

## **ANNEX “A” – SPECIFICATIONS**

**Title: Cableway Repairs** - Cableway Repairs - Water Survey of Canada Station at Ingenika River Above Swannell River (07EA004) near Mackenzie, British Columbia.

**The Contractor hereby agrees to provide the construction services outlined below in this Statement of Requirements.**

### **1.0 Introduction**

Environment and Climate Change Canada (ECCC) maintains cableway and hydrometric gauging stations across approximately 500 sites in the Pacific and Yukon areas. The hydrometric data support activities such as policy development, infrastructure design, water allocation, flood and drought response, recreation, navigation, ecosystem protection, and scientific study.

Hydrometric stations typically consist of a “walk-in” or “look-in” instrument shelter and a cableway or metering bridge to measure discharge. Other structures include helicopter pads and access stairways. Many of the hydrometric stations were built decades ago where structural degradation has occurred over time. As such, infrastructure deficiencies and safety concerns have been identified; requiring repairs and upgrades to return these stations to operational condition.

### **1.1 Objective**

ECCC requires a Contractor to conduct construction activities to upgrade the existing cableway to a level of safety acceptable for manned operation at the Water Survey of Canada Station at Ingenika River near Mackenzie, B.C.

### **2.0 Project Station Location and Access**

The subject station is located approximately 200 km northwest of Mackenzie, B.C. at end of Swannell logging camp runway and approximately 13.3 km SW of Ingenika airstrip. The station’s coordinates are roughly 56°43'50.2" N and 125°06'18.0" W. See the site maps below (Figure 1). See figure 2 for station map.

The far-side of the site is located alongside the Finlay-Swannell FSR. This side can be reached by vehicle. It is approximately a 325km drive from Mackenzie, BC. The location of the anchor is on a slope and specific measures may be required for an excavator to reach the anchors.

The cableway is approximately 200m downstream of a bridge. The home-side may be accessible through the forest from the bridge. The density of the forest is unknown. It may be possible to create an access path for an excavator. If the site cannot be reached by foot, a helicopter will be required. There is a helipad located on site. If an excavator cannot reach the site, hand digging will be required.

The soil on the home-side is expected to be a mixture of silt and sand.

The soil on the far-side is expected to a mixture of sand and gravel.

The schedule has been chosen to minimize risk of saturation within the excavation, but it is possible that flooding within the excavation may be encountered on the home-side.

Shoring or proper sloping of the excavation will be expected.



Figure 1: Ingenika River Location

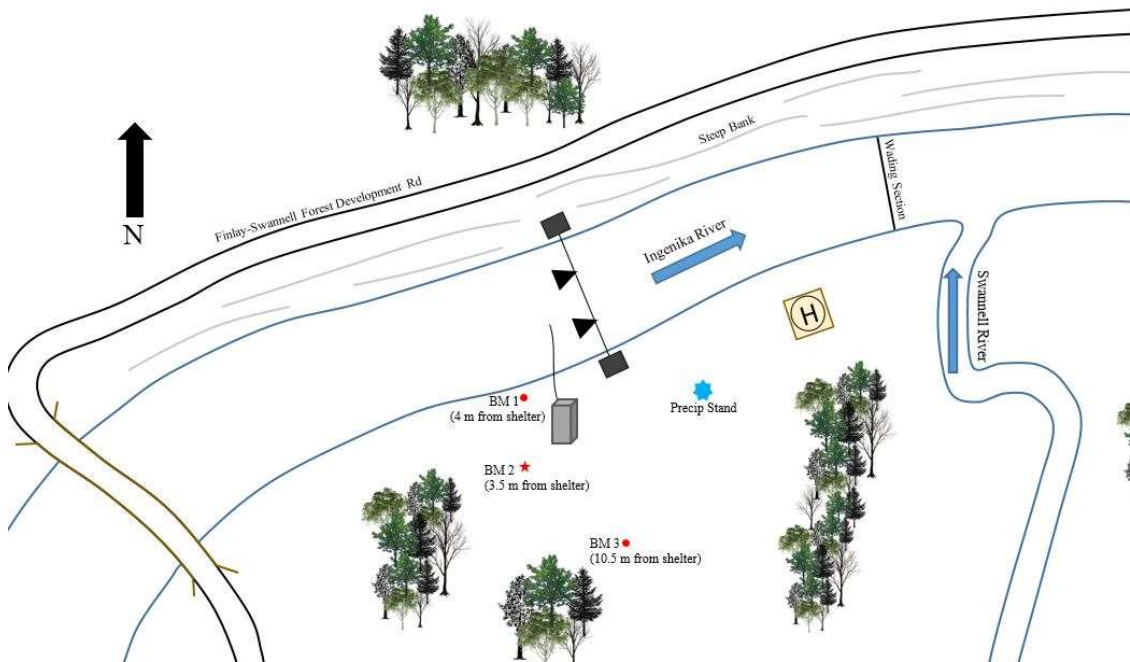


Figure 2: Ingenika River Station Map

### 3.0 Existing Infrastructure

The existing cableway spans approximately 98m across Ingenika River (Figure 3).

The right bank consists of a 5.31m tall steel pipe A-frame tower and a single plate anchor. The anchor is composed of a 14ft rod with a 3ft by 5ft plate at the end. The A-frame is supported by steel plate footings with dimensions of 0.3x0.3m buried to an approximate depth of 1.5m. The A-frame is resting on a freely rotating hinge connection allowing rotation towards and away from the river. The A-frame is held in place by a 3/8" diameter 1x7 IWRC backstay cable extending from the steel plate anchor to the top of the A-frame.

The left bank consists of two anchors, one anchor holding the main cable and the other the marker cable. The anchors buried directly into the slope.

The cables spanning across the river consist of a 1-inch diameter 6x19 IWRC main cable and 3/8-inch diameter 1 x 7 AC marker cable. The marker cable supports three aircraft marker cones. The cable car type is an aluminum stand-up car, approximately 2m in height.

See section 2.0 for details regarding soil type.

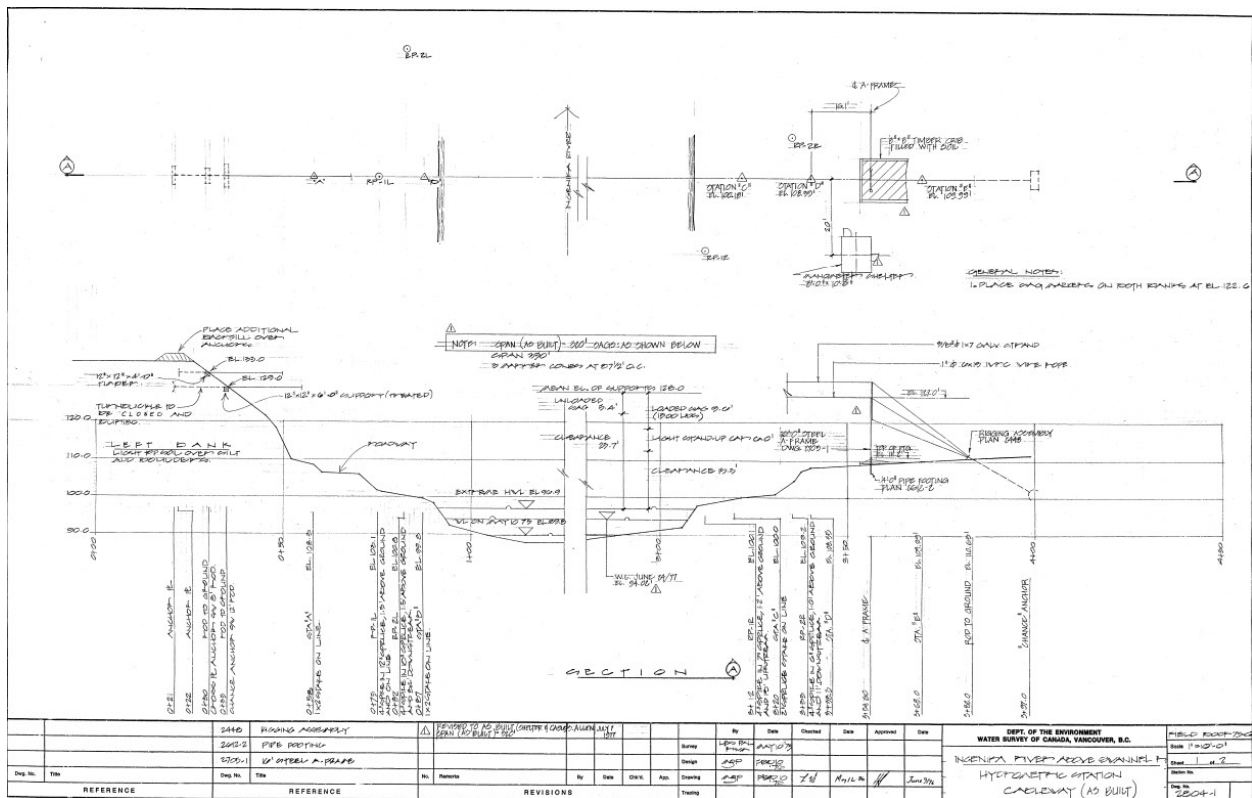


Figure 3: Ingenika River Existing Structure

### 4.0 Deliverables and Scope

The Contractor will provide mobilization and demobilization, all labour, supervision/project management, equipment, and supplies, as required, to complete the requested services.

## 4.1 Deliverables

The Contractor must provide the following deliverables, see section 4.2 details:

Deliverables	Description
1	Mobilization and demobilization – including material transportation to the job site
2	Installation of five (5) total steel plate anchors, two (2) on the far-side and three (3) on the home-side
3	Installation of pipe support and timber foundation on far-side
4	Installation of two (2) additional 1m x 1m baseplates to the existing home-side A-frame footings
5	Installation of the main cable
6	Installation of two (2) backstay cables on the home-side and one (1) backstay cable on the far-side
7	Installation of aircraft marker cable and marker balls
8	Installation of safety chain on the home-side
9	Installation of A-frame safety loop on both banks
10	Disposal of existing infrastructure and construction waste
11	Restoration of the site. Far-side to be landscaped to allow installation of new A-frame

## 4.2 Scope

The below list details items included in section 4.1 Deliverables.

1. Mobilization and demobilization
  - a. Includes pick-up and transportation of materials from Richmond, BC to the project site
2. Replace the existing steel plate anchors on far-side of the cableway with two (2) new steel plate anchors and three (3) on the home-side as per River Cableway Drawing – General Final sheets D302, D401, D303, and D402
  - a. The existing steel plate anchor can be left in place (unless it is in the way of the new anchors), aircraft cable will be attached to it
  - b. Compaction of the soil on the steel plate anchors during backfill
  - c. Anchors to be at approximately 2.5m depth, but can vary by site. The Contractor is obligated to excavate as deep as required for proper placement of infrastructure per ECCC requirements
  - d. ECCC Project Manager will layout the anchor position
  - e. Excavation is not to be backfilled unless approval is provided by ECCC Technical Authority;
  - f. Excavation to be completed by hand if excavator cannot access the site
  - g. Load test is not required for anchors, ECCC field review will be conducted prior to concealment
3. Installation of a pipe support with timber cribbing foundation on the far-side (leftbank)
  - a. Pipe specifications
    - i. Pipe is 10-inch diameter
    - ii. End plates are 12-inch x 12-inch x 3/8-inch plate
    - iii. Cribbing built from timber
  - b. ECCC Project Manager will layout the support position
  - c. The access is on a steep bank and a precautions for excavator access may be required
  - d. Excavation of footings to be completed by hand if excavator cannot access the site





**Figure 4:** Example of Pipe Support



**Figure 5:** Pipe Support

4. Installation of 2 additional 1m x 1m baseplates to the existing home-side A-frame footings, one (1) on each footing, per drawing 5001 – Additional Base Plate
  - a. Existing A-frame to be lifted from the footings, footings to be removed and new plate to be installed under the existing footings. (Refer to figure 6 and photos for reference)
  - b. Under the footing to be flat and compacted
  - c. Re-install footings to be plumb





**Figure 6:** A-frame footings installation of additional base plate

5. Replacement of the main cable with 1" 6x26 IWRC and all associated hardware
  - a. Hardware includes
    - i. Fist Grips, installation per River Cableway Drawing sheet D501
    - ii. Thimbles
    - iii. Sockets
    - iv. Turnbuckles
  - b. Cotter pins to be oriented to the downwards position where installed
  
6. Replacement of the backstay cables with three (3) total 1/2" 6x26 IWRC and all associated hardware
  - a. Two (2) on the home-side and one (1) on the far-side
  - b. Hardware includes
    - i. Fist Grips, installation per River Cableway Drawing sheet D503
    - ii. Thimbles
    - iii. Sockets
    - iv. Turnbuckles
  - c. Cotter pins to be oriented to the downwards position where installed
  - d. To be installed to existing anchor if left in place
  
7. Replacement of the aircraft marker cable with 3/8" 6x26 IWRC and all associated hardware
  - a. Hardware includes
    - i. Fist Grips, installation per River Cableway Drawing sheet D503
    - ii. Thimbles
    - iii. Sockets
    - iv. Turnbuckles
    - v. Marker cones or balls
  - b. Cotter pins to be oriented to the downwards position where installed
  - c. To be installed to existing anchor if left in place
  - d. Spacing of the cones/balls to be provided by ECCC on-site

8. Installation of safety chains/safety bar at the rear of the A-frame platform on the home-side
9. Installation of A-frame safety loop on each side as per River Cableway Drawing sheet D403
10. Proper disposal of removed infrastructure or other waste produced by construction
  - a. Receipt of disposal to be provided to ECCC
11. Site must be restored to its original grade and condition on the home-side. Far-side is to be graded to allow for same elevation at bottom of A-frame as top of anchors.
  - a. Before and after photos are required per section 5.2
12. Submittal of a Work Plan prior to mobilization, as outlined in section 5.1.1
13. Submittal of a Health and Safety Plan prior to mobilization, as outlined in section 5.1.1
14. The Contractor is responsible for pick-up and delivery of materials and components from Richmond, BC or any other facility, including Vernon, as designated and provided by ECCC, to site location;
  - a. ECCC will provide the list of materials and components
  - b. Pick-up address to be provided upon contract award. Will be in Richmond, BC unless otherwise provided.
  - c. The contractor is recommended to bring a flatbed trailer

Please see attachment 1 to Annex A for additional photos.

## **5.0 Considerations and General Requirements**

### **5.1 General Requirements and Procedures**

The above-noted cableway is **out of service** and **should not** be used under any circumstance for the transportation of people. Goods may be transported with the cableway with advanced approval from the Technical Authority. It is the Contractor's responsibility to ensure safety for any goods on the cableway.

#### *5.1.1 Work Plan*

The Contractor must provide a Work Plan, clearly stating their methodology for the relevant points below:

- Installation of the new steel plate anchors;
- Lowering and replacing the main cable and marker cable; the cable **must not** be left in the river for longer than 1 hour. Care is to be taken by the Contractor to ensure the cable does not cause a safety concern for any traffic within the river. Care must be taken to notify and highlight any danger to river traffic;
- Stabilizing or lowering A-frame; the A-frame **cannot** impact the river bank or be placed in the stream;
  - The steel A-frames have a pin base connection, and it is unstable under reduced tension in the existing cables – **the A-frame structure on both banks are required to be stabilized in all direction during the entire construction activity.**
- Contractor's "Chance find procedures" for Archaeological Materials; ECCC to provide a sample upon contract award.
  - The "Chance Find Procedures" is a project-specific procedure that outlines actions required if previously unknown heritage resources, particularly archaeological resources, are encountered during the project construction and operation.
- List of Contractor's tools and equipment;
  - See section 5.2 for ECCC recommendations;

- Quality control plan;
- Waste management plan;

#### *5.1.2 Safety Plan*

The Contractor must provide a Health and Safety Plan, clearly stating the procedures for ensuring safety throughout the project. This should include steps in the case of emergency, in the case of potential construction problems, and everyday procedures to promote safety. If at the time of construction the COVID-19 pandemic is ongoing, the Contractor must include measures to reduce the risk of COVID-19 spread between individuals on site. Health and Safety Plan must be in conformity with all regulations and requirements outlined in section 8.0.

#### *5.1.3 Unforeseen Obstacles*

Unforeseen obstacles during excavation may include large boulders requiring alternate methods of removal, tree trunks, and significant difference in soil type compared to expected. See section 2.0 for expected soil type. When unforeseen obstacles are identified, the Contractor must immediately inform ECCC's Technical Authority via phone or email as soon as reasonably possible. In cases where unforeseen obstacles are being claimed, full documentation including photos illustrating the obstruction in a clear manner and dimensions (to a reasonable degree) as well as an outline of challenges during removal, must be provided to ECCC's Technical Authority for review and file documentation. Unless otherwise agreed upon, it remains the responsibility of the Contractor to remove the obstruction.

#### *5.1.4 Cable Installation*

The main cable and marker cable must not be dragged across the river by boat. The cable must be pulled across the river from either shore by winching or other similar methods. It is recommended that the existing cable be used to support the new cable while it is being pulled.

All excavation must be properly shored in accordance with the Canadian Labour Code and Worker's Compensation Board Guidelines.

The Contractor is required to have the proper equipment and experience to carry out cable installation. Cables must be installed in accordance to the ECCC/Technical Authority design and specifications, cable manufacturer, and cable hardware specification/guidelines. The main cable is required to be installed at the design unloaded sag and tensioned correctly and secured per ECCC standards upon construction completion. The Contractor is responsible for stretching the cable after installation. To stretch cable, the cableway must be rid no less than five times one way.

#### *5.1.5 Groundworks*

The Contractor is required to have sufficient equipment and experience to carry out the plate anchors and A-frame footings installation. Anchors must be installed at an adequate depth to achieve the correct angles and stick-out as per ECCC "River Cableway Drawings" sheet D301, D302, and D303, and it is the responsibility of the Contractor to do so. Full documentation including photographs must be provided to ECCC's Technical Authority. ECCC will conduct a field review prior to concealment to ensure adherence to requirements. Organic material, such as tree branches, bushes, etc., are not to be used as backfill.

#### *5.1.6 Property and Public Safety*

Property belonging to ECCC or a private entity on-site or related to any project must not be damaged. Any damage must be repaired prior to demobilization at the Contractor's expense. ECCC is responsible for notifying the Landowners, Parks, etc. The Contractor must not enter the site without approval from the Technical Authority.



The Contractor is responsible for the health and safety of the public during and outside construction hours. Lowered cables and open holes must be clearly marked. If the cable must be lowered, the contractor is responsible for ensuring the safety of any persons within the vicinity of the project, including public use trail or riverway. A flagger may be required.

#### *5.1.7 Site Access*

Snow clearing/ access path clearing/fixing, removal of vegetation if required (based on recommendation and approval of an Environmental Consultant and/or Technical Authority), is the responsibility of the Contractor. If access requires removal of vegetation, pre-approval must be sought from ECCC Technical Authority. A QEP may be required on-site for this work, see section 5.5 for details.

## **5.2 Work Authorization**

The Contractor must ensure that all pre-construction deliverables, including a detailed outline of all work, schedule, project sequence, shop drawings, mill-certificates, and items related to Section 4.0 are provided prior to the mobilization and commencement of work.

A construction methodology for all parts of the Work must be submitted to ECCC Technical Authority for review prior to any work commencing. ECCC Technical Authority has five (5) business days to review and provide comments.

The Contractor must ensure it provides photos of its work at the site, before, during, and after construction activities. This includes photos of all major installations and changes on the construction site. Extra measures must be taken for installation of the cables/fist grips and steel plate anchors to meet the adequate depth and angle requirements.

Receipt of disposal at an approved facility must be provided to ECCC by the Contractor. Photos of the material being disposed at an approved facility are also required. All photos must be provided to the Technical Authority within five (5) business days from completion of the Work. ECCC reserves the right to withhold payment in the case of inadequate photos or receipt.

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

- Contract Drawings, as provided by ECCC, outlined in section 11.0;
- Environmental Protection Plan, if provided by ECCC;
- Archaeological Assessment, if provided by ECCC;
- Specifications, if provided by ECCC;
- Contract Documents, as agreed upon;
- Addenda, as agreed upon;
- Reviewed Shop Drawings, as created by the Contractor and approved by the Technical Authority;
- List of Outstanding Shop Drawings, as created by the Contractor;
- Other Modifications to Contract, as agreed upon;
- Copy of Accepted Work Schedule, as created by the Contractor and approved by the Technical Authority;
- Work Plan, as created by the Contractor;
- Health and Safety Plan, as created by the Contractor, and;
- Other documents as required.

The Contractor must adhere to recommendations included in the Environmental Protection Plan (EPP) and Archaeological Assessment (AA) provided by ECCC. Cases of Contractor's or its Subcontractor(s) non-compliance to the EPP or AA observed by ECCC will follow the procedures outlined in section 8.0.

The Contractor must ensure the site is left at the same grade and ground layout as was found. No piles of soil are to be left, any leftover fill must be scattered uniformly through the site. All excess materials, waste, and tools must be removed from the site during demobilization. Surface sources of water flowing through or towards ECCC infrastructure are to be rerouted downstream of infrastructure by Contractor, as deemed reasonable by ECCC and the Contractor.

Delivery of the project on schedule, budget, and safely is the responsibility of the Contractor. ECCC is not obliged to provide guidance or suggestions beyond those outlined in section 12.0. It is the responsibility of the Contractor to ensure that the construction meets the standards and dimensions specified by ECCC. The Contractor should not rely on ECCC to provide construction methodology.

### **5.3 Project Related Materials**

The Contractor is responsible for the transportation of the required materials and components to the project site. It is the Contractor's decision to determine the most efficient and cost-effective method of transporting the equipment and materials to either side of the cableway. Any transportation methods are the responsibility of the Contractor. Written confirmation is to be provided to ECCC Technical Authority for any material that is collected from ECCC.

The Contractor is responsible for the removal and disposal of old material from the project site. Existing/used cable hardware must be marked and is not to be re-used. Receipt of disposal at an approved facility must be provided to ECCC by the contractor.

Any unused material must be returned within one (1) month from the completion of the project to the ECCC Richmond, B.C. or other sub-office, including Vernon, unless otherwise directed by ECCC Technical Authority. Address will be provided upon contract award.

### **5.4 Recommended Specialized Tools/Equipment**

ECCC recommends the following tools/equipment:

- Cable Grips, large (up to – 1.1”) for the main cable – two or more units;
- Cable Grips, small (up to – 7/8”) for marker and tieback cables – two or more units;
- Torque Wrench, 3 ft handle (225 ft-lbs) for the main cable's fist grips;
- Torque Wrench, small (45 ft-lbs and 65 ft-lbs) for marker and tieback cables' fist grips;
- Chain Hoist 1.5 – 3.0 Ton – two or more units;
- Portable Winch (min 8000lbs);
- Shackles, ropes, straps, come-along, etc.

### **5.5 Environmental Considerations**

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

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 QEP. Re-planting of vegetation will not be required.

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 QEP to be on-site. Specifically, a QEP may be required on-site for certain cases of vegetation clearing or crossing an excavator over the river. Requirement for QEP on-site will be determined by the QEP prior to action. ECCC will arrange for the QEP to be on-site, but it is the responsibility of the Contractor to ensure a QEP is present for any action requiring QEP on-site.

Cases of non-compliance observed by ECCC will follow the procedures outlined in section 9.0.

## **6.0 Tasks**

ECCC reserves the right to withhold payment in the case of all incomplete tasks.

### **6.1 Pre-Construction**

The Contractor must ensure that all pre-construction deliverables are completed. This includes:

- Work Plan Methodology;
- Schedule;
- Health and Safety Plan;
- Chance Find Procedures;
- Pick-up of materials;
- Shop drawings, as applicable;
- Mill-certificates, as applicable.

Documents are to be provided prior to the mobilization and commencement of work. Details of construction methodology to be per section 5.1.1. ECCC Technical Authority has **5 business days** to review and provide comments.

### **6.2 Construction**

The Contractor must ensure that all deliverables related to the construction are completed. The Contractor must:

- Provide the ECCC Technical Authority with a written receipt of materials collected from ECCC;
- Provide all services outlined in Section 4.0.

### **6.3 Post-Construction**

Upon completion, the Contractor must ensure that all post-construction deliverables are submitted to the Technical Authority. This includes:

- Photos of before, during, and after construction;
  - See section 5.2 for photo requirements;
- Receipt of disposal;
- Return of unused materials.

## **7.0 Damages, Lost Materials, and Defective Work**

Property belonging to ECCC, the Crown, or 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. Any material that is lost or damaged by the Contractor must be reported to ECCC Technical Authority as soon as reasonably possible and replaced at the Contractor's expense. Extra material is to be returned to ECCC at the completion of the project as per section 5.3.

Any Work rejected by ECCC as a result of poor workmanship, use of defective products or damage caused by negligent or deliberate acts or omissions of the Contractor or of its Subcontractors is to be replaced by the Contractor at the Contractor's expense.

## **8.0 Safe Work Procedures**

The Contractor must remain in compliance with the Canada Labour Code, National Joint Council Occupational Health and Safety Directive, and WorkSafeBC Guidelines. The Contractor must provide ECCC Technical Authority with details for each construction task compiled into a Health and Safety Plan.

The Contractor is expected to follow safe work procedures, including proper Personal Protective Equipment (PPE) use at all times. A Personal Flotation Device must be worn if there is a risk of drowning. A complete Basic First Aid Kit must be carried and on-site. Protection against wildlife is included within PPE.

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. Cases of non-compliance observed by ECCC will follow the procedures outlined in section 9.0.

All guidelines and regulations provided by the Government of Canada, the Province of BC, WorkSafeBC, and the British Columbia Construction Association relating to the COVID-19 pandemic must be practiced throughout all construction activities.

## **9.0 Notifications of Non-Compliance**

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

1. The Technical Authority will notify Contractor in writing of observed non-compliance related to Health and Safety, Environment, Private Property, or any other regulations and requirements.
2. After receipt of such notice, the Contractor shall inform the Technical Authority of proposed corrective action within one (1) day to obtain the approval from the ECCC Technical Authority. Technical Authority will provide review and approval in one (1) day.
3. Once approval has been provided by the ECCC Technical Authority, the Contractor may proceed with the proposed actions.
4. If warranted, the ECCC Technical Authority will issue a Stop Work Order until satisfactory corrective action has been taken by the Contractor.
5. Suspensions will be lifted once the corrective action(s) have been proposed and taken by the Contractor, with the approval of the Technical Authority.
6. No time extensions will be granted or equitable adjustments will be given to the Contractor for such suspensions.
7. In the case where there is immediate danger to the health and safety of a worker or integrity of infrastructure, the Contractor may take immediate actions.

## **10.0 Schedule**



ECCC estimates that completion of the project will require 7 days on-site. Unless otherwise agreed upon, the project is to be completed over 7 days between **April 15, 2022**, and **June 30, 2022**. The final invoice must be submitted once work has been completed, no later than **March 15, 2023**.

A kick-off meeting between ECCC and the Contractor shall be scheduled within five **(5) business days** of contract award. Meeting to be arranged and led by the representative of ECCC.

The Contractor must submit to ECCC a comprehensive schedule of the project work/task(s) prior to mobilization. The schedule must be approved by both parties.

Weekly progress meetings are to be arranged by the Contractor to provide weekly updates to ECCC. This should include reporting of ongoing project schedule.

Standard work schedules for members of ECCC are Monday to Friday 8:00 AM to 4:30 PM. 72-hour notice must be provided when an ECCC member is required outside of these hours. ECCC cannot guarantee the availability of a representative for on-site support outside of these hours.

A standard construction workday, used in the estimated project length, is considered 7.5 hours per day.

The Contractor must provide 72-hour advance notice when requesting the on-site presence of an ECCC member. See section 12.0 for a list of items requiring ECCC field review.

### **11.0 Documents**

The following documents, drawings, and photos are part of this project (located in the ZIP files) and are intended to be read with this Statement of Requirements. They are to be maintained on site by the Contractor per section 5.2.

- (1) River Cableway Drawings – General Final
- (2) 3136 – Heavy Duty A-frames
- (3) 5001 – Additional Base Plates
- (4) Crosby Fist Grip Specifications
- (5) HG-228 J&J Turnbuckles Specifications
- (6) SAMPLE Chance Find Procedures
- (7) Ingenika River Existing Structure – As Built
- (8) Related Photos

### **12.0 Environment and Climate Change Canada Responsibilities**

ECCC will provide the following:

- All materials required for construction;
- Acquisition of relevant permits and background information with the Province of British Columbia and the Department of Fisheries and Oceans;
  - BC Water Act Notification;
  - Archaeological Assessment;
  - Desktop Study - Environmental Assessment;
  - Working around Water Permit, as applicable;
- Providing drawings and descriptions of all components related to the work;
- Supply of Qualified Environmental Professional (QEP) services, as required;
- Will provide on-site and remote support during all phases of the project;
  - Will be on-site at the beginning of construction and to conduct a final sign-off and survey upon completion;

- ECCC will provide field review of the following installations:
  - Lay-out of the steel plate anchors locations and distance from the A-frame;
  - Approval of depth, angle, and location of components installed by excavation prior to backfill;
  - Inspection of cableway at completion of construction and prior to hand-over.

**Attachment 1 to Annex A – Additional Photos**

1.1





1.2





1.3



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