



Multi-Use Community Space – Design Report

Taku River Tlingit First Nation

January 2024



Multi-Use Community Space – Design Report
Taku River Tlingit First Nation

Prepared by:

ISL Engineering and Land Services
17-1114 Front Street
Whitehorse, YT Y1A 1A3
T: 867.322.6862
theal@islengineering.com

islengineering.com



ISL Engineering and Land Services Ltd. Is an award-winning full-service consulting firm dedicated to working with all levels of government and the private sector to deliver planning and design solutions for transportation, water, and land projects.

January 11, 2024

Our Reference: 70025

Taku River Tlingit First Nation
PO Box 132
Atlin, BC V0W 1A0

Attention: Moses Track, Manager, Capital, Housing and Public Works

Reference: TRTFN Multi-Use Community Space – Design Report

1.0 Introduction

The Taku River Tlingit First Nation (TRTFN) has retained ISL Engineering and Land Services Ltd. (ISL) to develop a design for a new covered outdoor community space in the 5 Mile Subdivision in Atlin, BC. The goal of this report is to summarize the design and estimated construction cost for the facility.

It is anticipated that the project will be procured through a conventional design-bid-build process, or by construction management through the First Nation's own forces. Detailed designs of the primary structure have been prepared, while construction documents for the entire site will be finalized pending complete funding.

1.1 Project Team

The following people have contributed to the development of the project:

TRTFN Team

- Moses Track – Manager, Capital, Housing and Public Works
- Andy Carlick – O&M Coordinator

Consultant Team

- Tyler Heal – Project Manager/Structural Engineer, ISL Engineering and Land Services Ltd.
- Jack Kobayashi – Architect, Kobayashi+Zedda Architects Ltd.
- Adam Greenwood – Civil Engineer, Greenwood Engineering Solutions
- Corry Martin – Electrical Engineer, Setplan Engineering
- Jeff Pike – Mechanical Engineer, Building Systems Consultants
- Myles Plaunt – Geotechnical Technologist, Tetra Tech

1.2 Reference Documents

The following documents were provided by TRTFN:

- Drone photos of site (February 2, 2022)
- Topographic survey and site plan, by Baxendale Project Services (March 7, 2022)

1.3 Schedule

Proposed key milestone dates are summarized in Table 1. In reviewing this report, TRTFN should comment on timing of deliverables and allowances for review periods.

Table 1: Project Schedule

Milestone	Date
Design Report (final)	January 10, 2024
<i>Review by TRTFN and notification to proceed pending funding approvals and internal review</i>	<i>January 26, 2024</i>
75% Design drawings – for Changeroom Building (remainder of design already complete)	February 23, 2024
<i>Review by TRTFN completed</i>	<i>March 1, 2024</i>
Issued for Tender drawings – for full project	April 5, 2024
Tender and Construction	To Be Confirmed

2.0 Current State

The proposed project site is in TRTFN's 5 Mile Reserve in Atlin, BC, off Taxgoon Road. There are currently around 100 residents of the 5 Mile subdivision, including 30 youth.

As shown in Figure 1, the project site is located immediately to the south of an existing outdoor rink. The existing rink site is not considered to be feasible for the proposed project as it is constrained by an existing road to the south and west, and by adjacent existing buildings to the north and east:

- Tutan Hit Building (northeast): multi-purpose, with health/social office, outreach space, kitchen, and residence.
- Boat Shed (north)
- Residences (east)
- Water storage shed (east): must remain in place, as it serves the residences to the east. Electricity for this building is currently fed from the “cultural building” north of the boat shed (TRTFN to confirm service size).

In terms of other community recreation facilities in Atlin, the only other hockey rink is a small outdoor rink at the school. It is serviced by an ice resurfacers (Zamboni) but is not covered or regulation size.

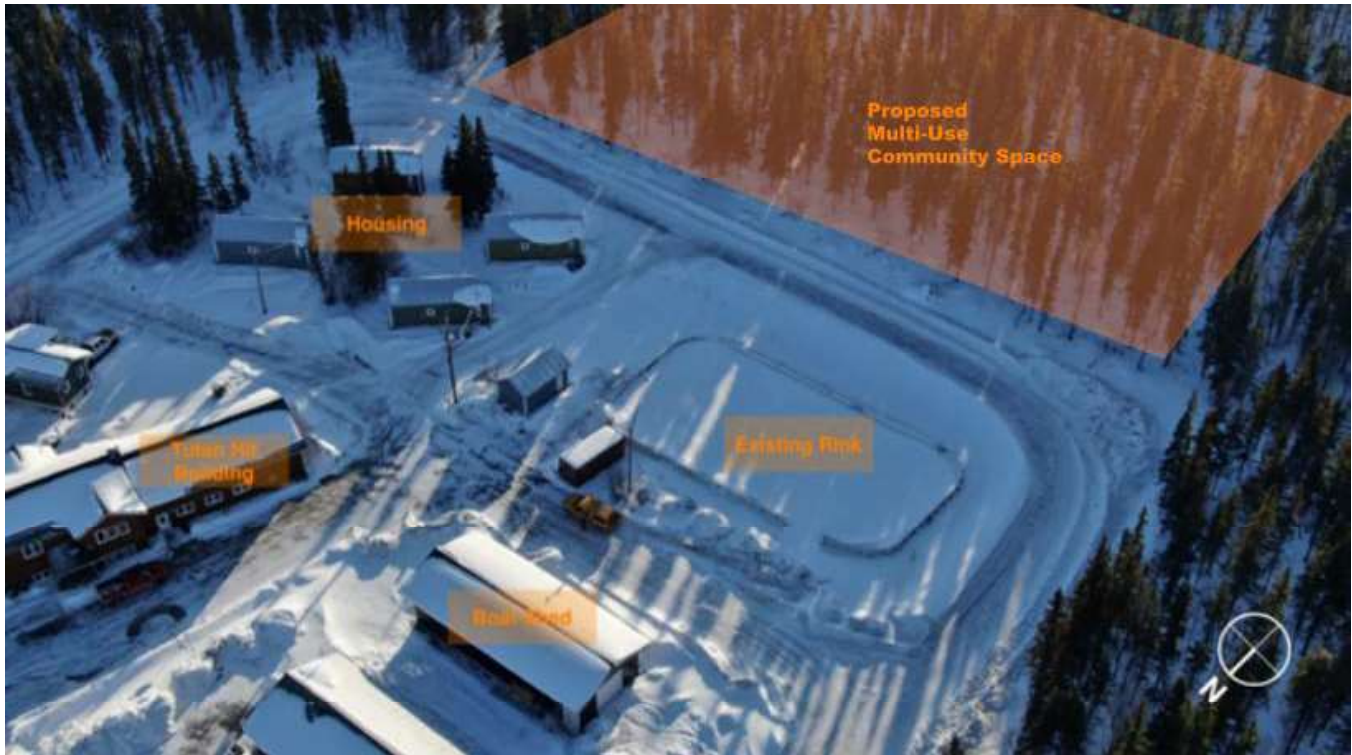


Figure 1: Existing project site in 5 Mile subdivision

2.1 Project Goals

At the project start-up meeting on December 14, 2021, the following goals were identified:

- Provide a multi-use space for TRTFN citizens and Atlin residents:
 - Summer: basketball, ball hockey
 - Winter: hockey, skating, broomball
 - Potlatches and community gatherings up to 150 people
- Quality covered outdoor recreation space, with concrete surfacing and proper drainage

TRTFN provided direction for ISL’s design of a mass timber and steel structure to cover the multi-use surface and planning to include amenities such as seating (~80 spectators), changerooms, washrooms, and storage. The main structure is not enclosed and will not be conditioned (heated or cooled). The rink will rely on natural ice in the winter; a refrigeration system for artificial ice is not contemplated in the future.

3.0 Space Planning

The multi-use space will provide a covered space with lighting and basic fit-out (dasher boards, benches, basketball hoops, and bleachers only) and will be completed with a separate enclosed building for auxiliary spaces, such as changerooms, washrooms, storage. The site will be developed with parking.

3.1 Space Requirements

Based on the facility requirements outlined by TRTFN, Table 2 lists the spaces that will be provided. These areas are based on a review of several reference documents and comparable facilities:

- Mt. Lorne Recreation Centre outdoor rink
- Takhini Arena, Whitehorse, YT
- International Ice Hockey Federation (IIHF) Ice Rink Guide, April 2016
- City of Ottawa Recreation Facility Infrastructure Standards, February 2019

These spaces have been arranged in the design drawings as shown in Appendix A.

Table 2: Space Requirements

Space Name	Notes	Area (sq. ft.)
Core Uses (Covered Recreation Space)		
Playing Surface	Sized similar to existing boards (60'x110'). Sufficient for FIBA regulation basketball court (50'x92'). Height: minimum 34' clear to underside of structure is specified by IIHF for rinks, but TRTFN has instructed that 18' clear is sufficient.	7,150
Penalty Box and Timekeeper	Separated into two areas (with plugs), ~5' deep	90
Team Boxes (2)	With bench for players, ~5' deep	2x 80
Bleachers	Three rows, to seat ~80 people, moveable	4x 60
Electrical Kiosk	Enclosure for electrical service, meter, future P/A system	10
Auxiliary Spaces (Changeroom Building)		
Changerooms (2)	Space for player changing with benches and hooks. Floor to be rubber matting. Will be combined with bathrooms.	2x 340
Bathroom (5)	For 150 person occupancy, 2 male / 3 female washrooms are required. Gender-neutral separate rooms will be provided, including one barrier free washroom.	5x 30
Equipment Storage	Storage for equipment, supplies, ice resurfacer, etc.	200
Electrical/Mechanical Room	Electrical panel, ventilation equipment	70
Parking	Gravel parking for ~10 vehicles, including accessible stalls	10x 160

Based on discussion with TRTFN, it was decided that a new surface of similar size to the existing rink (which is 60'x110') is sufficient, and that a larger surface is not desired. TRTFN understands that this does not meet the “full outdoor” size rink from the City of Ottawa standards (70'x165'), or NHL regulation size (85'x200').

3.2 Site Concept

A survey of the site, including existing features, lot boundaries and topography, will need to be completed by TRTFN. Detailed design drawings for the adjacent site have been prepared, which will require minor changes for construction on the south site. Refer to Appendix A.

With the decision to use the site immediately to the south of the existing rink, there is space to fit the proposed overall roof footprint of 86'x120' (for a 65'x110 surface) on the site as well as the changeroom building.

Strategies for site drainage will be provided in the design for the new site. It is anticipated that water would be managed through surface drainage via site grading, and swales/ditches where needed. Clearance to existing overhead power lines will also need to be confirmed (typically a minimum of 3 m is required).

3.2.1 Geotechnical Report

A desktop geotechnical report for the site has been prepared by *Tetra Tech* (file 704-ENG.WARC04159-01) and is attached in Appendix B. Key findings from the geotechnical report are summarized as follows:

- Underlying soils are silt and sand till, with groundwater at approximately 7.6 m below ground surface. These soils have high fines content and are very frost susceptible.
- Slab-on-grade will require minimum 0.8 m sub-excavation of existing material, import of 1.0 m of engineered fill, and a minimum of 100 mm of rigid insulation under the slab for frost protection.
- Footings for the roof superstructure should be located min. 1.2 m below grade and protected with 100 mm of rigid insulation to reduce the potential for frost heave.
- Specific attention should be given to the concrete exposure class and finishing for the ice surface slab.

3.3 Building Design

Design drawings for the building are attached in Appendix A. A mass timber and steel structure with a shed roof covers the ice surface and stands, while the changerooms and storage are in a separate enclosed building.

Chain link fencing is provided for security, with opportunities for artwork panels created by TRTFN citizens. Dashboards and gates will be provided around the rink surface. The changeroom and storage building will be framed with conventional light-frame lumber.

3.3.1 Structural

The foundations for the structure are concrete spread footings founded at a depth of 1.2-1.8 m for frost protection, with concrete pedestals extending above grade. Lateral ties, where required by the superstructure, are provided between the pedestals through the slab. A 125 mm thick concrete slab supports the facility surface.

The design of the superstructure is a prefabricated mass timber and steel structure with a simple shed roof, suitable for completion by local and Yukon trades. Key elements of the proposed structure:

- Roof: Metal roofing, on self-adhered membrane, on ½" T&G plywood
- Lumber purlins: 2x10 @ 24" o/c
- Mass timber trusses (~12' spacing, 11 bays): queen post style, glulam top chord and steel rod bottom chord
- Steel columns with steel cross-bracing

3.3.2 Electrical

Refer to the electrical drawings prepared by Setplan Engineering attached in Appendix A. Key elements of the electrical design include:

- New service from BC Hydro distribution system: 200A 120/240V single-phase 3-wire
- Electrical equipment located within a stand-alone kiosk or exterior-mounted panel with integral meter
- Lighting: LED fixtures, targeted 500 Lux lighting intensity on ice surface, 5000K colour temperature
 - Controls will allow for timer-based pushbuttons, different lighting zones, and dimming
- Power provided to timekeeper area and to scoreboard
 - Equipment assumed to be selected and provided by Owner
- Rough-in (conduits) for future P/A system, CCTV, and data/telecom
- Changerooms and storage:
 - Dedicated feed and sub-panel provided
 - LED fixtures for smaller rooms, 4000K colour temperature
 - Power for mechanical systems and changeroom/washroom heating
 - Overhead radiant heating for bleacher area

3.3.3 Mechanical

For the washrooms and changerooms, the following HVAC systems are anticipated:

- Heat recovery ventilator (HRV) for ventilation
- Air curtains at changerooms entries to reduce drafts and avoid need for vestibules
- Fan coils and electric baseboards for heating
- No cooling will be provided

Water and sewer services for the washrooms will be provided through tanks and trucked delivery/pump-out. Drainage from the rink surface will be directed to adjacent ditches.

3.3.4 Equipment

In addition to the “base building” itself, there are several items of equipment that may be required for use of the space. These are identified below, and it is assumed that they will be procured by TRTFN separately from a construction contract. As such, costs for them have not been included in the estimates in this report.

- Basketball hoops: mounted to floor through sleeves in concrete slab
- Public address / sound system: rough-in with conduits and power will be provided in base building
- Ice surface/slab cover: rubber matting to provide a better surface for summer/gathering uses
- Retractable dividers
- Scoreboard: rough-in with conduits and power will be provided in base building
- Hockey nets
- First aid equipment, including AED
- Cleaning equipment and supplies

4.0 Costing

A budgetary estimate of construction costs has been prepared for the Multi-Use Community Space, with a breakdown attached in Appendix C. The following assumptions and exceptions apply:

- There is significant volatility and uncertainty in the construction industry due to supply chain disruptions and labour shortages. As such, these costs may be subject to significant change as market conditions continue to evolve.
- Only construction costs are included. A 20% markup for General Contractor overheads has been included in each item; other “soft costs” such as land, permits and financing are not included.
- Costs for furniture, fixtures, and equipment are not included.
- Rink roof superstructure costs are based on quotes received from suppliers. Changeroom building costs are based on an inclusive square footage construction cost of \$600/sq ft.
- GST/PST are not included, as it is assumed that TRTFN is exempt.

Table 3: Budgetary Construction Cost Estimate

Item	Cost
Site works	\$145,100
Building foundations	\$54,100
Concrete slab	\$135,300
Building structure	\$961,200
Electrical	\$69,300
Fit-out	\$238,800
General Conditions	\$320,700
<i>Contingency (20%)</i>	<i>\$384,900</i>
Subtotal – Covered Space	\$2,309,400
Parking area	\$43,300
Water/sewer services	\$34,000
Changeroom/storage building	\$623,900
General Conditions	\$140,200
<i>Contingency (20%)</i>	<i>\$168,300</i>
Subtotal – Amenity Spaces	\$1,009,700
Consulting Costs & TRTFN Project Mgmt	\$230,000
Total Budget (rounded)	\$3,550,000

5.0 Conclusion

The proposed new building will provide a multi-use covered outdoor community space in 5 Mile for TRTFN citizens and Atlin residents, including hockey, basketball, potlatches, funerals, and other community/recreational uses.

The design has taken into consideration long-term durability and performance, aesthetics, lower carbon footprint, and the involvement of local labour during construction.

5.1 Next Steps

Following are the next steps and decisions that TRTFN will need to take to move the project forward:

- Confirm funding for the project
- Finish design for the new site to the south of the existing rink
- Determine procurement method to be used for tender (own forces, conventional design-bid-build, construction management by TRTFN or ATELP)

It has been a pleasure working with the Taku River Tlingit First Nation on the design of this important piece of community infrastructure, and we look forward to the construction of the 5 Mile Multi-Use Community Space. We are available to answer any questions that may arise about this report or the project.

Prepared by:
ISL Engineering and Land Services Ltd.



Adrian Fournier, EIT.
Structural Engineer in Training

Reviewed by:
ISL Engineering and Land Services Ltd.



Tyler Heal, M.Eng., P.Eng.
Structural Engineer

Attachments:

Appendix A: Project Drawings
Appendix B: Geotechnical Reports
Appendix C: Cost Estimate

Corporate Authorization

This document entitled *TRTFN Multi-Use Community Space – Design Report* has been prepared by ISL Engineering and Land Services Ltd. for the use of Taku River Tlingit First Nation. The information and data provided herein represent ISL's professional judgement at the time of preparation. ISL denies any liability whatsoever to any other parties who may obtain this report and use it, or any of its contents, without prior written consent from ISL.