

STATEMENT OF WORK

July 2022

Table of Contents

1 – Objectives ..... 2

2 – Background ..... 2

3 – Scope of Work..... 3

4 – Deliverables ..... 4

5 – Project Administration / Responsibilities ..... 7

6 – Environmental Impact ..... 8

7 – Cultural Resource Management and Archaeological Impacts ..... 9

8 – Location of Work and Travel ..... 9

9 – Schedule ..... 10

10 – Design Requirements & Considerations..... 10

11 – Green Building / Sustainable Design ..... 10

12 – Additional Information ..... 11



## STATEMENT OF WORK

July 2022

### 1 – Objectives

Parks Canada Agency (PCA) is seeking the services of an structural engineering firm recognized and licensed to practice in Saskatchewan with experience in vehicular bridge design and construction.

The objective of the project is to design and replace two existing bridges within Grasslands National Park. We will be replacing the Dixon & Walker Bridges to provide access for vehicles and to minimize impacts of flooding on the bridges. Additionally, the roads accessing the bridges will need to be improved to ensure access to the bridges during flood events. The intent is to design and replace the bridges. The construction work to replace the bridges will be dependent on the amount of funding available.

### 2 – Background

Both the Dixon & Walker bridges cross the Frenchman River within the West Block of Grasslands NP. They are in poor condition and in need of numerous repairs. Additionally, during spring runoff and severe rainfall events, the bridges are subject to significant flooding, which prevents crossing and is contributing to further deterioration of the bridges. We have determined the best way to address these issues is to build new bridges, out of more durable materials, and at a higher elevation.

#### A. Dixon Bridge:

The existing Dixon Bridge is a two span timber bridge that crosses the Frenchman River in the West Block of Grasslands National Park. The existing bridge is 7.0 metres wide, 8.5 metres long and is situated deep in the natural channel of the Frenchman River.

The road that leads to and from the bridge is a 7m wide gravel road. The road and bridge are not heavily used, but are the only available access to lands north of the Frenchman River from the west. It is therefore a critical piece of infrastructure and access must be maintained throughout construction.

The bridge is located at GPS Coordinates: 0324499, 5441246 (latitude: 49.099007° N, longitude: 107.404308° W)

#### B. Walker Bridge:

The existing Walker Bridge is a 3-span timber bridge that crosses the Frenchman River in the West Block of Grasslands National Park. The existing bridge is 7.3 metres wide and 18.3 metres long.

The road that leads to and from the bridge is a 7m wide gravel road. The road and bridge are not heavily used, but are the only available access to occupied lands south of the Frenchman River. It is therefore a critical piece of infrastructure and access must be maintained throughout construction.



## STATEMENT OF WORK

July 2022

The Walker bridge is located at GPS Coordinates 0327932, 5435835 (latitude: 49.051343°, longitude: -107.355017°)

### 3 – Scope of Work

The scope of work includes the following:

- Review available information, which may include: photos, Inspection Reports, Geo-Technical Report, details regarding typical bridge usage, opportunities, constraints, and mitigations to be identified through the environmental review process. It is the consultant's responsibility to ensure they have all of the information they require.
- Visit the site to confirm existing conditions, constraints, and opportunities.
- Review existing Geotechnical report for the Dixon Bridge area, and confirm how much additional investigation is required. Perform additional assessment and provide a report.
- Perform a Geotechnical assessment and provide a report for the Walker Bridge area.
- Site Survey and field work to be completed to collect information and data that will provide sufficient information for detailed designs and drawings for these particular sites.
- Perform a Hydrotechnical assessment for both bridges
- Consult with PCA Team as required regarding requirements, current issues, and concerns.
- Schedule and attend regular meetings from Contract Award through completion of IFT documents. Consultant responsible for taking meeting notes and distributing to all attendees.
- Review requirements for the bridge based on current standards, codes, and Parks Canada specific requirements
- Evaluate the road on either side of the bridges to determine the impact of flooding on those roads as they approach the bridges. At least one area of roadway near Dixon Bridge is in a flood plain and subject to flooding as well. The consultant will ensure the road on either side of the both bridges is raised appropriately to ensure safe, continued access to the bridges during a flood.
- Provide options, analysis, and recommendations to the project team
- Incorporate mitigations derived through the environmental and archaeological reviews as well as the impact assessment processes into the project designs.
- Provide a fully engineered, tender-ready set of drawings and specifications for the bridges including modifications as required to the road to provide safe access to and from the bridge.
- Provide Cost Estimates for the design at each stage of drawing submittal.
- Cost estimates and specifications to be submitted with the drawings at each stage (50%, 95%, and IFT) of design
- Optional Services: Tender Process, Residential Construction Administration, and Post Construction Services



## STATEMENT OF WORK

July 2022

The Consultant must consider all applicable standards and codes including, but not limited to, the following technical documentation and associated codes. All documentation and codes must be the current federally approved edition:

- Canada National Parks Act and Regulations
- Applicable Parks Canada Directives, Policies, Guidelines, & Standards
- The National Building Codes of Canada (2020)
- Parks Canada Agency Directive for Design, Construction, and Inspection of Vehicular and Pedestrian Bridges (2008)
- CSA S6:19 Canadian Highway Bridge Design Code
- Saskatchewan Highways Bridge Design & Roadways Design
- Manual for Uniform Traffic Control Devices
- Department of Fisheries Act
- Impact Assessment Act
- Canadian Navigable Waters Act
- Canadian Environmental Protection Act
- Local Provincial and Municipal Codes, Standards and Regulations accepted as having jurisdiction in the National Parks where work is being performed and for which the requirements are more stringent than those named above, shall be followed
- Metrification: Projects shall be in accordance to Metric Drawings Practice and S.I. units as issued by the Metric Commission of Canada.

### 4 – Deliverables

The Consultant will prepare and submit drawings and specifications as well as cost estimates. Attend meetings, take notes and distribute record of meetings to all attendees within 48 hours of meeting.

#### 1. Hydrotechnical Report (Required Services):

The consultant will be required to complete a hydrotechnical assessment for both bridges. The report will include, at a minimum:

- flood discharge (note that we are targeting 1:200 year flood levels),
- flows and elevations, and
- bank restoration techniques and designs which will be used during Preliminary and Detailed design

#### 2. Geotechnical Investigations and Report (Required Services):

Dixon Bridge: There was an investigation and report completed around the Dixon Bridge in 2015, but it is not expected to cover all of the area that may be required by this design. Additional geotechnical investigations and a report is expected to be necessary.



## STATEMENT OF WORK

July 2022

Walker Bridge: A geotechnical investigation has not been completed for the area around this bridge. This will be required.

3. Preliminary Design Report (Required Services):

The consultant will be required to prepare a preliminary design report sufficient to allow PCA to make sound decisions on design options. The report should clearly show the individual requirements and analysis for each bridge, or be separated into two reports.

At a minimum, this report will include:

- Three viable design options, for each bridge, incorporating results from all available information including the hydrotechnical report, geotechnical report and preliminary environmental & archaeological reviews.
- Each option will be accompanied by a detailed evaluation of the design and the green building strategies included. List advantages, disadvantages, and the consultant's recommendation for a preferred option.
- Estimated construction timelines for each option
- Class 'D' estimates for each option

4. Detailed Design & Specifications (Required Services):

- Provide draft designs and specifications for the bridge at approximately 50% and 95% completion. Incorporate feedback from the PCA team into each successive revision.
- Estimates are required at each stage (Class C at 50%, Class B at 95%).

5. Final Design & Specifications (Required Services):

- After review by the Parks Canada team, and incorporation of feedback, provide a fully engineered, tender-ready set of drawings and specifications as well as a Class 'A' estimate
- Provide additional documentation as required by PCA and the contracting department for the tender process such as bid breakdown forms.

### **Optional Services:**

The following services will be dependent on funding availability for construction for one or both of the bridge replacement work.

6. Tender Process Support (Optional Services):

- Attend pre-tender bidders' conference
- Answer questions that may arise from potential bidders regarding the drawings and specifications for the project
- Clarify tender documentation upon request



## STATEMENT OF WORK

July 2022

- Provide additional details and information as may be required to answer questions that arise during the tender period
  - All responses during this time are time sensitive and are required within 24 hours of request.
7. Construction Administration Services (Optional Services):
- Monitor the progress of the Contractors' work, compliance with all drawings and specifications, time schedules, quality standards and progress reports, through resident site supervision during the construction period.
    - i. *Daily Reports* – provide a brief daily report each day highlighting progress and any concerns that may need to be addressed right away
    - ii. *Daily Log & Weekly Report* – Resident Engineer will keep a daily log recording weather activities, major material and equipment deliveries, daily activities and major work done, start, stop or completion of activities, unusual site conditions, special visitors on site, authorities given contractor to undertake certain or hazardous work, environmental incidents, health and safety notices and incidents, reports, instructions from Appropriate Authorities Response Actions, and any other relevant information. Daily logs will be submitted to the Project team weekly.
  - Additional site inspections as required.
    - i. *Site inspection reports* – will include a summary of findings on site including work completed, deficiencies, defects, corrections to previous deficiencies or defects, safety concerns, issues that need to be resolved along with proposed solutions to defects, concerns, and issues. Reports to be submitted to PCA within 48 hours of site inspection. PCA should be informed of any critical items immediately.
  - All personnel providing resident and non-resident construction inspection services must be fully knowledgeable with technical and administrative requirements of the project.
  - The resident engineering services will be provided by a professional engineer licensed in Saskatchewan, or a person with sufficient experience and knowledge to provide the same level of services.
  - Attend meetings, including start-up and regular project meetings as required, in person or virtually. Meetings will be bi-weekly, with additional meetings added as required.
  - Review & respond to all submittals, including safety documentation and schedules received from the contractor, within 2 weeks of receipt.
  - Carry out field quality assurance reviews, produce change order documentation, issue supplemental drawings and information as required, and review contractor invoices providing feedback to PCA. All potential changes and supplemental/site



## STATEMENT OF WORK

July 2022

instructions must be reviewed and signed off by PCA prior to issuing to the contractor.

- Document Tracking Log – Consultant to prepare a log of all project documentation including submittals, changes, and site instructions. Log to be maintained and kept up to date with information such as: documents received, reviewed, and revisions required. Log to be reviewed at each meeting.
- Carry out substantial completion inspection, creating a list of all deficiencies to be corrected, and following up to ensure deficiencies are being completed correctly and in a timely manner. Deficiency List and updates showing corrected deficiencies to be provided to PCA
- Carry out a final inspection, confirming that all deficiencies have been corrected. Submit Final Inspection report to PCA.
- Assist in conflict resolution. The consultant may be asked to comment and confirm or dismiss any claims for delays made by the Contractor based on their monitoring of work progress. All delays must be tracked and reported to the Project Manager as they occur.

### 8. Post Construction Services (Optional Services):

- Ensure contractor has submitted all close out documentation and forms
- Sign off any required forms for close out and completion of the construction works
- Lead a warranty review at approximately 10 months after substantial completion and as required during the warranty period.

Where deliverables and submissions include summaries, reports, drawings, plans, specifications and schedules, one (1) copy shall be provided to the PM in electronic PDF format; original format and hard copies might be required as requested.

Deliverable submissions should be in a format that is accessible to all team members such as PDF. Design work shall be completed in AutoCAD or Revit, and should be available upon request. All drawings and specifications will follow Government of Canada standards, including title blocks. This information will be provided.

## 5 – Project Administration / Responsibilities

The Consultant will:

- Act as the Prime Consultant, coordinating the work of the entire team including any required sub-consultants;
- Provide rigorous quality assurance reviews during the planning and implementation phases, including the application of value engineering reviews during the design process.
- Prepare and provide regular updates on the progress of the work being conducted;
- Attend meetings as required in person or virtually;
- Submit and maintain a project execution plan/schedule to clarify how the work will be conducted.



## STATEMENT OF WORK

July 2022

### 6 – Environmental Impact

Parks Canada's mandate is to protect and present nationally significant examples of Canada's natural and cultural heritage, and foster public understanding, appreciation and enjoyment in ways that ensure the ecological and commemorative integrity of these places for present and future generations on behalf of the people of Canada.

Grasslands are one of the world's most threatened ecosystems. Grasslands National Park is the only national park to represent the mixed grass prairie ecosystem in Canada, and is located in one of the largest areas of "undisturbed" mixed-grass prairie in North America.

In their native state, the central grasslands support rich and highly specialized plant and animal communities. Maintenance and restoration of ecological integrity is the first priority of National Parks. Species at risk, their residences, and their habitat are protected by existing national park regulations and management regimes, and by the Species at Risk Act (SARA). Under SARA, PCA is responsible for the protection and recovery of listed species found in National Parks, and all other areas administered by Parks Canada. Grasslands National Park is home to over 30 species at risk including the Greater sage-grouse which is under an Emergency Protection Order (EPO) that has stricter requirements.

The consultant is required to work with the Grasslands NP Resource Conservation group and an Environmental Consultant (who will be under contract to PCA), and become familiar with the restrictions, requirements, and mitigations and how they apply to this project from investigations through construction completion. In addition to requirements during construction, many of the mitigations may also impact the consultant and their work on site.

Information provided will include:

- Emergency Protection Order – Greater Sage-Grouse
- SARA (Species at Risk Act) – PCA will provide guidance regarding the applicable sections and mitigations that are relevant to this project.
- Relevant PRIA (Preapproved Routine Impact Assessment) for typical activities such as Geo Technical Investigations.
- Impact Assessment Reports at draft and final stages.

#### **Dixon Bridge:**

The replacement of the Dixon Bridge is subject to environmental review under Canada's *Impact Assessment Act*. Parks Canada's most comprehensive level of impact assessment, a detailed impact assessment (DIA), has been selected as the appropriate assessment pathway for this project.

The DIA itself will be completed by an environmental consulting firm. The environmental consulting firm will be under contract with PCA and will work concurrently with the design consultant. The design consultant will assist in the development of the DIA (Detailed Impact





## STATEMENT OF WORK

July 2022

Assessment) by providing relevant design information and participating in meetings as required. The design and environmental consultant's work will be iterative, such that mitigations can be incorporated into design in a timely, efficient and cost-effective manner.

### **Walker Bridge:**

The replacement of the Walker Bridge is subject to environmental review under Canada's *Impact Assessment Act*. The Basic Impact Assessment (BIA) has been selected as the appropriate assessment pathway for this project. The consultant will assist in the development of the BIA by providing relevant design information.

The BIA itself will be completed by a Parks Canada Environmental Assessment officer. The consultant will assist in the development of the BIA by providing relevant information. Mitigations resulting from the BIA will need to be incorporated into the design in a timely, efficient, and cost-effective manner.

## **7 – Cultural Resource Management and Archaeological Impacts**

In addition to the conservation, protection, and presentation of the Prairie Grasslands, Grasslands National Park also preserves extensive and significant evidence of 10,000 years of human history on the Northern Plains.

### Dixon Bridge

An Archaeological Impact Assessment (AIA) was undertaken this past year to determine the potential impact of the replacement of the Dixon Bridge and associated roadway works. A significant and varied amount of artifacts were found in the area, but additional assessment is required for some areas.

### Walker Bridge

An AIA was undertaken this past year to determine the potential impact of the replacement of the Walker Bridge and associated roadway works in this area. Some artifacts were found in the area, but additional assessment is required for some areas.

PCA will be entering into a contract with an Archaeological Consultant to provide additional assessment for both bridges. The AIA reports will provide mitigations that will need to be incorporated into the design documents.

## **8 – Location of Work and Travel**

Design - The majority of the design work can be completed primarily from the Consultant's office. It is expected that there will be at least one site visit, but additional visits may be required to ensure the consultant has all of the information that will be required. It is expected that the



## STATEMENT OF WORK

July 2022

majority of meetings, such as kick-off meetings, progress update meetings, and any other meetings as required can be done via conference calls.

Construction – Resident Inspection & supervision services are required during construction. Additional site visits and inspections may be required by other members of the consultant team.

### 9 – Schedule

Options Analysis (including all investigations and reports)	- <b>October 31, 2022.</b>
Final IFT Package reviewed and sealed	- <b>February 28, 2023.</b>
Construction Substantial Completion	- <b>March 31, 2024.</b>

Consultant to provide schedule upon award of contract. Continuously monitor and update schedule as required throughout design and construction.

### 10 – Design Requirements & Considerations

The following should be considered when designing the bridge:

- Bridges needs to be designed to support the loads of heavy equipment and vehicles such as: gravel trucks, cattle liners, graders, tractors, and semis. The heaviest expected load is a 3- axle gravel truck.
- Width of the Dixon Bridge should be sufficient to allow 2 vehicles to pass each other safely.
- Width of the Walker bridge can be single lane with alternating traffic
- Design to target 1:200 year flood, but we are looking for advice from the consultant as to what is an appropriate level for these 2 bridges and related roads to and from those bridges.
- Ice in the river has had impacts on the existing bridges
- Consider opportunities for conservation gains for these bridges into the design. PCA can provide guidance on opportunities.
- Access must be maintained throughout construction by adding a temporary bridge and access to that temporary bridge. It is assumed that work on the bridges will happen consecutively, but work happens concurrently, then both bridges will need separate temporary bridges.
- The Frenchman River is regularly used by visitors in kayaks and canoes. While visitor use will not be allowed during construction, usage by visitors needs to be considered in the design.

### 11 – Green Building / Sustainable Design

Parks Canada is committed to reducing our environmental impacts and has developed a Departmental Sustainable Development Strategy as well as a Greening Government Strategy. the project intent is to achieve the most sustainable structure possible within the defined budget.



## STATEMENT OF WORK

July 2022

The strategies for this project, at a minimum, will include:

- a. Diverting Waste from Landfills.
  - i. A minimum of 75% of non-hazardous waste will be diverted from the landfill. Design considerations should include ways to reduce waste through strategies such as efficient use of construction materials, and packaging of materials that is reusable, recyclable, and/or minimal.
- b. Low Carbon Building Materials:
  - i. Reduction of Embodied Carbon in materials, especially concrete. Require Environmental Product Declarations for available products
  - ii. Reduction of Carbon emissions related to this project by considering extraction and manufacturing processes as well as transportation requirements for each material used.
- c. Reduce Water Usage during construction
- d. Minimize Ecosystem Impacts
- e. Choosing sustainable materials where possible.
  - i. Consider materials that are: renewable, sustainably harvested, locally available, and/or durable, as well as materials that contain recycled material and/or are recyclable.
  - ii. Choose Materials that will provide durability and longevity of the bridges to increase their useful life. This in turn reduces the life cycle Carbon and environmental impacts

Tracking will be required to show proof that these strategies were incorporated, followed, and achieved.

### 12 – Additional Information

The following information is included with this Statement of Work.

- Photos of Existing Bridge
- Geotechnical Investigation Report at Dixon Bridge (2015)
- General maps showing approximate locations of bridges

The following information is available and will be provided to the successful consultant.

- Inspection Reports
- Environmental and archaeological documentation including impact assessment reports
- Other information that may be available that will assist with the Design work