

Public Works and Government Services Canada

Issued for TENDER

Construction Specifications for

Salt River Bridge Repair

Wood Buffalo National Park of Canada

PWGSC Project Number: R.076217.001

February 2016

TABLE OF CONTENTS	PAGES
DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS	
Section 00 01 07 - Seals Page	1
Section 00 01 10 - Table of Contents	1
Section 00 01 11 - List of Drawings	1
Section 00 11 00 - Summary of Work	3
DIVISION 01 - GENERAL REQUIREMENTS	
Section 01 14 00 - Work Restrictions	5
Section 01 25 20 - Mobilization & Demobilization	1
Section 01 32 18 - Construction Progress Schedule	3
Section 01 33 00 - Submittal Procedures	5
Section 01 35 43 - Environmental Procedures	9
Section 01 45 00 - Quality Control	5
Section 01 74 11 - Cleaning	2
Section 01 77 00 - Closeout Procedures	2
Section 01 78 00 - Closeout Submittals	3
Section 013529.06 - Health and Safety Requirements	4
DIVISION 02 - EXISTING CONDITIONS	
Section 02 41 16 - Structure Demolition	4
DIVISION 03 - CONCRETE	
Section 03 10 00 - Concrete Forming and Accessories	2
Section 03 20 00 - Concrete Reinforcing	3
Section 03 30 00 - Cast-In-Place Concrete	5
DIVISION 05 - METALS	
Section 05 50 00 - Metal Fabrications	3
DIVISION 31 - EARTHWORK	
Section 31 05 16 - Aggregate Materials	4
Section 31 22 13 - Rough Grading	2
Section 31 37 00 - Rip Rap	2
Section 312333.01 - Excavating, Trenching and Backfilling	7
Section 313219.01 - Geotextiles	3
APPENDIX A – Environmental Impact Assessment	

END OF DOCUMENT

DRAWINGS BOUND SEPARATELY

Drawing No.	Title
--------------------	--------------

GENERAL

G-01	Cover Page and Drawing List
------	-----------------------------

CIVIL

C-01	Civil – Civil Works
------	---------------------

STRUCTURAL

S-01	Structural – General Arrangement and Notes
------	--

S-02	Structural – Demolition and Removals
------	--------------------------------------

S-03	Structural – New Construction
------	-------------------------------

STANDARD REFERENCE DRAWINGS

S-1653-00	PL-1 Low Height Thrie Beam Bridgerail
-----------	---------------------------------------

RDG B1.5	W Beam Strong Post TL-3 Fleet 350 Energy Absorbing Terminal
----------	---

END OF DOCUMENT

Part 1 General

1.1 PROJECT LOCATION

- .1 The project is located in the Province of Alberta, approximately 24 km south of Fort Smith, NWT, on Pine Lake Road crossing the Salt River en route from Fort Smith to Wood Buffalo National Park.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- .1 Isolation of concrete abutments on existing Salt River Bridge from river water and removal of unsound concrete and construction of new concrete jacketing at each abutment. The work also includes regrading and armouring of river banks, repair of cracked concrete on the bridge curbs, replacement of bridgerails, and installation of new guardrails and hazard markers.
- .2 Without limiting the scope of work, major scope items include: water isolation, concrete removal, installation of formwork, placement of galvanized reinforcement, batching and placement of concrete, regrading of river banks, armouring of river banks, gravity injection of cracks in concrete bridge curbs, replacement of bridgerails, regrading of roadway approaches, and installation of guardrails.

1.3 CONTRACT METHOD

- .1 Construct Work under Lump Sum Price.

1.4 SPECIFICATIONS

- .1 All work and materials shall be in accordance with the National Master Specification sections provided herein.

1.5 SCHEDULE

- .1 A pre-construction meeting is tentatively scheduled for two weeks following the award of tender at the Salt River Bridge.
- .2 Contractor shall be mobilized and prepared to commence work no later than 30 days after award.
- .3 The fabrication of major bridge elements such as galvanized reinforcement, bridgerails, and guardrails shall commence immediately upon award.
- .4 Contract site cleanup and de-mobilization shall be completed by September 28, 2016.

1.6 WORK SEQUENCE

- .1 Contractor may work 7 days per week during daylight hours.
- .2 Schedule work progress to allow the Departmental Representative unrestricted access to inspect all phases of the Work.
- .3 Undertake no instream work from April 15, 2016 to July 15, 2016.
- .4 Substantial Completion shall be achieved by September 9, 2016.
- .5 Final Completion shall be achieved by September 28, 2016.

1.7 CONTRACTOR USE OF PREMISES

- .1 Limit use of premises for Work, for storage, and for access, to limits of construction shown on drawings.
- .2 Coordinate use of premises under direction of the Departmental Representative.
- .3 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.
- .4 Leave the site in a clean and safe manner at the end of each work day.
- .5 Limit the use of the laydown area to the area identified on the site plan.

1.8 CONSTRUCTION SIGNAGE

- .1 No signs or advertisements, other than warning signs, are permitted on site.
- .2 Signs and notices for safety and instruction shall be in both official languages.
- .3 Signs shall be diamond grade and shall conform to CAN3-Z321.
- .4 The Contractor shall maintain approved signs and notices in good condition for duration of project, and dispose of off-site on completion of project or earlier if directed by Departmental Representative.
- .5 All temporary traffic control signs that are used for longer than one day shall be mounted on wood posts.
- .6 If required, additional signage shall be coordinated with other Contractors.

1.9 SETTING OUT OF WORK

- .1 The Departmental Representative will provide bench mark information, including coordinates and elevations.
- .2 The Contractor shall:
 - .1 Set additional control points as necessary.
 - .2 Set all work stakes necessary to complete work.
 - .3 Allow sufficient time for Departmental Representative to take measurements for payment.
 - .4 Do no damage to geodetic benchmarks or control monuments unless authorized by the Departmental Representative.
 - .5 Receive no separate payment for setting out work, unless Departmental Representative adjusts alignment in field and additional survey costs are incurred. Payment for additional survey required due to changes by Departmental Representative to be paid for as part of Prime Cost Sum.
 - .6 Do all construction survey work required and work shall be incidental to related work items. No separate payment will be made for this work.

1.10 DOCUMENTS REQUIRED

- .1 Maintain at job site, one copy of each document, as follows:
 - .1 Contract Documents
 - .2 Specifications
 - .3 Addenda
 - .4 Reviewed Shop Drawings
 - .5 Change Orders
 - .6 Environmental Assessment
 - .7 Environmental Protection Plan
 - .8 Erosion and Sediment Control Plan
 - .9 Copy of Approved Work Schedule
 - .10 Health and Safety Plan and other related documents.

Part 2 Products

2.1 NOT USED

- .1 Not Used

Part 3 Execution

3.1 NOT USED

- .1 Not Used

END OF SECTION

Part 1 General

1.1 ACCESS AND EGRESS

- .1 The parking area, to be used by the Contractor as the laydown area, is accessible from Pine Lake Road.

1.2 USE OF THE SITE AND FACILITIES

- .1 The Work Site as specified by Departmental Representative shall only be used for the purposes of the Work. The Work Site will be made available by Departmental Representative to the Contractor for its non-exclusive use for the duration of the Work, unless otherwise provided in the Contract Documents.
- .2 Contractor shall maintain adequate drainage at the Worksite.
- .3 A office-tool trailer may be set up at the laydown area of the site.
- .4 The Contractor shall keep the Work Site clean and free from accumulation of waste materials and rubbish regardless of source. Snow shall be removed by the Contractor as necessary and at no additional cost.
- .5 The Contractor shall provide sanitary facilities for work force in accordance with governing regulations and the Environmental Procedures for this project. The Contractor shall post notices and take such precautions as required by local health authorities and keep area and premises in sanitary condition. There are washrooms available at the day use area and their use is as per the discretion of the Departmental Representative.
- .6 Any damage to the Work Site caused by the Contractor shall be repaired by the Contractor at his expense.
- .7 Nearest accommodation is in Fort Smith, NWT
- .8 Parking Area on southwest corner of bridge is to be used for Contractor Laydown and workers parking.
- .9 There is not consistent cell phone coverage in the area. Typically there is coverage available from the Day Use Area south of the project site, or the contractor may use a cell booster or satellite phone. The contractor will be supplied with a radio that can be used for emergency contact with Parks Canada Agency staff.
- .10 There is no water or power available at the work site.
- .11 If undertaking work prior to sunrise or following sunset, Contractor shall provide adequate lighting to safely perform work.

.12 In case of emergency, contact

Within Alberta

Fire Department	911
Ambulance	911
Health Centre	(780) 697-3650
RCMP	(780) 697-3665
Spill Line: Alberta Environment	1-800-222-6514

Within Northwest Territories

Fire Department	(867) 872-2222
Ambulance	(867) 872-3111
Health Centre	(867) 872-6200
RCMP	(867) 872 1111
Spill Line: Alberta Environment	(867) 920-8130

1.3 WORK CONDUCTED OVER OR ADJACENT TO WATERWAYS

- .1 All components of the Work shall be conducted in accordance with Section 01 35 43 - Environmental Procedures.
- .2 All components of the Work shall be conducted without equipment entering into wetlands, water bodies, streams or rivers.
- .3 All waste materials from the Work shall be contained and collected in a manner to prevent any contact with the Salt River. All collected waste materials shall be disposed of in accordance with Section 01 35 43 - Environmental Procedures and the Environmental Protection Plan prepared for the project. One "Bear Proof" garbage container for domestic use will be provided by Departmental Representative. Containers shall be used for domestic use only, and not construction waste.

1.4 ACCESS TO ADJACENT PROPERTIES

- .1 Construction operations shall be completed on time to minimize inconvenience to the public.

1.5 PROTECTION OF PERSONS AND PROPERTY

- .1 The Contractor shall comply with all applicable safety regulations of the Workers' Compensation Board of Alberta (WCB) including, but not limited to, WCB's Industrial Health and Safety Regulations, Industrial First Aid Regulations, and Workplace Hazardous Materials Information System Regulations.
- .2 The Contractor shall take all necessary precautions and measures to prevent injury or damage to persons and property on or near the Work Site.

- .3 The Contractor shall promptly take such measures as are required to repair, replace or compensate for any loss or damage caused by the Contractor to any property or, if Departmental Representative so directs, shall promptly reimburse to Departmental Representative the costs resulting from such loss or damage.

1.6 USE OF PUBLIC AREAS

- .1 The Contractor shall ensure that its vehicles and equipment do not cause nuisance in public areas. All vehicles and equipment leaving the Work Site and entering public roadways shall be cleaned of mud and dirt clinging to the body and wheels of the vehicle. All vehicles arriving at or leaving the Work Site and transporting materials shall be loaded in a manner which will prevent dropping of materials or debris on the roadways, and where contents may otherwise be blown off during transit such loads shall be covered by tarpaulins or other suitable covers. Spills of materials in public areas shall be removed or cleaned immediately by the Contractor at no cost to Departmental Representative. All activities shall be in accordance with Section 01 35 43 - Environmental Procedures and the Environmental Protection Plan prepared for the project.

1.7 SUPERVISORY PERSONNEL

- .1 Within five Days after award notification, the Contractor shall submit to Departmental Representative confirmation of the names of the supervisory personnel and other key staff designated for assignment on the Contract. The following personnel shall be included in the list:
 - .1 Project Superintendent
 - .2 Safety Representative.
- .2 The above personnel shall perform the following duties:
 - .1 The Project Superintendent shall be employed full time and shall be present on the Work Site each and every workday that Work is being performed, from the commencement to Substantial Completion of the Work;
 - .2 The Project Superintendent shall nominate a Deputy Project Superintendent who shall have the authority of the Project Superintendent during the latter's absence;
 - .3 The Safety Representative shall possess safety experience in general construction. Duties shall encompass all matters of safety activities from commencement to Substantial Completion of the Work.

1.8 MEETINGS

- .1 The Work includes attending meetings between the Contractor and Departmental Representative. The meetings will be called and chaired by Departmental Representative as required. The Contractor shall be represented at such meetings to the satisfaction of Departmental Representative.
- .2 Departmental Representative will schedule an initial meeting to be held on site after award notification. Senior representatives of Departmental Representative, Contractor, major Subcontractors, field inspectors and supervisors are to be in attendance.

- .3 The Contractor will be requested to assemble his site staff and sub-contractors for an environmental briefing to be conducted by Departmental Representative. The briefing shall be approximately 1 hour in duration and held at initial project start-up. The Contractor shall ensure that all his current project staff is in attendance. Departmental Representative and the Contractor will co-operate in setting the most appropriate time and place for the briefing. Subsequent to the initial environmental briefing, additional environmental briefings will be arranged for new staff and sub-contractors showing up on the project.
- .4 Cost of attending the above meetings shall be considered incidental to the Contract and no additional payment will be made.
- .5 Complete records of meeting minutes to be taken and distributed by the Departmental Representative.

1.9 WASTE DISPOSAL

- .1 All surplus, unsuitable and waste materials shall be removed from the job site to approved sites outside.
- .2 Deposit of any construction debris into any waterway is strictly forbidden.
- .3 Cost for Waste Disposal described above shall be considered incidental to the Bridge Demolition Unit Price and no additional payment will be made.
- .4 Waste Disposal shall be completed in accordance with Section 01 35 43 - Environmental Procedures.

1.10 ENVIRONMENTAL REQUIREMENT

- .1 According to Alberta Environment and Parks "Code of Practice for Watercourse Crossing", Salt River is a mapped Class C watercourse at the bridge crossing location, the restricted activity period for these sites is April 16 to July 15. The Contractor shall meet the environmental requirements in accordance with the Environmental Protection Plan prepared for the project and Section 01 35 43 – Environmental Procedure.
- .2 Tree clearing shall occur outside migratory bird nesting window of April 16 to August 31 and in accordance with Migratory Birds Conservation Act.

1.11 WORK STOPPAGE

- .1 Give precedence to safety and health of public and site personnel and protection of the environment over cost and schedule considerations for Work.

Part 2 Products

2.1 NOT USED

.1 Not Used

Part 3 Execution

3.1 NOT USED

.1 Not Used

END OF SECTION

Part 1 General

1.1 Description

- .1 Mobilization and Demobilization consists of preparatory work and operations including but not limited to, those necessary for the movement of personnel, equipment, offices, supplies and incidentals to and from the project site.
- .2 Any protective measures or movement of Contractor trailers necessitated by animal interactions and required by Departmental Representative will be paid by the Departmental Representative, and are not to be anticipated in the Lump Sum Contract Price for Mobilization and Demobilization.

1.2 Measurement And Payment

- .1 Measurement and Payment for this Work shall be included in the lump sum bid price. This payment shall be the full compensation necessary to acceptably complete the Work as shown on the drawings and described in this section.

Part 2 Products

2.1 Not Used

- .1 Not Used

Part 3 Execution

3.1 Not Used

- .1 Not Used

END OF SECTION

Part 1 General

1.1 MEASUREMENT AND PAYMENT

- .1 Measurement and Payment for this Work shall be included in the lump sum bid price. This payment shall be the full compensation necessary to acceptably complete the Work as shown on the drawings and described in this section.

1.2 PRECEDENCE

- .1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Specification.

1.3 DEFINITIONS

- .1 Activity: An element of Work performed during course of Project. An activity normally has an expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.
- .2 Bar Chart (Gantt chart): A graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.
- .3 Baseline: Original approved plan for Project, plus or minus approved scope changes.
- .4 Construction Work Week: Monday to Sunday, inclusive, will provide seven day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.
- .5 Duration: Number of work periods (not including holidays or other nonworking periods required to complete an activity or other Project element. Usually expressed as workdays or work weeks.
- .6 Master Plan: A summary-level schedule that identifies major activities and key milestones.
- .7 Milestone: A significant event in Project, usually completion of a major deliverable.
- .8 Project Schedule: The planned dates for performing activities and the planned dates for meeting milestones. A dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.
- .9 Project Planning, Monitoring and Control System: Overall system operated by Departmental Representative to enable monitoring of project work in relation to established milestones.

1.4 REQUIREMENTS

- .1 The Contractor shall develop and submit a Project Schedule that is practical and remains within specified Contract duration.
- .2 The contractor shall include all Contract Work identified in the Project Schedule.
- .3 The Contractor shall plan to complete Work in accordance with prescribed Project Schedule.
- .4 Limit activity durations to maximum of approximately 14 working days, to allow for progress reporting.
- .5 The Contractors schedule shall indicate the Award of Contract as the beginning date, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.
- .6 The Contractors schedule shall include the requirements of Section 01 14 00 - Work Restrictions and Section 01 35 43 - Environmental Procedures.

1.5 SUBMITTALS

- .1 The Contractor shall submit to Departmental Representative within 10 working days of Award of Contract, Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.

1.6 PROJECT MILESTONES

- .1 Project milestones form interim targets for Project Schedule. Completion of each Stage of Construction:
 - .1 The Contractor shall be mobilized and prepared to commence work no later than 30 days after the award of Contract.
 - .2 Final Completion shall be achieved by September 28, 2016.

1.7 MASTER PLAN

- .1 The Contractor shall structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).
- .2 Departmental Representative will review and return revised schedules within 5 working days.
- .3 The Contractor will revise impractical schedule and resubmit within 5 working days.
- .4 Accepted revised schedule will become Master Plan and be used as baseline for updates.
- .5 Master Plan shall include any lane restrictions or reductions for the duration of the Work.

1.8 PROJECT SCHEDULE

- .1 Develop detailed Project Schedule derived from Master Plan.

- .2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
 - .1 Award.
 - .2 Permits.
- .3 Submittals:
 - .1 Project Schedule.
 - .2 List of subcontractors, suppliers and Departmental Representative.
 - .3 Contractor Chain of Command including Sub-Contractors and Departmental Representatives.
 - .4 Prime Contractor / Co-ordination with other Contractor's Plans.
 - .5 Work Plan.
 - .6 Environmental Protection Plan.
 - .7 Traffic Management Plan.
 - .8 Site access / Detour Plan.
 - .9 Emergency Response Protocol.
 - .10 Site Specific Health and Safety Plan, incl. MSDS sheets.
 - .11 On site Contingency and Emergency Response Plan.
 - .12 Survey Plan.
 - .13 Quality Control Plan.
 - .14 Shop Drawings.
 - .15 Concrete mix Designs.
 - .16 Mobilization.
 - .17 Additional Work as and when requested.
 - .18 Interim Inspection.
 - .19 Site Clean-up / De-mobilization.

Part 2 Products

2.1 NOT USED

- .1 Not Used

Part 3 Execution

3.1 NOT USED

- .1 Not Used

END OF SECTION

Part 1 General

1.1 MEASUREMENT PROCEDURES

- .1 Measurement and Payment for this Work shall be included in the lump sum bid price. This payment shall be the full compensation necessary to acceptably complete the Work as shown on the drawings and described in this section.

1.2 ADMINISTRATIVE

- .1 Submit to the Departmental Representative submittals listed for review. Submit with reasonable promptness and in orderly sequence so as to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Do not proceed with Work affected by submittal until review is complete.
- .3 Present shop drawings, product data, samples and mock-ups in SI Metric units.
- .4 Where items or information is not produced in SI Metric units converted values are acceptable.
- .5 The Contractor shall review submittals prior to submission to the Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and shall be considered rejected.
- .6 Notify the Departmental Representative in writing at time of submission, identifying any deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Verify field measurements and affected adjacent Work is consistent.
- .8 Contractor's responsibility for errors and omissions in submission is not relieved by the Departmental Representative review of submittals.
- .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by review.
- .10 Keep one reviewed copy of each submission on site

1.3 SHOP DRAWINGS, PRODUCT DATA AND MIX DESIGNS

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by the Contractor to illustrate details of a portion of Work.
- .2 The term "mix design" means engineered design for proportioning materials in concrete including all supporting test results, materials properties.

- .3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of section under which adjacent items will be supplied and installed. Indicate cross-references to design drawings and specifications.
- .4 Allow 5 business days for the Departmental Representative review of each submission.
- .5 Adjustments made on shop drawings by the Departmental Representative are not intended to change the Contract Price. If adjustments affect the value of Work, state such in writing to the prior to proceeding with the Work.
- .6 Make changes in shop drawings as the Departmental Representative may require, consistent with the Contract Documents. When resubmitting, notify the Departmental Representative in writing of any revisions other than those requested.
- .7 Submit letter(s) of certification for the concrete mix design.
- .8 Accompany submissions with a transmittal letter containing:
 - .1 Date
 - .2 Project title and number
 - .3 Contractor's name and address
 - .4 Identification and quantity of each shop drawing, mix design, product and sample
 - .5 Other pertinent data
- .9 Submissions shall include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subcontractor
 - .2 Supplier
 - .3 Manufacturer
 - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with the Contract Documents.
 - .5 Details of appropriate portions of the Work as applicable:
 - .1 Fabrication
 - .2 Performance characteristics
 - .3 Standards
- .10 After the Departmental Representative's review, distribute copies.
- .11 Submit one (1) electronic copy of the shop drawings or mix design for each requirement requested in the Specification Sections and as requested by the Departmental Representative.

- .12 Submit one (1) electronic copy of the product data sheets or brochures for requirements requested in the Specification Sections and as requested by the Departmental Representative where shop drawings will not be prepared due to standardized manufacture of the product.
- .13 Delete information not applicable to project.
- .14 Supplement standard information to provide details applicable to project.
- .15 If upon review by the Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
- .16 The review of shop drawings and mix designs by the Departmental Representative is for the sole purpose of ascertaining conformance with general concept. This review shall not mean that the Departmental Representative approves detail design inherent in shop drawings, responsibility for which shall remain with the Contractor submitting same, and such review shall not relieve the Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting all requirements of construction and Contract Documents. Without restricting generality of foregoing, the Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of all sub-trades.

1.4 CERTIFICATES AND TRANSCRIPTS

- .1 Immediately after award of Contract, submit Workers' Compensation Board status.
- .2 Submit transcription of insurance immediately after award of Contract.

1.5 REQUIRED CONTRACTOR SUBMITTALS

- .1 Construction Phase Submittals.
- .2 Weekly Progress Reports that outline the detailed Work (Contractor, subcontractors, suppliers, consultants) completed to date as well as the anticipated Work to be performed for the following week on a day-by-day basis. Work to be linked to activities in project schedule and to provide information on materials, equipment and manpower. Also, alternate Work to be identified if Work or a portion of, proposed cannot be done due to weather, equipment breakdown, delays in delivery, etc.
- .3 Quality Control Inspection Reports - The Contractor shall maintain a daily inspection report that itemizes the results of all Quality Control inspections conducted by the Contractor. The reports shall be made available for review by the Departmental Representative upon request. A summary of all Quality Control inspections conducted to date shall be submitted by the Contractor with each request for payment.

- .4 Shop Drawings and Mix Designs - The Contractor shall submit all design drawings, shop drawings and mix designs required to fabricate and / or conduct the work a minimum 30 days prior to fabrication / production.
- .5 Progress Photographs:
 - .1 Formats:
 - .1 Electronic: .jpg files, minimum three (3) mega pixels.
 - .2 Submission requirements: one (1) set of electronic files.
 - .3 Identification: name and number of project, description of photograph and date.
 - .4 Viewpoints: viewpoints determined by Construction Manager or the Departmental Representative.
 - .5 Submission Frequency: prior to commencement of Work and weekly thereafter with progress statement, or as directed by Construction Manager or the Departmental Representative.
 - .6 Submit CD with all electronic pictures as part of closeout package.
- .6 Submit an electronic copy of Contractor's authorized representative's work site health and safety inspection reports to the Departmental Representative.
- .7 Submit copies of reports or directions issued by Federal and Provincial health and safety inspectors.
- .8 Submit copies of incident and accident reports.
- .9 Project Completion Submittals
- .10 Record Drawings -The Contractor shall submit copies of all Contractor's Drawings revised as necessary to record all as-built changes to the Work and the Contractor shall submit a set of Contract Drawings clearly marked to record as-built changes to the Work.
- .11 Quality Control Records - The Contractor shall submit a bound and itemized set of project quality control documentation.
- .12 The Contractor shall not construe the Departmental Representative's authorization of the submittals to imply approval of any particular method or sequence for conducting the Work, or for addressing health and safety concerns. Authorization of the programs shall not relieve the Contractor from the responsibility to conduct the Work in strict accordance with the requirements of Federal or Provincial regulations, this specification, or to adequately protect the health and safety of all workers involved in the project and any members of the public who may be affected by the project. The Contractor shall remain solely responsible for the adequacy and completeness of the programs and work practices, and adherence to them.

Part 2 Products

2.1 NOT USED

.1 Not Used

Part 3 Execution

3.1 NOT USED

.1 Not Used

END OF SECTION

Part 1 General

1.1 MEASUREMENT AND PAYMENT

- .1 Measurement and Payment for this Work shall be included in the lump sum bid price. This payment shall be the full compensation necessary to acceptably complete the Work as shown on the drawings and described in this section.

1.2 REFERENCES

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.
- .2 Health Canada: Workplace Hazardous Materials Information System (WHMIS) and Material Safety Data Sheets (MSDS).
- .3 Province of Alberta: Occupational Health and Safety Act, R.S.A. 2013.

1.3 SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit site-specific Health and Safety Plan: Within seven (7) days after date of Notice to proceed and prior to commencement of Work. Health and Safety Plan must include:
 - .1 Contractor's safety policy.
 - .2 Identification of applicable compliance obligations.
 - .3 Definition of responsibilities for project safety/organization chart for project.
 - .4 General safety rules for project.
 - .5 Job specific safe work procedures.
 - .6 Inspection policy and procedures.
 - .7 Incident reporting and investigation policy and procedures.
 - .8 Occupational Health and Safety meetings.
 - .9 Occupational Health and Safety communications and record keeping procedures.
 - .10 Results of site specific safety hazard assessment.
 - .11 Results of safety and health risk or hazard analysis for site tasks and operation.
 - .12 Submit copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative, weekly.
- .3 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within ten (10) days after receipt of plan. The Contractor will revise the plan as appropriate and resubmit plan to Parks Canada within five (5) days after receipt of comments.
- .4 Departmental Representative's review of the Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.

- .5 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel.
- .6 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

1.4 FILING OF NOTICE

- .1 File Notice of Project with Provincial authorities prior to beginning of Work.
- .2 Provide Departmental Representative with copy of filing.

1.5 SAFETY ASSESSMENT

- .1 Perform site specific safety hazard assessment related to project.

1.6 MEETINGS

- .1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.
- .2 Departmental Representative recognizes that federal Occupational Health and Safety legislation places specific responsibilities upon Departmental Representative as owner of the work place. In order to meet those requirements, Departmental Representative has implemented a contractor safety regime to ensure roles and responsibilities assigned under Part II of the Canada Labour Code and the Canada Occupational Health and Safety Regulations are implemented and observed when involving contractor(s) to undertake work in Departmental Representative work places, including on Departmental Representative property. After contract award and prior to commencement of any work under the contract, the Project Manager will hold a health and safety meeting with the Contractor. At this meeting, the Contractor is required to complete and sign an Attestation to certify the Contractor will comply with the requirements set out in the Attestation and the terms and conditions of the contract.

1.7 REGULATORY REQUIREMENTS

- .1 Do Work in accordance with National Parks Act.

1.8 GENERAL REQUIREMENTS

- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .2 Department Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.9 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.10 COMPLIANCE REQUIREMENTS

- .1 Comply with Occupational Health and Safety Act, General Safety Regulation, Alberta.
- .2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.11 UNFORESEEN HAZARDS

- .1 When unforeseen or peculiar safety-related factor, hazard, or conditions occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction and advise Parks Canada verbally and in writing.

1.12 HEALTH AND SAFETY COORDINATOR

- .1 Employ and assign to Work, competent and authorized representative as Health and Safety Coordinator. Health and Safety Co-ordinator must:
 - .1 Have minimum 2 years site-related working experience specific to activities associated with heavy civil construction.
 - .2 Have working knowledge of occupational safety and health regulations.
 - .3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
 - .4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
 - .5 Be on site during execution of Work and report directly to and be under direction of site supervisor.

1.13 POSTING OF DOCUMENTS

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with Parks Canada.

1.14 CORRECTION OF NON-COMPLIANCE

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction.
- .2 Provide Parks Canada with written report of action taken to correct non-compliance of health and safety issues identified.

- .3 Parks Canada may stop Work if non-compliance of health and safety regulations is not corrected.

1.15 WORK STOPPAGE

- .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

Part 2 Products

2.1 NOT USED

- .1 Not Used

Part 3 Execution

3.1 NOT USED

- .1 Not Used

END OF SECTION

Part 1 General

1.1 MEASUREMENT AND PAYMENT

- .1 Measurement and Payment for this Work shall be included in the lump sum bid price. This payment shall be the full compensation necessary to acceptably complete the Work as shown on the drawings and described in this section.

1.2 DEFINITIONS

- .1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade environment aesthetically, culturally and/or historically.
- .2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.3 SUBMITTALS

- .1 Prior to commencement of construction the Contractor must provide written confirmation that they have read and understood and will comply with environmental procedures as outlined in this section.
- .2 The Contractor shall submit to the Departmental Representative in accordance with Section 01 33 00 Submittal Procedures.

1.4 ENVIRONMENTAL ASSESSMENT

- .1 Prior to commencement of Work, the Contractor must provide written confirmation that they have read and understood the environmental recommendations outlined in the Environmental Impact Assessment titled **Salt River Bridge Repairs, Wood Buffalo National Park, WB15-1002**
- .2 Potential impacts of Construction have been identified in the Environmental Assessment, as well as mitigation measures.
- .3 The Contractor shall ensure that all work is performed in accordance with the Environmental Impact Assessment titled **Salt River Bridge Repairs, Wood Buffalo National Park, WB15-1002**

1.5 ENVIRONMENTAL PROTECTION PLAN

- .1 The Contractor must prepare a project and site-specific Environmental Protection Plan (EPP). The EPP must outline the applicable sections of the federal and provincial legalisation and the measures that will be implemented to ensure compliance with those regulations.

- .2 The EPP must outline the proposed construction schedule, construction materials and methods to be used during construction activities. The EPP must identify the environmental sensitivities associated with the project location and proposed activities, including those addressed in the EA. The EPP must indicate the mitigation measures that will be implemented to prevent or minimize the potential impacts to the environment and will include a plan for contingency measures to be implemented in the event of mitigation measure failure.
- .3 A site-specific Erosion and Sediment Control (ESC) plan must be included as part of the Contractor's EPP.
- .4 The EPP will be reviewed by Departmental Representative for approval prior to commencing construction.
- .5 The Contractor will ensure effective implementation of the EPP.

1.6 NATIONAL PARK REGULATIONS

- .1 The Contractor shall ensure that all work is performed in accordance with the ordinances, laws, rules and regulations set out in the Canada National Parks Act and Regulations.

1.7 MONITORING

- .1 The Departmental Representative will have an Environmental Surveillance Officer (ESO) attending the site to monitor the construction activity for conformance with the Environmental Procedures. The ESO will be allowed access to the construction site for the purposes of ensuring activities are completed in compliance with the applicable legislation and regulations, and the recommendations of the EA. The ESO or Departmental Representative will present the "environmental briefing". The ESO's main duties are to monitor progress of the construction on an on-going basis to ensure compliance with the environmental protection measures, and to provide guidance through the Departmental Representative, in event of unanticipated environmental problems. Although the ESO has authority to enforce National Parks Act violation, direction to the Contractor will be the duty of the Departmental Representative.
- .2 Notification
 - .1 Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's EPP. Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.
 - .2 Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.
 - .3 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

1.8 CONSTRUCTION SITE ACCESS AND PARKING

- .1 All private vehicles must be parked on Laydown Areas pre-approved by the Departmental Representative. Generally, personal vehicles shall be parked at least 10 metres distance from any watercourse.
- .2 The Contractor shall ensure that the environment either within and beyond the work limits is not negatively impacted or damaged by workers' vehicles or construction machinery. The Contractor shall instruct all workers of the project limits so that the "footprint" of the project is kept within defined boundaries.

1.9 PROTECTION OF WORK LIMITS

- .1 The Contractor is to prepare an Environmental Protection Plan (EPP) which details how the work limits shall be marked and what procedures will be employed to ensure trespass outside these limits does not occur, to the satisfaction of the Departmental Representative.
- .2 The Contractor shall prepare a construction site layout plan to be reviewed and approved by the Departmental Representative. The approved plan must indicate project site boundaries, the limits of clearing and excavation, in addition to equipment and material storage and vehicle parking locations. The plan must be reviewed by all crew members during the project Pre-Construction meeting and upon arrival to the project construction site.

1.10 EROSION AND SEDIMENT CONTROL

- .1 Erosion control measures that prevent sediment from entering any waterway, water body or wetland in the vicinity of the construction site are a critical element of the project and shall be implemented by the Contractor.
- .2 Erosion control measures that prevent the loss of salvaged topsoil are critical to the preservation of soils, native vegetation species and natural seed banks important for site reclamation.
- .3 Erosion and sediment control measures must be constructed and functional prior to initiating construction activities.
- .4 All ESC measures must be inspected daily prior to the start of construction activities, and immediately following periods of heavy precipitation or storm events.
- .5 All ESC inspections shall be documented and any deficiencies or damaged ESC measures shall be repaired, amended or altered immediately. If the design of the ESC measures is not functioning effectively they are to be altered or alternative measures implemented. The Departmental Representative and ESO will monitor erosion control performance and must approve all amendments and alterations.
- .6 Temporary ESC measures shall be implemented prior to the start of construction activities and shall remain in place until permanent ESC measures can be implemented, disturbed areas are reclaimed and stabilized, and or until vegetation growth has established to the satisfaction of the Departmental Representative.

- .7 The site will be secured against erosion during any period of construction inactivity or shutdown.

1.11 POLLUTION CONTROL

- .1 The Contractor shall prevent any deleterious and objectionable materials from entering streams, rivers, wetlands, water bodies or watercourses that would result in damage to aquatic and riparian habitat. Debris containment measures must be implemented during bridge removal and construction activities to prevent the release or deposition of waste material or debris into Salt River.
- .2 The containment, storage, security, handling, use, unique spill response requirements and disposal of empty containers, surplus product or waste generated in the use of any hazardous or toxic products shall be in accordance with all applicable federal and provincial legislation. Hazardous products shall be stored no closer than 100 metres from watercourses banks and slope breaks.
- .3 The Contractor shall provide spill kits at re-fuelling, lubrication, and repair locations that will be capable of dealing with 110% of the largest potential spill and shall be maintained in good working order on the construction site.
- .1 The ESO and Departmental Representative prior to project start-up must approve these spill kits.
- .2 The Contractor and site staff shall be informed of the location of the spill response kit(s) and be trained in its use.
- .4 Spill kits must be present in all equipment and machinery used on site.
- .5 Timely and effective actions shall be taken to stop, contain and clean-up spills as long as the site is safe to enter. Parks Dispatch will be contacted at (780) 852-3100 immediately of any spill. The Departmental Representative shall be notified following reporting to Parks Dispatch.
- .6 In the event of a major spill, all work shall be stopped and all personnel devoted to spill containment and clean-up.
- .7 The costs involved in a spill incident (the control, clean up, disposal of contaminants and site remediation to pre-spill conditions), shall be the responsibility of the Contractor. The site will be inspected to ensure completion to the expected standard and to the satisfaction of the Departmental Representative and ESO.

1.12 EQUIPMENT MAINTENANCE, FUELLING AND OPERATION

- .1 The Contractor shall ensure that all soil, seeds, and any debris attached to construction equipment to be used on the project site shall be removed (e.g. power washing) outside the Wood Buffalo National Park before delivery to the work site. The Departmental Representative and ESO will have the right to refuse equipment or vehicle entry to the Park and project site if equipment and vehicles are not clean and free of dirt and debris.
- .2 All equipment or vehicles rejected by the Departmental Representative due to presence of dirt, soil weeds or grease or fluid leaks will be removed from the Park immediately. All costs incurred to clean or fix leaks of equipment and vehicles will be borne by the Contractor.

- .3 Equipment fuelling sites will be identified by the Contractor and approved by the Departmental Representative and the ESO. Except for chain saws, any fuelling closer than 100 metres from any streams, wetlands, water bodies, waterways and slope breaks shall require the authorization and oversight of the Departmental Representative.
- .4 Mobile fuel containers (e.g. slip tanks, small fuel carboys) shall remain in the service vehicle at all times. Protection and containment of approved fuel storage site is addressed in #2 and #3 of Pollution Control above.
- .5 The Contractor is to ensure that unnecessary idling of vehicles is avoided.
- .6 Oil changes, lubricant changes, greasing and machinery repairs shall be performed at locations approved by the Departmental Representative. Waste lubrication products (e.g. oil filters, used containers, used oil, etc.) shall be secured in spill-proof containers and properly recycled or disposed of at an approved facility. No waste petroleum, lubricant products or related materials are to be discarded, buried or disposed of in borrow pits, turnouts, picnic areas viewpoints, etc. anywhere within Wood Buffalo National Park.
- .7 The Contractor shall ensure that all equipment is inspected daily for fluid/fuel leaks and maintained in good working order. Equipment and Machinery inspections must be documented each day and a record of the inspection kept with each piece of equipment.
- .8 Fuel containers and lubricant product shall be stored only in secure locations specified by the Departmental Representative. Fuel tanks or other potentially deleterious substance containers shall be secured to ensure they are tamper proof, bear proof, and cannot be drained by vandals when left overnight in Wood Buffalo National Park. Alternatively, the Contractor may hire a security person employed to prevent vandalism.

1.13 OPERATION OF EQUIPMENT

- .1 Equipment movements shall be restricted to the "footprint" of the construction area. The work limits shall be identified by stake and ribbon or other methods approved by the Departmental Representative. Unless authorized by the Departmental Representative activities beyond the work limits are not permitted. No machinery will enter, work in or cross over streams, rivers, wetlands, water bodies or watercourses, nor damage aquatic and riparian habitat or trees and plant communities outside of the permitted project limits.
- .2 The Contractor shall instruct workers to prevent pushing, placement, raveling, storage or stockpiling of any materials (e.g. slash, rock, fill or topsoil) in the trees bordering the approved laydown areas or into watercourses or water bodies.
- .3 When, in the opinion the Departmental Representative, negligence on the part of the Contractor results in damage or destruction of vegetation, or other environmental or aesthetic features beyond the designated work area, the Contractor shall be responsible, at his or her expense, for complete restoration including the replacement of trees, shrubs, topsoil, grass, etc. to the satisfaction of the Departmental Representative and ESO.
- .4 If weeds are identified on site the Departmental Representative will flag the infested areas and restrict vehicle, equipment and construction crew access through the area.

- .5 Construction materials (gravel and aggregate fill) source pits will be inspected by a Parks Canada Environmental Officer before being approved and or transported to the project. The Contractor needs to give 10 calendar days' notice to inspect the source pits.
- .6 Additional project boundary restrictions may be required if sensitive wildlife species, their nests or habitats are identified in the project footprint during construction activities. The Departmental Representative will identify and mark the revised project limits if required.

1.14 FIRE PREVENTION AND CONTROL

- .1 A fire extinguisher shall be carried and available for use on each machine and at locations within office trailers and equipment storage in the event of fire. Basic firefighting equipment will be stored on-site in laydown and material storage areas and in pick-up trucks. Basic equipment includes 2 shovels, 2 Pulaski's, and 20 litre backpack pumps.
- .2 Construction equipment shall be operated in a manner and with all original manufacturers' safety devices to prevent ignition of flammable materials in the area.
- .3 Care shall be taken while smoking on the construction site to ensure that the accidental ignition of any flammable material is prevented. Designated smoking locations will be established and smoking will be restricted to these locations or inside vehicle cabs. Designated smoking areas will be equipped with fire extinguishers.
- .4 In case of fire, Parks Dispatch will be contacted at (780) 852-3100 shall be contacted immediately. The Contractor or worker shall take immediate action to extinguish the fire provided it is safe to do so.
- .5 Fires or burning of waste materials is not permitted.

1.15 WILDLIFE

- .1 During the Pre-Construction meeting all personnel shall be instructed by the Departmental Representative or ESO on procedures to follow in the event of wildlife appearance near or within the work site and any other wildlife concerns.
- .2 No pets are allowed on site or in any vehicles or laydown areas.
- .3 All site workers will observe posted speed limits and avoid or terminate activities on site that attract or disturb wildlife. Workers will vacate the area and stay away from the immediate location if bears or bison display aggressive behaviour or persistent intrusion and shall notify Dispatch immediately. Extra care to control materials that might attract wildlife (e.g. lunches and food scraps) must be exercised at all times. All waste material will be stored in sealed, bear-proof containers and not in the back of pick-up trucks
- .4 The Contractor will ensure that the work site is properly secured during non-work hours with excavations fenced and covered as required to prevent injury to wildlife.
- .5 Parks Dispatch will be contacted at (780) 852-3100 immediately about dens, litters, nests, carcasses (road kills), bear activity or encounters on or around the site. Other wildlife-related encounters are to be reported within 24 hours. Notify the Departmental Representative following reporting to Parks Dispatch.

1.16 VEGETATION

- .1 During the Pre-Construction meeting all personnel shall be instructed by the Departmental Representative or ESO on procedures to follow for the management and or removal of the existing vegetation. The project limits and vegetation to be cleared or removed will be clearly marked prior to construction.
- .2 Vegetation will be cleared and or felled away from watercourses, water bodies and wetlands.
- .3 Riparian vegetation must be preserved. Riparian vegetation must be pruned or topped to retain root system and maintain bank stability if clearing is required to complete construction activities.
- .4 If required, topsoil or sod removed from riparian areas will be salvaged and stockpiled separately and be used later during reclamation.
- .5 Disturbed areas must be reclaimed immediately following construction activities. All site workers will observe posted speed limits and avoid or terminate activities. The approved seed mix (Part 2, Section 2.1) will be used on-site to reclaim all disturbed areas.

1.17 RELICS OR ANTIQUITIES

- .1 Artifacts, relics, antiquities, and items of historical interest such as cornerstones, commemorative plaques, inscribed tablets, and similar objects found on the work site shall be reported to the ESO or the Departmental Representative immediately. The Contractor and workers shall wait for instruction before proceeding with their work.
- .2 All historical or archaeological objects found in Wood Buffalo National Park are protected under the National Parks Act and Regulations and are the property of Parks Canada. The Contractor and workers shall protect any articles found and request direction for the ESO or the Departmental Representative.
- .3 Contractor shall notify Departmental Representative a minimum of 2 weeks prior to commencing dewatering operations for each side of the river to arrange survey of the dewatered areas for archaeological features.
- .4 If artifacts or features are encountered on the project site, construction activity in that immediate location is to be stopped immediately and the Departmental Representative and Park Canada's Terrestrial Archaeology Section are to be notified.

1.18 WASTE MATERIALS STORAGE AND REMOVAL

- .1 The Contractor and workers shall dispose of hazardous wastes in conformance with the Environmental Contaminants Act and applicable provincial regulations while observing the Code of Good Practice for Management of Hazardous and Toxic Wastes at Federal Establishments.
- .2 All wastes originating from construction, trade, hazardous and domestic sources, shall not be mixed, but will be kept separate.
- .3 Construction, trade, hazardous waste and domestic waste materials shall not be burned, buried or discarded at the construction site or elsewhere in Wood Buffalo National Park.

These wastes shall be contained and removed in a timely and approved manner by the Contractor and workers, and disposed of at an appropriate waste landfill site located outside the park. Construction waste storage containers, provided by the Contractor, shall be emptied by the Contractor when 90% full. Waste containers will have sealed, bear-proof lids, and waste shall be covered while being transported.

- .4 A concerted effort shall be made by the Contractor and workers to reduce reuse and recycle materials.
- .5 All efforts to prevent wildlife from obtaining food, garbage or other domestic waste shall be made by the Contractor and contract staff while undertaking their work in Wood Buffalo National Park. Such wildlife attractants shall not be stored at the work site overnight. Lunches, coolers and food products, including waste food products, shall be securely stored away from access by animals. Daily removal of food scraps, food wrappers, pop cans or other attractive products to bear-proof containers is mandatory.
- .6 The Contractor and workers shall immediately report any circumstances related to food/garbage (e.g. overflowing container or strong smell) and wildlife to Parks Dispatch at (780) 852-3100 and report the details.
- .7 Toilets are available in the day-use facilities.

1.19 MISCELLANEOUS SITE MANAGEMENT CONTINGENCIES

- .1 If required, a Contractor's office and work headquarters material laydown, equipment parking and storage area will be permitted at the work site.
- .2 The National Park Act regulation prohibits anyone working within Wood Buffalo National Park from camping in non-designated areas.

Part 2 Products

2.1 SEED MIX

- .1 The primary purpose of re-vegetation of the project area is to provide soil stabilisation and, by using a native grass mixture, reduce the amount of invasive plant establishment. The site should be prepared by reducing compaction leaving surface rough and loose with small woody debris loosely spread around then hydro-seeded.
- .2 The recommended species below do not represent a naturally-occurring community of plants, but all are native to the park and are believed to grow successfully from seed in reclamation projects. Criteria for inclusion are: 1) naturally occurring in Wood Buffalo National Park, 2) grass sp, 3) known to have some success germinating and establishing by seeding, and 4) known to establish in reclamation sites (bare soil). They must be native collected seeds and not cultivars or ecovar variants.
 - .1 Slender wheatgrass for early establishment, erosion control, and weed suppression, followed by Slender Wheatgrass, Slough grass, Bluejoint, Tufted Hair Grass, Salt Grass, Sweetgrass, Junegrass, American Manna Grass, and Reed Canary Grass (ratio: equal through percentage volume).

- .2 The Contractor shall submit seed mix design to the Department Representative for review.

Part 3 Execution

3.1 NOT USED

- .1 Not Used

END OF SECTION

Part 1 General

1.1 MEASUREMENT AND PAYMENT

- .1 Measurement and Payment for this Work shall be included in the lump sum bid price. This payment shall be the full compensation necessary to acceptably complete the Work as shown on the drawings and described in this section.

1.2 DEFINITIONS

- .1 Quality Control (QC): The process of checking specific product or services to determine if they comply with relevant quality standards and identify ways to eliminate causes of unsatisfactory product or service performed.
- .2 Quality Assurance (QA): The process of ensuring that the Contractor's Quality Management Plan (QMP) is being followed. The results of the QA are provided as feedback to both the Contractor and the Departmental Representative. Where required, the Contractor shall implement changes to the project based on the feedback received from the QA process.

1.3 QUALITY MANAGEMENT PROGRAM

- .1 The Contractor shall prepare a Quality Management Program. The purpose of the program shall be to ensure the performance of the Work in accordance with Contract requirements.
- .2 The Quality Management Program shall be described in a Quality Management Plan. The Contractor shall submit the Quality Management Plan to the Departmental Representative for acceptance in accordance with Section 01 33 00 - Submittal Procedures. The Plan shall develop a logical system for tracking and documenting the Quality Control of the Work as well as the Contractor's internal Quality Assurance procedures to verify the compliance of the Quality Control process. A systematic format and a set of procedures patterned on a recognized Quality Control Standard will be acceptable, subject to review by the Departmental Representative.
- .3 The Quality Management Plan shall at a minimum include the following information:
 - .1 Distribution list, providing a list of names to whom the Manual shall be distributed;
 - .2 Title page, identifying the Contract, Contractor and copy number;
 - .3 Revision page, identifying the revision number and date of the Manual;
 - .4 Table of contents;
 - .5 Revision control, tabulating the revision number, date of revision, description of revisions and authorized signature;
 - .6 Details of measuring and test equipment including methods and frequency of calibration;
 - .7 Purchasing details of all materials and equipment including procurement documents and vendor's Quality Control Program standards;

- .8 Procedures for inspection of incoming items, in-process inspection and final inspection and tagging of all supply items;
 - .9 Details of special processes as identified by the Departmental Representative, including qualifications of personnel and certification;
 - .10 Procedures for shipping, packaging and storage of materials;
 - .11 Procedures for maintaining quality records and Statements of Compliance, including filing and storage of documents for a period of one year after Completion of the Works;
 - .12 Details of any non-conformance, including identification and recording of deficiencies, tagging procedures for "HOLD" or "REJECT" items, and final disposition of non-conformance forms by the Quality Control Manager;
 - .13 Inspection and test checklists, including tabulated checklists describing all manufacturing and delivery activities such as Inspection or Test, frequency of tests, description of tests, acceptance criteria of tests, such as verification, witnessing or holding tests and sign-off by the Quality Control Manager and the Quality Assurance Manager, if the Quality Assurance Manager witnesses the tests;
 - .14 Forms used to ensure the application of the inspection and test checklist requirements. These forms shall be identified in the checklists and describe all testing requirements for Specification compliance; and
 - .15 Details of the Quality Assurance Program including the Contractor's procedures to verify the compliance to the Quality Control process of on-site work and off-site work by fabricators.
- .4 The Contractor shall appoint qualified and experienced Quality Control and Quality Assurance Personnel, who are dedicated to quality matters and who will report regularly to the Quality Control Manager and Quality Assurance Manager as well as Contractor's management at a level which shall ensure that Quality Control and Quality Assurance requirements are not to be subordinated to manufacturing, construction or delivery. The Quality Control and Quality Assurance Personnel shall be empowered by the Contractor to resolve quality matters. Personnel involved in Quality Assurance shall be independent of the Quality Control Process.
- .5 The Quality Management Plan shall include samples of all forms to be filled in by the Quality Control and Assurance Personnel. All forms shall be signed by the Quality Control Manager and Quality Assurance Manager and submitted promptly to the Departmental Representative.
- .6 An independent check of all Work shall be performed by the Contractor. The Contractor shall appoint Quality Control Inspectors to ensure compliance of products and workmanship with Contract requirements. Quality Assurance Inspectors, will periodically (shall be a minimum of 10% of the Quality Control checks) perform a second independent check to assess if the Quality Control process is being followed. The same personnel may not be used to perform a given task and to check the quality and accuracy of the task.
- .7 The Contractor must facilitate any independent Quality Assurance checks by representatives designated by the Departmental Representative. At completion of the Work a bound and itemized copy of all Quality Control and Quality Assurance

documents and reports shall be prepared by the Contractor's Quality Control Manager and Quality Assurance Manager and submitted to the Departmental Representative.

1.4 TESTING

- .1 Testing required to provide Quality Control and Quality Assurance to assure that the Work strictly complies with the Contract requirements shall include, but not be limited to:
 - .1 Testing of structural concrete, reinforcing steel, granular material and compaction, structural elements (torque testing - bolted splice) and metals and all source acceptance testing;
 - .2 All testing specified in the Contract Documents; and
 - .3 Any other testing required as a condition for deviation from the specified Contract procedures.
- .2 The quality control testing proposed and testing frequency shall at a minimum, achieve the requirements of the following:
 - .1 The testing requirements in the 2013 Alberta Transportation Standard Specifications for Highway Construction Manual and subsequent updates or Alberta Transportation - Standard Specification for Bridge Construction 2013.
 - .2 Wherever standard specifications refer to standards (e.g., CSA, ASTM, and others) the minimum testing frequencies in these standards shall be utilized.
 - .3 The Contractor and its independent Quality Assurance testing agency that will carry out the testing must satisfy themselves that the test frequencies being completed are sufficient to ensure the quality requirements of the QMP.
- .3 The Contractor shall be fully responsible and bear all costs for all quality control testing and shall conduct such testing in the following manner:
 - .1 Provide testing facilities and personnel for the tests and inform the Departmental Representative in advance to enable the Departmental Representative to witness the tests if it so desired;
 - .2 Notify the Departmental Representative when sampling will be conducted;
 - .3 Within one Day after completion of testing, submit test results to the Departmental Representative; and
 - .4 Identify test reports with the name and address of the organization performing all tests, and the date of the tests.
- .4 Approval of tested samples will be for characteristics or use named in such approval and shall not change or modify any Contract requirements.
- .5 Testing agencies, their inspectors, and their representatives are not authorized to revoke, alter, relax, enlarge or release any requirement of the Contract Documents, nor to approve or accept any part of the Work.

- .6 Quality Assurance testing will be undertaken by the Contractor through an independent CSA certified testing firm. The independent testing firm will complete random sampling, inspection, and testing for the purposes of determining the compliance with specifications and other contract documents. The frequency, location of the inspections, sampling, and tests shall be a minimum of 10% of the Quality Control testing frequency.
- .7 The Contractor shall be responsible for third party testing of materials incorporated into the works.
- .8 The Departmental Representative may perform quality audits as desired. Such audits will not relax the responsibility of the contractor to perform work in accordance with Specifications. To facilitate this work the contractor shall:
 - .1 Notify appropriate agency and Departmental Representative in advance of work which the Departmental Representative may want to test.
 - .2 Submit samples and/or materials required for testing, as specifically requested in the Specifications or as requested by the Departmental Representative. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in the work.
- .9 Provide labour and facilities to obtain and handle samples and materials on site.

1.5 INSPECTION

- .1 Allow Departmental Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
- .2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.
- .3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections, or approvals before such is made; Contractor shall uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- .4 Departmental Representative may order any part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such Work is found not in accordance with Contract Documents, the Contractor shall correct such Work and pay costs of examination and correction.

1.6 INDEPENDENT INSPECTION AGENCIES

- .1 Independent Inspection/Testing Agencies may be engaged by the Departmental Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Departmental Representative.
- .2 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

- .3 If defects are revealed during inspection and/or testing, the appointed agency will request additional inspection and/or testing to ascertain full degree of defect. The Contractor shall correct the defect and irregularities as advised by the Departmental Representative at no cost to the Departmental Representative.

Part 2 Products

2.1 NOT USED

- .1 Not Used

Part 3 Execution

3.1 NOT USED

- .1 Not Used

END OF SECTION

Part 1 General

1.1 MEASUREMENT AND PAYMENT

- .1 Measurement and Payment for this Work shall be included in the lump sum bid price. This payment shall be the full compensation necessary to acceptably complete the Work as shown on the drawings and described in this section.

1.2 PROJECT CLEANLINESS

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris.
- .2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.
- .3 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .4 Provide on-site containers for collection of waste materials and debris.
- .5 Dispose of waste materials and debris at designated dumping areas outside of the National Park.
- .6 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .7 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall into watercourse or be blown by wind.

1.3 FINAL CLEANING

- .1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .3 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .4 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.
- .5 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .6 Remove dirt and other disfiguration from exterior surfaces.

Part 2 Products

2.1 NOT USED

.1 Not Used

Part 3 Execution

3.1 NOT USED

.1 Not Used

END OF SECTION

Part 1 General

1.1 MEASUREMENT AND PAYMENT

- .1 Measurement and Payment for this Work shall be included in the lump sum bid price. This payment shall be the full compensation necessary to acceptably complete the Work as shown on the drawings and described in this section.

1.2 ADMINISTRATIVE REQUIREMENTS

- .1 Acceptance of Work Procedures:
 - .1 Substantial Performance Inspection:
 - .1 Notify the Departmental Representative in writing when Work is considered ready for Substantial Performance and request the Departmental Representative's inspection.
 - .2 Accompany the Departmental Representative on preliminary inspection to determine items listed for completion or correction.
 - .3 Comply with the Departmental Representative's instructions for correction of items of Work listed in executed certificate of Substantial Performance and those determined in the final inspection.
 - .4 Notify the Departmental Representative of completion of items of Work listed in executed certificate of Substantial Performance and those determined in the final inspection.
 - .2 Completion Tasks: submit certificates that tasks have been performed as follows:
 - .1 Work: completed and inspected for compliance with Contract Documents.
 - .2 Defects: corrected and deficiencies have been completed.
 - .3 Work: complete and ready for final inspection.
 - .3 Final Inspection:
 - .1 When completion tasks noted above have been completed, request final inspection of Work by the Departmental Representative and Contractor. If Work is deemed incomplete by the Departmental Representative, complete outstanding items and request re-inspection.

1.3 DEFINITIONS

- .1 Undertake a final cleaning of the site at project completion:
 - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.
 - .2 All disturbed areas shall be returned to their original condition.

Part 2 Products

2.1 NOT USED

.1 Not Used

Part 3 Execution

3.1 NOT USED

.1 Not Used

END OF SECTION

Part 1 General

1.1 MEASUREMENT AND PAYMENT

- .1 Measurement and Payment for this Work shall be included in the lump sum bid price. This payment shall be the full compensation necessary to acceptably complete the Work as shown on the drawings and described in this section.

1.2 AS-BUILT DOCUMENTS AND SAMPLES

- .1 Maintain, in addition to requirements in General Conditions, at site for the Departmental Representative one record copy of:
 - .1 Contract Drawings
 - .2 Specifications
 - .3 Addenda
 - .4 Change Orders and other modifications to Contract
 - .5 Reviewed shop drawings, product data, and samples
 - .6 Field test records
 - .7 Inspection certificates
 - .8 Manufacturer's certificates
- .2 Store record documents and samples in field office apart from documents used for construction.
 - .1 Provide files, racks, and secure storage.
- .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual.
 - .1 Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition.
 - .1 Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by the Departmental Representative.

1.3 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

- .1 Record information on set of black line opaque drawings.
- .2 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.
- .3 Contract Drawings and shop drawings: legibly mark each item to record actual construction, including:
 - .1 Measured locations and appurtenances, referenced to visible and accessible features of construction.
 - .2 Field changes of dimension and detail.

- .3 Changes made by change orders.
- .4 Details not shown on original Contract Drawings.
- .5 References to related shop drawings and modifications.
- .4 Specifications: legibly mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
 - .2 Changes made by Addenda and change orders.
- .5 Other Documents: maintain manufacturer's certifications, inspection certifications, and field test records required by individual specifications sections.
- .6 Provide digital photos, if requested, for site records.

1.4 WARRANTIES AND BONDS

- .1 Warranty period for all bridge bearings and assemblies shall be five (5) years from the date of final acceptance as determined by the Departmental Representative.
- .2 Unless otherwise specified, all materials incorporated into the work must be new and undamaged. Both workmanship and materials must be of the quality specified in the Contract Documents.
- .3 The Contractor shall maintain, at no cost to Parks Canada, the work and every part thereof in reasonable working order and complete repair during the period of two (2) years from the date of written acceptance. Notwithstanding the generality of the foregoing, the Contractor will not be liable for:
 - .1 Damage caused by parties who are strangers to the Contract, or
 - .2 Damage resulting from malicious acts of other parties, or
 - .3 Damage for which Parks Canada has specifically assumed responsibility in writing, or
 - .4 Any condition which in the opinion of the Departmental Representative results from normal wear and tear, or
 - .5 Acts or omissions which in the opinion of the Departmental Representative are beyond the control of the Contractor
 - .6 Where in each case the damage or condition arose subsequent to the issuance of acceptance of work.
- .4 The Contractor, upon being so directed by the Departmental Representative by a notice in writing during the maintenance period, shall repair or replace any defect in or failure of any part of the work within the time set out in and according to the notice, to the satisfaction of the Departmental Representative.
 - .1 If the Contractor fails to repair or replace the defect or failures as required by any such notice, Parks Canada may proceed to have the repair or replacement made and may charge the Contractor with the cost thereof and at Parks Canada's option, deduct the amount from any amount due to the Contractor by Parks Canada either under the Contract or any other contract or otherwise or may collect the same from the Contractor by any lawful means available to Parks Canada.

- .2 At the end of the maintenance period, after all defects and failures have been corrected to the satisfaction of the Departmental Representative, or if there are not any defects or failures in the work, the Departmental Representative will issue a written final acceptance and Parks Canada shall release the performance bond with respect thereto.
- .5 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
- .6 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.
- .7 Verify that documents are in proper form, contain full information, and are notarized.
- .8 Co-execute submittals when required.
- .9 Retain warranties and bonds until time specified for submittal.
- .10 Except for items put into use with Department Representative's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.

Part 2 Products

2.1 NOT USED

- .1 Not Used

Part 3 Execution

3.1 NOT USED

- .1 Not Used

END OF SECTION

Part 1 General

1.1 DESCRIPTION

- .1 Work includes the complete removal of unsound concrete from the bridge abutments and the removal of existing bridgerails as shown on the drawings. Protective measures are required to prevent all demolished and/or removed elements, and debris from entering the River. All demolished material shall be removed to an approved location.

1.2 MEASUREMENT AND PAYMENT

- .1 Measurement and Payment for this Work shall be included in the lump sum bid price. This payment shall be the full compensation necessary to acceptably complete the Work as shown on the drawings and described in this section.

1.3 REFERENCES

- .1 Definitions:
 - .1 Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, include but not limited to: poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or materials that endanger human health or environment if handled improperly.
- .2 Reference Standards:
 - .1 CSA International
 - .2 CSA S350-M1980 (R2003), Code of Practice for Safety in Demolition of Structures.

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-demolition Meeting:
 - .1 A pre-demolition meeting will be scheduled one (1) week prior to beginning the demolition and removal of the existing bridge, with the Contractor and the Departmental Representative to:
 - .1 Verify project and demolition requirements.
 - .2 Verify existing site conditions adjacent to demolition work.
 - .2 The Contractor's key personnel and the demolition subcontractor are expected to attend.

- .2 Scheduling:
 - .1 The Contractor shall employ all necessary means to meet project time lines without compromising the specified environmental and safety requirements.
 - .2 In event of unforeseen delay notify Departmental Representative in writing.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Prior to commencing structure demolition, the Contractor shall submit a detailed demolition plan in accordance with Section 01 33 00 - Submittal Procedures. As a minimum, the demolition plan should include:
 - .1 Descriptions of and anticipated quantities of materials to be salvaged reused, recycled and landfilled.
 - .2 Schedule of selective demolition.
 - .3 Number and location of dumpsters.
 - .4 Name and address of waste facilities.
- .2 The Contractor shall submit copies of certified receipts from authorized disposal sites and reuse and recycling facilities for material removed from site upon request of the Departmental Representative.

1.6 SITE CONDITIONS

- .1 Environmental protection:
 - .1 Ensure Work is done in accordance with Section 01 35 43 - Environmental Procedures.
 - .2 Ensure Work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.
 - .3 Fires and burning of waste or materials is not permitted on site.
 - .4 Do not bury rubbish waste materials.
 - .5 Do not dispose of waste or volatile materials including but not limited to: mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses.
 - .6 Ensure proper disposal procedures are maintained throughout project.
 - .7 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers, or onto adjacent properties.
 - .8 Protect trees, plants and foliage on site and adjacent properties where indicated.
 - .9 Prevent extraneous materials from contaminating air beyond application area, by providing temporary enclosures during demolition work.
 - .10 Cover or wet down dry materials and waste to prevent blowing dust and debris. Control dust on all temporary roads.

1.7 EXISTING CONDITIONS

- .1 The Contractor is to take over the existing bridge based on its condition on the date the tender is accepted.

Part 2 Products

2.1 EQUIPMENT

- .1 Leave machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.

Part 3 Execution

3.1 PREPARATION

- .1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.
- .2 Cut pavement neatly along limits of proposed excavation in order that surface may break evenly and cleanly.
- .3 Protect buried services that are required to remain undisturbed.
- .4 Temporary Erosion and Sedimentation Control:
 - .1 The Contractor shall provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to surrounding area and watercourse, according to Section 01 35 43 Environmental Procedures.
 - .2 Inspect, repair, and maintain erosion and sedimentation control measures during demolition.
 - .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal after completion of demolition work.
- .5 Protection of in-place conditions:
 - .1 Work in accordance with Section 01 35 43 - Environmental Procedures.
 - .2 Support affected structures and, if safety of structure being demolished appears to be endangered, take preventative measures, stop Work and immediately notify Departmental Representative.

3.2 DEMOLITION

- .1 Excavate as shown on the drawings.
- .2 Crush rocks generated due to excavation to size suitable for transport and disposal or reuse as rip rap.

- .3 At end of each day's work, leave Work in safe and stable condition.
- .4 Demolish to minimize dust. Keep materials wetted.
- .5 Remove and dispose of demolished materials except where noted otherwise and in accordance with authorities having jurisdiction.

END OF SECTION

Part 1 General

1.1 MEASUREMENT & PAYMENT

- .1 Measurement and Payment for this Work shall be included in the lump sum bid price. This payment shall be the full compensation necessary to acceptably complete the Work as shown on the drawings and described in this section.

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CAN/CSA-S269.3, Concrete Formwork, National Standard of Canada.

Part 2 Products

2.1 MATERIALS

- .1 Formwork materials:
 - .1 Forms for exposed surfaces:
 - .1 Use 18 mm Coated Formply consisting of Douglas Fir substrate with resin-impregnated paper overlay and factory treated chemically active release agent.
 - .2 Use full-sized sheets as practical.
 - .3 Obtain approval of the Departmental Representative prior to the reuse of any form.
 - .4 Support pours less than 1.5 m height at 300 mm maximum on centres.
 - .5 Support pours greater than 1.5 m height at 200 mm maximum on centre.
 - .6 Use strong-backs or walers placed perpendicular to supports to ensure straightness of form.
 - .7 Construct metal bolts or anchorages within the form so as to allow their removal to a depth of at least 20 mm from the concrete surface.
 - .8 Remove plastic sleeves for a distance of 100 mm from the face of the concrete and fill cavity with a non-shrink grout approved by the Consultant to 75 mm from the surface. Fill remaining 75 mm with an approved concrete patching material.
 - .2 Forms for unexposed surfaces:
 - .1 15 mm plywood supported at 400 mm maximum on centre.

Part 3 Execution

3.1 FABRICATION AND ERECTION

- .1 Verify lines, levels and centres before proceeding with formwork/falsework and ensure dimensions agree with drawings.

- .2 Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.
- .3 Fabricate and erect falsework in accordance with CSA S269.1.
- .4 Refer to drawings for required finishes.
- .5 Do not place shores and mud sills on frozen ground.
- .6 Provide site drainage to prevent washout of soil supporting mud sills and shores.
- .7 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA-A23.1/A23.2.
- .8 Align form joints and make watertight.
 - .1 Keep form joints to minimum.
- .9 Use 25 mm chamfer strips on external corners and/or 25 mm fillets at interior corners, joints, unless specified otherwise.
- .10 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.
- .11 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections.
 - .1 Ensure that anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.
- .12 Clean formwork in accordance with CSA-A23.1/A23.2, before placing concrete.

END OF SECTION

Part 1 General

1.1 MEASUREMENT AND PAYMENT

- .1 Measurement and Payment for this Work shall be included in the lump sum bid price. This payment shall be the full compensation necessary to acceptably complete the Work as shown on the drawings and described in this section.

1.2 REFERENCES

- .1 CSA International
 - .1 CSA-A23.1/A23.2-2014, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
 - .2 CAN/CSA-A23.3-2014, Design of Concrete Structures.
 - .3 CSA-G30.18, Carbon Steel Bars for Concrete Reinforcement.
 - .4 CSA-G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .5 CAN/CSA-G164, Hot Dip Galvanizing of Irregularly Shaped Articles.
- .2 Reinforcing Steel Institute of Canada (RSIC)
 - .1 RSIC-2004, Reinforcing Steel Manual of Standard Practice.
- .3 American Standard for Testing and Materials (ASTM)
 - .1 ASTM-A767/A767M-2009, Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement.
 - .2 ASTM A780/A780M, Repair of Damaged and Uncoated Areas of Hot -Dip Galvanized Coatings.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prepare reinforcement drawings in accordance with RSIC Manual of Standard Practice.
- .3 Shop Drawings:
 - .1 Indicate placing of reinforcement and:
 - .1 Bar bending details.
 - .2 Lists.
 - .3 Quantities of reinforcement.
 - .4 Sizes, spacings, locations of reinforcement and mechanical splices if approved by the Departmental Representative, with identifying code marks to permit correct placement without reference to structural drawings.
 - .2 Detail lap lengths and bar development lengths to CAN/CSA-A23.3, unless otherwise indicated.

- .4 When Chromate solution is used as replacement for galvanizing non-prestressed reinforcement, provide product description for review by the Departmental Representative prior to its use.

1.4 QUALITY ASSURANCE

- .1 Submit in accordance with Section 01 45 00 - Quality Control.
- .2 Mill Test Report: provide the Departmental Representative with certified copy of mill test report of reinforcing steel, as part of the shop drawing submission.
- .3 Upon request submit in writing to the Departmental Representative proposed source of reinforcement material to be supplied.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .2 Storage and Handling Requirements:
 - .1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

- .1 Substitute different size bars only if permitted in writing by the Departmental Representative.
- .2 Reinforcing steel shall conform to CSA G30.18:
 - .1 Grade 400W shall be used for galvanized reinforcement
- .3 Cold-drawn annealed steel wire ties: to ASTM A82/A82M.
- .4 Chairs, bolsters, bar supports, spacers: to CSA-A23.1/A23.2.
- .5 Mechanical splices: subject to approval of the Departmental Representative.
- .6 Plain round bars: to CSA-G40.20/G40.21.

2.2 FABRICATION

- .1 Fabricate reinforcing steel in accordance with CSA-A23.1/A23.2 and Drawings. Galvanized coating applicator is to follow the procedures in the Quality Assurance Manual of the American Galvanizers Association.
- .2 Obtain the Departmental Representative's written approval for locations of reinforcement splices other than those shown on placing drawings.

- .3 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.
- .4 All surface of smeared ends of basrs as well as cracking and other visible damage or deterioration of the hot-dip galvanizing as a result of handling or installation operations, or any other causes, shall be repaired using ZINGA or approved equal formulation, in accordance with ASTM Practice A780M. all field applied galvanized coatings shall be applied in accordance with the manufacturer's recommendations and as directed by the Engineer. Repairs to the reinforcing bars shall be done prior to placing the bars in the forms.

2.3 SOURCE QUALITY CONTROL

- .1 Upon request, provide the Departmental Representative with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, minimum 2 weeks prior to beginning reinforcing work.
- .2 Upon request inform the Departmental Representative of proposed source of material to be supplied.

Part 3 Execution

3.1 FIELD BENDING

- .1 Do not field bend or field weld reinforcement except where indicated or authorized by the Departmental Representative.
- .2 When field bending is authorized, bend without heat, applying slow and steady pressure.
- .3 Replace bars, which develop cracks or splits.

3.2 PLACING REINFORCEMENT

- .1 Place reinforcing steel as indicated on placing drawings in accordance with CSA-A23.1/A23.2.
- .2 Prior to placing concrete, obtain the Departmental Representative's approval of reinforcing material and placement.
- .3 Ensure cover to reinforcement is maintained during concrete pour.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
- .2 Leave Work area clean at end of each day.
- .3 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

END OF SECTION

Part 1 General

1.1 MEASUREMENT & PAYMENT

- .1 Measurement and Payment for this Work shall be included in the lump sum bid price. This payment shall be the full compensation necessary to acceptably complete the Work as shown on the drawings and described in this section. This includes the supply and placement of all concrete and galvanized reinforcing steel and dowels, including the labour, delivery, installation, and equipment necessary to complete the Work, as well as the Trial Batches as described in this section.

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C309-03, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-37.2-M88, Emulsified Asphalt, Mineral Colloid-Type, Unfilled, for Dampproofing and Waterproofing and for Roof Coatings.
 - .2 CAN/CGSB-51.34-M86(R1988), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1/A23.2-2014, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA A283-00(R2003), Qualification Code for Concrete Testing Laboratories.
 - .3 CAN/CSA-A3000-03, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
 - .1 CSA-A3001-03, Cementitious Materials for Use in Concrete.

1.3 SUBMITTALS

- .1 Submittals in accordance with Division 01.
- .2 Submit testing inspection results and reports for review by Departmental Representative and do not proceed without written approval when deviations from mix design or parameters are found.
- .3 Concrete hauling time: submit for review by Departmental Representative deviations exceeding maximum allowable time of 120 minutes for concrete to be delivered to site of Work and discharged after batching.

1.4 QUALITY ASSURANCE

- .1 Quality Assurance: in accordance with Section 01 45 00 - Quality Control.
- .2 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Concrete hauling time: maximum allowable time for concrete to be delivered to site of Work and discharged not to exceed 120 minutes after batching.
 - .1 Modifications to maximum time limit must be agreed to Departmental Representative laboratory representative and concrete producer as described in CSA A23.1/A23.2.
 - .2 Deviations to be submitted for review by Departmental Representative.
- .2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.
- .3 Waste Management and Disposal:
 - .1 Unused admixtures and additive materials must not be disposed of into sewer systems, into lakes, streams, onto ground or in other location where it will pose health or environmental hazard.
 - .2 Prevent admixtures and additive 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. Dispose of waste in accordance with applicable local, Provincial/Territorial and National regulations.

Part 2 Products

2.1 MATERIALS

- .1 Cement: to CAN/CSA-A3001, Type GU.
- .2 Supplementary cementing materials: to CAN/CSA-A23.5, Type for Type C Flyash.
- .3 Water: to CSA-A23.1.
- .4 Aggregates: to CAN/CSA-A23.1/A23.2.
- .5 Admixtures:
 - .1 Air entraining admixture: to CAN3-A266.1.
 - .2 Chemical admixture: to CAN3-A266.2. Representative to approve accelerating or set retarding admixtures during cold and hot weather placing.

- .6 Shrinkage compensating grout: premixed compound consisting of non-metallic aggregate, Portland cement, water reducing and plasticizing agents to CSA-A23.1/A23.2.
 - .1 Compressive strength: 35 MPa at 28 days.
 - .2 Net shrinkage at 28 days: maximum 0.4%.
- .7 Non premixed dry pack grout: composition of non metallic aggregate Portland cement with sufficient water for mixture to retain its shape when made into ball by hand and capable of developing compressive strength of 35 MPa at 28 days.
- .8 Curing compound: to CSA-A23.1/A23.2.
- .9 Premoulded joint fillers:
 - .1 Bituminous impregnated fiber board: to ASTM D1751.
 - .2 Sponge rubber: to ASTM D1752, Type I, flexible firm grade.
- .10 Polyethylene film: to CAN/CGSB-51.34.

2.2 MIXES

- .1 Proportion normal density concrete in accordance with CAN/CSA-A23.1, Table 11. Alternative 1 to give following properties: for all concrete.
- .2 Cement:
 - .1 Type GU Portland cement.
 - .2 Minimum compressive strength at 28 days: 35 MPa.
 - .3 Flyash to a maximum of 20% by weight of cement is permitted.
 - .4 Class of exposure: C1.
 - .5 Nominal size of coarse aggregate: 20 mm.
 - .6 Slump at time and point of discharge: 50 to 110 mm.
 - .7 Air content: 5 to 8%.
 - .8 Chemical admixtures: type in accordance with CAN3-A266.4.
- .3 Do not change concrete mix without prior approval of Departmental Representative. Should change in material source be proposed, submit new mix designs to be reviewed by Departmental Representative. Ensure some source of materials for individual structures.
- .4 Use of super-plasticizer is recommended. Add to mix at jobsite immediately prior to placing concrete. Slump of concrete prior to super-plasticizer addition to be 70+20 mm. Slump of concrete after super-plasticizer addition to be maintained in the range of 120+ 30 mm during the discharge period.
- .5 One retempering of the mix permitted with super-plasticizer during the discharge period. Retempering of the mix with water after super-plasticizer addition not permitted.

Part 3 Execution

3.1 TRIAL BATCHES

- .1 The Contractor is required to complete trial batch(es) for the cast-in-place concrete mix. The Contractor shall produce evidence satisfactory to the Departmental Representative that the proportions selected will produce concrete of the quality specified. The trial batch(es) shall be performed a minimum of 35 days prior to placement of concrete at site. Each trial batch shall be a minimum of 3 m³ or 50% of the rated mixer capacity (whichever is greater).
- .2 Slump retention, temperature, and air content shall be evaluated at 15, 60, and 90 minutes after batching. At 60 minutes from the time of batching, samples shall be cast to determine compressive strength at 7 and 28 days.

3.2 PREPARATION

- .1 Obtain Departmental Representative's approval before placing concrete.
 - .1 Provide 72 hours notice prior to placing of concrete.
- .2 During concreting operations:
 - .1 Ensure concrete delivery and handling facilitates placing with minimum of re-handling, and without damage to existing structure or Work.
- .3 Pumping of concrete is permitted only after approval of equipment and mix.
- .4 Ensure reinforcement and inserts are not disturbed during concrete placement.
- .5 Prior to placing of concrete obtain Departmental Representative's approval of proposed method for protection of concrete during placing and curing in adverse weather.
- .6 Protect previous Work from staining.
- .7 Clean and remove stains prior to application for concrete finishes.
- .8 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.
- .9 In locations where new concrete is dowelled to existing work, drill holes in existing concrete.
- .10 Do not place load upon new concrete until authorized by Departmental Representative.

3.3 CONSTRUCTION

- .1 Do cast-in-place concrete work in accordance with CSA-A23.1/A23.2.

END OF SECTION

Part 1 General

1.1 DESCRIPTION OF WORK

- .1 The Work covered in this section includes the supply, fabrication, delivery and installation of the bridge rails, pipe sleeve, pipe insulation box and support systems. Protective Treatment of the rail system is included in this specification.

1.2 MEASUREMENT & PAYMENT

- .1 Measurement and Payment for this Work shall be included in the lump sum bid price. This payment shall be the full compensation necessary to acceptably complete the Work as shown on the drawings and described in this section. This includes all material, fabrication, finishes, labour, delivery, installation and equipment necessary to complete the Work.

1.3 REFERENCES

- .1 CSA International
 - .1 CSA G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CAN/CSA G164, Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CSA S16, Design of Steel Structures.
 - .4 CSA W48, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
 - .5 CSA W59, Welded Steel Construction (Metal Arc Welding) Metric.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
 - .1 Submitted shop drawings shall reflect bridge rail layout to match bridge deck panels.
 - .2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

1.5 QUALITY ASSURANCE

- .1 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certifications: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

- .1 Steel sections and plates: to CSA G40.20/G40.21, Grade 350W.
- .2 Welding materials: to CSA W59.
- .3 Welding electrodes: to CSA W48 Series.
- .4 Bolts and anchor bolts: to ASTM A307.

2.2 FABRICATION

- .1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
- .2 Where possible, fit and shop assemble work, ready for erection.
- .3 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.

2.3 FINISHES

- .1 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m² to CAN/CSA-G164.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for metal fabrications installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform the Department Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 ERECTION

- .1 Do welding work in accordance with CSA W59 unless specified otherwise.
- .2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.

- .3 Provide suitable means of anchorage acceptable to the Departmental Representative, such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.
- .4 Exposed fastening devices to match finish and be compatible with material through which they pass.
- .5 Supply components for work by other trades in accordance with shop drawings and schedule.
- .6 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.

3.3 CLEANING

- .1 Progress Cleaning: Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools, and equipment.

3.4 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by metal fabrications installation.

END OF SECTION

Part 1 General

1.1 MEASUREMENT AND PAYMENT

- .1 Measurement and Payment for this Work shall be included in the lump sum bid price. This payment shall be the full compensation necessary to acceptably complete the Work as shown on the drawings and described in this section.

1.2 REFERENCES

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM D4791-99, Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.

1.3 SAMPLES

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Allow continual sampling by Departmental Representative during production.
- .3 Provide Departmental Representative with access to source and processed material for sampling.
- .4 Pay cost of sampling and testing of aggregates which fail to meet specified requirements.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Divert unused granular materials from landfill to local facility as approved by Departmental Representative.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Transportation and Handling: Handle and transport aggregates to avoid segregation, contamination and degradation.
- .2 Storage: Store washed materials or materials excavated from underwater 24 hours minimum to allow free water to drain and for materials to attain uniform water content.

Part 2 Products

2.1 MATERIALS

- .1 Type 1 fill (Imported Backfill):
 - .1 Crushed or screened stone, gravel or sand consisting of hard, durable particles free from clay lumps, cementation, organic material, frozen material or other deleterious materials.
 - .2 Gradations to be within limits specified when tested to ASTM C136 and ASTM C117 and have a smooth curve without sharp breaks when plotted on semi-log charts.

- | | <u>Sieve Designation (um)</u> | <u>% Passing</u> |
|--|-------------------------------|------------------|
| | 25 000 | 100 |
| | 5 000 | 35 - 64 |
| | 630 | 12 - 34 |
| | 30 | 2 - 10 |
- .2 Aggregate quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material, clay lumps or minerals, or other substances that would act in deleterious manner for use intended.
- .3 Flat and elongated particles of coarse aggregate: to ASTM D4791.
- .1 Greatest dimension to exceed five times least dimension.
- .4 Fine aggregates satisfying requirements of applicable section to be one, or blend of following:
- .1 Natural sand.
- .2 Manufactured sand.
- .3 Screenings produced in crushing of quarried rock, boulders, gravel or slag.
- .5 Coarse aggregates satisfying requirements of applicable section to be one of or blend of following:
- .1 Crushed rock.
- .2 Gravel and crushed gravel composed of naturally formed particles of stone.
- .3 Light weight aggregate, including slag and expanded shale.
- .6 Submit a complete sieve analysis of two samples of granular base material to the Departmental Representative for approval, prior to delivery on site.
- .7 The sieve analysis must be performed by a qualified materials testing laboratory.
- .8 The aggregate must be crushed and have a minimum CBR of 60.
- .9 The coarse fraction of the aggregate must have a percent wear by the Los Angeles abrasion test of not more than 50.
- .10 The material passing the 0.4 mm sieve must have a plasticity index of 6 or less.
- .11 The material retained on the 5 mm sieve must have a minimum 60% by dry mass with at least two fractured faces.
- .12 Granular base must be placed in lifts not exceeding 150 mm in compacted thickness with each lift being uniformly compacted to a minimum of 100% of Standard Proctor maximum dry density (ASTM D698).

2.2 SOURCE QUALITY CONTROL

- .1 Inform Departmental Representative of proposed source of aggregates and provide samples at least 4 weeks prior to commencing production.
- .2 If, in opinion of Departmental Representative materials from proposed source do not meet, or cannot reasonably be processed to meet, specified requirements, locate an

alternative source or demonstrate that material from source in question can be processed to meet specified requirements.

- .3 Advise Departmental Representative 4 weeks in advance of proposed change of material source.
- .4 Acceptance of material at source does not preclude future rejection if it fails to conform to requirements specified, lacks uniformity, or if its field performance is found to be unsatisfactory.

Part 3 Execution

3.1 PREPARATION

- .1 Handling
 - .1 Handle and transport aggregates to avoid segregation, contamination and degradation.
- .2 Stockpiling
 - .1 Stockpile aggregates on site in locations as directed by Departmental Representative. Do not stockpile on completed pavement surfaces.
 - .2 Stockpile aggregates in sufficient quantities to meet Project schedules.
 - .3 Stockpiling sites to be level, well drained, and of adequate bearing capacity and stability to support stockpiled materials and handling equipment.
 - .4 Except where stockpiled on acceptably stabilized areas, provide compacted sand base not less than 300 mm in depth to prevent contamination of aggregate. Stockpile aggregates on ground but do not incorporate bottom 300 mm of pile into Work.
 - .5 Separate different aggregates by strong, full depth bulkheads, or stockpile far enough apart to prevent intermixing.
 - .6 Do not use intermixed or contaminated materials. Remove and dispose of rejected materials as directed by Departmental Representative within 48 h of rejection.
 - .7 Stockpile materials in uniform layers of thickness as follows:
 - .1 Max 1.5 m for coarse aggregate and base course materials.
 - .2 Max 1.5 m for fine aggregate and sub-base materials.
 - .3 Max 1.5 m for other materials.
 - .8 Uniformly spot-dump aggregates delivered to stockpile in trucks and build up stockpile as specified.
 - .9 Do not cone piles or spill material over edges of piles.
 - .10 Do not use conveying stackers.
 - .11 During winter operations, prevent ice and snow from becoming mixed into stockpile or in material being removed from stockpile.

3.2 CLEANING

- .1 Leave aggregate stockpile site in tidy, well drained condition, free of standing surface water.
- .2 Leave any unused aggregates in neat compact stockpiles as directed by Departmental Representative.
- .3 For temporary or permanent abandonment of aggregate source, restore source to condition meeting requirements of authority having jurisdiction.

3.3 QUALITY ASSURANCE

- .1 Supply copies of the following sieve analyses to ASTM C136 and other tests to ensure that aggregates being produced and supplied meet specified requirements. Contractor to provide a daily estimate of production tonnage to the Departmental Representative.
- .2 Grading of aggregate for stockpile
 - .1 A minimum of one sieve analysis per 500 tonnes of aggregate will be performed. Aggregate placed in stockpiles prior to acceptance by the Departmental Representative may be rejected, all or in part.
 - .2 Evaluation of tests: the average grading of the first 8 consecutive sieve tests shall conform to the specified grading band.
- .3 Grading of aggregate shipped direct from the crusher to jobsite
 - .1 A minimum of one sieve analysis per 300 tonnes of aggregate will be performed.
 - .2 Do not strip aggregate to jobsite until the applicable test results have been accepted by the Departmental Representative.

3.4 FILL TYPES AND COMPACTION

- .1 Unless otherwise specified, compact to the following densities at Optimum Moisture Content:
 - .1 Type 1 fill (Imported Backfill): 98% Standard Proctor Density.

END OF SECTION

Part 1 General

1.1 MEASUREMENT AND PAYMENT

- .1 Measurement and Payment for this Work shall be included in the lump sum bid price. This payment shall be the full compensation necessary to acceptably complete the Work as shown on the drawings and described in this section.

1.2 EXISTING CONDITIONS

- .1 There are no known underground or surface utility lines or buried objects on the job site. The Contractor shall confirm the existence of any such lines or objects prior to commencing work and report these to the Department Representative.
- .2 Refer to dewatering in Section 31 23 33.01 - Excavating Trenching and Backfilling.

1.3 PROTECTION

- .1 Protect and/or transplant existing fencing, trees, landscaping, natural features, bench marks, buildings, pavement, surface or underground utility lines which are to remain as directed by Departmental Representative. If damaged, restore to original or better condition unless directed otherwise.
- .2 Maintain access roads to prevent accumulation of construction related debris on roads.

Part 2 Products

2.1 MATERIALS

- .1 Fill material: In accordance with of Section 31 23 33.01 - Excavating, Trenching and Backfilling.
- .2 Excavated or graded material existing on site may be suitable to use as fill for grading work if approved by Departmental Representative.

Part 3 Execution

3.1 STRIPPING OF TOPSOIL

- .1 Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected as determined by Departmental Representative.
- .2 Commence topsoil stripping of areas as indicated by Departmental Representative after area has been cleared of brush weeds and grasses and removed from site.
- .3 Strip topsoil to full depth. Rototill weeds and grasses and retain as topsoil on site. Avoid mixing topsoil with subsoil.

- .4 Stockpile in locations as indicated by Departmental Representative. Stockpile height not to exceed 2 m.
- .5 Dispose of unused topsoil to location as indicated by Departmental Representative off site.
- .6 Stockpile topsoil on geotextile material, tarps or plywood. Cover topsoil stockpiles with polyethylene sheeting or tarps.

3.2 GRADING

- .1 Rough grade to levels, profiles, and contours allowing for surface treatment as indicated.
- .2 Grade ditches to depth as indicated.
- .3 Prior to placing fill over existing ground, scarify surface to depth of 150 mm. Maintain fill and existing surface at approximately same moisture content to facilitate bonding.
- .4 Compact filled and disturbed areas to maximum dry density as specified in Section 31 05 16 – Aggregate Materials.
- .5 Do not disturb soil within branch spread of trees or shrubs to remain.

3.3 TESTING

- .1 Refer to Section 01 45 00 - Quality Control.

3.4 SURPLUS MATERIAL

- .1 Remove surplus material and material unsuitable for fill, grading or landscaping off site as directed by Departmental Representative.

END OF SECTION

Part 1 General

1.1 DESCRIPTION

- .1 Excavation is the removal of all material (Rock and/or granular) necessary for the repair of the bridge abutment foundations, and the preparation of the native base in accordance with the drawings or as determined by the Departmental Representative. Excavation shall include the construction of any temporary works necessary to maintain the stability of the adjacent slope, the protection and maintenance of the excavations and the removal and disposal of unsuitable backfill material as determined by the Departmental Representative.
- .2 Backfill shall include all material required to fill excavations adjacent to the bridge abutments and the re-shaping of the bridge head slopes and approaches to suit a replacement bridge. Backfill shall include the supply and placing of materials necessary for the construction of roadway approach fill and roadway embankments and dechlorination runoff ditches.
- .3 Excavation and backfill consists of all the removal, supply, and replacement of materials in conformity with the grades and dimension as directed by the Departmental Representative and includes:
 - .1 Excavation around bridge abutments.
 - .2 Removal and disposal of waste materials from excavation, ditches, creeks.
 - .3 Bridge abutment backfill and reshaping the headslopes to suit the surrounding topography.
 - .4 Construction of approaches, roadway ditches, and other earthworks necessary for the construction of the works.
 - .5 Transportation of excavated materials, supply of backfill material.
 - .6 Final grading of approach roadway surfaces and slopes.

1.2 MEASUREMENT PROCEDURES

- .1 Measurement and Payment for this Work shall be included in the lump sum bid price. This payment shall be the full compensation necessary to acceptably complete the Work as shown on the drawings and described in this section.
- .2 Environmental mitigations required in accordance with Section 01 35 43 – Environmental Procedures, for the Work in this Section shall be incidental to the contract and no separate payment will be made to the Contractor.
- .3 No measurement payment will be made for:
 - .1 Excavating unnecessarily beyond lines established by Departmental Representative.
 - .2 Removing and disposing of roots, stumps and other materials excavated during waste operation.
 - .3 Removing and disposal of unsuitable material from embankment attributable to negligence.
 - .4 Watering, drying or compacting.

- .5 Compaction of material (150 mm) below subgrade horizon in areas of cut.

1.3 DEFINITIONS

- .1 Excavation shall include topsoil stripping, and all other rock and/or granular materials.
- .2 Rock excavation shall include the excavation of:
 - .1 Material from solid masses of igneous, sedimentary or metamorphic rock that, prior to removal, was integral with parent mass. Material that cannot be removed by means of heavy duty mechanical excavation equipment with 0.95m³ bucket or equivalent to be considered integral with parent mass.
 - .2 Boulder or rock fragments measuring 1.5 cubic metres or more in volume.
- .3 Backfill: Native or imported material meeting the requirements for structure. The processing of native material from trench or foundation excavations for use a structure or trench backfill will be permitted provided it meets the applicable specifications for backfill, and re-compaction to 98% SPD.
- .4 Topsoil:
 - .1 Material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.
 - .2 Material reasonably free from subsoil, clay lumps, brush, objectionable weeds, and other litter, and free from cobbles, stumps, roots and other objectionable material larger than 25 millimeters in any dimension.
- .5 Waste Material: material unsuitable for backfill, trench foundation or material surplus to requirements.

1.4 QUALITY CONTROL

- .1 Regulatory Requirements set out in Section 01 35 43 - Environmental Procedures and Section 01 45 00 - Quality Control.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 35 43 - Environmental Procedures.
- .2 Dispose of waste off-site at location provided by Contractor.

1.6 EXISTING CONDITIONS

- .1 Buried services:
 - .1 Before commencing work establish location of buried services on and adjacent to site.
 - .2 Hand expose or hydrovac buried utilities within 1.0 m of work.
 - .3 Arrange with appropriate authority for relocation of buried services that interfere with execution of work: pay costs of relocating services.
 - .4 Size, depth and location of existing utilities and structures as indicate are for guidance only. Completeness and accuracy are not guaranteed.
 - .5 Prior to beginning excavation Work, notify applicable Departmental Representative establish location and state of use of buried utilities and structures. Departmental Representative to clearly mark such locations to prevent disturbance during Work.
 - .6 Confirm locations of buried utilities by careful test excavations.
 - .7 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered.
 - .8 Where utility lines or structures exist in area of excavation, obtain direction of Departmental Representatives. Costs for such Work to be paid by the Contractor.
 - .9 Record location of maintained, re-routed and abandoned underground lines.
 - .10 Confirm locations of recent excavations adjacent to area of excavation.

1.7 WATER ISOLATION SYSTEM

- .1 Engage services of qualified professional engineer who is registered in the Province of Alberta to design and inspect a water isolation system sufficient to complete work as shown on design drawings.
- .2 At least 2 weeks prior to commencing work, submit design and support data to Departmental Representative for review.
- .3 Design and supporting data submitted to bear the stamp and signature of qualified professional engineer registered in the Province of Alberta.
- .4 Professional engineer responsible for design of temporary structures to submit proof of insurance coverage for professional liability except where engineer is employee of contractor, in which case contractor shall submit proof that work by professional engineer is included in contractor's insurance coverage.

Part 2 Products

2.1 MATERIALS

- .1 Type 1 fill (imported backfill): properties to Section 31 05 16 - Aggregate Materials.
- .2 Unshrinkable fill: proportioned and mixed to provide:
 - .1 Maximum compressive strength of 0.4 MPa at 28 days.
 - .2 Maximum cement content of 25 kg/m³ with 40% fly ash replacement: to CSA A3001, Type GU.

- .3 Minimum strength of 0.07 MPa at 24 h.
- .4 Concrete aggregates: to CSA A23.1/A23.2.
- .5 Cement: Type GU.
- .6 Slump: 160 to 200 mm.

Part 3 Execution

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to Environmental Assessment Recommendations and as directed by Departmental Representative.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.2 SITE PREPARATION

- .1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.
- .2 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly.

3.3 PREPARATION/PROTECTION

- .1 Keep excavations clean, free of standing water, and loose soil.
- .2 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Department Representative approval.
- .3 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.
- .4 Protect buried services that are required to remain undisturbed.

3.4 STRIPPING OF TOPSOIL

- .1 Begin topsoil stripping of areas as indicated after area has been cleared of trees and removed from site.
- .2 Strip topsoil to full depth.
 - .1 Do not mix topsoil with subsoil.
- .3 Stockpile in locations as directed by Departmental Representative.
 - .1 Stockpile height not to exceed 2 m and should be protected from erosion.
- .4 Dispose of unused topsoil as directed by Departmental Representative.

3.5 STOCKPILING

- .1 Stockpile fill materials in areas designated by Departmental Representative.
 - .1 Stockpile granular materials in manner to prevent segregation.
 - .2 Cover stockpile with polyethylene sheeting or tarps.
- .2 Protect fill materials from contamination.
- .3 Implement sufficient erosion and sediment control measures to prevent sediment release off construction boundaries and into water bodies.

3.6 DEWATERING AND HEAVE PREVENTION

- .1 Keep excavations free of water while Work is in progress.
- .2 Dewatering is defined as removal of water from the trench by means of a six inch submersible pump.

3.7 EXCAVATING

- .1 Advise Departmental Representative at least 7 days in advance of excavation operations for initial cross sections to be taken.
- .2 Excavate to lines, grades, elevations and dimensions as indicated on the drawings.
- .3 Do not disturb soil within branch spread of trees or shrubs that are to remain.
 - .1 If excavating through roots, excavate by hand and cut roots with sharp axe or saw.
- .4 Keep excavated and stockpiled materials safe distance away from edge of trench.
- .5 Restrict vehicle operations directly adjacent to open excavators.
- .6 Dispose of surplus and unsuitable excavated material off site.
- .7 Do not obstruct flow of surface drainage or natural watercourses.
- .8 Bottoms of excavations to be undisturbed rock, level, free from loose, soft or organic matter.
- .9 Notify Departmental Representative when bottom of excavation is reached.
- .10 Obtain Departmental Representative's approval of completed excavation.
- .11 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth as directed by Departmental Representative.
- .12 Hand trim, make firm and remove loose material and debris from excavations.
 - .1 Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.
 - .2 Clean out rock seams and fill with concrete mortar or grout to approval of Departmental Representative.
- .13 For trench excavation, unless otherwise authorized by Departmental Representative in writing, do not excavate more than 30 m of trench in advance of installation operations and do not leave open more than 10 m at end of day's operation.

- .1 All open excavation left overnight or during non-construction periods to be fenced with minimum 1.8 m chain-link fence.

3.8 BACKFILLING

- .1 Do not proceed with backfilling operations until completion of following:
 - .1 The Departmental Representative has inspected and approved installations.
 - .2 Inspection, testing, approval, and removal of concrete formwork.
 - .3 Removal of shoring and bracing; backfilling of voids with satisfactory soil material.
- .2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .3 Do not use backfill material which is frozen or contains ice, snow or debris.
- .4 Place backfill material in uniform layers not exceeding 150 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.
- .5 Backfilling around installations:
 - .1 Place bedding and surround material as specified on Drawings.
 - .2 Do not backfill around or over cast-in-place concrete within 24 hours after placing of concrete.
 - .3 Place layers simultaneously on both sides of installed Work to equalize compaction loading. Difference not to exceed 500 mm.
 - .4 Where temporary unbalanced earth pressures are liable to develop on walls or other structures:
 - .1 Permit concrete to cure for minimum 14 days or until it has sufficient strength to withstand earth and compaction pressure and approval obtained from the Departmental Representative.
- .6 Install drainage system in backfill as indicated on Drawings.

3.9 SUBGRADE COMPACTION

- .1 Break material down to sizes suitable for compaction and mix for uniform moisture to full depth of layer.
- .2 Each layer shall be brought to its required degree of compaction throughout its entire width before successive layers are placed.
- .3 Add water or dry as required to bring moisture content of materials to level required to achieve specified compaction.
- .4 For rock placed as fill, compact with large steel wheeled or tracked equipment of sufficient size to break larger particles. Compact until rock fill is stable under compaction equipment and all voids are filled.

3.10 PROOF ROLLING

- .1 Proof roll using a loaded tandem truck with tires inflated to normal operation pressures.
- .2 Proof roll subgrade.

- .3 Make sufficient passes with proof roller to subject surface to three separate passes of loaded tire. Departmental Representative to determine level of proof rolling.
- .4 Where proof rolling reveals areas of defective subgrade:
 - .1 Remove subgrade material to depth and extent as directed by the Departmental Representative.
 - .2 Backfill excavated subgrade with common material and compact in accordance with Section 31 23 33.01 - Excavation and Backfill.
- .5 Where proof rolling reveals areas of defective subgrade, remove and replace in accordance with the appropriate sections. Removal of defective subgrade material shall be the Contractor's responsibility.

3.11 FINISHING

- .1 Shape approach roadbed to within 50 mm of design elevations.
- .2 Round top of back slope as shown on the Drawings.
- .3 Remove rocks over 150 mm in dimension from slopes and ditch bottoms.
- .4 Trim between constructed slopes and edge of clearing to provide drainage.

3.12 PROTECTION

- .1 Maintain finished surfaces in condition conforming to this section until acceptance by the Departmental Representative.

END OF SECTION

Part 1 General

1.1 MEASUREMENT AND PAYMENT

- .1 Measurement and Payment for this Work shall be included in the lump sum bid price. This payment shall be the full compensation necessary to acceptably complete the Work as shown on the drawings and described in this section. No allowance will be made for seams and overlaps.

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM D4491, Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
 - .2 ASTM D4595, Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method.
 - .3 ASTM D4716, Standard Test Method for Determining the (In-Plane) Flow Rate Per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head.
 - .4 ASTM D4751, Standard Test Method for Determining Apparent Opening Size of a Geotextile.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-4.2 No. 11.2, Textile Test Methods - Bursting Strength - Ball Burst Test (Extension of September 1989).
 - .2 CAN/CGSB-148.1, Methods of Testing Geotextiles and Complete Geomembranes.
 - .1 No.2, Methods of Testing Geosynthetics - Mass per Unit Area.
 - .2 No.3, Methods of Testing Geosynthetics - Thickness of Geotextiles.
 - .3 No.6.1, Methods of Testing Geotextiles and Geomembranes - Bursting Strength of Geotextiles Under No Compressive Load.
 - .4 No.7.3, Methods of Testing Geotextiles and Geomembranes - Grab Tensile Test for Geotextiles.
 - .5 No. 10, Methods of Testing Geosynthetics - Geotextiles - Filtration Opening Size.
- .3 Alberta Transportation Standard Specifications
 - .1 Unless otherwise specified, the Geotextile shall conform to the requirement of the Alberta Transportation Standard Specifications for Bridge Construction, Section 10 – Heavy Rock Riprap.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for geotextiles and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Samples:
 - .1 Submit following samples 4 weeks prior to beginning Work.
 - .1 Minimum length of 2 m of roll width of geotextile.
 - .2 Methods of joining.
- .4 Test and Evaluation Reports:
 - .1 Submit copies of mill test data and certificate at least 4 weeks prior to start of Work.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Storage and Handling Requirements:
 - .1 Store and protect geotextiles from direct sunlight and UV rays.
 - .2 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIAL

- .1 Geotextile Filter:
 - .1 Non-woven synthetic fibre fabric, supplies in rolls.
 - .2 Width: 4.57 m minimum.
 - .3 Length: 91 m minimum.
 - .4 Seams: lapped in accordance with manufacturer's recommendations.
 - .5 Physical properties:
 - .1 Tensile strength and elongation (in any principal direction):
 - .1 Tensile strength: minimum 0.9 kN.
 - .2 Mullen burst strength: to CAN/CGSB-4.2, Method 11.1, minimum 2618 kPa, wet condition.
 - .2 Acceptable Material:
 - .1 Armtec "non-Woven" geotextile No. 250 or an approved equivalent for use under landscape rock mulch only.
 - .2 Amoco Propex 4545 "Non-Woven" geotextile or and approved equivalent.

Part 3 Execution

3.1 INSTALLATION

- .1 Place geotextile material by unrolling onto graded surface in orientation, manner and locations indicated and retain in position with weights.
- .2 Place geotextile material smooth and free of tension stress, folds, wrinkles and creases.
- .3 Place geotextile material on sloping surfaces in one continuous length from toe of slope to upper extent of geotextile.
- .4 Overlap each successive strip of geotextile 600 mm over previously laid strip.
- .5 Join successive strips of geotextile by sewing.
- .6 Pin successive strips of geotextile with securing pins at 1500 mm intervals at mid-point of lap.
- .7 Protect installed geotextile material from displacement, damage or deterioration before, during and after placement of material layers.
- .8 After installation, cover with overlying layer within 4 hours of placement.
- .9 Replace damaged or deteriorated geotextile to approval of Departmental Representative.

3.2 PROTECTION

- .1 No vehicles permitted directly on geotextile.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

END OF SECTION

Part 1 General

1.1 MEASUREMENT & PAYMENT

- .1 Measurement and Payment for this Work shall be included in the lump sum bid price. This payment shall be the full compensation necessary to acceptably complete the Work as shown on the drawings and described in this section.

1.2 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 11 - Cleaning.
- .2 Divert left over geotextiles to local plastic recycling facility as approved by Departmental Representative.

Part 2 Products

2.1 STONE

- .1 Hard, dense, with relative density (formally specific gravity) not less than 2.65, durable quarry stone, free from seams, cracks or other structural defects, to meet following size distribution for use intended:
- .1 Heavy rip rap: Rip Rap Class 2 or larger.
- .2 The material provided for each class specified shall have a gradation that conforms to the following:

Size		Class	
		2	3
Nominal Mass (kg)		200	700
Nominal Diameter (mm)		500	800
None greater than:	kg	700	1800
	or mm	800	1100
20% to 50%	kg	300	1100
	or mm	600	900
50% to 80%	kg	200	700
	or mm	500	800
100%	kg	40	200
	or mm	300	500

2.2 GEOTEXTILE FILTER

- .1 Geotextile: in accordance with Section 31 32 19.01 - Geotextiles.

Part 3 Execution

3.1 PLACING

- .1 Where rip-rap is to be placed on slopes, excavate trench at toe of slope to dimensions as indicated.
- .2 Fine grade area to be rip-rapped to uniform, even surface. Fill depressions with suitable material and compact to provide firm bed.
- .3 Place geotextile on prepared surface in accordance with Section 31 32 19.01- Geotextiles and as indicated. Avoid puncturing geotextile. Vehicular traffic over geotextile not permitted.
- .4 Place rip-rap to thickness and details as shown on the drawings.
- .5 Place stones in manner approved by Department Representative to secure surface and create a stable mass. Place larger stones at bottom of slopes.
- .6 Hand placing:
 - .1 Use larger stones for lower courses and as headers for subsequent courses.
 - .2 Stagger vertical joints and fill voids with rock spalls or cobbles.
 - .3 Finish surface evenly, free of large openings and neat in appearance.

END OF SECTION

APPENDIX A

ENVIRONMENTAL IMPACT ASSESSMENT

Environmental Impact Assessment

Salt River Bridge Repairs Wood Buffalo National Park WB15-1002



Report Prepared By:

Sharon Irwin
Resource Management Officer
Wood Buffalo National Park
November 2015

1.0 Project Description

Purpose and Justification

"The bridge was identified for rehabilitation by Public Works and Government Services Canada (PWGSC) and Parks Canada Agency (PCA) due to its poor condition as identified in previous inspection reports. A site inspection performed by Associated Engineering (AE) noted severe deterioration of the abutment concrete and reinforcing steel at the water level. Additionally, there is significant scour and loss of river bed and embankment fill material at the structure location due to high water velocities of the river at the bridge, as the existing hydraulic opening of the bridge constricts the river in high flow events. The inspection also noted that there is no guardrail, the bridge rail is damaged, and furthermore does not meet the current Canadian Highway Bridge Design Code requirements. More minor in nature, narrow cracks in the concrete curbs were identified." (Associated Engineering, 2015)

Scope of Project

This work consists of the rehabilitation of a cast-in-place rigid frame bridge structure with a 9.1m span, a 7.3m clear roadway, and a total length of 25.6m. This bridge is located in Wood Buffalo National Park on the Pine Lake Road approximately 24 Km south of Fort Smith. This site is only accessible from Fort Smith NWT via the Pine Lake Road. The work may begin as early as mid-April 2016, except for in-stream work which is permitted to begin after July 15.

The scope of work shall include the following:

1. Mobilization
2. Dewatering of the site as required to access all areas of deteriorated concrete on the abutment walls, headwalls, and wing walls as indicated by the consultant. It is presumed that this will be done in two stages, once for each abutment. It is estimated that approximately 15m of cofferdam or similar will be required longitudinally in the river and parallel to the abutment headwall. An additional 6m of cofferdam or similar will be required parallel to the abutment wing walls at each corner and up the bank to seal the area off.
3. Construction of a 150 mm thick concrete jacket around the abutments and wingwalls. This shall include, but not be limited to:
 - a. Removal of loose and unsound concrete as indicated by the consultant by means of scabbling and sandblasting of the concrete surface
 - b. Construction of a reinforced concrete jacket around the abutments and wingwalls using a low permeability concrete
 - c. Keeping the abutment area dewatered for a period of time to allow the proper curing of the new concrete jacket.
4. This project will need to address the loss of material at the embankments resulting from scour. Embankment work, restoration of backfill along the spread footings, and bank protection to mitigate high water velocity through the site will be required. This would include armouring the river bank approximately 10 m upstream and downstream of the bridge.
5. Hauling from local pit and placement of heavy rock riprap (Class III, nominal size 800mm, 700Kg) on top of the spread footings and around the base of the abutment and footing as directed by the Consultant. This includes removal of deposited stream material down to the top of the spread footing level.
6. Bridgerail and Guardrail upgrades

Site Description

The Salt River bridge is located in Wood Buffalo National Park on the Pine Lake Road approximately 24 km south of Fort Smith. The bridge is half in and half out of the national park as the boundary runs down the centre of the river. There is a reserve owned by Smith Landing First

Nation on the east banks of the Salt River outside of the park. A rough dirt road follows the river upstream for several kilometres. There is also a reserve owned by Salt River First Nation on the west side of the Salt River (south of the Pine Lake Road) inside of the park. There are signs of past human disturbance on the south side of the road on both sides of the bridge. Gravel may have been extracted in one of these locations. The park maintains a day use area on the escarpment above the Salt River. On the northwest side of the bridge the natural vegetation has been cleared down to the water's edge. This area is used for picnicking and for road maintenance crews to pump water into their trucks. A number of hiking trails start from the day use area and one follows the Salt River for approximately 1 km. Bison are often hunted in this area as they cross the river out of the park. Longnose suckers are netted in the spring during spawning by aboriginal people.

This land system is known as salt flats. The waters of the Salt River are fed by many salt springs. The salinity of the deposits falls very rapidly with increased distance from its source. The drainage is poor with the water table within 0.5 metre of the surface. The vegetation within the salt flats is unique in the park. Saline meadows contain species characteristic of a maritime environment. As the salinity decreases the vegetation becomes similar to that of other areas of the park. Meadows of slender wheatgrass and june grass, with patches of swamp birch and willow, develop on the least saline soils. In higher areas and along drainage channels, there are stands of white spruce, aspen and jackpine. (UMA Engineering, 2005). In the immediate vicinity of the bridge the vegetation is meadow (grasses and forbs) and shrubs (buffaloberry, wild rose, large willows, small white spruce) in the river floodplain and forest stands with the above mentioned species on the escarpments. There are some non-native species around the bridge including yellow sweet clover.

A number of fish species are found in the Salt River, although some species utilize only the lower reaches closer to the Slave River. The list of known species is: Ninespine Stickleback, Northern Pike, Longnose Sucker, White Sucker, Brook Stickleback, Walleye, Spoonhead Sculpin, Inconnu, and Goldeye. The area from the bridge and upstream a couple of hundred metres is used for spawning by Longnose Suckers in May. Black bears are common along the roadside in the spring and are attracted to the bridge area during spawning to feed on the suckers. Bison graze the meadows on either side of the bridge in the summer and fall. Peregrine falcons nest each year approximately 1 km downstream from this crossing. The cliff immediately downstream of the bridge is occupied by a colony of cliff swallows. In spring this section of the river thaws before any of the small lakes and ponds in the area. As a result, gulls, ducks and geese use this stretch of water early in the year. A red-sided garter snake hibernaculum exists a few hundred metres from the site. The snakes emerge in late April or early May then leave for summer feeding sites by the end of May or early June. Many of them swim the river or cross the road close to the bridge to reach a beaver pond a few kilometres outside of the park. The snakes then return to their denning site in late August and early September.

Other mammals that can be expected in this area include the grey wolf, lynx, red fox, snowshoe hare, fisher, marten, ermine, red squirrel and a variety of vole and shrew species. There are also a number of bird species that use this area in spring and summer.

The stream is a shallow banked meandering river within a well-defined wide valley. The water is deeper under the bridge than it is immediately upstream and downstream. The substrate in the vicinity of the bridge is large gravel (around 2") and silt. There are a number of large boulders that have been placed in the water around the abutments of the bridge. Riprap placed previously between abutments has been moved downstream. Banks are comprised of past water borne materials that are susceptible to erosion and changing alignments. The existing bridge and road grade is the controlling structure for alignment and the channel must align with the bridge opening. The structure restricts the channel by 1/2 during periodic high water and up to 90 % during stage floods. Velocities increase significantly through the bridge opening. (UMA Engineering, 2005)

A number of archaeological assessments and cursory investigations have occurred in the vicinity of the Salt River bridge on both sides of the Salt River (Stevenson 1982; Stevenson and Proch 1983; Ferguson 1986; Hems, 2001). Several sites have been located within the immediate vicinity of the Salt River Bridge and the parking / day use area located to the west of the highway on the south (WBNP) side of the Salt River. During Marc Stevenson's 1982 interior survey some inventory was conducted on lands in the vicinity of the 0.4 square kilometres proposed for the Salt River Treaty Entitlement. Pre-contact remains (34R32) including a burin/graver have been documented within 10 meters of the southwest corner of the parking lot of the Salt River picnic area. It is situated on top of a level terrace back from the limestone/gypsum cliffs which borders the Salt River (Stevenson 1982). Another site (34R33) has also been recorded 300-400 metres east of the Salt River Bridge. It is situated in a small clearing on a level terrace just back from the edge of a 5 metre high lime stone cliff overlooking a flood plain meadow. This site has yielded an abundance of pre-contact material including blades, a burin/graver, utilized primary and secondary flakes and hundreds of flakes ranging from primary to tertiary flakes (Stevenson 1982). There also has been inventory work conducted by the University of Alberta associated with Treaty Land Entitlement to the north-west along the east bank of the Salt River. This survey by Theresa Ferguson (1986) recorded 26 historic sites (along a cat-trail to give access to the salt flats). These sites included fireplaces, a lean-to, hunting blinds, tent poles and temporary creek crossings as well as a collapsed cabin associated with Pierre Squirrel. The cabin was likely to have been used between 1900-1960. Most of the sites seem to relate to local hunting activities from the 1940's into the 1960's. One of the fireplace remains also revealed evidence of disturbed pre-contact remains as result of the trail.

2.0 Environmental Impacts

2.1 Environmental Effects

2.1.1 Wildlife - The potential exists for an increase in sensory disturbance to wildlife in the immediate vicinity of the project. The operation of vehicles and equipment will increase noise levels and may result in temporary displacement of some animals from the area. It is expected that most animals that normally frequent the area are habituated to a level of disturbance associated with the road. Species most likely to be sensitive to human noise disturbance, i.e., large carnivores, are most likely to utilize the habitat near the site at night (Heuer, 1995).

The potential exists for wildlife to be attracted to the site through poor food and garbage handling practices.

2.1.2 Vegetation – There may be a loss of vegetation along the riverbank.

2.1.3 Landform – The area around the bridge will be altered to help prevent erosion.

2.1.4 Hydrological Resources

Equipment working in or near the water, including the bucket of a backhoe, has the potential to add toxic substances through leaks, add sediment and mobilize sediment that already exists, alter stream bank vegetation and change stream bottom materials. The subsequent siltation of the creek and the river downstream could lead to degradation of fish and invertebrate habitat, injury to eggs and fish, and a decrease in plant and microorganism growth.

In-stream works such as a coffer dam may create an alteration in water depth or flow causing a disruption in access to fish habitats essential for various life processes within local fish populations such as spawning and rearing.

All loose and unsound concrete will have to be removed from the bridge abutments. Fresh concrete will be used in the repair of abutments. One litre of concrete wash water or leachate in 1000L of water will kill fish. Cement-based products including grouts and concrete are lethal to fish and many other aquatic organisms. Raw product or leachate entering a watercourse will alter water chemistry, making it more basic or alkaline.

2.2 Pollution - There is a potential for fuel leaks or spills from equipment. On site storage of trade waste, garbage and human waste present potential for the introduction of additional pollutants to the local environment.

2.3 Cultural Features

2.3.1 Public Facilities and Services - There may be traffic delays to allow heavy equipment to access the riverbank.

2.3.2 Human Safety - There is a potential hazard to motorists while heavy equipment is maneuvering at the site. There is a potential for workers to come into contact with wildlife such as bison or bears.

2.3.3 Cultural Resources

The Salt River has long been, and still is used as a place to fish during the annual spring spawning run by suckers and associated camps are most likely to be found particularly in this area. While a systematic archeological investigation to assess and record all the sites along the Salt River has yet to occur, there is enough combined information to be able to determine the archaeological potential of the Salt River in general and in particular the area of the Salt River bridge development.

The presence of a pre-contact site at the Salt River Day use area and an historic and pre-contact site east of the bridge, in concert with the identification of so many historic sites north and west is indicative or suggests that this river was used both historically and earlier for resource gathering / hunting / fishing purposes. The archaeological potential within the vicinity of the Salt River Bridge is extremely high, although these heritage resources are only documented by survey and limited testing and therefore the nature and extent of these resources is not well understood, but the potential for resources to exist remains high along both sides of the Salt River.

When the Salt River bridge was originally constructed in the 1960s, there was no prior archaeological assessment of the construction area. Within the immediate construction area, there are areas of prior disturbance created during the original bridge construction project, but it was originally unclear if the proposed bridge impact footprint would be totally or partially confined to previously disturbed areas, particularly along the banks that will be impacted by 'embankment work and restoration of backfill'. This issue has now been clarified by Mark Scanlon P. Eng. Of Associated Engineering (Edmonton AB):

"Associated Engineering performed a thorough review of the site and existing drawings beginning at the Pre-Design phase of the project and we are confident that the work required to acceptably complete the project will not disturb any areas that were not disturbed during construction of the existing Salt River Bridge. We are only placing material for the road re-grading and river bank armouring within the right-of-way and over existing material, and doing no excavating or disturbing existing material in those areas. Minor excavations will be required around the bridge abutments, but none outside the footprint of the original construction" (February 2, 2016).

Additionally, borrow areas will have to be accessed and material removed for cofferdams, rip rapping and grading. As this activity was mentioned, and those borrow areas or access points were not identified in the Scope of Work, there was concern that these locations may have high potential for archeological resources that would be impacted by pit work and access to the borrow area itself. The location of borrow areas have been confirmed to be existing quarry locations with established access routes. Therefore, it is determined that the Salt River bridge project, as proposed has very limited potential to impact on previously undisturbed archaeological resources.

Dewatering portions of the river during the project may present an opportunity to investigate for archaeological resources such as fish weirs or other such structures to be located and recorded that may enhance the understanding of the area.

The Salt River Bridge was built in 1966 and considered a more recent construction within the park with no known heritage or CRM values associated with the bridge itself.

2.3.4 Socio-Economic Impacts - There will be further erosion and damage to the bridge, and therefore greater costs, if it is not repaired at this time.

3.0 Mitigating Measures

3.1 Environmental Effects

3.1.1 Wildlife

1. Work will take place in daylight hours so will reduce the potential for displacement of wildlife due to construction noise and activity.
2. All food and food garbage will be stored in a manner that prevents wildlife access. No food or food garbage will be kept on site overnight.

3.1.2 Vegetation & Landforms

3. Clearing of riparian vegetation should be kept to a minimum: use existing trails or roads wherever possible to avoid disturbance to the riparian vegetation and prevent soil compaction. When practicable, prune or top the vegetation instead of grubbing/uprooting.
4. Minimize the removal of natural woody debris, rocks, sand or other materials from the banks, the shoreline or the bed of the waterbody below the ordinary high water mark. If material is removed from the waterbody, set it aside and return it to the original location once construction activities are completed.
5. Immediately stabilize shoreline or banks disturbed by any activity associated with the project to prevent erosion and/or sedimentation, preferably through re-vegetation with native species suitable for the site.
6. Restore bed and banks of the waterbody to their original contour and gradient; if the original gradient cannot be restored due to instability, a stable gradient that does not obstruct fish passage should be restored.
7. If replacement rock reinforcement/armouring is required to stabilize eroding or exposed areas, then ensure that appropriately-sized, clean rock is used; and that rock is installed

at a similar slope to maintain a uniform bank/shoreline and natural stream/shoreline alignment.

3.1.3 Hydrological Resources

Timing Windows

8. In-stream work should be timed so that it avoids the restricted activity period for fish spawning and incubation. The restricted activity period for the Salt River is: April 16 to July 15.

In-Stream Activities

9. Ensure that all in-water activities, or associated in-water structures, do not interfere with fish passage.
10. Contact the Surveillance Officer if any fish are trapped within an isolated/enclosed area at the work site and need to be safely relocated to an appropriate location in the same waters. Fish may need to be relocated again, should flooding occur on the site.

Dewatering

11. A site specific dewatering plan is required be provided before commencing a pump-out sump to dewater excavation sites with specific details on how and where the water will be discharge.
12. Site specific mitigations may be required depending on the conditions of the discharge area, freezing conditions operation, overflow avoidance, decanting and settlement pond reclamation.
13. Water containing suspended materials shall not be pumped into watercourses, drainage systems or on to land, except with the permission of the Surveillance Officer.
14. Soil and vegetation erosion protection is required for water pumped on to land.
15. Where possible equipment will not be allowed in the water. If it is necessary to have equipment in or near the water the ensuing guidelines should be followed:
 - a) Time spent in the water should be kept to a minimum.
 - b) Carefully select access points through riparian zone.
 - c) Minimize the size and duration of disturbance, preserve streamside vegetation and undergrowth wherever possible.
 - d) Reconstruct and revegetate stream banks to original condition as soon as construction is finished.
 - e) Ensure equipment is clean and in good mechanical order.
 - f) Require use of biodegradable hydraulic fluids for machinery used in water.

Pump Screens

16. In freshwater, fish-bearing waters design and installation of intake end-of-pipe fish screens:
 - o Locate screen in areas and depths of water with low concentrations of fish throughout the year away from natural or artificial structures that may attract fish that are migrating, spawning, or in rearing habitat.
 - o Orient the screen face in the same direction as the flow of water.
 - o Ensure openings in the guides and seals are less than the opening criteria to make "fish tight".

- Screens should be located a minimum of 300 mm (12 in.) above the bottom of the watercourse to prevent entrainment of sediment and aquatic organisms associated with the bottom area.
- Provide structural support to the screen panels to prevent sagging and collapse of the screen. Large cylindrical and box type screens should have a manifold installed to ensure even water velocity distribution across the screen surface. The end of the structure should be made of solid materials and the end of the manifold capped.
- Heavier cages or trash racks can be fabricated out of bar or grating to protect the finer fish screen, especially where debris loading (woody material, leaves, algae mats, etc.) is a concern. A 150 mm (6 in.) spacing between bars is typical.
- Provision should be made for the removal, inspection, and cleaning of screens.
- Ensure regular maintenance and repair of cleaning apparatus, seals, and screens to prevent debris fouling and impingement of fish.
- Pumps must be shut down when fish screens are removed for inspection and cleaning.

Operation of Machinery

17. Ensure that machinery arrives on site in a clean condition and is maintained free of fluid leaks, invasive species and noxious weeds.
18. Whenever possible, operate machinery on land above the high water mark, on ice, or from a floating barge in a manner that minimizes disturbance to the banks and bed of the waterbody.
19. Limit machinery fording of the watercourse to a one-time event (i.e., over and back), and only if no alternative crossing method is available. If repeated crossings of the watercourse are required, construct a temporary crossing structure.
20. Wash, refuel and service machinery and store fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering the water.

Onsite Temporary Concrete Washout Facility

21. Temporary concrete washout facilities shall be located a minimum of 30m from storm drain inlets, open drainage facilities, and watercourses.
22. Temporary concrete washout facilities shall be temporary pit or bermed areas constructed and maintained in sufficient quantity and size to contain all liquid and concrete waste generated by washout operations.
 - a. Straw bales, wood stakes, and sandbag materials can be used to construct temporary containment walls or "barriers".
 - b. Plastic lining material shall be a minimum of 10-mil polyethylene sheeting and shall be free of holes, tears or other defects that compromise the impermeability of the material.
 - c. The soil base shall be prepared free of rocks or other debris that may cause tears or holes in the plastic lining material.
 - d. Perform washout of concrete mixer trucks in designated areas only.
 - e. Wash concrete from mixer truck chutes into approved concrete washout facility or collect in an impermeable bag for disposal.
 - f. Pump excess concrete in concrete pump bin back into concrete mixer truck.

- g. Concrete washout from concrete pumper bins can be washed into concrete pumper trucks and discharged into designated washout area or properly disposed offsite.
- h. Once concrete wastes are washed into the designated area and allowed to harden, the concrete shall be broken up, removed, and disposed of per federal and provincial regulations.

Maintenance and Inspection of Temporary Concrete Washout Facilities

- 23. Temporary concrete washout facilities shall be maintained to provide adequate holding capacity with a minimum freeboard of 100 mm (4 inches) for above grade facilities and 300 mm (12 inches) for below grade facilities.
- 24. Maintaining temporary concrete washout facilities shall include removing and disposing of hardened concrete and returning the facilities to a functional condition.
- 25. Existing facilities must be cleaned, or new facilities must be constructed and ready for use once the washout is 75% full.
- 26. Temporary concrete washout facilities shall be inspected for damage (i.e. tears in PVC liner, missing sand bags, etc.).
- 27. Onsite concrete waste storage and disposal procedures should be monitored at least weekly or as directed by the ESO.

Removal of Temporary Concrete Washout Facilities

- 28. Holes, depressions or other ground disturbance caused by the removal of the temporary concrete washout facilities shall be backfilled and restored.

Onsite Concrete Management

- 29. Rolling concrete mixers with surplus concrete in amounts less than one cubic metre of wet concrete may waste this concrete in the grade right-of-way as directed by the Parks Canada Representative in areas that drain well away from watercourses. Surplus amounts in excess of one cubic metre are to be returned to the batching yard.
- 30. Water contaminated in the placing of cement and curing of concrete shall be contained and removed from the site to an approved disposal facility.
- 31. The concrete batching plant must be operated pursuant to applicable dust, air emission, and water quality control regulations.
- 32. Waste, solidified concrete from rolling concrete mixers in amounts less than 1 cubic meter and waste solidified concrete from construction pour shall be buried in the grade within 48 hours of the pour, subject to approval and direction from the Departmental Representative.

Erosion and Sediment Control

- 33. Schedule work to avoid wet, windy and rainy periods that may increase erosion and sedimentation.
- 34. Develop and implement an Erosion and Sediment Control Plan for the site that minimizes risk of sedimentation of the waterbody during all phases of the project. Erosion and sediment control measures should be maintained until all disturbed ground has been permanently stabilized, suspended sediment has resettled to the bed of the waterbody or settling basin and runoff water is clear. The plan should, where applicable, include:

- a) Installation of effective erosion and sediment control measures before starting work to prevent sediment from entering the water body.
- b) Measures for managing water flowing onto the site, as well as water being pumped/diverted from the site such that sediment is filtered out prior to the water entering a waterbody. For example, pumping/diversion of water to a vegetated area, construction of a settling basin or other filtration system.
- c) Site isolation measures (e.g., silt boom or silt curtain) for containing suspended sediment where in-water work is required.
- d) Measures for containing and stabilizing waste material (e.g., dredging spoils, construction waste and materials, accumulated debris) above the high water mark to prevent re-entry into the waterbody.
- e) Regular inspection and maintenance of erosion and sediment control measures and structures during the course of construction.
- f) Repairs to erosion and sediment control measures and structures if damage occurs.
- g) Removal of non-biodegradable erosion and sediment control materials once site is stabilized.

3.2 Pollution

- 35. Service and maintain all machinery that is required to work near the high water mark to prevent leaks of fuel, lubricants and hydraulic fluids. No vehicle maintenance or repairs will take place on site.
- 36. Fueling will take place on the road, at least 100 metres from the high water mark.
- 37. Storage of any of the above fluids will be at least 100 metres from any watercourse or wetland and stored in a secure manner.
- 38. Any spills or leaks of fuel, hydraulic fluid, oil or other potentially polluting materials will be immediately contained and cleaned up. All such incidents will be reported to the surveillance officer.
- 39. Garbage facilities will be inspected on a regular basis to ensure there is no pollution related impacts. No garbage or construction materials will be left on site after the project is complete. A final site inspection will be undertaken by the project surveillance officer and the contractor's representative.
- 40. Plan activities near water such that materials such as paint, primers, blasting abrasives, rust solvents, degreasers, grout, or other chemicals do not enter the watercourse.
- 41. Develop a response plan that is to be implemented immediately in the event of a sediment release or spill of a deleterious substance and keep an emergency spill kit on site.
- 42. Ensure that building material used in a watercourse has been handled and treated in a manner to prevent the release or leaching of substances into the water that may be deleterious to fish.
- 43. Remove all construction materials from site upon project completion.

3.3 Cultural Features

3.3.1 Public Facilities and Services - Traffic delays will be kept as short as possible.

3.3.2 Human Safety - An appropriate speed reduction will be posted at this location during maintenance. A Health and Safety Plan will be in place for dealing with bears and bison near workers on site.

3.3.3 Cultural Resources

It has been determined that the Salt River bridge project, using the methods as described in the Cultural Resources Impact Assessment request has limited potential to negatively impact on archaeological resources. Therefore an Archaeological Impact Assessment prior to work commencing will not be required. This determination is based largely on the previous archeological information provided that illustrates that although the Salt River was heavily used in prehistory and historic times and the potential risk to negatively impact significant archaeological cultural resources in the vicinity of Salt River is considered to be very high, any resources that may have previously occurred in the footprint of the Salt River Bridge before it was constructed in the 1960's would have been heavily disturbed and/or destroyed during the original bridge construction. Therefore the following limited archaeological requirements outlined below are being set for this project:

1. As mentioned, de-watering two separated portions of the river during the project may present an opportunity to investigate for archaeological resources such as fish weirs or other such structures to be located and recorded that may enhance the understanding of the area. This survey needs to be completed by a qualified archaeologist able to hold a Parks Canada Research and Collection Permit, and communications and scheduling with the contractor are key to fulfilling this requirement. Therefore the proponent and or its contractors should notify HCCD FII Terrestrial Archaeologists of the scheduling of dewatering operations so that arrangements can be made to survey the dewatered areas for archaeological features.
2. **Any change(s)** to the work plan that involve ground disturbance activities that go beyond the original (1960's) construction footprint of the Salt River Bridge must first be reviewed by HCCD archaeologists prior to work commencing.

3.3.4 Socio-Economic Impacts - The repairs will be done as soon as possible to prevent further erosion and damage.

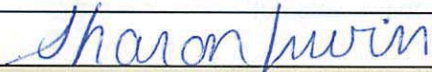
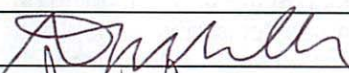
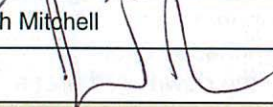
4.0 Surveillance Requirements

A surveillance officer will be assigned to the project. Project surveillance will take place at least twice per week on a random basis for the duration of the project. During operations that have a high potential for aquatic or pollution related impacts, surveillance frequency will be increased. The surveillance officer will maintain a written log to document the implementation of mitigation measures.

If artifacts or features are encountered during the project, construction **activity in that immediate location should be stopped.** Parks Canada's Terrestrial Archaeology Section is to be contacted immediately for further guidance. In order to assess the situation, documentation should include, what was seen, the location of where the material was encountered, what the surrounding soil looked like, how deep it was from the ground surface, or if it was at ground surface. If possible, photographs should be taken and sent along with the description information to the archaeologist. Preferably, artifacts should be left in place until a Parks Canada archaeologist has been consulted.

5.0 Monitoring Requirements

Success of revegetation efforts, if required, will be monitored annually for three years after project completion.

PUBLIC PARTICIPATION		<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes
DECISION			
Taking into account implementation of mitigation measures outlined in the analysis, the project is:			
<input checked="" type="checkbox"/>	Not likely to cause significant adverse environmental effects.		
<input type="checkbox"/>	Likely to cause significant adverse environmental effects.		
SIGNATURES AND APPROVAL			
EA Author			
Name: Sharon Irwin		Title: Resource Management Officer	
Signature 		Date: 2016-02-08	
DECISION APPROVAL			
Name: Stuart Macmillan		Title: Resource Conservation Manager	
Signature 		Date: 08/02/16	
Name: Jonah Mitchell		Title: FU Superintendent	
Signature 		Date: 8 Feb 16	
REFERENCE LIST			
<p>Associated Engineering Alberta Ltd. October 2015. PRELIMINARY DESIGN REPORT: Salt River Bridge Repair Condition Assessment & Rehabilitation Strategy. Prepared for Public Works and Government Services Canada.</p> <p>Ferguson, T. A. 1986. Wood Buffalo National Park Salt Flat-Escarpment Survey-1986: Permit 86-23 Report on file Cultural Resource Services Archaeological Field Services, Parks Canada, Western Canada Service Center, Winnipeg.</p> <p>Fisheries and Oceans Canada. 2013. Measures to avoid causing harm to fish and fish habitat. http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/measures-mesures-eng.html</p> <p>Hems, David. 2001. Memorandum to Suzanne Richards, Environment Assessment Coordinator Ecological Services Western Canada Service Centre. January 29, 2001. On file, Western Canada Service Center, Parks Canada, Winnipeg.</p> <p>Heuer, K. 1995. Wildlife corridors around developed areas of Banff National Park. Parks Canada, Banff Warden Service.</p> <p>Parks Canada, 2000. Environmental Screening Report – Rampart Creek Campground Access Reroute, LLYK Field Unit.</p> <p>Parks Canada. July 2015. Parks Canada national best management practices for roadway, highway, parkway and related infrastructure. http://collaboration/sites/ea/BMP%20Library/Forms/AllItems.aspx</p> <p>Stevenson, Marc. 1982. Wood Buffalo National Park original field notes 1982. Original field notes on file with</p>			

Archaeological Services, Prairie and Northern Region, Winnipeg. WBNP two volumes. Field notes from 1982 field season: Ft. Chip. assessment; Salt River Picnic Site; Parsons Lake Road; Monitor of Peace Pt.; Peace Pt.-Garden Creek road; Rainbow Lakes and road; Peace River to Jackfish River and Slave River Survey.

Stevenson, Marc and Douglas Proch. 1983. Two Years of Archaeological Survey in Wood Buffalo National Park, Alberta-Northwest Territories. Manuscript on file at Archaeological Services, Prairie and Northern Region. WBNP A summary of sites surveyed during the 1980 and 1982 field seasons in Wood Buffalo National Park.

UMA Engineering, 2005. Bridge File Number 00004, Salt River Bridge. Unpublished report, 6pp.

Appendix A – Google Earth Map of Salt River Bridge area



Appendix B

Email from DFO

15-HCAA-00624 Bridge Repair, Salt River, Wood Buffalo National Park
Fisheries Protection
to:
Sharon.Irwin@pc.gc.ca
09/06/2015 10:33 AM
Show Details

Dear Sharon:

Subject: Bridge Repair, Salt River, Wood Buffalo National Park
15-HCAA-00624

The Fisheries Protection Program (the Program) of Fisheries and Oceans Canada received your proposal to make repairs to a bridge on Salt River on May 19, 2015.

Based on the information provided, your proposal has been identified as a project where impacts can be avoided or mitigated by following standard measures.

Serious harm to fish is prohibited under subsection 35(1) of the Fisheries Act, and impacts to aquatic species at risk and their habitats, are prohibited under sections 32, 33 and 58 of the Species at Risk Act. Where such impacts can be avoided, further review by DFO is not required and these projects are not considered as requiring an authorization under the Fisheries Act or the Species at Risk Act in order to proceed.

In order to remain in compliance with these Acts, it is recommended that you follow our guidance tools which can be found at the following website <http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/index-eng.html>). It remains your responsibility to meet the other requirements of federal, provincial and municipal agencies.

It remains your responsibility to ensure you avoid causing serious harm to fish in compliance with the Fisheries Act, and that you meet the requirements under the Species at Risk Act as it may apply to your project. Should your plans change or if you have omitted some information in your proposal such that your proposal meets the criteria for a site specific review, as described on our website, (<http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html>) you should complete and submit the request for review form that is also available on the website.

Please be advised that it is also your Duty to Notify DFO if you have caused, or are about to cause, serious harm to fish that are part of or support a commercial, recreational or Aboriginal fishery. Such notifications should be directed to <http://www.dfo-mpo.gc.ca/pnw-ppe/violation-infraction/index-eng.html>.

Should you have any questions or concerns about the compliance of your proposal with the Fisheries Act and/or those prohibitions of the Species at Risk Act that apply to listed aquatic species, you may wish to engage an environmental professional familiar with measures to avoid impacts to fish and fish habitat (<http://www.dfo-mpo.gc.ca/pnw-ppe/env-pro-eng.html>).

Yours sincerely,

Jennifer Thomas
A/Team Leader, Triage and Planning
Fisheries and Oceans Canada

Fisheries and Oceans Canada has changed the way new project proposals(referrals), reports of potential Fisheries Act violations (occurrences)and information requests are managed in Central and Arctic Region(Alberta, Saskatchewan, Manitoba, Ontario, Nunavut and the Northwest Territories). Please be advised that general information regarding the management of impacts to fish and fish habitat and self-assessment tools(e.g. Measures to Avoid Harm) that enable you to determine Fisheries Act requirements are available at DFO's "Projects Near Water" website at www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html. For all occurrence reports, or project proposals where you have determined, following self-assessment, that you cannot avoid impacts to fish and fish habitat, please submit to fisheriesprotection@dfo-mpo.gc.ca. For general inquiries call 1 855 852-8320.

-----Original Message-----

From: Sharon.Irwin@pc.gc.ca [mailto:Sharon.Irwin@pc.gc.ca]
Sent: May-19-15 4:03 PM
To: Fisheries Protection
Subject: Request for Review - Salt River Bridge Repair

(See attached file: Salt River Photo.pdf)(See attached file: Salt River Scope of Work.doc)(See attached file: GoogleEarth_SaltRiver_close.jpg)(See attached file: GoogleEarth_SaltRiver_far.jpg)(See attached file: DFO_Request_Review_SaltRiverBridgeRepair_May2015.pdf)

Sharon Irwin
Resource Management Officer / Agente de gestion des ressources Wood
Buffalo National Park / Parc national du Canada Wood Buffalo
Box 750, Fort Smith, NT, X0E 0P0
Telephone (867)-872-7948 Fax (867)-872-3910
Government of Canada / Gouvernement du Canada



Request for Review

A) Contact information

Name of Business/Company:

Wood Buffalo National Park

Name of Proponent:

Lindsay Wasylyshyn

Mailing address:

P.O. Box 750

City/Town:

Fort Smith

Province/Territory:

NT

Postal Code:

X0E 0P0

Tel. No. :

867-872-7924

Fax No.:

867-872-3910

Email:

lindsay.wasylyshyn@pc.gc.ca

Select additional contact:

Contractor/Agency/Consultant (if applicable):

Mailing address:

City/Town:

Province/Territory:

Postal Code:

Tel. No. :

Fax No.:

Email:

Is the Proponent the main/primary contact? ☐ Yes ☒ No

If no, please enter information for the primary contact or any additional contact.

Sharon Irwin, 897-872-7948, sharon.irwin@pc.gc.ca



B) Description of Project

If your project has a title, please provide it.

Salt River Bridge Repair

Is the project in response to an emergency circumstance*? ☐ Yes ☒ No

Does your project involve work in water? ☒ Yes ☐ No

If yes, is the work below the High Water Mark*? ☒ Yes ☐ No

What are you planning to do? Briefly describe all project components you are proposing in or near water.

1. Partial depth repairs of all deteriorated concrete as indicated by the consultant on the abutment walls, headwalls, and wingwalls. This shall include, but not be limited to:
 - a. Sawcutting of the deteriorated areas of concrete to a 25mm depth as indicated by the consultant
 - b. Jackhammering, chipping, or scabbling of all areas of deteriorated concrete to a depth of 25mm below the rebars.
 - c. Removal and replacement of any rebar exhibiting sectional loss of 20% or greater.
 - d. Sandblasting of the concrete and rebar down to white metal in the areas of concrete to be repaired.
 - e. Recasting of the concrete repair areas to the original neat lines or to provide a minimum 25mm of cover over any rebar using a patching material approved by the Consultant
 - f. Keeping the area of concrete repair dewatered for a period of time to allow the proper curing of the patching material.
2. Repair of incorrect lapping of the flexbeam bridgerail at two locations.
3. Supply and installation of additional layer of galvanized flex-beam material on the bridgerail areas.
4. Supply and installation of 30.0m of deep beam guardrail at each sides of each approach to the bridge (120.0m total). This includes tying the guardrail into the flex-beam bridgerail with approved connections and proper turn down end terminations.
5. Hauling from local pit and placement of heavy rock riprap (Class III, nominal size 800mm, 700Kg) on top of the spread footings and around the base of the abutment and footing as directed by the Consultant. This includes removal of deposited stream material down to the top of the spread footing level.
6. Miscellaneous repairs:
 - a. Replacement of one broken bridgerail "U" bolt anchorage. This is not limited to but shall include:
 - i. Sawcutting around the affected area as directed by the Consultant to a depth of 25mm.
 - ii. Removal by chipping or jackhammering of the surrounding concrete to a depth of 25mm behind or below rebar.
 - iii. Replacement of the bridgerail "U" bolt anchorage unit with new material.
 - iv. Sandblasting of the repair area to provide proper anchorage of the patching material.
 - v. Recasting of the concrete repair area to the original neat lines or to provide a minimum 25mm of cover over any rebar using a patching material approved by the Consultant.
 - vi. Keeping the area of concrete repair dry for a period of time to allow the proper curing of the patching material.
 - b. Replace one missing bridgerail to post bolt.
 - c. Replace one missing bridgerail to post timber spacing block.

How are you planning to do it? Briefly describe the construction materials, methods and equipment that you plan to use.

1. Dewatering of the site as required to access all areas of deteriorated concrete on the abutment walls, headwalls, and wingwalls as indicated by the consultant. It is presumed that this will be done in two stages, once for each abutment. It is estimated that 12m of cofferdam or similar will be required longitudinally in the river and parallel to the abutment headwall. An additional 6m of cofferdam or similar will be required parallel to the abutment wingwalls at each corner and up the bank to seal the area off.
2. Equipment to be used: jackhammers, sandblasters, drills, saws, loaders, backhoes, shovels, trucks, etc.

Include a site plan (figure/drawing) showing all project components in and near water.



Are details attached? ☐ Yes ☒ No

Identify which work categories apply to your project.

- | | |
|---|--|
| <input type="checkbox"/> Aquaculture Operations | <input type="checkbox"/> Log Handling / Dumps |
| <input type="checkbox"/> Aquatic Vegetation Removal | <input type="checkbox"/> Log Removal |
| <input type="checkbox"/> Beaches | <input type="checkbox"/> Moorings |
| <input type="checkbox"/> Berms | <input type="checkbox"/> Open Water Disposal |
| <input type="checkbox"/> Blasting / Explosives | <input type="checkbox"/> Piers |
| <input type="checkbox"/> Boat Houses | <input type="checkbox"/> Riparian Vegetation Removal |
| <input type="checkbox"/> Boat Launches / Ramps | <input type="checkbox"/> Seismic Work |
| <input type="checkbox"/> Breakwaters | <input type="checkbox"/> Shoreline Protection |
| <input checked="" type="checkbox"/> Bridges | <input type="checkbox"/> Stormwater Management Facilities |
| <input type="checkbox"/> Cable Crossings | <input type="checkbox"/> Surface Water Taking |
| <input type="checkbox"/> Causeways | <input type="checkbox"/> Tailings Impoundment Areas |
| <input type="checkbox"/> Culverts | <input type="checkbox"/> Temporary Structures |
| <input type="checkbox"/> Dams | <input type="checkbox"/> Turbines |
| <input type="checkbox"/> Dewatering / Pumping | <input type="checkbox"/> Water Control Structures |
| <input type="checkbox"/> Docks | <input type="checkbox"/> Water Intakes / Fish Screens |
| <input type="checkbox"/> Dredging / Excavation | <input type="checkbox"/> Water Outfalls |
| <input type="checkbox"/> Dykes | <input type="checkbox"/> Watercourse Realignment |
| <input type="checkbox"/> Fishways / Ladders | <input type="checkbox"/> Weirs |
| <input type="checkbox"/> Flow Modification (hydro) | <input type="checkbox"/> Wharves |
| <input type="checkbox"/> Groundwater Extraction | <input type="checkbox"/> Wind Power Structures |
| <input type="checkbox"/> Groynes | |
| <input type="checkbox"/> Habitat Restoration | |
| <input type="checkbox"/> Ice Bridges | <input type="checkbox"/> Other Please Specify <input type="text"/> |

Was your project submitted for review to another federal or provincial department or agency? ☐ Yes ☒ No

If yes, indicate to whom and associated file number(s).

C) Location of the Project

Coordinates of the proposed project Latitude N Longitude W

OR UTM zone ; Easting
 Northing

Include a map clearly indicating the location of the project as well as surrounding features.

Name of Nearest Community (City, Town, Village):

Fort Smith

Municipality, District, Township, County, Province:

AB



Name of watershed (if applicable):

Slave River

Name of watercourse(s) or waterbody(ies) near the proposed project:

Salt River

Provide detailed directions to access the project site:

23 km south of Fort Smith on Pine Lake Road

D) Description of the Aquatic Environment

Identify the predominant type of aquatic habitat where the project will take place.

- ☐ Estuary (Estuarine)
- ☐ Lake (Lacustrine)
- ☐ On the bank/shore at the interface between land and water (Riparian)
- ☒ River or stream (Riverine)
- ☐ Salt water (Marine)
- ☐ Wetlands (Palustrine)

Provide a detailed description of biological and physical characteristics of the proposed project site.

The Salt River bridge is located in Wood Buffalo National Park on the Pine Lake Road approximately 24 km south of Fort Smith. The bridge is half in and half out of the national park as the boundary runs down the centre of the river. There is a reserve owned by Smith Landing First Nation on the east banks of the Salt River outside of the park. A rough dirt road follows the river upstream for several kilometres. There is also a reserve owned by Salt River First Nation on the west side of the Salt River (south of the Pine Lake Road) inside of the park. There are signs of past human disturbance on the south side of the road on both sides of the bridge. Gravel may have been extracted in one of these locations. The park maintains a day use area on the escarpment above the Salt River. On the northwest side of the bridge the natural vegetation has been cleared down to the water's edge. This area is used for picnicking and for road maintenance crews to pump water into their trucks. A number of hiking trails start from the day use area and one follows the Salt River for approximately 1 km. Longnose suckers are netted in the spring during spawning by aboriginal people.

This land system is known as salt flats. The waters of the Salt River are fed by many salt springs. The flow is natural with a peak in flow in spring as the ice is melting off the river. The water level drops throughout the summer with temporary swells from rain events. The salinity varies with season and precipitation. A researcher measured the conductivity in 1999 at 27,540 mS/cm. The drainage is poor with the water table within 0.5 metre of the surface. Meadows of slender wheatgrass and June grass, with patches of swamp birch and willow, develop on the least saline soils. In higher areas and along drainage channels, there are stands of white spruce, aspen and jack pine. In the immediate vicinity of the bridge the vegetation is meadow (grasses and forbs) and shrubs (buffaloberry, wild rose, large willows, small white spruce) in the river floodplain and forest stands with the above mentioned species on the escarpments. There are some non-native species around the bridge including yellow sweet clover.

A number of fish species are found in the Salt River, although some species utilize only the lower reaches closer to the Slave River. The list of known species is: Ninespine Stickleback, Northern Pike, Longnose Sucker, White Sucker, Brook Stickleback, Walleye, Spoonhead Sculpin, Inconnu, and Goldeye. Longnose Suckers spawn in the vicinity of the bridge in May. They spawn in deeper spots where there is a gravel bottom. In low water years they spawn right under the bridge (H. Beaver, pers.comm., May 15, 2015).

The stream is a shallow banked meandering river within a well-defined wide valley. The water is deeper under the bridge than it is immediately upstream and downstream. The substrate in the vicinity of the bridge is large gravel (around 2") and silt. There are a number of large boulders that have been placed in the water around the abutments of the bridge. Riprap placed previously between abutments has been moved downstream. Banks are comprised of past water borne materials that are susceptible to erosion and changing alignments. The existing bridge and road grade is the controlling structure for alignment and the channel must align with the bridge opening. The structure restricts the channel by 1/2 during periodic high water and up to 90 % during stage floods. Velocities increase significantly through the bridge opening.



Include representative photos of affected area (including upstream and downstream area) and clearly identify the location of the project.

E) Potential Effects of the Proposed Project

Have you reviewed the Pathways of Effects (PoE) diagrams (<http://www.dfo-mpo.gc.ca/pnw-ppe/pathways-sequences/index-eng.html>) that describe the type of cause-effect relationships that apply to your project?

☒ Yes ☐ No

If yes, select the PoEs that apply to your project.

- | | |
|--|--|
| <input type="checkbox"/> Addition or removal of aquatic vegetation | <input checked="" type="checkbox"/> Placement of material or structures in water |
| <input type="checkbox"/> Change in timing, duration and frequency of flow | <input checked="" type="checkbox"/> Riparian Planting |
| <input checked="" type="checkbox"/> Cleaning or maintenance of bridges or other structures | <input type="checkbox"/> Streamside livestock grazing |
| <input type="checkbox"/> Dredging | <input type="checkbox"/> Structure removal |
| <input type="checkbox"/> Excavation | <input type="checkbox"/> Use of explosives |
| <input type="checkbox"/> Fish passage issues | <input type="checkbox"/> Use of industrial equipment |
| <input type="checkbox"/> Grading | <input checked="" type="checkbox"/> Vegetation Clearing |
| <input type="checkbox"/> Marine seismic surveys | <input type="checkbox"/> Wastewater management |
| <input type="checkbox"/> Organic debris management | <input type="checkbox"/> Water extraction |
| <input type="checkbox"/> Placement of marine finfish aquaculture site | |

Will there be changes (i.e., alteration) in the fish habitat*? ☒ Yes ☐ No ☐ Unknown

If yes, provide description.

Temporarily during repair of concrete abutments

Will the fish habitat alteration be permanent*? ☐ Yes ☒ No ☐ Unknown

Is there likely to be destruction or loss of habitat used by fish? ☐ Yes ☒ No ☐ Unknown

What is the footprint (area in square meters) of your project that will take place below the high water mark*?

200 sq. meters

Is your project likely to change water flows or water levels? ☒ Yes ☐ No ☐ Unknown

If your project includes withdrawing water, provide source, volume, rate and duration.

If your project includes water control structure, provide the % of flow reduction.

If your project includes discharge of water, provide source, volume and rate.

Will your project cause death of fish? ☐ Yes ☒ No ☐ Unknown

If yes, how many fish will be killed (for multi-year project, provide average)? What species and lifestages?



Are there aquatic species at risk (http://www.sararegistry.gc.ca/species/aquatic_e.cfm) present? If yes, which ones?

No

What is the time frame of your project?

The construction will start on 07/16/2016

and end by 09/30/2016

If applicable, the operation will start on MM/DD/YYYY

and end by MM/DD/YYYY

If applicable, provide schedule for the maintenance

If applicable, provide schedule for decommissioning

Are there additional effects to fish and fish habitat that will happen outside of the time periods identified above?

☐ Yes

☒ No

(If yes, provide details)

Have you considered and incorporated all options for redesigning and relocating your project to avoid negative effects to fish and fish habitat?

☒ Yes ☐ No

If yes, describe.

Have you consulted DFO's Measures to Avoid Harm to Fish and Fish Habitat (<http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/index-eng.html>) to determine which measures apply to your project?

☒ Yes ☐ No

Will you be incorporating applicable measures into your project? ☒ Yes ☐ No

If yes, identify which ones. If No, identify which ones and provide reasons.

- Time work in water to respect timing windows
- Conduct instream work during periods of low flow
- Undertake all instream activities in isolation of open or flowing water
- Develop a response plan that is to be implemented immediately in the event of a sediment release or spill of a deleterious substance and keep an emergency spill kit on site.
- Develop and implement an Erosion and Sediment Control Plan for the site that minimizes risk of sedimentation of the waterbody during all phases of the project.
- Clearing of riparian vegetation should be kept to a minimum.
- If replacement rock reinforcement/armouring is required to stabilize eroding or exposed areas, then ensure that appropriately-sized, clean rock is used; and that rock is installed at a similar slope to maintain a uniform bank/shoreline and natural stream/shoreline alignment.
- Remove all construction materials from site upon project completion.
- Ensure that all in-water activities, or associated in-water structures, do not interfere with fish passage, constrict the channel width, or reduce flows.
- Screen any water intakes or outlet pipes.
- Ensure that machinery arrives on site in a clean condition and is maintained free of fluid leaks, invasive species and noxious weeds.



• Operate machinery on land above the high water mark in a manner that minimizes disturbance to the banks and bed of the waterbody.
• Wash, refuel and service machinery and store fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering the water.

Have you considered and incorporated additional best practices and mitigation measures recommended in relevant guidelines to avoid negative effects to fish and fish habitat?

☒ No ☐ Yes

If Yes, include a list of the guidelines being used to avoid negative effects to fish and fish habitat.

Are there any relevant best practices or mitigation measures that you are unable to incorporate? ☐ Yes ☒ No

(If yes, identify which ones.)

Can you follow appropriate Timing Windows (<http://www.dfo-mpo.gc.ca/pnw-ppe/timing-periodes/index-eng.html>) for all your project activities below the High Water Mark*?

☒ Yes ☐ No

(If no, provide explanations.)

What residual effects to fish and fish habitat do you foresee after taking into account the avoidance and mitigation measures described above?

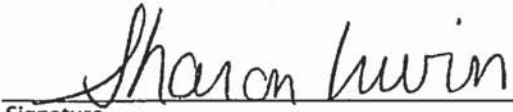
None



F) Signature

I, Sharon Irwin

(print name) certify that the information given on this form is to the best of my knowledge, correct and completed.


Signature

04/05/2015

Date

Information about the above-noted proposed work or undertaking is collected by DFO under the authority of the *Fisheries Act* for the purpose of administering the fisheries protection provisions of the *Fisheries Act*. Personal information will be protected under the provisions of the *Privacy Act* and will be stored in the Personal Information Bank DFO-PPU-680. Under the *Privacy Act*, Individuals have a right to, and on request shall be given access to any personal information about them contained in a personal information bank. Instructions for obtaining personal information are contained in the Government of Canada's Info Source publications available at www.infosource.gc.ca or in Government of Canada offices. Information other than "personal" information may be accessible or protected as required by the provision of the *Access to Information Act*.

*All definitions are provided in Section G of the *Guidance on Submitting a Request for Review*