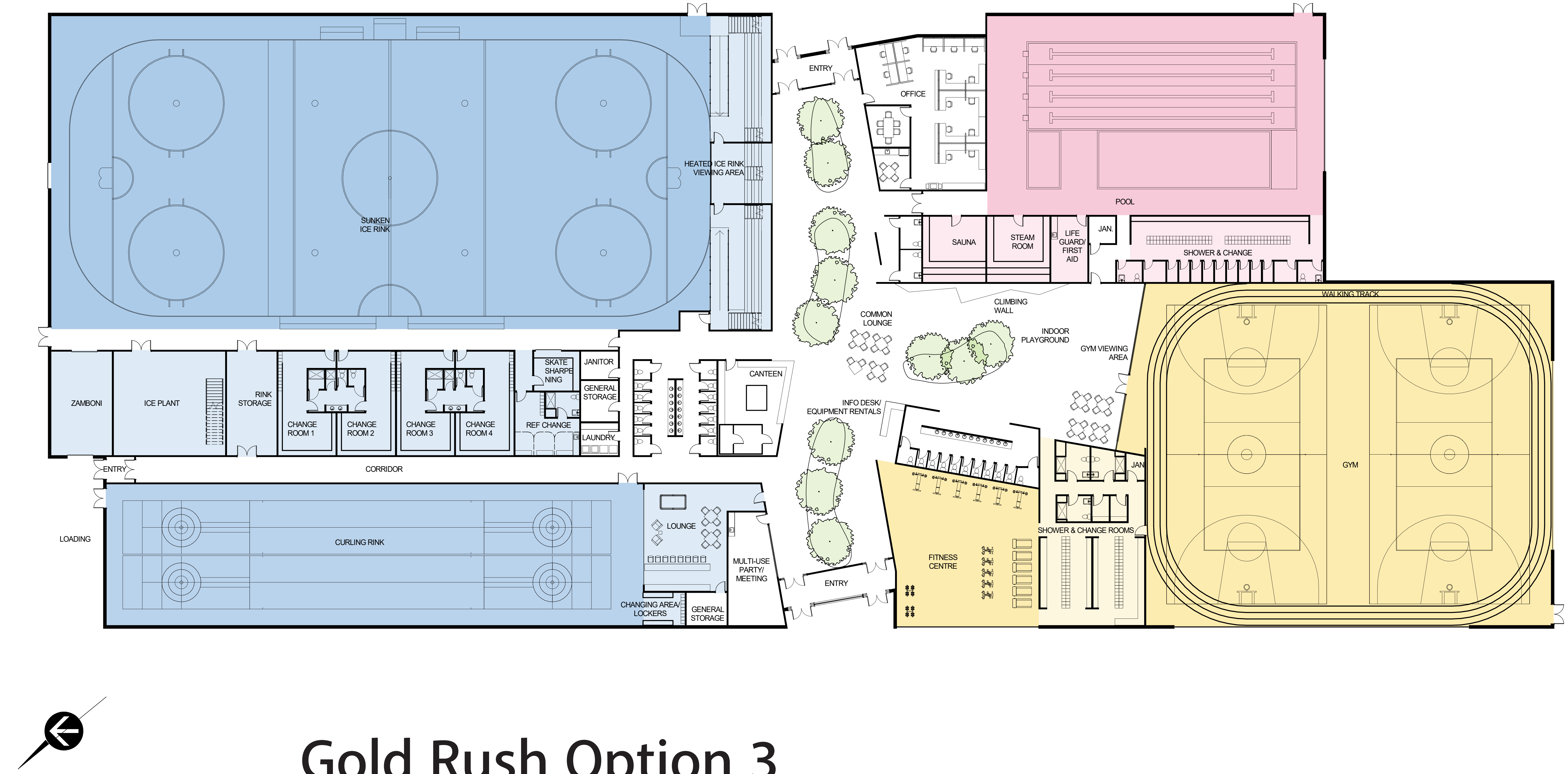
REPUBLIC ARCHITECTURE INC



Gold Rush Option 3

Site Plan

REPUBLIC ARCHITECTURE INC



- Area: 8,700 m^2
- Two storeys

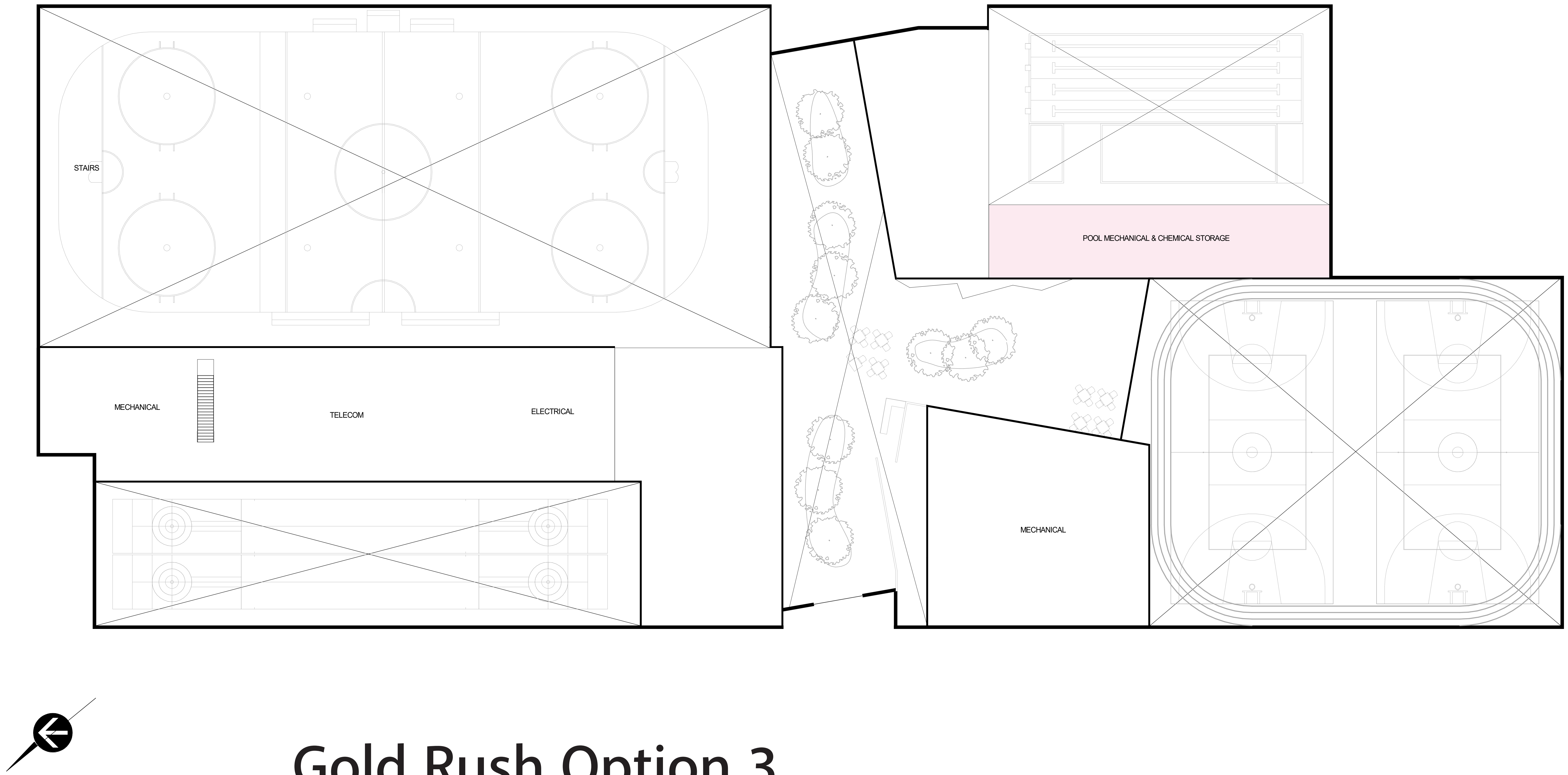
Amenities Include:

- Ice Rink
- Curling Rink
- Fitness Centre
- Gymnasium
- Aquatics
- Centralized, interior park space

REPUBLIC ARCHITECTURE INC

Gold Rush Option 3

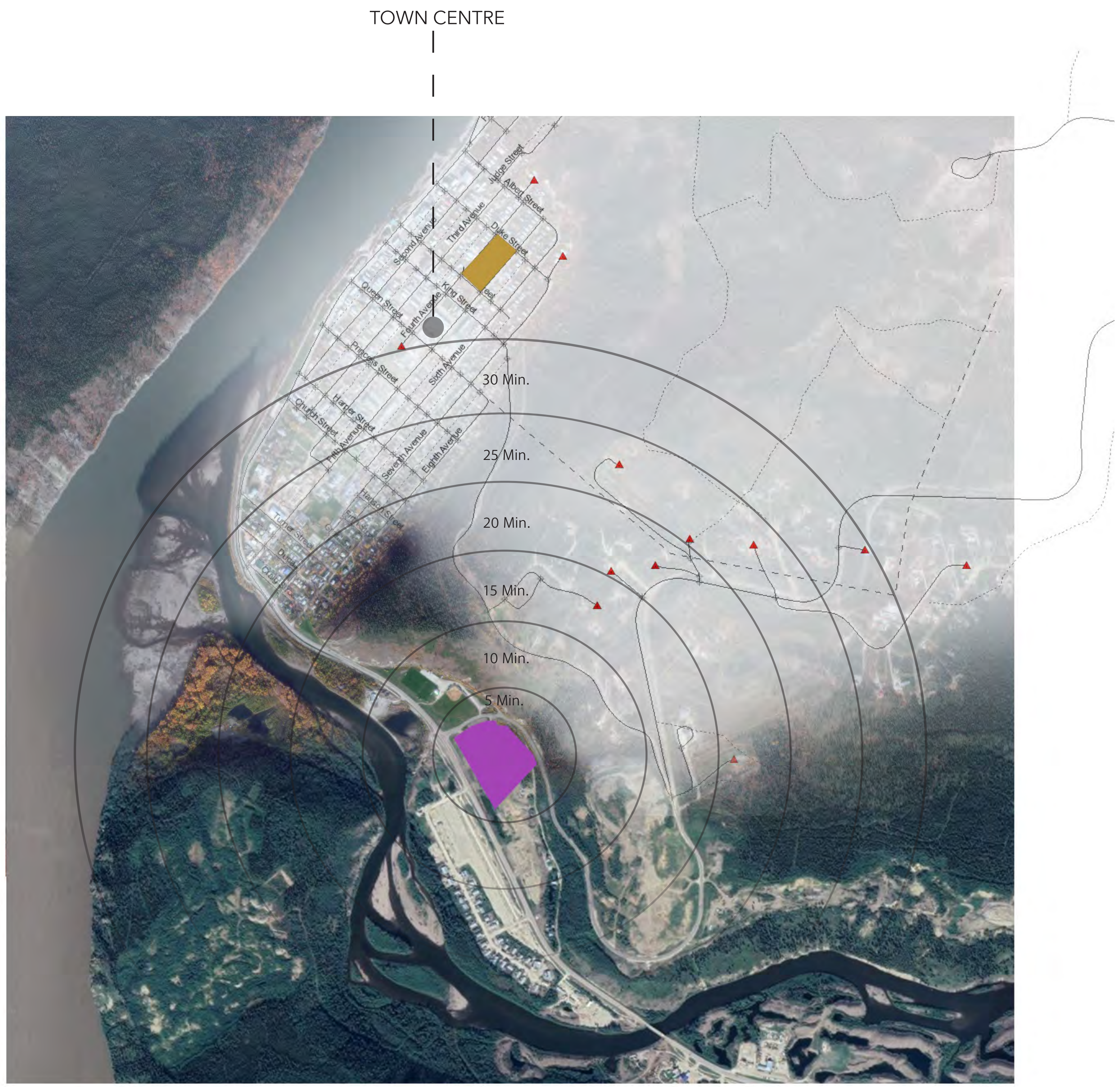
Main Floor Plan



Gold Rush Option 3

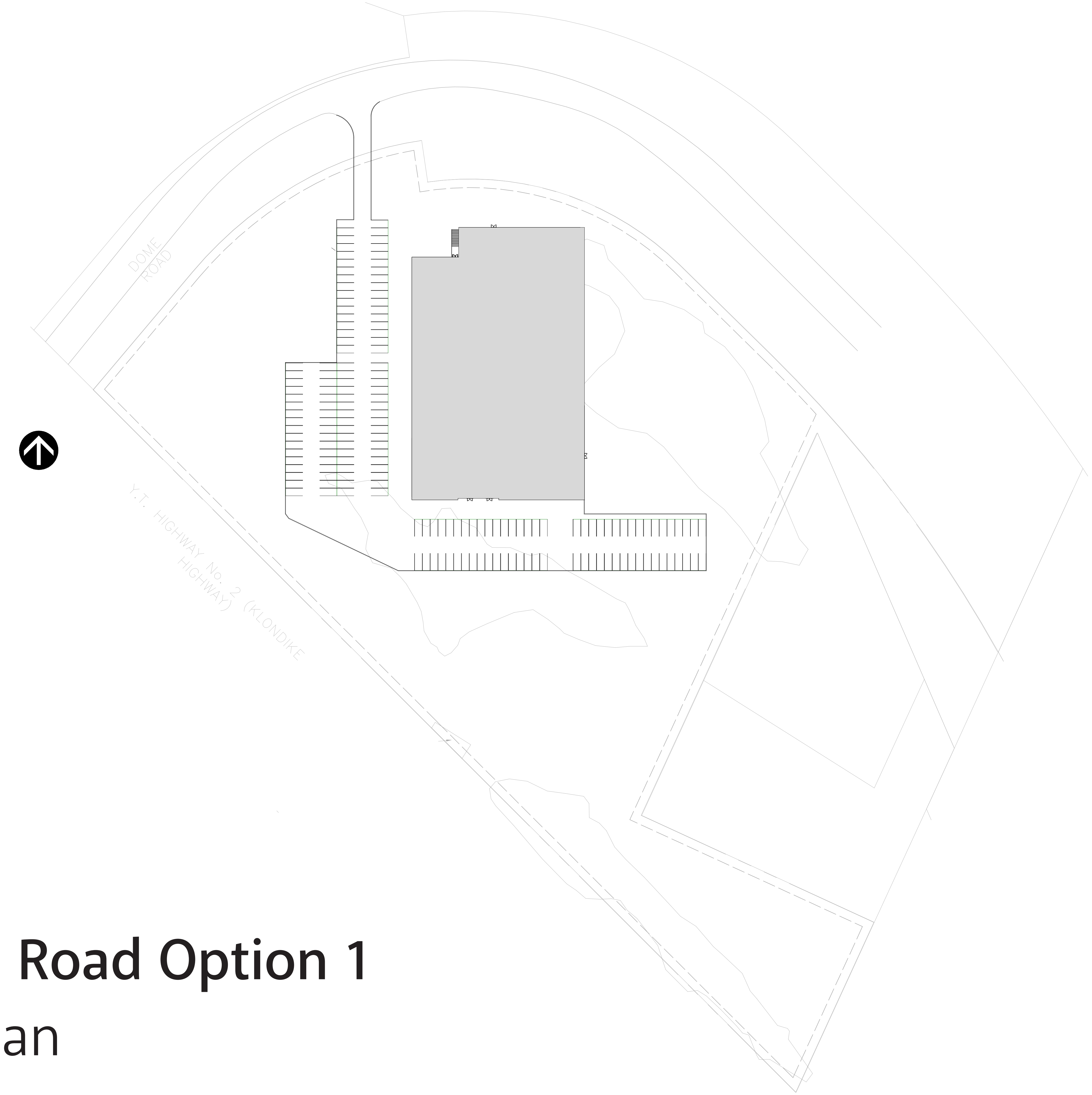
Second Floor Plan

Conceptual Design Options
Dome Road



REPUBLIC ARCHITECTURE INC

Context & Walkability



Dome Road Option 1

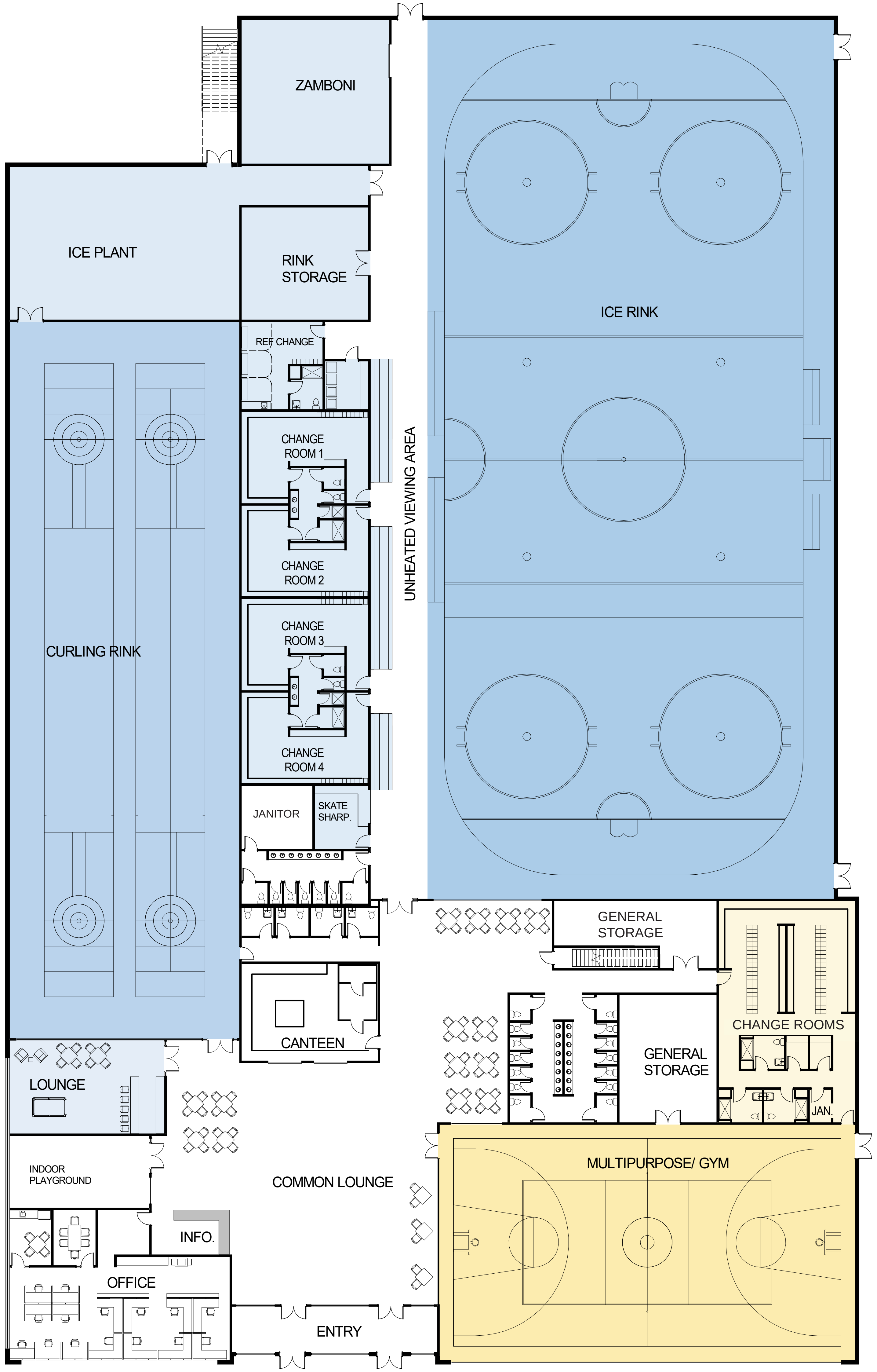
Site Plan

REPUBLIC ARCHITECTURE INC

- Area: 6,590 m^2
- All amenities on main floor

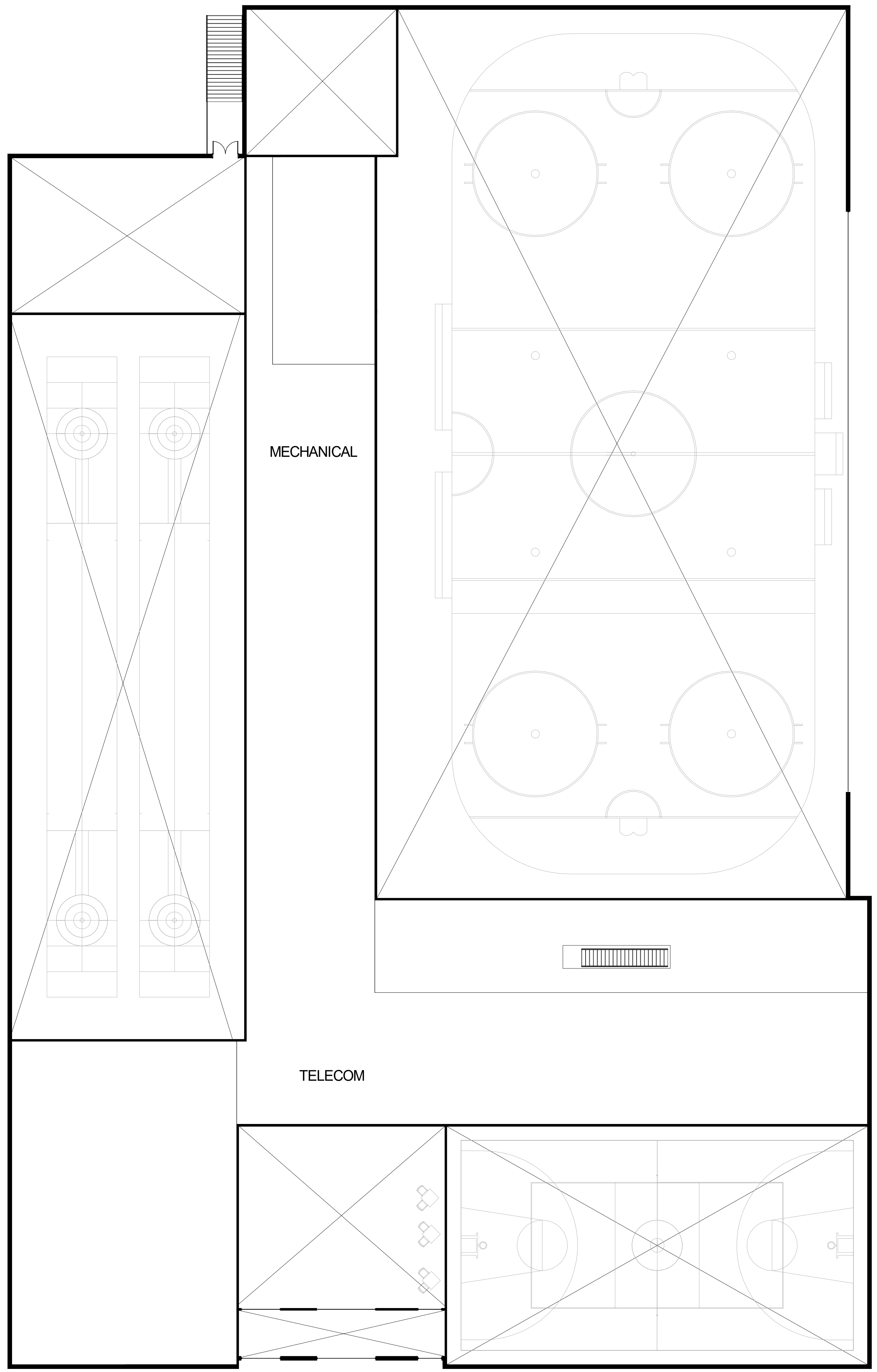
Amenities Include:

- Ice Rink
- Curling Rink
- Multi-purpose Space
- Views from Ice Rink towards mountains from unheated seating area



Dome Road Option 1

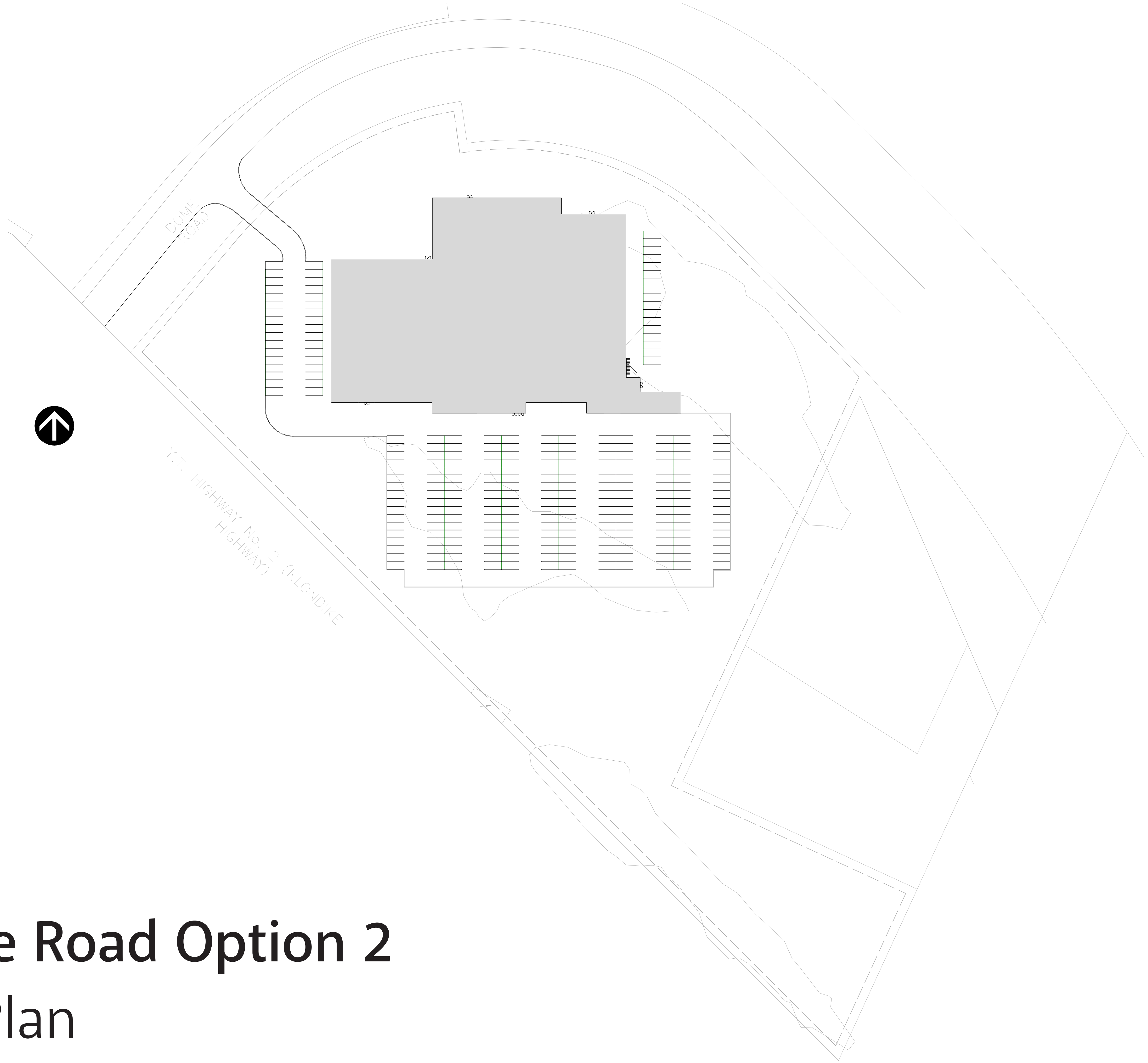
Main Floor Plan



Dome Road Option 1

Second Floor Plan

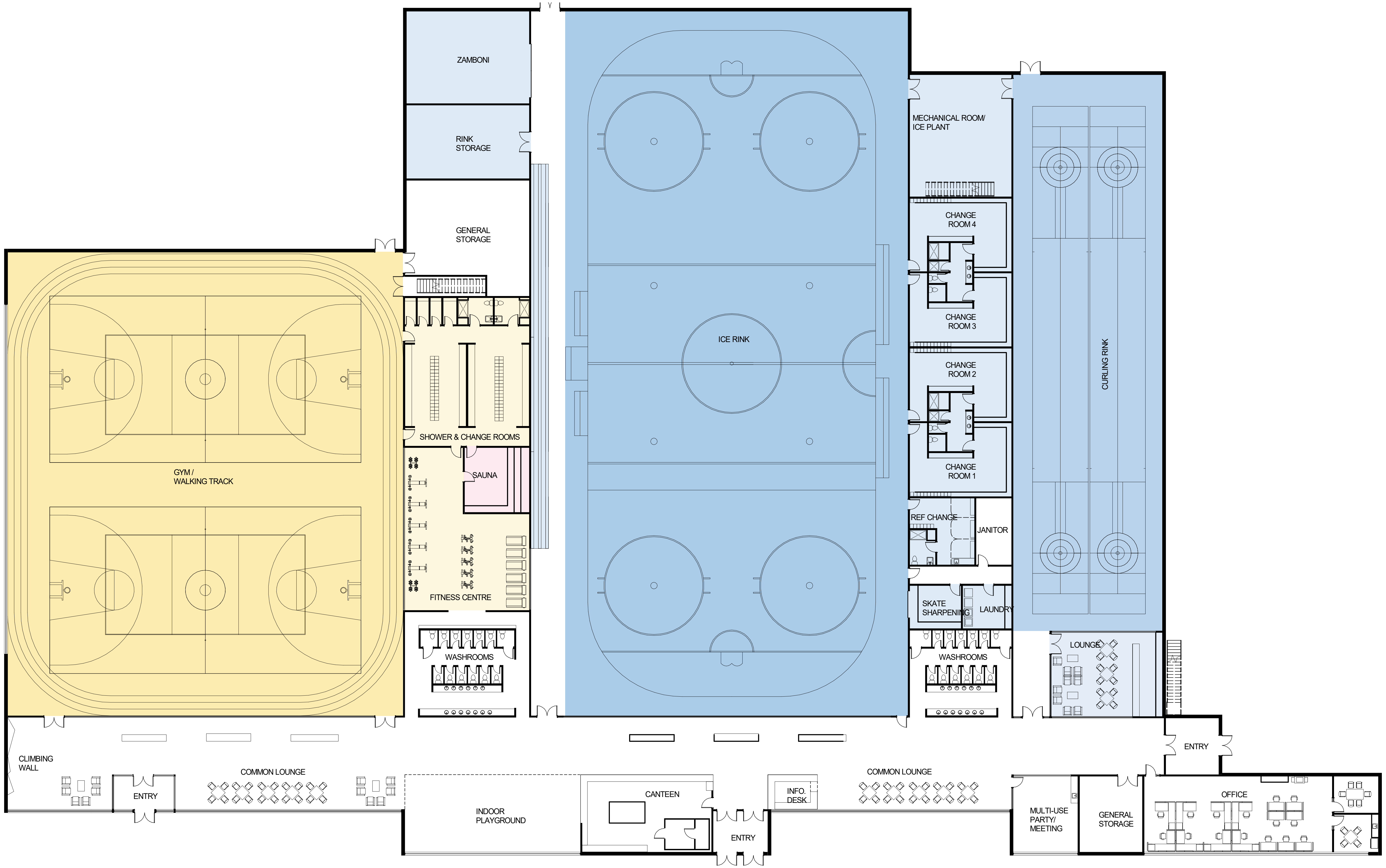
REPUBLIC ARCHITECTURE INC



Dome Road Option 2

Site Plan

REPUBLIC ARCHITECTURE INC



- Area: 7,918 m^2
- All amenities on main floor

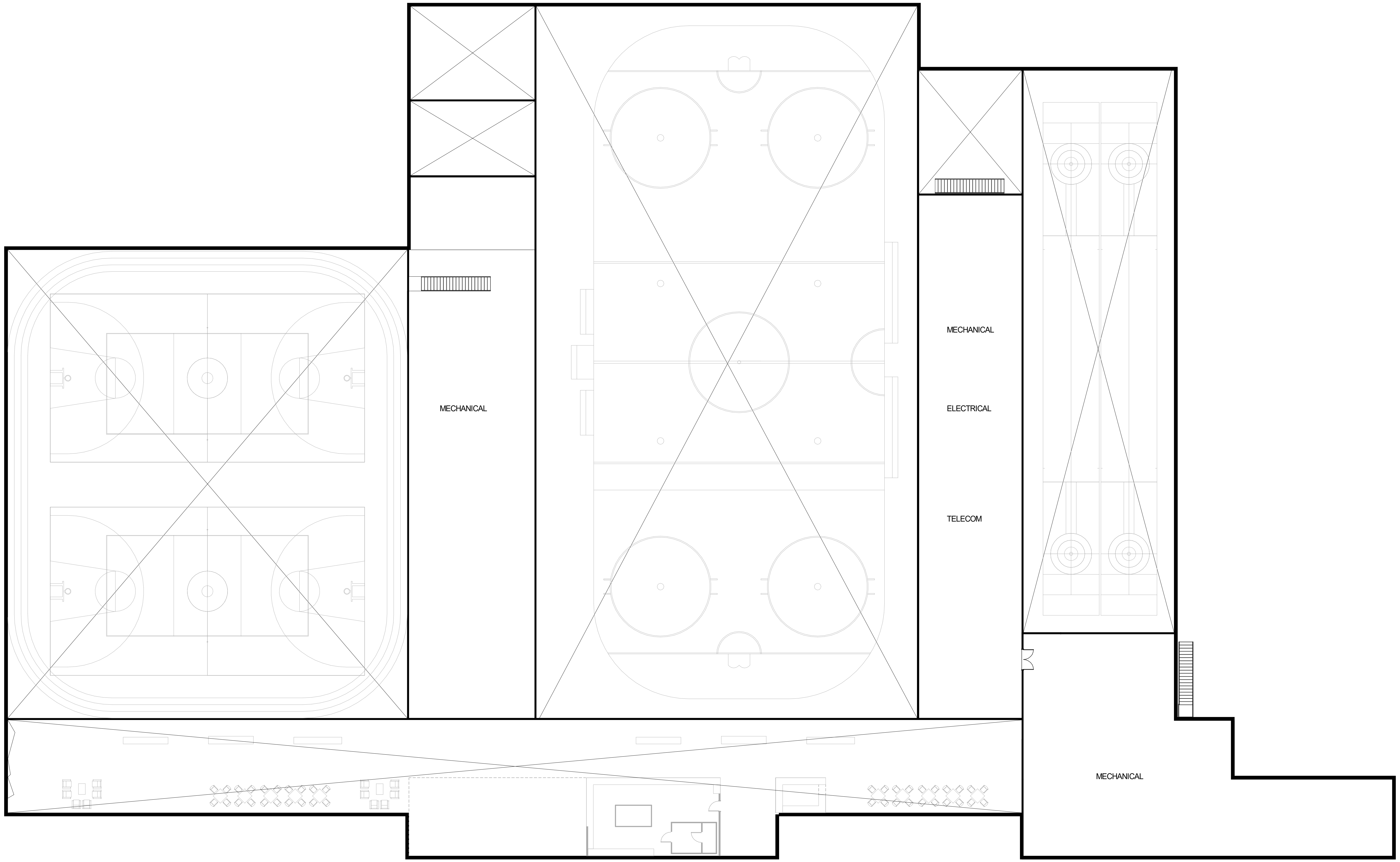
Amenities Include:

- Ice Rink
- Curling Rink
- Fitness Centre
- Climbing Wall

Dome Road Option 2

Main Floor Plan

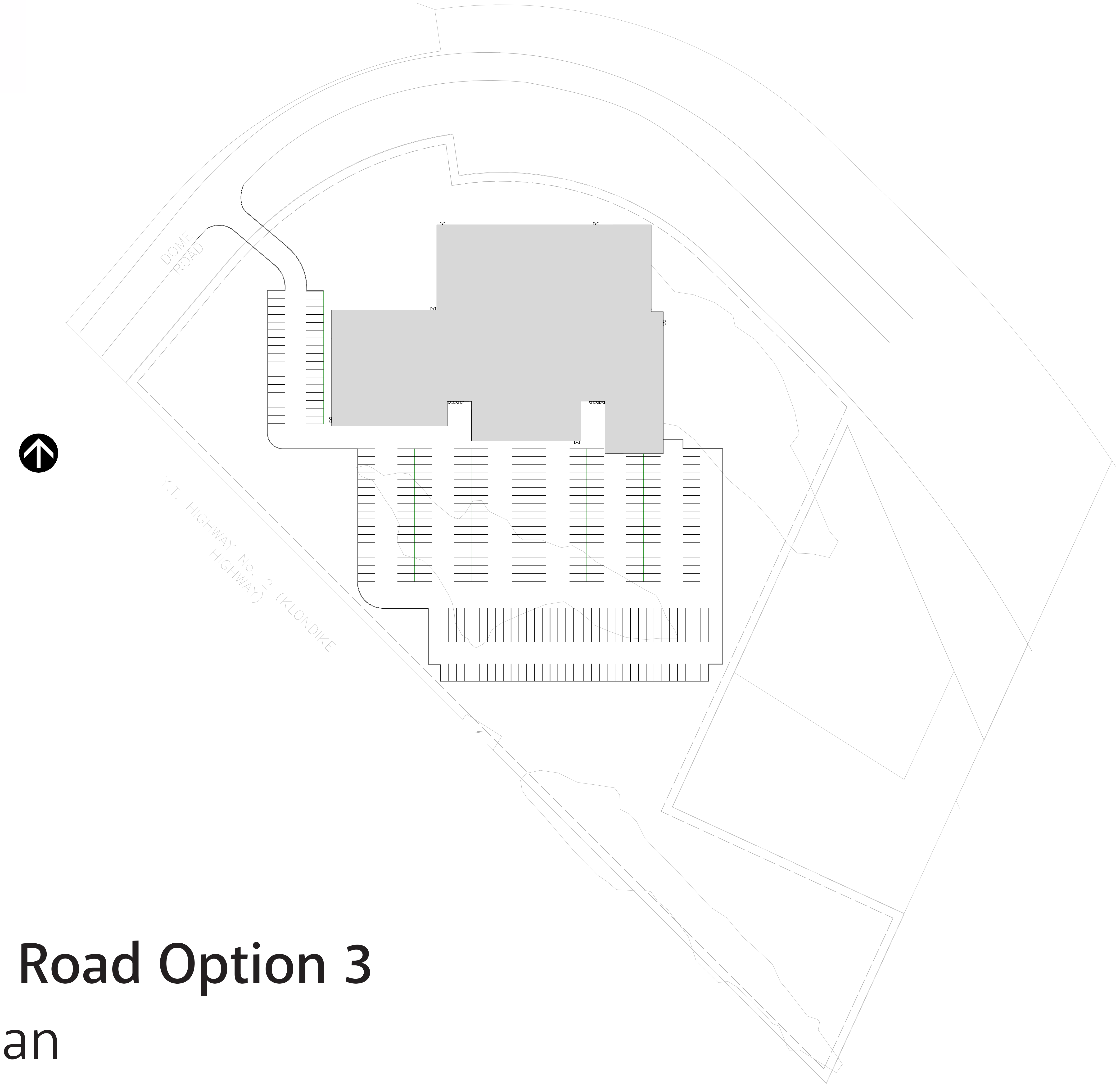
REPUBLIC ARCHITECTURE INC



REPUBLIC ARCHITECTURE INC

Dome Road Option 2

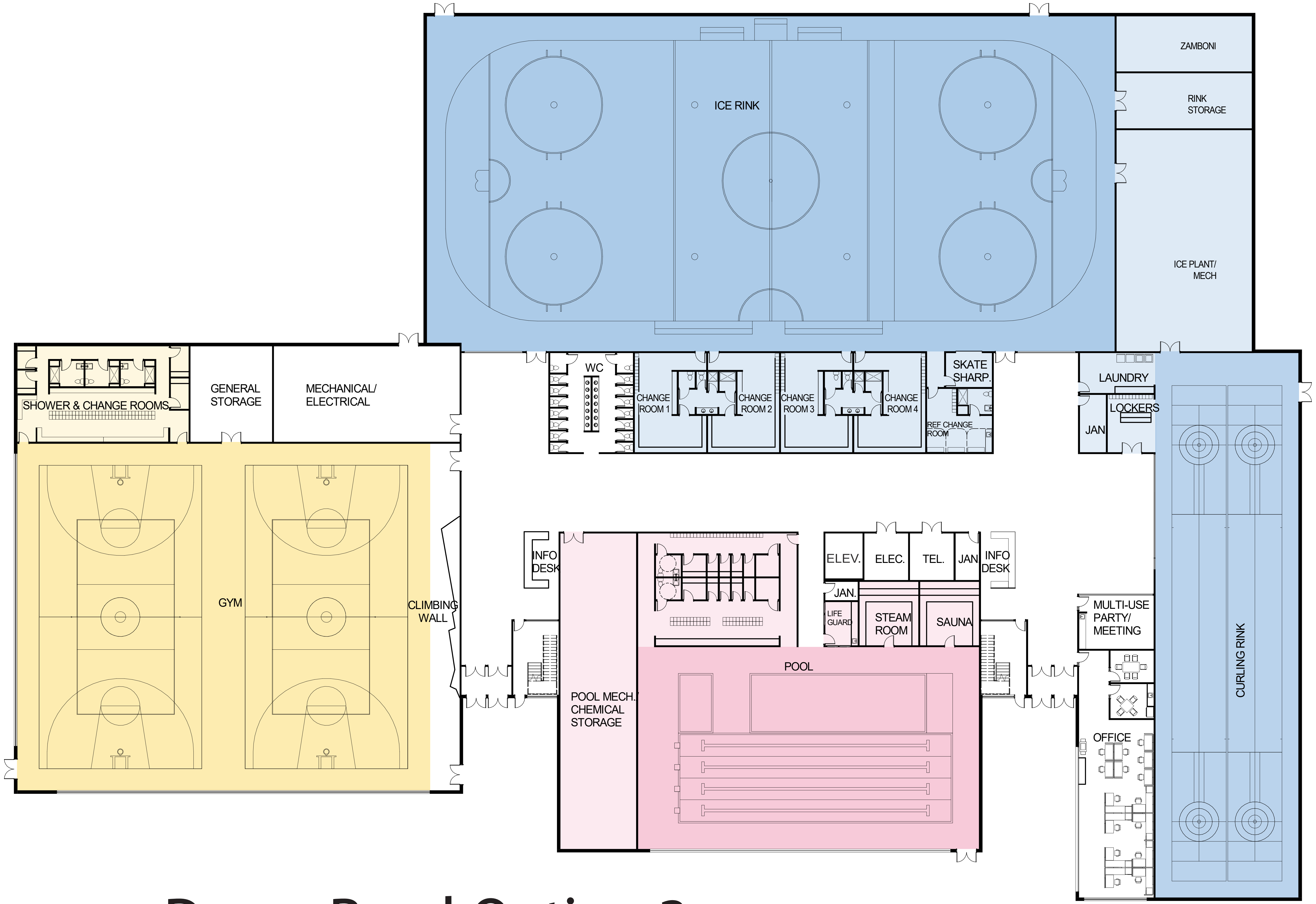
Second Floor Plan



REPUBLIC ARCHITECTURE INC

Dome Road Option 3

Site Plan



- Area: 10,363 m^2
- Two storeys

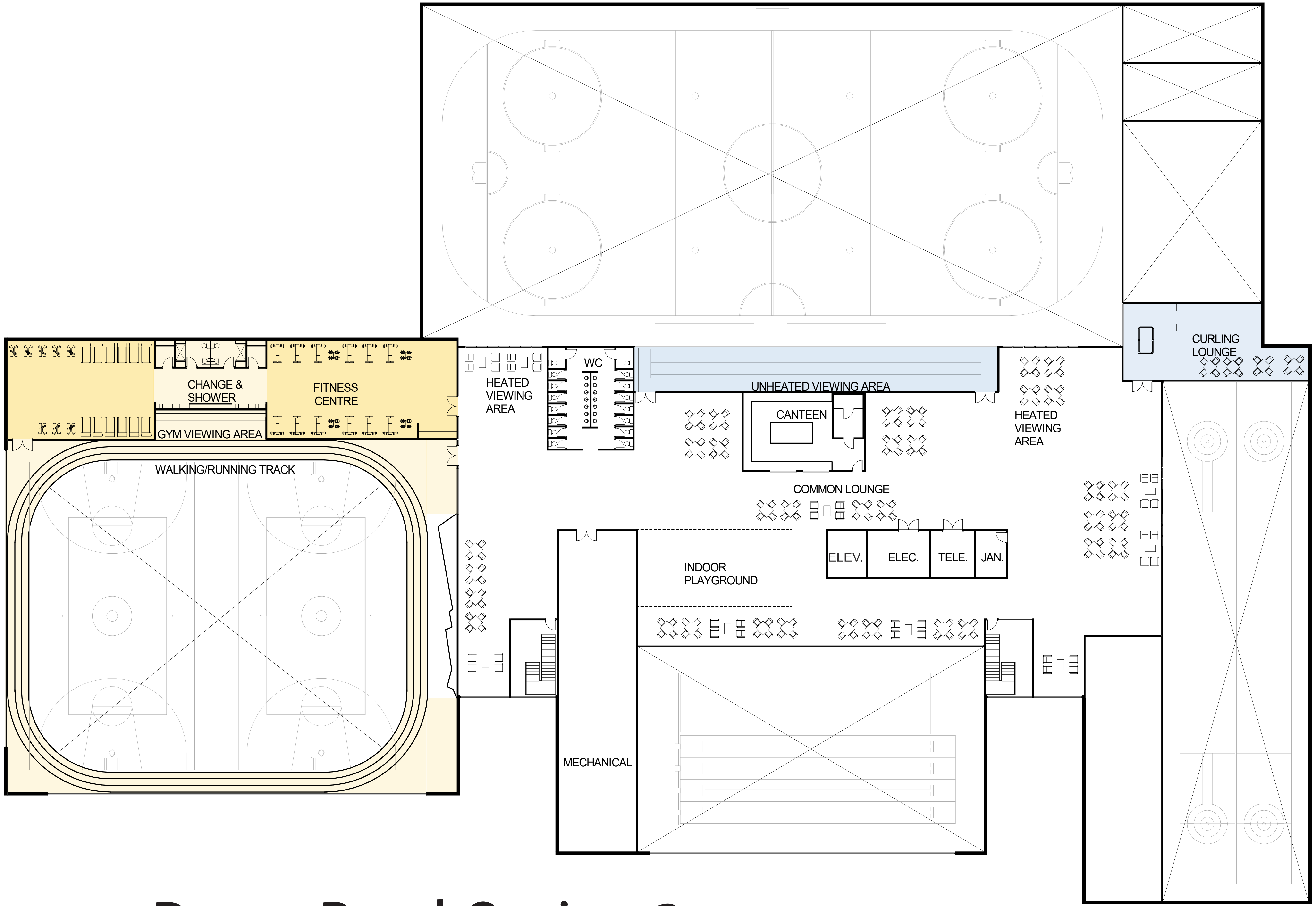
Amenities Include:

- Ice Rink
- Curling Rink
- Fitness Centre
- Gymnasium
- Climbing Wall
- Aquatics

REPUBLIC ARCHITECTURE INC

Dome Road Option 3

Main Floor Plan

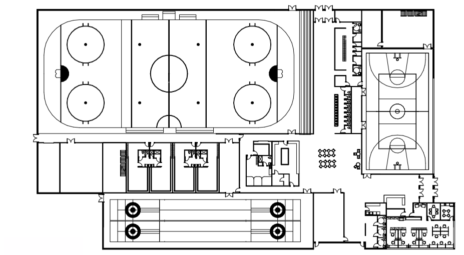
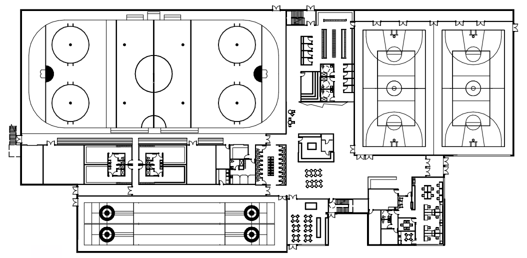
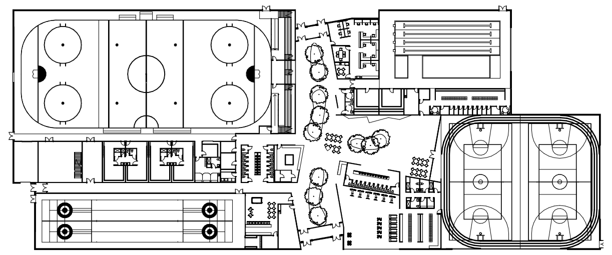
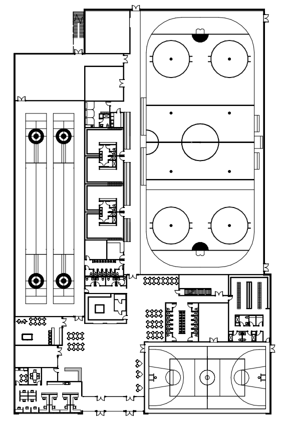
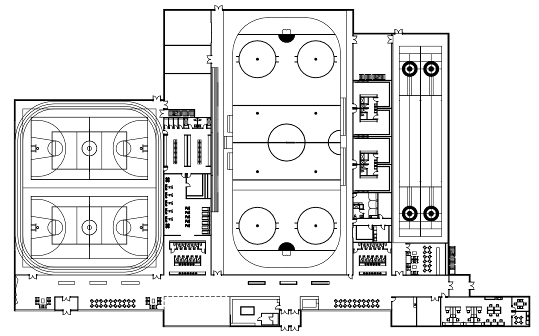
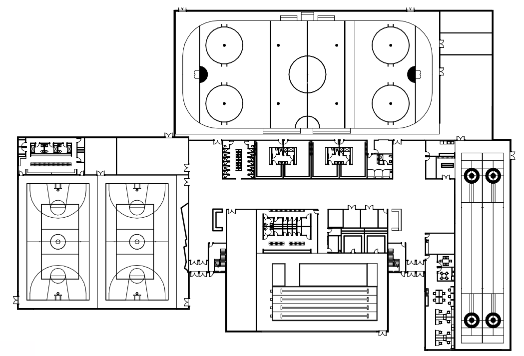


Dome Road Option 3

Second Floor Plan

REPUBLIC ARCHITECTURE INC

Construction Costs

	Gold Rush			*Dome Road*		
	Option 1	**Option 2**	**Option 3**	**Option 1**	**Option 2**	**Option 3**
Construction Cost	$50,902,900	$63,365,030	$71,332,600	$54,109,400	$64,875,900	$80,583,400
Cost/m²	$8,244	$10,263	$11,553	$8,764	$10,507	$13,052

Cost Estimates do not account for project phasing.

REPUBLIC ARCHITECTURE INC

Construction Cost Overview

Feasibility Analysis

	Option 1 Replace AMFRC	Option 2 Add Fitness Centre	Option 3 Add Aquatics
Construction Costs	$50.9M - $54.1M	$63.3M - $64.9M	$71.3M - $80.6M
Difference		(Add $13M)	(Add $8M - $15M)
Salary / Operations / Maintenance Costs			
Current Facilities	$294,000	$31,000	$210,000
New Facilities	$294,000	$31,000	$303,000
Difference	$0	$0	-$93,000
Utility Costs			
Current Facilities	$234,000	$10,000	$60,000
New Facilities	$153,000	$7,000	$51,000
Difference	$81,000	$3,000	$9,000

REPUBLIC ARCHITECTURE INC

Feasibility - Costs

Community Survey

Dawson City Recreation Centre

Community Survey

REPUBLIC ARCHITECTURE INC

Please identify preferences or provide a written response to the following questions. Answers may be based on individual preferences or to represent a household.

EXAMPLE:

Fill in the box to make your selection(s).
- ☐ Item A
- ☒ Item B
- ☐ Item C

OR

Rank items by number. Use each number only once.

Item A	Item B	Item C
3	1	2

1 In which neighborhood do you reside (**select one**):

- ☐ Dredge Pond
- ☐ C-4 Tr'ondëk Subdivision
- ☐ Callison Subdivision
- ☐ Dome Subdivision
- ☐ Historic Townsite
- ☐ West Dawson
- ☐ Henderson
- ☐ Rock Creek
- ☐ Bear Creek
- ☐ Other (please specify below):

2 Based on my personal interests in the amenities currently shown in the options, I expect to use the facility (**select one for each option. This applies to both locations**):

Option 1	Option 2	Option 3
☐ less than once a month	☐ less than once a month	☐ less than once a month
☐ 1 - 2 times per month	☐ 1 - 2 times per month	☐ 1 - 2 times per month
☐ 3 – 5 times per month	☐ 3 – 5 times per month	☐ 3 – 5 times per month
☐ 6 – 10 times per month	☐ 6 – 10 times per month	☐ 6 – 10 times per month
☐ 11 - 20 times per month	☐ 11 - 20 times per month	☐ 11 - 20 times per month
☐ more than 20 times per month	☐ more than 20 times per month	☐ more than 20 times per month

3 What kind of event would you use a multipurpose room for? (**select all that apply**):

- ☐ Large meeting (ie. Business meeting, volunteer organization, etc.)
- ☐ Party/Celebration (ie. Kids birthday, family reunion, etc.)
- ☐ Group fitness (ie. Yoga, Pilates, karate, etc.)
- ☐ Business venture (ie. Massage therapy or physiotherapy clinic, client meetings, etc.)
- ☐ Club activity (ie. Chess club, book club, quilting/sewing club, etc.)
- ☐ Other
- ☐ Not interested in using this space

4 Please rank the concept design options (**indicate 1 through 6** where 1 is the preferred option, 6 is the less preferred option. **Use each number only once**):

Gold Rush Campground Site	Option 1	☐
	Option 2	☐
	Option 3	☐
Dome Road Site	Option 1	☐
	Option 2	☐
	Option 3	☐

5 My preferences in question 4 are primarily based on (**select up to 3**):

- ☐ Location
- ☐ Capital cost of the facility
- ☐ Operational cost for the day-to-day needs of the facility
- ☐ Suitability of the amenities to meet the needs of the community
- ☐ Suitability of the amenities to meet the needs of my household
- ☐ Flexibility of individual spaces to meet various needs
- ☐ Flexibility for future development
- ☐ Opportunity for revenue from community events
- ☐ Opportunity for marketing to tourism trade
- ☐ Environmental sustainability approach
- ☐ Ability to provide year-round activity offerings
- ☐ Increasing recreation options
- ☐ Other (Please describe your preference in the space provided at the end of the survey.)

6 I would make use of the following spaces (**indicate yes, no, or maybe for each space**):

YES	NO	MAYBE	
☐	☐	☐	Ice Rink
☐	☐	☐	Curling Rink
☐	☐	☐	Multipurpose/Gym
☐	☐	☐	Multipurpose/Meeting
☐	☐	☐	Fitness Centre
☐	☐	☐	Lounge/Canteen
☐	☐	☐	Indoor Playground
☐	☐	☐	Aquatic Centre
☐	☐	☐	Steam Room
☐	☐	☐	Sauna
☐	☐	☐	Walking/Running Track
☐	☐	☐	Climbing Wall

7 Please indicate the age groups represented in your household (**select all that apply**):

- ☐ Under 18 years
- ☐ 18 - 30 years
- ☐ 31 - 45 years
- ☐ 46 - 60 years
- ☐ 61 - 75
- ☐ Over 75 years

Please provide additional comments below:

Thank you for completing this survey!

2 Based on my personal interests in the amenities currently shown in the options, I expect to use the facility (**select one for each option. This applies to both locations**):

Option 1	Option 2	Option 3
☐ less than once a month	☐ less than once a month	☐ less than once a month
☐ 1 - 2 times per month	☐ 1 - 2 times per month	☐ 1 - 2 times per month
☐ 3 – 5 times per month	☐ 3 – 5 times per month	☐ 3 – 5 times per month
☐ 6 – 10 times per month	☐ 6 – 10 times per month	☐ 6 – 10 times per month
☐ 11 - 20 times per month	☐ 11 - 20 times per month	☐ 11 - 20 times per month
☐ more than 20 times per month	☐ more than 20 times per month	☐ more than 20 times per month

REPUBLIC ARCHITECTURE INC

Community Survey

Thank you!

Any additional feedback?

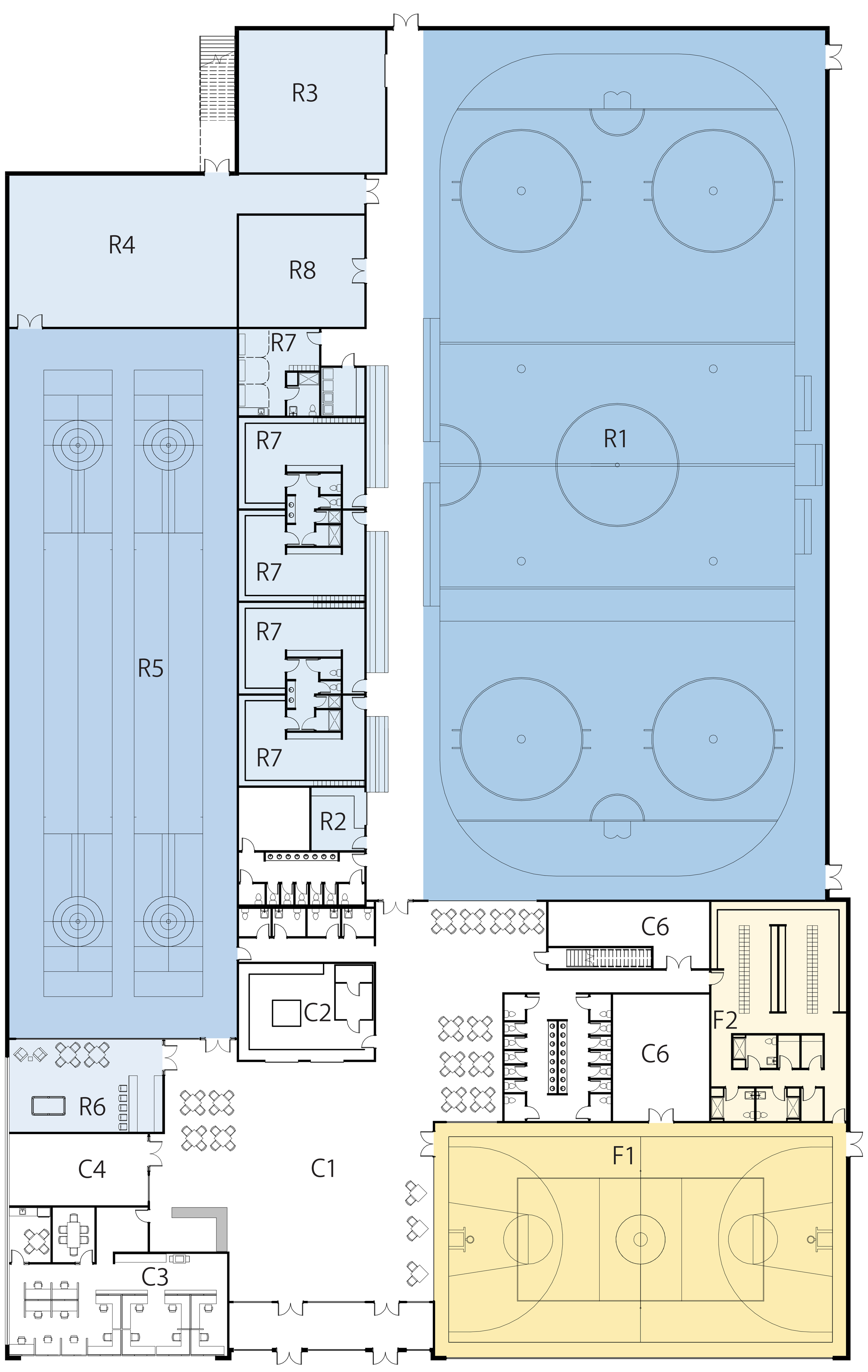
dawsonreccentre@republicarchitecture.ca

Thank you!

Any additional feedback?

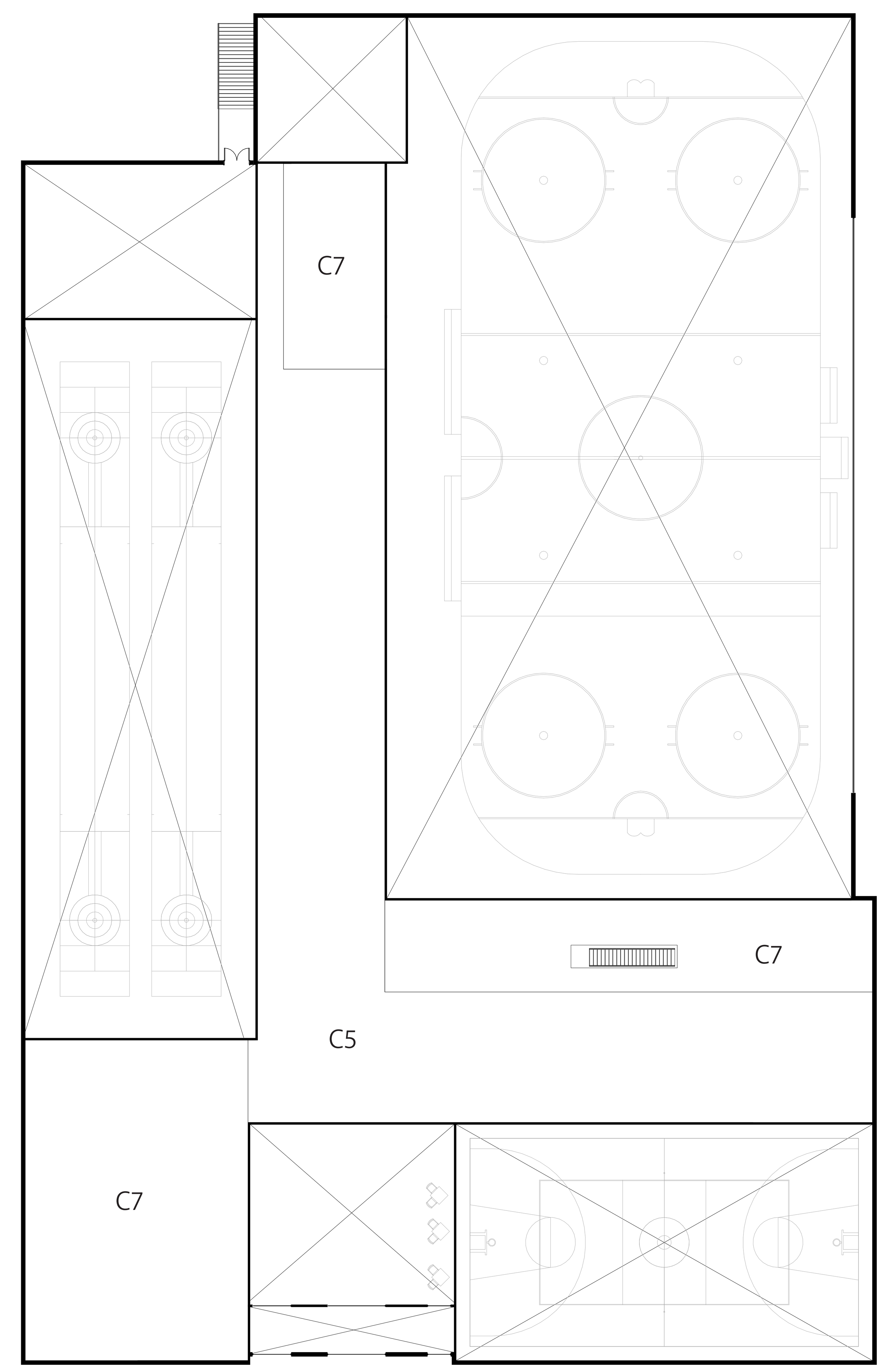
dawsonreccentre@republicarchitecture.ca

(Community Engagement)
Appendix B
Boards



MAIN FLOOR PLAN

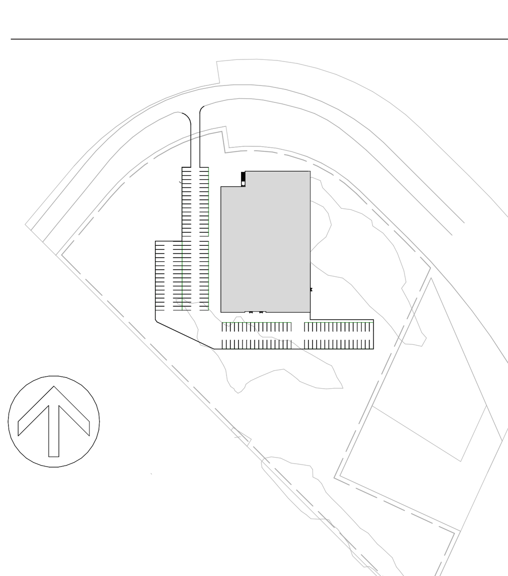
0 5 10 20



SECOND FLOOR PLAN

0 5 10 20

COMMON AMENITIES		ICE		FITNESS		AQUATICS
C1	Common Lounge	R1	Ice Rink	F1	Gymnasium	
C2	Canteen	R2	Skate Sharpening	F2	Change Room	
C3	Office	R3	Zamboni			
C4	Indoor Playground	R4	Ice Plant			
C5	Mechanical / Electrical	R5	Curling Rink			
C6	Storage	R6	Curling Lounge			
C7	Potential Unfinished Area	R7	Change Room			
		R8	Rink Storage			



DAWSON CITY RECREATION CENTRE

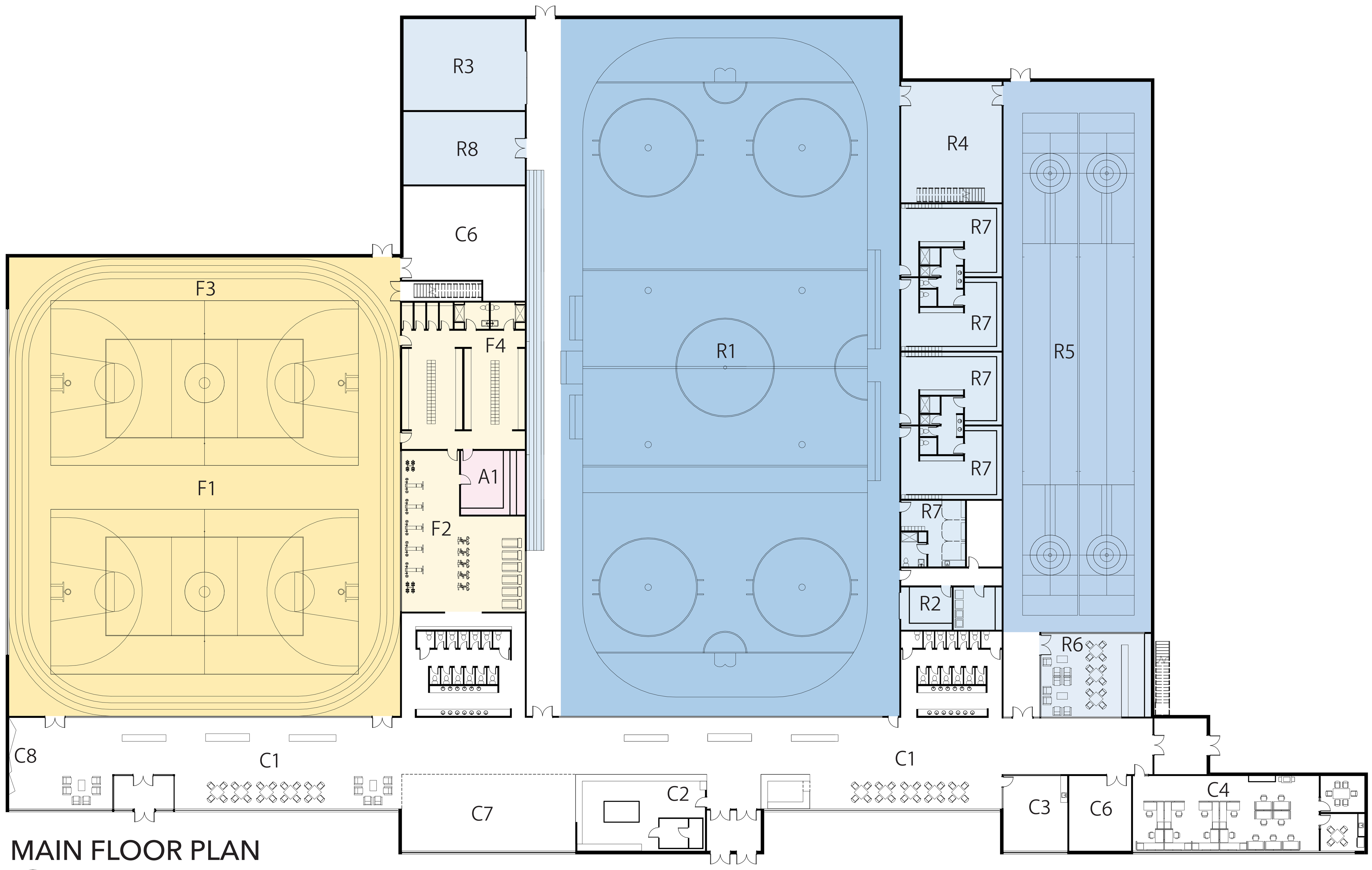
Dome Road Site - OPTION 1

TOTAL BUILDING AREA
6,590 m²

ESTIMATED CONSTRUCTION VALUE
$54,109,400.00

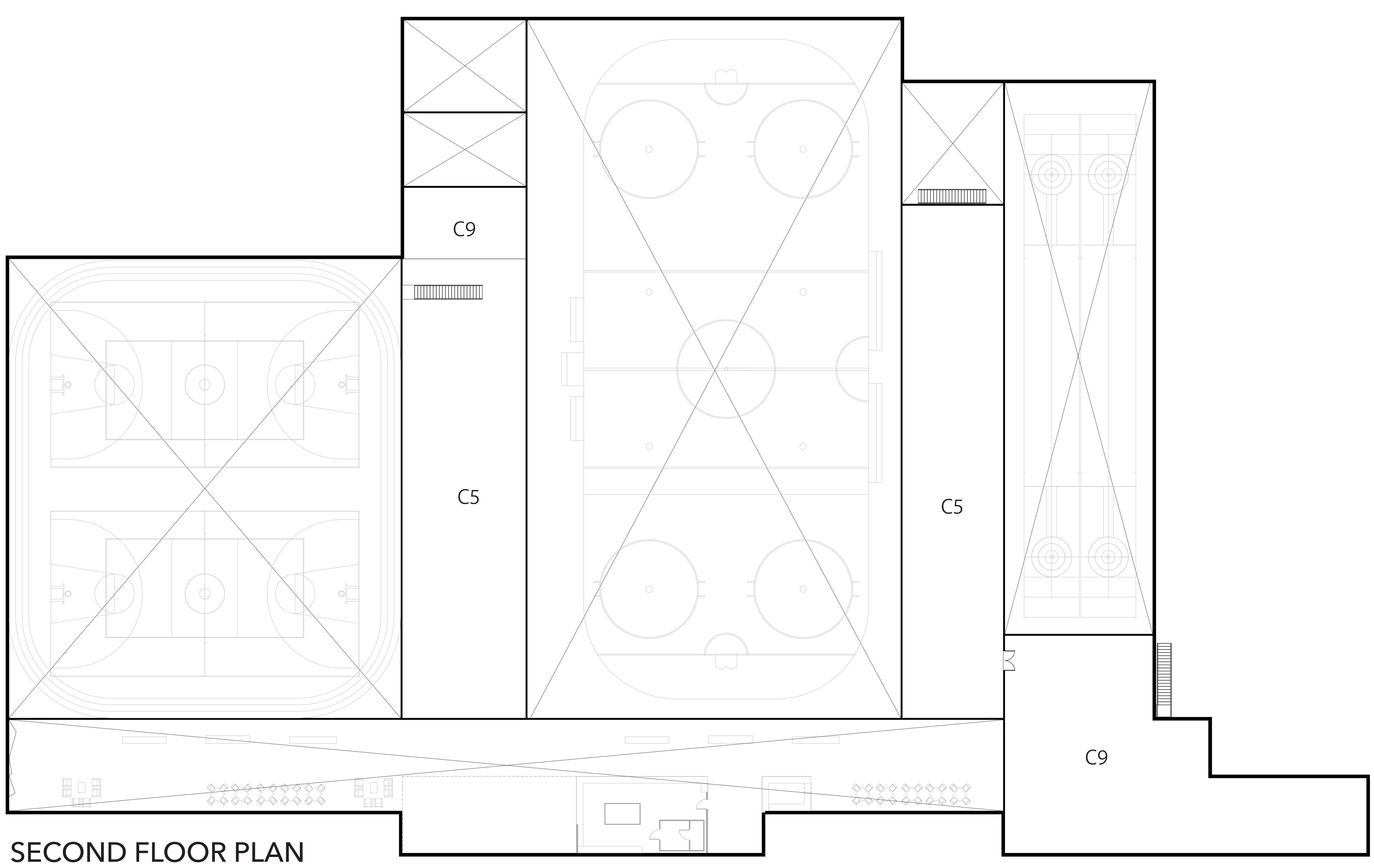
Yukon

REPUBLIC ARCHITECTURE INC



MAIN FLOOR PLAN

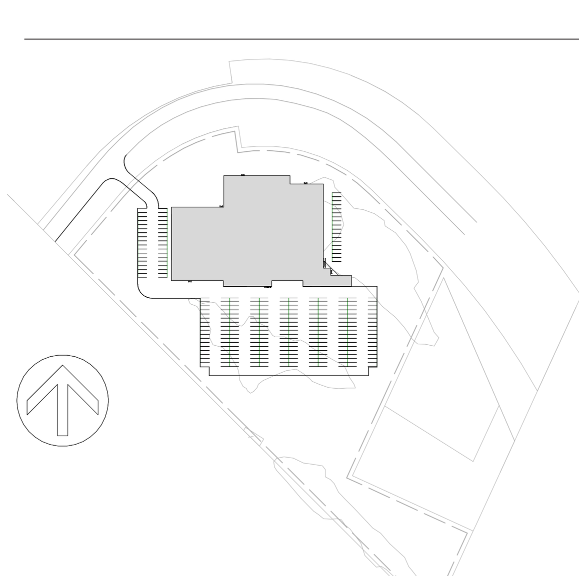
0 5 10 20



SECOND FLOOR PLAN

0 5 10 20

COMMON AMENITIES	ICE	FITNESS	AQUATICS
C1 Common Lounge	R1 Ice Rink	F1 Gymnasium	A1 Sauna
C2 Canteen	R2 Skate Sharpening	F2 Fitness Centre	
C3 Multi Use Meeting Room	R3 Zamboni	F3 Walking Track	
C4 Office	R4 Ice Plant	F4 Change Room	
C5 Mechanical / Electrical	R5 Curling Rink		
C6 Storage	R6 Curling Lounge		
C7 Indoor Playground	R7 Change Room		
C8 Climbing Wall	R8 Rink Storage		
C9 Potential Unfinished Area			



DAWSON CITY RECREATION CENTRE

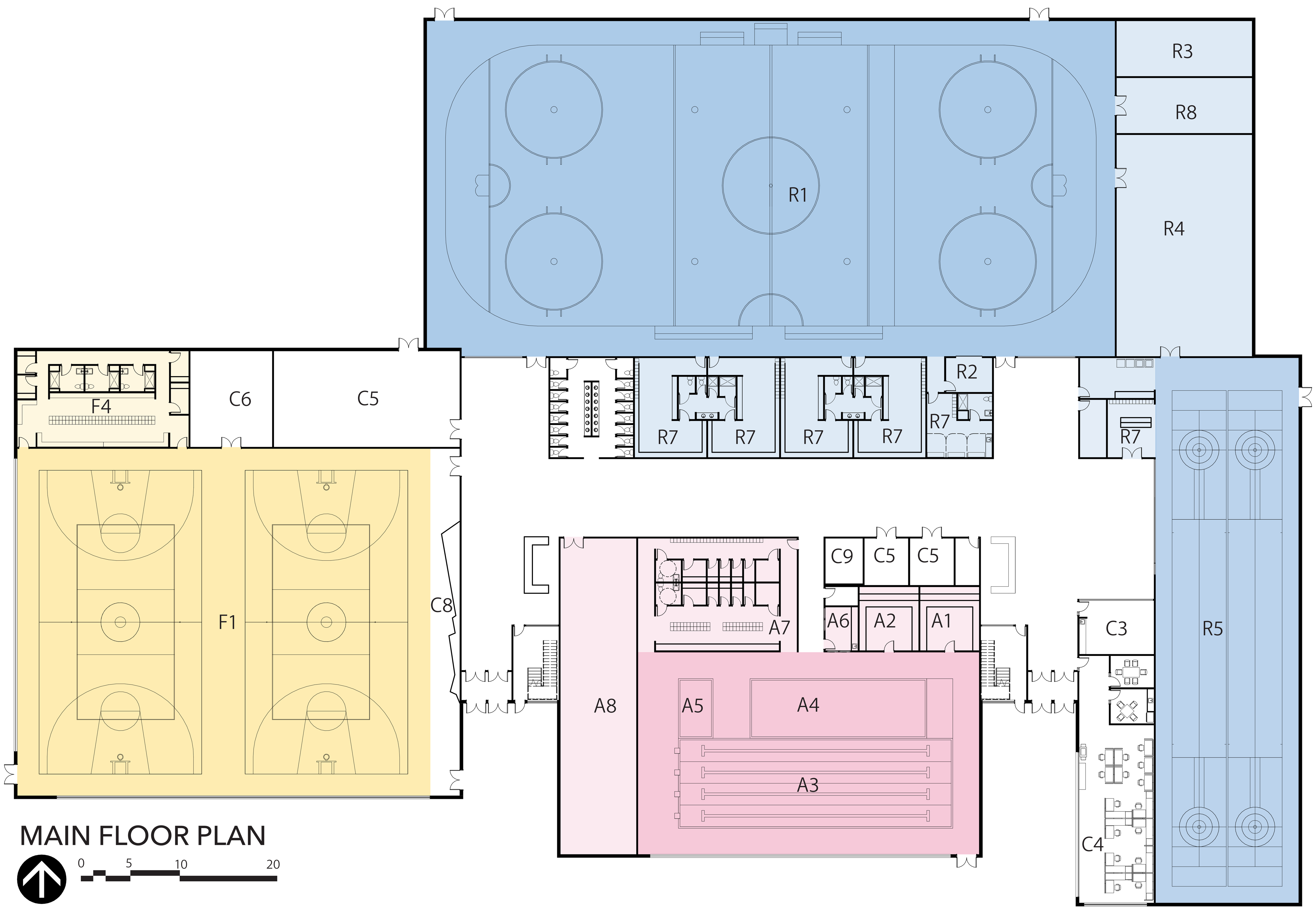
Dome Road Site - OPTION 2

TOTAL BUILDING AREA
7,918 m²

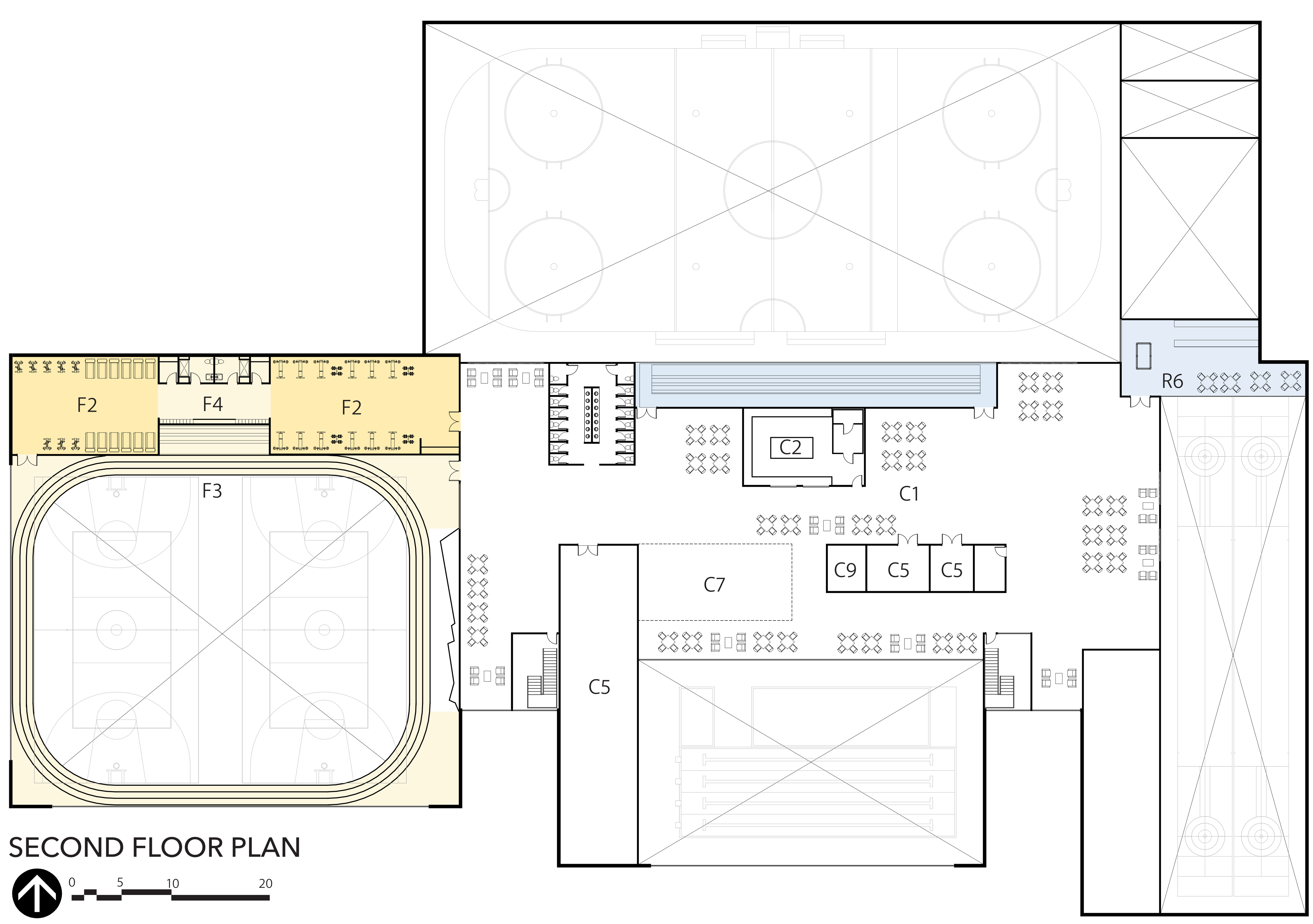
ESTIMATED CONSTRUCTION VALUE
$64,875,900.00

Yukon

REPUBLIC ARCHITECTURE INC

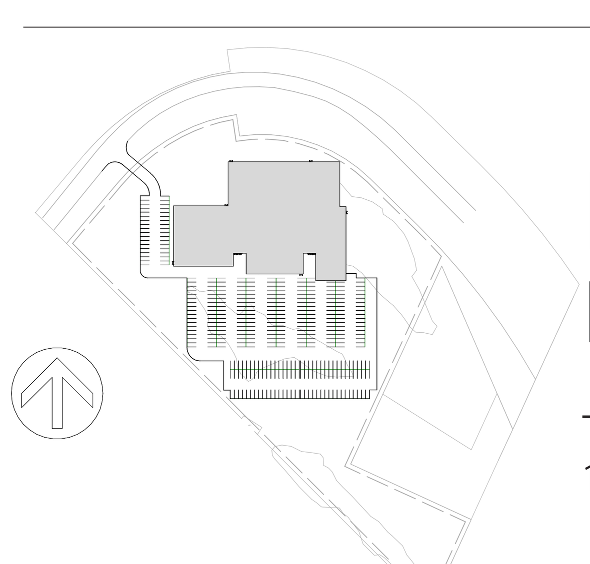


MAIN FLOOR PLAN



SECOND FLOOR PLAN

COMMON AMENITIES	ICE	FITNESS	AQUATICS
C1 Common Lounge	R1 Ice Rink	F1 Gymnasium	A1 Sauna
C2 Canteen	R2 Skate Sharpening	F2 Fitness Centre	A2 Steam Room
C3 Multi Use Meeting Room	R3 Zamboni	F3 Walking Track	A3 Lap Pool
C4 Office	R4 Ice Plant	F4 Change Room	A4 Kiddie Pool
C5 Mechanical / Electrical	R5 Curling Rink		A5 Hot Tub
C6 Storage	R6 Curling Lounge		A6 Lifeguard / First Aid
C7 Indoor Playground	R7 Change Room		A7 Change Room
C8 Climbing Wall	R8 Rink Storage		A8 Pool Mechanical
C9 Elevator			



DAWSON CITY RECREATION CENTRE

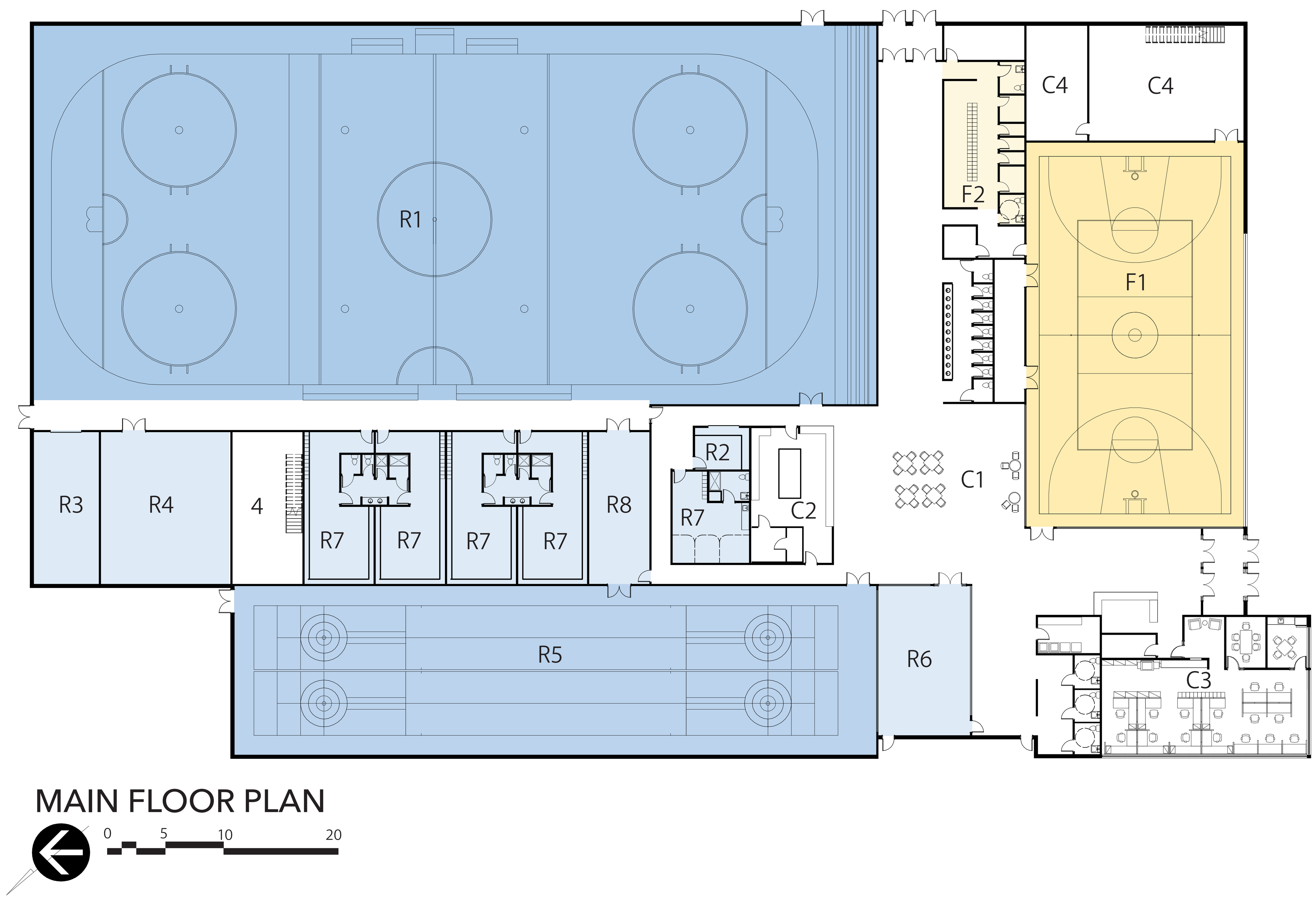
Dome Road Site - OPTION 3

TOTAL BUILDING AREA
10,363 m²

ESTIMATED CONSTRUCTION VALUE
$80,583,400.00

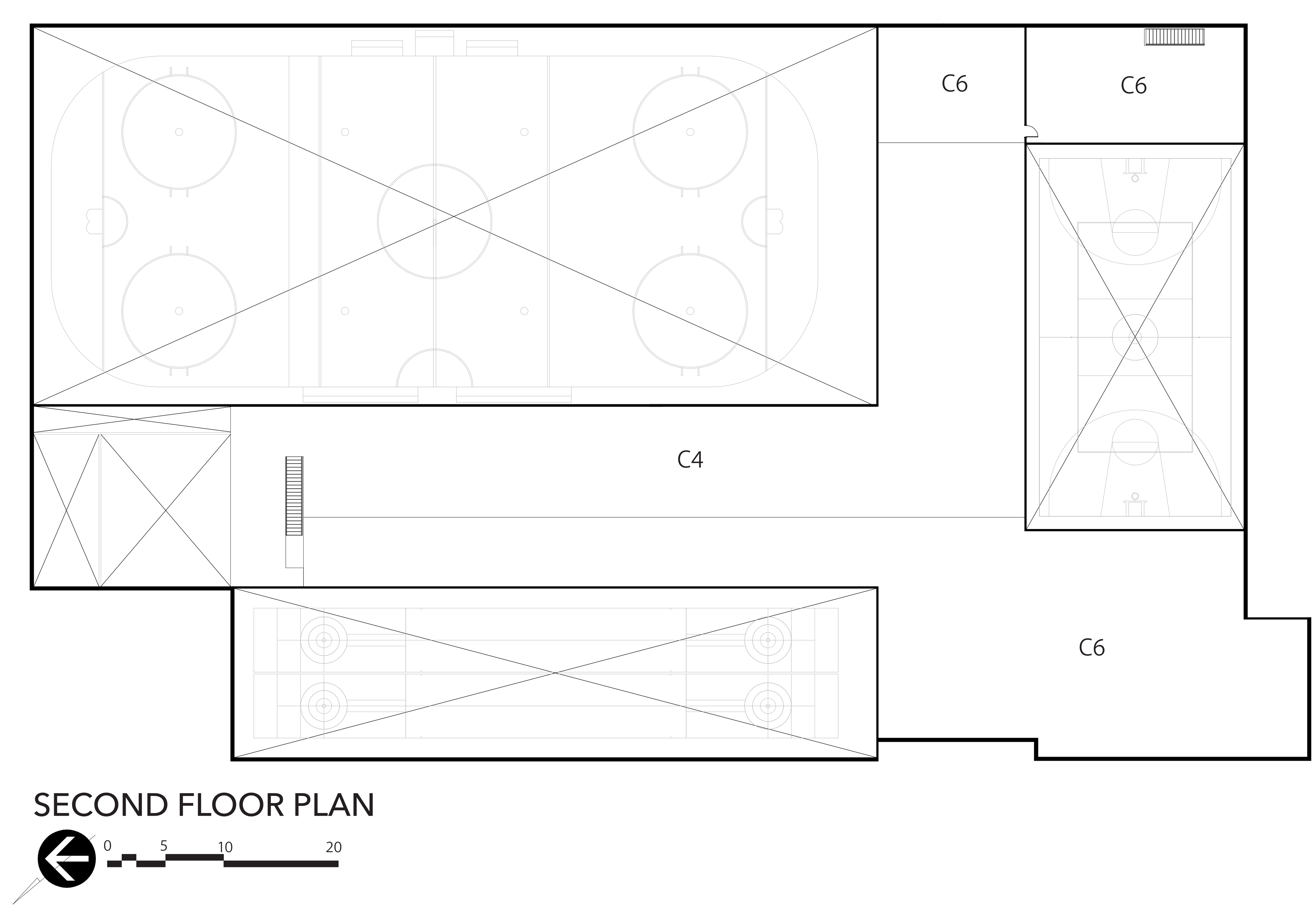
Yukon

REPUBLIC ARCHITECTURE INC



MAIN FLOOR PLAN

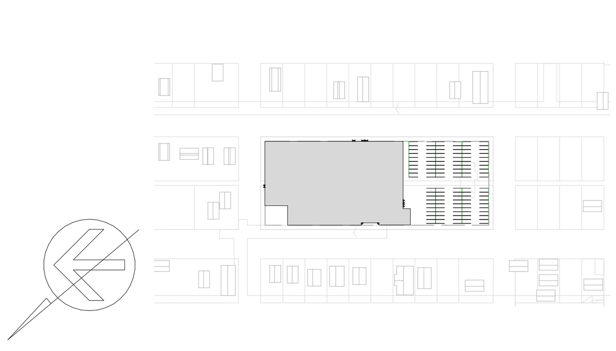
0 5 10 20



SECOND FLOOR PLAN

0 5 10 20

COMMON AMENITIES	ICE	FITNESS	AQUATICS
C1 Common Lounge	R1 Ice Rink	F1 Gymnasium	
C2 Canteen	R2 Skate Sharpening	F2 Change Room	
C3 Office	R3 Zamboni		
C4 Mechanical / Electrical	R4 Ice Plant		
C5 Storage	R5 Curling Rink		
C6 Potential Unfinished Area	R6 Curling Lounge		
	R7 Change Room		
	R8 Rink Storage		



DAWSON CITY RECREATION CENTRE

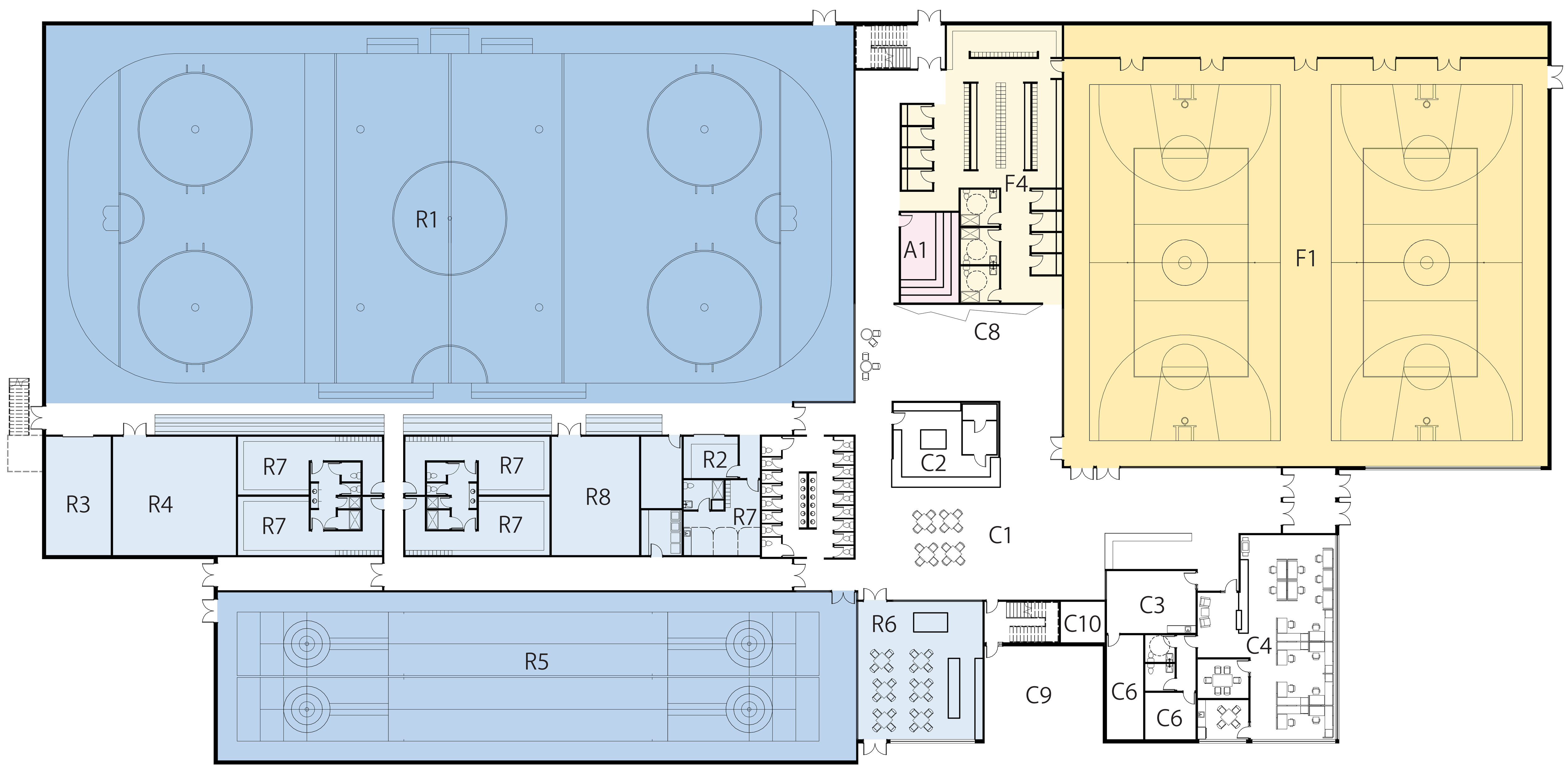
Gold Rush Site - OPTION 1

TOTAL BUILDING AREA
6,174 m²

ESTIMATED CONSTRUCTION VALUE
$50,902,900.00

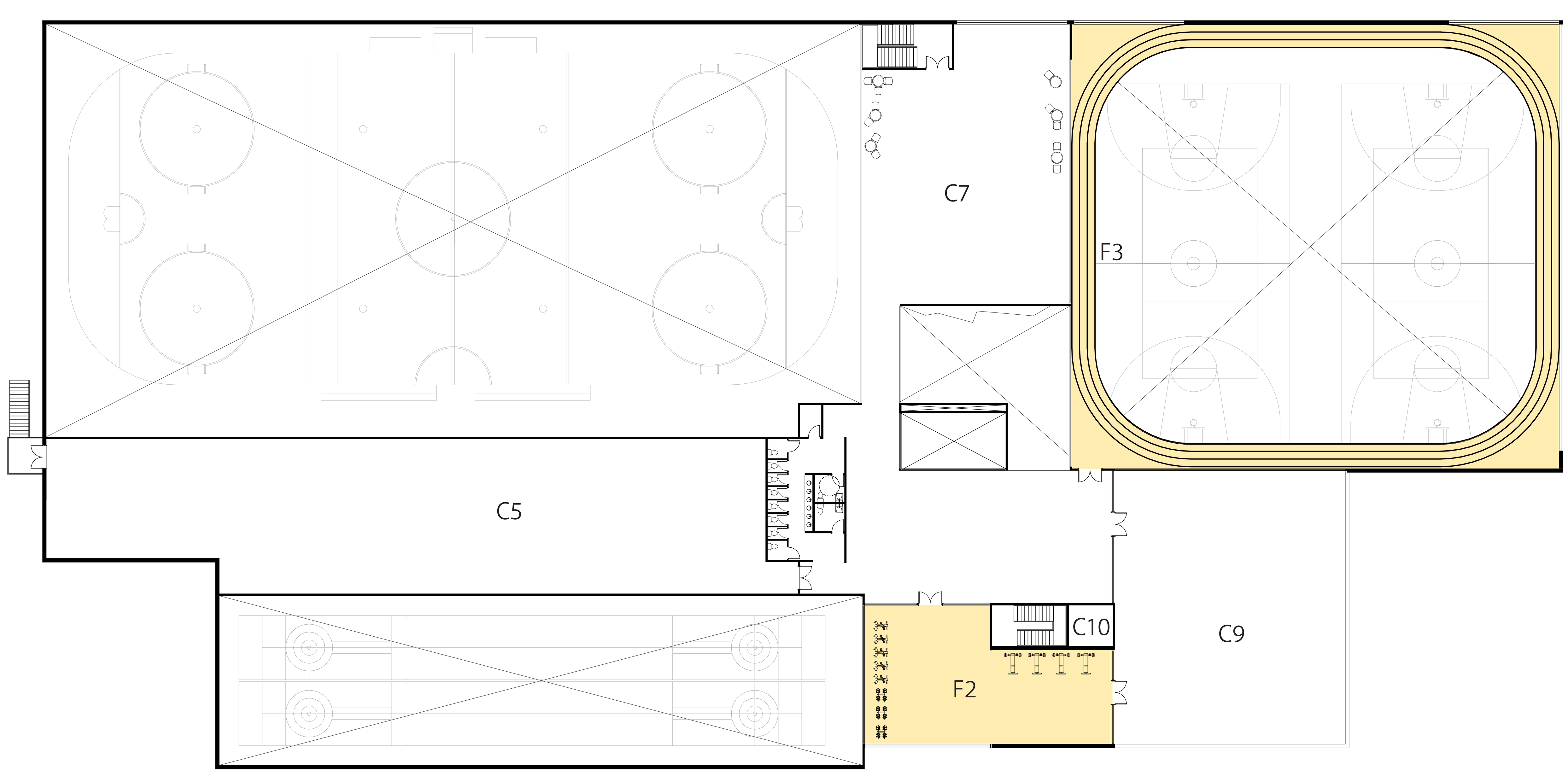
Yukon

REPUBLIC ARCHITECTURE INC



MAIN FLOOR PLAN

0 5 10 20



SECOND FLOOR PLAN

0 5 10 20

COMMON AMENITIES	ICE	FITNESS	AQUATICS
C1 Common Lounge	R1 Ice Rink	F1 Gymnasium	A1 Sauna
C2 Canteen	R2 Skate Sharpening	F2 Fitness Centre	
C3 Multi Use Meeting Room	R3 Zamboni	F3 Walking Track	
C4 Office	R4 Ice Plant	F4 Change Room	
C5 Mechanical / Electrical	R5 Curling Rink		
C6 Storage	R6 Curling Lounge		
C7 Indoor Playground	R7 Change Room		
C8 Climbing Wall	R8 Rink Storage		
C9 Outdoor Patio			
C10 Elevator			

DAWSON CITY RECREATION CENTRE

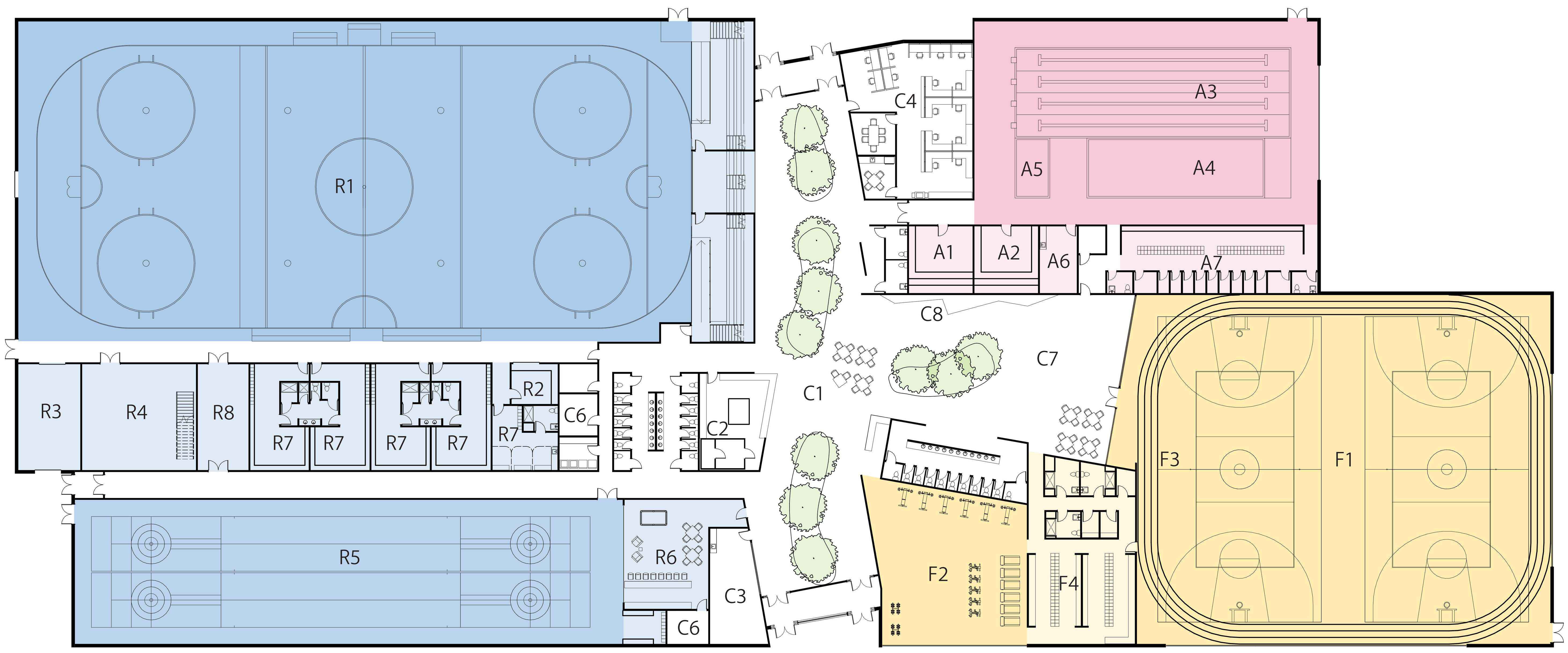
Gold Rush Site - OPTION 2

TOTAL BUILDING AREA
8,112 m²

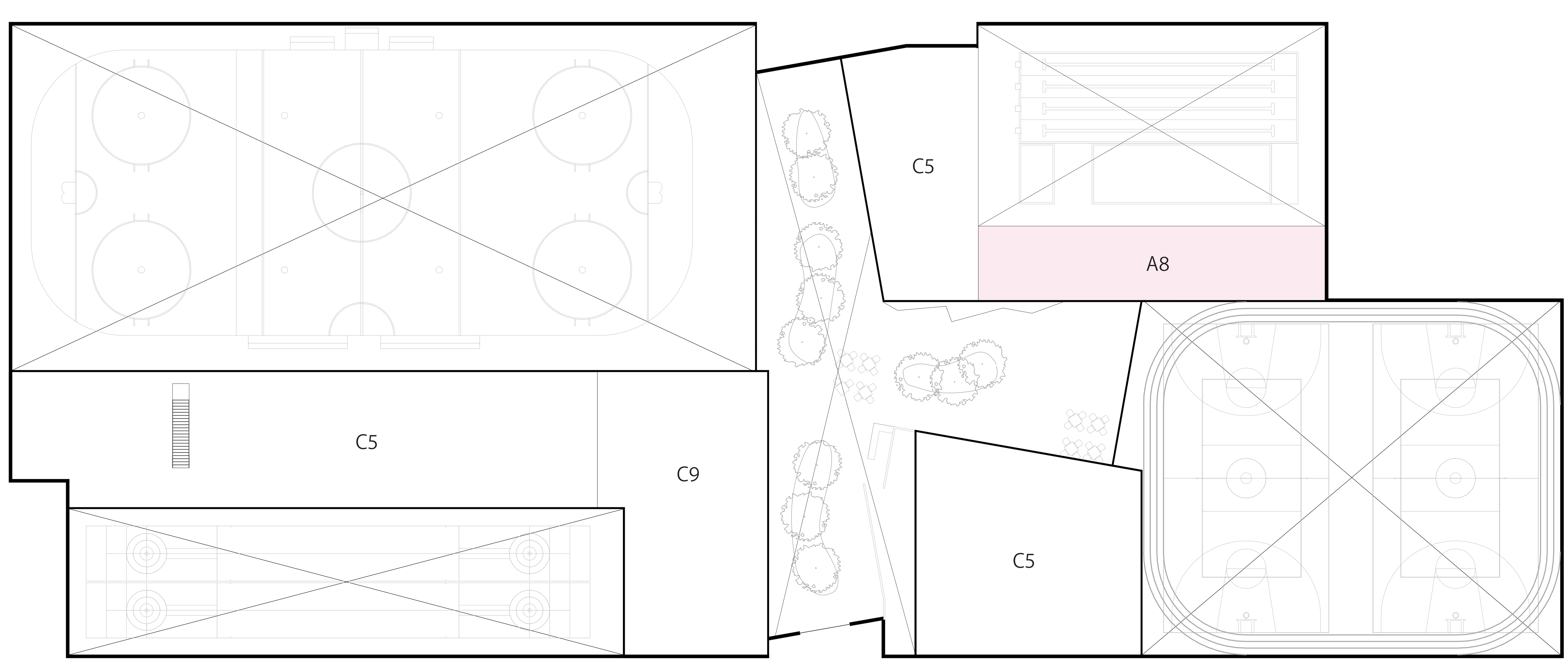
ESTIMATED CONSTRUCTION VALUE
$63,365,000.00

Yukon

REPUBLIC ARCHITECTURE INC

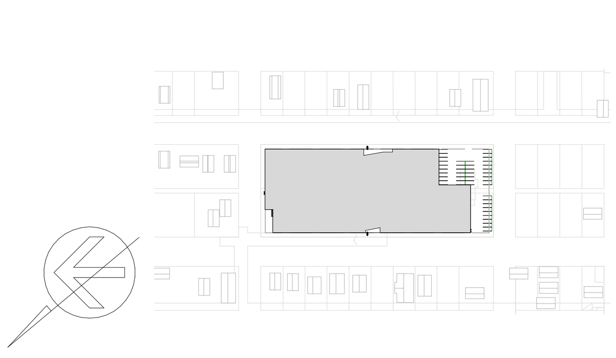


MAIN FLOOR PLAN



SECOND FLOOR PLAN

COMMON AMENITIES	ICE	FITNESS	AQUATICS
C1 Common Lounge	R1 Ice Rink	F1 Gymnasium	A1 Sauna
C2 Canteen	R2 Skate Sharpening	F2 Fitness Centre	A2 Steam Room
C3 Multi Use Meeting Room	R3 Zamboni	F3 Walking Track	A3 Lap Pool
C4 Office	R4 Ice Plant	F4 Change Room	A4 Kiddie Pool
C5 Mechanical / Electrical	R5 Curling Rink		A5 Hot Tub
C6 Storage	R6 Curling Lounge		A6 Lifeguard / First Aid
C7 Indoor Playground	R7 Change Room		A7 Change Room
C8 Climbing Wall	R8 Rink Storage		A8 Pool Mechanical
C9 Potential Unfinished Area			



DAWSON CITY RECREATION CENTRE

Gold Rush Site - OPTION 3

TOTAL BUILDING AREA
8,700 m²

ESTIMATED CONSTRUCTION VALUE
$73,332,600.00

Yukon

REPUBLIC ARCHITECTURE INC

(Community Engagement)

Appendix C

Community Survey

Dawson City Recreation Centre

Community Survey

REPUBLIC ARCHITECTURE INC

Please identify preferences or provide a written response to the following questions. Answers may be based on individual preferences or to represent a household.

EXAMPLE:

Fill in the box to make your selection(s).

- ☐ Item A
- ☒ Item B
- ☐ Item C

OR

Rank items by number. Use each number only once.

Item A	Item B	Item C
3	1	2

1

In which neighborhood do you reside (**select one**):

- ☐ Dredge Pond
- ☐ C-4 Tr'ondëk Subdivision
- ☐ Callison Subdivision
- ☐ Dome Subdivision
- ☐ Historic Townsite
- ☐ West Dawson
- ☐ Henderson
- ☐ Rock Creek
- ☐ Bear Creek
- ☐ Other (please specify below):

____

2

Based on my personal interests in the amenities currently shown in the options, I expect to use the facility (**select one for each option. This applies to both locations**):

Option 1	Option 2	Option 3
☐ less than once a month	☐ less than once a month	☐ less than once a month
☐ 1 - 2 times per month	☐ 1 - 2 times per month	☐ 1 - 2 times per month
☐ 3 – 5 times per month	☐ 3 – 5 times per month	☐ 3 – 5 times per month
☐ 6 – 10 times per month	☐ 6 – 10 times per month	☐ 6 – 10 times per month
☐ 11 - 20 times per month	☐ 11 - 20 times per month	☐ 11 - 20 times per month
☐ more than 20 times per month	☐ more than 20 times per month	☐ more than 20 times per month

3

What kind of event would you use a multipurpose room for? (**select all that apply**):

- ☐ Large meeting (ie. Business meeting, volunteer organization, etc.)
- ☐ Party/Celebration (ie. Kids birthday, family reunion, etc.)
- ☐ Group fitness (ie. Yoga, Pilates, karate, etc.)
- ☐ Business venture (ie. Massage therapy or physiotherapy clinic, client meetings, etc.)
- ☐ Club activity (ie. Chess club, book club, quilting/sewing club, etc.)
- ☐ Other
- ☐ Not interested in using this space

4

Please rank the concept design options (**indicate 1 through 6** where 1 is the preferred option, 6 is the less preferred option. **Use each number only once**):

Gold Rush Campground Site	Option 1	☐
	Option 2	☐
	Option 3	☐
Dome Road Site	Option 1	☐
	Option 2	☐
	Option 3	☐

5

My preferences in question 4 are primarily based on (**select up to 3**):

- ☐ Location
- ☐ Capital cost of the facility
- ☐ Operational cost for the day-to-day needs of the facility
- ☐ Suitability of the amenities to meet the needs of the community
- ☐ Suitability of the amenities to meet the needs of my household
- ☐ Flexibility of individual spaces to meet various needs
- ☐ Flexibility for future development
- ☐ Opportunity for revenue from community events
- ☐ Opportunity for marketing to tourism trade
- ☐ Environmental sustainability approach
- ☐ Ability to provide year-round activity offerings
- ☐ Increasing recreation options
- ☐ Other (Please describe your preference in the space provided at the end of the survey.)

6

I would make use of the following spaces (**indicate yes, no, or maybe for each space**):

YES	NO	MAYBE	
☐	☐	☐	Ice Rink
☐	☐	☐	Curling Rink
☐	☐	☐	Multipurpose/Gym
☐	☐	☐	Multipurpose/Meeting
☐	☐	☐	Fitness Centre
☐	☐	☐	Lounge/Canteen
☐	☐	☐	Indoor Playground
☐	☐	☐	Aquatic Centre
☐	☐	☐	Steam Room
☐	☐	☐	Sauna
☐	☐	☐	Walking/Running Track
☐	☐	☐	Climbing Wall

7

Please indicate the age groups represented in your household (**select all that apply**):

- ☐ Under 18 years
- ☐ 18 - 30 years
- ☐ 31 - 45 years
- ☐ 46 - 60 years
- ☐ 61 - 75
- ☐ Over 75 years

Please provide additional comments below:

Thank you for completing this survey!

(Community Engagement)

Appendix D

User Group Survey

Dawson City Recreation Centre

User Groups & Programmers Survey

REPUBLIC ARCHITECTURE INC

Complete this survey if you are responsible for running programming related to recreation in Dawson.

Please identify preferences or provide a written response to the following questions.

EXAMPLE:

Fill in the box to make your selection(s).

- ☐ Item A
- ☒ Item B
- ☐ Item C

OR

Rank items by number. Use each number only once.

Item A	Item B	Item C
3	1	2

1

Which organization(s) do you represent?

1. Soccer/Futsal - Johnny Nunan.
2. I represent 39% of kids at RSS who play soccer.
3. (229 kids total)

2

Do you anticipate your program(s) would make use of the amenities offered in the options?

- ☒ Yes
- ☐ No

If yes, what amenities are you most interested in integrating into your program? Please provide a brief description of how the amenity areas will benefit the program:

1. Option with 2 sized basketball courts in a gym. One basketball court is enough the other could be futsal sized.
2. Change rooms for gym home/away teams + officials change room
3. hot tub - for therapeutic reasons as well as recreational.
4. futsal size field is in the range of 38-42m long and 20-25m wide.
5. parking
6. weight room for training

Is there an amenity space that you feel is missing from the concept design options? If yes, please describe:

Some kind of auxiliary room which could host smaller activities like dance classes, ping pong etc.

3

Please rank the concept design options (**indicate 1 through 6** where 1 is the preferred option, 6 is the less preferred option. **Use each number** __only once__):

Gold Rush Campground Site			Dome Road Site		
Option 1	Option 2	Option 3	Option 1	Option 2	Option 3
		4	3	2	1

I ranked the option above as #1 because:

it is the most logical.

4

Please describe any team-building activities that the participants of your program typically engage in. For example, if you anticipate that the participants in your program area will all use the steam room immediately following the organized portion of the program, or if the participants always gather for refreshments immediately following the organized portion of the program, identify the activity here:

- refreshments
- weights
- hot tub (head injuries)

5

Please describe any recommendations for improvements that could be made to the way that spaces are laid out based on how your program area will use the facility. For example, if there are challenges with accommodating mixed gender team changing requirements, or if the group you lead is extraordinarily large and would not be able to function in the defined area, identify the challenge here:

- views of the gym activities is a high priority. Parents like to see their kids play.
- we would need viewing options for Arctic winter games.

Comments on the area to build a new recreation centre.

My first comment regards the Community Survey Sheet.
-for me I found #2 very vague and thus confusing. What amenities shown in the options and yes I realize we're talking about both locations? This survey sheet is based on #2. With such vagueness, the rest of the questions are weak such as, "based on my personal interests in the amenities currently shown in the options". Where are these options clearly stated? It seems a guessing game. I did not complete the survey. Thus, my written comments.

I am 100% in favour of the new complex being build at the foot of Crocus Bluff.
-the preparation of the pad for the structure seems to be much easier to construct at a considerable less expense than the campground choice. Stability is a key issue and a complex of this size needs a "guaranteed" solid foundation which seems iffy at the town site.
-the rec centre in this location would service the ball diamond, the soccer field, the walking trails, the bicycle routes and in the winter the cross country ski trails and Moose Mountain and of course future outdoor activities.
-with C-4 in the developing stage, there is a population at hand that would use the facilities. Too, with the future development of the housing development on the old claims, the new rec centre would be of great benefit to children and adults alike being on their doorstep.
-the Settlement on the tailings has grown over the years and most likely will continue to grow. The rec facilities would be a great calling card for many families with children out alone, the adults.
-in the past, the ball diamond had another use, the site for the Highland Games
-parking would most likely be considered on this site

I'm sure with public consultation there will be other reasons why this site is an excellent choice.

The Campground Location

No, to this choice.

After reading Tetra Tech Canada Inc. report, the dollar signs flashed before me and the words "assuming sufficient foundation improvements are made," along with the possibility of ground water issues. Then there's all this 'stripping' and the area that has permafrost covering. Other interesting comments were made which didn't fair well to this reader. And how much disruption over the construction of this large pad would it be to the home owners on the surrounding streets along with a certain amount of traffic disruption? How long would it take before building would begin? What if the weather was against such an enterprise? Yes, I know we have no control over the weather. Just a thought. Another thought-has a price been given for either one of this sites to be prepared for construction?

I know the city has been asked for lots to construct single family unites. Of course eyeing the campground for these lots seems the logical thing to do since the city owns the block. However, this isn't the answer either. Much would be lost in doing so. I'm sure when it comes time for public input there will be discussions.

I can't help but think that with a search of the town site there's land out there that could make good future land for homes.

eg. -vacant parcels of land owned by the city not in use,
-land owned by absentee landowners,
-privately owned derelict buildings that are beyond restoration but the land needed for future growth,

as a few suggestions for housing.

I'm looking forward to up coming public meeting(s) on this most important topic.

Thanks you for your time.

Shirley J. Pennell

993-5277

(Community Engagement)

Appendix E

Additional Comments from Survey

Q10 Please provide additional thoughts and comments below:

Answered: 136 Skipped: 241

#	RESPONSES	DATE
1	We are concerned about losing the Gold Rush campground and the positive affects on our tourism industry. Why move our present facility to a site that will probably have the same problems or worse?	3/29/2021 2:32 PM
2	Would use facilities more in winter than summer. choices are "aspirational" until/unless we have actual capital funding.	3/29/2021 2:26 PM
3	This is my wish list, but where is the money coming from?	3/29/2021 2:22 PM
4	It's been a long time waiting, now is the time.	3/29/2021 2:18 PM
5	I find we are limiting ourselves if we choose the location at the Gold Rush site. Dawson will only be growing, leaving the Dome Rd site more "central". I represent myself & my partner's opinion on this survey! 4 people household + my kids!	3/29/2021 2:16 PM
6	I think the Gold Rush Site will have the same problems with permafrost. Should be built on tailings.	3/29/2021 2:09 PM
7	I know we are a small community, but I really feel that a pool would be great for us in the winter. I also think that offices for therapists would be a beneficial too. I would also like a place to rollerskate, could this happen in the multipurpose room?	3/29/2021 2:09 PM
8	Please ensure that the "multi purpose" space is large enough to run large groups of classes. I am a local dance, fitness, yoga instructor and run many groups but have been limited in the past due to a lack of available space and also a space not large enough to accommodate the needs of these classes (example: only able to register a few clients due to a small studio space and having a waitlist more than double the size of the class). The gym, even with an accordion wall barrier will be too loud for yoga classes. Please consider installing mirrors, barres for ballet and dance classes and think about the safety of flooring (sprung floors are proper flooring for these activities).	3/23/2021 12:49 AM
9	Please design us something we can afford. Why do we need a steam room? Or sauna? Or hot tub? How do we afford that?	3/21/2021 3:17 PM
10	Please include a public laundromat and showers not just for those living off-grid but also for miners, and to take pressure off of the private sector who can barely keep up with demand	3/19/2021 9:08 PM
11	Pool + sauna pls! In town location for seniors, elders, school/daycare access + environmental reasons - at lease some pple could walk. Also accessibility for visitors. Don’t need two gyms, one is good. Like the suspended walking track concept. Really dig the indoor plants/garden/courtyard idea - would be so nice in the winter	3/19/2021 8:37 PM
12	The gold rush location should not be considered. How can we have a full Rec facility with no parking? Our community culture is one which drives to recreation activities even when they are in town. Look at the arena, baseball field, fitness centre, Minto park, pool, for examples (the feasibility should have, but didn’t, consider the current traffic rates for our red facilities, before recommending the gold rush location. It is unrealistic to think that the GR location will sway the public to change their behaviour. What we can expect are traffic issues and parking all over in every which way. (Note the feasibility study doesn’t consider impacts to traffic or the cost of road upgrades, another shortfall of the study). A facility without parking does not meet the needs of the community and will be limiting if the community decides to host events such as tournaments for multiple communities. I love the idea of having a year round pool but I am weary of the cost and question whether we can afford to operate a pool year round. The feasibility study doesn’t look at this and it needs to. The dome location offers opportunities to expand the area, if need be, and will be close to c-4 the new expanded dome subdivision area as well as being easily accessible by the historic town and all other subdivisons. It is the more logical location option of the two being presented. I attended the presentation by the city’s consultants about the feasibility study. I was incredibly disappointed to see that no one from	3/19/2021 8:13 PM

	city council was present at the meeting. It is hard to feel like the community's concerns are being taken seriously when not a single decision maker shows up to a community engagement event. I was left feeling frustrated and let down. The session wasn't recorded so city council can't even watch it. I expect at least some representation from mayor and council for public engagement events in the future. If it isn't important enough for city council to attend, why should we bother as citizens? We are all busy but some of us came out to learn and share our views. Views I am not at all confident we're heard or even recorded.	
13	I believe it's Important to start offering more options for everyone. Right now, the sports facilities available in my opinion, are not very inclusive.	3/19/2021 8:01 PM
14	I have a physical disability & appreciateaccessibility. I would have difficulty getting to Dome site.	3/19/2021 6:21 PM
15	I think that rebuilding the rec centre in its current location would be optimal. I think the campground lot would be preferable to the Dome lot. I think other options for in town should be explored such as Fort Herchmer. I think it is imperative for as many children and youth as to be able to get to the rec centre without having to be driven. This is more important to me than for a tourist have to drive in order to visit the businesses and attractions in town.	3/19/2021 5:00 PM
16	I feel the rec center should be located at the dome road site so that the gold rush site could then be used for residential housing which is badly needed at this time. This would also be better for parking options as well. The gold rush site is a very low cost development option for housing since the infrastructure is already in place. You can always move the gold rush campground to the mud bog area under the slide. I am concerned about the existing mineral rites tied to the dome road site however. It seems this should have been confirmed to not be an issue prior to spending any consideration, time, effort or money on design options for this site. How do you propose to deal with the existing mineral rites and the conflict around land use at this site? A year round pool as well as an indoor playground would be such amazing assets to this community. I see some concerns with some of the designs where they do not appear to provide ice level bleachers behind the player's benches. I think this should be a must in the designs, especially when considering how parents can interact with their kids playing hockey. I also feel the curling lounge would be best directly attached to the curling rink rather than separated by a floor. The separation would make it awkward for curlers going from lounge to rink and vice versa if they had to walk trough other parts of the facility to get to stairs. I think the indoor playground should be self contained in its own room. I don't like the gold rush option 3 design for the indoor playground where it seems to be in the middle of common space. Also why isn't there an indoor playground in goldrush option 1? I did not view the presentation and only looked at the concept options drawings. That being said, I did not see any info on O&M cost of this facility. What would be the impact of operating a facility like this on the tax payers? How much more taxes/user fees should we expect to pay if one of the option 3s were built? Why can't we have an option 3 with swimming pool but only one gym? I'm not sure we would need two gyms.	3/19/2021 12:20 PM
17	Indoor playground!!! Indoor year-round pool!!! For the love of god, give these poor kids somewhere to burn off steam when it's -40!!	3/19/2021 11:14 AM
18	Please don't screw this up	3/19/2021 10:55 AM
19	As much as I would like a full time functioning gym and fitness centre, I'm concerned that the Rec Department is once again overreaching. Similar to when they build the original rink/curling rink and intended to put a track and fitness center on the second floor. Please ensure you hire an engineer suitable and capable of drafting plans in an area with permafrost. I'd hate to see ANOTHER of the Rec Departments plans come unraveling.	3/19/2021 10:34 AM
20	Bowling hall	3/19/2021 10:19 AM
21	It would be great to have a BOWLING ALLEY here in dawson. So much family and friends fun times!! Never understood why there isn't one?	3/19/2021 8:01 AM
22	I personally would like to keep costs down, but I don't believe there was a reasonable option there for me and my family. I think a year round pool would be a necessity, as I have a young family and am often concerned with the small amount of time my children get to learn to swim. The current pool only being open 3 months a year is not enough time, and during the winter it would be a huge benefit to have a pool. I would like to see a basic setup with an ice rink, curling rink, and a pool, maybe a climbing wall. We currently have the gym in the school that I believe is adequate for the community.	3/18/2021 11:40 PM

23	Year round swimming pool sauna,steam room. physiotherapy options!!	3/18/2021 11:12 PM
24	My preference is for Gold Rush - option2. I believe this option provides a variety of valuable spaces for recreation - including a climbing wall, and an indoor playground - two facilities this town needs. I do not think this new recreation facility needs to have a pool. The primary goal should be to replace the Art and Margaret Fry Building. Adding a pool complicates the matter and greatly increases the construction cost and O&M cost. The current pool is functional. I do not think a year round pool would get used much in the winter. I also think it is important to keep the recreation center in town. It is more accessible to the community in town, particularly the daycares and school. Having the facility in town provides a warm, safe place for children that need it. A recreation centre located in town adds to the community feel which Dawson takes pride in. Finally, I think that we should be moving away from a driving culture. Having the recreation center out of town would force most users to drive. Having the recreation center in town eliminates the need to drive for some locals, but also for visitors such as hockey/curling teams in town for a tournament, or visitors in town for a conference.	3/18/2021 11:04 PM
25	Put in a squash court. And put this thing on the dome.	3/18/2021 9:27 PM
26	Don’t shut down the Gold Rush RV It’s very very important that the tourists have a place to park thier RV in the summer Build it at the Dome Road	3/18/2021 7:34 PM
27	Year round indoor pool. This time... let's do it! I was raised in a “winter city” and swam 2 -4 times a week my entire youth. (I stood outside in -30, in the dark to catch the bus home - so it can be done.) I have never been much for team sports and prefer less aggressive activity, but as a kid I did take on many different water based sports which suited my nature. Swimming has remained with me as my first choice of activity. After 30+ years, there are only three things I don't like about living in Dawson and one is the lack a year round pool. Summers are too busy to try and shove a 6am swim into (if the youth life guards actually show up and the chemicals are not out of balance). Winters are slower and there's more opportunity to add a fitness routine. It would be nice to see a pool culture built here and see the changes on health and fitness for a very wide range of people. I skated last year for something to do- and I can do it and even can skate backwards, but the fear of falling outweighed the enjoyment. You get to an age and if you aren't into the team sport then its just a danger rather than a joy. I like swimming. Swimming and aquatic fitness are “cradle to grave” activity. Children as young as 6 months benefit from water activity and if the entrance and exit to the pool is built correctly, elders and +50 people can enjoy pain free activity and social engagement (aqua aerobics and water yoga). This can not be said for curling or hockey or a climbing wall. If the change rooms and poolside areas are built correctly, access by all ages and fear of falling is reduced. Pools are the best exercise for pregnant people both pre and post natal. Programs where kids are in their classes and mothers can take a class or take a swim support health, vitality and post party depression avoidance. Swimming builds long, lean muscles, complete flexibility, robust lungs, supported circulatory system and strong joints. It's a completely different kind of fitness and vitality. You can't really damage your body swimming- with the exception of diving and water polo/hockey. This can not be said about other sports. Pools create a warm and enjoyable space for families or friends to gather end enjoy themselves while exercising. Kids are clean and tired at the end of their Sunday afternoon swim. Swimming and aquatic classes are safe, healthy and enjoyable. A year round pool - if built correctly- could support individual use, but also swim clubs like diving, water polo/ underwater hockey, synchronized swimming and speed swimming. Swimming promotes healthy muscle tone in all ages and is a recommended approach to healing injury (that are often from sports like hockey and other contact activity). Many people fall in the winter and a pool is a good way to recover using low impact and water resistance. I know people who have had to move to Whitehorse or points south to do their rehab from surgeries because water is the preferred system. That is a big expense and impact on local employers and families. Swimming could be included in the Robert Service School gym /fitness programs and Yukon Government could pay fees for use thus gaining revenue. Also use by McDonald Lodge. Maybe revenue generation with that too. Being in a warm, large room enjoying a swim or a aquatic class promotes good mental health. It shortens the winters and aids in the fight on depression. Many people live in small spaces, often with many other people. A pool makes you feel like you can spread out and been free for a couple hours. Hockey does not do this- its all brain, aggressiveness and cardio. This isn't for everyone. In swimming you can put on your goggles and ear plugs and be alone in the warmth and be fully supported while you exercise. It’s the best. Swimming and the Red Cross program is an excellent after school activity. Dawson will have qualified pool staff if it is a year round facility (rather than a summer job) this provides good local employment. Many families like to travel and having children (or adults) that are experienced and confident swimmers means safer and more enjoyable trips outside. Same for summer lake trips. Teen and youth recreation can be	3/18/2021 6:07 PM

	built into year round programming adding more activity and non ”team sport” activity. In other northern pools innovative programming included projection of water themed films for kids, teens and adults while people float around on inflatable. Warm, clean fun in winter. Swimming and aquatic programming provides activity for retired people or under employed / seasonal people in winter. So many people move away as you get to certain age and the only thing left to do is go for coffee and take a yoga class. Revenue generation- pools can be rented for events and birthdays. This with a meeting space for cake and snacks, a pool makes the base for a healthy and enjoyable party. Every kid in our community has a birthday ($) and those born in winter have limited options for a kid friendly space. You could contact the Canada Games Centre and see how many rentals of this sort they have. I have rented the Dawson pool twice for a private party. Made for a special occasion. When consultation for the last pool was underway, I suggested a laundry facility as part of the plan. I still think this is a good idea. Many people without running water (both local and summer seasonal) will utilize the pool showers. If there was laundry services at hand, I think parents/ people could be doing laundry while kids are doing activities. They would also sit and eat in the cafe if there was one. The City could lease the laundry facility out as they do the snack bar at the Art and Maggie Fry Centre. Dawson does not have enough facilities for people without water. This is a solution and maybe a small revenue generator and business development. I think the City should lease out a space to the CPMP (healthy Mothers/Healthy Babies programs). This would be good revenue from a federal funded program that is so supportive to families in Dawson. A multi-use facility would be an ideal place for a base for this organization especially if it had a cafe, pool and place for the kids to get wild and run around. We have excellent employment opportunities in Dawson but good winter indoor recreation as well as housing issues makes it less attractive to professionals to move here. Build a year round pool.	
28	The site that has been chosen in downtown Dawson, is totally unacceptable, due to the proven problems of sinking and shifting ground. Having lived in Dawson, my own house went through this. The site by the ballpark off the newer Dome Rd is a much better building site, having tailings and thawed stable ground to build on and room for the addition buildings to be built at a later time. We definitely don’t need another rec centre plagued with problems like what we’re experiencing now.	3/18/2021 3:40 PM
29	If the Gold Rush site is chosen, we must be absolutely certain that the ground is stable enough for the facility. In addition, if the Gold Rush campground is closed and used to build a rec facility, consider offering the Dome Road site to the Gold Rush campground owners if possible. And, where is a sewage treatment plant going?	3/18/2021 2:51 PM
30	With our ageing population, the need for an adequate year round aquafitting is increasing.	3/18/2021 2:15 PM
31	The existing Goldrush campground site is an important tourist attraction. The Dome Road site is more appropriate for a sports "multiplex".	3/18/2021 1:59 PM
32	I understand the initial capital cost might seem prohibitive, but having a long term plan for a multifaceted centre, rather than just "replacing" the failing arena seems wisest to me. If we are investing this much into the town, let's do it right and meet the needs. Having a year round pool will have a dramatic effect on my health and quality of life and I can think of many others who would as well.	3/18/2021 1:57 PM
33	We need a year round pool; it is essential. We live near a River so for safety, children and adults need To understand water safety and that comes From experience in a more controlled environment with coaches, instructors and staff. The current situation with our make-shift Pool that is barely functioning for the few months we have access is deplorable. It’s honestly one of a few reasons I’d consider moving...the lack of (pool) facilities is embarrassing. I’m grateful it’s beginning to be addressed. Without a pool, the ‘new’ facility is a band-aid solution to the need and desires of the community at large.	3/18/2021 12:59 PM
34	Do not support the Goldrush Campground site.	3/18/2021 11:50 AM
35	I think a year round pool for the kids would be a great thing. But personally if there isn’t a fitness centre\gym included in the building i won’t be using the facilities.	3/18/2021 10:58 AM
36	Design should include public showers and laundry	3/18/2021 1:59 AM
37	Need year round swimming pool	3/18/2021 1:30 AM
38	While a pool would be amazing, it is evident that at people complain about recreational option but few use them. I’m often the only one at public skate with my kids, for example. If you build a pool please separate the lanes from the leisure pool. The current pool is freezing,	3/18/2021 12:07 AM

	unpleasant, and the temperature is a big deterrent. Whatever you build it would be great if it worked, period.	
39	I think the location by the dome road would be less cost effective, the ground is so much better then in town, the building will have such a better foundation, the location is also mid central for all of Dawson. Plus you can use the in town lots for future housing as there is such a shortage in that area.	3/17/2021 10:16 PM
40	Under the Dome Road is in walking distance from town, the Dome and Tr'ondek subdivision, Mary McLeod Rd and a good walk or bike ride from Dredge Pond subdivision. In town there is a shortage of space for housing lot's. Saving land for homes rather than recreational. Also the large building will be better supported on the grounds under the Dome Road. There will be room for future expansion.	3/17/2021 10:01 PM
41	I really would like to see future plans for developing racquet sports such as squash, racketball, pickle ball and even indoor tennis. I feel these are sports that are often missing in communities and there is a desire and need. During our long, cold winters it is very beneficial in building a healthy community to have options for indoor sports like racquet sports. They develop specific skills and fulfill needs for all age groups.	3/17/2021 6:46 PM
42	Considering the fact that the dome road site has been mined, I believe that the ground is much more stable than the permafrost in town. Which I think makes it more desirable to avoid the structural problems we're currently having. I also think that I'd like to see the city mainly focus on bringing new activities to Dawson, rather than moving the ones we already have, unless it's financially profitable to do so. It would be nice to be able to swim in the winter, but repurposing that building sounds like a costly endeavor. As a climbing enthusiast, I love that there are plans to bring indoor rock climbing to Dawson, but I find the climbing wall placement on the Gold Rush 2 project dangerous. I find it unsafe to be climbing in a lounging area where people will be walking around, possibly not paying attention to people climbing overhead. I love the idea of multi-purpose rooms. I know a few residents who are eager to organize weekly events but can't host them due to the lack of designated spaces.	3/17/2021 6:26 PM
43	Please don't let the current owners of the Gold Rush Campground and their buddies determine the future of this community.	3/17/2021 6:22 PM
44	If the mineral rights with Darrell Carey are sorted out I think that the best option for Dawson is to build the Recreation Center at the Dome Road location. However, I then think that the Gold Rush site should be converted to residential lots which would provide at least 20 new lots with very good cost recovery for the city, and most likely even a profit. An RV Park could be put in the north end where the Mud Bogs are, land unsuitable for any permanent structures but would be lovely for camping/an RV park. This would also alleviate the concerns of Dawsonites who worry about how removing the RV park from the downtown core could effect commercial businesses. While I list the Gold Rush site option 3 as my #1 choice for design I would like to see this design at the Dome Road location for the above-mentioned reasons. This is my preferred design choice but if it can't be located at the Dome Road than Dome Road option 3 would be my #1 choice with the following considerations: 1. I strongly feel that two gymnasiums, regardless of the design, is excessive and unnecessary for our small community. I think that one gymnasium would be great and able to meet the recreational needs of Dawson. 2. I am so happy to see an indoor playground in these designs. As a parent of two small children this is something that I really long for throughout the winter, especially on really cold days when outside play is limited. However, i na few of the designs it looks as though the indoor playground isn't a separate, enclosed space. I think it is very important for the indoor playground to be an enclosed room so it's easier for parents to keep there kids contained and to minimize sound travel from the rest of the rec center. I also feel like it's veyr important for this indoor playground to be large enough to let kids get out all their energy! In a few of the designs it looks like it might be quite small. 3. While it may seem like dreaming big to have a year-round aquatic center, I feel it would be amazing for the mental and physical health of this community. I think that a year-round pool would be especially beneficial to children, seniors and folks with disabilities throughout the long winter months. Many people are unable to use the skating rink so this puts big limitations on the available recreation for them during the winter. The low-impact activities that a pool provides would be so beneficial to so many people.	3/17/2021 5:18 PM
45	I attended the very first meeting on the 7th. I am not really in agreement with any of the plans. As a board member of the curling club, we have not been approached to find out our needs as a club. The space provided for the curling lounges are very small and no storage space in most of the designs. As a club, we need storage, and viewing. we have a 100year old pool table that has been with the club and moved. We also carry a liquor licence, which would not	3/17/2021 3:26 PM

	be able to function out of the small spaces designed. Please consult the parties prior to drawing a design. As long as the ground is properly prepared, either location is fine. I do not believe that an aquatic centre is needed in the facility, seems it would only cause more headaches. In my opinion we only need the ice surfaces, but a better design, and maybe one gym if needed. Thanks for listening.	
46	I worry about the safety of our kids around so many rivers and ponds. There is not enough time when the pool is open or the ponds are warm enough to learn to swim properly. If we are going to spend the money to build a year round rec centre it should get the most use possible. Our family will buy a membership for each of us every year for the rest of our lives.	3/17/2021 10:55 AM
47	I much prefer the idea of siting the new rec centre at Minto Park, as presented in the Stantec report.	3/17/2021 9:43 AM
48	The land in Dawson, where the Rec Centre is now and where the proposed site in Dawson is planned (the location of the town campground is) has been proven to be unstable for construction for a large building. Building on swampy ground, is always going to cause issues. How many times has this been proven? The land is sinking and creates problems. Lots of problems over the years. Using the site by the Dome Rd out by the ball diamonds is stable with no risk of sinking or settling, would provide a stable, thawed site to build a Rec Centre.	3/17/2021 4:06 AM
49	Shared washrooms/showers between hockey changerooms is a recipe for conflict. You don’t need big showers or washrooms here - two showers nozzles, one toilet, one sink is plenty. Hardly anyone showers in the changerooms currently.	3/17/2021 2:44 AM
50	Please plan a space for the snooker table to stay a part of public rec space	3/16/2021 9:15 PM
51	Important to look at year round use, especially for aquatic centre. I don’t use the summer only facility much because summers are too busy. Winter availablity would be amazing! Also want to stress importance of energy efficiency to make them sustainable operating cost in the long run. Worth the upfront cost	3/16/2021 8:42 PM
52	I think the Dome road option is more central and allow more people to access it easily. (We often see a lot of car parked everywhere when there's hockey practice). I aslo think that to have that kind of building in town would disfigure it, a big bloc, I'm not sure people living around would be happy to have that in front of there place. I know I wouldn't. I choose option 3 because the thought of having a year around swimming pool would be awesome. As a last comment, I would find it really interesting to add a bouldering gym with the climbing wall.	3/16/2021 4:47 PM
53	I would suggest the addition of at least 1 squash/racquetball court, please and thank you!	3/16/2021 12:37 PM
54	Parking space is so limited downtown, as is room for outdoor space activities like the Gold Show. And that will negatively impact residents, especially in the winter when the streets are narrow and people leave their vehicles running outside the rec centre.	3/16/2021 10:05 AM
55	thanks for everything you guys are doing	3/16/2021 12:35 AM
56	I missed whether there was adequate seating area for arena spectators. Why has there been no opportunity to provide more detailed feedback. The options seem like they're already pre-packaged. I hope we end up with something that suits our community needs.	3/16/2021 12:31 AM
57	I would not be supportive of any of the options for the goldfish campground site as I don't think the balance of amenities and access for ALL of Dawson is good. Even a facility that had more amenities in the townsite would result in increased traffic. I don't think that encouraging increased vehicle traffic in a downtown area is a good step forward for the transportation planning for our community. We already have significant parking on street from the existing rec centre and I know of at least 2 people who drive less than a block to the arena because it is more convenient when transporting children and sports equipment. I think this will be at least as bad if not worse for any new facility, b ut having the facility out of town will provide better options for parking and congestion management. Providing a dedicated walking/cycling path from the downtown area to the dome road site would be a much better option in my opinion for those people who would walk or cycle to the new facility. Having the site out of town would also make it a much more accessible space for the future residential development plans out of the historic town site. encouraging population growth out of town would result in more people travelling into the town to use facilities and so add to congestion. Being outside of the historic town site would also allow for a more flexible approach to architectural design at a lower cost because of the cost savings on groundworks and engineering associated with better building conditions according to the geotechnical surveys. The concept ideas for the dome road option	3/15/2021 11:05 PM

	3 (with the most amenities) is a great starting point, I would suggest some differences in layout, particularly around the layout of change rooms and would suggest the inclusion of a soft play area that could be used as a creche facility for parents so that they can use facilities while their children are cared for. Some outdoor gathering space, perhaps on a rooftop would also be nice for use in the summer months. The fitness centre we currently have is already too small for our community so having at least double the space is essential for housing the equipment necessary for a good quality gym/fitness centre. The inclusion of a multi-purpose indoor space that can be used for everything from yoga to circuit training is a great idea, as is the climbing wall. I know a good number of people who would use a climbing wall and if it had bouldering and soft landing that would be even better and make it a more flexible amenity. I also think it is important to include a year-round pool and wet facilities. I would again suggest some layout changes when it came to final designs but essentially having them more closely associated with the change rooms would be preferable. I also think including a few spaces that could be utilised by physiotherapists, massage therapists, beauty therapists etc would provide a good revenue stream for the city. As a therapist, I would lease a reasonably priced space in a full amenity recreation centre to be able to help people access services in a convenient way. I can't say strongly enough how important having the whole range of services suggested in concept 3 is forth the wellbeing of the community and the be able to support our growing population. I also can't say strongly enough how much I think having this facility inside the historic townsite is a mistake. Being out of town will give greater opportunity for development and future growth as well as making the most of the opportunities for renewable energy production.	
58	I have lived in Dawson now for over 4 years and have heard countless residents wish that the swimming pool was year round. I myself used to be an ardent swimmer and loved the physical and emotional health benefits of aquatic fitness and the steam and sauna facilities. As a registered nurse, I must say as well, that the aquatic facilities (pool, sauna, hot tub) would provide a huge health resource for physical wellness and rehabilitation (physiotherapy) for this community. I cannot emphasize enough how much we need a recreation facility that includes full aquatic facilities. As a resident and health professional, I would be overjoyed to have this resource available to us all! Thank you! Fingers are crossed! :-)	3/15/2021 8:19 PM
59	TOWN LOCATION IS RIDICULOUS! DO NOT USE THIS LOCATION. IT WOULD BE GREAT IF WE HAD A FACILITY THAT ACTUALLY WORKED IN ALL ASPECTS!	3/15/2021 8:17 PM
60	Do not want to see it built in the middle of town. Better suited with the outdoor activity space at the bottom of the Dome	3/15/2021 4:57 PM
61	with a ball diamond and soccer field already at the crocus site, it makes sense to keep everything together.	3/15/2021 1:44 PM
62	I prefer the Dome location as the intown would remove the RV Park which brings in revenue for local business.	3/15/2021 1:36 PM
63	I don't believe it's necessary to have more than 1 basketball court in the new facility.	3/15/2021 1:39 AM
64	Dawson is a growing community, and as such the location should be one that we can grow into- which is the Dome. A large recreation facility at Gold Rush will be out of place amongst all the homes and can only be built a certain size- there is no room for growth. I believe that accessibility to the Dome location can be thought of after by way of carpooling, shuttles and school buses for kids. Many people living in and around Dawson own cars- or snowmobiles for winter and walking biking in summer. For those who cannot walk such as seniors and kids there is room for a shuttle service to be put in place, or run programming directly after school and school bus the kids out there. It is imperative for the gymnasium space to be able to have dance/fitness/yoga classes. A sprung floor (at least over some sections) would be preferable. Making sure the double gym can be adequately divided so that sound doesn't travel is necessary. Should have a sound system. One side of mirrored walls is also a must. Otherwise a separate large studio space should be considered. Trying to condense viewing areas for the arenas into one would be great social activities. Love the idea of an outdoor patio. Definitely the indoor playground is necessary for families. I think if budget allows, an aquatic centre would be heavily utilized year round. Considering that we have a pool only in summer that is barely ever open, might as well cut our losses and build something that works and can be staffed. I love the idea of a climbing wall, but it might invite issues with kids if it is near a play area. A non supervised climbing wall wouldn't be safe, but it's unsustainable to have it supervised all the time. A hot tub/sauna/steam room situation, even without a pool would be awesome for the winter months!!	3/15/2021 12:26 AM

65	The design of the facility should take into account first and foremost replacing the existing winter use facility. Designed to function efficiently and Can be used to there full potential without creating unaffordable user fees in a small community.	3/14/2021 4:40 PM
66	two different court options (soccer and basketball)	3/13/2021 10:39 PM
67	I feel if the new facility is constructed and placed at the existing Gold Rush campground location, it would drastically reduce and effect the communities strong tourism industry. It would also reduce the potential opportunities for local businesses, which is the heart of the community.	3/13/2021 8:53 PM
68	I really don't see how the gold rush campsite layouts would fit.. where is parking?	3/13/2021 4:02 PM
69	Year round pool and hot tub essential! (Sauna and steam room not necessary) Climbing wall great addition. Location would be best central in town so majority of kids/people can walk to/from. However I worry about stability of ground at Gold Rush site	3/13/2021 2:30 AM
70	Thank you for providing us with a new facility. Living here for 22 yrs and winters included. Please I beg of the powers that be.. to put a year round pool in. Please	3/12/2021 11:47 PM
71	I would love to see an aquatic centre in Dawson. It is very important to me that my children learn to swim and we would use this facility often. An indoor play room would also be very useful, especially during our long winters!!	3/12/2021 10:52 PM
72	There are many people in the community that would love to see a squash quart in this rec centre! Please consider this!	3/12/2021 9:13 PM
73	Year round swimming pool Will help people so much more then an indoor gym	3/12/2021 8:53 PM
74	Thanks for allowing my input	3/11/2021 8:51 PM
75	I feel that the Dome location is the best choice for the future and expansion of Dawson City. We also have are soccer field and baseball field beside that location. It's the true central are of are community when considering Dome,C4, Bear creek and downtown.	3/11/2021 8:20 PM
76	Hello and Good day, I am pleased to hear about this project. The facilities I'd like to see are as follows; A gymnastics set up -a spring board floor -rings -vault -trampolines An area capable of teaching professional dance. We have a few year round residents, that are professional dancers, and we also have many seasoned damcers as well. Thank you for your consideration, Thank you for this opportunity. God bless you and your team	3/11/2021 8:09 PM
77	Being surrounded by rivers makes it even more important to have exceptional aquatic services here in our community !!!!!	3/11/2021 7:57 PM
78	Working in the tourism industry I see the high value of having a campground in town, as well that it is always at capacity. We are a unique tourism town with a casino, people need a walking campground with services to spend their money. Having the rec centre outside of town will be closer to the new Dome subdivision, as well to Henderson, Rock Creek, Bear Creek, Dredge Pound, C4, Dredge road, South end of town. Then the old rec centre, pool and current fitness centre will open lots and opportunities for new developments. Right now with the rec centre in town people are driving there and the roads around it are full of vehicles, even people living close are driving(and they have to carry their big ice hockey bags). You can see in the evenings how the parking is too small. Knowledge is showing that the ground is way better in the dome side(and sustainable), we should not make the mistake twice for the bad ground. If this Centre is there for the next 50years and with a growing population let's have option #3, it will be well use and then more expensive to build a third rec centre...	3/11/2021 2:28 PM
79	Why is there no running track on the done road option?	3/11/2021 1:06 PM
80	Go big or go home put it all in one area crea lots of room in town for future development	3/10/2021 7:48 PM
81	I see 2 gymnasiums in some of the plans. Could we consider adding racquetball/squash courts instead. We already have gyms at the school and we could use new activities that we don't already have. Especially for people that don't play hockey.	3/10/2021 5:20 PM
82	If we put it in west Dawson maybe the government will build us a bridge!	3/10/2021 4:35 PM
83	No room for a squash court or half tennis court?	3/10/2021 3:31 PM
84	My concern is that there is a lack of long-term planning for the vision we are trying to achieve	3/10/2021 3:23 PM

	for this "centre". In my view, the scope of work for this project or the concept development should prioritize the development of a long-term "hub" of recreation rather than a discrete centre or facility. In this way, the in-town location is not suitable. The Dome location offers the potential to not only actually offer the parking requirements necessary for the facility, but also the opportunity for growth. The proximity to the river and existing walking trails into town, and the potential to connect to walking trail networks on the dome (including existing cross country ski trails) and farther south into the Klondike Valley offers incredible potential for a recreational hub in this community. Furthermore, Dawson is only growing and this growth is likely to keep creeping outside the historic downtown core into areas adjacent to or near by the Dome site. In the long run, this location is much more likely to serve the majority of the community even though it is farther from downtown. On top of all this, there is significant apprehension (as I am sure has been evident by now) in the community in regards to ground stability and the failures we face with our existing facility. While feasibility studies may indicate suitable ground conditions (with modifications) to the existing Gold Rush site, I would suspect the selection of an area free of permafrost altogether, such as is offered by the Dome site, offers a level of security and peace of mind to residents and builders alike. In summary, I urge the concept developers to push the City of Dawson to consider the need for a recreational "hub" with potential growth rather than a discrete "facility". Additionally, while the site selection decision is for Mayor and Council, I urge the concept developers to consider resident apprehension to ground stability as a significant factor in what is conceived as a "suitable" site for consideration. Thank you for your efforts, this is not an easy task.	
85	Obviously, cost is a huge factor, both in construction and ongoing maintenance. However, if this is a facility that will be built with the long term vision of Dawson, the importance of access to a proper fitness and aquatic centre cannot be overstated. If properly executed, the centre would be a massive boost to our community's year-round recreation possibilities ands would be a facility that we can all be proud of. I would love to see a bold step taken to achieve this, but understand that it may not be possible.	3/10/2021 2:20 PM
86	I love the idea of a year round pool. I know that it will get more use in the winter then it does in the summer and create more job opportunities for students in lifeguarding. Having everything in one space will enable families to enjoy the facility.	3/10/2021 12:43 PM
87	I hope there is another survey for the location debate! I live south of the klondike and I felt I had no input on the location decision based on those questions in this survey!	3/10/2021 12:07 PM
88	This survey is ridiculous just like every other survey that has come in past few years. Why did I have to rank every option from one to six when I didn't like any? Why are you trying to build a facility that we will never be able to afford to maintain? Why not build a basic arena/curling rink that has the ability to be built onto in the future if needed.	3/10/2021 11:41 AM
89	Although I love the idea of having a aquatic Centre attached to the new Rec centre it just does not seem feasible for our town and I do not understand how the city would handle the upkeep and running of it when we haven't had our regular operational for 2 years now. It seems extra and I would rather have a reliable Rec centre that meets what the community actually needs and the city is able to manage the upkeep well.	3/10/2021 11:16 AM
90	Maybe a football/soccer field	3/10/2021 12:29 AM
91	The year around swimming pool (+sauna) are the most needed facilities in town. If there is such a big project going to be planned, let include these for sure.	3/10/2021 12:03 AM
92	Considering the different reports by Tetra tech and Stantec that have been published regarding the 2 different sites, it seems obvious that the Dome road site is a better location for the next Rec Centre. Having the Rec Centre outside of town seemed to also have been largely approved by the community from what the report says about the engagement survey done by the city about this question. It would reduce pollution in town because of the number of vehicles idling in the winter over there. Plus, it will make it more accessible to the numerous (and future) subdivisions south or east of town. I actually just drove by the actual Rec Centre after viewing the meeting tonight and the parking was full and overflowing on 4th and 5th Avenue. I recognized a lot of vehicles to be people I know that live in town. It is obvious that hockey players come to the Arena with so much gear that it makes it much easier to drive over there. The Gold Rush site is too small and I believe having such a big building in a more residential part of town would ruin the views and peacefulness of the people living along 4th and 5th avenue. Going with option 3 of the dome road site makes it great to have year round facilities including the pool. Then, the lots of the old Rec centre and the pool can be sold or leased to bring an income to the city. Those could be multi residential lots to also improve the	3/9/2021 11:32 PM

	housing situation in town. It's a win-win situation! That could also mean that the Gold Rush campground could remain where it is as there would be plenty of housing lots available then. It is not worth kicking a good profitable business for town out when there is that perfect empty space at the bottom of the dome to build the Rec Centre. Also, the current fitness centre can also be re-purpused and create another income of lease or rental of the building. We have to ensure in the new Rec Centre that the fitness centre needs to be a bit bigger than the current one as it can be quite busy in there at the rush hours. It also needs a higher ceiling to be able to do proper exercises. Also, just as a thought, maybe the curling rink and the hockey rink could be side by side in the new building to avoid having two separate non-heated spaces in the building? The fact that every option has them separated by a heated section makes it probably harder to heat the space. Having the two rinks closer would probably improve the projected heating costs of the Rec Centre. The bigger Dome road option might be more expensive, but it is worth doing it all good now, on solid ground where there is no permafrost, instead of repeating the same errors that have been made with large buildings in this town. I am fairly sure that there is room in the Federal and Territorial governments to fund this kind of project. Recreation is important. Also, the room for future development is important and the proximity of exterior baseball and soccer fields at the bottom of the dome road make it a perfect location. I work outside of town and in the summer, on my way back from work, I see kids playing in those fields litteraly every night. And there are no vehicles in the parking lot. Proof that kids who want to participate in recreational programs can walk or bike to the bottom of the Dome road for it. I laughed in one of the reports because they said that if they close the Gold Rush campground because they want to put the are Centre central, RV'ers would have to stay at the campgrounds outside of town and it's "only" 3.5kms from town. So tourists with no vehicles other than RVs that are probably hooked up and leveled for the night (mostly retired people we have to say) are going to be told that they can walk to town because it's not that far but locals are told they can't walk to the bottom of the dome road for Recreation because it's too far when in factx, if someone leaves from the far end of the North end of Dawson, it's not even 3kms to the Dome Road? Isn't that ironic? I am going to stop now as I could keep going but I feel the main points I wanted to bring are there. Thank you for listening to the residents of Dawson and it's surroundings and hopefully going with the best option in the end.	
93	I think one thing I would consider is the usability if the center is in town. If attendees of the intended rec center were already prone to driving to town for its use, and that's something that is being considered anyways, to me, it makes sense that in town would be a viable option. Especially for kids who are getting out of school, who might want something to do that doesn't rely on their parents. As for parking, perhaps the old rec center could be used as such? I think it's going to be a while before tourism becomes a trophy holder for income for the city, and with the increase in mining, development is well on it's way. It's especially important to consider folks in West Dawson who already have an arduous task of travelling to town in the winter, and having an in town access to showers is important also to consider. Another idea to consider perhaps, is the existence of a fitness center already? Perhaps that could be used to make room for more access to parking for those less abled. Much to think about, I think this is a huge asset to this community and I can't wait to see what happens. Kayla	3/9/2021 9:52 PM
94	I asked both questions at the engagement meeting, but I want to emphasize my concern around two areas, namely the community's child-aged population: 1. The playground space is currently designed as a very small indoor playground to serve a handful of 5 -10 year olds at a time, however, a tremendous need is a warm, dry play space for early years children aged 0-4 and their parents/caregivers to get together and provide social and age-appropriate play opportunities given that children aged 5 and up, while definitely also in need of a warm, dry playground, do have recreation options available. I would strongly advocate for the inclusion of a much larger, dry space/playground that can accommodate children from 0-10 years of age. 2. The Dawson's non-for-profit daycare, Little Blue, is currently housed in an unsuitable, small, and failing building (heat, foundation, space etc.) with a waitlist as big or larger than the current capacity of children they can offer care for. Given the proposed population growth come 2040 and with consideration to the tremendous funds being requested, it would make sense to consider the inclusion of a daycare space that either Little Blue can lease from the City or other. This gap in service has been worsening year-to-year with the increase in babies born per year and the static cap of daycare availability to families. I would encourage the revisitation of a daycare space as a way to meet the needs of families and their kids with an opportunity for reliable and suitable daycare space. 3. One item that surprised me was the seeming non-assessment of whether our community's taxes could support the proposed facilities, whether via maintenance, utilities or staff. I would assume before any concepts are offered, this is taken into primary consideration in order to ensure offering of a realistic facility, not only in terms of site feasibility, but longterm costs. 4. Finally, what intent is there for timelines and if	3/9/2021 9:49 PM

	the Goldrush site was used, what would happen with recreation for the duration of the build? Thank you for your consideration!	
95	I think the Do e Road is an excellent location, ore room for additional amenities etc. Whereas the campground you are limited, I also think the campground is important for all the tourists that come to our fair town	3/9/2021 9:47 PM
96	I passionately believe that Dawson's kids (and us adults) would benefit greatly from a year round swimming pool, the younger that kids are when they learn to swim and be comfortable in water, the safer they will be for the rest their lives around water. It is extremely good exercise for everyone and can be enjoyed in all seasons with the right facility. Thanks	3/9/2021 9:42 PM
97	I am hoping that this happens. However I do hope that the groups involved in this decision make sure to make a decision that benefits the community. I also want them to make the correct decision for location as the town has a history of making rushed decisions and regretting it in the end. Thanks for all that you do.	3/9/2021 7:39 PM
98	Lap pool with depth for diving so that younger persons can get certifications	3/9/2021 7:12 PM
99	All options with the swimming pool are absurd. It is irresponsible to consult the community about facilities that the City is in no position to afford to build or even more importantly... to operate. I am shocked that you are wasting people's time and raising people's hopes up yet again in this way. WHY ARE YOU SETTING YOURSELVES UP FOR FAILURE?????????!!!!!	3/9/2021 5:47 PM
100	I would love if I could roller skate in the gymnasium. Can this happen?	3/9/2021 5:44 PM
101	I think option three regardless of location should be prioritize. Our youth are struggling and need more winter indoor recreation spaces where they can partake in healthy physical activities. Our community needs a year round swimming pool/aquatic centre and we should prioritize this in the new facility. I have heard many youth speak to needing more gym time and increased gym spaces for recreational sports such as basketball, so by offering larger recreational spaces in the new facility to have more gym time would benefit the community and youth greatly	3/9/2021 5:25 PM
102	Being honest I found this survey very poor. Maybe I have misunderstood and I am ahead of the project and there will be another survey later? I was not fulfilled at all after completing the survey. I was expecting Many questions about do you drive, walk, bike?, do you want this center to be like the CGC where you can hang out and eat dinner with you family on a late night playing sports?, if built on dome road will there be a cross walk to cross the hwy or will there be a path along the base of crocus? Will the baseball diamond washrooms be removed? How will this affect Transnorth helicopters? There is many questions left unanswered. I am currently living in whitehorse for this winter and I have noticed alot of issues with projects being built around the city but not fully thought out. Yes Dodge and the yukon in general are growing quickly but I would hate for something that can change the future of dawson in the youth through sport to be ruined by ill planed projects. I am not concerned with any of the data presented i am concerned with the lact of voice from the people on Dawson's biggest investment ever!	3/9/2021 3:25 PM
103	just don't build this in the town... go make an engineered pad outside of town.	3/9/2021 3:03 PM
104	There's a strong need and desire for a year round pool in Dawson	3/9/2021 2:33 PM
105	I personally think that having the fitness centre and the two gym spaces would be a huge asset to our community. I am somewhat worried that the O&M for a swimming pool and the staff requirements would prove to be too expensive. My one caveat about having the facility in town, is that the school uses the rink frequently in the winter. If the school can accomodate using the facility if it is at C-4, I would be more supportive of having it out of town.	3/9/2021 2:28 PM
106	Absolutely no shared bathrooms and showers in arena dressing rooms. They are problematic and inconvenient at best as well as unsecure areas at times. I have been in arenas with this setup elsewhere and no one likes them. Absolutely no!	3/9/2021 2:16 PM
107	Since its construction, the current pool has had ongoing maintenance and mechanical problems, which have been patch-worked to a barely functional level. The hot tub is rarely operational. The facility is expensive to operate for a brief and unpredictable season. A new facility without the incorporation of a year-round predictably available pool would be a mistake. On a further note, a high quality canteen would promote the usage of the new rec facility, encouraging it as a meeting place and community hub. Lastly, there has been a shift towards	3/9/2021 10:55 AM

	family tourism in Dawson with notable use of the bike trails by visiting families. A fully enhanced and functional facility, clearly visible at the entrance to town, would facilitate this shift towards healthy living.	
108	Unless this fitness center has a year round pool, what's the point? Also, your survey was not very clear.	3/9/2021 8:41 AM
109	Dome road location will provide more room for the amenity as well as parking. The fields, baseball and soccer will be close by so those will be accessible a lot easier having all of our recreation in one easy location! That's just how see it as a family and community member!	3/9/2021 12:37 AM
110	There is a growing need for dance spaces in Dawson. I'm wondering if this is something the City of Dawson is aware. As SOVA and KIAC and the Rec center are having a hard time meeting all the needs of the dance and performance programming.	3/9/2021 12:14 AM
111	I would like to strongly encourage and support the inclusion of the full aquatics areas and amenities. I have heard many residents speak to how much they wished we had a year round pool. Furthermore, it would provide significant resources for those requiring physical therapy. Thank you	3/8/2021 11:27 PM
112	We don't need to build this facility in town. The area you have selected in town will just be as bad for ground movement as what we have now. We also don't want to take away the RV Park because this brings tourist dollars into our community and and sustains the economy. Yes building out of town may make people walk a little further for those who do walk. But being at the arena everyday during the season most people drive to drop their children off and themselves to use the facility. One thing to keep in mind is a place for kids to play mini sticks. Pre covid times the hall way at the arena are filled with kids play mini sticks. Great to see but does interfere with other users getting to the dressing rooms. Having all of our recreational structures under one roof will see more usage, especially the pool. When parents drop their kids off for activities the parents can now stay for that hour and use facilities, not just drop the kids off and go else where.	3/8/2021 10:51 PM
113	partner with Husky Bus to offer shuttle services to the dome road option	3/8/2021 10:25 PM
114	Put the facility on the dome road where slinky mines was	3/8/2021 10:13 PM
115	No need to take out the gold rush campground if you can build below the dome	3/8/2021 9:43 PM
116	Dawson is in desperate need for year round aquatic facilities - ie. pool, showers, sauna, steam room, hot tub. Must also note that for the significant population of Dawsonites that live off-grid/without running water, access to public showers/bathing is a MUCH needed necessity. Especially during a global pandemic like COVID-19, where cleanliness is highly recommended/mandatory, we need proper access. It's been over a year now that the gym showers and arena showers have been closed, and I'm experiencing unrest, discomfort and annoyance about the lack of bathing facilities in town within my peer network.	3/8/2021 9:36 PM
117	I believe the dome location is certainly the best option. Close to soccer field and baseball. More inclusive for out of town dwellers. Leaves possibility for every lark to stay open, which is extremely important for tourism!	3/8/2021 9:13 PM
118	The Dome Road site will anchor the town in a way gold rush can't.	3/8/2021 9:00 PM
119	Year round potential for recreation activities such as swimming pool, sauna , gym , rock climbing , racing track , space for classes of all sort and really all the option possible would benefit our community on a year round base but specially in the deep of winter. All Individual / family will profit from such a construction in a very positive way . The outcomes could change many life and keep our community active year round and save many people from seasonal depression and lac of physical activities !! As a young adult that recently bought property here in Dawson I could see myself and family needing such beneficial center . This would be an asset to this beautiful community	3/8/2021 8:32 PM
120	The lap pool seems extremely short. It would be preferable to have a longer pool to accommodate adult lap swims and teen swim club, not just kids swimming lessons.	3/8/2021 7:21 PM
121	Please just have it a functional year round building.	3/8/2021 7:11 PM
122	THE GOLD RUSH CAMP GROUND PLAN IS A DISASTER WAITING TO HAPPEN THE MAIN REASONS BEING THE LOCATION,ITS NOT BIG ENOUGH FOR FUTURE	3/8/2021 6:31 PM

	EXPANSION AND ALSO THE GROUND IS JUST NOT SUITABLE ASK ANY OF THE CONTRACTORS	
123	An indoor walking track and a useable swimming pool for adults would provide a huge increase in my quality of life as a person with multiple chronic illnesses. Somewhere inside, with even ground, to walk in the winter and somewhere year round to swim and float is a literal dream come true. The idea of a patio to lounge on is also lovely. It would be so neat to have a public patio to hang on that isn't attached to a bar!	3/8/2021 5:18 PM
124	Why the need to put them all together? Why is the Aquatics so small? Short, too few of lanes. WHY when Whitehorse got…ya, I know, flipping spoiled!!! Too big of a splash pool with no surrounding deck for the kiddy pool. GET it away from the Hot Tub. In fact, get rid of the Hot Tub…bacteria stew!! EWWWW!!! Canteen is too small. Look at the current and it is considered too small!! Go to NAIT main Campus for a good example of change/shower rooms. PLEASE!!!!	3/8/2021 5:01 PM
125	We need @ least 3 curling ends to be able to hold bigger competitions. The Watson lake facility is similar to what we need.	3/8/2021 4:35 PM
126	A commercial grade dish sanitzer for the canteen!	3/8/2021 2:30 PM
127	Please make the new arena look like it fits into the town, so it's not just a giant warehouse . Accessible walking paths from town are important. Properly developed plans so we can actually use the space all year, unlike our current pool. A much larger fitness center would be great.	3/8/2021 1:29 PM
128	None of those facility plans are very good. There seems to be a lack of regard for spectating, specifically with curling and hockey. Having a nice warm space to observe is just as important for mental health as actually playing. This has the potential to be a safe place for people to go hang out. We need to make it more accommodating for that part. Curling rink and hockey side by side, with a heated, vestibule/hallway between them (for example) with windows on both sides so you can sit and watch either activity. Anyways, I'd get some more blueprint options if I were you.	3/8/2021 12:39 PM
129	A space for dance classes would be great, a large, mirrored, space with suitable flooring.	3/8/2021 11:49 AM
130	Given the current conditions of the 20 year old pool, rec center, and waterfront building, it is imperative to have qualified staff to maintain this new facility. Maintenance schedules needs to be strictly followed to ensure fire alarm/sprinkler systems are tested and operating correctly, filters routinely cleaned and replaced in air handling units to provide clean air, door closures to be reset during seasonal temperature differences so someone doesn't lose and arm, chemical usage and storage so that the pool can be operational and not rust out structural components. Gym equipment maintenance according to manufacture's specs to achieve maximum life span, etc, etc etc,,, It is very obvious that the city lacks in caring and maintaining equipment and components in every building they own, thus paying for huge, avoidable emergency expenses. Do not build it unless you have the assets to maintain it.	3/8/2021 11:44 AM
131	I believe that not only is it important to have a "Rink" but additional gym space for organized sports is lacking in Dawson. We were unable to use the only other gym at the school due to covid and all sports other then hockey have been axed. No soccer, basketball or volleyball. I know Hockey and skating are Canadian past times but we need to have options other then those two very specific things. Also I believe as this community expands the Dome options are better for future development closer for the expanding dome and C4 subdivisions. Option 2 at either location would be the best in my mind. An aquatic space would be great but i dont believe Dawson at this time as the population to make it work at the costs. I really hope that the typical lowest cost option as we see so much in Dawson is used.	3/8/2021 11:42 AM
132	Indoor play area for daycares is essential. ALSO, thought should be given to including a spot for a daycare -- there is currently a massive shortage in daycare spots and a new facility is needed. A daycare could be a reliable tenant -- and meet massive community need -- for an upstairs space.	3/8/2021 11:35 AM
133	Sauna/steam room is a breeding ground for germs if not cleaned frequently and correctly. Also limited number of people able to access at one time. A hot shower in the locker rooms should be adequate enough. Is the pool strictly a lap pool? It needs to be deep enough to dive in from the deck so certification can be done...minimum 2.75m depth for at least 6m length or whatever the current requirement is. Gold rush site has no parking and street parking would take up current residential street parking, increased light and noise pollution and air pollution in	3/8/2021 11:27 AM

	winter with vehicles constantly idling. Few would park at the potential parking lot where current rec centre is. Would wifi be available for no fee public use. Dome option needs to address possible traffic issue with downhill curve coming down Dome road as people tend to speed around that corner	
134	Please do not back out of any plan including a dedicated space for indoor playground. This desperately needed along with year round pool.	3/8/2021 11:08 AM
135	Build for the future growth of population. Within the next 50 years the growth of the City will be out on the Dome location area.	3/8/2021 11:05 AM
136	The Goldrush property clearly has limitations in terms of space available for future growth, and the ground characteristics are duplicates of those where the present rec centre is located. It is folly to think that moving the rec complex a block north of its present location will result in better ground conditions, and the result will be another complex that is plagued with stability problems. Additionally, there is a public petition demanding that the city choose a better location for a potential rec complex and/or housing on the property.	3/8/2021 10:44 AM

(Community Engagement)

Appendix F

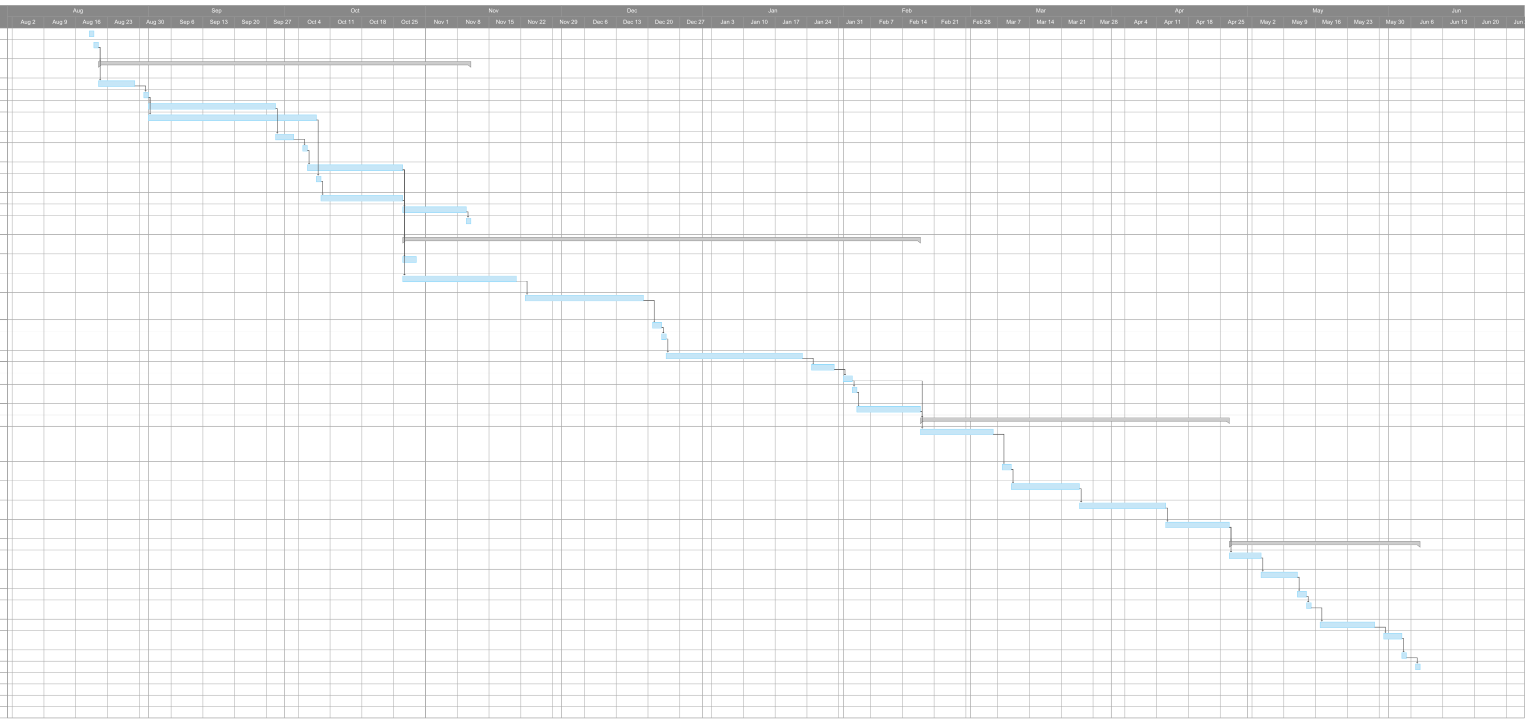
Project Schedule

499 YG CoD Rec Centre - Internal Schedule

REPUBLIC ARCHITECTURE INC

499 YG City of Dawson Recreational Centre FP & FS - Detailed Schedule (Revised 2021 03 31)

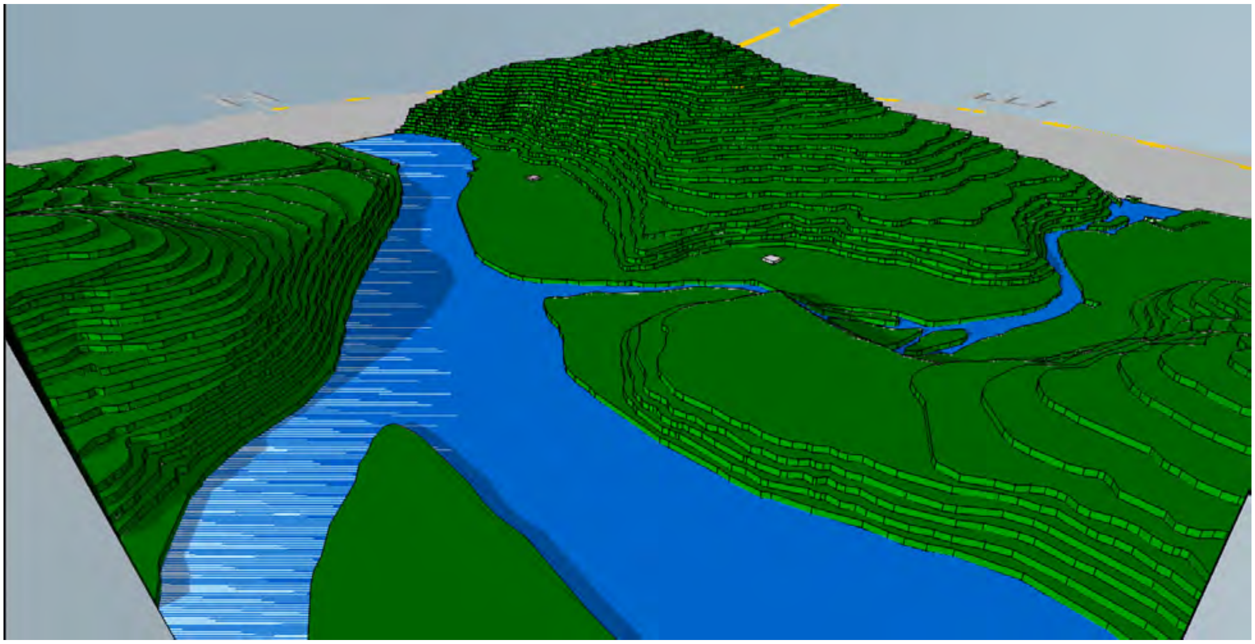
	Task Name	Duration	Start	Finish	Predecessors
1	Start Up Meeting	1d	08/19/20	08/19/20	
2	Programming Meeting with City of Dawson	1d	08/20/20	08/20/20	
3	**Functional Program and Block Plan Development Phase**	56d	08/21/20	11/10/20	2
4	Program Development by RAI	6d	08/21/20	08/28/20	2
5	Submission to Client for Review	1d	08/31/20	08/31/20	4
6	Client Review	19d	09/01/20	09/28/20	5
7	Community Engagement Plan Development	26d	09/01/20	10/07/20	5
8	Revision Period (by RAI)	4d	09/29/20	10/02/20	6
9	Submission of Final Program and Block Diagrams	1d	10/05/20	10/05/20	8
10	Client Approval	14d	10/06/20	10/26/20	9
11	Submission of Draft Community Engagement Plan	1d	10/08/20	10/08/20	7
12	Client Review	11d	10/09/20	10/26/20	11
13	Revision Period (by RAI)	10d	10/27/20	11/09/20	12
14	Submission of Final Community Engagement Plan	1d	11/10/20	11/10/20	13
15	**Schematic Design/Draft Feasibility Study Phase**	78d	10/27/20	02/17/21	10
16	Draft Report: RAI to Sub-Consultants for Coordination	3d	10/27/20	10/29/20	10
17	Schematic Design Plans by RAI (6 Options)	18d	10/27/20	11/20/20	10
18	Schematic Design Submission (including Draft Report and Energy Modelling) by Consultants	20d	11/23/20	12/18/20	17
19	RAI Coordination	2d	12/21/20	12/22/20	18
20	Submission to QS for Cost Estimate	1d	12/23/20	12/23/20	19
21	Cost Estimate	19d	12/24/20	01/22/21	20
22	Building O&M Viability Analysis	5d	01/25/21	01/29/21	21
23	Draft Report Coordination by RAI	2d	02/01/21	02/02/21	22
24	Draft Report Submission to Client for Review	1d	02/03/21	02/03/21	23
25	Client Review	10d	02/04/21	02/17/21	24
26	**Public Consultation Period**	48d	02/18/21	04/26/21	23
27	Incorporation of minor changes/revisions requested by CoD, compilation of presentation materials	12d	02/18/21	03/05/21	25
28	In-Person Community Presentation	2d	03/08/21	03/09/21	27
29	Online/paper Survey Completion by the Community	11d	03/10/21	03/24/21	28
30	Synthesis of the Information Gathered	13d	03/25/21	04/12/21	29
31	Review of Survey Results by YG, Approval to Proceed	10d	04/13/21	04/26/21	30
32	**Final FS Report**	30d	04/27/21	06/07/21	31
33	Final Report: RAI to Sub-Consultants for Coordination	5d	04/27/21	05/03/21	31
34	Final Report: Sub-Consultants to RAI	6d	05/04/21	05/11/21	33
35	Final Report Coordination by RAI	2d	05/12/21	05/13/21	34
36	Final Report Submission to Client (draft for review)	1d	05/14/21	05/14/21	35
37	Client Review	10d	05/17/21	05/28/21	36
38	Revision Period: Sub-consultants to RAI	4d	05/31/21	06/03/21	37
39	Final Report Coordination by RAI	1d	06/04/21	06/04/21	38
40	Final Report Submission to Client	1d	06/07/21	06/07/21	39
41					
42					
43					
44					



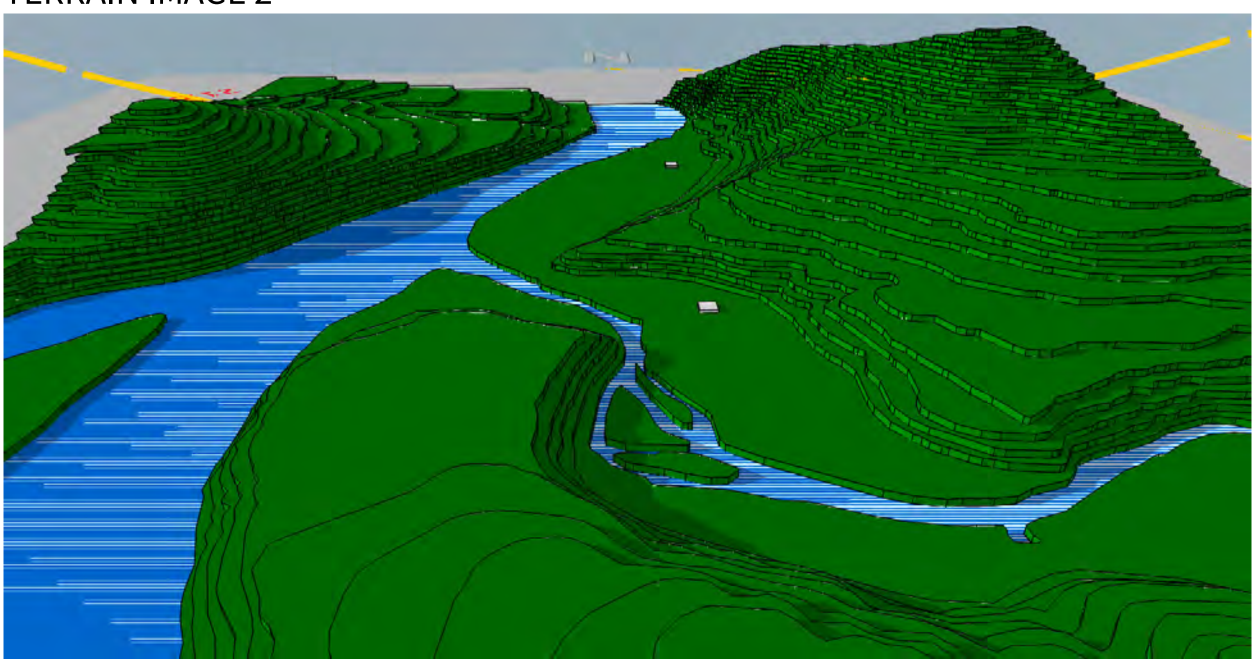
Appendix J

Solar Exposure Review

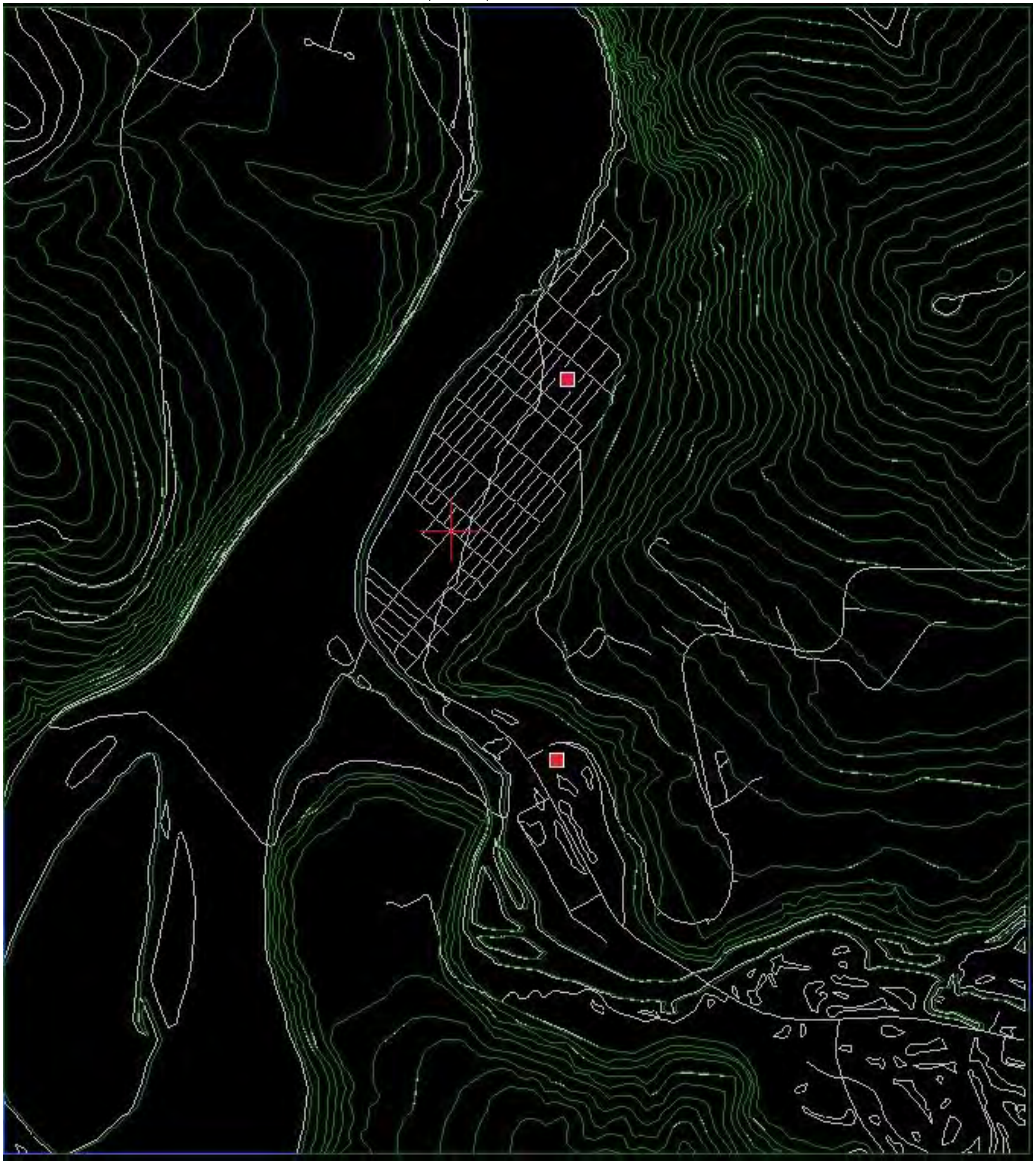
TERRAIN IMAGE 1



TERRAIN IMAGE 2

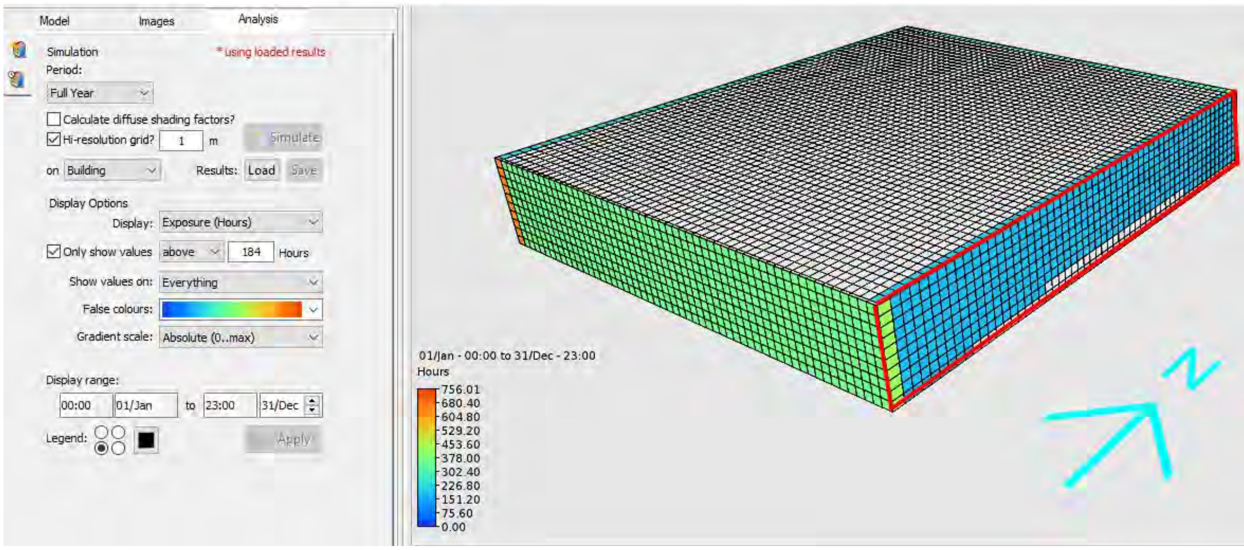


TERRAIN WITH BLOCK BUILDING (RED) ON 2 SITES

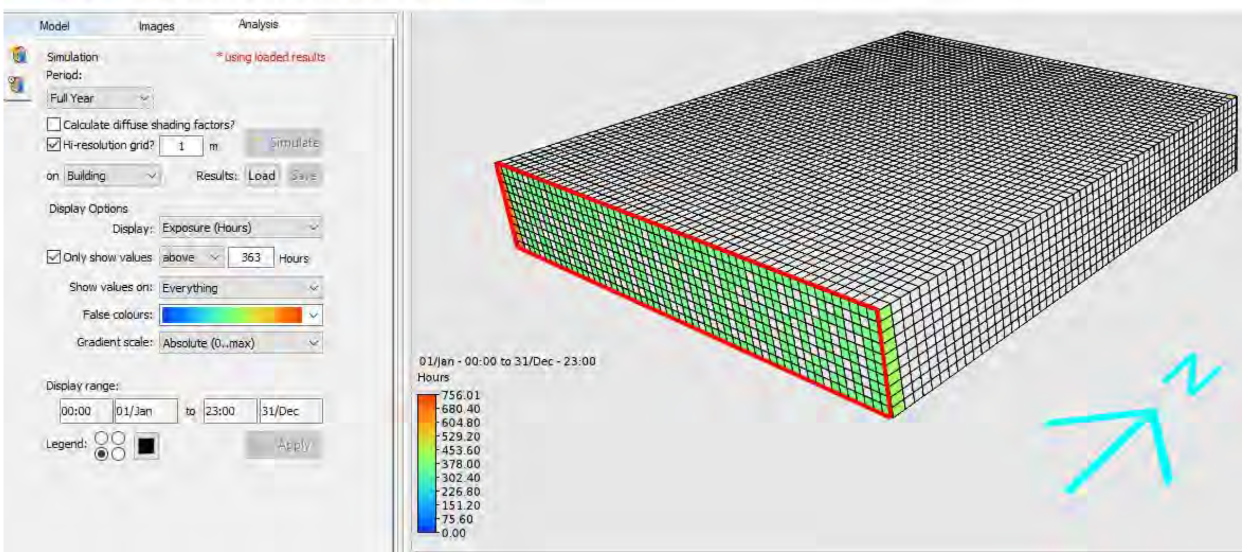


DOME ROAD SITE SOLAR EXPOSURE ANALYSIS

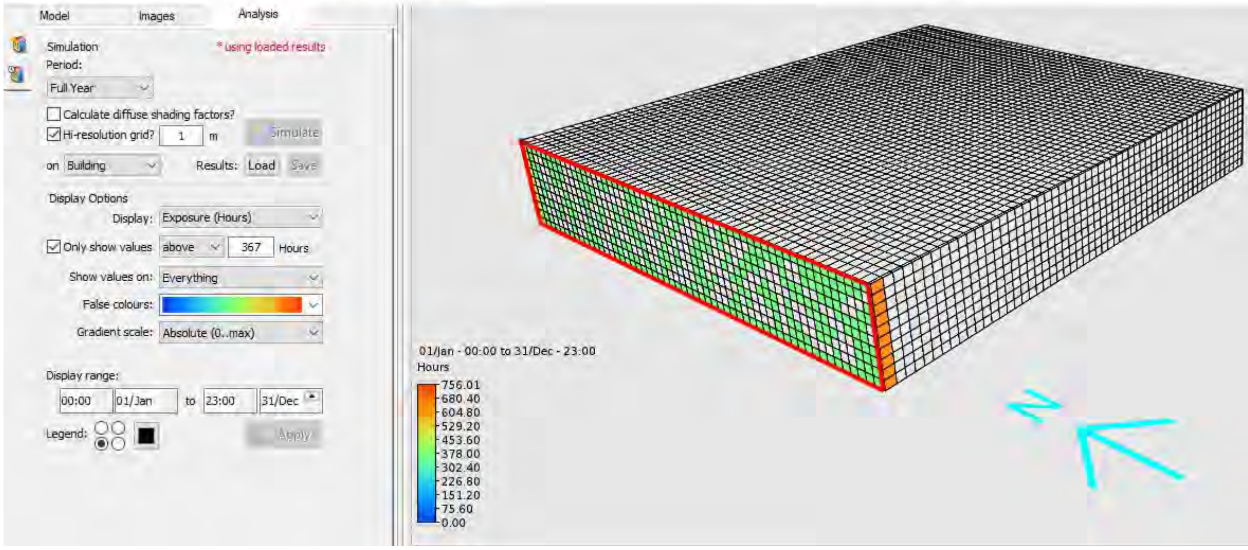
SITE - DOME ROAD
ORIENTATION ANALIZED - EAST
MAXIMUM SUN EXPOSURE HOURS = 184



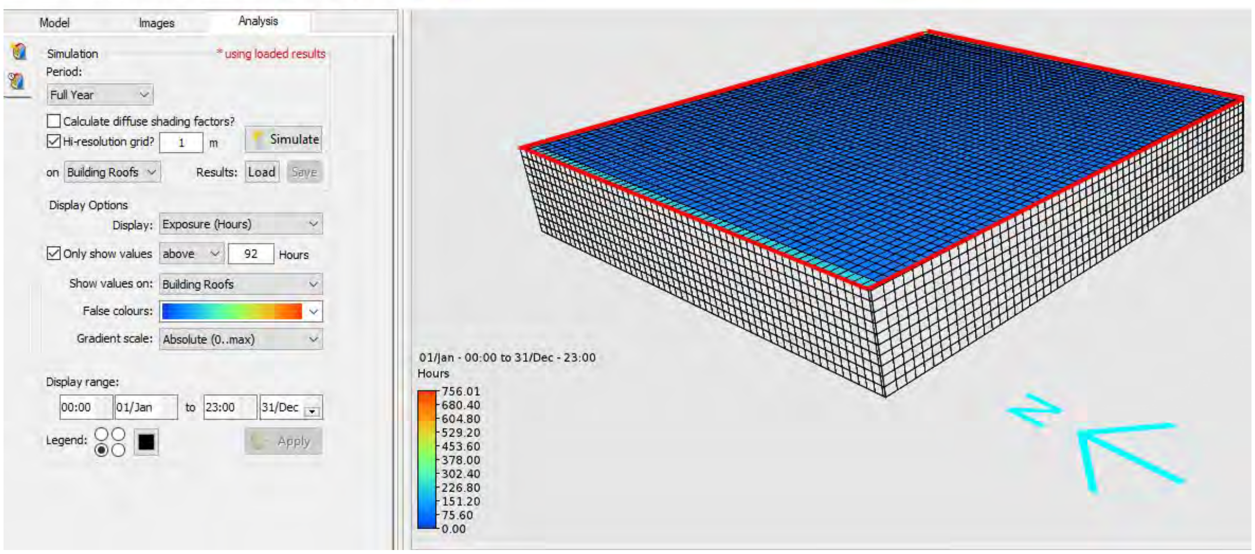
SITE - DOME ROAD
ORIENTATION ANALIZED - SOUTH
MAXIMUM SUN EXPOSURE HOURS = 363



SITE - DOME ROAD
ORIENTATION ANALIZED - WEST
MAXIMUM SUN EXPOSURE HOURS = 367

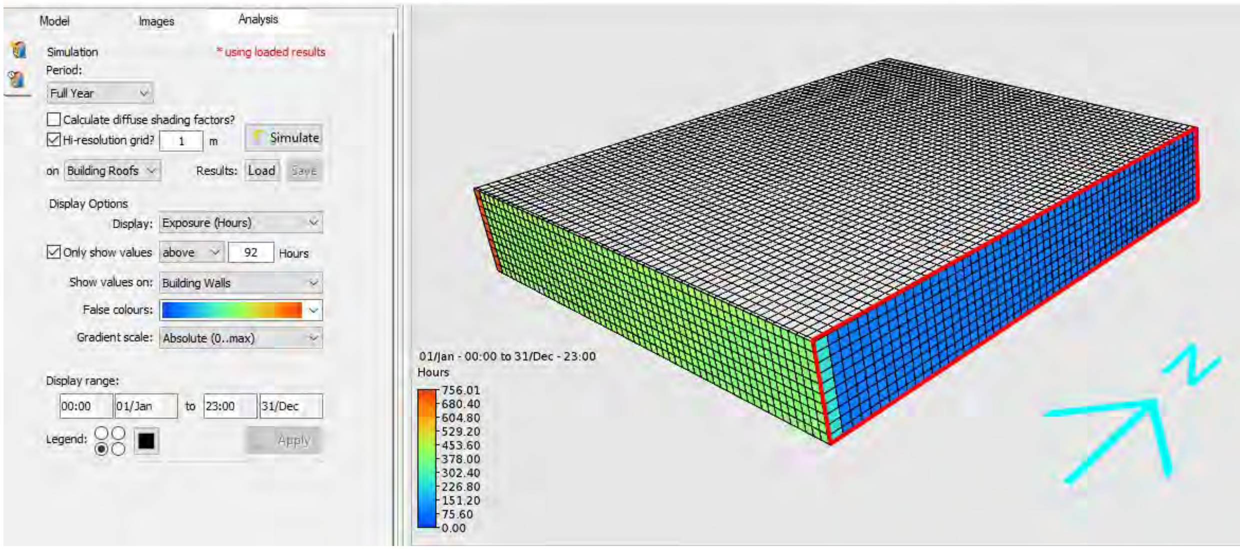


SITE - DOME ROAD
ORIENTATION ANALIZED - TOP (ROOF)
MAXIMUM SUN EXPOSURE HOURS = 92

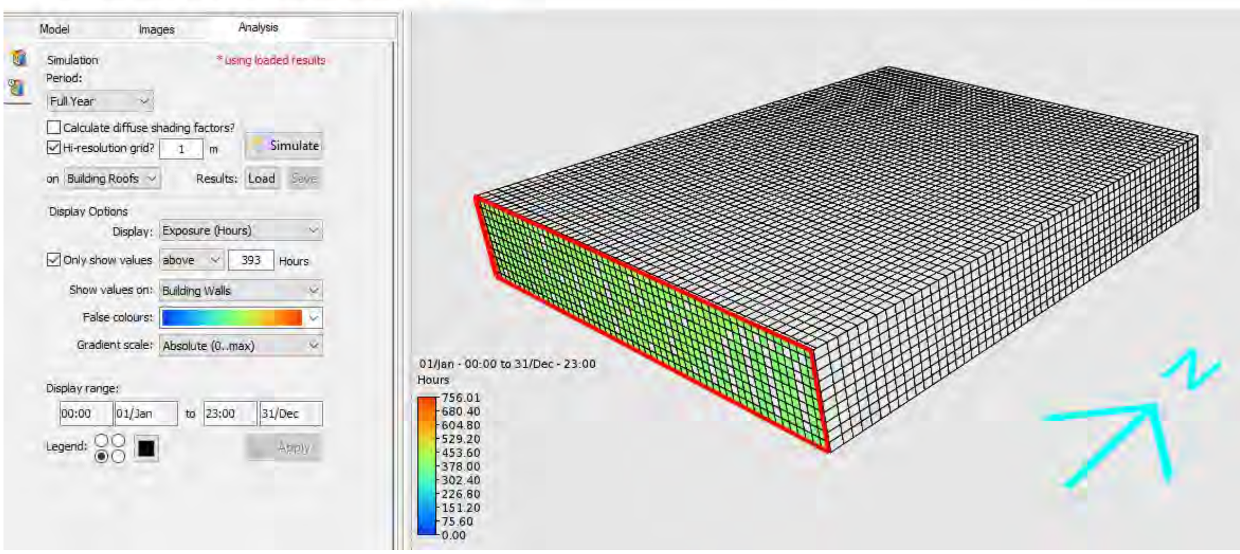


GOLDRUSH CAMPGROUND SITE SOLAR EXPOSURE ANALYSIS

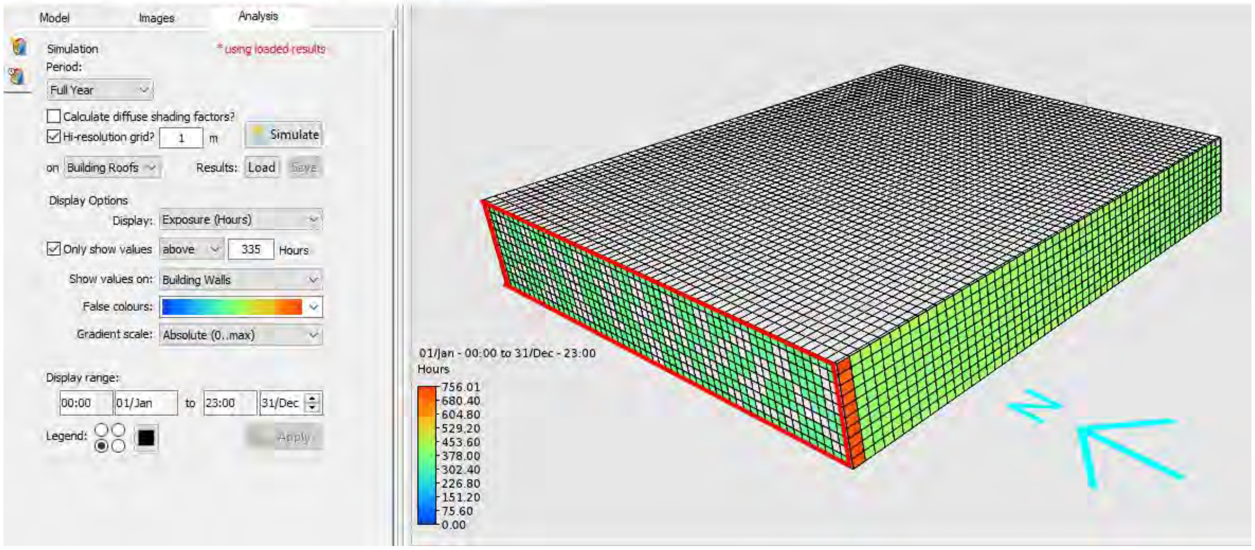
SITE - GOLDRUSH CAMPGROUND
ORIENTATION ANALIZED - EAST
MAXIMUM SUN EXPOSURE HOURS = 92



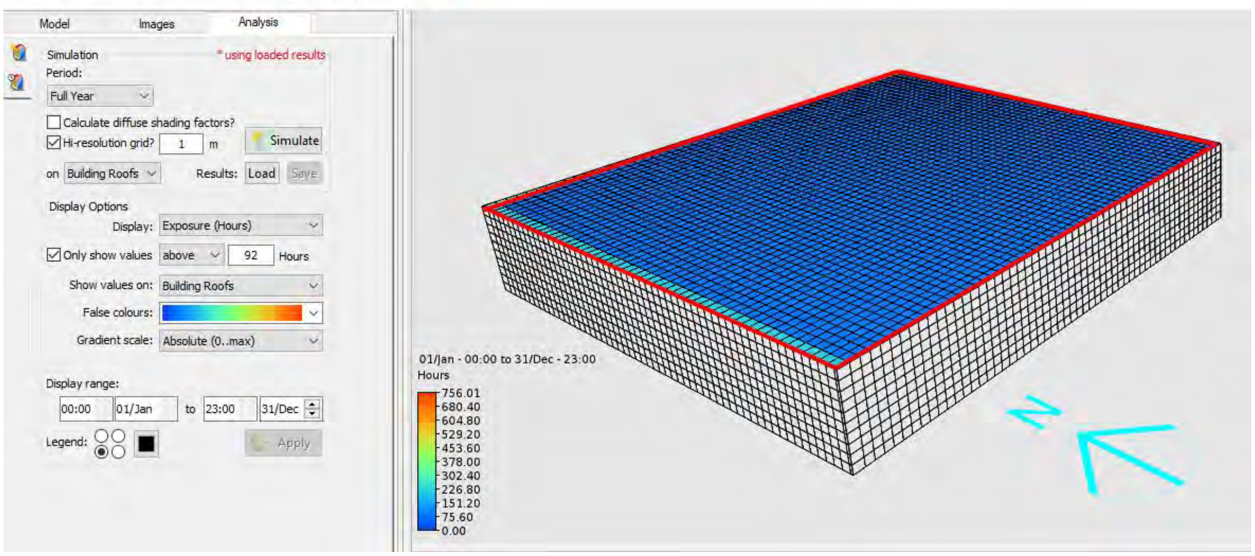
SITE - GOLDRUSH CAMPGROUND
ORIENTATION ANALIZED - SOUTH
MAXIMUM SUN EXPOSURE HOURS = 393



SITE - GOLDRUSH CAMPGROUND
ORIENTATION ANALIZED - WEST
MAXIMUM SUN EXPOSURE HOURS = 335



SITE - GOLDRUSH CAMPGROUND
ORIENTATION ANALIZED - ROOF
MAXIMUM SUN EXPOSURE HOURS = 92



SUMMARY

Solar Exposure Analysis (Hours)				
Site	Orientation			
	East	West	South	Roof
Dome Road	184	367	363	92
Goldrush Campground	92	335	393	92