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EXECUTIVE SUMMARY
1 Executive Summary

A Brief Overview

This Design Development Report represents an important milestone in the overall project timeline of the Northern Water Sports Centre (NWSC). It is intended to outline the architectural development of the building design as well as summarize our approach to sustainable design, building systems and life safety.

The project is being conceived as an aquatic centre of excellence. It involves the creation of a 16,000 square foot facility in the Bell Grove area of Bell Park, complete with a regulation 1000 metre race course for paddling and rowing events, at an estimated project cost of nearly $6 million.

The proposed Northern Water Sports Centre will facilitate the continuing partnership between the Sudbury Canoe Club (SCC), Sudbury Rowing Club (SRC), Sudbury Dragon Boat Festival (SDBF) and the City of Greater Sudbury, promote community access to the lake by non-motorized watercraft and enable the project partners to host competitive water sports events up to an international level.

The design of the facility responds to the recommendations, comments and feedback from the steering committee. Their involvement has played an intrinsic role in the overall conception of the building and the layout of all the program spaces.

Finally, the new facility will be an exemplary example of a truly integrated approach to sustainable design. Its construction and presence will set itself apart from other buildings and it will emerge as a notable landmark throughout Northern Ontario for its innovative green building practices.
1 Executive Summary
Approach to Facility Design

PLANNING PARAMETERS

- The approach to concept development must respect the tenants of the Bell Park Covenant and the Bell Park Master Plan;
- The approach to concept and program development must maintain or enhance the community’s access to Bell Park and non-motorized water activities on Lake Ramsey;
- The on-water, water’s edge, site and building features must be environmentally sensitive and maximize opportunities for long term sustainability.

OBJECTIVES

- Facilitate public access to Lake Ramsey by non-motorized watercraft and broad community use of the facilities on a year-round basis;
- Create opportunities for space and equipment sharing as well as operational synergies and efficiencies amongst user groups;
- Enable the project partners to host competitive water sports events up to an international level;
- Provide the infrastructure required to support the training and operational needs of the primary users; and
- Encourage access to Bell Park and use by the broader community.
A Gateway to Bell Park

Based on the functional requirements to accommodate all of the on-water, water’s edge and facility program needs, the ideal location for the new facility is in the Bell Grove area of Bell Park, to the west of the existing public boat launch, with access from Ramsey Lake Road.

Situated amongst one of Sudbury’s most significant cultural and recreational landscapes, the NWSC will not only improve Ramsey Lake’s shoreline development but will also enhance the city scape as a backdrop to the lake. The site will have visual exposure from Paris Street, Bell Park and from Ramsey Lake itself.
2 Site Design

Connection to Recreation Trails

The NWSC will be well positioned to connect to some of Sudbury’s major recreation trails and tourism landmarks such as Bell Park and Science North. The new also site plan takes into consideration the proposed connection to the Rainbow Routes Trails along the shore line and from Ramsey Lake Road.

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**LEGEND**

- JIM GORDON BOARDWALK
- BELL PARK BIKE PATH
- RAMSEY LAKE SKATING PATH
- RAINBOW ROUTES BIKE PATH
- RAINBOW ROUTES WALKING PATH
2 Site Design

Building Orientation

The site which is located on a point west of the existing boat launch. The point is currently defined by a rock outcrop rising approximately 12 feet above the water level.

The orientation of the building is based on the following criteria:
- maximum exposure to water
- maintain public beaches
- maintain natural features

A number of floating docks will extend from fixed dockage that will hug the existing shoreline and be constructed so as to minimize the impact on the shoreline. The setback between the docks and building will exceed the 10 metres required by the by-law and be developed as a staging area to accommodate the large numbers of paddlers and rowers that congregate in the area during training and major events. By taking advantage of the higher grade to the south, the new upper level will be accessible from the south west portion of the site. Concrete wing walls will guide the users and visitors into the building at the front entrance.
2 Site Design

Building Orientation

The rock outcrop at the north east point of the site will remain as both an architectural feature for the site as well as a natural feature that will deter any adverse possession of the existing public beach.

The lower level proposed for the design, is composed of the boat storage areas for the three partners, as well as the exterior deck area necessary for the staging of the various boating program activities.

The gravel parking area will have 30 spaces and the appropriate number of barrier free parking spaces to suit the occupant load. New road access will connect the existing roadway with the new parking area.

The shoreline and apron design balances the following:

- Respecting the minimum 33 feet building setback from the water’s edge
- Balancing the proximity to the water of the boat storage areas with the necessary deck area suited for the various boat sizes and types
3 BUILDING CONCEPT
3 Building Concept

Modern Vernacular

Particularity of Place

The approach to the overall design of the building has been twofold:

1 to seek a design which responds to the immediate environment through sustainable building design and construction practices

2 to seek a design which responds to the occupants’ functional and space requirements on both a large and intimate scale.

Often buildings forms are derived from a universal or economical vision that does not take into account important elements such as solar orientation or the comfort of interior conditions. The Northern Water Sports Centre has been designed as a direct response to Sudbury’s environment, climate and ever changing seasons. The siting of the building, its orientation, the overall form, glazing and construction assemblies are intended to create an architecture that has minimal reliance on typical HVAC systems to maintain comfortable interior conditions.

![3D rendering of the Northern Water Sports Centre](image-url)
3 Building Concept
A Signature Building

The building is being conceived as a new, free-standing structure sited amongst the ubiquitous bedrock of Sudbury’s landscape. Its silhouette speaks of both modesty and confidence through strong architectural gestures.

- The overall form of the building develops from the solar/wind chimney. Not only is the chimney a means to provide natural ventilation; its strong form anchors the building within the landscape and links all levels.
- The chimney anchors the large sloping roof, as the roof leads up to and terminates at the chimney.
- The roof is a large protective canopy that provides significant overhangs to shade the windows and extends out over the western terrace adjacent the exercise area.
- The covered terrace offers protection from the elements on the exterior terrace area. The Northern terrace adjacent the multi-purpose room remains uncovered. This now provides two types of exterior space—covered and uncovered.
3 Building Concept

A Signature Building

- A large sloping canopy covers and protects the building’s main entrance. This not only protects the access but also signals and identifies the public entrance. A low retaining wall extends from the building outward and acts as the base of a tall column that supports and extends past the canopy’s roof.
- The building is layered by the materials that clad the exterior. Various textures such as copper, stone and architectural block will assist in defining the building’s various parts.
- The chimney and retaining walls will both be rugged dark stone
- The roof will be clad in a heavily textured fibreglass shingle
- The base of the building’s base will be a rugged architectural concrete block
- Glass and metal railings will surround the terraces
- Terraces overhang the lower bases to act as a capital/top to the base
4  Schematic Design

Lower Level

The organization of the design starts by locating one of the partners on the eastern edge of the point. With the minimum building setback line of 33 feet established, the best use of this section of the site is the Sudbury Canoe Club (SCC). Most of their boats can be accommodated on the exterior deck within the 33 feet setback.

This location provides a variety of exterior access points to the north, west and east side of the SCC space.

Moving westward, the next partner best accommodated with the available site is the Sudbury Dragon Boat Festival (SDBF). This location also benefits from an existing natural launch area nestled along the shoreline at this point. The SDBF storage area is set back from the SCC’s northern face to respect the setback line and accommodate a minimum 45 feet deck for the dragon boats. Given that the dragon boats use is for a shorter duration of the season (spring/early summer) and that the building is setback, this provides an additional access point (40 feet facing west) for the SCC.
4  Schematic Design

Lower Level

The Sudbury Rowing Club (SRC) is located west of the SDBF and setback from the SDBF’s northern face to respect the setback line and accommodate a section of the deck for the 65 feet rowing shells.

The various stepping back of the partners’ area permit the location of the workshop on the east side of the facility. This location offers the opportunity to have direct, independent access to the water.

A corridor of the southern side of the facility provides access to the 3 partners’ storage spaces, lift and stair to the upper level as well as the exterior on the east side.

A block of change rooms is located south of the corridor. This locates the change rooms on the level closest to where most of the physical activity occurs.

A mechanical room is planned at the southwest corner of the building

Programmatic Spaces

- Sudbury Rowing Club Boat Storage
- Sudbury Canoe Club Boat Storage
- Sudbury Dragon Boat Festival Boat Storage
- Workshop
- Changerooms
- Washrooms
4 Schematic Design

Upper Level

The upper level is a rectangular shape positioned over the eastern side of the lower level. This leaves the roof area of the northern wing of the SDBF as a deck for the upper level and the west area of the SRC roof as an exterior landscaped area.

The multipurpose room is located at the lakeside of the building in an area of great significance. It has an excellent view of the lake as well as the exterior activities of the lower level.

The training room is located on the west side. It has direct access to the adjacent roof terrace as well as the multipurpose room via a folding partition.

A clear circulation path is established. A single corridor links the main southern entrance to the multipurpose room. This lobby/corridor is flanked by the lift and a 6 feet wide open stair to the lower level. The corridor also provides access to four (4) individual offices and the kitchen.
A secondary loop links the entrance area to the large meeting room and washrooms.

Five (5) individual washrooms are planned on the west side of the secondary corridor. The intent of individual washrooms is to permit them to double as change rooms. Within this bank of four (4) washrooms, two (2) are intended to be designated as barrier-free and three (3) areas equipped with individual showers.

A large storage area is provided near the entrance of the facility.

**Programmatic Spaces**

- 5 Administrative Offices
- Meeting Room
- Training Room
- Multi-Purpose Room
- Kitchen
- Washrooms
- Storage Rooms
CITY OF GREATER SUDBURY
SUDBURY CANOE CLUB
SUDBURY ROWING CLUB
SUDBURY DRAGON BOAT FESTIVAL

5 SUSTAINABLE DESIGN
5 Sustainable Design
Preliminary Studies

DAYLIGHT

Target: Achieve a daylight factor (DF) of at least 2% in all permanently occupied spaces. Daylight factor measures the daylight quality in a room. It describes the ratio of outside illuminance over inside illuminance.

We have run daylight simulations to evaluate if the current distribution and geometry of the proposed openings meets the proposed daylight target. The results show that the current design achieves a DF higher than 2% as an average in the office spaces at the top floor. The bottom floor does not meet the minimum threshold.

This daylight model also shows that installing skylights on the roof of the bottom floor spaces when feasible, would improve significantly the daylight factor in those spaces.

![Daylight Analysis Diagram]

SUN PATH AND SHADING DISPLAY ON A SUMMER DAY
Natural Ventilation
Target: Reduce cooling energy consumption by maximizing natural ventilation
We have conducted an assessment of Sudbury climate to evaluate the requirements for cooling. We have found that mechanical cooling is required less than 1% of the time along the year and strategies such as natural ventilation could provide comfort during most of the hot days in the summer. To maximize the effect of natural ventilation, operable windows and a ventilation chimney oriented facing the prevalent winds has been proposed.

Comfort Settings
Target: Minimize energy consumption by establishing comfort temperature set points according to the use and programmatic needs of each space.
To reduce energy consumption, an analysis of the thermal and comfort needs of each space has been developed according to the predicted use, metabolic rate, the activity developed in those spaces, and the expected occupancy levels for each space in the building. Adapting the control settings by implementing this strategy will reduce energy expenditure, especially during periods in which the building is expected to have lower levels of occupancy.