HAMLET OF GRISE FIORD

Grise Fiord Pedestrian Walkway

Preliminary Design of Pedestrian Walkway to Cross 'Airport River'

Document No. Rev. 0: 317086-59828-00-MA-REP-00001

23 December 2025

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PERMIT TO PRACTICE
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NT/NU Association of Professional Engineers and Geoscientists

PROJECT 317086-59828-00-MA-REP-00001 : Grise Fiord Pedestrian Walkway - Preliminary Design of Pedestrian Walkway to Cross 'Airport River'					
Rev	Description	Originator	Reviewer	Worley Approver	Revision Date
A	Issued for Customer Review	A. Dratwa/J. Gibson	D. Beaumont/C. Meisl	A. Dratwa	23 October 2025
0	Issued for Use	DocuSigned by: C799CE40CC9A4AB... DocuSigned by: Jeffrey Gibson 7A0E566BB2E4C2... A. Dratwa/J. Gibson	Signed by: D. Beaumont AE59125628A441C... DocuSigned by: C Meisl E188383FB7534B8... D. Beaumont/C. Meisl	DocuSigned by: C799CE40CC9A4AB... A. Dratwa	23 December 2025

Table of Contents

Appendices

List of Tables

List of Figures

1. Introduction

Worley Consulting (Worley) understands that the Hamlet of Grise Fiord (the Hamlet) has experienced several washouts of a small river crossing close to the community's Tank Farm, requiring ongoing maintenance and repair. It is understood that the Hamlet have historically used locally sourced sand and gravel with steel culverts to construct a river crossing through the 'Airport River', as an alternative and shorter route crossing for pedestrians.

Worley has been retained by the Hamlet to undertake preliminary design and environmental permitting for the construction of a proposed pedestrian walkway across 'Airport River'.

The scope of services is in accordance with Worley proposal (Document No. 317086-58655-00-PU-LET-00001_R0) dated February 7, 2025, included:

- Information gathering and desktop review.
- Preliminary assessment of extreme river flows.
- Geotechnical assessment of anticipated subsurface conditions, foundation design requirements, preparation and construction recommendations.
- Conceptual bridge design including basis of design, optimal siting, design drawings, constructability, and project timelines.
- Develop permitting needs for the project including the preparation and submittal of the Nunavut Water Board (NWB) license application and Hamlet of Grise Fiord Development Permit.
- Conceptual cost estimate for development (Class 4 level), including a brief scope of work.
- Description of further site work that is required to complete detailed design in the future.
- Report summarizing details and sketches of the concepts and surveys plan.

This report presents a summary of the findings from desktop study, bridge assessment with associated Class 4 cost estimate, and recommendations for future work.

2. General Site Conditions

Grise Fiord is located on the southern coast of Ellesmere Island, in the Qikiqtaaluk Region of Nunavut. The community lies at the head of Grise Fiord, a deep inlet opening into Jones Sound on a narrow coastal bench backed by steep mountains of the Arctic Cordillera.

The terrain is underlain by continuous permafrost, with elevations in the surrounding area rising abruptly to over 700 m. Grise Fiord is remote and accessible only by air or seasonal sealift. The harsh polar climate, rugged topography, and logistical constraints present significant challenges to development and infrastructure planning.

2.1 Topography

The region is characterized by mountains with large U-shaped valleys carved out by a network of active and/or retreating glaciers, fed by the area's ice caps.

There are two main valleys, one running northwest to southeast and the other northeast to southwest, which connect north of the community with an elevation change of approximately 500 m to 750 m from the community to the mountain plateaus. Valley walls are dominated by individual and coalescing rock fall talus cones and/or avalanche cones and boulder tongues, with very steep rock walls at the top, becoming gentler near the base due to the accumulation of talus.

The community is located at the mouth of the two valleys on a series of bench like marine terraces (Tetra Tech 2021). A seasonal river coming from the northeastern valley runs through the Grise Fiord community, passing to the east of the airport runway, and is hence known as Airport River.

The site sits at an elevation ranging from approximately 13.2 m Geodetic Datum (GD) to 17.5 m GD.

2.2 Hydrology

Local knowledge suggests Airport River originated from melting snow and glaciers, though recent investigation suggests there is no evidence of glacial contribution (exp, 2022). River flow reportedly begins in late June, reaching its highest levels in early July, and gradually decreasing over the course of the summer (Dillon Consulting, 2023). Airport River has a drainage basin between 3,390 hectares (ha) (TetraTech, 2021) and 3,414 ha (exp, 2022), which extends some 6 kilometres (km) inland from the proposed site (exp, 2022).

The peak flow for the 100-year, 24-hour flood event for the Grise Fiord River was obtained from the Hamlet Master Drainage Plan (MDP) (Tetra Tech, 2021). The MDP determines the peak flow to be 35.14 m^3/s, which includes a 28.3% climate change adjustment.

2.3 Ground Conditions

2.3.1 Surficial Geology

Surficial geology and permafrost feature mapping was undertaken as part of the Hamlet MDP study undertaken by Tetra Tech (2021). The surficial geology in the area surrounding the river crossing (taken and modified by Tetra Tech [2021]) is shown on Figure 2-1.

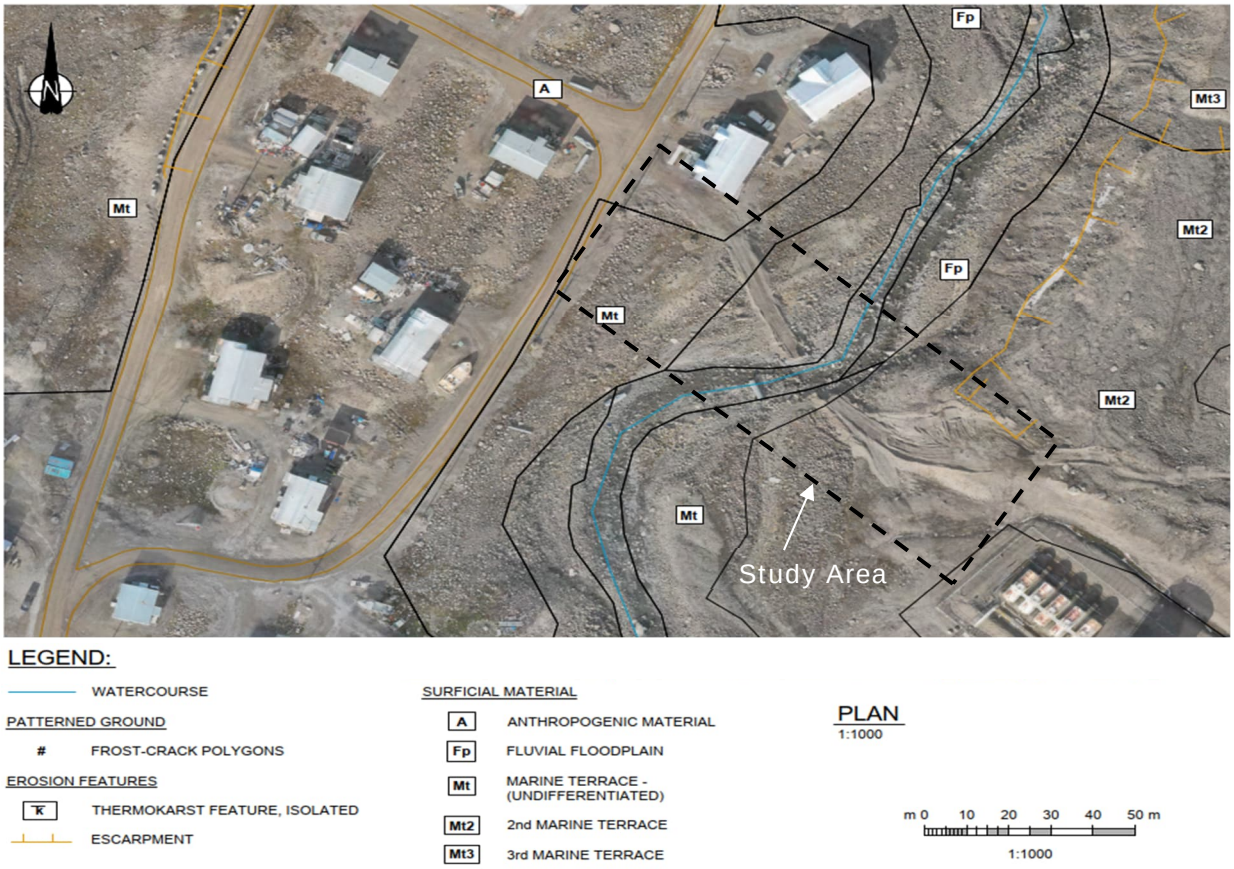

Figure 2-1: Surficial Geology (Tetra Tech, 2021 [Modified])

A total of five marine terraces (symbols Mt1 to Mt5) were identified in and around the community between elevations ranging from 0 m to 80 m, formed during post glacial isostatic rebound of the land following glacial retreat in the Pleistocene and Holocene (Tetra Tech, 2021). The marine terraces comprise sandy and gravelly soils near surface, becoming finer grained silts and clays with depth. Two terraces were identified in the footprint of the proposed river crossing including undifferentiated marine terrace deposits (Mt) and the second marine terrace (Mt2). Anthropogenic material (Symbol A) obscures the boundary between the first marine terrace (Mt1) and second marine terrace (Mt2), hence the differentiated marine terrace (Mt).

The active river cutting through the community contains alluvial deposits and forms the active fluvial floodplain (Symbol Fp).

2.3.2 Bedrock Geology

Bedrock near the community of Grise Fiord is part of the ETAH plutonic assemblage (Canadian Geoscience Map 34 - Geology, Tectonic Assemblage Map of Grise Fiord) and formed during the Orosirian epoch (approximately 1,880 to 1,915 million years before present). The assemblage includes major rock types such as tonalite, granite, minor paragneiss, and pegmatite. The community of Grise Fiord is located along an approximate fault, which follows a valley running approximately northeast to southwest.

2.3.3 Permafrost

Grise Fiord is located in the region of continuous permafrost approximately 15 m deep with an annual mean ground temperature in 2022 of -10.2 deg. C (Duchesne et al 2024). The average thawing and freezing indices were approximately 254 deg. C-days and 5,301 deg. C days, respectively. It is estimated that the active layer thickness varies between 0.8 m and 1.3 m depending on the site conditions (ABG, 2023).

Several thermistor strings have been installed in the community, two by Worley at the Hamlet Works Garage and one by EXP near the proposed Water Treatment Plant location, to monitor the ground temperatures up to 10 m below surface. Readings from the garage thermistors are generally in line with the ABG observations and indicate an active layer up to 2 m inside the garage footprint and approximately 0.6 m outside the garage footprint.

2.4 Climactic Conditions

2.4.1 Temperature

The design temperature data for Grise Fiord was obtained from the Government of Nunavut Good Building Practices Guidelines Third Edition (GN GBPG). Figure 2-2 shows the 30-year averages for temperature and precipitation from Environment Canada:

- January Design Temperature (2.5%): -40 deg. C
- July Design Temperature (2.5% Dry): 12 deg. C
- Degree-Days Below 18 deg. C: 12,100

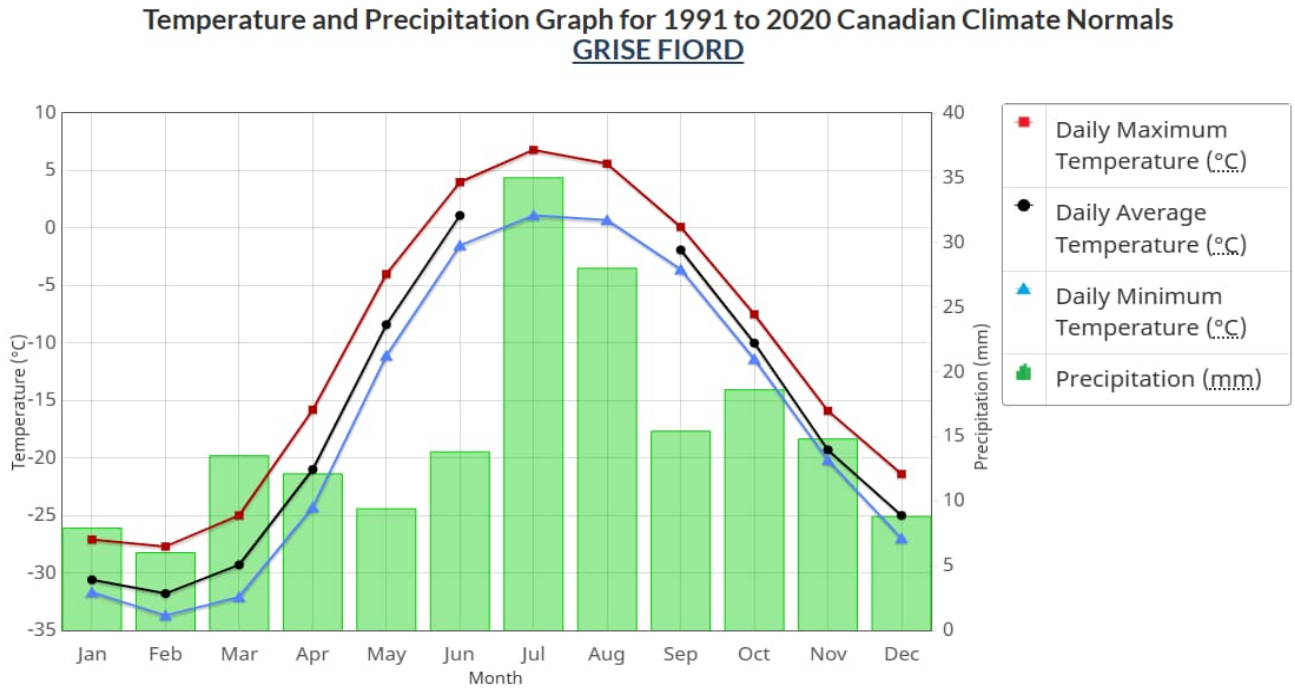

Figure 2-2: Average Temperatures for Grise Fiord from 1991 to 2020

2.4.2 Precipitation

The following rainfall data for Grise Fiord was obtained from the GN GBPG:

- 15 Minute Rainfall (1 in 10 Years): 5 mm
- One Day Rainfall (1 in 50 Years): 50 mm
- Annual Rainfall (Average): 65 mm
- Annual Total Precipitation (Average): 165 mm

Average monthly precipitation for 1991 to 2020 is also presented in Figure 2-2.

The following snow load data for Grise Fiord was obtained from the GN GBPG:

- Ground Snow Load (1 in 50 Years): Ss = 2.8 kPa, Sr = 0.1 kPa

2.4.3 Wind Pressure

The following wind pressure data for Grise Fiord was obtained from the GN GBPG:

- Hourly Wind Pressure (1 in 10 Years): 0.54 kPa
- Hourly Wind Pressure (1 in 30 Years): 0.64 kPa
- Hourly Wind Pressure (1 in 50 Years): 0.69 kPa
- Hourly Wind Pressure (1 in 100 Years): 0.77 kPa

2.4.4 Seismic Conditions

The area under consideration for the bridge was designated Site Class C (X_C), with a ground profile of very dense soil and soft rock. The 2020 National Building Code of Canada Seismic Hazard Tool was utilized to derive the 2%-in-50-year seismic hazard values for the design of the pedestrian bridge:

- Spectral Acceleration (0.05, X_C): 0.262 g
- Spectral Acceleration (0.2, X_C): 0.259 g
- Spectral Acceleration (0.5, X_C): 0.185 g
- Spectral Acceleration (1.0, X_C): 0.109 g
- Spectral Acceleration (2.0, X_C): 0.055 g
- Spectral Acceleration (5.0, X_C): 0.0157 g
- Spectral Acceleration (10.0, X_C): 0.0055 g
- Peak Ground Acceleration (X_C): 0.12 g
- Peak Ground Velocity (X_C): 0.127 m/s

3. Site Reconnaissance and Survey

A project specific site reconnaissance and topographic survey was not part of the scope. However, a topographic survey was completed as part of the Grise Fiord Community Harbour project (August 2024) which covers the area of the proposed river crossing. A site reconnaissance was completed during a geotechnical field investigation to support the Grise Fiord Community Harbour project in April 2025. Both are described in more detail below.

3.1 Topographic and Drone Survey

Worley engaged Underhill Geomatics Ltd. (Underhill) to undertake a topographic survey and collect orthorectified drone imagery of Grise Fiord as part of the Grise Fiord Community Harbour project. Topographic surveys of the bridge crossing were conducted in August 2024 to the CGVD2013 Vertical Datum, hereon referred to as Geodetic Datum (GD). The site topography is presented in Drawing No. 00-CI-0001 in Appendix A.

3.2 Site Reconnaissance

A site walkover of the river crossing was undertaken by three Worley personnel (Associate Engineering Geologist [Jeff Gibson] and Senior Geologists [Lauren Tagg and Melanie Jones]) and three Hamlet representatives (David General [SAO], Marty Kuluguqtuq [ASAO], and Chris Dederick [Foreman]) on April 3, 2025. Although the site was snowed over, it allowed for local input regarding previous washouts of the crossing, identification of typical water levels, and active river channel width.

The crossing, which includes an active river channel, has a length of approximately 130 m as measured from the adjacent north-south road to the rear of the tank farm and generally runs on northwest-southeast alignment. The top of the gravel road varies in elevation at the river crossing from approximately 18 m GD (top of slope on northern bank) to 20 m GD (top of slope on southern bank). The lowest elevation within the alignment is approximately 12 m GD along the southwest edge at the streambed. The existing road at the crossing is approximately 4 m wide at both approaches.

A total of four culverts were observed during the site reconnaissance exposed above the snow line and can be seen in the photo shown in Figure 3-1. Note the depressions on the road surface between the culverts. Chris from the Hamlet provided an estimate of typical levels of high-water river flows as indicated in Figure 3-1 and Figure 3-2, though it should be noted high flow events frequently overtop the crossing.

Figure 3-1: View of River Crossing Looking Southwest

Figure 3-2: View of River Crossing Looking Northwest

The river crossing appears to have been constructed after 2020 based on satellite imagery, but such imagery is extremely limited in Grise Fiord, leaving the original construction date unknown. River flow is generally maintained by means of culverts installed along the streambed, over which a sand and gravel roadway has been installed. The width of the road is typically 3 m wide along its full length with flared ends at the tops of bank. Approximately 1.3 m of road gravel was recorded below the road surface at the lowest point. The road crossing fill materials comprise sand and gravel with some fines and trace to some cobbles, and aerial images suggest the material may have been sourced from the riverbank immediately adjacent to the southern portion of the road.

Community knowledge suggests the river typically expands up to 18.5 m wide at the crossing during high flows. During exceptionally high river flow events, it was reported that approximately 14 m of road crossing above the culverts consistently washes out requiring repair.

Recent images from a high flow event are presented in Photo 3-1 and Photo 3-2 and show the water having completely washed out the crossing, as well as displacing the existing steel culverts, which are reportedly 1.22 m (4 ft.) in diameter.

Photo 3-1: River Crossing Washout on August 25, 2025, Looking Southeast (Photo by David General)

Photo 3-2: River Crossing Washout on August 25, 2025, Looking Downriver (Photo by David General)

4. Regulatory and Permitting

The following section sets out the expected regulatory requirements for the proposed crossing.

4.1 Federal Regulations

Both the Department of Fisheries and Oceans - Fish and Fish Habitat Protection Program (DFO-FFHPP) and Environment and Climate Change Canada (ECCC) are responsible for administering the *Fisheries Act*. DFO-FFHPP is responsible for the administration of provisions related to the protection of fish and fish habitat, including:

- Section 34.4(1): Prohibition against causing the death of fish, by means other than lawful fishing.
- Section 35(1): Prohibition against causing the harmful alteration, disruption, or destruction (HADD) of fish habitat.

ECCC administers and enforces the pollution prevention provisions of the *Fisheries Act*, including:

- Section 36: Pollution prevention provisions dealing with the deposit of deleterious substances into waters frequented by fish.
- Section 38(5): Requires immediate notification to an ECCC-designated inspector and implementation of reasonable corrective actions following a deposit of a deleterious substance.

Local knowledge indicates that Airport River is not fish-bearing (see correspondence in Appendix B, NPC File No. 150536). Stream flow is sourced from snow melt and surface runoff in the watershed and there are no significant waterbodies upstream of the project area (exp, 2022). It is therefore not expected that a Letter of Advice or *Fisheries Act* Authorization will be required from DFO. DFO have been contacted to confirm this, but a response was not available at the time of report preparation.

Transport Canada (TC) is the regulatory authority for the *Canadian Navigable Waters Act* through the Navigation Protection Program (NPP). The Act provides the federal framework for regulating works that may interfere with navigation in navigable waters. The average water flow in Airport River indicates that it would not be defined as navigable waters and therefore the Act would not impact the project.

4.2 Nunavut Territorial Requirements

Projects in Nunavut must comply with regulatory requirements set out in the *Nunavut Agreement* and the *Nunavut Planning and Assessment Act*. These requirements are managed through the Nunavut Planning Commission (NPC) and the Nunavut Impact Review Board (NIRB). The proposed project was submitted to NPC in 2024 who determined it was exempt from review by NPC and NIRB (Appendix B, NPC File No. 150536).

The NWB regulates activities that may impact fresh water through the *Nunavut Water Regulation* and *Nunavut Water and Nunavut Surface Rights Tribunal Act*. Correspondence between the Hamlet and NWB in September 2024 confirmed that an approval for a water license would be required (Appendix B, NWB Correspondence). Schedule 2 of the Nunavut Water Regulations suggests the work requires a Type B License, which the Manager of Licensing confirmed via correspondence in November 2025, as the project involves a water-crossing structure where the width of the watercourse at the point of construction is greater than 5 m. The associated application is planned for initial submission to the NWB following this report, and approval thereof can vary from several months to a year. Final acceptance of the application will remain pending until the submission of completed construction drawings to the NWB.

The *Nunavut Archaeological and Palaeontological Sites Regulations* protect the region's archaeological heritage under the *Nunavut Act* and permits are required to investigate or disturb archaeological or palaeontological sites. The *Grise Fiord Community Plan* and *Zoning Bylaw* also set out protections for these sites and require reporting to the Development Officer if archaeological specimens are found during construction. It is recommended that a desk study assessment is prepared by an archaeologist to determine the risk of encountering an archaeological site in the project area.

4.3 Municipal Requirements

The proposed project aligns with the *Grise Fiord Community Plan* which states the "Hamlet will seek opportunities to improve connectivity of walkways and other transportation corridors, where possible, to maximize safety and efficiency for users."

The Grise Fiord Zoning Bylaw has provisions for Development and Building Permits. The Bylaw has an exemption to the requirement for a Development Permit for installation of public works carried out by the Hamlet on land which is publicly owned or controlled. Similarly, through discussions with the Hamlet (personal communication, David General SAO, 03Oct2025) it is understood that a building permit should not be required, but if required, the approval timeline would be short. Because construction is proposed below high-water mark, erosion and sediment control (ESC) measures and spill planning will be required for construction.

4.4 Summary and Recommendations

Based on our assessment, permitting requirements are expected to include:

- NWB Licence for work within the watercourse.
- ESC and spill control measures to be implemented during construction.
- Municipal Development Permit

We recommend the following:

- Contact NWB and determine if the licensing can be initiated based on preliminary drawings; the design is not expected to change following tender and this may reduce approval timelines.
- Update this report following communication with DFO, and clarification of their expectations.
- Prepare an archaeological desk study assessment to determine the risk of encountering an archaeological site in the project area.
- If there are any significant changes to the project, re-engage with the NPC/NIRB to confirm that exemptions still apply.

5. Pedestrian Bridge Design

5.1 Design Methodology

5.1.1 Design Criteria

The pedestrian bridge was designed to meet the environmental criteria highlighted in Section 2.4, as well as the following:

- The bridge was designed in accordance with the following codes and standards:
  - CSA S7:23 - Pedestrian, Cycling, and Multiuse Bridge Design Guideline
  - CSA S6:19 - Canadian Highway Bridge Design Code
  - National Building Code of Canada (NBC) 2020
  - Transportation Association of Canada Geometric Design Guide 2020
  - Government of Nunavut Good Building Practices Guidelines 2020
- The bridge was designed to primarily function for pedestrian use and considers up to 14 people crossing in any direction simultaneously. The bridge was also dimensioned to support the transit of a single ATV or snowmobile in one direction in the event of emergency.
- The bridge was designed to optimize for cost, ease of construction, and system robustness, and not necessarily to simply span across the entire river crossing.

5.1.2 Design Water Levels

The design water level is based on a 100-year, 24-hour flood event. The peak flow of 35.14 m^3/s for the 100-year, 24-hour flood event for the river was obtained from the Hamlet of Grise Fiord MDP (Tetra Tech, 2021).

The low points in the bed of the active river channel at the crossing were obtained from topographical surveys of the area undertaken during the Grise Fiord Community Harbour project. Based on this flow and local topographic data, a one-dimensional hydraulic model of the site using the Hydraulic Engineering Center River Analysis System (HEC-RAS) was created for sections both upstream and downstream of the bridge alignment.

For the target sections, the low points in the riverbed are approximately 13.1 m GD for the upstream section and 12.5 m GD for the downstream section. The model subsequently generated a maximum water surface elevation of 14.52 m GD and 13.62 m GD, respectively. This results in a maximum water depth of approximately 1.42 m above the riverbed and a maximum width of up to approximately 30 m as shown in Figure 5-1 and Figure 5-2. Additional modelling with slightly modified orientations of the upstream and downstream sections were undertaken and presented marginally different results - with stream bed low points of 12.88 m GD for the upstream section and 12.53 m GD for the downstream section, output maximum water surface elevations were 14.86 m GD and 13.58 m GD, respectively. The maximum water surface of elevation of 14.86 m GD was carried forward into design, along with the variant maximum width of approximately 30.7 m.

Local knowledge suggests that peak flows in an average year may reach 14.8 m GD and spread across a width of up to 18.5 m. This is generally in accordance with the model results and makes sense for the topography, as evidence by the width of the river in Photo 3-1 and Photo 3-1, thereby substantiating the result.

The above suggests that a large clear-span bridge is needed to accommodate flow during annual freshet, and that extreme events may result in a large increase in width. Consequently, the abutment should be built-up and protected by armour stone to provide sound foundation for the bridge and avoid scour, especially if flows are concentrated at high velocity against one or both abutments.

While extreme events may cause wide flooding, minimizing construction costs and simplifying installation are viewed as higher priorities. For a shorter span bridge to accommodate extreme events, the approach roads should have portions constructed at or below bridge level which are designed to act as a fuse in the system. By building at the correct elevations, the roads should be high enough to avoid damage during typical annual flows but will wash out to accommodate extreme flow before the bridge is damaged.

Based on these factors, the underside of the bridge girders is set at 16.0 m GD, with a span of approximately 27.5 m. On the basis that this elevation is over 1 m above the peak water level at the crossing during a 1-in-100-year event, impact and debris flows have been ignored. Approach roads will be constructed at the existing grade or at approximately 15.5 m GD for some distance, allowing them to serve as controlled overflow paths in extreme events as shown in Drawing No. 00-CI-0002 in Appendix A.

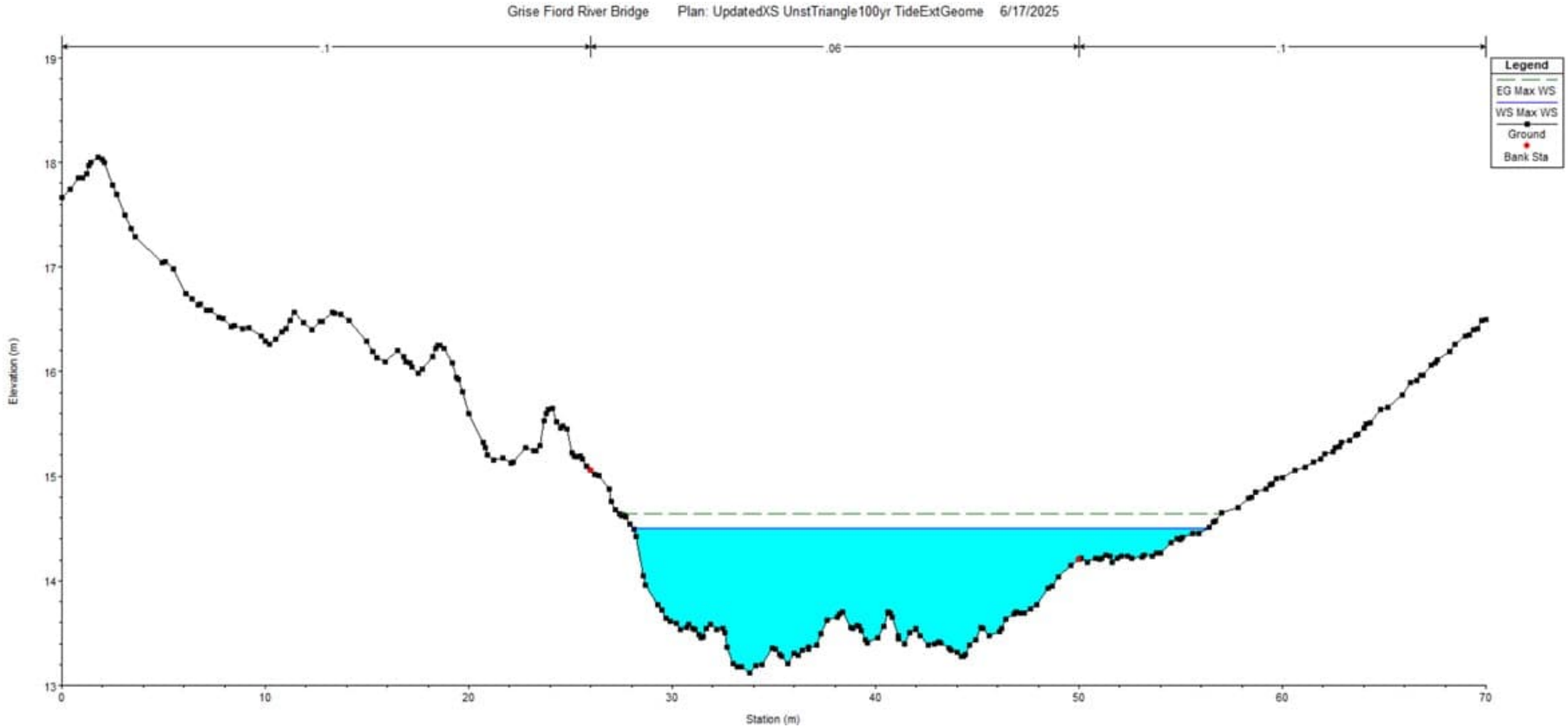

Figure 5-1: Model Output Upstream of Bridge Alignment with Water Surface Elevation of 14.52 m GD

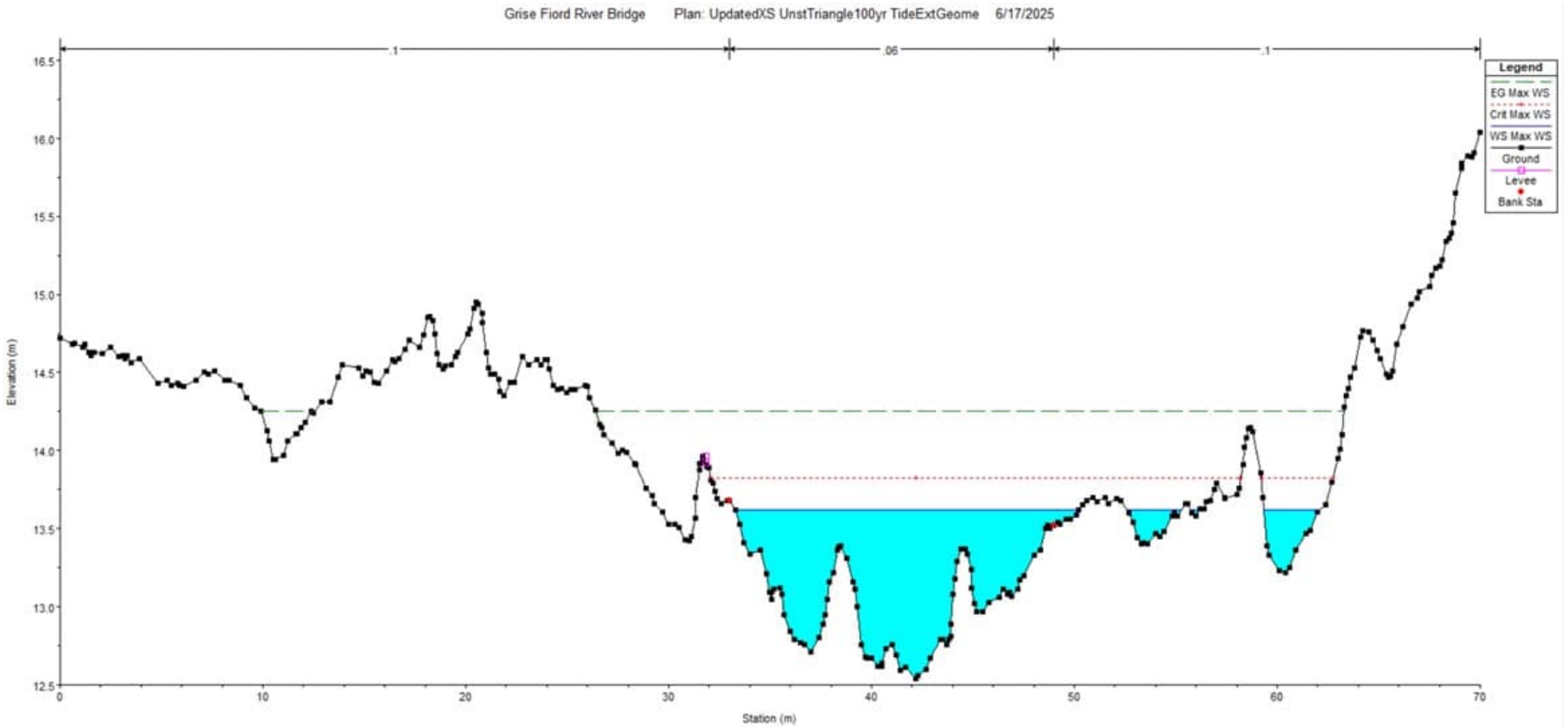

Figure 5-2: Model Output Downstream of Bridge Alignment with Water Surface Elevation of 13.62 m GD

5.1.3 Substructure

The substructure for the bridge is conceptually based on using Binwall abutments which provide a durable, cost-effective, and easy to install system. These are made of galvanized steel components which can be bolted together on-site or delivered preassembled in convenient lightweight loads based on project requirements. The Binwalls are installed such that the bridge bearing is above the normal stream flow level. The lower portion of the Binwalls are founded on permafrost and installed approximately 2 m below grade, and are in-filled with good quality, free draining, well graded granular material.

When Binwalls are constructed in or near water, its foundation level must be established such that it is below the potential scour depths. Loss of foundation material supporting the Binwalls can cause loss of backfill retained and subsequently lead to stability issues. Thus, heavy armour will be placed around the base of the Binwalls when being backfilled.

The Binwall units are built-up to the required elevation to suit the bridge superstructure and protected against runoff scour with suitably sized riprap. The Binwalls should be detailed to avoid destabilization in the extreme event that the approach roads immediately behind get washed out.

Typical isometric illustration and cross-section of the Binwall abutment (for reference only) is presented in Figure 5-3 and Figure 5-4.

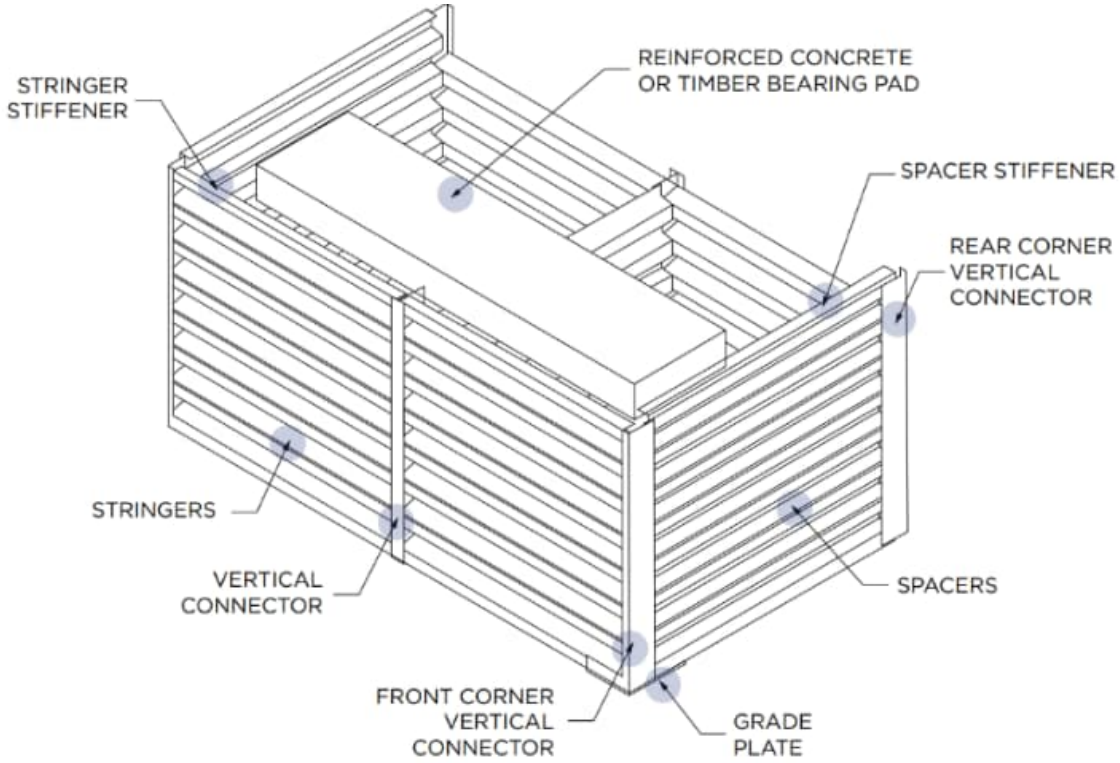

Figure 5-3: Typical Binwall Abutment (Indicative)

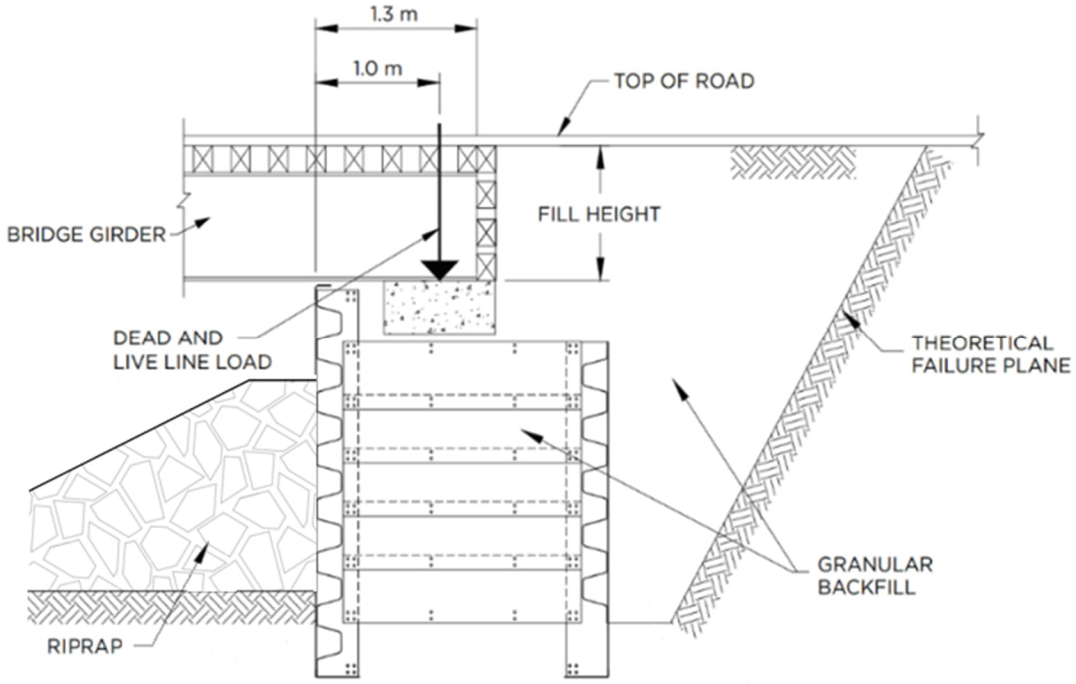

Figure 5-4: Cross-Section of the Binwall Abutment (Indicative)

5.1.4 Superstructure

Key design/load requirements for the superstructure are summarized below:

- Live Load, Pedestrian: 4.8 kPa
- Live Load, Vehicle: 5.5 kN
- Snow Load: 2.8 kPa
- Snow Load, Wet Snow: 0.1 kPa
- Ice Accretion: 31 mm
- Wind Load: 0.69 kPa

Two options were originally investigated for the potential bridge: an assembly of prefabricated truss bridge sections, as well as a modular truss panel type bridge, also known as a Bailey bridge. The prefabricated bridge has major benefits in that it allows for the majority of bridge assembly to take place at a fabrication shop but would be more difficult to ship and install due to the size and weight of assembled components. A Bailey bridge utilized more modular components, facilitating shipping, but would require greater assembly effort at the site. For the purposes of this study, community members noted that a Bailey bridge is not considered to be aesthetically pleasing, and so the prefabricated truss is the preferred option. However, in the event that costs for the supply and installation of a prefabricated truss preclude its construction, the option of a Bailey bridge is maintained in this report for ease of reference. The substructure and design methodology for both bridges would be very similar. The indicative examples of both options can be seen in Figure 5-5.

Figure 5-5: Prefabricated Truss Bridge (Left) and Modular Panel (Bailey) Bridge (Right) (Photos Courtesy of Algonquin Bridge)

The proposed superstructure is a 27.5 m long pony truss composed of hollow structural steel sections. The truss chords are generally 2.44 m (8 ft.) tall, and the width of the deck is 2.5 m. The deck structure is built up of floor beams and longitudinal timber planking. Both sides of the deck are fitted with steel picket guardrails up to an elevation of 1.07 m above the finished bridge deck surface.

The bridge assembly would be supported on precast concrete footings installed at grade within the bin-wall foundation atop the compacted Binwall infill. These precast concrete elements will serve as spread footings to transfer loads to the Binwall infill footings and provide a solid surface on which to install the bridge components. Between the footings and the bridge itself, partially restrained bridge bearings would serve to accommodate the longitudinal and transverse movement of the bridge as it undergoes thermal expansion and contraction. Given the significant temperature variations in Grise Fiord and the long single span, a full set of fixed or pin supports are not recommended.

Appendix A presents drawings of the prefabricated truss concept design.

5.2 Approach Roads

The approach roads will be constructed with compacted general granular fill to suit the existing path. Gentle slopes of maximum 1:10 at both ends of the bridge are provided to reach the bridge deck elevation. As noted in Section 5.1, portions of the road will be built at EL. 15.5 m GD, lower than the bottom chord of the bridge, to act as a system fuse during exceptional flow events (i.e., greater than a 1-in-100-year event) and channel excess water away from the structure as the granular roadway is far easier to repair.

5.3 Construction Methodology

The truss is proposed to be prefabricated in three or more sections and would be shipped to site via sealift and assembled in-situ via bolted connections. The decking could either come pre-installed and sized to the sections or could be provided separately for installation after assembly of the truss, thereby reducing the weight of each bridge segment. If a suitable bridge nose and rollers can be afforded and potentially retrograded in the same shipping season, the entire truss structure could be launched across the river crossing, though the topography of the site may pose a challenge as the crossing sits in a valley. Alternatively, temporary shoring could be installed within the river crossing to support the individual prefabricated segments as they are lifted into place.

Construction of the bin-wall substructure should be readily achievable with local resources - primarily the Hamlet's 590SN backhoe. The backhoe has a maximum excavation depth of approximately 4.7 m, which is well beyond the expected depth of hardpan material or permafrost. Individual materials for the bin-wall, including spacers, stringers, and connectors should individually weigh less than the backhoe's loading capacity of approximately 3,720 kg, but larger pallets may be maneuverable with the Hamlet's WA950 front-end loader.

The truss concept has been designed such that the execution can generally be performed utilizing the Hamlet's equipment, specifically the WA950 loader and 590 SN backhoe. Limited small, containerized equipment will also be required, such as walk-behind compactors (jumping jacks), heaters (frost fighters), and a concrete mixer.

The individual segments of the truss are expected to be manipulated and/or installed using the Hamlet's WA 950 loader:

- Specifications for the loader identify its lifting capacity as 11,200 kg.
- With a 27.5 m length, the design bridge is readily divisible into two segments measuring 10 m long (four 2.5 m spans), and one segment measuring 7.5 m long (three 2.5 m spans). The estimated weight of a 10 m long segment would be 7,685 kg, which is approximately 70% of the capacity of the loader.

6. General Assumptions and Exclusions

6.1 Hydrological

- Bathymetry data for the river was not available. Therefore, if there was any flow in the river at the time of LiDAR topographic survey, the water surface elevation was interpreted in the HEC-RAS model as the bottom of the streambed.
- Due to the lack of flow distributions for this river that could have been used to create a hydrograph corresponding to this peak flow, a triangular distribution spanning 24 hours was used. Therefore, the flow hydrograph for the 100-year scenario started at 4 m^3/s at time 0:00, peaked at 35.14 m^3/s at time 12:00, and ended at 4 m^3/s at time 24:00. This triangular hydrograph may slightly overestimate the volume of water in the river for the 100-year, 24-hour flood event.
- Tidal data from station “Grise Fiord – 06570” of the Canadian Hydrographic Service Tidal Information Website was used for the tidal stage hydrographs at the downstream boundaries of the model. The elevations from the tidal station were relative to Chart Datum and were converted to the CGVD2013 vertical datum by subtracting 1.872 m from each value. One tidal stage hydrograph was incorporated at the downstream end of the north stream, the other at the downstream end of the south stream. The day of record was May 16, 2025, where the tide ranged from 1.328 m GD to -1.272 m GD. However, the negative values in the stage hydrograph were causing model instabilities and were therefore replaced with an elevation of 0 m GD.

6.2 Geotechnical

- The development of new pits to source granular backfill and armour stone have not been considered. It is assumed that enough suitable granular backfill and armour stone will be available from existing and/or future borrow pits.
- Ground temperature data is unknown at the proposed bridge abutments. We assume that depth to permafrost is less than 1 m below grade based on boreholes drilled in the community.
- Anticipated subsurface conditions is based on desktop mapping (Tetra Tech, 2021) and soil conditions encountered from drilling programs in the community, including the proposed water treatment plant, community garage (Worley, 2025) and onshore borehole associated with the proposed small craft harbour (Worley, 2024). Accordingly, subsurface materials are assumed to consist of sandy and gravelly soils near surface, becoming finer grained silts and clays with depth, and a hardpan depth of approximately 1 m to bedrock or permafrost. Worley are not aware of any subsurface investigations undertaken at the proposed bridge crossing site, and unforeseen ground conditions may differ from those anticipated.

6.3 Structural

- The bridge has been designed to serve as a pedestrian crossing. While the bridge has been dimensioned to accommodate all-terrain vehicles and snowmobiles, such transits are assumed to be irregular, undertaken by singular vehicles, and only in case of emergencies. The bridge has not been designed to support the transit of multiple vehicles simultaneously.

- Based on site reconnaissance and hydrological modelling, the elevation of the bridge was established such that it sits above the highest maximum water surface elevation and the expected snowline. Accordingly, it was assumed that the bridge would not be exposed lateral impacts from debris and/or ice flows and has not been designed as such.

6.4 Environmental

- Permit requirements and expected timelines in this review are based on regulatory guidance and past experience.
- Airport River is assumed to be non fish-bearing based on feedback from the local community. Confirmation is required from DFO to determine if the *Fisheries Act* will apply.
- Limited engagement with DFO suggests that by following the Code of Practice for "Clear Span Bridges: Construction, Maintenance and Decommissioning", no further submissions or permitting are required.
- Further engagement with NPC has indicated that the exemption from the submissions in 2024 (see Appendix B) remains valid, and that no further review by NPC or NIRB will be required.
- The NWB Type-B Water License application requires the submission of detailed construction drawings. It is assumed that detailed design will be undertaken by the bridge vendor, who will subsequently be expected to submit final construction details and drawings to the NWB and replace Worley as the Applicant Representative.

7. Cost Estimate

The estimated costs for the options are presented in the Table 7-1. A detailed breakdown of these estimates is presented in Appendix C.

Table 7-1: Class D Capital Cost Estimates (Accuracy ±30%)

Description	Cost
Design and Permitting Costs	
Design and Permitting Project Management	$9,400
Permitting and Environmental Support	$14,100
Detailed Engineering Design	$51,500
Construction Engineering Support	$155,300
Construction Costs	
Mobilization/Demobilization	$738,400
Excavation, Rock Production, and Backfilling	$69,050
Substructure	$225,900
Superstructure	$325,250
Approach Roads	$101,900
Labour and Equipment	$385,100
Indirect Costs	$461,700
Subtotal	$2,537,600
Escalation (7%)	$177,600
Total	$2,715,200

In reviewing the cost estimates, it is important to note the following:

- The estimate, inclusive of contingency, has been prepared in alignment with Class D, ±30% accuracy, level requirements in accordance with the Guide to Cost Predictability in Construction prepared by the Joint Federal Government/Industry Cost Predictability Taskforce. However, the level of accuracy is materially lower than what is traditionally associated with a Class D estimate due to market conditions in the region—particularly challenges related to contractor availability and evolving logistics in the Arctic.
- The above estimates are based on pricing for the third quarter of 2025. Escalation of 7% has been allowed for assuming that the work is tendered before the end of 2026. It is important to note that inflationary impacts seen in Nunavut far exceed those seen in the south.
- The estimate includes a 30% contingency within each item. The contingency is not intended to serve as an accuracy margin. The contingency allocated is an allowance to account for costs and items that remain unquantified due to the current level of engineering development and/or insufficiently detailed site data. Typical allowances within the contingency may include:
    - Variation in quantities of measured quantities.
    - Variations or uncertainties in surveys or records of site data that may require confirmation.
    - Variation in local subsurface conditions due to a lack of comprehensive geotechnical data.

- Variation in the quality of aggregate materials available for production and/or the assumption that such products meet the prescribed requirements. Alternatively, the proponent may need to spend additional funds to produce adequate aggregates or accept reduced performance.

- The estimate has been developed based on in-house experience with other heavy civil projects. Costs for the superstructure were obtained from Algonquin Bridge Ltd., who recently installed the bridge on the Apex trail between Iqaluit and Apex.
- We recommend that the in addition to the above estimate, the project maintain distinct allocations for Risk Contingency and Management Reserve to address the following considerations:
  - Market-related risks, which currently exhibit a high level of uncertainty.
  - The growing prevalence of aggressive contractor claims, often correlated with low profit margins that tend to drive more assertive claim strategies.

The following assumptions were made during the development of the cost estimate:

- It has been assumed that fill and riprap products can be obtained from the moraine northwest of the community or some other reasonably suitable source without the need for active quarrying of materials. The costs associated with Hamlet quarry royalties has been excluded.
- It has been assumed that the construction could be achieved in a three-week period timed to begin shortly after the sealift delivery of equipment and bridge components, or shortly before the sealift the following year. Accordingly, an allowance has been included for one year's winterization of limited containerized equipment. Should additional contractor equipment be required to be mobilized, equipment be required to be overwintered beyond one year, or the sealift vessel be held in demurrage for several days, costs should be expected to increase well beyond contingency allowances.
- It has been assumed that a local contractor from the Qikiqtaaluk area will direct and/or execute the work with support from a southern facility for prefabrication. It is also assumed that most work is completed in one season utilizing local Hamlet resources as well as an extremely limited amount of containerized contractor equipment assumed to be maintained onsite and winterized for one year.
- It has been assumed that the Hamlet's WA950 loader and 590 SN backhoe would be provided for use at no cost to the project (i.e., free supply).
- It has been assumed that onsite engineering construction support would be limited to two dedicated site visits with remote support provided otherwise.
- It has been assumed that costs related to bridge launching equipment and/or temporary works and shoring are built into the contractor's mobilization costs.
- It has been assumed that construction would occur during low flows in the river.
- No additional costs have been assumed for the supply of a dedicated construction camp. It is assumed that local accommodation will be available for a crew size of approximately 5-10 people. In the event a camp is required, labour and equipment costs should be expected to increase significantly.

The following items are excluded from the cost estimate:

- Costs related to QEC and/or electrical connections.
- Costs related to extensive travel delays flying in/out of Grise Fiord.
- Costs related to extreme weather delays (i.e., high flows in the river).
- Costs related to additional travel for field investigations in support of permitting.
- Costs related to overwintering of mobile equipment beyond one year.
- Costs related to disposal of existing infrastructure (i.e., culverts).
- Costs related to Risk Contingency and Management Reserve.
- Costs related to extended ship demurrage.
- Costs related to environmental abatement.
- Costs related to habitat offsetting.
- Owner's costs.
- Royalties.
- Taxes.

8. Construction Execution Schedule

The following generalized execution assumes that all field work, especially those that can affect permits or construction risk are obtained before seeking funding approval. As noted in Section 7, it assumed that fill and riprap products can be obtained from nearby borrow sources. In the event that such products are unavailable, or not available in sufficient quality or quantity, it is recommended that the project be deferred such that construction is undertaken simultaneously with the Grise Fiord Community Harbour to be able to benefit from the resources mobilized for that project (i.e., active quarry production of armour stone).

8.1 Year 1 (2025)

- Conduct consultations to present the preferred option to the community and gather information and feedback from the Hamlet authorities.
- Engage with regulatory agencies to confirm the scope of field work required to support permit applications.
- Complete detailed design, producing plans, and specifications for construction tendering.
- Submit territorial and federal regulatory applications during detailed design, allowing sufficient time (minimum six months) from the desired receipt date, assuming the process is expected to be smooth.
- Receipt of final permits.

8.2 Year 2 (2026)

- Tender the construction. An issue date in January is desirable to provide sufficient time for the contractor to obtain the necessary outside pricing support and plenty of time to assemble and ship equipment and fabricated components from the south or other nearby communities.
- Mobilize for construction and prepare site for temporary facilities and contractor's laydown area.
- Prepare project site by undertaking necessary excavating and foundation preparation, building the approach roads to required level.
- Bridge crossing construction.
- Complete all adjoining earthworks.
- Complete final as-built surveys.

8.3 Year 3 (2027)

- Demobilize contractor equipment.

9. Limitations

This report has been prepared in accordance with a specific brief and scope of work. It should be read in its entirety.

The responsibility of Worley is solely to the Hamlet. This report is not intended for, and should not be relied upon, by any third-party. No liability is undertaken to any third-party.

Any interpretation or recommendation given in this report shall be understood to be based on judgement and experience for the purpose of a conceptual design, not on greater knowledge of facts other than those reported.

10. Closure

We trust that this report satisfies your current requirements and provides suitable documentation for your records. If you have any questions or require further details, please contact the undersigned at any time.

Report Prepared by:

DocuSigned by:
C799CE40CC9A4AB...

Andre Dratwa, P.Eng.
Marine Structural Engineer

DocuSigned by:
Jeffrey Gibson
7A0E565BB2BE4C2...

Jeff Gibson, P.L.Eng. (BC)
Associate Engineering Geologist

DocuSigned by:
Robert Bracken
DCB2C0DF76DA405...

Robert Bracken, P.Eng.
Technical Director Regulatory and Environment

Signed by:
D195A764BCC8404...

Kasgin Banab, P.Eng.
Associate Geotechnical Consultant

Senior Review by:

DocuSigned by:
C Meisl
E100989FD7594BC...

Chris Meisl, P.Eng.
Principal Marine Structural Engineer

11. References

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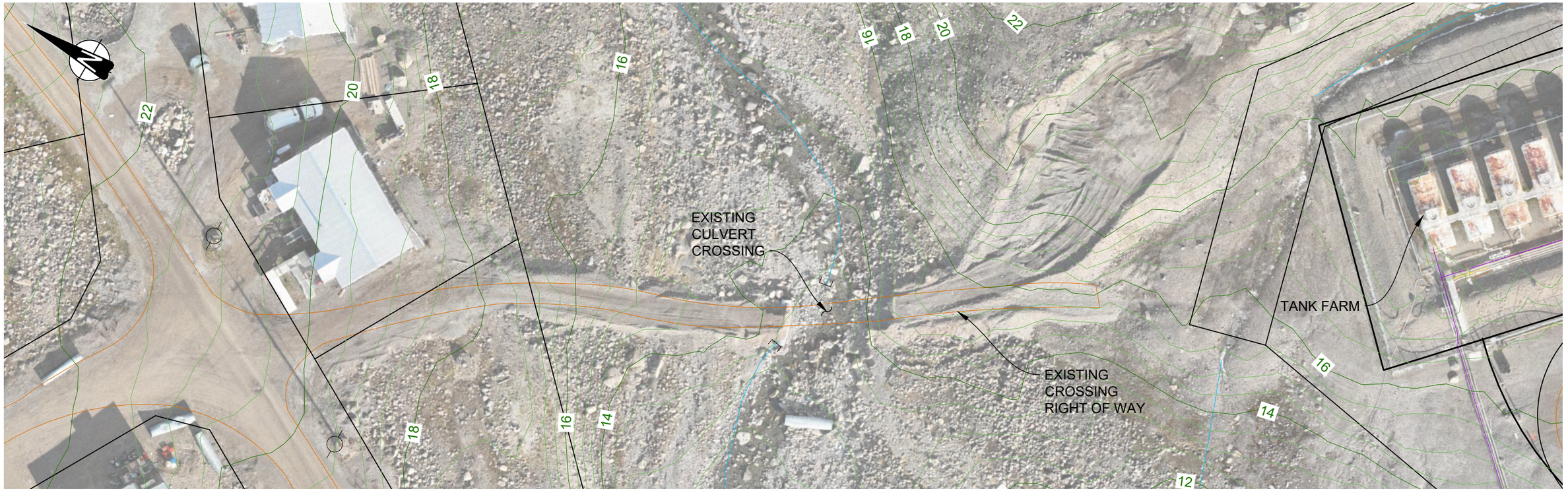
Appendix A. Concept Plans



PLAN
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VIEW - SOUTH EAST
CROSSING

VIEW - SOUTH EAST
CROSSING

VIEW - NORTH EAST
UPRIVER

VIEW - SOUTH EAST
RAINFALL EVENT

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1:500

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
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NOTES:

1. ALL ELEVATIONS ARE TO CGVD2013 VERTICAL DATUM.

HAMLET OF GRISE FIORD
AIRPORT RIVER UPPER LEVEL PEDESTRIAN CROSSING

EXISTING PLAN AND PHOTOS

Date: 2025-10-08	Drawn by: JLC	Edited by: JLC	App'd by: JG

worley consulting

Worley Project No. 317086-59828

FIG No 00-CI-0001 | REV B

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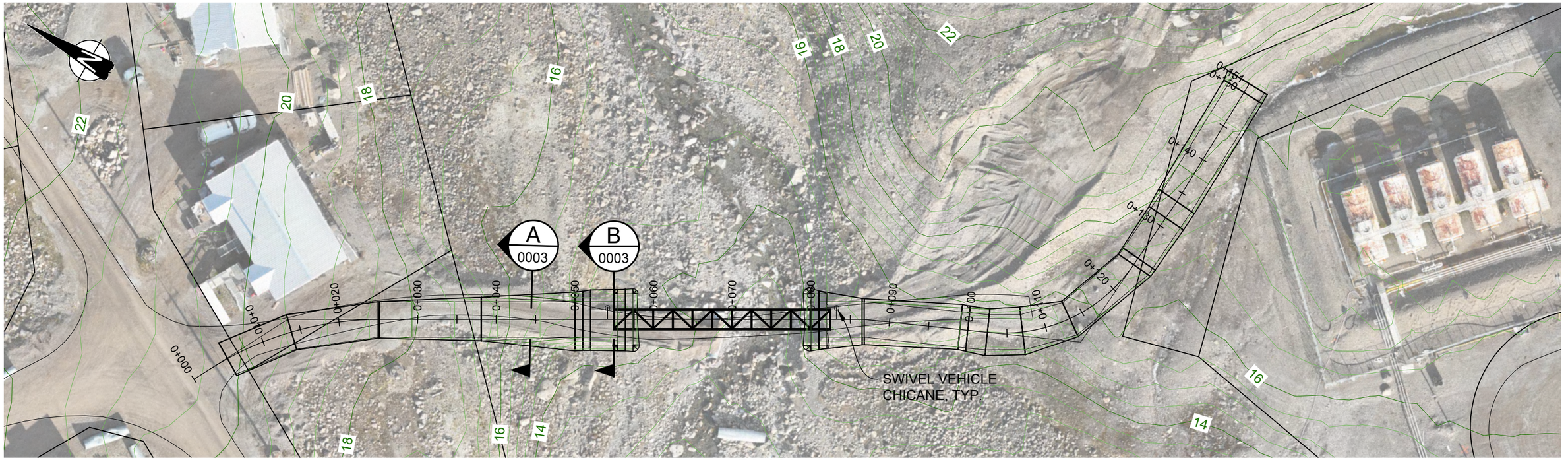
ISSUING OFFICE: VANCOUVER, B.C.



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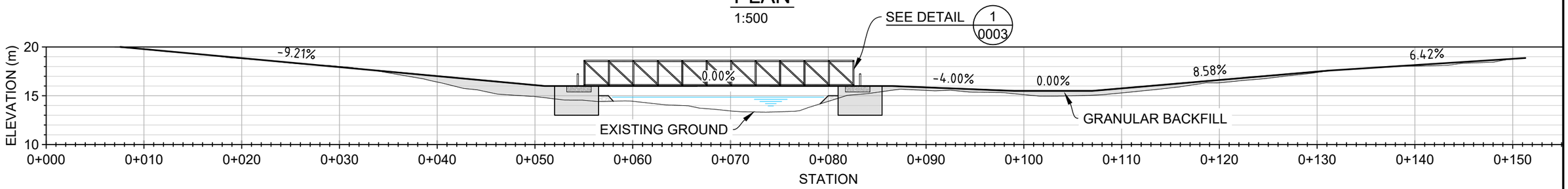

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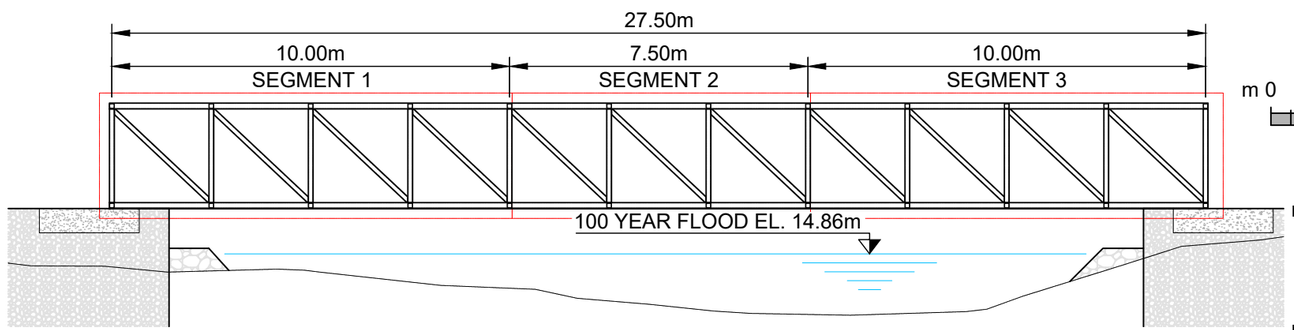

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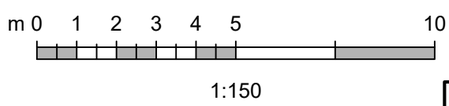

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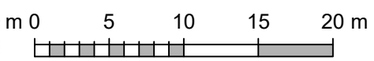

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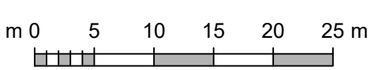

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NOTES:

1. ALL ELEVATIONS ARE TO CGVD2013 VERTICAL DATUM.

HAMLET OF GRISE FIORD
AIRPORT RIVER UPPER LEVEL PEDESTRIAN CROSSING

PLAN AND PROFILE

Date:	Drawn by:	Edited by:	App'd by:
2025-10-08	JLC	JLC	JG

Worley Project No. 317086-59828
FIG No 00-CI-0002
REV C

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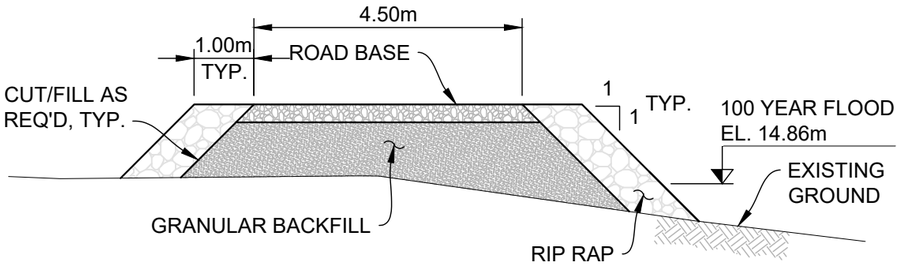
ISSUING OFFICE: VANCOUVER, B.C.



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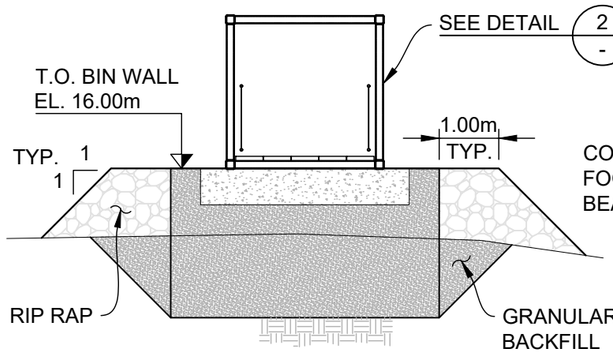

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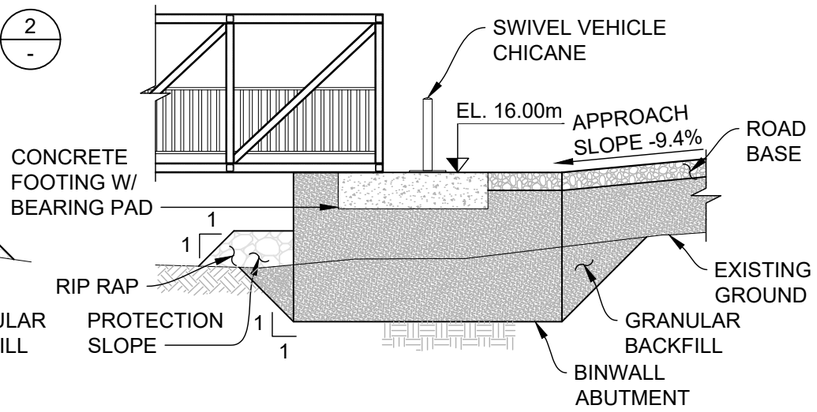

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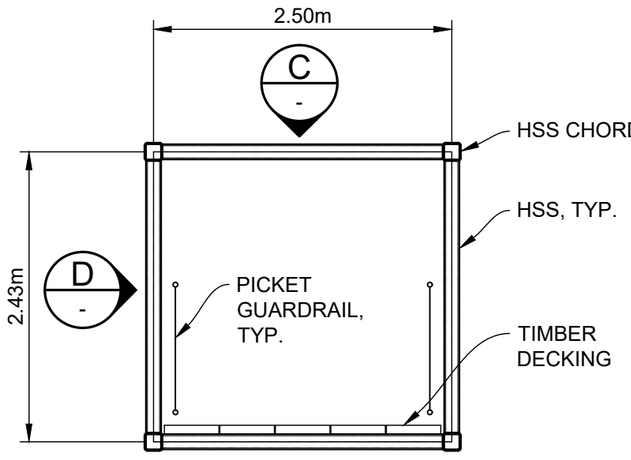

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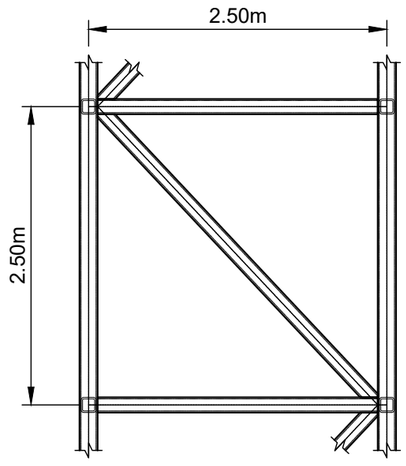

VIEW C
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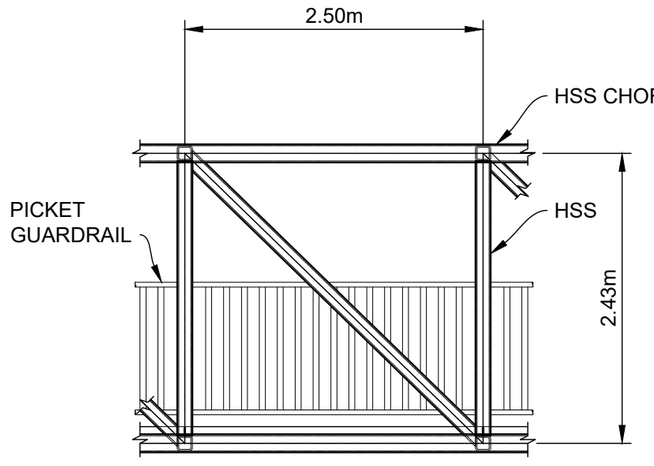

VIEW D
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NOTES:

1. ALL ELEVATIONS ARE TO CGVD2013 VERTICAL DATUM.

PRELIMINARY
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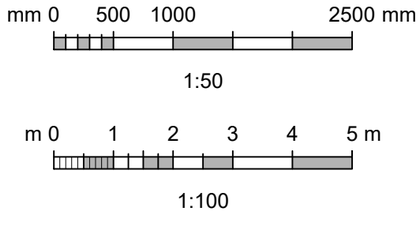
Last Saved: Oct. 23/25 11:25am



HAMLET OF GRISE FIORD
AIRPORT RIVER UPPER LEVEL PEDESTRIAN CROSSING

TYPICAL DETAILS AND SECTIONS

Date: 2025-10-23	Drawn by: JLC	Edited by: JLC	App'd by: JG

Worley Project No. 317086-59828

FIG No **00-CI-0003** | REV **B**

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Appendix B. Reference Correspondence

From:	**Richard Dwyer** <richard.dwyer@nwb-oen.ca>
To:	**Grise Fiord SAO** <gfsao@qiniq.com>
CC:	**Ali Shaikh** <ali.shaikh@nwb-oen.ca>
Subject:	Re: FW: Touching Base
Date:	03.09.2024 17:52:44 (+02:00)

Good afternoon,

When the plans for construction are finalized with the contractor please send this information to the Nunavut Water Board.

Thanks,

Richard

Richard Dwyer - ᕆᓚᑦᓱᑦ ᑐᐊᐃᔪᖅ - he\him\his

Manager of Licensing- Responsable des permis

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NUNAVUT WATER BOARD - OFFICE DES EAUX DU NUNAVUT

ᓄᓇᕗᑦ ᐃᒪᓕᕆᔩᑦ ᑲᑎᒪᔨᖏᑦ - NUNAVUT IMALIRIYIN KATIMAYINGI

www.nwb-oen.ca

P.O. Box 119 Gjoa Haven, NU, X0B 1J0 | C.P. 119 Gjoa Haven (Nunavut), X0B 1J0 | ᑎᑎᕋᖅᑲᕐᕕᐊ 119 ᐅᖅᓱᖅᑑᖅ, ᓄᓇᕗᑦ X0B 1J0 | Titigaqaqvia 119 Uqhuqtuuq, NU, X0B 1J0

Tel / Téléphone / ᓯᕗᔭᐅᑖ / Hivayauta: (867) 360-6338 | Fax / Télécopieur / ᓱᑲᔪᒃᑯᑦ / Fax-kut: (867) 360-6369

Toll Free / Sans / ᐊᑭᖃᙱᑦᑐᖅ / Akiittuq: 1-855-521-3745

On Tue, Sep 3, 2024 at 3:35 M Grise Fiord SAO <gfsao@qiniq.com> wrote:

> Thanks Richard.
>
> I can provide whatever additional information you require, just let me know.
>
> David
>
> ---
>
> **From:** Richard Dwyer <richard.dwyer@nwb-oen.ca>
> **Sent:** September 3, 2024 12:01 PM
> **To:** Lusty, Megan <MLusty@gov.nu.ca>
> **Cc:** Ali Shaikh <ali.shaikh@nwb-oen.ca>; Grise Fiord SAO <gfsao@qiniq.com>; Robert Hunter <robert.hunter@nwb-oen.ca>; Karén Kharatyan <karen.kharatyan@nwb-oen.ca>
> **Subject:** Re: FW: Touching Base
>
> Good morning,
>
> If this isn't part of the municipal water licence then it will require either an approval or a water licence. The Nunavut Water Board requests more information to make the determination whether it requires an approval or water licence.
>
> Regards,
>
> Richard

On Tue, Sep 3, 2024 at 9:51 /span>AM Lusty, Megan <MLusty@gov.nu.ca> wrote:

Hi Richard,

As previously stated, this pedestrian bridge is not part of the 3BM-GRI2025 licence for drinking water, wastewater and solid waste infrastructure and has no impact on those facilities.

Regards,

Megan

ᒪᐃᑲᓐ ᓚᔅᑎ Megan Lusty

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Manager, Municipal Works

Community Infrastructure Division
Community and Government Services
Government of Nunavut

Atangujaq, Hamlatkunni Havauhiit

Nunallaani Napaqtirinirmun Havagvia
Nunalingni Kavamatkunilu Pivikhaqautikkut
Nunavut Kavamanga

Gestionnaire des Projets Municipaux

Division des Infrastructures Communautaires
Services Communautaires et Gouvernementaux
Gouvernement du Nunavut

867-975-5478

mlusty@gov.nu.ca

From: Richard Dwyer <richard.dwyer@nwb-oen.ca>
Sent: September 3, 2024 11:37 AM
To: Lusty, Megan <MLusty@GOV.NU.CA>
Cc: Ali Shaikh <ali.shaikh@nwb-oen.ca>; Grise Fiord SAO <gfsao@qiniq.com>; Robert Hunter <robert.hunter@nwb-oen.ca>; Karén Kharatyan <karen.kharatyan@nwb-oen.ca>
Subject: Re: FW: Touching Base

Good morning,

As per water licence 3BM-GRI2025 please submit a construction summary report.

4. The Licensee shall, within ninety (90) days of completion of Modification or construction of facilities and/or infrastructure associated with the project, submit to the Board for review a Construction Summary Report along with stamped as-built plans and drawings, providing explanation to reflect any deviations from for construction drawings taking into account construction and field decisions and how they may affect the performance of engineered facilities.

The construction summary report may also be provided with the 2024 annual report.

Regards,

Richard

On Tue, Sep 3, 2024 at 9:20 /span>AM Lusty, Megan <MLusty@gov.nu.ca> wrote:

> Thanks Ali.

ᒪᐃᒐᓐ ᓚᔅᑎ Megan Lusty

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Manager, Municipal Works

Community Infrastructure Division
Community and Government Services
Government of Nunavut

Atangujaq, Hamlatkunni Havauhiit

Nunallaani Napaqtirinirmun Havagvia
Nunalingni Kavamatkunilu Pivikhaqautikkut
Nunavut Kavamanga

Gestionnaire des Projets Municipaux

Division des Infrastructures Communautaires
Services Communautaires et Gouvernementaux
Gouvernement du Nunavut

867-975-5478

mlusty@gov.nu.ca

From: Ali Shaikh <ali.shaikh@nwb-oen.ca>
Sent: September 3, 2024 10:55 AM
To: Lusty, Megan <MLusty@GOV.NU.CA>
Cc: Richard Dwyer <richard.dwyer@nwb-oen.ca>; Grise Fiord SAO <gfsao@qiniq.com>; Robert Hunter <robert.hunter@nwb-oen.ca>; Karén Kharatyan <karen.kharatyan@nwb-oen.ca>
Subject: Re: FW: Touching Base

Good morning Megan,

A separate water licence application is not required for the installation of a pedestrian bridge.

Regards,

Ali

On Tue, Sep 3, 2024 at 7:04 /span>AM Lusty, Megan <MLusty@gov.nu.ca> wrote:

Good morning Richard,

This project is not part of the 3BM-GRI2025 licence for drinking water, wastewater and solid waste infrastructure.

I believe the question David was asking is if a separate water licence application is required for the installation of a pedestrian bridge. NPC determined that they did not need to review a pedestrian bridge, and therefore also did not require NIRB review (email below, August 29, 2024).

The scope of the pedestrian bridge as per David's first email to the NPC is as follows:

> *We would like to purchase a pedestrian bridge to cross what we call 'Airport River'. The river basically divides the town in half, with housing on both sides of the river.*
>
> *The reason for the bridge would be to allow residents to take a walking shortcut from one side of town to the other. It is more dangerous to walk on our main bridge, which is along the beach, and is frequented by polar bears in the winter (at times).*
>
> *This is basically snow melt and glacial runoff, there is no fish in the river for example.*
>
> *Varies based on the time of year, but maybe is 30-60 feet in width, and the bridge might then be 80-100 feet in length.*

As the pedestrian bridge is not a structure intended to contain, withhold, divert or retain water within Airport River, I do not believe a water licence would be required. Can you please confirm this?

Thanks,

Megan

ᒪᐃᒐᓐ ᓚᔅᑎ Megan Lusty

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Manager, Municipal Works

Community Infrastructure Division
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Gestionnaire des Projets Municipaux

Division des Infrastructures Communautaires
Services Communautaires et Gouvernementaux
Gouvernement du Nunavut

867-975-5478

mlusty@gov.nu.ca

From: Richard Dwyer <richard.dwyer@nwb-oen.ca>
Sent: August 30, 2024 4:58 PM
To: Grise Fiord SAO <gfsao@qiniq.com>
Cc: Ali Shaikh <ali.shaikh@nwb-oen.ca>; Robert Hunter <robert.hunter@nwb-oen.ca>; Karén Kharatyan <karen.kharatyan@nwb-oen.ca>; Lusty, Megan <MLusty@GOV.NU.CA>
Subject: Re: FW: Touching Base

Good afternoon David,

The Nunavut Water Board requires more information, please submit a brief summary of the works to be completed.

The conditions of the attached Hamlet of Grise Fiord water licence reads:

PART E: CONDITIONS APPLYING TO MODIFICATIONS AND CONSTRUCTION
1. The Licensee shall submit to the Board for review, for construction design drawings stamped by a qualified Engineer, sixty (60) days prior to the construction of any dams, dykes or structures intended to contain, withhold, divert or retain Water or Waste.

Regards,

Richard

On Fri, Aug 30, 2024 at 2:24 /span>PM Grise Fiord SAO <gfsao@qiniq.com> wrote:

> Richard, would you mind to take a look at the 'thread' below?
>
> I am wanting to make sure the installation of a commercial pedestrian bridge, as outlined below, would not require regulatory or other approvals.
>
> Megan Lusty with CGS suggested I check with you.
>
> David
>
> ---
>
> **From:** Jonathan Savoy <jsavoy@nunavut.ca>
> **Sent:** August 29, 2024 1:38 PM
> **To:** Grise Fiord SAO <gfsao@qiniq.com>
> **Cc:** Jonathan Ehaloak <jehaloak@nunavut.ca>; Sharon Ehaloak <sehaloak@nunavut.ca>
> **Subject:** RE: Touching Base
>
> Hi David,
>
> Thanks for reaching out.
>
> We don't consider a pedestrian bridge within the built-up area of the community across a non fish bearing stream to be a project that the NPC needs to review. This also means that you do not need contact the NIRB about this.
>
> Have a great day,

Jonathan Savoy, RPP, MCIP

Director of Policy and Planning

Nunavut Planning Commission

P.O. Box 2101 Cambridge Bay, NU X0B 0C0

NEW PHONE# (867) 447-4564

From: Sharon Ehaloak <sehaloak@nunavut.ca>
Sent: Thursday, August 29, 2024 12:11 PM
To: Grise Fiord SAO <gfsao@qiniq.com>
Cc: Jonathan Savoy <jsavoy@nunavut.ca>; Jonathan Ehaloak <jehaloak@nunavut.ca>
Subject: RE: Touching Base

Good morning David,

First sorry for the delay in responding, we were in Commission meetings. Its very nice to hear from you, I hope you are liking Grise Fiord.

I have sent your e-mail on to Jonathan Sovoy and Jonathan Ehaloak, both cc'd on this and one of them will follow up with you.

Thanks.

Respectfully,

Sharon Ehaloak

Executive Director

From: Grise Fiord SAO <gfsao@qiniq.com>
Sent: Wednesday, August 21, 2024 11:39 AM
To: Sharon Ehaloak <sehaloak@nunavut.ca>
Subject: Touching Base

Hi Sharon,

Nice to see that you are still with NPC!

I am the SAO here at Grise Fiord.

Question for you.

We would like to purchase a pedestrian bridge to cross what we call 'Airport River'. The river basically divides the town in half, with housing on both sides of the river.

The reason for the bridge would be to allow residents to take a walking shortcut from one side of town to the other. It is more dangerous to walk on our main bridge, which is along the beach, and is frequented by polar bears in the winter (at times).

This is basically snow melt and glacial runoff, there is no fish in the river for example.

Varies based on the time of year, but maybe is 30-60 feet in width, and the bridge might then be 80-100 feet in length.

Do I proceed with a Project Proposal (as per your website)? Joseph Monteith advised me that this would be where I'd start.

David General

Senior Administrative Officer

Hamlet of Grise Fiord

867-980-9959

From:	**Dionne Filiatrault** <dfiliatrault@nirb.ca>
To:	**Grise Fiord SAO** <gfsao@qiniq.com>
CC:	**Tara Arko** <tarko@nirb.ca>
Subject:	RE: [EXTERNAL] FW: NPC File No. 150536 [Pedestrian Walkway Grise Fiord]
Date:	01.11.2024 12:45:40 (+01:00)

Hi David
Apologize for the delayed response but as per NPCs correspondence the “proposal is exempt a review by the NPC and screening by the Nunavut Impact Review Board”. No additional submission required to the NIRB.
Regards
Dionne

Dionne Filiatrault, P. Eng (NU/NWT, AB), FEC
Executive Director
Nunavut Impact Review Board
Mobile: 1-867-391-0131(Preferred)
Email: dfiliatrault@nirb.ca
Direct: 1-867-983-4608
Head Office Toll Free: 1-866-233-3033
Website: www.nirb.ca

From: Grise Fiord SAO <gfsao@qiniq.com>
Sent: September 23, 2024 7:12 AM
To: Dionne Filiatrault <dfiliatrault@nirb.ca>
Subject: [EXTERNAL] FW: NPC File No. 150536 [Pedestrian Walkway Grise Fiord]

Hello Dionne,

Please see the email below from the NPC, as well as my attached (very brief) ‘project description’.

Will this need approval from NIRB, given NPC’s conformity determination?

Thanks you.

David General
SAO
Hamlet of Grise Fiord

From: Daniel Haney <dhaney@nunavut.ca>
Sent: September 20, 2024 4:45 PM
To: Patch, William <wpatch@gov.nu.ca>; gfsao@qiniq.com; NWB Licensing <licensing@nwb-oen.ca>; Richard Dwyer <richard.dwyer@nwb-oen.ca>; Cassel Kapolak <ckapolak@nirb.ca>; info@nirb.ca; Keith Morrison <kmorrison@nirb.ca>
Subject: NPC File No. 150536 [Pedestrian Walkway Grise Fiord]

RE: NPC File No. 150536 [Pedestrian Walkway Grise Fiord]

Please find attached the conformity determination letter regarding the above-noted project/project proposal. All project materials are available on our Public Registry at www.nunavut.ca.

Please note that the proponent is responsible for identifying, contacting, and complying with all regulatory authorities' licensing requirements to conduct their planned activities.

Do not hesitate to contact me should you have any questions.

Quana – ᖃd\u5421 ?ᓴ\u5319 ?Γ\u5251 ? – Quyanainni – Ma'na – Nakurmiik – Qujannamiik – Thank You – Merci

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Ċ\u5314 ?ᐅ\u5354 ? H\u5130 ?Δ\u5314 ? | Daniel Haney (he/him)
Planner
Nunavut Planning Commission
Cell: (867) 222-5265
Email: dhaney@nunavut.ca
www.nunavut.ca
Operates on EST (UTC -5)

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Nunavunmi Parnaiyiit
Nunavut Planning Commission
Commission d'Aménagement du Nunavut

20 September 2024
NPC File No. 150536

Richard Dwyer
Manager, Licensing
Nunavut Water Board (NWB)
Gjoa Haven, NU
By email: richard.dwyer@nwb-oen.ca; licensing@nwb-oen.ca

Cassel Kapolak
Manager, Public Registry
Nunavut Impact Review Board (NIRB)
Cambridge Bay, NU
By email: ckapolak@nirb.ca; info@nirb.ca; kmorrison@nirb.ca

William Patch
Director, Planning & Lands
Dept. of Community & Gov. Services (GN-CGS)
Kugluktuk, NU
By email: wpatch@gov.nu.ca

David General
Hamlet of Grise Fiord (Proponent)
Grise Fiord, NU
By email: gfsao@qiniq.com

Dear Richard Dwyer, Cassel Kapolak, William Patch, and David General:

RE: NPC File No. 150536 [Pedestrian Walkway Grise Fiord]

The following works and activities have been proposed in the above-noted project proposal:

1. Permanent structures: The Hamlet of Grise Fiord would like to position a prefabricated pedestrian walkway across the community's "Airport River" (a non fish bearing, meltwater stream).
2. Location: Qikiqtani Region; [Hamlet of Grise Fiord]

A complete description of the proposal reviewed by the Nunavut Planning Commission (NPC) can be accessed online using the link below.

The NPC has completed its review of the above-noted project proposal and has determined that it falls within the exemption of certain works and activities from the definition of the term "project" under the *Nunavut Planning and Project Assessment Act* and from the definition of the term "project proposal" under the *Nunavut Agreement.* The NPC only has a statutory mandate to review "projects/project proposals", and as such, the proposal is exempt from a review by the NPC and screening by the Nunavut Impact Review Board.

By way of this letter, the NPC is forwarding the proposal to the regulatory authority identified by the proponent. Project materials are available at the following address: https://lupit.nunavut.ca/portal/registry/registry.aspx?appid=150536.

This decision applies only to the above-noted proposal as submitted. Proponents may not carry out projects and regulatory authorities may not issue licenses, permits, and other authorizations in respect of projects if a review by the NPC is required.

If you have any questions, please do not hesitate to contact me at (867) 979-3444.

Sincerely,

Goump Djalogue
Manager of Planning & Implementation, MCIP, RPP
Nunavut Planning Commission

Appendix C. Detailed Cost Estimate

Detailed Cost Estimate

Client	Hamlet of Grise Fiord	Date	December 23, 2025
Project	Airport River Crossing	Originator	Andre Dratwa
Proj. No.	317086-59828	Checker	Chris Meisl
Accuracy	Class D	Approver	Andre Dratwa

		Materials				Labour								
Description	Remarks	Quantity	Unit	Rate	Subtotal	Duration	Unit	Rate	Subtotal	Allowance	Subtotal	Contingency		Total
DIRECT COSTS														
Mobilization														
Mobilization and General Conditions	Incl. temp facilities rental	14	month	$12,000.00	$ 168,000				$ -	$ 230,000	$ 398,000	~30%	$ 119,400	$ 517,400
Demobilzation														
Demobilzation		1	LS		$ -				$ -	$ 170,000	$ 170,000	~30%	$ 51,000	$ 221,000
Earthworks														
Excavation/backfill		730	cu.m	$ 40.00	$ 29,200				$ -		$ 29,200	~30%	$ 8,800	$ 38,000
Armour rock production	300-1000 mm dia.	40	cu.m	$ 230.00	$ 9,200				$ -		$ 9,200	~30%	$ 2,800	$ 12,000
General fill production	75-300 mm dia.	366	cu.m	$ 40.00	$ 14,640				$ -		$ 14,640	~30%	$ 4,400	$ 19,040
Road base production	75 mm minus	180	cu.m	$ 280.00	$ 50,400				$ -		$ 50,400	~30%	$ 15,200	$ 65,600
Road surfacing production	19 mm minus	90	cu.m	$ 310.00	$ 27,900				$ -		$ 27,900	~30%	$ 8,400	$ 36,300
Substructure														
Steel bin-wall w/accessories	4.5 m x 3 m x 2 m w/accessories	60	m2	$ 750.00	$ 45,000				$ -		$ 45,000	~30%	$ 13,500	$ 58,500
Cast-in-place concrete footings	Including reinforcing	14	m3	$ 5,600.00	$ 78,400				$ -		$ 78,400	~30%	$ 23,600	$ 102,000
Bridge supports	Including bearing pads	1	LS		$ -				$ -	$ 50,000	$ 50,000	~30%	$ 15,000	$ 65,000
Geotextile		27.6	m2	$ 10.00	$ 276				$ -		$ 276	~30%	$ 100	$ 376
Superstructure														
Prefabricated steel truss	As quoted by Algonquin Bridge Ltd.	1	LS		$ -				$ -	$ 239,640	$ 239,640	~30%	$ 71,900	$ 311,540
Vehicle bariers	Assuming two bicycle chicanes	1	LS		$ -				$ -	$ 3,000	$ 3,000	~30%	$ 900	$ 3,900
Lighting/electrical	Bridge lighting; excludes QEC connection	1	LS		$ -				$ -	$ 7,500	$ 7,500	~30%	$ 2,300	$ 9,800
Construction														
Site Labour	Assuming crew of 7 for 20 days	140.00	man-days	$ 1,290.00	$ 180,600				$ -		$ 180,600	~30%	$ 54,200	$ 234,800
Shipping (Volumetric; NSSI)	Prefab bridge segments.	67.00	2.5m3 units	$ 490.00	$ 32,830				$ -		$ 32,830	~30%	$ 9,900	$ 42,730
Shipping (Weight; NSSI)	Concrete materials.	35.00	tonne	$ 490.00	$ 17,150				$ -		$ 17,150	~30%	$ 5,200	$ 22,350
Shipping (Containerized; NSSI)	Fasteners, small equip & tools	2.00	ea.	$ 7,574.92	$ 15,150				$ -		$ 15,150	~30%	$ 4,600	$ 19,750
Shipping (Retrograde; NSSI)	Small equip & tools	1.00	ea.	$ 4,923.70	$ 4,924				$ -		$ 4,924	~30%	$ 1,500	$ 6,424
Direct Cost Subtotal					$ 673,670				$ -		$ 1,373,810		$ 412,700	$ 1,786,510
INDIRECT COSTS														
Mobilization														
Insurance	Assumed built into general conditions.	1	LS		$ -				$ -		$ -	~30%	$ -	$ -
Temporary Works	Assumed built into general conditions.	1	LS		$ -				$ -		$ -	~30%	$ -	$ -
Room & Board	Assuming crew of 7 for 20 days	140.00	man-days	$ 600.00	$ 84,000				$ -		$ 84,000	~30%	$ 25,200	$ 109,200
Woker Travel Costs	Assuming crew of 7	7.00	travel fees	$ 29,630	$ 207,410	490	hrs	$ 130	$ 63,700		$ 271,110	~30%	$ 81,400	$ 352,510
Equipment Rental														
Concrete mixer	For cast-in-place footing.	2	day	$ 1,350.66	$ 2,701	14	month	$ 115	$ 1,610		$ 4,311	~30%	$ 1,300	$ 5,611
Heater (Frostfighter or similar)	For cast-in-place footing.	14	day	$ 1,350.66	$ 18,909	14	month	$ 115	$ 1,610		$ 20,519	~30%	$ 6,200	$ 26,719
Walk-behind compactor		14	day	$ 1,350.66	$ 18,909	14	month	$ 115	$ 1,610		$ 20,519	~30%	$ 6,200	$ 26,719
Loader	Assuming hamlet WA950 at no cost.	1	LS		$ -				$ -		$ -	~30%	$ -	$ -
Backhoe	Assuming hamlet 590 SN at no cost.	1	LS		$ -				$ -		$ -	~30%	$ -	$ -
Engineering Design														
Engineering Project Management					$ -	40	hrs	$180	$ 7,200		$ 7,200	~30%	$ 2,200	$ 9,400
Permitting Applications					$ -	60	hrs	$180	$ 10,800		$ 10,800	~30%	$ 3,300	$ 14,100
Detailed Plans and Specifications	Performance Specification				$ -	220	hrs	$180	$ 39,600		$ 39,600	~30%	$ 11,900	$ 51,500
Construction Support Site Visits	Incl. 2x 5 day site visits + travel costs	2	travel fees	$ 33,230	$ 66,460	254	hrs	$180	$ 45,720		$ 112,180	~30%	$ 33,700	$ 145,880
Remote Construction Support					$ -	40	hrs	$180	$ 7,200		$ 7,200	~30%	$ 2,200	$ 9,400
Indirect Cost Subtotal					$ 331,930				$ 126,130		$ 458,060		$ 137,700	$ 751,040
TOTAL					$ 1,005,599				$ 126,130		$ 1,831,869		$ 550,400	$ 2,537,549
Escalation from 2025 to 2026	Assumed 7% escalation.													$ 177,628
GRAND TOTAL					$ -				$ -		$ -		$ -	$ 2,715,178