ANNEX "A" – SPECIFICATIONS

PASSENGER-OPERATED CABLEWAY REBUILD
LITTLE SMOKY RIVER NEAR GUY – 07GH002 – ALBERTA

1. Introduction

Environment and Climate Change Canada - National Hydrological Service / Water Survey of Canada (WSC) (ECCC - NHS) was established in 1908 to provide water level and flow data to all Canadians. NHS is the lead agency responsible for the collection, interpretation and dissemination of standardized water resource data and information in Canada. In partnership with the Provinces, Territories, and other agencies, there are over 400 active gauging stations in the Alberta Hydrometric Network operated under the Canada-Alberta Memorandum of Agreement for Water Quantity Surveys between WSC and Alberta Environment and Parks (AEP).

1.1. Objective

The objective of this project is to construct a new passenger operated cableway in a timely manner allowing continuous production of discharge data. The construction services are to be carried out in accordance with all applicable guidelines and standards, and result in minimal impact to the environment.

1.2. Background

The existing hydrometric station has been operated by ECCC-NHS since 1960 and is due for infrastructural upgrades. For the continued production of discharge data and operation safety, a new passenger operated cableway is required.

The required services of this project will be the installation of a new cableway at this site, in the same location as the existing cableway. Upgrades of the new cableway design includes taller A-Frame steel towers and a span of 151 meters across the river.

1.3. Project Location

1.3.1. The site is located approximately 45 kilometers north of Valleyview, Alberta.

- Station Number and Name: 07GH002 Little Smoky River near Guy
- Legal Land Description: NE33-74-21-W5
- Coordinates: 55°27'22.4"N, 117°09'42.8"W
- Municipality: Municipal District of Smoky River
- Land Ownership: Alberta Transportation Right of Way

1.3.2. Access to the Right Bank, East Home Side is via road. Take construction/camping area turnout on northeast end of Hwy 49 traffic bridge, then follow defined dirt trail into site.

1.3.3. Access to the Left Bank, West Far Side is via trail road. On the southwest end of Hwy 49 traffic bridge, take trail turn off, then follow the grassy access path into site. The site can also be accessed by an 100 meter hike.

1.4. Existing Infrastructure

There is no existing main span cable, but the towers and anchors are in place. The Right Bank Home Side consists of a 14' tall heavy duty steel pipe A-frame supporting a ½" 6x19 fiber core tieback cable, shown in Appendix 1. The A-frame legs are supported by two 18" diameter concrete piers and fixed to the baseplates by bolts. The anchoring system is a concrete anchor block (approximately 48" W x 48" L, with assumed depth of 40").

Safety deficiencies have been identified due to the undersized concrete anchors, the aged superstructure, and insufficient freeboard of the main cable.

The existing infrastructure on the Left Bank Far Side is a 3" x 6" board stack and a 4" x 4" board supporting the cable, shown in Appendix 1. The concrete anchor is approximately 49" L x 50" W, with assumed depth of 40".

1.5. Reference Documents

The Drawings show the existing site conditions and the proposed design for the placement of completed structure. Annex “A” must be read in conjunction with the Drawings provided by Technical Authority. For conditions not explicitly shown, the Contractor must immediately request clarifications from Project Authority. In the event of discrepancies in the Annex “A”, Drawings, or contract documents, the most stringent requirements apply.

1.6. Roles and Responsibilities

The general roles and responsibilities shall be as follows:

Role	**Responsibility**
Project Authority (Environment and Climate Change Canada)	- General inquiries - Pre-construction Deliverables - Mobilization and Miscellaneous Deliverables and Tasks - Operational Health and Safety Plan Review - Environmental Protection Plan Review - Budget, Schedule, and Scope-related change approvals
Technical Authority	- Field reviews - Technical approvals

2. Scope

ECCC is seeking a qualified Contractor to conduct construction activities to build a passenger operated cableway at the hydrometric station 07GH002 Little Smoky River near Guy. The scope of work includes:

- Removal and disposal of existing infrastructure,
- Alignment pre-construction survey
- Installation of steel plate footings,
- A-frame tower erection,
- Steel wire rope stringing across Little Smoky River,
- Steel wire rope marker cable stringing across Little Smoky River,
- Installation of cable fittings and cable hardware,
- Supply and construction of one (1) concrete anchor,
- Construction of one (1) triple steel plate anchor, with ECCC supplied plate anchors and rods,
- As-built survey;
- Site restoration.

The Contractor must provide construction services for the project, including mobilization and demobilization, all labour and materials, supervision/project management, equipment and supplies, as required. The scope of work encompasses the following deliverables and tasks:

Item	Deliverables and Tasks
1.	Mobilization and Miscellaneous: - Mobilization, site preparation, and demobilization, - Site restoration to and setting of required grades around infrastructure, - Alignment and as-built land survey, - Pre-construction and post-construction submittals. - Collect required soil samples to confirm soil properties prior to backfilling.
2.	Removal and Disposal of Old Infrastructure: - Removal and disposal of old A-Frame, cables, platform infrastructure and any other above ground infrastructure. - Removal and disposal of old concrete footings and concrete mass anchors.
3.	Construction of Concrete Anchor: - Supply ready-mix concrete and concrete formwork and falsework (if applicable), - Supply reinforcement to CSA G30.18, Grade 400R. - Construction of cast-in-place concrete anchors as per the Drawings. Formwork must be removed along sides of anchor. - Concrete Testing: Compression Cylinder Testing at 7 and 28 days. A slump test and an air entrainment test. Target values are in the Drawings and CSA standards. - Placement and installation of reinforcement and the supplied U-bars as per the Drawings. - Installation of one (1) ECCC supplied benchmark, to be cast on concrete anchor.
4.	Installation and Construction of Triple Plate Anchor System: - Excavation and backfilling - Installation of one triple plate anchor system as per drawings. - Installation of one (1) ECCC supplied benchmark on steel rod driven to refusal.
5.	Steel Footings and Foot Pieces Installations on both banks: - Placement and installation of steel footings and foot pieces as per Drawings.
6.	A-Frames and Associated Components Installation: - Assembly and installation of two (2) new A-Frames (1 m and 5 m) and associated platforms, railing, ladders, safety bar, gate, and danger signs. ECCC will provide A-Frame and associated A-Frame components. - Tower erection to plumb position. - A-frames to be installed as per 3136 series drawings.
7.	Cables and Associated Components Installation: - Installation of new main cable, marker cable and aircraft marker balls, tieback cables, safety loops, cable car, and associated cable fittings as per Drawings. ECCC will provide the cables and associated cable fittings. - Main and marker cables must be attached to anchors, as per Items 2 and 3, on each bank.

Item	Deliverables and Tasks
	- Adjust the unloaded sag as per Drawings.

The Contractor must comply with the Drawings and Specifications, federal and provincial regulatory requirements, occupational health and safety regulation, as well as other applicable codes and industry standards.

3. Deliverables and Tasks

3.1. Prior to Construction

3.1.1. The Contractor must fully understand all provided and relevant documents prior to the Work and create a work plan to carry out the construction.

3.1.2. The Contractor must ensure that all pre-construction deliverables listed below are completed within ten (10) business days after the contract is awarded, or not later than fifteen (15) business days prior to commencement of work. All pre-construction deliverables must be provided to ECCC Project Authority for review, acceptance and/or approval. Project Authority has five (5) business days to review and provide comments.

3.1.3. The Contractor must attend an official kick-off meeting with all key personnel and verify project requirements once pre-construction deliverables are completed.

3.1.4. Authorization from the Project Authority is required by the Contractor before mobilization to the work site. The Contractor must notify Project Authority five (5) business days in advance about the date of mobilization and commencement of work.

3.1.5. Pre-construction submittals include:

a. Confirmation of names of the supervisory personnel and other key staff designated for the assignment;
   - The Contractor is responsible for providing personnel trained in the following certifications alongside any additional Occupational Health and Safety requirements:
     - Standard First Aid – Level C CPR/AED
     - Industrial Fall Protection, Level II
     - Spill Response Training
     - Ground Disturbance Training
     - Swiftwater Safety Rescue Training

b. Site-specific Health and Safety Plan; including On-site Contingency and Emergency Response Plan. With a schedule of health and safety meetings with the project Authority;

c. Work plan outlining construction methodology in detail and quality control plan;

d. Project Schedule, including key hold points;

e. Construction Standard Operating Procedure (SOP);

f. Environmental Protection Plan (EPP)
   - The EPP shall include a comprehensive overview of known or potential environmental issues to be addressed on site during construction.
   - Address topics at level of detail commensurate with environmental issue and required construction tasks.
   - Include in Environmental Protection Plan (EPP):
     - Name[s] of person[s] responsible for ensuring adherence to EPP.
     - Name[s] and qualifications of person[s] responsible for manifesting hazardous waste to be removed from site.
     - Name[s] and qualifications of person[s] responsible for training site personnel.
     - Description of environmental protection personnel training program.

- Submit a site-specific Erosion and Sediment Control Plan (ESCP) identifying the type and location of erosion and sediment control measures to be provided on site. Include monitoring and reporting requirements to ensure that erosion and sediment control measures are in compliance with ESCP, Federal and Provincial regulations, and Municipal by-laws.
- Submit drawings indicating locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.
- Submit a Site Work Plan (SWP) showing work areas for proposed activities in each portion of area and identifying areas of limited use or non-use.
  - Include measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.
- Submit a Spill Control Plan (SCP) including procedures, instructions, and reports to be used in the event of unforeseen spill of regulated substance.
- Submit a Solid Waste Disposal Plan (SWDP) for non-hazardous solid wastes, identifying methods and locations for solid waste disposal, including clearing debris.
- Submit a Waste Management Plan (WMP) in accordance with applicable regulations, for identifying methods and procedures for management waste which are derived from construction activities. ECCC's goal is to re-use and recycle as much as possible.
  - The Contractor must ensure that the removal and disposal of formwork and concrete accessories is addressed in the WMP.
  - It is prohibited to clean concrete agitator trucks on the construction site.
  - Disposal of unused admixtures and additive materials into sewer systems, lakes, streams, onto the ground or in other locations to pose a health or environmental hazard is prohibited.
  - Prevent grout materials from entering drinking water supplies or streams.
  - Using appropriate safety precautions, collect liquid or solidify liquid with inert, non-combustible material and remove for disposal.
- Submit a site-specific Contaminant Prevention Plan (CPP) identifying the proper procedures and actions to be implemented to prevent, potentially or expected hazardous substances due to the presence of any hazardous substances within the project site.

g. Shop drawings for formwork and falsework.

- Prepare shop drawings in accordance with CSA S269.1 for formwork and falsework.
- Indicate method and schedule of construction, shoring, stripping and re-shoring procedures, materials, arrangement of joins, special architectural exposed finishes, ties, liners and locations of temporary embedded parts.
- Indicate sequence of erection and removal.

h. Shop drawings for reinforcement details.

- Design, materials, practices, fabrication are to refer and conform to reference standards:
  - CSA A23.1/A23.2. - Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete
  - CAN/CSA A23.3 - Design of Concrete Structures
  - CSA G30.18 - Carbon Steel Bars for Concrete Reinforcement
  - CSA G40.20/G40.21
  - ASTM A123/A123M - Zinc (Hot-Dip Galvanized) coatings on Iron and Steel Products
  - ACI Detailing Manual 2004, SP-66.
- Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.
- Indicate on shop drawings the bar bending details, lists, quantities of reinforcement, sizes, spacings, locations of reinforcement and mechanical splices. Include identifying code marks to permit correct placement without reference to structural drawings. Prepare reinforcement

drawings in accordance with Reinforcing Steel Manual of Standard Practice – by Reinforcing Steel Institute of Canada.

i. Testing results and reports for concrete mix design and certification for review and acceptance.

j. Provide mill certificates for reinforcing steel and U-bars for review and acceptance

- The mill certificates must include the physical and chemical characteristics, performance criteria, dimensions, finishing and limitations.
- The Contractor must indicate the source of supply for the materials to be supplied.

3.1.6. Environmental Considerations

a. Drainage

- Ensure that the ESCP measures are provided and that its recommendations are followed on site at all times during construction.
- Provide temporary drainage and pumping as required to keep excavations on site free of standing water.
  - Obtain Project Authority's approval before pumping standing water, which is free of suspended materials, into waterways, sewer or drainage systems.
  - Control disposal or runoff of water containing suspended materials or other harmful substances in compliance with the requirements of authorities having jurisdiction.

b. Site Clearing and Plant Protection

- Protect trees and plants on site and adjacent properties.
- Follow directions and guidance of a Qualified Environmental Specialist if required
- Protect trees and shrubs adjacent to construction. Ensure that control measures used for protection are in compliance with laws and regulations.
- Minimize stripping of topsoil and vegetation.

c. Work Adjacent to Waterways

- Construction equipment is to be operated on land only.
- Keep waterways free of excavated fill, waste material and debris.
- Design and construct temporary crossings to minimize waterways erosion.
- Do not skid logs or construction materials across waterways.

d. Historical/Archaeological Control

- Protect archeological materials in accordance with the Alberta Historical Resources Act. If Archeological materials are exposed or discovered during Work, stop all Work and notify the Project Authority immediately.

e. The Contractor must submit a request to the Project Authority for any work including removal of vegetation or snow or any actions affecting the environment. ECCC Project Authority will consult with a Qualified Environmental Specialist (QES) to determine requirements and limitations for work. Project Authority proceed or request to re-evaluate approach. The Contractor must not proceed with the action prior to approval. Approval may include any amount of limitations determined by QES.

f. All cleared vegetation shall be cut and evenly distributed in small brush piles within/at the edge of existing vegetation outside riparian zones. No large brush piles that could pose a potential fire risk shall be created. Any medium to large diameter vegetation removal will be monitored by QES. Re-planting of vegetation will not be required.

g. Limitations may include but are not limited to, restriction of the area where vegetation can be cleared, size/amount of vegetation that can be cleared, or requirement for QES to be on-site. Specifically, QES may be required on-site for certain cases of vegetation clearing or crossing of equipment or machinery over the river. Requirement for QES on-site will be determined by Project Authority prior to action. Project Authority will arrange for QES to be on-site, but it is Contractor's responsibility to ensure a QES is present for any action requiring QES on-site.

3.2. During Construction

3.2.1. The Contractor must ensure all the construction activities are performed to meet the requirements of Drawings and Specifications, taking Technical Authority and Project Authority's recommendations into consideration. The Contractor is required to have sufficient equipment and experience to carry out the Work. Full documentation throughout the project must be maintained on-site by the Contractor and made available for inspection by Project Authority and Technical Authority.

The following documents will be maintained on-site by the Contractor, one copy of each document as follows:

a. Current Contract Documents, including but not limited to Specifications and Drawings
b. Health and Safety Plan; including On-site Contingency and Emergency Response Plan
c. Submittals
d. Written permission from landowner(s), provided by Project Authority
e. Regulatory permits
f. Environmental reports
g. Records of meetings, including meeting minutes
h. Change Orders and other modifications to Contract
i. Reviewed shop drawings, product data and samples
j. Manufacturer's instructions and certificates
k. Incident reports

3.2.2. Property belonging to ECCC, a private entity on-site, or related to the project must not be damaged. Any damage must be repaired prior to demobilization at the Contractor's expense. Care must be taken to notify Project Authority when the Contractor or its subcontractors are on-site.

3.2.3. Pick up and transport of materials provided by ECCC.

a. The Contractor is responsible for picking up the ECCC supplied materials and transporting them from the ECCC Calgary Warehouse to the project site, upon confirmation of quantities and specs per the list provided by the ECCC Project Authority.

3.2.4. Mobilization and Demobilization consists of preparatory work and operations including, but not limited to, those for the movement of personnel, equipment, materials, offices, supplies and incidentals to and from the project sites.

3.2.5. Site clearing

a. All clearing works must be done to minimize damage to the environment. A QES may be required for an impact assessment to determine requirements and limitations of work. A QES will be provided by ECCC, if and when required.
b. Any merchantable timber must not be destroyed.
c. Work area and access must be kept clear of snow and ice.

3.2.6. Site Preparation

a. Protect native soils from softening and frost. Remove all softened or frost damaged soils prior to placement of footings or anchors. Protect bearing soils from freezing after footing construction.
b. Excavations to be free of water prior to and during concrete placement. Provide adequate means of removing water from excavations and trenches.
c. Minimum frost cover to be 1400 mm.
d. Minimum depth of excavation for anchors to be approximately 2500mm. Minimum depth of excavation for A-frame foundations to be approximately 2000mm. Depth may vary with site. The Contractor is obligated to dig as deep as required to attain proper placement of infrastructure.

e. Loose or wet sub-base under footings may require removal, sub excavation, and replacement with structural fill.

f. Compact fills in maximum lifts and to required densities, and test for compaction at sufficient intervals to verify conformance.

3.2.7. Alignment survey

a. Stake out the reference points for infrastructure with Contractor-provided surveyor.

b. Confirm with survey that components are properly set and aligned.

c. Notify and check alignment with Technical Authority before excavation commences. Inform Technical Authority of any changes from Drawings.

3.2.8. Soil Testing

a. Prior to backfilling Collect two (2) soil samples on each bank (four (4) total) and deliver to Project Authority for testing.

- Two (2) soil samples required per bank.
- Each sample to be approximately 2 cups of soil.
- Deliver to Project Authority for testing.

b. Wait for accepted results prior to backfilling excavations.

3.2.9. Supply ready-mix concrete and concrete formwork

a. Measurement procedures

- Heating of water and aggregates and providing cold weather protection will not be measured but considered incidental to work. Cooling of concrete and providing hot weather protection will not be measured but considered incidental to work.
- Supply and installation of anchor bolts, nuts, washers and bolt grouting not measured but considered incidental to work.

b. Samples and quality assurances requirements:

- Provide testing report and certification by qualified inspection and testing laboratory that the following materials and mix designs used in concrete mixture meet specified requirements.
  - Portland cement.
  - Supplementary cementing materials.
  - Admixtures.
  - Aggregates.
- Minimum four (4) weeks prior to starting concrete work the ECCC Technical Authority and Project Authority must be provided with valid and recognized certificate from plant delivering concrete. Indicate the mix proportions selected will produce concrete of specified quality and yield and that strength will comply with CAN/CSA-A23.1 and the design is adjusted to prevent alkali aggregate reactivity problems. Indicate that the plant, equipment, and materials to be used in concrete comply with requirements of CAN/CSA-A23.1.
- Provide testing results and reports for review by Technical Authority and do not proceed without written approval when deviations from mix design or parameters are found.

3.2.10. Supply reinforcing bars

a. Supply components in accordance with Drawings

b. Fabricate the work square, true, straight, and accurate to required size, with joints closely fitted and properly secured. Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.

c. Deliver, store and handle materials with manufacturer's written instructions. Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

d. Replace defective or damaged materials with new.

3.2.11. Excavation and installation of concrete anchors and steel plate footings

a. Excavation

- Before commencing work, verify and establish location of buried services (utilities, communications lines, pipelines, gas lines) on and adjacent to site. Conduct line locates for a ticket regarding the excavation area. Safely expose utilities within 1.0 m of work. Protect buried services that are to remain undisturbed.
- Remove vegetation from project area for access, compaction, leveling, regrading, and any groundworks required. Begin topsoil stripping of areas after area has been cleared of grass and removed from site. Do not mix topsoil with subsoil.
- The Contractor must excavate as deep as required for proper placement of infrastructure per requirements as shown on Drawings. This includes removal of all rock regardless of size from the required area for proper placement of anchors.
- Position and Alignment of Concrete Anchor will be field fitted to ensure cableway is perpendicular to the river. Position and Alignment will be reviewed by Technical Authority. Contractor must not pour concrete until position and alignment is reviewed and approved by Technical Authority.
- Hand trip, make firm and remove loose material and debris from excavations.
- Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter. Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.
- Keep excavation clean and free of standing water and loose soil. Protect open excavations against flooding and damage due to surface run-off.
- Excavation must still be completed if groundwater is encountered. However, avoid excavation below groundwater table if quick condition or heave is likely to occur.
    - Encountered groundwater and any pooling water must be disposed of in an approved manner not detrimental to public and private property. The Contractor must ensure that open excavations must be protected/enclosed for public health and safety considerations.
    - Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff and prevent any sediment release into water bodies.
    - Inspect, repair, and maintain erosion and sedimentation control measures during construction.
    - Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

b. Placement and installation of reinforcing bars and U-bars

- Place reinforcing bars and U-bars as per Drawings.
- Do not drop or drag bars. Materials shall be protected from damage during shipping, handling, storage and installation. For lifting, use nylon lifting slings, padded slings, separators, or other means recommended by epoxy coated reinforcing steel supplier.
- Do not field bend or weld except where authorized by the Technical Authority. When authorized bend without heat.
- Any changes to approved shop drawings in the field must have written approval from the Technical Authority.
- Replace any bars that develop cracks or splits.
- Cutting or puncturing vapors retarder is not permitted; repair damage and reseal vapour retarder before placing concrete.
- Protect epoxy and paint coated portions of bars with covering during transportation and handling.
- Touch up damaged and cut ends of epoxy coated or galvanized reinforcing steel with compatible finish to provide continuous coating.

- Anchor U-bar angles to horizontal must be the same as the cable angle to which they attach.
- The Technical Authority shall be notified at least 72 hours in advance of concreting for inspection and approval of reinforcement and U-bar placement. Concrete shall not be poured until reinforcing steel has been reviewed by the engineer and found to be in general conformance with the drawings and contract documents.

c. Cast-in-Place Concrete

- Materials:
  - Portland Cement: Portland Cement in accordance with CAN/CSA-A5, Type 10.
  - Supplementary cementing materials: to CAN/CSA-A23.5.
  - Water: to CSA A23.1.
  - Aggregates: to CSA A23.1. Coarse aggregates to be normal density.
  - Admixtures:
    - Air entraining admixture: to ASTM C260.
    - Chemical admixture: to ASTM C494. Project Authority to approve accelerating or set retarding admixtures during cold and hot weather placing.
- Mixes
  - Proportion concrete in accordance with CAN/CSA-A23.1 and Structural Specifications.
- Site tests:
  - Third-party Concrete Cylinder Test (7 & 28-day Maturity Compressive Strength) and Slump Test
  - Concrete samples must be taken during concrete pour.
  - 1 set of 3 test cylinders shall be tested. 1 cylinder shall be tested at 7 days, and 2 shall be tested at 28 days.
  - **Must provide Concrete Cylinder Test results at 7 and 28-day maturity for review by Technical Authority.**
  - At 28-day maturity, concrete compressive strength should be equal or greater than the designated compressive strength as per Drawings.
  - For a specified compressive strength of 30 MPa or less, single compressive strength should not be less than the designated compressive strength by more than 3.0 MPa.
  - Ensure testing laboratory certified to CSA A283.
  - Perform Slump Test during construction and provide written results to ECCC Project Authority.
- Site conditions:
  - Placing concrete during rain or weather events that could damage concrete is prohibited. Protect newly placed concrete from rain or weather events.
  - **Sufficient protection for concrete pouring and curing must be maintained if temperatures fall below 10 °C or rise above 27 °C in accordance with CSA A23.1**
    - Cold weather protection: Maintain protection equipment, in readiness on Site. Placing concrete upon or against surface at temperature below 10°C is prohibited.
    - Hot weather protection: Protect concrete from direct sunlight when ambient temperature above 27°C. Prevent forms from getting too hot before concrete placed. Apply accepted methods of cooling not to affect concrete adversely. Protect from drying.
- Delivery and handling:
  - Concrete hauling time: provide for review by Project Authority deviations exceeding maximum allowable time of One-hundred-twenty (120) minutes for concrete delivered to site of Work and discharged after batching.
  - Ensure concrete delivery and handling facilitate placing with minimum of re-handling, and without damage to existing structure or Work.
- Installation and removal of formwork:

- Clean formwork in accordance with CSA A23.1/A23.2, before placing concrete.
- Fabricate and erect formwork in accordance with CAN/CSA S269.3. To produce finished concrete conforming to tolerances required by CSA A23.1/A23.2.
- Align form joints and make watertight. Keep form joints to minimum.
- Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections. Ensure that anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.
- Remove formwork once concrete has attained sufficient strength to support its own weight and construction loads.

- During concreting operations:
  - Development of cold joints not allowed.
  - Pumping of concrete permitted only after approval of equipment and mix.
  - Disturbing reinforcement and inserts during concrete placement is prohibited.
  - Prior to placing of concrete obtain Project Authority approval of proposed method for protection of concrete during placing and curing.
  - Clean and remove stains prior to application for concrete finishes.
  - Maintain accurate records of poured concrete items to indicate date, location of pour, quality, workability, air content, temperature and test samples taken.
  - Do not place load upon new concrete until authorized by Project Authority.
  - Maintain cover to reinforcement during concrete pour.

d. Backfilling
   - Excavation is not to be backfilled until written approval is provided by Technical Authority via field review of the anchor installation. Provide minimum of 72 hours' notice to Technical Authority prior to backfilling.
   - Place backfill material in uniform layers not exceeding one-hundred-fifty (150) mm. Compact each layer before placing succeeding layer.
   - Protect fill materials from contamination, including freezing, ice, snow and other debris.
   - The excavated local soil will be used for backfilling.
   - Removal of concrete formwork is required prior to backfilling. Along with removal of shoring and bracing. Backfill the voids with satisfactory soil material.
   - Do not backfill around or over cast-in-place concrete within 24 hours after placing of concrete.
   - Ensure backfilled areas are free from debris, snow, ice, water and frozen ground.

e. Load test is not required for anchors. Project and Technical Authority field review will be conducted prior to concealment. Provide a minimum of three (3) business days' notice to the Project and Technical Authorities when ready for the field review.

f. The Contractor is responsible for ensuring orientation of anchors are per Drawings. If orientation cannot be achieved, the Contractor must notify the Project Authority and Technical Authority immediately and prior to backfilling.

g. Work includes installation of U-bars, supply, transport, and installation of concrete anchor. reinforcement and concrete pouring including formwork, falsework (if required), and finishing and all other assets as per Drawings.

h. Provide mill test for reinforcing steel, and certificate of concrete strength from supplier for review and approval by Technical Authority.

i. Notify Technical Authority and Project Authority when excavation is completed.

3.2.12. Steel footing installation

a. Install each footing and foot piece as per Drawings.

b. Ensure placement location is surveyed accurately.

c. Follow same excavation conditions as applicable in the concrete anchor excavation and backfilling.

3.2.13. Triple steel plate anchor system installation

a. Install each plate anchor and rod as per Drawings.
b. Ensure placement location, depth and angle are surveyed accurately.
c. Follow excavation conditions as applicable in the concrete anchor excavation, backfilling and compaction.

3.2.14. A-frames and all the associated components installation.

a. Assemble A-frames, platform, platform timber boards, ladder and all the associated components as per Drawings.
b. Erect A-frame towers to plumb position.
c. Add safety chain/cable on the platform side opposite to the ladder.

3.2.15. Cables and all the associated components installation as per Drawings.

a. Main cable and all the associated cable fittings to manufacturer and Drawing specifications (cable clamps, turnbuckles, and thimbles, etc.).
b. Main cable safety loops.
c. Aircraft marker cable and all the associated cable fittings to manufacturer and Drawing specifications (cable clamps, turnbuckles, and thimbles, etc.).
d. Four (4) aircraft marker balls at specified spacing as per section 10.4 Catenary Markers in Transport Canada Standard 621 – Obstruction Marking and Lighting – Canadian Aviation Regulations (CARs).
e. Two (2) tieback cables on each bank.
f. Assemble and install one (1) USGS Light Duty Stand Up cable car.
g. Adjust the unloaded sag as per Drawings.
h. Two (2) danger signs, one on each tower.

3.2.16. Site clean-up and restoration as per pre-construction condition

a. Site restoration as per Drawings and pre-construction conditions.
b. Ensure positive drainage away from the tower footings and anchors.
c. Dispose of waste off site at the proper locations and provide receipts or permits if necessary.
d. Return of unused material to ECCC Calgary warehouse.

3.2.17. As-built site survey

a. Contractor to provide redlined drawings to ECCC Project Authority and Technical Authority of as-built conditions.
b. Provide a certified surveyor to complete an as-built survey of A-Frame, concrete anchor, plate anchor components, unloaded sag and surrounding area after site restoration is completed.

3.2.18. Project management and documentation

a. Collect photographs and videos throughout the concrete anchor construction process, particularly on steel plate footing spacing between each footing, as well as relative to the concrete anchor (distance, alignment), placement of reinforcement U-bar angles with respect to the ground, distance of infrastructure to nearby riparian areas and vegetation.
b. Ensure progress photos and updates are documented daily or when each itemized installation is completed.
c. Contractor is required to provide notice to Project Authority and Technical Authority when construction is complete and must provide site access.

3.3. Post-Construction

3.3.1. Photographs and Videos

3.3.2. Construction Daily Site Log (if applicable)

3.3.3. Health and Safety Incident Report Log (if applicable)

3.3.4. Red-lined drawings noting any changes from Drawings.

3.3.5. As-built drawings and survey data points

a. Raw survey points must also be submitted as a Comma Separated Values (CSV) file or Text file (.txt), with appropriate point names and description of each point.

b. Prepare and submit as-built drawings for the site and the structure in both Portable Document Format (PDF) and AutoCAD format, with all essential infrastructure and benchmarks captured and the topography (coordinates/elevations) of all points obtained.

4. ECCC-NHS Supplied Material

ECCC will supply the following items:

- Four (4) 1.0 m x 1.0 m x 2.0 m steel footings
- Four (4) foot pieces
- One (1) 1m A-Frame Assembly
- One (1) 5m A-Frame Assembly
- One (1) USGS Light Duty Stand-Up cable car
- Two (2) cable-car sheaves
- Four (4) aircraft warning marker balls
- Platform timber boards
- Two (2) danger signs
- One (1) 1-3/4” diameter U-Bar
- Two (2) 3/4” diameter U-Bars
- Three (3) plate anchors
- Three (3) plate anchor rods
- All associated nuts, bolts and associated hardware for the plate anchors.
- Cables and all associated cable fittings
- Two (2) WSC Brass Cap benchmarks

It is the Contractor’s responsibility, prior to mobilization, to pick up the materials from ECCC Calgary warehouse and deliver to the work site with the coordination of the ECCC Project Authority. The warehouse is located at:

ECCC Calgary Warehouse Address: 7400 64 St. SE, Calgary, Alberta, T2C 5V6

The Contractor is responsible for supplying all other equipment and materials for construction.

5. Project Requirements and Desirable Provisions

5.1. Regulatory Framework, Protocols, Guidelines and Standards

The Contractor must ensure that all project activities are carried out in accordance with all applicable Federal and Provincial guidelines, standards and criteria, and result in minimal impact to the environment. Actions may be necessary to be compliant with the following Acts and other applicable to the site-specific conditions:

- Fisheries Act
- Water Act
- Canadian Environmental Protection Act (CEPA)
- Canadian Environmental Assessment Act (CEAA)
- Canadian Wildlife Act (CWA)

- Transportation of Dangerous Goods Act (TDGA)
- Species at Risk Act (SARA)
- Migratory Birds Convention Act (MBCA)

5.2. Environmental Sensitivities

5.2.1. Waterbody

The waterbody is classified as Class C. The Restricted Activity Period (RAP) is from September 1 to June 30. Nevertheless, there must be no in-stream works at any point of this project during any time of the year, unless otherwise permitted by the ECCC Technical Authority.

The location is also in a yellow zone for whirling disease. Whirling disease is a relatively new problem in Alberta affecting salmonid fish and can cause high mortality rates. Yellow zone represents a moderate to high risk of whirling's disease. For this reason, decontamination of all equipment, including boots and clothes, is essential. There is no in-stream work involved in this project.

5.2.2. Wildlife and Wildlife Habitat

The migratory bird-nesting period: The migratory bird nesting period in the project area, located in the Nesting Zone of B4, is from mid-April to late-August. Vegetation clearing is recommended outside of this period. If vegetation clearing is required during this period, a pre-disturbance assessment for active nests and breeding birds must be completed seven (7) days prior, under the guidance of a QES retained by ECCC Project Authority.

5.2.3. Historical Resource Value

There is a land area within the region that has historical resource value. The Contractor is to ensure that if there is any discovery, that work is halted and the Project and Technical Authority be notified immediately. No further work can occur until authorized by the Technical Authority.

5.3. Safe Work Procedures

5.3.1. The Contractor must remain in compliance with the Canada Labour Code, National Joint Council Occupational Health and Safety Directive, and Worker's Compensation Board guidelines.

5.3.2. The Contractor must provide Project Authority with details of a safe work plan for each construction task.

5.3.3. The Contractor is responsible for circulation of the Health and Safety Plan to all individuals on site and ensuring that all individuals are in adherence to the Health and Safety Plan.

5.3.4. The Contractor is expected to follow safe work procedures, including use of proper Personal Protective Equipment (PPE) at all times.

5.3.5. A Personal Flotation Device must be worn if there is a risk of drowning.

5.3.6. A complete Basic First Aid Kit must be carried by the Contractor and on-site at all times during construction.

5.3.7. Protection against wildlife is included within EPP.

6. Contractor Responsibilities

- Provide certified land surveyor to complete alignment and as-built survey.
- Provide temporary bracing of all building elements against construction loading conditions and construction erection procedures.
- Conduct inspection of work, identify deficiencies and defects, and repair as required. Notify Technical Authority of completion of Contractor's inspection and corrections.
- Fully understand the construction specifications documents. Check and verify all dimensions, quantities, grades, and site conditions and notify Technical Authority of any errors or discrepancies prior to commencing any work. Maintain close coordination and communication with Project Authority and Technical Authority.

- Provide construction services required as outlined in the scope of work.
- All work must be carried out in accordance with current Alberta Construction Standards of Practice and meet all relevant Federal, Provincial and Municipal codes and guidelines.
- Comply with all permissions, agreements, permits and access restrictions issued in order to undertake the scope of work, including but not limited to: Water Act, Public Lands Act temporary access agreements, letters of consent, mutually agreed to terms and conditions and all relevant statutory provisions in the Province of Alberta and with various Federal Government Departments.
- Abide by all relevant health and safety regulations and perform work in accordance with generally accepted safety practices. The use of personal protective equipment is required.

7. ECCC Responsibilities

- Supply the materials as per Section 4 and provide documents specified under Section 3.2.1.
- Provide a Qualified Environmental Specialist (QES), if and when required.
- Obtain all required permissions, agreements, authorizations and permits from the various regulatory bodies at the Federal and Provincial levels involved, in order to undertake the work at the site location.
- Provide the Contractor with copies of field authorization documents obtained by ECCC and required by granting authorities to be kept on site by the Contractor during construction activities.
- Act as a liaison with any involved parties, including the landowner(s) for site access.
- Provide Drawings and Specifications related to the work.
- Provide support and guidance during all phases of the project and as required.
- Inspection of cableway at completion of construction and prior to hand-over.
- A cableway inspection will be completed by the Project Authority and Technical Authority to confirm compliance with the scope of work and to commission the cableway.
- A certificate of completion will be provided by Project Authority to the Contractor upon satisfactory completion and acceptance of the work.

8. Schedule

8.1. Completion of the scope of work

8.1.1. Completion of the scope of work is anticipated within fourteen (14) weeks as described in the following:

a. Concrete work to be completed within four (4) weeks after pre-construction deliverables are accepted by Technical and Project Authority. However, concrete work should be scheduled during the construction season to the best possible extent (Spring-Summer) in which case completion is anticipated by **August 1, 2024.**

b. The remaining construction deliverables are to be completed by February 1, 2025, ideally within four (4) weeks after concrete work is completed.

8.1.2. Post-construction deliverables are to be completed within three (3) weeks of construction completion.

8.1.3. The project must be completed by **March 1, 2025,** at the latest.

8.2. Hours of Work

8.2.1. A standard construction workday, used in the estimated project length, is considered 8 hours per day.

8.2.2. Technical and Project Authority will provide support during the length of the project from Monday to Friday 8AM to 5PM.

8.2.3. **48-hour notice must be provided for a requirement outside regular hours, however, ECCC cannot guarantee the availability of a representative outside regular work hours.**

9. Notifications of Non-Compliance

The following procedures will be followed in the case that non-compliance is observed by ECCC.

9.1. The Project Authority will notify the Contractor in writing of observed non-compliance related to health and safety, environment, private property, or any other regulations and requirements.

9.2. After receipt of such notice, the Contractor must inform the Project Authority of proposed corrective action(s) within one (1) day to obtain acceptance from the Project Authority. Project Authority will provide review and direction in one (1) day.

9.3. Once acceptance has been provided by the Project Authority, the Contractor may proceed with the proposed action(s).

9.4. If warranted, the Project Authority will issue a Stop Work Order until satisfactory corrective action has been taken by the Contractor.

9.5. Suspension will be lifted once the corrective action(s) have been proposed and taken by the Contractor, with the acceptance of the Project Authority.

9.6. No time extensions will be granted or equitable adjustments will be given to the Contractor for such suspensions.

9.7. In the case where there is immediate danger to the health and safety of a worker or integrity of infrastructure, the Contractor must take immediate actions.

10. Official Language

The Work will be completed in English.

Appendix 1 of Annex A: Photos of Existing Site

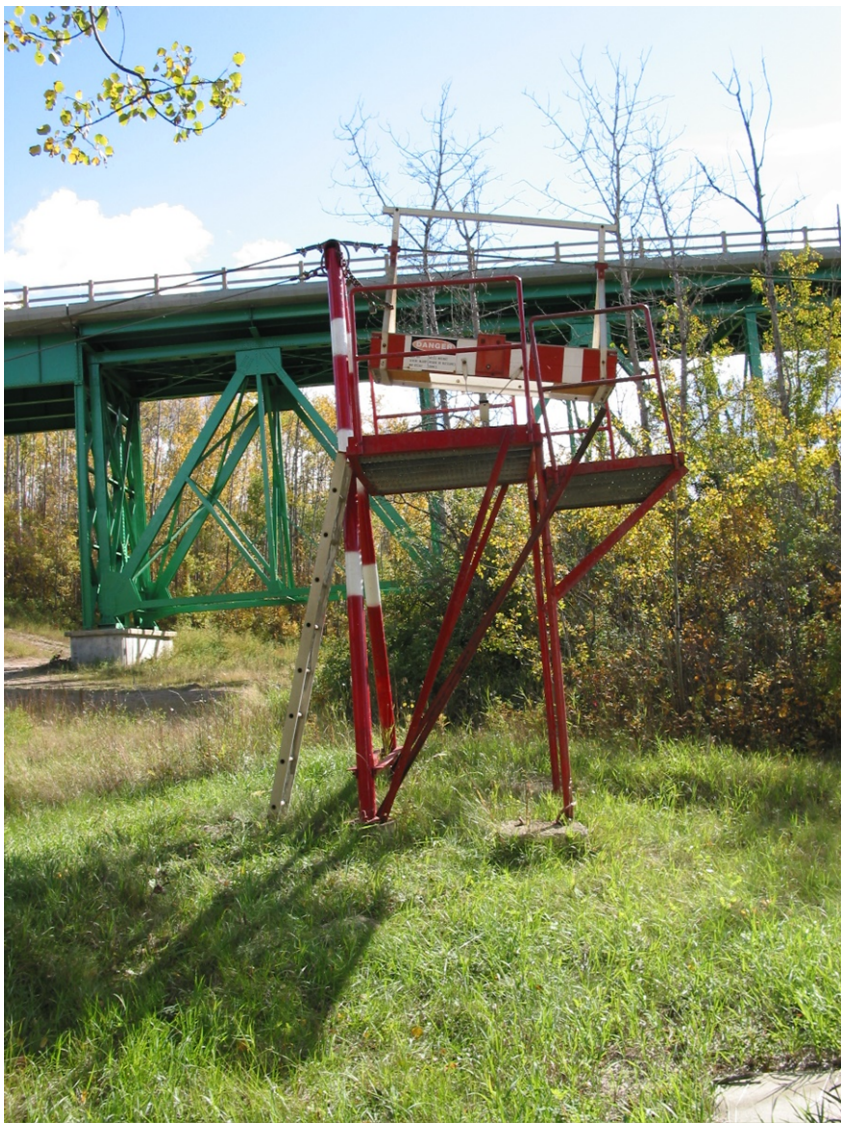

Figure 1: Existing tower on the Right Bank Home Side

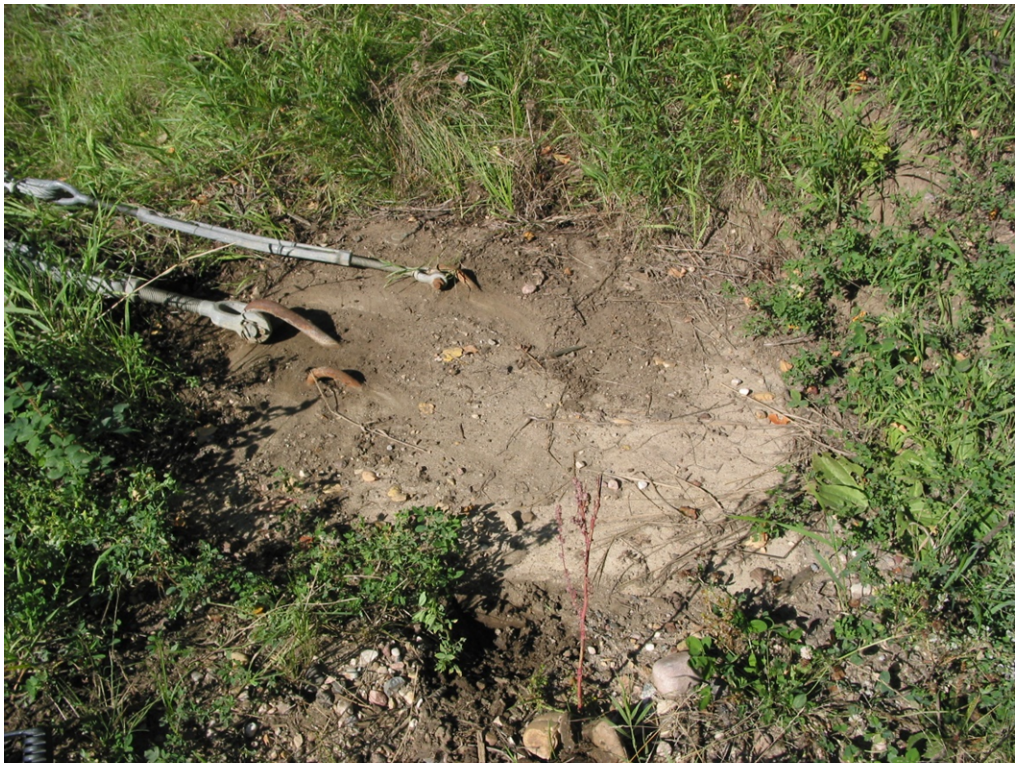

Figure 2: Concrete anchor on Right Bank Home Side

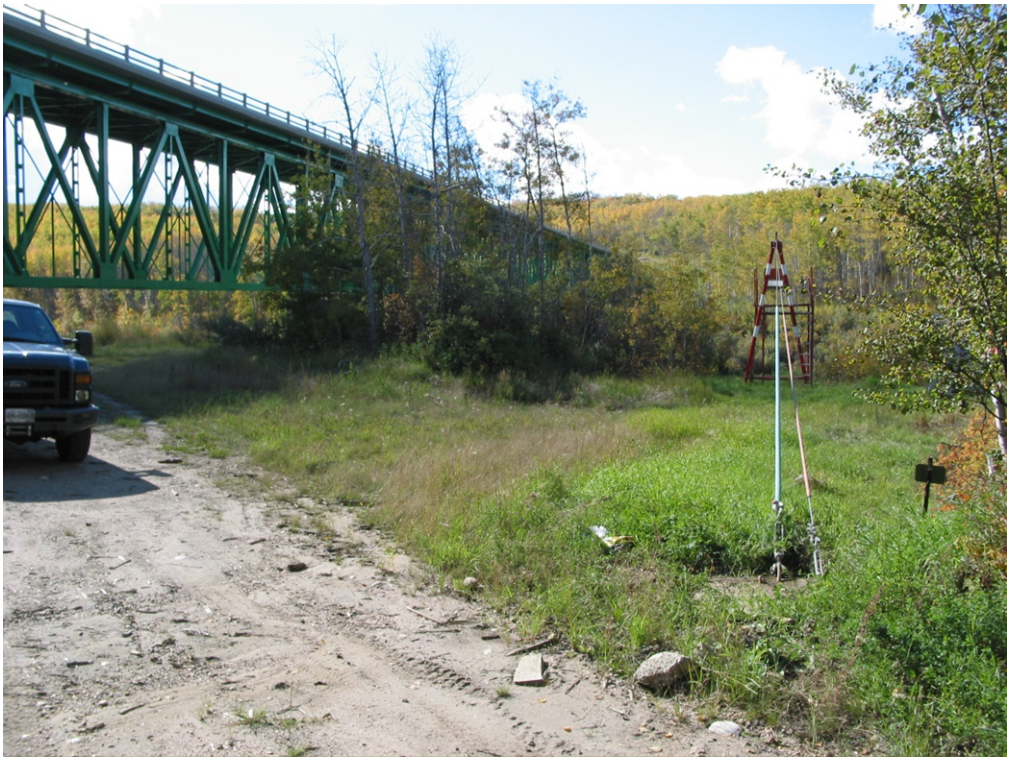

Figure 3: Infrastructure and surroundings on Right Bank Home Side

Figure 4: Infrastructure on Left Bank Far Side (Note: main center cable has been removed)

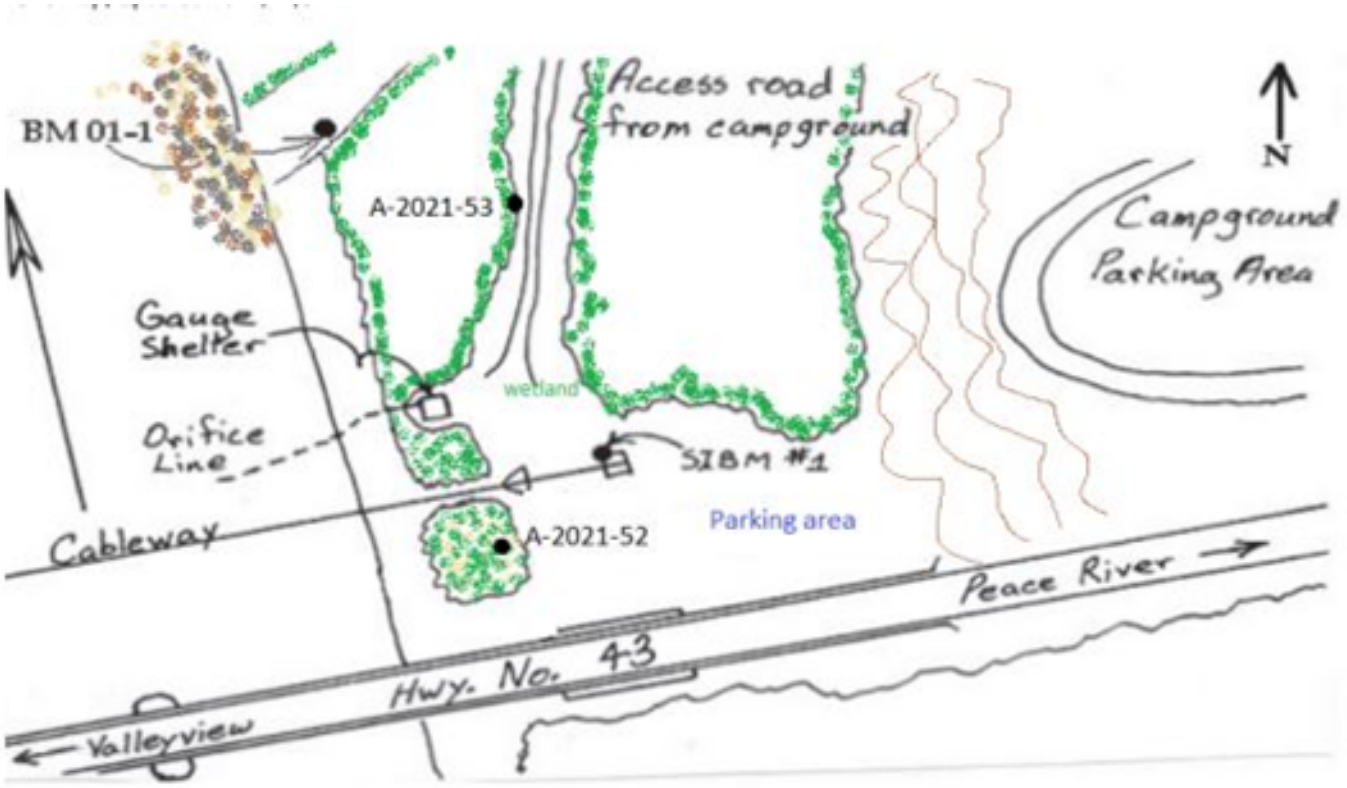

Figure 5: Site Map