

PARKS CANADA AGENCY

JASPER NATIONAL PARK

Fiberglass Reinforced Polymer Bridge Design and Supply

xxx-23-00XX

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STATEMENT OF WORK

1 PURPOSE

Parks Canada Agency (PCA) with Jasper National Park (JNP) requires the services of an Fiberglass Reinforced Polymer (FRP) bridge supplier for the design and supply of three spans of an FRP bridge in Jasper National Park. The services required generally include the design of the bridge spans according to below specifications, supply of the necessary materials, and providing detailed assembly instructions.

1.1 Objectives

- 1.1.1 To design and supply a three span FRP bridge compliant with the Canadian Highway Bridge Design Code (CHBDC) adequate for horse passage.
- 1.1.2 To manufacture and supply all necessary FRP bridge pieces and hardware to Jasper National Park for assembly and installation by Parks Canada staff.
- 1.1.3 To supply detailed assembly instructions and troubleshooting support during assembly and construction.

2 BACKGROUND

An FRP Bridge is required to replace a washed out bridge near Brazeau Lake in Jasper National Park. This new bridge will be used by both hikers and horse-users. The bridge spans must be designed to be lightweight and easily transported by helicopter to the installation site and be compliant with the CHBDC. In order to comply with Parks Canada policy, the FRP bridge must be designed and sealed by a professional engineer. Like many other bridges in Jasper National Park, it will be constructed and installed by Jasper National Park’s Trail Crew under the supervision of a Parks Canada engineer.

3 ANTICIPATED MILESTONES

Project Phase	Milestone Completion Date
Supply Contract Award	To be Determined
Preliminary Design & PCA Approval	November 06 2023
Detailed Design & PCA Approval	January 08 2024
Material Delivery	March 01, 2024

4 PROJECT DELIVERABLES AND REQUIREMENTS

4.1 Bridge Design and Supply

- 4.1.1 Design and supply 3 spans of an FRP bridge, bridge spans must be designed as a FRP Composite Truss Span.
- 4.1.2 All members shall be fabricated from pultruded FRP composite profiles and structural shapes as required.
- 4.1.3 Bridge spans can be precambered to eliminate initial dead load deflections.
- 4.1.4 Design the bridge such that it can be anchored into various materials such as concrete, rock gabion, or wooden cribbing
- 4.1.5 Bridge spans must provide adequate load bearing capacity in ambient temperatures of 45 degrees Celsius.
- 4.1.6 Each span shall be 10m in length and shall be measured from each end of the bridge span structure. Bridge spans must connect to each other.



- 4.1.7 Each span shall be compliant with the CHBDC and have an identical design.
- 4.1.8 Bridge shall be rated and designed to allow for horse passage (weight considerations, adequate decking, and be 1.6m in width that shall be measured from the inside face of structural elements at deck level). Anticipate that one horse will cross the bridge at a time and that the decking must be conducive for horse use, lengthwise gaps in the bridge are not acceptable.
- 4.1.9 Bridge span decking will be FRP and must have anti-slip properties, decking must be textured
- 4.1.10 Bridge should be able to be anchored into concrete, rock gabion, or wooden cribbing. This Abutment and Pier design to be completed by Parks Canada. Supplier's engineer may specify which pier/abutment material is preferred.
- 4.1.11 Bridge will be delivered unassembled/in pieces and will be assembled and installed by Parks Canada staff under the supervision of a Parks Canada engineer. If the supplier needs to observe the construction or installation to start the warranty period, that can be accommodated. Travel, accommodation, and all other expenses related to this inspection will be at the supplier's expense.
- 4.1.12 When each span is constructed it needs to be able to be lifted into place by a helicopter, therefore each span must weight less than 1500 lbs. If this isn't possible, the bridge must be flown out in sections and assembled in the field (e.g. decking and railings can be flown out separately and installed in place).
- 4.1.13 Bridge must be designed and sealed by a professional engineer and done in accordance with recognized engineering practices and principles.
- 4.1.14 Detailed instructions on how to assemble the bridge must be provided, and the supplier must be available during construction to help troubleshoot any problems which may arise.
- 4.1.15 Supplier must also provide all bolt connections and other hardware required for assembly
- 4.1.16 Supplier must also specify mounting devices/connections based on the pier and abutment types selected by Parks Canada's project manager.
- 4.1.17 FRP Bridge must be pre-drilled, pre-cut and ready to be bolted together.
- 4.1.18 FRP Bridge must be UV resistant, have fire-resistant properties, and have a guaranteed lifespan of at least 25 years.
- 4.1.19 Delivery to Jasper National Park Compound must be included, 1 Compound Road, Jasper, AB.
- 4.1.20 All materials shall be carefully handled to prevent them from abrasion, cracking, chipping, twisting, and other types of damage. Manufactured materials will be packaged in a manner which ensures that no damage will occur during delivery.
- 4.1.21 All FRP components needing drilling and cutting prior to delivery will be worked on by an experienced fabricator and safety and dimensional tolerances must be strictly followed during the whole fabrication process.
- 4.1.22 Deck drainage must be considered in the design, ensure that drains are not discharging over structural elements of the bridge spans.
- 4.1.23 Colour of FRP bridge spans will be natural and neutral and the colour will not be painted on, rather added during the manufacturing process. All bridge components shall be the same colour.
- 4.1.24 FRP bridge must withstand a snow load equivalent to 3m of snow with a density of 200kg/m³. Bridge will not see use in winter.
- 4.1.25 FRP bridge shall be designed for a minimum wind load of 1200 N/m². The wind is calculated on the entire vertical surface of the bridge as if fully enclosed.
- 4.1.26 Preliminary design drawings must be provided to, and approved by, the Parks Canada project manager
- 4.1.27 Detailed design drawings must be provided to, and approved by, the Parks Canada project manager. Detailed design drawings will be sealed by a licensed professional engineer.



- 4.1.28 Structural calculations shall be submitted to, and approved by, the Parks Canada project manager. All calculations will be sealed by a licensed professional engineer.
- 4.1.29 Supplier must have a QAQC program which ensures that the manufactured FRP meets the structural, quality, and aesthetic requirements set out in this Statement of Work and as required by the approved design drawings, calculations, and notes.
- 4.1.30 FRP resins shall be Vinyl Ester and have chemical properties necessary to provide superior corrosion resistance, strength, and fire resistance.
- 4.1.31 Finished FRP shall be smooth (except for textured decking), resin-rich, free of voids and without dry spots, cracks, bubbles, or unreinforced areas. All glass fibers shall be well covered with resin to protect against their exposure due to wear or weathering.

4.2 General Requirements

- 4.2.1 Provide proposed Project schedule including allowance for 5 business days for PCA review at each submission and incorporating, at minimum, anticipated milestone dates
- 4.2.2 The Supplier Team must employ their own quality control and quality assurance program and remain fully responsible for the design and services provided. Reviews conducted by PCA are for information and awareness only, not quality control for the Consultant.
- 4.2.3 Attend, at minimum, 3 project project meetings by tele/video conference chaired by the Parks Canada project manager. Further to point 4.1.11, site visits may be required.
- 4.2.4 Record project meeting minutes, including issues and decisions. Prepare and distribute minutes within two (2) working days, throughout all Phases of the Project.

4.3 Additional Consultant Responsibilities

- 4.3.1 Success in satisfying and where possible exceeding the expectations and needs of PCA clients and stakeholders.
- 4.3.2 Delivery of the project by utilizing best practices in support of PCA needs, respecting the approved scope, quality, financial budget and schedule.
- 4.3.3 A cohesive functional partnership and open communication between all members of the project delivery team and stakeholders throughout all phases of the project life.
- 4.3.4 An integrated and focused Consultant team with an in-depth understanding and collective 'buy-in' of the project requirements, scope, budget and scheduling objectives, working constructively to ensure a collaborative and cooperative team approach with knowledgeable and timely input and contribution by all project team members.
- 4.3.5 Rigorous quality assurance reviews during the planning and implementation phases, including the application of value engineering reviews during the design.
- 4.3.6 A rigorous quality management plan in order to respond and correct, in a timely and effective manner, all issues as they occur.
- 4.3.7 Success by assigning an experienced and well-seasoned Project Engineer that shall be responsible for the project, and shall ensure that there is a continuity of key personnel working as an integrated dedicated team for the full duration of the project.
- 4.3.8 Optimum professional conduct in all phases of the project, by employing best practices for budget, schedule, quality, and scope management.
- 4.3.9 A continuous risk identification and management program employing effective methodologies to ensure claims avoidance.
- 4.3.10 Continuous and comprehensive documentation of the project at all stages of the project implementation.



- 4.3.11 The Consultant must ensure their employees and/or subcontractors adhere to Canada Labour Code and Canada Occupational Health and Safety Regulations while performing the work.

5 CODES, ACTS, STANDARDS AND REGULATIONS

5.1 Applicable Code

- 5.1.1 In addition to Provincial and Municipal Acts, Codes, By-laws and Regulations appropriate within the area of the Work, the following are a list of Codes, Acts, Standards and Guidelines, applicable to this project in their latest edition (in the event of a conflict between codes, the more stringent shall take precedence). This list is for reference and does not constitute a full representation of all requirements of the Supplier in delivery of the Project.

- 5.1.1.1 Canadian Highway Bridge Design Code (CHBDC)
- 5.1.1.2 The Canada Labour Code (CLC)
- 5.1.1.3 The Canada Occupational Health and Safety Regulations
- 5.1.1.4 Canada National Parks Acts and Parks Canada Agency Regulations
- 5.1.1.5 Directives and Guidelines

6 Constraints

6.1 Bridge Construction and Installation

- 6.1.1 The bridge must be design and supplied such that they can be assembled and installed by Parks Canada manual labour staff under the supervision of a professional engineer
- 6.1.2 Bridge spans must be suitable for helicopter transport to the installation site

6.2 Delivery

- 6.2.1 The bridge spans must be delivered and to the Jasper National Park Compound, and delivery costs must be included in the proposal. The bridge span components will be accepted by the project manager.

6.3 Business License

- 6.3.1 A PCA business licence is required by the Consultant prior to performing work within Jasper National Park. Contact the Administration Officer at jasperbusinesslicence@canada.ca to make arrangements.

7 PCA RESPONSIBILITIES

7.1 Documents and Records

- 7.1.1 PCA will provide any relevant existing documents and records related to the project upon request.