

## **1. SPECIAL PROVISIONS**

### **1.1 STANDARD SPECIFICATIONS AND STANDARD DRAWINGS**

#### **1.1.1 Standard Specifications for Highway and Bridge Construction Work**

The specifications for highway and bridge construction work, which shall form part of the Contract Agreement, are published in the following Government of Northwest Territories manuals:

- Standard Specifications for Highway Construction – 2021;
- Standard Specifications for Bridge Construction – Edition 1, 2021.

### **1.2 STANDARD DRAWINGS**

In addition to the separate drawings referenced in the specifications, the following standard drawings shall apply:

<b>Northwest Territories Transportation Standard Drawings</b>	
<b>Drawing No.</b>	<b>Drawing Title</b>
SD-200-02-12	TYPICAL SIGN INSTALLATION HEIGHT AND LATERAL LOCATIONS
SD-200-02-13	BREAKAWAY SIGN POST (TYPICAL) INSTALLATION DETAILS)
SD-300-06-01	BENCHING FOR EMBANKMENT WIDENING
SD-400-01-51	STANDARD SLOPED END SECTIONS (C.S.P. ROUND CULVERTS)
SD-400-01-53	TYPICAL SLOPED END CULVERT MARKER INSTALLATION
SD-700-04-01	STEEL W-BEAM GUARDRAIL RAIL DETAIL
SD-700-04-02	STEEL W-BEAM GUARDRAIL BURIED TERMINALS INSTALLATION DETAIL
SD-700-04-04	STEEL W-BEAM GUARDRAIL POST CAP DETAILS
SD-700-04-05	STEEL W-BEAM GUARDRAIL PLACEMENT AT BRIDGE APPROACHES (TWO-LANE TRAFFIC)
<b>Alberta Transportation Standard &amp; Typical Drawings</b>	
<b>Drawing No.</b>	<b>Drawing Title</b>
S-1411-87-REV6	STANDARD CONCRETE JOINTS
S-1642-20	TL-4 DOUBLE TUBE TYPE BRIDGERAIL - BRIDGERAIL DETAILS
S-1643-20	TL-4 DOUBLE TUBE TYPE BRIDGERAIL - APPROACH RAIL TRANSITION DETAILS WITH STRONG POST W-BEAM GUARDRAIL
S-1847-20	STANDARD IDENTIFICATION PLAQUES AND BENCHMARK TABLETS
S-1850-20	STANDARD STEEL PILE DETAILS
T-1761-20	STANDARD IDENTIFICATION PLAQUES AND BENCHMARK TABLETS

### **1.3 REFERENCE DRAWINGS**

The following Record Drawings of the existing bridge are included with these documents for reference purposes only. The Department provides no warranty, express or implied, that these reference drawings are accurate, correct, or complete. Use of these reference drawings shall be at the sole risk of the Contractor, and no claims will be entertained for issues resulting from errors contained in these reference drawings.

<b>Drawing No.</b>	<b>Drawing Title</b>
100-21-700 Sheet 1	General Layout
100-21-700 Sheet 2	North & South Abutments Concrete Details
100-21-700 Sheet 3	North & South Abutments Reinforcing Details
100-21-700 Sheet 4	120'-0 Pony Truss
100-21-700 Sheet 5	Deck Details
100-21-700 Sheet 6	Schedules

### **1.4 CONTRACT INFORMATION DOCUMENTS**

Contract Information Documents including, but not limited to, geotechnical report, hydrotechnical report, miscellaneous documents, and reference drawings that may have been provided to the Contractor, or made available to the Contractor for viewing during the tender period shall not be considered part of the Contract documents.

The Contractor is not entitled to rely upon the factual information or factual data in any Contract Information Document, nor any opinions or interpretations contained therein. Contract Information Documents shall not be considered accurate, complete or appropriate, and are made available solely for the purpose of providing the Bidder with access to the information available to the Department.

### **1.5 ENGINEER**

Transportation Division, Department of Infrastructure

Government of the Northwest Territories  
2nd Floor, 5015 49th Street  
Box 1320, Yellowknife NT, X1A 2L9

### **1.6 CONSULTANT**

Jacobs  
First Tower, Suite 2700, 411 – 1 Street SE  
Calgary, Alberta, T2G 4Y5

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## **1.7 SCOPE OF WORK**

### **1.8 GENERAL**

Jean Marie River is located at Highway No.1 (Mackenzie Highway) km 411.2 km, near the south of the junction to Hwy 7, and is approximately 65 km south of Fort Simpson, Northwest Territories. Constructed in 1969, the existing highway bridge consists of a single span half through (pony) truss bridge over the Jean Marie River with span length of 36.58 m. The bridge is built square to the highway (0° skew) with a clear roadway width of 8.53 m. Location map and bridge photos are attached in Appendix A.

The scope of work for this project includes removal and disposal of the existing bridge structure and construction of a new single span bridge structure, as well as erosion control, grading, surfacing construction, temporary detour road with a temporary bridge structure and related roadway approach work on Highway No.1 along the approaches to the new Jean Marie River Bridge.

Unless otherwise specified, the Contractor shall supply all materials necessary to complete the Work. A complete job is called for, therefore any labour, material, equipment, tool or incidental item not specifically mentioned, but necessary for completeness will be considered incidental to the Work, and no separate or additional payment will be made.

The scope of work for this project includes, but is not limited to, the following:

- Mobilization and Demobilization
- Development of an Environmental Construction Operation (ECO) Plan for the construction and carrying out of the work in accordance with the accepted plan. The ECO Plan shall include erosion and sediment control measures during the construction, watercourse protection measures, and considerations to protect aquatic life, wildlife and Species at Risk in the area and their habitats
- Development and maintenance of the traffic accommodation plan during all stages of construction
- Development and execution of a construction waste recycling program for concrete, steel, and waste water from demolition activities
- Provision of all surveys required during the Work
- Road Construction and Erosion Control as Subsection of 1.7.2 of this Special Provision
- Bridge Construction as Subsection of 1.7.3 of this Special Provision

### **1.9 ROAD CONSTRUCTION AND EROSION CONTROL**

The Work consists of grading and surfacing construction and related Work on Highway No.1 and related access roads. The scope of work shall include, but is not limited to the following:

- Stripping, clearing and grubbing

- Grading including common excavation
- Embankment construction from road common excavation and borrow excavation
- Subgrade preparation
- Granular base course construction
- Granular subbase course construction
- Double asphaltic surface treatment construction (chip seal)
- Culvert removals and installation of new culverts
- Placement of topsoil and hydroseeding
- Sign removal and installation of new traffic signs
- Removal of steel guardrails, concrete barriers and installation of new steel W-Beam Guardrails
- Temporary roadway line marking
- Detour road with a temporary bridge and traffic signals for Single Lane Alternating Traffic (SLAT) over temporary bridge

#### **1.10 BRIDGE CONSTRUCTION**

Work includes the construction of a single span bridge structure (Jean Marie River Bridge) carrying Highway No.1 over the Jean Marie River at above mentioned location and the removal of the existing bridge structure. The scope of work for this project shall include, but is not limited to, the following:

- Removal and disposal of existing bridge
- Construction of head slopes and side slopes
- Excavation
- Backfill
- Supply, delivery, and installation of steel H-piles for abutments and approach slab sleeper beams
- Supply, delivery, and erection of precast concrete elements including deck panels, abutment seats, abutment diaphragms, wing walls, approach slabs, and approach slab sleeper beams
- Construction of concrete abutments including connections between precast concrete abutment seat elements and piles, casting shear blocks on abutment seats, connections between girders and precast concrete abutment diaphragms, and wingwalls
- Supply, delivery, and installation of bridge bearings
- Supply, delivery and erection of structural steel girders
- Construction of concrete deck including connections between precast concrete deck elements, girders and abutment diaphragms
- Construction of approach slab sleeper beams including connection with piles

- Construction of concrete approach slabs including connections between precast concrete approach slab elements and abutment diaphragms
- Supply, delivery, and installation of bridgerails and approach rail transitions
- Supply, delivery, and installation of safety rails
- Supply and placement of reinforcing steel
- Install drain troughs
- Miscellaneous iron
- Supply and application of concrete sealers.
- Heavy rock riprap

#### **1.11 CONSTRUCTION SCHEDULING AND INTERIM COMPLETION DATES**

The site will be available for commencement of mobilization any time after the Contract has been awarded. The Contractor's operations shall be subject to the following interim and contract completion dates:

- Temporary detour road with a temporary bridge shall be completed and open to public detour traffic by **DATE**;
- The new bridge, with approach roadway works shall be completed and open to public traffic by **DATE**;
- All remaining Work, site restoration, and cleanup shall be completed by **DATE**;

Should work fail to progress according to the approved progress schedule, the Contractor shall be required to modify and resubmit the work schedule accordingly in order to meet completion deadlines provided. The Contractor may consider working additional time (including weekends and holidays) in accordance with Bylaws, employ additional workers or both, as may be required to bring the work back to schedule, at no additional cost to the Department.

All work shall be in accordance with existing Bylaws.

The Contractor is advised that the Department's offices will be closed for Christmas holidays from **Dec 21, 2024 until Jan 2, 2025, and Dec 21, 2025 until Jan 2, 2026**, inclusive. The contractor shall be responsible for maintaining the construction site for all activities including but not limited to safe traffic operations during the holiday period.

#### **1.12 PRE-CONSTRUCTION REQUIREMENTS**

Each bidder, by submitting a tender, acknowledges that the Drawings, Specifications, permits, supplemented information including geotechnical information, and Contract Documents under this contract has been examined and that every detail of the scope and intent of the Work required is understood. Each bidder further acknowledges that the site and surrounding area was examined and that all conditions and any restrictions which could affect or limit operation during construction such as environmental constraints, public traffic, and surrounding property issues are known.

The Contractor and his sub-contractors shall attend a pre-construction meeting at which time the

required pre-construction documentation will be discussed. At least 14 calendar days prior to this meeting, the Contractor shall submit all specified pre-construction documentation as follows to the Engineer for review and acceptance:

- Detailed construction schedule
- Traffic accommodation strategy
- Safety program
- Environmental Construction Operations (ECO) plan
- Proposed waste recycling program for steel, concrete and waste water and any other construction wastes
- Proposed work methods and sequence
- Quality Control Program
- List of sub-contractors and their respective tasks
- Selection of precast concrete fabricator(s)
- Selection of steel girder fabricators
- Selection of bearings
- 5-year written warranty letter for bearings which will be effective from the date of final completion of the project.

### **1.13 SCHEDULED CONSTRUCTION MEETINGS**

The Contractor shall be responsible for scheduling, coordinating and hosting site construction meetings with the Engineer. These meetings shall be held at the Contractor's site office or at a location determined by the Engineer.

The purpose of these meetings will be for the full and complete coordination of the work.

Meetings shall normally be held bi-weekly unless unscheduled meetings are required by the Contractor, the Consultant, or the Department to discuss specific issues. The Contractor will take and distribute minutes of the meetings within one week after the meeting.

All costs associated with these meetings will be considered incidental to the work and no separate or additional payment will be made.

### **1.14 SITE OFFICE**

The Contractor shall provide a site office for the Engineer for the entire project duration; which shall include the following items:

- The Engineer should have an office separate from the Contractor's office;
- A meeting area with a table and chairs to accommodate 10 people;
- Office shall include a whiteboard, approximately 1,220 mm x 2,440 mm, with a minimum of 4 different coloured markers installed in the meeting room;

- Office shall be equipped with 2 desks and 2 adjustable high back chairs on casters, one 2-drawer file cabinet;
- Office shall be equipped with 2 waste bin containers, a first aid kit and certified fire extinguisher;
- Security bars shall be installed across window openings;
- Office shall be equipped with a thermostat-controlled air conditioner and furnace;
- Gravel access road and parking area to accommodate approximately 2 cars;
- Potable drinking water supply shall be made available;
- Office shall be equipped with a holding type toilet and hand wash facility with weekly maintenance; and
- Phone and high-speed internet connection for at least 2 personnel. Contact NWTEL for Phone & Internet line connection or contractor shall establish, operate and maintain an adequate satellite phone/internet system on the project as necessary to undertake the Work.

The cost of providing the site office with the above mentioned additional requirements and with all the associated costs shall be considered incidental to the Work and no separate or additional payment will be made.

### **1.15 CONSTRUCTOR'S CONSTRUCTION SCHEDULE AND SUBMISSION**

#### **1.15.1 Submission Requirements**

Within ten days of award of Contract, the Contractor shall submit a detailed construction progress schedule to the Department. The schedule shall meet minimum requirement as follows:

- Prepare the schedule using critical path method techniques.
- Prepare the schedule in the form of a horizontal bar chart showing activity restraints, duration of activity, early and late start and finish dates, and float.
- Provide a separate bar for each operation.
- The schedule shall include column for percentage (%) completed for each major task.
- Provide a horizontal time scale identifying the first day of the week.
- Clearly identify the staging required to complete the Work. Submit separately a narrative describing the plan for the Work.
- Identify any activities required from the Engineer.
- Identify hours worked per week for each activity.
- Identify project milestones.
- Identify percent complete for all major activities in subsequent schedules.

The Engineer will review the schedule and provide comments within ten working days after receipt.

If any revisions are required, the contractor shall submit the updated schedule within five working days after receipt of comments.

### **1.15.2 Schedule Monitoring and Updates**

The Contractor shall distribute copies of the initial and revised schedules to the job site office, sub-contractors and other concerned parties. Concerned parties shall report any anticipated problems with the schedule to the Contractor within five working days of the distribution of schedule or the occurrence of an event that will influence the timely completion of the work.

The project schedule shall be updated monthly and shall be submitted with the monthly progress payment application, and shall include the dates for the commencement and completion of each major element of construction that occurred during the month.

The Contractor shall include major changes in scope, modified activities, revised projections of progress and completion and other identifiable changes with each submission.

The Contractor shall provide a narrative report defining problem areas, anticipated delays, and the impact on the schedule with the monthly progress payment applications.

The Contractor should recommend corrective action and the anticipated effect on the schedule.

The Contractor shall provide a two (2) weeks look ahead schedule at every bi-weekly meeting.

The Contractor shall provide an updated material procurement and delivery tracking chart at every bi-weekly meeting.

### **1.15.3 Work During Night Time**

If the Contractor expects to work night shifts to increase productivity, he shall provide additional crew from day shift; not exceeding the legal requirements for shift hours in the Northwest Territories. The Contractor shall provide separate traffic accommodation and safety plan with lights on the bridge and work areas with a detailed schedule for night work. The plan shall be approved by the Engineer as per requirements of Subsection 1.20.3 of this Special Provisions.

### **1.15.4 Environmental Protection**

#### **1.15.5 General**

The Department will obtain the environmental approvals, permits, licenses, and/or authorizations required for tendering of the project. The contractor shall review and shall follow the conditions contained in relevant Land Use Permits for this project including Land use Permit MV2023E0012H, for Highway 1 Km 278-800, and Land Use Permit MV2023E0032, for Highway 7. These Land Use Permits are attached as Appendix B.

The Contractor shall be familiar with all applicable federal and territorial legislation and regulations concerning environmental protection, and shall conduct activities in accordance with such legislation and regulations, including, but not limited to:

- NWT Environmental Protection Act

<https://www.justice.gov.nt.ca/en/files/legislation/environmental-protection/environmental->



[protection.a.pdf](#)

- NWT Environmental Protection Act - Spill Contingency Planning and Reporting Regulations

<https://www.justice.gov.nt.ca/en/files/legislation/environmental-protection/environmental-protection.r2.pdf>

- NWT Waters Act

<https://www.justice.gov.nt.ca/en/files/legislation/waters/waters.a.pdf>

- Canada Fisheries Act

<https://laws-lois.justice.gc.ca/eng/acts/f-14/>

- Canada Migratory Birds Convention Act, 1994

<https://laws-lois.justice.gc.ca/eng/acts/m-7.01/>

- Canadian Navigable Waters Act

[https://laws.justice.gc.ca/eng/acts/N-22/-](https://laws.justice.gc.ca/eng/acts/N-22/)

- NWT Archaeological Sites Regulations

<https://laws-lois.justice.gc.ca/eng/regulations/SOR-2001-219/20060322/P1TT3xt3.html?wbdisable=true>

During construction, the Contractor shall contain all debris and prevent it from falling into the river. If the Contractor fails to contain the debris, work will cease immediately until an acceptable revised method of demolition and containment is submitted to the Department and approved.

The Contractor shall ensure that no pollutants, including debris from construction operations, petroleum products from equipment operations, and refuse from worksites, etc., are allowed to enter any body of water whether flowing or static.

#### **1.16 ENVIRONMENTAL CONSTRUCTION OPERATIONS (ECO) PLAN**

The Contractor shall prepare and implement an Environmental Construction Operations (ECO) Plan for the Contractor's project activities.

The ECO Plan is intended to deal with temporary environmental control measures under the control of the Contractor during construction; not permanent or long term environmental or erosion control devices as may be specified in the Contract.

The ECO Plan will be considered a living document and shall be updated and resubmitted when the Engineer, Contractor, or Regulatory Authority note any matters of concern.

The Contractor shall submit the ECO Plan to the Engineer at least 14 calendar days prior to the pre-construction meeting. The Engineer will review the ECO Plan and communicate any concerns to the Contractor at least 7 calendar days prior to the pre-construction meeting. The Contractor shall address any issues or concerns with regard to the proposed ECO Plan to the satisfaction of the Engineer prior to the commencement of the Work.

The finalization of the ECO Plan to the mutual satisfaction of the Engineer and the Contractor

does not constitute an approval or assurance from the Engineer or the Department that the "temporary environmental control measures" detailed in the ECO Plan are sufficient to ensure compliance with all applicable legislation, regulations or conditions of approval. The Contractor is ultimately responsible to ensure all measures, used on the project, are sufficient to ensure compliance with all applicable authorities. This may mean increasing the number of installations, providing alternate devices or modifying procedures to the satisfaction and acceptance of the Engineer and regulatory authority.

The Engineer may suspend work in cases where, in his opinion, the Contractor fails to comply with procedures stated in the ECO Plan. If the Contractor fails to adhere to the finalized ECO Plan, the Engineer may make other arrangements to have the Work completed and deduct the cost thereof from any money owing to the Contractor.

All temporary environmental protection or erosion control devices or procedures required to ensure compliance with the Specifications, applicable legislation, regulations or approvals during construction are deemed to be necessary only as temporary environmental protection measures and shall be the direct responsibility of the Contractor. This shall include the responsibility for determining the quantities, nature and locations of such devices or procedures and the timing of each event. The Contractor shall, to the extent possible, identify these devices or procedures in his Environmental Construction Operations Plan.

The Contractor shall monitor and maintain temporary erosion control devices at all times throughout construction and during periods of shutdown, to the extent required to protect the environment. In case of issue(s) identified by the Engineer with Environmental controls devices or measures not working adequately, the Contractor shall rectify the issue within 12 hours on receipt of verbal or written notice by the Engineer and submit completion report with photographic evidence if applicable.

The Canadian Department of Fisheries and Ocean has reviewed this project and provided avoidance and mitigation measures that need to be integrated into the ECO Plan. The measures provided in the Request for Review letter must be incorporated by the Contractor in the ECO Plan. The Request for Review letter is attached in **Appendix C**.

Provided that the Contractor incorporates these measures into the plans, DFO is of the view that the project will not require an authorization under the Fisheries Act, the Aquatic Invasive Species Regulations or the Species at Risk Act.

Contractor shall keep a copy of the Request for Review letter on site at all times, while the work is in progress.

Contractor has the Duty to Notify DFO if you have caused, or are about to cause, the death of fish by means other than fishing and/or the harmful alteration, disruption or destruction of fish habitat. Such notifications should be directed to FisheriesProtection@dfo-mpo.gc.ca or 1-855-852-8320.

Contractor must notify DFO at least 10 days before starting any in-water works. Send your notification to the assessor (contact information below) and the DFO 10 notification mailbox:

DFO.OP.10DayNotification-Notification10Jours.OP.MPO@dfo-mpo.gc.ca

Protecting Species at Risk in the area and their habitat would need to be considered in the ECO Plan including such species of migratory birds and the western Toad found along highway 7. Please refer to the following resources for ECO Plan guidance for the migratory birds and toads in NWT:

- Western Toad Management Best Practices - Department of Infrastructure, attached in Appendix D
- Migratory Birds: General Checklist - Bird Monitoring, attached in Appendix E
- INF Guidelines on the Protection of Migratory Birds, attached in Appendix F
- Rev04\_GNWT\_Migratory\_Bird\_Beneficial\_Management\_Practices, attached in Appendix G

#### **1.16.1 NWT Archaeological Sites Regulations**

No known heritage resources will be impacted by the project. To inform the Contractor about Change Finds, an orientation on the identification of heritage resources will be provided by Departmental Representative. As per the Northwest Territories Archaeological Sites Regulations, should chance finds of archaeological artifacts be encountered, the find will be isolated, and the NWT Territorial Archaeologist shall be immediately notified. Management Decisions will be co-development based on the nature of the find. Contact for notification is:

Archaeology Education, Culture and Environment  
Culture and Heritage  
4740 48th Street  
PO Box 1320  
Yellowknife, NT X1A 2L9  
867-767-9347 - extension 71251  
archaeology@gov.nt.ca

#### **1.16.2 Control of Equipment**

The Contractor shall carefully control all equipment and work operations so that operations do not extend beyond the designated working limits unless otherwise specifically authorized by the Department.

Secondary containment for equipment / machine should be provided. If any concerns noted by the regulatory authority, the Contractor shall fix the problem within 24 hours and provide a written report with photo evidence to the Department of Infrastructure and the regulatory authority for verification.

#### **1.16.3 Noise Control**

The Contractor shall retain responsibility for controlling noise at the project site. Wherever possible, the Contractor shall use noise abatement systems and shall schedule the noisiest operations during the day. Any work which causes noise between the hours of 7:00 p.m. and 6:00 a.m. shall not be allowed.

#### **1.16.4 Burning**

Burning is not permitted on this project.

#### **1.16.5 Migratory Birds**

Further to the requirements of work subject to Migratory Birds Convention Act, the work under this Contract is subject to the following conditions and requirements.

The potential nesting period for this location has been determined from the regional nesting period tables in Canada provided by Environment and Climate Change Canada. This document should be reviewed at:

[https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods/nesting-periods.html#\\_zoneB\\_calendar](https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods/nesting-periods.html#_zoneB_calendar)

Nesting periods determine when migratory birds might be nesting so you can plan your activities to reduce the risk of harming them. For planning purpose the project is located within Nesting Zone B, Bird Conservation Region 6 (BCR 6) - Boreal Taiga Plains, corresponding to Regional Nesting Period B7 and B8 with a regional nesting period of Early May – Late August. It is the Contractors responsibility to evaluate nesting risks and determine the measures required.

The Contractor shall monitor the bridge structure/project site for signs of nesting activity until completion of the Work, or until the potential nesting period has ended; whichever occurs first. If nesting activities are observed during the potential nesting period, the Contractor shall consult with a Wildlife Specialist for removal of inactive partially completed nests and shall implement additional measures as necessary to discourage further nesting activities. The Contractor will be permitted to carry out work during the potential nesting period, provided proposed anti-nesting measures are approved for use by the Engineer prior to implementation.

The Department of Infrastructure will assume responsibility for nesting prevention to two weeks after execution of the Contract. The Contractor shall assume responsibility for nesting prevention two weeks after acceptance of the Contract.

The contractor is directed to the following URL for additional information on understanding obligations under the Migratory Birds Convention Act:

<https://laws-lois.justice.gc.ca/eng/acts/m-7.01/>

The Contractor is advised that nests can be established in as little as three days, and that any substantially completed nests will be considered active. Once active, disturbance of these nests will not be permitted until it has been determined by a Wildlife Specialist that the nests are no longer active, or the potential nesting period has ended; whichever occurs first.

All costs associated with monitoring the bridge structure/project site for signs of nesting activity including delays or construction interruptions resulting from birds / nest presence will be not be paid separately or claimed by the contractor and is solely contractor's responsibility to adhere to federal and Territorial laws / acts.

#### **1.16.6 Truss Removal and Disposal**

The scope of work for this Contract includes the removal and disposal of the trusses. The Contractor should be aware that the existing paint system on the bridge steel elements contain amounts of lead. A copy of certificate of analysis is available from the Department upon request. All work involving lead coated materials shall be in accordance with applicable legislation, regulations and guidelines.

The Contractor shall develop a health & safety plan and work procedures for handling and disposing of the lead contaminated material in accordance with all applicable laws and regulations and submit to the Engineer for review. The plan shall include training plan for workers handling the contaminated material. The plan shall indicate the facility where the lead contaminated materials will be disposed of.

The collection, storage and disposal of the blasting or demolition shall be carried out in accordance with Section 1.17 of this Special Provisions.

The Contractor shall provide delivery acceptance receipts from the accepting facility for each shipment of waste within 14 days of removal of waste from site. The temporary site storage of all removed materials with paint shall be in a temporary containment system to prevent leaching of lead contents into ground. In case of a containment failure, the contractor shall submit the reclamation plan to the Engineer within 24 hours for review, and complete the reclamation within 10 days to the satisfaction of the engineer; at no extra cost to the owner.

#### **1.16.7 Waste Water Treatment from Concrete Deck Removal**

The Contractor shall develop and execute a construction waste management program for concrete and waste water from concrete deck removal activities. This should be included in the Contractor's ECO plan.

#### **1.16.8 Site Offices, Storage Area and Access Roads**

The Department will make the work and storage areas available as shown on **Appendix A.**

The site affords limited work and storage areas. The Contractor's operations will have to be arranged with this in mind, and processes such as just in time deliveries set in place. Equipment stored on site shall be limited to equipment necessary to carry out work within a reasonable time frame.

Except for parking areas, storage areas shall be secured by chain link fencing.

Any areas damaged by the Contractor shall be restored to original condition at the Contractor's expense. This shall include, but not be limited to, the replacement in kind of any damaged trees or vegetation. The timing of such restorative work shall be at the sole discretion of the Engineer but not beyond the issue of substantial completion date, and no later than final demobilization by the Contractor.

The Contractor shall take pre-construction photographs to document the condition of the site at the time of occupancy on all quadrants, lay down area, and storage areas. All work, storage, and mobilization areas shall be restored by the Contractor to the original condition or better that they were in prior to the start of work.

Prior to completion of the Work, the access, work and storage areas are to be restored to stable slopes and compacted grade equal to or better than prior to construction work.

All topsoil stripped from the access, work and storage areas is to be returned as nearly as possible to the area from which it was stripped, blended into the slope or grade. New topsoil shall then be added as required to provide a minimum thickness of 150 mm.

These areas shall then be sodded or seeded preferably with mulch or hydro-seed as accepted by the Engineer.

The site offices, storage area and any footprint around the site, or storage area used by the Contractor for any shut down should be maintained all the time and prevent rutting caused by machine tracks and vehicles, standing water, and wheel tracks going to the highway. Contractor shall address and fix/clean the construction site/road (with wheel tracks) the areas with-in 4 hours of the verbal or written notice provided by the Engineer.

In case of undue delay by the Contractor, the Engineer may engage other services to complete cleanup for which expenses will be charged to the Contractor.

All the associated cost shall be considered incidental to the Work and no separate or additional payment will be made.

#### **1.16.9 Payment**

This item shall include but is not limited to developing and implementing environmental safeguards, an environmental assurance program (ECO Plan). Payment for this work will be made on a lump sum basis, which shall include full compensation for all labor, materials, equipment, tools and incidentals to complete the Work.

- The Contractor will be paid 20% of the lump sum bid, once the Plan is accepted and the Contractor has mobilized to the site and installed the protective controls with successful demonstration to the Engineer.
- The second 20% of the lump sum bid will be paid at the completion of all demolition of abutment works.
- The third 20% of the lump sum bid will be paid when the deck and concrete works are completed to the satisfaction of the Engineer.
- 25% of the lump sum bid payment will be made when the Contractor provides the receipts / acceptance notes at hazardous material disposal facility(s) for lead based paint, removed bridge elements.

The remaining 15% at the removal of all temporary / removable erosion / sedimentation control and re-seeding the affected areas (construction footprints) and the site has been restored to/close to preconstruction conditions and to the satisfaction of the Engineer.

#### **1.17 CARE OF WATER**

The Contractor should be aware that there may be sudden changes in water levels and peaks in flow rates as a result of rainfall taking place in the Jean Marie River's watershed. A Care of Water (C.O.W.) plan is required to address response measures which the Contractor will take. The

Contractor shall submit his C.O.W. Plan to the Engineer a minimum of 4 weeks prior to any planned instream activity. No work will be permitted until the C.O.W. Plan has been reviewed and accepted by the Engineer.

The Contractor shall design, construct and maintain temporary works to accommodate the continuous flow of the river and to isolate the work area from stream flow during construction. Downstream flows shall be maintained at all times throughout construction. Isolation berms shall be constructed of non-erodible materials and shall be protected from erosion and stream attack throughout construction. Isolation berms shall be removed and reclaimed upon completion of the construction of the new bridge.

The C.O.W. Plan shall include, but not necessarily be limited to, detailed design and layout plans for instream access berm and cofferdam facilities, dewatering of work areas, and contingency plans for dealing with unexpected events such as large precipitation, flood flow events and impounded surface water and ice flow.

All costs associated with Care of Water and accommodating water will be considered incidental to the work and no separate payment will be made.

The Contractor shall be required to modify his water accommodation methods at no extra cost to the Department, at the Engineer's discretion.

#### **1.18 NAVIGATIONAL CLEARANCE**

Jean Marie River Bridge is considered a navigable watercourse by Transport Canada. There is a recreational boat launch immediately downstream of the bridge. The Jean Marie River Settlement is located on the Jean Marie River about 50 km downstream of the river; Indigenous peoples may pass through the bridge site for travel or transport. All activities, installations and works associated with the project will have to ensure that navigation by such users be taken into account and that the ability to navigate safely and move along the watercourse, including through the project location, be maintained for the duration of the project. This could include, but not be limited to, the installation of appropriate signage up and down stream of the project location, that warn boaters/users of works occurring at the bridge locations, as well as ensuring that users can continue to move safely through the project site and project activities for the duration of the project.

Recommendation for temporary form work and/or containment structures, and the temporary bridge clearance is provided in Drawing Bridge Cross-Sections and Navigation Clearance, attached in Appendix H, as identified in the CNWA approval application, unless otherwise specified by Transport Canada in the CNWA approval.

The Contractor shall install signs as specified by CNWA prior to the start of any bridge work. The signs shall be installed on both banks of the waterways at 100 m upstream and downstream of the bridge (4 signs total), and maintained properly until completion of the project.

"Overhead Works Ahead" signs will be supplied by the Department. The Contractor shall be responsible for hauling the signs from Transportation Engineering Branch Whitehorse, installing (including fabricating of signs stand) and maintenance of signs over the construction period. The Contractor shall also be responsible for removing the signs at the end of the project and hauling the signs to the Transportation Engineering Branch Whitehorse or as directed by the Engineer.

All associated works will be considered incidental to the work and no separate payment will be made.

## **1.19 MOBILIZATION AND DEMOBILIZATION**

### **1.19.1 General**

Mobilization is not limited to the movement of personnel, equipment, supplies and incidentals to the Work, the establishment of offices and other facilities necessary to undertake the work, nor for expenses incurred for other work and operations which must be performed prior to the commencement of the Work.

This Item shall include all of the general charges of the Contractor. These charges include but are not limited to the cost for establishment of the construction site, construction of the temporary access roadway to laydown area, survey, progress photographs, partnering sessions, all signage, all temporary facilities, supervisory and all overhead costs for insurance and bonding, demobilization, restoration of all disturbed areas and cleanup at project completion, and all other incidental work required which is not specifically itemized in the Tender Form.

### **1.19.2 Progress Photographs**

The Contractor shall furnish progress photographs taken of the site prior to commencement of the Work, and monthly thereafter, continuing as long as the work is in progress.

Every month the Contractor shall provide a minimum of twenty digital photographs to the Engineer to adequately show the progress of the Work. The Contractor shall take sufficient photographs of the Work to show all parts of the Work being undertaken during the progress period.

All photographs taken by the Contractor and sub-contractors shall remain the property of the Department and shall not be used by the Contractor or sub-contractors for any other purpose without the prior written permission of the Department.

### **1.19.3 Record Drawings**

The Contractor shall maintain project record drawings and accurately record deviations from the Contract documents caused by site conditions or changes required by the Engineer.

The information shall be recorded concurrently with construction progress and no Work shall be concealed until all required information is recorded. Changes shall be made to the Drawings in red colored ink.

The recorded information shall include:

- Field changes of dimensions and details.
- Changes made by Change Order or Construction Communication.
- Upon completion of the Contract, the Contractor shall forward to the Engineer one complete set of marked up drawings indicating in red ink any changes in the Contract Documents, complete with covering letter stating that all changes have been recorded on these drawings.



#### **1.19.4 Survey Data**

##### **1.19.4.1 General**

The Contractor shall supply to the Engineer copies of all survey data used in setting out the Work, including but not limited to:

- Notes and observations
- Computations
- Sketches
- Drawings

##### **1.19.4.2 Survey for Bridge and Roadway Construction**

Survey required for bridge and roadway construction and as specified in the Drawings shall be the responsibility of the Contractor.

All detailed survey and setting out shall be done by the Contractor at his own expense. The Contractor shall be responsible for the correctness of elevation and dimensions from such survey.

If, during the course of the Work, the Contractor finds any discrepancy between the Contract Drawings and the physical conditions of the locale, and errors or omissions in the Contract Drawings, Specifications, or layout as given by points or instructions, the Contractor shall immediately inform the Engineer. The Engineer will verify the same and issue appropriate instructions. Any work done after such a discovery, before further work is authorized, will be done at the Contractor's risk.

##### **1.19.4.3 Survey for Roadway Approaches Construction**

The Contractor shall be responsible for all survey within the construction limit throughout the duration of the Work. The Contractor shall obtain Engineer's acceptance that design elevations have been met prior to moving to the next phase of the Work.

All detailed survey and setting out shall be done by the Contractor at his own expense. The Contractor shall be responsible for the correctness of elevation and dimensions from such survey.

The Contractor shall become acquainted with, and carefully preserve and protect benchmarks, reference points, Water Survey of Canada infrastructure utilities, stakes and legal survey pins. Should any of the monuments be disturbed by the Contractor, the Department shall be reimbursed for the cost of restoring the monuments.

Prior to commencing work at any point, the Contractor shall be satisfied as to the meaning and correctness of all stakes and instructions. No claims will be considered for any alleged inaccuracies, failure to read reference points correctly, or failure to interpret instructions correctly.

If, during the course of the Work, the Contractor finds any discrepancy between the Contract Drawings and the physical conditions of the locale, and errors or omissions in the Contract Drawings, Specifications, or layout as given by points or instructions, the Contractor shall immediately inform the Engineer. The Engineer will verify the same and issue appropriate instructions. Any work done after such a discovery, before further work is authorized, will be done at the Contractor's risk.

### **1.19.5 Payment**

Payment for this work will be made on a lump sum basis as bid and will be scheduled at the following percentages of the lump sum bid:

- 30% upon move into the site, setting up site fencing and security, and setting up construction offices.
- 50% divided equally between each of the regular progress claims over the course of the work. The Contractor shall provide a detailed project schedule at the start of the project that states the number of anticipated progress claims that will be submitted.
- 20% upon project completion and the issuance of the Construction Completion Certificate, including restoration of construction storage areas and cleanup and repair to its original condition or better, of any area damaged or disturbed during the work.

## **1.20 TRAFFIC ACCOMMODATION**

### **1.20.1 General**

The Contractor is advised that the AADT on Mackenzie Highway within the work area is less than 200 vehicles-per-day. The Contractor shall construct a two-lane detour road, a single lane temporary river crossing bridge, and a traffic signal for Single Lane Alternating Traffic (SLAT) over the temporary bridge for this project during construction. The detour road, the temporary bridge and temporary traffic signal shall be designed by the Contractor's engineer(s).

The Contractor shall prepare a Traffic Accommodation Strategy (TAS) as per Division 2, Section 7, "Traffic Accommodation and Temporary Signing" of Standard Specifications for Highway Construction. The Contractor will be required to accommodate permit vehicles through the construction zone on an as and when basis.

The Contractor is advised that there are two local accesses from Mackenzie Highway at the bridge site, one is located on southeast quadrant of the bridge crossing for launching boats and the other one is located on northeast quadrant to Checkpoint and B&B private business. The Contractor shall include traffic accommodation and safety arrangements for the public during construction activity.

The Contractor shall ensure that the temporary concrete barrier system to be used for traffic accommodation has an appropriate deflection room to meet the safety requirements for the entire duration of the project. The Traffic Accommodation Strategy shall be submitted to the Department for review a minimum of 14 days prior to the pre-construction meeting. The Department will review the Traffic Accommodation Strategy and communicate any concerns to the Contractor within 7 days of the pre-construction meeting. Any issues or concerns regarding the Contractor's proposed Traffic Accommodation Strategy shall be addressed to the mutual satisfaction of the Engineer prior to the commencement of the Work.

### **1.20.2 Requirements for Traffic Accommodation and Temporary Signing**

Unless otherwise specified, the Contractor shall accommodate vehicular traffic through the Work Zone on a 24-hour per day basis using any means at the Contractor's discretion, subject to the

minimum requirements of the Alberta Transportation Traffic Accommodation in Work Zones manual and the following:

The Contractor shall:

- Make suitable provisions to accommodate all vehicular traffic safely and with a minimum of inconvenience through or around the Work.
- Make suitable provisions to accommodate boating and recreational activity on the water throughout the construction activity both in winters and summers.
- Provide, install, maintain and protect traffic control devices such as signs, barriers, fences and traffic lights.
- Provide the required number of flag persons during all periods of active construction operations to accommodate normal traffic operations. The flag persons should be trained according to WSCC flag person training; also supervisors must be trained as per WSCC requirements (THIS IS ALSO PART OF SAFETY).
- Provide and use such other methods or equipment necessary to accommodate traffic safely through the work site.
- Provide traffic lights on both ends of the work site, and a variable message sign (VMS) with speed radar prior to both approaches. The speed limit will be 15 km/h.
- Provide contact information for the repair of the traffic lights after work hours.
- The Contractor shall change and update the signs when directed by the Engineer to suit the prevailing traffic patterns and requirements.
- The contractor shall remove construction signs and reinstall the signs as before the construction in case of any shut down approved by the Engineer.
- The contractor shall be responsible to maintain signage and traffic control devices during the Christmas holidays, any statutory holidays or contractor's planned days off.
- Contractor shall provide signs at both ends of the construction site, as approved by the engineer, showing contractor's emergency contact numbers during the afterhours or work days off.
- Any original signs on the bridge or highway that are not intended for removal per Contract Drawings but removed by the Contractor prior to or during construction should be salvaged by Contractor. The Contractor shall reinstall these signs after construction is completed and before the bridge is opened to the public.
- The Contractor shall maintain and supply daily sign inspection logs to the Engineer.

The Contractor shall remove or cover all traffic control devices when not essential for the safe accommodation of traffic.

The Contractor shall coordinate traffic accommodation measures with those of other parties that may be working at or adjacent to the Work, as required to accommodate traffic safely and

conveniently. This shall not relieve the Contractor of responsibility for the safe accommodation of traffic over the whole of the Work.

The Contractor shall limit the speed in the construction zone to a maximum of 15 km/hr.

The Traffic Accommodation Plan will be considered a living document and shall be revised by the Contractor, including removing or installing additional signs / devices to ensure safe traffic operations to match the site changing conditions, or when anomalies are observed by the Contractor, the Engineer or Engineer's representatives.

Two project signs will be produced and provided by the Department. The Contractor shall install the signs with frames and posts on the locations indicated by the Engineer at no separate payment.

### **1.20.3 Work During Night Time**

If the Contractor expects to work night shifts to increase productivity, additional crew shall be provided and the legal requirements for shift hours in the Northwest Territories shall not be exceeded. The Contractor shall provide a separate traffic accommodation strategy and safety plan with lights on the bridge and work areas for the night shift along with a detailed schedule for night work for approval by the Engineer.

Allowing night work is subject to acceptance of plans and procedures by the Department and is at the sole discretion of the Engineer. No additional payment will be made for work carried out at night, or for a night shift refused by the Engineer due to safety or noise concerns.

### **1.20.4 Payment**

Traffic Accommodation will be paid for at the lump sum price bid for "Traffic Accommodation". This payment will be considered full compensation for, but not limited to, the following:

- Preparation of the Traffic Accommodation Strategy;
- All Work associated with the design and implementation, including signing, retaining structures, and barriers;
- The supply, installation, maintenance and removal of temporary construction signing;
- Staging, modification or realignment of the existing roadway approach required to suit the Contractor's operations;
- Plan for monitoring and maintenance of the detour
- Temporary traffic signals;
- Equipment proposed for maintenance activities including, but not limited to snow removal, debris removal, surface repair, fence repair.
- All labor, materials and equipment for the accommodation of public traffic through or around the construction site.

The Contractor will be paid 60% of the lump sum bid once the Traffic Accommodation Strategy is accepted and the Contractor has mobilized, and successfully demonstrated to the satisfaction of

the Engineer that traffic accommodation is as per the approved TAS and sign plan.

The remaining 40% will be paid after the Contractor has demobilized following completion, and final signs are in place for normal bridge operations as per the approved plan and to the satisfaction of the Engineer.

## **1.21 TEMPORARY CROSSING AND DETOUR**

### **1.21.1 General**

Before demolition and removal of any elements on the existing Jean Marie River Bridge, the contractor shall design, supply and install a two-lane detour road with a single span, one-lane temporary bridge with traffic control signals for Single Lane Alternating Traffic (SLAT) over the temporary bridge. The temporary bridge and approaches shall remain open to traffic until the new bridge and the approach roadway have been completed and are in service. Conceptual detour plans are shown in the Contract Drawings for the Contractor's reference only.

### **1.21.2 Design of Detour Road and Temporary Bridge**

The Contractor shall submit, signed, and sealed drawings by a Professional Engineer registered in the Northwest Territories, for the detour road and temporary bridge design. The detour design drawings shall be submitted a minimum of two weeks prior to the start of the detour construction for review by the Engineer. Construction of the temporary bridge and detour route shall not start until the Engineer has completed the review process and accepted the submitted drawings and the design. Engineered drawings shall provide all required details for detour road and temporary bridge including installation and removal procedures, and sediment and erosion control measures.

#### **1.21.2.1 Detour Road**

The detour plans supplied by the Department are conceptual drawings showing one feasible option and are intended for reference by the Contractor only. The Contractor is solely responsible for design, supply, installation, maintenance and demolition of the temporary detour road, temporary bridge and associated traffic signals for the Single Lane Alternating Traffic (SLAT) over the temporary bridge. The design drawings of detour road, temporary bridge and traffic signals are subject to the review and acceptance by the Engineer prior to construction.

The conceptual detour plans show the detour road on the west side of the existing bridge given the site constraints including existing accesses on the east side of the bridge. The construction of the detour road and temporary bridge shall consider safety and operations of public traffic, and requirements of all traffic staging, demolition of existing bridge and construction of the new bridge. In addition, the footprint of the detour road and temporary bridge shall be contained within the 60 m road right-of-way as shown on Contract Drawings.

#### **1.21.2.2 Temporary Bridge**

The temporary bridge shall be a clear span bridge with a minimum one metre buffer of riparian growth between the ordinary high water mark (OHWM) and each abutment. The temporary bridge structure shall be designed and constructed in such a way that no infill will enter the water course,

and there will be no impact to stream bank riparian vegetation. Narrowing the river width will not be permitted.

Recommendation for the temporary bridge clearance is provided in Drawing Bridge Cross-Sections and Navigation Clearance, attached in **Appendix H**, as identified in the CNWA approval application, unless otherwise specified by Transport Canada in the CNWA approval.

The temporary bridge shall be designed to the latest edition of CAN/CSA-S6 for CL-625 loading by the Contractor's design engineer. A minimum clear deck width (inside curb to curb) of 4.5 metres is required.

The temporary bridge shall be designed to accommodate wide loads (up to 7.5 m wide) by overhanging the bridgerail. Modular panel (e.g. Bailey) detour bridges will not be permitted.

The temporary bridge shall accommodate all legal widths and weights as per the Motor Vehicles Act of Northwest Territories. The Act can be found in the following link:

[Large Vehicle Control Regulations \(gov.nt.ca\)](http://gov.nt.ca)

Load evaluation of the temporary bridge structure will be required from the Contractor, in accordance with Section 15, Load Evaluation, of the Standard Specifications for Bridge Construction.

A Hydrotechnical Design Report for Jean Marie River Bridge Replacement prepared by Matrix Solution Inc. is available for the Contractor as reference. The report was prepared for the Department for the purpose of designing the new Jean Marie River Bridge and conceptual design for the detour Temporary Bridge. Hydrotechnical design shall be independently conducted by the Contractor's engineer to ensure the bridge will satisfy the flood water passing during the bridge service period. The use of the Hydrotechnical Design Report prepared by Matrix Solution Inc., including **Appendix I**, Temporary Bridge Design Criteria Memorandum, will be at the Contractor's own risk.

A Geotechnical Investigation Report for Jean Marie River Bridge Replacement prepared by Maskwa Engineering Ltd. is available for the Contractor to use as reference. The report was prepared for the Department for the purpose of designing the new Jean Marie River Bridge. The Contractor shall retain a geotechnical engineer to conduct independent geotechnical investigation for the Temporary Bridge. The use of the Report prepared by Maskwa Engineering Ltd., will be at the Contractor's own risk.

The Contractor shall comply with all aspects of the project permits, licenses, and approvals for the construction, operations and maintenance of the detour road and detour bridge.

The Contractor shall construct the detour road to meet the geometric design requirements found in the most recent edition (2017) of the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads.

The detour road shall be designed and constructed to meet the following criteria:

- Minimum Design Speed: 50 km/h;

- Minimum Road Width: 6.5 metres (4.5 metre travel lane and 1.0 metre shoulders);
- Maximum Super-elevation: 0.08 metre/metre;
- Minimum Curve Radius: 90 metres;
- Normal Crown (metre/metre): 0.04 metre/metre for gravel road surfaces;
- Maximum Gradient: 6.0%;
- Minimum Stopping Sight Distance: 65 metres on a level surface, adjusted for grades as required;
- Minimum K Values: 13 Sag vertical curves and 8 Crest vertical curves;
- Steepest embankment fill slope: 2H:1V; and
- At the transitions zones to and from the Mackenzie Highway to the detour road, the Contractor shall provide minimum sight distance of 130 metres.
- The Contractor shall provide protection for errant vehicles from entering Jean Marie River at the temporary bridge by the use of approved barrier or guard rail protection.
- The footprint of the detour roadway shall not extend outside of the highway right-of-way.
- All temporary signs, delineators and temporary traffic control devices for the detour road and the transitions to and from the existing Klondike Highway to the detour road shall conform to the requirements of the most recent edition of the TAC Manual of Uniform Traffic Control Devices for Canadian Roads.
- The detour road shall be surfaced with a minimum of 150 millimetre lift of approved Granular "A" material. The Contractor shall transport the suitable granular material for the detour road pavement structure, detour road embankment and temporary bridge abutment fill.
- The temporary detour road shall be cleared and grubbed to the limits of the cut and fill slopes. Stockpile all grubbed material for use as topsoil. Stockpiled materials shall not be stored within 10 m of the watercourse.
- The Contractor shall cut and dispose of trees and bushes as necessary for clearing within the highway right-of-way to construct the detour. Cutting and salvage of trees and bushes will be considered incidental to the work and no separate payment will be made.
- Prior to putting the temporary bridge into operation, the Contractor's design Engineer shall conduct a site inspection of the installed temporary bridge and provide a letter of inspection, signed and sealed by a Professional Engineer registered in the Northwest Territories, stating that the temporary bridge has been supplied and installed in accordance with its engineered drawings, Water Licence and CNWA approval, and that the completed installation is fit for its intended use.
- The Contractor shall take all necessary precautions to protect from damage all existing utilities in the vicinity.

- The Contractor shall be solely responsible for maintaining the temporary bridge, detour road, all required signage, delineators and other traffic control for the duration of construction to the satisfaction of the Engineer. Where, in the opinion of the Engineer, the maintenance of the temporary bridge and road is not sufficient for safe travel by the public, the Engineer may direct Government of Northwest Territories forces to undergo maintenance activities at the Contractor's expense.
  - .1 Dust control shall be required as per the requirements of the drawings and specifications and as noted herein.
  - .2 The surface of the detour road shall be maintained free of ruts, potholes and all other surface irregularities at all times. It is the Contractor's responsibility to ensure that maintenance of the detour road is scheduled on a regular basis and after all precipitation events to maintain the road surface to the Engineer's satisfaction.
  - .3 The Contractor shall ensure all road signage, delineators, pavement markings and other traffic control devices are cleaned regularly and remain undamaged. All traffic control devices must be visible 24 hours per day for the duration of construction. The Contractor shall replace all damaged traffic control devices promptly.
  - .4 Regularly inspect the temporary bridge for signs of wear, defects and all other deficiencies. The Contractor shall notify the Engineer immediately if any problems are detected. The Contractor shall maintain all components of the temporary bridge as required including the bridge deck, bridge guardrails and approach guiderails to the satisfaction of the Engineer.
- When the new road and bridge are ready for traffic, remove the temporary bridge and obliterate the detour road as follows:
  - .1 Remove temporary bridge to the extent of the detour footprint, including abutment infill.
  - .2 Obliterate the detour roads and restore the site to a natural appearance from the Mackenzie Highway:
    - .1 Ensure positive drainage throughout the obliterated roadway. Ditches not required for drainage, shall be filled and the roadway shall be restored to approximately the original contour of the ground.
    - .2 Re-contour temporary bridge abutment area to original grade and slope.
    - .3 Cover obliterated roadway with 150 millimetres of topsoil suitable for re-vegetation. Topsoil may be grubbed material. Source material to be approved by the Engineer.
    - .4 Install sediment and erosion control measures.



- Clearing and Grubbing

- .1 Disposal of grubbed material by burial will not be permitted. The material shall be stockpiled within the construction limits at a location approved by the Engineer.
- .2 Clearing activities are subject to provisions of the Mitigating Conditions. The typical salvage threshold is 150 millimetres in diameter or greater at a height of approximately 1.5 metres above ground to a point on the tree where the diameter has decreased to 100 millimetres.
- .3 Unless expressly stated otherwise in the Mitigating Conditions, salvaged timber shall be cut in lengths no greater than 1.2 metres and neatly stockpiled at the edge of clearing, or as directed by the Engineer.
- .4 Grubbing shall consist of removing the top 200 millimetres of existing ground to the new roadway embankment footprint limits as shown on the design drawings.
- .5 Grubbing shall be of sufficient depth to remove all organics, spoil piles from detour road works and material unsuitable for embankment construction, leaving a surface free of organics and contoured to promote drainage.
- .6 Notwithstanding all other Sections, payment for all associated works regarding the clearing and grubbing required for construction, including salvage and/or disposal will be considered incidental to the work and no separate payment will be made.

### **1.21.3 Payment**

Payment for the detour road and the temporary bridge shall be made on a lump sum basis and shall include all labour, engineering, equipment, traffic control, materials and any other work required to complete the work and maintain the detour as specified in this section.

The Contractor will be paid 70% of the lump sum bid once the detour road and the temporary bridge are accepted and the traffic is shifted to the detour. The remaining 30% will be paid after the traffic is shifted to the new bridge and the site conditions are restored to the satisfaction of the Engineer.

Any additional costs incurred as part of the detour road and the temporary bridge work shall be considered incidental to the work and shall not be compensated.

The Contractor shall maintain the detour road and the temporary bridge structure in a safe and acceptable manner throughout its use and shall fix any issues with bolts or connections when instructed by the Engineer or when perceived by the Contractor and within a safe time period to prevent any damage to traffic.

## **1.22 REMOVAL AND DISPOSAL OF EXISTING BRIDGE STRUCTURE**

### **1.22.1 General**

The existing Jean Marie River Bridge shall be removed and disposed. This bridge consists of a

single span half through (pony) truss bridge over the Jean Marie River with span length of 36.58 m with a clear roadway width of 8.53 m.

Only after the traffic is shifted to the detour bridge to the satisfaction of the Engineer, may the Contractor commence demolition of the existing bridge structure.

None of the bridge components are listed for salvage. The Contractor shall remove and dispose of the bridge structure, including but not limited to, the truss elements, the concrete deck, bridgerail, deck joints, bearings, substructure elements, timber piles and approach roadway barriers. The Work shall be in accordance with Section 21, of the Standard Specifications for Bridge Construction (SSBC) except that the Contractor shall assume ownership of all material removed and shall dispose of the materials in a manner acceptable to the Engineer. The Contractor shall provide the Engineer with copies of the Agreement or letter of consent from the Department of the disposal site(s).

Based on preliminary discussions with the Town of Fort Simpson in April 2024 the Town of Fort Simpson Landfill will accept the following with advance notification:

- Metals – 3,500 – 4,500 kg
- Sanitary wastewater 230L/day for approximately 300 days (expecting to dispose of wastewater once per week)
- Domestic waste – 60 kg per day for approximately 300 days

However, please note that the Town of Fort Simpson Landfill will NOT accept the following:

- Steel bridge structure – steel with lead-based paint is NOT accepted. Hazardous waste is not accepted in NWT communities
- Wood – (Treated timber piles) Treated timber is NOT accepted
- Concrete with reinforcing steel is NOT accepted as the volume is too large and it is too difficult to deal with mixed concrete/steel

The steel with lead-based paint and the treated timber must be transported to an approved facility to accept hazardous waste outside the NWT.

The Contractor must arrange suitable disposal locations for the hazardous waste, concrete and other waste that will not be accepted in Fort Simpson Landfill. Other suitable locations for disposal are unlikely to be in NWT.

The Contractor shall cut off abutment timber piles relative to seat or ground conditions along each abutment and pier footing. Pile cut-offs shall be the lower of:

- 0.6 m below the bottom of the existing abutment seat
- 0.6 m below the new finished soil ground.

The Contractor shall backfill resulting abutment excavation, holes with approved Compacted Non-Granular Material and restore disturbed areas to match the slopes and contours of the surrounding ground to the satisfaction of the Engineer.

The existing riprap on the bridge headslopes shall be salvaged as specified in the Drawings.

#### **1.22.2 Polluting and Deleterious Materials**

The Contractor is advised that the existing bridge steel structural truss element paint coatings contain lead content, and amount of the lead is over the limit for landfill requirements.

Because existing steel components contain lead paint, soil testing in accordance with Subsection 22.5.8, Background Contamination Levels, of the Standard Specifications for Bridge Construction shall be included in the Contractor's ECO plan.

The existing steel components containing lead paint shall be treated as "Special Waste". The Contractor shall be responsible for the collection, storage, shipping special waste to a licensed facility. The Contractor will be required to provide certification that the waste has been delivered to and disposed of by a licensed disposal facility in accordance with applicable legislation.

Steel paint, Concrete dust from bridge demolition and excavations which disturb soils have the potential to harm fish and their habitat. The Contractor shall take all necessary precautions to prevent coating material, concrete dust and other deleterious materials from entering surrounding soils, the Jean Marie River, any adjacent watercourse and any wetland areas. Specific measures and methods to prevent any portion of the existing bridge including painted coatings, steel, wood, soil, materials, or dust, from entering the Jean Marie River watercourse, during demolition and Bridge Construction shall be included in the Contractor's ECO plan. Disposal of all demolished or removed materials shall comply with applicable environmental and safety regulations. All removed materials shall be taken off site as work progresses to prevent environmental damage.

#### **1.22.3 Reference Drawings**

Reference drawings for the existing bridge are included with the tender documents. The Contractor is cautioned that actual details may vary from those shown on these drawings due to the age of the structure, possible unrecorded work, ongoing scour, lateral erosion, ditch erosion and slumps that have occurred along the channels. Dimensions and details that could impact the Work shall be confirmed in the field by the Contractor.

#### **1.22.4 Submittals**

The Contractor shall submit a bridge removal and demolition procedure to the Consultant for review and acceptance at least 4 weeks prior to the start of demolition. The demolition procedure shall describe the sequence and staging of bridge removal and bridge demolition operations. The demolition procedure shall include the disassembly procedure to be utilized including the proposed types and locations of lifting equipment to be used for removal and demolition of the structure's components. Drawings, photographs and diagrams shall provide sufficient details to clearly illustrate the demolition procedure. Any temporary works and

containment strategies to prevent pollution or deleterious materials from entering the environment shall be shown. Related engineering designs, calculations, and procedures shall bear the stamp of a Professional Engineer registered in the Northwest Territories. The Contractor shall obtain approvals from permitting agencies and address their requirements in their bridge demolition and removal procedure. The plan shall comply with and address Occupational Health and Safety Regulations requirements.

Bridge demolition and removal work shall not commence until the procedure has been accepted by the Engineer. The Engineer's acceptance shall not relieve the Contractor of the responsibility effectiveness or safety of the procedure or its implementation.

The Contractor's project manager, site superintendent and the professional engineer who developed the procedure shall attend a pre-job meeting at a location determined by the Engineer prior to starting field work related to bridge demolition and removal.

Removal and demolition shall be monitored by the stamping engineer to confirm the submitted and accepted procedure is followed. The Contractor shall continue to be fully responsible for the results obtained by the use of sealed drawings, with the Professional Engineer also assuming responsibility, as the Contractor's Agent for the results obtained.

#### **1.22.5 Measurement and Payment**

Payment for the Work will be made at the lump sum price bid for "Removal of Bridge Structure". The Contractor will receive 50% of the lump sum price bid upon the removal and disposal of the superstructure and abutments. The remaining 50% will be paid upon the satisfactory removal of the substructure to the extents described on the Drawings.

Haul and disposal of bridge materials will be considered incidental to the Work and no separate or additional payment will be made.

Any temporary berm or other access required to provide access for removal will be considered incidental to the Work and no separate or additional payment will be made.

Any damage resulting from the Contractor's elected method(s) of removal of the existing structure shall be repaired by the Contractor to the satisfaction of the Engineer and shall be completed at no cost to the Department.

#### **1.22.6 Payment**

Payment for the above described work will be considered completely covered by the lump sum price bid for "Removal and Disposal of Existing Bridge Superstructure", which price shall be full compensation for all labour, materials, equipment, tools and incidentals necessary to complete the work to the satisfaction of the Engineer. The Contractor will receive the full amount of the lump sum price bid upon removal and acceptable disposal of the superstructure.

Hauling of removed materials will be considered incidental to the Work and no separate or additional payment will be made.

Testing on existing bridge coating to determine the lead content will be considered incidental to the Work and no separate or additional payment will be made.

Collection, storage, shipping of special waste will be considered incidental to the Work and no separate or additional payment will be made.

Contamination from lead paint and other contaminants occurring during the operations, and costs for monitored by other agencies will be considered incidental to the Work and no separate or additional payment will be made.

### **1.23 EXCAVATION - STRUCTURAL**

The Contractor shall excavate all materials necessary for the construction of foundations, substructure and other works in accordance with the Contract Drawings and the requirements specified in Section 1, Excavation, of the Standard Specifications for Bridge Construction.

Excavation shall be shored, braced or protected where necessary to maintain the integrity and stability of the existing headslope, sideslope and fills at all times.

Payment will be made at the lump sum prices bid for "Excavation - Structural", and will be full compensation for all labour, equipment, tools and incidentals necessary to complete the Work as shown on the Drawings and to the satisfaction of the Department Representative.

When the required extents of excavation are greater than originally anticipated, as determined by the Department Representative, the additional quantities of excavation may be paid for through a negotiated lump sum price, or as extra expense in accordance with the General Terms and Conditions.

All cost associated with the control and management of water and/or ice will be considered incidental to the Work, and no separate or additional payment will be made.

All costs associated with maintaining the stability of slopes, fills, or existing structures will be considered incidental to the Work, and no separate or additional payment will be made.

### **1.24 BACKFILL**

The contractor shall supply and place materials required to backfill necessary to complete the Work in accordance with the Contract Drawings and the requirements specified in the Section 2, Backfill, of the Standard Specifications for Bridge Construction.

The Contractor shall supply and install 150 mm diameter smooth wall Perforated Pipe Subdrains wrapped in filter fabric and backfilled with select granular material as detailed on contract drawings. The work will be considered incidental

The Contractor shall supply and install Nilox DN50-2 (JDR J-Drain 302) to provide a drainage path down vertical element. The Contractor shall install the drainage side with the non-woven filter fabric face toward the soil side to separate embankment from vertical concrete surfaces. This includes all interior faces of abutment diaphragms, seats and wingwalls. Details of this work are shown on the Drawings.

Drainage and isolation measures related to Backfill are incidental to the lump sum price bid for Backfill and no separate or additional payment will be made for this work.

In addition to the requirements specified in the Section 2.2.3, Backfill Material Tests, of the Standard Specifications for Bridge Construction, all quality control tests completed by an independent third-party testing agent shall be conducted in the presence of the Department Representative. The Contractor shall provide the Department Representative with a minimum of 24 hours advance notice of a scheduled test.

Payment will be made at the lump sum price or prices bid for "Backfill", for the types of material specified, and will be full compensation for the supply of material; placement and compaction; sampling and testing; and all labour, materials, equipment, tools and incidentals necessary to complete the Work as shown on the Drawings and to the satisfaction of the Department Representative.

When the required extents of excavation are greater than originally anticipated, as determined by the Department Representative, the additional quantities of backfill may be paid for through a negotiated lump sum price, or as an extra expense in accordance with the General Terms and Conditions.

## **1.25 STEEL PILES**

### **1.25.1 General**

Supply and installations of steel piles shall be completed in accordance with the Contract Drawings and the requirements specified in the Section 3, Foundation, of the Standard Specifications for Bridge Construction.

### **1.25.2 Pile Cut Off Elevations**

The Contractor is advised that the pile cut off elevations shown on the Drawings are based on assumed bearing height indicated in the Drawing. The bearing height, which will be designed by the bearing fabricator/supplier, will affect the abutment seat elevations. Consequently, it will result in the pile cut off elevation adjustment if the bearing design height is different from the assumption. The Contractor shall not proceed with abutment pile cutting off operation until bearing design is completed and reviewed by the Engineer.

The Contractor shall make necessary pile cut off elevation adjustments and submit to the engineer for review and acceptance prior to the work.

The Contractor shall have no claim against the Government of the Northwest Territories resulting from delay and extra cost by such adjustment.

### **1.25.3 Measurement and Payment**

Measurement and payment shall be in accordance with the Subsections 3.6.1.1 to 3.6.1.6, of the Standard Specifications for Bridge Construction.

## **1.26 PRECAST CONCRETE**

### **1.26.1 General**

Precast units for the new Jean Marie River Bridge include:

- 14 Deck Panels, including bridgerail post anchorage assemblies and a bench mark tablet on an end panel;
- 8 Approach Slab Elements;
- 6 Abutment Seat Elements;
- 2 Abutment Diaphragms, including embedded girder connection anchor plate assemblies.
- 4 Abutment Wingwall Element, including embedded safety rail post anchorage assemblies and bridge plaques, and
- 2 Approach Slab Sleeper Beam Elements.

Precast Concrete shall be completed in accordance with the Contract Drawings, the requirements specified in the Section 7, Precast Concrete Units, of the Standard Specifications for Bridge Construction and as noted herein.

#### **1.26.2 Precast Concrete Element Dimensions**

The Contractor is advised that the bearing dimensions, which will be designed by the bearing fabricator/supplier, will affect the geometric dimensions of precast concrete abutment diaphragm, wingwall, bearing and shear block pocket on the abutment seats. The dimensions of the related precast elements shown on the Drawings are based on assumed bearing dimensions indicated in the Drawing.

The Contractor shall not proceed fabrication of related precast concrete elements until bearing design is completed and reviewed by the Engineer.

The Contractor shall make necessary geometric adjustment on the related precast concrete elements and submit the proposed adjustment to the engineer for review and acceptance before the fabrication of the elements if any of bearing dimension is different from the assumption in the Drawings.

The Contractor shall have no claim against the Government of the Northwest Territories resulting from delay and extra cost by such adjustment.

#### **1.26.3 Concrete Material**

Concrete mix design for precast concrete units shall be in accordance with Subsections 7.2.4.1 to 7.2.4.7, and Subsections 4.2 to 4.4, of the Standard Specifications for Bridge Construction. Concrete Class HPC and Class C as per Subsection 4.4 of the Standard Specifications for Bridge Construction, shall be modified as necessary to satisfy Section 7, Precast Concrete Units, of the Standard Specifications for Bridge Construction requirements.

#### **1.26.4 Mass Concrete**

Precast Concrete abutment seat elements are defined as Mass Concrete and the Work shall satisfy the Mass Concrete requirements specified in Section 4, Cast-In-Place Concrete, of the Standard Specifications for Bridge Construction.

### **1.26.5 Shear Studs and Embedded Steel Plates**

Shear Studs for diaphragm embedded plates shall conform to Subsection 6.2.4.3, Stud Shear Connectors, of the Standard Specifications for Bridge Construction.

Embedded steel plates shall be in accordance with the Drawings.

Payment for shear studs and embedded steel plates will be considered incidental to the Work and no separate or additional payment will be made.

### **1.26.6 Class 6 Floated Surface Finish, Surface Textured**

The work shall be completed in accordance with Subsection 4.25.7, Class 6 Floated Surface Finish, Surface Textured, of the Standard Specifications for Bridge Construction. The texture shall be transverse grooving that parallel to the bridge deck transverse direction.

### **1.26.7 Construction**

The following provisions are in addition to the requirements noted in Subsection 7.3, Construction, of the Standard Specifications for Bridge Construction.

- Lifting forces shall be vertical for precast concrete deck, approach slab, abutment diaphragm, abutment wingwall and approach slab sleep beam elements.
- Precast concrete deck and approach slab elements shall be in the flat position all the time during handling, transportation, storage and erection.
- Precast concrete diaphragm and wingwall elements shall be in the flat position all the time during transportation and storage.
- Precast concrete approach slab sleeper beam elements shall be in the finished vertical position all the time during handling, transportation, storage and erection.
- Precast concrete deck, approach slab, diaphragm, wingwall, and approach slab sleeper beam elements are either thin and/or slender. The Contractor shall take due care to prevent damage the element during the work. The elements shall be properly supported during all the time during handling, transportation, storage and erection.
- The Contractor shall submit temporary supporting design with sketches to present the temporary support details during handling, transportation, storage for precast concrete deck, approach slab, diaphragm, wingwall, and approach slab sleeper beam elements to the Department Representative for review and acceptance a minimum of 4 weeks prior to the commencement of element fabrications. The design will be considered Professional Work Products and shall be authenticated by a Professional Engineer licensed to practice within the Northwest Territories and Nunavut and validated with the firm's Permit to Practice stamp, as issued by NAPEG. The Contractor shall not commence element fabrications until review of the design by the Department Representative has been completed and all comments arising from that review have been addressed to the satisfaction of the Department Representative.
- The ends of abutment wingwalls shall be temporarily vertically supported from ground all



the time during and after integrated with abutment diaphragms until deck system are composite with steel girders if the wingwalls are constructed before the deck/girder in composite condition.

Subsection 7.3.2.2, Girder Erection Procedure, of the Standard Specifications for Bridge Construction shall be read as "Precast Unit Erection Procedure" and is revised as follows:

*The Contractor shall submit erection procedures for all precast concrete units to the Department Representative for review and acceptance a minimum of 4 weeks prior to the commencement of precast unit erection work. The erection procedures will be considered Professional Work Products and shall be authenticated by a Professional Engineer licensed to practice within the Northwest Territories and Nunavut and validated with the firm's Permit to Practice stamp, as issued by NAPEG. The Contractor shall not commence any erection work until review of the girder erection procedure by the Department Representative has been completed and all comments arising from that review have been addressed to the satisfaction of the Department Representative.*

*The Department Representative's review and acceptance shall not be considered as relieving the Contractor of the responsibility for the safety of their methods or equipment, nor from carrying out the work in full accordance with the erection procedures, drawings and specifications. The Contractor shall follow the engineered erection procedures at all times.*

*Element layout and component identification contained in the erection procedure shall be consistent with the element layout and component identification shown on the Drawings. The erection procedure shall include drawings and supporting documents necessary to describe the following:*

- *Traffic Accommodation Strategy (TAS);*
- *Access to the work, including temporary access berms and/or work bridges;*
- *Details of temporary works and supporting structures, including location and elevations.*
- *Vertical, horizontal, and longitudinal position adjustment mechanisms;*
- *An as erected survey of elements (hold point) once a set of precast concrete elements are erected for each bridge component and ready for field UHPC connection including North-easting coordinates and elevations. Survey points include but not limited to:*
  - *Top corners of each abutment seat element;*
  - *Top corners of each approach slab sleeper beam element;*
  - *Top corners of each abutment diaphragm element;*
  - *Top corners of each of each abutment wingwall element;*

- *Top corners of each of each deck panel, and*
- *Top corners of each approach slab panel.*
- *Type and capacity of cranes;*
- *Sequence of work, including position of cranes and delivery trucks;*
- *Position of cranes relative to abutments with details of load distribution of wheels and outriggers; geotechnical loads and ground capacity requirements;*
- *Lifting device details, location of lifting devices, and lifting forces;*
- *Each precast unit stabilization details, methods of maintaining unit location and alignment, and details of temporary supports and removal;*
- *Precast concrete unit connection schedule and sequence (witness point);*
- *Lift hook cutting sequence and repair procedure for lifting holes and pockets;*

*A construction milestone meeting shall occur a minimum of two (2) weeks prior to commencement of each set of erection work. The Contractor's project manager, fabricator, hauler, erector's project manager, field superintendent(s), post-tensioning superintendent, and foreman shall attend a construction milestone meeting at a date, time and location acceptable to the Department Representative.*

*Safety and compliance with the Northwest Territories Safety Act and Occupational Health and Safety Regulations thereunder shall be an integral part of the work. The Contractor shall immediately provide the Department Representative with any documentation required by the Occupational Health and Safety Regulations upon request.*

Subsection 7.3.2.3, Fall Protection System, of the Standard Specifications for Bridge Construction is applicable to precast concrete deck panel erection and connection.

#### **1.26.8 Sealer Application**

Sealer application shall be in accordance with the Drawings, Subsection 7.2.5.14, Concrete Sealer, of the Standard Specifications for Bridge Construction and **Section 1.35, Sealer**, of this Special Provisions.

#### **1.26.9 Miscellaneous Iron**

Miscellaneous Iron shall be in accordance with the requirements specified in the Subsection 13, "Miscellaneous Iron" of the Standard Specifications for Bridge Construction, and include the following:

- bridge plaques
- benchmark tablet

Two bridge plaques will be pre-installed in precast concrete wingwall elements as indicated on the Drawings.

One benchmark tablet will be pre-installed in an end deck panel as indicated in the Drawings.

Payment for Miscellaneous Iron will be considered incidental to the Work and no separate or additional payment will be made.

#### **1.26.10 Quality Assurance Inspection and Testing by the Department Representative**

The Department Representative will inspect the work and review all QC inspection and testing records and/or reports produced by the Contractor to verify their conformance to the Contract requirements.

The Department may retain a third party to complete additional quality assurance inspection and/or testing at their sole discretion. The Contractor shall provide full access to the work in accordance with Subsection 7.2.6.1, Access, of the Standard Specifications for Bridge Construction.

#### **1.26.11 Payment**

Payment for precast concrete units will be made at the lump sum price bid for each Item listed below will in accordance with to Subsection 7.4, Payment, of the Standard Specifications for Bridge Construction:

- Precast Concrete Deck Panels – Supply and Fabrication, Delivery and Erection
- Precast Concrete Approach Slab Elements – Supply and Fabrication, Delivery and Erection
- Precast Concrete Abutment Seat Elements – Supply and Fabrication, Delivery and Erection
- Precast Concrete Abutment Diaphragms – Supply and Fabrication, Delivery and Erection
- Precast Concrete Abutment Wingwall Element – Supply and Fabrication, Delivery and Erection
- Precast Concrete Approach Slab Sleep Beam Elements – Supply and Fabrication, Delivery and Erection

Supply and placing reinforcing steel in the precast concrete elements will be considered incidental to the Work, and no separate or additional payment will be made. If supply and placing reinforcing steel in the precast concrete elements exceed quantities in the Bar List on the Drawings, due to the Drawing's errors, after reviewed and accepted by the Department Representative, the extra amount of supply and placing reinforcing steel will be paid at the unit price "Plain Reinforcing Steel – Precast Concrete Extra Supply and Place"

### **1.27 CAST-IN-PLACE CONCRETE – CLASS C**

Cast-in-place Concrete – Class C shall include 4 reinforced concrete Shear Blocks on Abutment

Seats at locations shown on the Drawings.

Pre-bagged concrete is allowed for Cast-in-place Class C Concrete on the shear blocks. The work shall be in accordance with Section 4, Cast-In-Place Concrete, Subsections 20.5.6.1, Pre-bagging for Site Batching, and 20.5.6.2, Concrete Mixer Trucks and Water Supply for Site Batching, of the Standard Specifications for Bridge Construction.

Stainless steel plates and studs assemblies for shear blocks shall conform to the requirements of the American Iron and Steel Institute (AISI) Type 304. The chemical and mechanical properties shall conform to the requirements of ASTM A240/A240M. Welding of stainless steel shall be in accordance with AWS D1.6/D1.6M.

Stainless steel plates and studs assemblies for shear blocks will be considered incidental to the Work and no separate or additional payment will be made. Measurement for payment of cast-in-place concrete will be by the cubic metre of concrete acceptably placed, measured to the nearest 0.01 m<sup>3</sup>.

Payment will be made at the unit prices bid for "Class C Concrete – Supply and Place" and shall be in accordance with Subsection 4.27, Measurement and Payment, of the Standard Specifications for Bridge Construction.

## **1.28 FIELD-CAST ULTRA-HIGH-PERFORMANCE-CONCRETE**

### **1.28.1 General**

The work of this Section covers the supply and placement of field-cast Ultra-High-Performance-Concrete (UHPC), which is applicable for the following locations as shown on the Drawings:

- Abutment Seats: UPHC connections between precast concrete abutment seat elements and fixing the piles to abutment seats by filling the pile pockets with UHPC;
- UHPC connections between precast concrete abutment diaphragm elements and abutment wingwall elements;
- Deck: UHPC connections between precast concrete deck panels; completing girder composite connection to precast deck panel by filling the pile pockets with UHPC
- pockets on the panels and girder haunches;
- Approach slabs: connection between precast concrete approach slab panels and pockets on the panels for abutment diaphragm corbel supports;
- Pile pockets in approach slab sleeper beam.

### **1.28.2 Reference Standards**

The work shall be completed in accordance with the Drawings, specified herein, and Section 4, Cast-In-Place Concrete, of the Standard Specifications for Bridge Construction.

Additionally, the work shall conform to the following standards. Standards shall be latest issue at the time of tender:

- CSA-S6, "Canadian Highway Bridge Design Code".
- CSA-A23.1, "Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete"
- ASTM C39, "Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens".
- ASTM C109, "Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens)".
- ASTM C230, "Standard Specification for Flow Table for Use in Tests of Hydraulic Cement".
- PCI MNL – 116, "Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products".

### **1.28.3 Falsework and Formwork**

Falsework and formwork shall be in accordance with Subsection 4.10, Falsework and Formwork, of the Standard Specifications for Bridge Construction.

### **1.28.4 Submittals**

Product data sheets, installation procedures, detailed falsework and formwork drawings, and any accessories shall be submitted to the Department Representative for review and acceptance a minimum of 3 weeks prior to commencement of the work.

In addition, the Contractor shall:

- Submit a Quality Management Plan for this Work to the Engineer for acceptance no less than twenty-one (21) days prior to commencement of the work. The Quality Management Plan shall include:
  - Casting procedures in general compliance with the Precast Concrete Institute (PCI) Manual – 116
  - Testing Procedures in general compliance with the Precast Concrete Institute (PCI) Manual – 116
  - Batching and casting sequence
- The batching sequence shall include the order and time of the introduction of the materials, mixing time and Quality Control procedure for verification of the mix uniformity.
- The casting sequence shall identify the location of all cold joints. Cold joints shall be minimized where possible. All approved cold joints shall be located in the shear blockouts.
- Construction equipment and loads on the bridge precast deck.

### **1.28.5 Materials**

### **1.28.6 Approved Product**

Ductal® UHPC product supplied by Lafarge Canada Inc. (Lafarge) is an approved product applied to this product. The Contractor may select an equivalent product and submit to the Engineer review and acceptance. Such equivalent may or may not be accepted the Engineer.

A representative of UHPC product supplier shall be on site for all stages of mixing and placement of the concrete. The representative shall be knowledgeable and experienced in the supply, mixing, delivery, placement and curing of the Ductal® material.

#### **1.28.6.1 Concrete:**

UHPC material for the project shall be ultra-high performance concrete Ductal® JS1000 by Lafarge Canada Inc. or approved equivalent.

The proportion of ingredients for the mix parameters shall be as follows:

- Premix: 2195 kg/m<sup>3</sup>
- Water: 140 kg/m<sup>3</sup>
- SP liquid: 30 kg/m<sup>3</sup>
- Steel Fibres 156 kg/m<sup>3</sup>

The concrete shall meet the following compressive strength requirements:

- 80 MPa minimum at 96 hours moist cure
- 100 MPa minimum at 28 days moist cure

Water used for batching Ductal® shall be in accordance with supplier's specifications for the product.

Admixtures shall be Premia 150 (30% dry cement)

Steel fibres:

- Steel Fibres shall be Bekaert OL 13/02 high carbon steel fibres with a minimum tensile strength of 2100 MPa or equivalent as approved by the Engineer.
- The Contractor shall ensure the proper storage of premix, fibres, and additives as required by the supplier's specifications in order to protect materials against loss of physical and mechanical properties.

Filler for bug holes shall be with Sikadur 31 Hi-Mod Gel or approved equal.

### **1.28.7 Equipment**

Equipment for mixing UHPC shall be as specified and supplied by UHPC product supplier.

### **1.28.8 Inspection and Testing**

Inspection and testing shall be in accordance with Subsection 4.9, Inspection and Testing, of the Standard Specifications for Bridge Construction.

Concrete compressive strength tests shall be carried out in accordance with ASTM C39. Use 75 mm diameter by 150 long specimens. The tests shall be performed at 4 days, 28 days and following a thermal treatment of 90bC for 48 hours.

Flow shall be determined according to ASTM C109 on a flow table constructed to ASTM C230. The test shall be performed with every batch.

### **1.28.9 Execution**

#### **1.28.9.1 General**

The UHPC shall be supplied, mixed, placed and cured in accordance with the recommended practices and procedures specified by the supplier.

#### **1.28.9.2 Forms**

All forms for UHPC shall be medium density overlay plywood except that forms underneath precast concrete deck panel connections shall be steel formwork unless specified by the UHPC supplier.

Construct a 'chimney' in the top forms for placing the material and maintaining head.

Place soffit of top forms 5 mm higher than the top of the blockout or joint to ensure the blockout or joint is fully sealed with concrete unless otherwise specified in the Drawings, or by the UHPC supplier.

The Contractor shall pay particular attention to water-tight sealing the formworks to avoid leakage of the field-cast UHPC.

#### **1.28.9.3 Mixing and Placement**

UHPC shall be mixed and placed in accordance with recommended practices and procedures specified by the product supplier.

Remove any large clumps of cement or steel left after mixing before placing the concrete.

All girder haunches, shear blockouts, joints, pockets where specified using UHPC on the Drawings shall be completely filled with UHPC material.

#### **1.28.9.4 Curing**

UHPC shall be cured in accordance with the recommended practices and procedures specified by the product supplier.

Ductal® shall be moist cured for a minimum of four (4) days and at a minimum temperature of 16 degrees Celsius in order reach 80 MPa in 96 hours.

#### **1.28.9.5 Finishing**

Grinding of Ductal® will be required after curing. The time to start grinding operation shall be no earlier than UHPC's recommendation. The UHPC shall be ground smooth and flush with the adjacent precast panels.

All bug holes on the surface shall be filled using Sika 31 or approved equivalent.

#### **1.28.10 Tolerances**

The surface of the Ductal® field joints shall be finished flush with the precast concrete elements to within a tolerance of plus or minus 2 mm.

#### **1.28.11 Loading**

Following placement, a minimum compressive strength of 80 MPa shall be obtained prior to any live load or additional dead load being placed on the connected precast elements.

#### **1.28.12 Measurement and Payment**

Measurement of UHPC will be by the cubic metre of concrete acceptably placed, measured to the nearest 0.01 m<sup>3</sup>.

The quantity of concrete paid for will be the volume of concrete remaining within the neat lines as shown on the Drawings.

Payment will be made at the unit prices bid for "UHPC – Supply and Place" less any applicable payment adjustments for compressive strength, and will be full compensation for falsework and formwork; curing; concrete surface finishing; testing and inspection; and all labour, materials, equipment, tools and incidentals necessary to complete the Work as shown on the Drawings and to the satisfaction of the Department Representative.

All costs associated with concreting in cold weather, when required, will be considered incidental to the Work, and no separate or additional payment will be made.

70% of the unit price bid will be paid once the concrete has been acceptably placed and the 4 day concrete compressive strength tests indicate, in the opinion of the Department Representative, that the concrete will achieve the specified strength. Initial payment will not constitute full acceptance of the concrete. 30% of the unit price bid will be made once concrete surface finishing, the condition of weathering steel girders, concrete work and other bridge components, and 28 day concrete compressive strength test results have been reviewed and accepted by the Department Representative.

The Department Representative reserves the right to reject concrete that does not meet the specified requirements. The Department Representative may, at its sole discretion, accept concrete that does not meet the specified 28 day concrete compressive strength at a reduced price. Payment adjustment may be made in accordance with Compressive Strength Test Result Payment Adjustment as below:

- 100 MPa and over, full bid price



- 98 MPa to 100 MPa, bid price less \$40 per cubic metre
- 96 MPa to 98 MPa, bid price less \$100 per cubic metre
- 94 MPa to 92 MPa, bid price less \$180 per cubic metre
- 90 MPa to 92 MPa, bid price less \$280 per cubic metre
- Less than 90 MPa, rejected

Compressive strengths at longer concrete ages will not be accepted as replacement.

### **1.29 REINFORCING STEEL**

Supply, fabrication, handling and placing of reinforcing steel shall be in accordance with Section 5, Reinforcing Steel, of the Standard Specifications for Bridge Construction.

Payment for Reinforcing Steel, in all precast concrete, including reinforcing steel projected from the elements, will be considered as incidental to the precast concrete units, and no separate or additional payment will be made.

Payment for Reinforcing Steel in drain troughs will be considered as incidental to the Drain Troughs, and no separate or additional payment will be made.

Payment for Reinforcing Steel for filed placed reinforcing steel, except in drain troughs, will be made in accordance with Subsection 5.6.2, Payment, of the Standard Specifications for Bridge Construction.

### **1.30 STRUCTURAL STEEL GIRDERS**

#### **1.30.1 General**

Structural Steel Girders includes, but is not limited to the following:

- 5 girder lines of welded steel plate girders
- bracing and diaphragms
- splicing material including plates and bolts
- bolts, nuts and washers
- stiffeners
- shear studs
- rubber drip stops

The work shall be completed in accordance with the Contract Drawings and Section 6, Structural Steel, of the Standard Specifications for Bridge Construction, and the Special Provisions.

### **1.30.2 Quality Assurance Inspection and Testing by the Department Representative**

The Department representative will complete visual inspection of all welds and review all quality control inspection and testing records and/or reports produced by the Contractor to verify their compliance with the Contract. The Department will retain a third party to complete additional quality assurance inspection and/or testing at their sole discretion. The Contractor shall provide full access to the work in accordance with Subsection 6.2.8.1, Access, of the Standard Specifications for Bridge Construction.

### **1.30.3 Erection**

The following provisions are in addition to the requirements noted in Subsection 6.3.2.2, "Structural Steel Erection Procedure", of the Standard Specifications for Bridge Construction.

The Contractor's Engineer shall submit to the Engineer:

- Calculations that demonstrate that the girder and other bridge components meet stability and structural capacity requirements at all stages of the proposed erection procedure.
- Maximum displacements, rotations, diaphragm forces and reactions at temporary supports at each stage of the proposed erection procedure Design and details of the temporary supports used, which in the case of temporary shoring towers includes upper steel grillage, lower mat / foundation, lateral bracing and tie down rods, along with verification calculations for the load capacity and stability of members.

### **1.30.4 Payment**

Payment for the supply of steel girders will be made at the lump sum price bid for "Structural Steel Girders - Supply and Fabrication, Delivery and Erection" and will be full compensation for the supply and fabrication of structural steel girders and associated material; inspection; testing; storage; loading; transporting; hauling to the project site; unloading; cleaning and/or repair if required; storage at the project site; erection; temporary stability supports, assembly; installation; including all labour, equipment, tools and incidentals necessary to complete the Work in accordance with the Contract and to the satisfaction of the Department Representative. The lump sum price bid will be paid in accordance with Subsection 6.4.1.1, Supply and Fabrication, Subsection 6.4.1.2, Delivery, and Subsection 6.4.1.3, Erection, of the Standard Specifications for Bridge Construction.

## **1.31 BEARINGS**

### **1.31.1 General**

The supply, fabrication, delivery and installation of bearings shall be as shown on the Contract Drawings and in accordance with Section 8, Bridge Bearings, of the Standard Specifications for Bridge Construction.

Bearing materials include but not limited to the following:

- Bearing base plates
- Elastomeric bearings at abutments (10 total)

- Tapered sole plates
- Bolts, nuts and washers
- Pintles and shim plates

The Contractor shall ensure proper coordination between the bearing, precast concrete suppliers and girder suppliers with respect to the attachment details required. Connections details shall be submitted to the Engineer for review.

Since the bearings will be designed by the bearing fabricator/supplier, and the bearing design with the dimensions hold the fabrication of related precast concrete element because of geometric confirmations, the Contractor is recommended to arrange the bearing design at the earliest possible time to avoid construction delay on related works.

### **1.31.2 Closed Cell Neoprene Sponge**

A continuous strip of closed cell neoprene sponge between finished abutment seat and abutment diaphragm is required for each abutment as identified on the Drawings. The material shall satisfy the following minimum requirements:

- Density great than 140 kg/m<sup>3</sup>
- Tensile strength no less than 500 kPa
- Low temperature range: equal or lower than -40 ° C

Supply and installation of Closed Cell Neoprene Sponge Strips are incidental to the lump sum price bid for Bearing and no separate or additional payment will be made for this work.

### **1.31.1 Payment**

Payment for bearings will be made at the lump sum price bid for "Bearings – Supply and Fabrication, Delivery and Installation" for the type and size specified, and will be full compensation for the design; supply and fabrication; inspection; testing; storage; loading; transporting; hauling to the project site; unloading; cleaning and/or repair if required; assembly; installation; including all labour, equipment, tools and incidentals necessary to complete the Work in accordance with the Contract and to the satisfaction of the Department Representative.

The lump sum price bid will be paid in accordance with Subsection 8.5.1.1, Supply and Fabrication, Subsection 8.5.1.2, Delivery, and Subsection 8.5.1.3, Installation, of the Standard Specifications for Bridge Construction. If written acceptance of the Contractor's ITPs is not provided by the Department Representative prior to the commencement of the Work, the Work will be rejected and no payment will be made.

## **1.32 BRIDGERAIL**

### **1.32.1 General**

Bridgerail shall include but not limited to the supply, fabrication and installation of steel tube type bridgerail, approach rail transition and safety railing on top of the wingwalls. Approach rail

transition shall include three beam or W-beam guardrail sections, W-three beam transition section, terminal connectors, steel or timber guardrail posts, spacers, and guardrail connection and wing end sections where specified.

The supply, fabrication and installation of Bridgerail and Approach Rail Transition will be in accordance with the Contract Drawings and Section 12, Bridgerail, of the Standard Specifications for Bridge Construction.

#### **1.32.2 Quality Assurance Inspection and Testing by the Department Representative**

The Department Representative will complete visual inspection of all welds and review all quality control inspection and testing records and/or reports produced by the Contractor to verify their compliance with the Contract.

The Department Representative may retain a third party to complete additional quality assurance inspection and/or testing at their sole discretion. The Contractor shall provide full access to the work in accordance with Subsection 12.2.7.1, Access, of the Standard Specifications for Bridge Construction.

#### **1.32.3 Payment**

Payment for bridgerail will be made in accordance with Subsection 12.4, Payment, of the Standard Specifications for Bridge Construction.

### **1.33 DRAIN TROUGHS**

The Contractor shall install 2 drain troughs at locations shown on the Contract Drawings, and be in accordance with Section 9, Drain Trough, of the Standard Specifications for Bridge Construction.

Pre-bagged concrete is allowed for Cast-in-place Class C Concrete on drain troughs. All work shall be in accordance with Section 4, Cast-In-Place Concrete, Subsection 20.5.6.1, Pre-bagging for Site Batching, and 20.5.6.2, Concrete Mixer Trucks and Water Supply for Site Batching of the Standard Specifications for Bridge Construction.

Measurement for payment of drain troughs will be in accordance with Subsection 9.8, Measurement and Payment, of the Standard Specifications for Bridge Construction.

### **1.34 HEAVY ROCK RIPRAP**

#### **1.34.1 General**

The Contractor shall supply, transport and install imported heavy rock riprap, granular filter base, salvage existing riprap with blending of or filling voids with smaller riprap, cobbles and gravels, as shown on the Contract Drawings, and be in accordance with Section 10, Heavy Rock Riprap, of the Standard Specifications for Bridge Construction.

The existing riprap on the bridge headslopes shall be salvaged as specified in the Drawings.

### **1.34.2 Heavy Rock Riprap - Imported**

“Heavy Rock Riprap - Imported” is new imported riprap to be placed as shown on the Drawings and directed by the Engineer’s representative.

The Contractor shall transport the suitable riprap material for the bridge.

The Contractor has the option to select either Class 1 or Class 2 Heavy Rock Riprap for the new riprap with the corresponding thickness specified in the Drawings. The work shall be in accordance with be Section 10, Heavy Rock Riprap, of the Standard Specifications for Bridge Construction.

Measurement for payment of heavy rock riprap will be by the cubic metre of heavy rock riprap acceptably placed, measured to the nearest 1 m<sup>3</sup>.

The quantity to be paid for will be based on the thickness of heavy rock riprap specified on the Drawings multiplied by the actual measured surface area of ground covered with imported heavy rock riprap as determined by the Department Representative. Heavy rock riprap placed outside of the plan limits on the Drawings or beyond boundaries as directed by the Engineer’s representative will not be paid.

Payment will be made at the unit price bid for “Heavy Rock Riprap - Imported”, and will be full compensation for royalties; permits; sampling and testing; transportation; the preparation, weighing and inspection of sample sizes; excavation and subgrade preparation, including backfilling; the supply and placement of heavy rock riprap; interim stockpiling; and all labour, equipment, tools and incidentals necessary to complete the Work as shown on the Drawings and to the satisfaction of the Department Representative.

### **1.34.3 Heavy Rock Riprap – Relocating Salvaged**

This “Heavy Rock Riprap – Relocating Salvaged” will include relocating existing riprap to its permanent location as shown on the Drawings and directed by the Engineer’s representative, or due to the new bridge headslope grading to the design slope.

Payment will be made at the lump sum price bid for “Heavy Rock Riprap - Salvaged Replacing”, and will be full compensation for the preparation, excavation and subgrade preparation, including backfilling; removing, relocating and placement of heavy rock riprap; interim stockpiling; and all labour, equipment, tools and incidentals necessary to complete the Work as shown on the Drawings and to the satisfaction of the Department Representative.

### **1.34.4 Smaller Riprap - Imported**

“Smaller Riprap -Imported” is new imported smaller size of riprap, cobbles and gravels to be used for blending with the salvaged existing riprap to meet the full Class 2 heavy rock riprap gradation on Top Portion of the riprap, or filling voids of existing riprap to approximated meet Class 2 Heavy Rock Riprap on the Mid Portion of the riprap as shown on the Drawings and directed by the Engineer’s representative.

All materials shall be sourced and supplied by the Contractor. The Contractor shall be responsible for royalties, processing, loading, hauling, placing, compacting, quality control testing and any other incidentals required to supply these materials in place.

The material shall be as specified in the Drawings, Specifications and of a quality acceptable to the Department Representative.

Measurement for payment of will be by the cubic metre of heavy rock riprap acceptably placed, measured to the nearest 0.1 m<sup>3</sup>.

The quantity to be paid for will be based on the actual amount of Smaller Riprap to be imported and placed as determined by the Department Representative.

Payment will be made at the unit price bid for "Smaller Riprap -Imported", and will be full compensation for royalties; permits; sampling and testing; transportation; the preparation, weighing and inspection of sample sizes; excavation and subgrade preparation, including backfilling; the supply and placement of smaller size of riprap, cobbles and gravels; interim stockpiling; and all labour, equipment, tools and incidentals necessary to complete the Work as shown on the Drawings and to the satisfaction of the Department Representative.

#### **1.34.5 Heavy Rock Riprap – Granular Filter Base**

Granular Filter Base beneath heavy rock riprap shall be supplied and placed as the Drawings and directed by the Engineer's representative.

All materials shall be sourced and supplied by the Contractor. The Contractor shall be responsible for royalties, processing, loading, hauling, placing, compacting, quality control testing and any other incidentals required to supply these materials in place.

The material shall be as specified in the Drawings, Specifications and of a quality acceptable to the Department Representative.

Measurement for payment of Heavy Rock Riprap – Granular Filter Base will be by the cubic metre of material acceptably placed, measured to the nearest 0.1 m<sup>3</sup>.

The quantity to be paid for will be based on the thickness of granular filter base specified on the Drawings multiplied by the actual measured surface area of ground covered with granular filter base as the Drawing or determined by the Department Representative. Granular filter base placed outside of the plan limits on the Drawings will not be paid.

Payment will be made at the unit price bid for "Heavy Rock Riprap – Granular Filter Base" and will be full compensation for the supply of material; placement and compaction; sampling and testing; and all labour, materials, equipment, tools and incidentals necessary to complete the Work as shown on the Drawings and to the satisfaction of the Department Representative.

#### **1.35 SEALER**

Supply and application of sealers shall be in accordance with the Drawings, Subsection 4.25.4, Class 3 Bonded Surface Finish and Subsection 7.2.5.14, Concrete Sealer, of the Standard Specifications for Bridge Construction. Sealers shall be applied on precast concrete units and field placed UHPC concrete connections, pockets, and grout lifting pockets as specified in the Drawings.

Type 1c sealer is applicable for Class 2 and 5 finish; pigmented Type 3 sealer is applicable for Class 3 finish as specified in the Contract Drawings. The colour of the pigmented sealer shall be

Concrete Grey.

The Contractor has the options to apply sealers on the precast units either in shop and then field applying corresponding sealers on the element connection and other areas accordingly, or in field together with all concrete connection and other areas.

If sealers are applied in shop on the precast units, the work shall be in accordance with Subsection 7.2.5.14, Concrete Sealer, of the Standard Specifications for Bridge Construction. Additionally, UHPC connection surfaces, UHPC pockets and lifting hook pockets shall not receive sealer and shall be protected to avoid seal dropping. Sealers applied in shop on the precast units shall be the same products as applied in the field on the connection and other areas,

All field application of sealers shall be in accordance with Subsection 4.25.4, Class 3 Bonded Surface Finish, of the Standard Specifications for Bridge Construction, for Pigment Sealer; Subsection 4.26, Type 1c Sealer, for Type 1c sealer accordingly.

Payment for sealers will be made at the lump sum price bid for "Sealers – Supply and Application", and will be full compensation for the supply, surface preparation and application; including all labour, equipment, tools and incidentals necessary to complete the Work in accordance with the Contract and to the satisfaction of the Department Representative.

### **1.36 LOAD EVALUATION**

Load evaluation of the new bridge structure will not be required from the Contractor, notwithstanding Section 15, Load Evaluation, of the Standard Specifications for Bridge Construction.

### **1.37 ROADWAY CONSTRUCTION**

#### **1.37.1 General**

The Contractor shall construct roadway approaches from the end of the new wingwall to tie to the existing highway and new bridge approach slabs as per the Contract Drawings and as directed by the Engineer, and in accordance with the GNWT Standard Drawings, Standard Specifications for Highway Construction, and special provisions below.

The work includes but is not limited to the following work:

- Stripping
- Clearing and grubbing
- Roadway excavation
- Embankment construction
- Subgrade preparation
- Granular subbase and base course
- Double asphaltic surface treatment (Chip Seal)

- Topsoil placement
- Hydroseeding
- Steel W-Beam guardrail
- Guardrail removal
- Concrete barrier removal
- New culvert
- Culvert removal
- Traffic signs
- Temporary roadway line markings
- Removal of waste stripping material

#### **1.37.2 Stripping**

The Contractor shall strip the existing ground per the Contract Drawings. The minimum stripping depth is to be 200mm so that no organic materials are present.

Payment for Stripping will be at the Contract unit price per cubic metre in the Unit Price Table. The Price per Unit Bid shall include all costs for stripping, stockpiling and all other items necessary for successful completion of the work.

#### **1.37.3 Clearing and Grubbing**

The clearing and grubbing shall be in accordance with the requirements specified in Division 3, Section 1, "Clearing" and Section 2, "Grubbing", GNWT Standard Specifications for Highway Construction, and Contract Drawings.

Prior to construction of the excavations and embankment fills, the ground surface within the embankment footprint shall be cleared of all debris, snow, ice, stones larger than 150 mm in diameter, trees, vegetation, and organic soils.

The Contractor shall dispose of clearing and clearing debris by chipping and mulching the material and spreading it on site at a location acceptable to the Engineer.

Payment for Clearing and Grubbing will be at the Contract unit price per hectare in the Unit Price Table. The Price per Unit Bid shall include all costs for all items necessary for a successful completion of the work.

#### **1.37.4 Roadway Excavation**

Roadway Excavation shall be in accordance with the requirements specified in Division 3, Section 3, "Roadway Excavation" and Section 4, "Borrow Excavation", GNWT Standard Specifications for



Highway Construction.

Payment for Roadway Excavation Common will be at the Contract unit price per cubic metre in the Unit Price Table. The Price per Unit Bid shall include all costs for all items necessary for a successful completion of the work.

### **1.37.5 Embankment Construction**

The work shall be in accordance with the requirements specified in Division 3, Section 6, "Embankment Construction", GNWT Standard Specifications for Highway Construction.

Contractor shall supply all materials required for the embankment fill.

The existing highway is to be widened for the new bridge. In order to avoid a manufactured slip plane between the existing embankment and the new fill, the stripped slope of the existing embankment shall be notched in a series of steps as per GNWT Standard Drawing and Contract Drawings. The new embankment fill material shall be of pit run type material with a maximum particle size of 300 mm and shall be placed in horizontal layers to the required height at the maximum lift thickness of 300 mm or as specified by the Engineer. No fill shall be placed in layers parallel to the existing side slope.

Payment for Embankment Construction using excavated material onsite will be at the Contract unit price per cubic metre for Embankment Construction – from Roadway Excavation Common (onsite) in the Unit Price Table.

Payment for Embankment Construction using borrowed material offsite will be at the Contract unit price per cubic metre for Embankment Construction – from Borrowed Excavation Common (offsite) in the Unit Price Table.

The Price per Unit Bid shall include all costs for all items necessary for a successful completion of the work.

### **1.37.6 Subgrade Preparation**

The work shall be in accordance with the requirements specified in Division 5, Section 4, "Subgrade Preparation", GNWT Standard Specifications for Highway Construction.

Payment for Subgrade Preparation will be at the Contract unit price per square metre in the Unit Price Table.

### **1.37.7 Granular subbase and base course**

The Contractor shall supply, haul, place and compact 20 mm minus base course and 50 mm minus subbase course aggregate materials in accordance with Division 5, Section 2, "Granular Base and Subbase Course Construction", GNWT Standard Specifications for Highway Construction, and Contract Drawings.

The specifications are amended as followings:

1. Clause 5.2.3.1 (c), first paragraph is deleted and replaced with the following:

.1 General

(c) Granular subbase and base course materials shall be placed to the lines, grades and cross-sections as shown on the Contract Drawings or as directed by Engineer.

The Contractor shall place and compact 20 mm minus base course aggregate and 50 mm minus sub-base course aggregate in maximum 150 mm compacted uniform lifts to 100% standard proctor value according to ASTM D698 before being approved for placing the following lift of material.

The Contractor shall place material using methods that do not lead to segregation or degradation of the aggregates. Materials shall be placed on the surface free from snow and ice with no frozen material being placed.

2. Clause 5.2.3.2 (b) shall be deleted and replaced with the following:

(b) Compaction Testing Requirements

The Contractor's quality control and quality control testing program shall include all compaction density and moisture testing required for the construction of the granular subbase and base course in accordance with the specifications.

The Contractor shall carry out compaction testing using nuclear equipment, two (2) tests per 40 m along the roadway randomly; one on the left and one on the right side of centerline for the subbase course and the base course construction, and as directed by Engineer. The Contractor shall apply water as necessary during compacting to obtain the specified density.

Each layer of material shall be compacted to the specified density and the results shall be submitted to the Engineer for verification of compliance with the specifications before the next layer is placed.

The Contractor shall apply compaction effort sufficient to achieve a uniform density not less than 100% of maximum density at optimum moisture content to compact the base course and subbase course materials.

The Contractor shall establish the maximum density at the optimum moisture content in accordance with the latest edition of AASHTO T99, for each Classification and Designation of material incorporated into the Work. Original copies of all worksheets and laboratory test results shall be submitted to the Engineer prior to commencement of the chip seal operations.

3. Clause 5.2.3.3 (d) is deleted and replaced with the following:

The Contractor shall prepare as-built information for every twenty (20) metres along the roadway for the completed subbase and base course and send to the Engineer for verification prior to the application of subsequent material thereon.

Production and supply of as built data for subbase and base courses will be incidental to construction of the base and subbase courses.

### 1.37.8 Double Asphaltic Surface Treatment (Chip Seal)

The Contractor shall construct a wearing course composed of an asphaltic binder and a crushed aggregate spread, compacted in two applications as shown on the Contract Drawing or as directed by the Engineer and in accordance with Division 6, Section 5, "Single Asphaltic Surface Treatment", GNWT Standard Specifications for Highway Construction.

The specification is amended as follows:

#### 1. Supply and Application of Materials

1) Division 6, Section 5; Clause 6.5.2.1 is deleted and replaced with the following:

The contractor will supply chip seal aggregate (16 mm minus) required for Double Asphaltic Surface Treatment.

2) Division 6, Section 5, Clause 6.5.2.2 add the following:

The Contractor shall supply the bituminous binder (HF 250S) for Double Asphaltic Surface Treatment and shall meet the following requirements:

Tests on Emulsion	HF-250S		Test Method
	Min.	Max.	
Residue by Distillation, (% by mass)	62	-	CAN 2-16.5-M84 Section 6.2.1
Oil portion of Distillate (% by Volume)	1.0	6.0	A.S.T.M D244
Viscosity, Saybolt Furol Seconds at 50°C	35	150	A.S.T.M D244
Demulsibility 50ml 0.1N $\text{CaCl}_2$ (%)	-	-	A.S.T.M D244
Tests on Residue	HF-250S		Test Method
	Min.	Max.	
*Penetration at 25°C, 100g 5 Sec (0.1 mm)	250	450	CAN 2-16.5-M84 Section 6.2.4
Viscosity @ 60° C (Pa.s)	-	-	CAN 2-16.5-M84 Section 6.2.5

Float Test @ 60° C Sec	1200	-	CAN 2-16.5-M84  Section 6.2.6
* Penetration tests shall be conducted on residue which has been distilled to 204° C +/- 5° C			

3) Division 6, Bituminous Materials, Section 5, 6.5.3.6 and 6.5.3.7 shall have the first sentences deleted and replaced with:

a) Generally, the Asphalt Binder Application Rate will be in the range of 1.8 to 2.3 litres per square metre.

b) Generally, the Aggregate Application Rate will be in the range of 20.0 to 24.0 kilograms per square metre.

The Contractor shall be responsible for the quality of the final product. The application rates as described above are provided for information. The Contractor must establish the application rates best suitable for the surface receiving the Double Asphaltic Surface Treatment, the asphalt oil and the aggregate provided.

4) The Asphaltic Surface Treatment shall be applied to a width of 10.0 metres or as directed by the Engineer.

5) The Contractor shall ensure that no surface deficiencies are created as a result of the centerline referencing.

6) The asphaltic surface treatment shall be dampened with water prior to the sweeping to control dust.

## 2. Quality Control and Quality Control Testing

1) Paragraph 5 of Section 6.5.3.1(a) of Division 6 – Bituminous Materials, is amended as follows:

The Contractor shall retain and utilize Professional Engineering Services to carry out all quality control and quality control testing and to ensure the work meets all specification requirements. The Professional Engineering Services employed by the Contractor shall be licensed to operate in the Northwest Territories.

2) Paragraph 7 of Section 6.5.3.1(a) of Division 6 – Bituminous Materials, is amended as follows:

All quality control tests and test results shall be calculated, recorded and submitted to the Engineer on industry standard worksheets. The tests and test results shall be certified for correctness by the Professional Engineering Services employed by the Contractor to perform the tests and shall be signed by the Contractor's representative. Original copies of all worksheets, including calculations, shall be submitted to the

Engineer daily.

All worksheets shall be reviewed and certified for correctness by a Professional Engineer from the Professional Engineering Services employed by the Contractor to perform the tests, on a minimum weekly basis.

#### **1.37.9 Topsoil Placement**

The topsoil placement shall be a minimum of 100 mm depth per Contract Drawings and spread evenly for all disturbed areas other than the road driving surface and gravel side slope areas. The suitable material from stripping shall be used for the topsoil placement or as directed by the Engineer.

Payment for Topsoil Placement shall be at the Contract unit price per hectare in the Unit Price Table. The Price per Unit Bid shall include all costs for all items necessary for a successful completion of the work.

#### **1.37.10 Hydroseeding**

The Contractor shall hydroseed all graded or disturbed areas that have a minimum of 100 mm topsoil placement. Hydroseed mix composition at a minimum rate of 20 kg/hectare. The Contractor shall supply fertilizer and mulch to be applied at the recommendation of the seed supplier. The grass seed mix shall be reviewed and approved by the Engineer.

Seeding can occur during any period when germination can be successful and plants have sufficient time to become established before the end of the growing season. Seeding should occur in spring or in fall for optimum results. Seeding conducted in the fall or on up to 0.15 m of snow will overwinter and germinate the following spring.

Water the seeded areas after seeding to achieve germination and a uniform stand of grass. Apply water uniformly to seeded areas without causing displacement or erosion of the materials and soil. A warranty period of 1 year will apply following initial seeding.

At locations that fail to show a uniform stand of grass for any reason during the calendar year following the year of initial seeding, repair the defective locations as determined by the Engineer. Contractor may repair defective areas with means other than hydroseeding, such as broadcast seeding, as approved by the Engineer. A uniform stand of grass will be considered as grass that shows no deterioration or exposed soil greater than 1 square meter in size, and provides a minimum of 80 percent ground cover as determined by the Engineer. The contractor will not be required to reseed any area more than once. Payment for Hydroseeding will be at the Contract unit price per hectare in the Unit Price Table. The Price per Unit Bid shall include all costs for all items necessary for a successful completion of the work.

#### **1.37.11 Steel W-Beam Guardrail**

The work shall be in accordance with the requirements specified in Division 7, Section 3, "Supply and Installation of Steel W-Beam Guardrail", GNWT Standard Specifications for Highway Construction, GNWT Standard Drawings and Contract Drawings.

### **1.37.12 Guardrail Removal**

The work shall be in accordance with the requirements specified in Division 7, Section 2, "Steel Guardrail Removal", GNWT Standard Specifications for Highway Construction.

### **1.37.13 Concrete Barrier Removal**

The concrete barrier removal shall be in accordance with the Contract Drawings and disposal to an approved location by the Engineer.

Payment for concrete barrier removal will be at the Contract unit price per linear metre for Removal and Disposal of Concrete Barriers in the Unit Price Table. The Price per Unit Bid shall include all costs for removal, disposal to an accepted location by the Engineer and all items necessary for a successful completion of the work.

### **1.37.14 New Culvert**

The work shall be in accordance with the requirements specified in Division 4, Section 1, "Supply and Installation of Corrugated Steel Pipe Culverts", GNWT Standard Specifications for Highway Construction, GNWT Standard Drawings and Contract Drawings.

### **1.37.15 Culvert Removal**

The work shall be in accordance with the requirements specified in Division 4, Section 2, "Culvert Removal", GNWT Standard Specifications for Highway Construction.

Payment for culvert removal shall be at the Contract unit price per linear metre for the item of Removal and Disposal of Existing Culvert in the unit price table. The Contract unit price shall include all costs for removal, disposal and all other items necessary for successful completion of the work.

### **1.37.16 Traffic Signs**

The work shall be in accordance with the requirements specified in Division 7, Section 1, "Traffic Signs", GNWT Standard Specifications for Highway Construction, GNWT Standard Drawings and Contract Drawings.

Payment for the new traffic signs shall be at the Contract unit price for the total number of the sign for the item of Supply and Installation of Traffic Signs in the Unit Price Table.

Payment for the removal and disposal of existing traffic signs shall be at the Contract unit price for the total number of the existing signs removed for the item of Removal and Disposal of Traffic Signs in the Unit Price Table. The unit price shall include all costs for removal and disposal of sign panels, posts and foundation and all other items necessary for successful completion of the work.

### **1.37.17 Temporary Roadway Line Markings**

The work shall be in accordance with the requirements specified in Division 8, Section 1, "Supply and Application of Painted Roadway Markings", GNWT Standard Specifications for Highway

**Construction.**

The temporary roadway line markings shall include 100 mm solid yellow directional dividing line and 100 mm solid white edge lines with gaps at the access locations per Contract Drawings.

**1.37.18 Removal of Waste Stripping Material**

Suitable material from stripping operations shall be used for the topsoil placement before hydroseeding operations. Any non-suitable stripping material or any surplus stripping material after topsoil placement operations shall be disposed to an offsite location approved by the Engineer.

Payment for the Removal and Disposal of Waste Stripping Material shall be at the Contract unit price per cubic metre in the Unit Price Table.

**1.38 EXISTING UTILITIES**

Contractor is advised that there are underground NorthwesTel fibre optic line on both sides of the highway at the existing bridge location, which shall be considered by the contractors as required while making work plans and due diligence be done to ensure the existing utilities are not damaged during the Work.


The existing NorthwesTel fiber optical lines will be relocated by the utility owner prior to the start of work. In case the relocation is not finished before this project starts, the Contractor is responsible for any coordination with the utility owner, utility contractor or GNWT for the utility relocation.

## Appendices



**Subject:** [EXTERNAL] RE: 24-HCAA-00451 - Request for Review - Jean Marie River Bridge Replacement Project  
**Sent:** 4/25/2024, 12:17:40 PM  
**From:** OP Habitat (DFO/MPO)<DFO.OPHabitat.MPO@dfo-mpo.gc.ca>  
**To:** Lucas Warner  
**Cc:** Azarnejad, Azita; Shewen, Charles; Alina\_Goldenberg@gov.nt.ca; Alexis\_Campbell@gov.nt.ca; JMRB

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 Fisheries and Oceans Canada  
Ontario and Prairie Region  
Fish and Fish Habitat Protection  
Program  
867 Lakeshore Rd.  
Burlington, ON  
L7S 1A1

Pêches et Océans Canada  
Région de l'Ontario et des Prairies  
Programme de protection du poisson et de son  
habitat  
867 chemin Lakeshore  
Burlington, ON  
L7S 1A1

Dear Lucas:

**Subject: [Bridge Replacement, Jean Marie River, Fort Simpson] (24-HCAA-00451) – Implementation of Measures to Avoid and Mitigate the Potential for Prohibited Effects to Fish and Fish Habitat**

The Fish and Fish Habitat Protection Program (the Program) of Fisheries and Oceans Canada (DFO) received your proposal on February 26, 2024. We understand that you propose to:

- Remove existing structure on Jean Marie River and replace with a 39.20m clear span bridge; and
- Re-grade and re-armour embankments on both sides of the creek to match existing hydraulic conditions; and,
- Installation of a temporary clearspan bridge to detour traffic.

We understand the following aquatic species listed under the Species at Risk Act may use the area in the vicinity of where your proposal is to be located:

- Bull Trout listed as Special Concern

Our review considered the following information:

- Request for Review form and associated documents.

Your proposal has been reviewed to determine whether it is likely to result in:

- the death of fish by means other than fishing and the harmful alteration, disruption or destruction of fish habitat which are prohibited under subsections 34.4(1) and 35(1) of the *Fisheries Act*;
- effects to listed aquatic species at risk, any part of their critical habitat or the residences of their individuals in a manner which is prohibited under sections 32, 33 and subsection 58(1) of the *Species at Risk Act*; and,
- the introduction of aquatic species into regions or bodies of water frequented by fish where they are not indigenous, which is prohibited under section 10 of the *Aquatic Invasive Species Regulations*.

The aforementioned impacts are prohibited unless authorized under their respective legislation and regulations.

To avoid and mitigate the potential for prohibited effects to fish and fish habitat (as listed above), we recommend implementing the measures listed below:

- Plan in-water works, undertakings and activities to respect [timing windows](#) to protect fish, including their eggs, juveniles, spawning adults and/or the organisms upon which they feed and migrate;
- Aquatic invasive species are introduced and spread through transporting sands and sediments and using contaminated construction equipment. To prevent the spread of aquatic invasive species during construction in aquatic environments:
  - Clean, drain and dry any equipment used in the water; and,
  - Never move organisms or water from one body of water to another;
- Limit impacts on riparian vegetation to those approved for the work, undertaking or activity;
  - Limit access to banks or areas adjacent to waterbodies;
  - Construct access points and approaches perpendicular to the watercourse or waterbody;
  - Re-vegetate the disturbed area with native species suitable for the site;
- If replacement rock reinforcement/armouring is required to stabilize eroding areas around bridge structures (e.g., abutments and/or wing walls), the following measures should be incorporated:
  - Place appropriately-sized, clean rocks into the eroding area;

- Do not obtain rocks from below the ordinary high water mark of any water body;
- Ensure rock does not interfere with fish passage or constrict the channel width;
- Restore stream geomorphology (i.e., restore the bed and banks, gradient and contour of the waterbody) to its initial state;
- Develop and implement an erosion and sediment control plan to avoid the introduction of sediment into any waterbody during all phases of the work, undertaking or activity;
  - Schedule work to avoid wet, windy and rainy periods (and heed weather advisories) that may result in high flow volumes and/ or increase erosion and sedimentation;
  - Monitor the watercourse to observe signs of sedimentation during all phases of the work, undertaking or activity and take corrective action; and,
- Develop and implement a response plan to avoid a spill of deleterious substances.

Provided that you incorporate these measures into your plans, the Program is of the view that your proposal will not require an authorization under the *Fisheries Act*, the *Aquatic Invasive Species Regulations* or the *Species at Risk Act*.

Should your plans change or if you have omitted some information in your proposal, further review by the Program may be required. Consult our website (<http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html>) or consult with a qualified environmental consultant to determine if further review may be necessary. It remains your responsibility to remain in compliance with the *Fisheries Act*, and the *Species at Risk Act* and the *Aquatic Invasive Species Regulations*.

Whirling disease, a disease of finfish, caused by infection with a microscopic parasite called *Myxobolus cerebralis*, has been identified in Alberta. There may be a requirement for you to apply for a permit from the Canadian Food Inspection Agency to move certain species of finfish, such as rainbow trout, and things, such as sediments, within or out of Alberta. Please visit <http://www.inspection.gc.ca/animals/aquatic-animals/domestic-movements/eng/1450122972517/1450122973466> for more information.

It is also your *Duty to Notify* DFO if you have caused, or are about to cause, the death of fish by means other than fishing and/or the harmful alteration, disruption or destruction of fish habitat. Such notifications should be directed to [FisheriesProtection@dfo-mpo.gc.ca](mailto:FisheriesProtection@dfo-mpo.gc.ca) or 1-855-852-8320.

**Please notify this office at least 10 days before starting any in-water works.** Send your notification to the assessor (contact information below) and the DFO 10 notification mailbox: [DFO.OP.10DayNotification-Notification10Jours.OP.MPO@dfo-mpo.gc.ca](mailto:DFO.OP.10DayNotification-Notification10Jours.OP.MPO@dfo-mpo.gc.ca). We recommend that a copy of this letter be kept on site while the work is in progress. It remains your responsibility to meet all other federal, territorial, provincial and municipal requirements that apply to your proposal.

If you have any questions with the content of this letter, please contact Lucas Coletti at [Lucas.Coletti@dfo-mpo.gc.ca](mailto:Lucas.Coletti@dfo-mpo.gc.ca). Please refer to the file number referenced above when corresponding with the Program.

Yours sincerely,

Lucas Coletti

Biologist | Biologiste

Fisheries and Oceans Canada | Pêches et Océans Canada

Fish and Fish Habitat Protection Program | Programme de Protection du Poisson et de Son Habitat

M: (905)-317-1541

Email/Courriel: [Lucas.Coletti@dfo-mpo.gc.ca](mailto:Lucas.Coletti@dfo-mpo.gc.ca)

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# WESTERN TOAD MANAGEMENT

Best Practices

Department of Infrastructure



An adult Western Toad



Western Toad tadpoles

The Western Toad is listed as 'special concern' under the federal Species at Risk Act and considered 'threatened' under the Species at Risk (NWT) Act.



Government of  
Northwest Territories



# How to identify a Western Toad

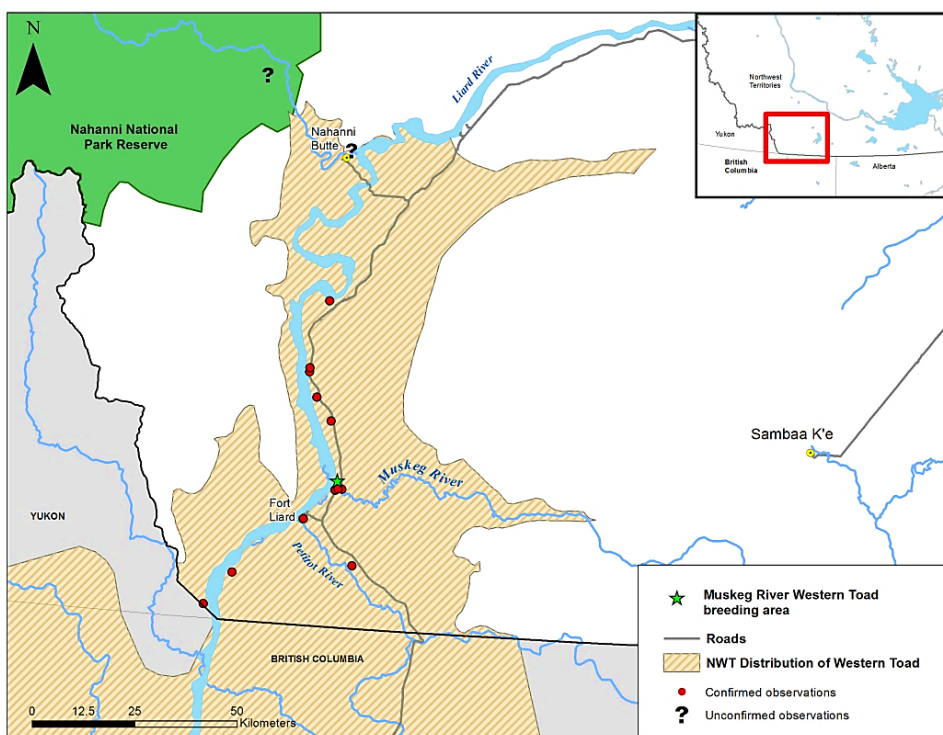
- The Western Toad is a green to brown toad with a light stripe down the middle of the back. Their coloring can vary from olive green, reddish brown, or black.
- They have small round 'warts' on the back, sides, and upper arms. Toadlets (juvenile toads) look like tiny versions of the adults but may be darker coloured or black.
- Western Toads can be quite small (5 cm in length), although some can grow up to 12 cm (about the length of a finger). Toadlets can be smaller than a dime. Newly hatched tadpoles are black and 1 cm in length.

## When and where

Western Toads hibernate through winter and begin breeding after ice breakup in spring.

Toads migrate to and from breeding ponds and overwintering sites so you may see adult toads or toadlets on our roads between late-April and late-May, and also during late summer and fall as they migrate to overwintering sites.

Breeding habitat consists of a variety of wetlands such as shallow silty/sandy ponds, lake shores, rivers, streams, marshes, gravel pits, and roadside ditches.



Distribution of western toads in southwestern Northwest Territories. Map by B. Fournier, GNWT ENR, June 12 2018.

After breeding they disperse into other terrestrial habitats. The attached map shows the known distribution of Western Toads in the Northwest Territories.

There is an important western toad breeding site beside the Liard Highway by the Muskeg River Bridge. Western Toads breed in the gravel pit ponds at km 46.7 and are known to cross the Liard Highway in this area. Toad crossing road signs identify this area.

# You've encountered Western Toads at your worksite. What should you do?



## 1. General

- If you come across a toad or toadlet notify the site manager immediately.
- Do not disturb, touch, move, destroy, or take Western Toads.
- Prevent transmission of amphibian diseases by limiting contact of clothing, boots and machinery with bodies of water.

## 2. Buffers

- Establish buffer zones around breeding ponds and minimize activities in the immediate area. Use barricades or flagging to ensure all site crew avoid the identified populations.

## 3. Prevent Toad Mortality

- When working in the gravel pit at km 46.7 of the Liard Highway (near the Muskeg River Bridge), do not walk, drive, park equipment, or store supplies near the ponds. These ponds are used by western toads for breeding.
- Toads (adults and/or toadlets) may cross roads while migrating and are at risk of being run over. Implement additional traffic control measures (reduce speed, station flaggers near Western Toad populations during spring and summer and watch for toads on the road. Be on the lookout for toads near the Muskeg River Bridge.

## 4. Reporting

- When western toads are encountered on site, notify the INF Environmental Affairs Manager.
- Notify all personnel of the location of the toads on site and their legal obligations to prevent any adverse effects or legal liabilities.

## You're **working within or near Western Toad ranges.** What should you do?



Western Toad eggs in a pond, courtesy of Fraser Valley Conservancy.

### 1. **Minimizing Disturbance Activities**

- Engines should be properly maintained and muffled to prevent leaks and noise disturbances.
- Take precautions to avoid spills of any contaminants near water bodies or streams.
- Ensure waste that attracts toad predators such as food scraps is stored in closed containers.
- Water bodies and streams are key habitat areas and should not be unnecessarily disturbed.

### 2. **Survey**

- Western Toads return to breeding sites seasonally, meaning if they aren't observed at your worksite now they may appear at another time. Be aware and check your worksite for toads, and toadlets.

**For more information on the Western Toad,  
visit [enr.gov.nt.ca](http://enr.gov.nt.ca).**

Migratory Bird Activity Daily Inspection Form					
Project Title					
Geographic Location					
Date					
Time					
Surveyor Name					
Birds Exhibiting Breeding Behaviour	Yes	No	Approximate Location (UTM)		Notes
			Easting	Northing	
Paired birds					
Birds carrying nesting material					
Birds carrying food					
Birds displaying territorial singing/alarm calls or distraction displays					
Nest observed					



Migratory Bird Activity Daily Inspection Form					
Equipment Inspection	Yes	No	Approximate Location (UTM)		Notes
			Easting	Northing	
Nest building detected on equipment (e.g. mud or grasses applied by birds)					
Other Hazards to Birds Identified	Yes	No	Notes		
Where bird habitat potential is high and bird activity is observed are doors and windows on buildings and equipment closed					
Have temporary exclusion measures been installed on culverts, bridges, or other structures to prevent birds from accessing a work area					
Are harmful substances being managed in ways to not result in a deposition of a substance that is harmful to birds					
Are exposed soils, aggregate extraction areas, excavations and stockpiled materials being managed to avoid creation of nesting habitat for bank swallows					
Other					

**Notes:**

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# **Department of Infrastructure**

## **Guidelines on the Protection of Migratory Birds**

### **STATEMENT**

The Government of the Northwest Territories' (GNWT) Department of Infrastructure (INF) is committed to ensuring that its activities and operations support the long-term conservation of migratory birds by minimizing the risk of harm to migratory birds, nests, eggs and their habitats, pursuant to the *Migratory Birds Convention Act* (S.C. 1994), the *Migratory Birds Regulations* (C.R.C., c. 1035), and the *Species at Risk Act* (S.C. 2002).

### **PURPOSE**

To provide guidance on the implementation of the INF "Beneficial Management Practices for Migratory Birds in the Northwest Territories," found in Attachment A, including roles, responsibilities, and accountabilities of INF and its contractors.

This will form a component of INF's due diligence under the *Migratory Birds Convention Act* (S.C. 1994) section 13.17, which states that "a person or vessel that establishes that they exercised due diligence to prevent the commission of an offence under this Act, shall not be found guilty of the offence."

### **PRINCIPLES**

1. Any interactions with migratory birds by INF staff and its contractors shall be done in a way that is in compliance with the *Migratory Birds Convention Act* (S.C. 1994), the *Migratory Birds Regulations* (C.R.C., c. 1035), and the *Species at Risk Act* (S.C. 2002).
2. INF is committed to building strong and collaborative partnerships with its contractors.

### **SCOPE**

These guidelines apply to all INF staff and contractors conducting activities on behalf of the INF associated with construction and operations.

## DEFINITIONS

Beneficial Management Practices (BMP) – any management practice that reduces or eliminates an environmental risk, taking into consideration legislation, practicality and operational needs for a specific operation.

## GUIDELINES

### 1. Accountability

- a. INF Assistant Deputy Ministers are responsible for the administration of these guidelines and tracking and reporting on their implementation within their respective Divisions/regions.
- b. INF Design and Technical Services (DTS) Environmental Affairs section is responsible and accountable for maintaining the guidelines and training program.

### 2. Mitigation Measures

The responsibilities between INF staff and its contractors with respect to implementing mitigation measures from the BMP will be evaluated by INF Project Managers on a case-by-case basis to address project-specific circumstances and will be reflected through an action plan and/or contract language.

### 3. Training Program

- a) GNWT INF staff and its contractors involved in INF construction and operation activities will be required to take annual training prior to the start of nesting season.
- b) Contractors will be required to show proof of training completion as part of their contract requirements.
- c) If a staff person is hired after the annual training takes place, they must take the online training as soon as possible. Their supervisor can provide additional training where needed to ensure the new hire is aware of their responsibilities.

- d) INF DTS Environmental Affairs Section is responsible for sending an annual reminder to Directors and Regional Superintendents with a link to resources and training.
- e) Directors and Regional Superintendents will ensure that the message from INF DTS Environmental Affairs Section is appropriately relayed and that their staff are completing the webinar.
- f) INF Project Officers and Project Managers are responsible for ensuring that contractors receive this information and complete their training as per the stipulations of their contracts.
- g) The training webinar will be accessible online and on-demand, to both INF staff and contractors.
- h) INF Project Officers and Project Managers are responsible for tracking and maintaining their own information in DIIMS using the annual training tracking document and ensuring that it is accessible to INF DTS Environmental Affairs Section. INF DTS Environmental Affairs Section will summarize this information into a database at the end of each season.

#### 4. Reporting

##### a. Bird Activity Inspections

###### i. Active Sites

Trained INF staff and its contractors are responsible for conducting daily migratory bird activity inspections in the work area, on equipment and on buildings, and completing the form found on B-7 and B-8 of Attachment A of the BMP, as outlined through the action plan and/or contract language.

###### ii. Inactive Sites

Inactive sites where there is no risk of incidental take do not require bird activity inspections, unless the sites are anticipated to become active, in which case site inspections should begin prior to nesting season.

###### iii. Records

INF staff and its contractors will maintain files that demonstrate due diligence throughout the lifecycle of a project. Files should be retained within DIIMS for at least five years. INF staff and contractors will

provide daily migratory bird activity inspection forms (B-7 and B-8 of Appendix A of the BMP) to their supervisors at their “toolbox talk” meeting (daily/weekly OHS meeting). The Site Supervisor will add the inspection reports and the annual training documents to DIIMS and communicate to INF DTS Environmental Affairs Section where this information is located. INF DTS Environmental Affairs Section will summarize this information at the end of each season.

#### b. Incidents

Where there are mortalities or contraventions of the *Migratory Birds Convention Act* (S.C. 1994), *Migratory Birds Regulations* (C.R.C., c. 1035), or the *Species at Risk Act* (S.C. 2002):

- i. INF staff or the contractor will notify the INF Project Officer or Project Manager immediately.
- ii. INF Project Officer or Project Manager or Site Manager will notify the Manager of the INF DTS Environmental Affairs Section of the incident.
- iii. The Manager of the INF DTS Environmental Affairs Section will help determine appropriate mitigation measures and provide feedback to the Site Supervisor to help them decide the best course of action.
- iv. The Project Manager or Site Manager will record details of the incident and measures taken to prevent or reduce a repeated occurrence.
- v. The Project or Site Manager is responsible for filing the report in DIIMS and sending a copy to INF DTS Environmental Affairs Section.

#### 5. Signage

Where permitted and applicable, signage should be displayed by INF and its contractors in areas accessible to the public or contractors in order to warn of any migratory birds present in the area.

Signs are the responsibility of the respective program or regions to purchase and maintain. Signs must be compliant with the GNWT Visual Identity Program and meet appropriate language requirements. INF Communications can assist Regions to ensure that signage meets these requirements, and with developing a design template that the regions could order.

#### 6. Communications

Communications will follow the established protocol (Appendix A) between INF staff, its contractors, and federal counterparts such as Environmental and Climate Change Canada (ECCC – Canadian Wildlife Service), Parks Canada, etc.

Regional Superintendents will ensure that project officers and contractors are trained on migratory bird awareness and made aware of communication protocols relating to migratory birds (i.e. project manager/officer, INF DTS Environmental Affairs, contractor, Environment and Climate Change Canada, biologists). Contractors and their employees are essential partners responsible for the conservation of migratory birds.

## 7. Review

The INF DTS Environmental Affairs Section will review the INF Beneficial Management Practices and these Guidelines on the Protection of Migratory Birds every three years to monitor effectiveness by identifying:

- a. Number of staff and contractors trained;
- b. Number of incidents;
- c. Jurisdictional review on new findings and information on mitigation measures of management practices;
- d. Regulatory scan for any legislative/regulatory updates;
- e. Feedback from INF staff or contractors relating to the guidelines.

Findings from the review will be used to:

- a. Ensure compliance with guidelines;
- b. Inform updates, if any, on measures of management practices, as part of GNWT's adaptive approach;
- c. Inform updates, if any, on other aspects of the guidelines including training, reporting, signage, and communication processes.

Appendix A – Communications Protocol for INF Guidelines on the Protection of Migratory Birds

Attachment A – Beneficial Management Practices for Migratory Birds in the Northwest Territories

## Appendix A - Communications Protocol for INF Guidelines on the Protection of Migratory Birds

When	What	To Whom	From Whom	How	Why
Planning	Update mitigation measures best practices	CWS-ECCC	GNWT DTS EA	Email Phone	Keep abreast of latest best practices relating to mitigation measures, which will inform updates to the BMP.
Planning	Provide information and training materials annually and prior to nesting season	Directors  Regional Superintendents	GNWT DTS-EA	Email  Information and Training Materials	Reminder of upcoming migratory bird nesting season and ensuring that new or revised materials are distributed.
Planning	Provide information and training materials annually and prior to nesting season	Project Managers  Project Officers  Operational/Field Staff  Contractors	Directors  Regional Superintendents	Email  Information and Training Materials	Reminder of upcoming migratory bird nesting season and ensuring that new or revised materials are distributed.
Planning	Pre-activity planning with contractors	Contractors	Project Managers	Contract documents  INF Guidelines  Beneficial Management Practices document  Communication Chart	To ensure contractors are aware of their legal obligations within their contracts, and to provide information on how to adhere to these obligations.
Planning	Training	Project Managers  Project Officers	Project Managers	Training Webinar	Annual training prior to nesting season to provide guidance on the

		Contractors			implementation of the INF Beneficial Management Practices document.
During Activity	Supervision	Regional Staff Project Officers Contractors	Project Managers GNWT DTS-EA	On-site supervision  Maintain written records  Communicate incidents to DTS-EA as needed	Supervision of employees and contractors on site to ensure that employees are following the BMP, written records are maintained, and that incidents are communicated to DTS-EA as needed.
During Activity	Filling out field inspection reports	Project Managers Project Officers	Regional staff Contractors	Submit field inspection reports during “toolbox talk” meeting (daily/weekly/OHS Meeting).	Ensure that inspections are being completed.
During Activity	Reporting incidents	Project Manager Site Manager	GNWT DTS-EA	Email  Phone  Incident Report	To help determine appropriate mitigation measures and provide feedback to the Site Supervisor to help them decide the best course of action.
During Activity	Federal government guidance	CWS ECCC	GNWT DTS-EA	Email  Phone	To seek guidance in the event of an incident, on mitigation measures, setbacks, to engage and avian expert.
Post-Activity	Submit nesting activity to Project NestWatch	CWS ECCC	GNWT DTS-EA	Email  Through the website: <a href="https://www.birdscanada.org/bird-science/project-nestwatch/">https://www.birdscanada.org/bird-science/project-nestwatch/</a>	Project NestWatch is a long-term monitoring program of breeding birds and nesting activity in Canada. Data gathered through this project provide valuable information on the health of bird populations and changes in the environment.
Post-	Storing field	GNWT DTS-EA	Project Managers	Upload to DIIMS	File field inspection reports on

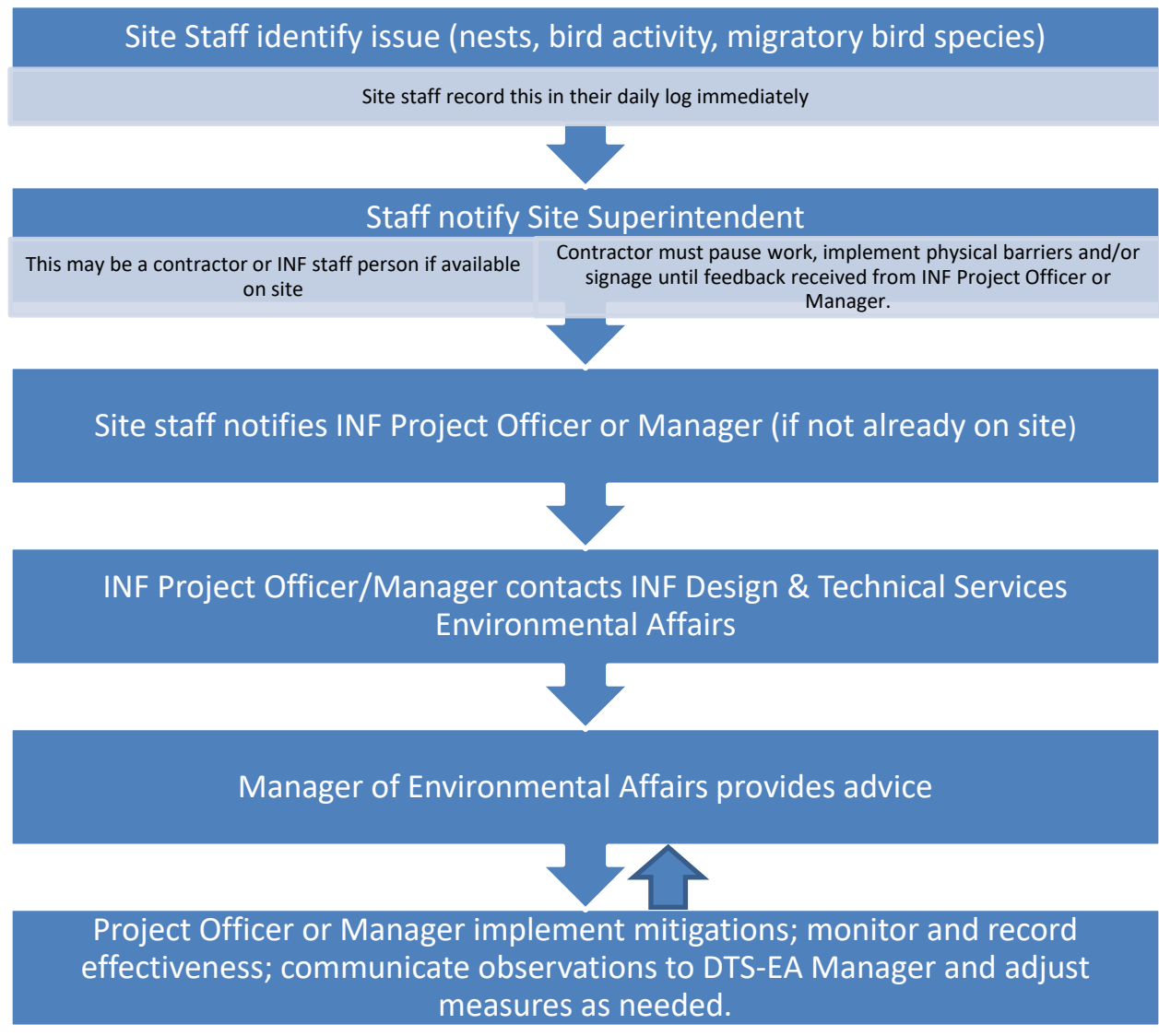


Activity	inspection reports on DIIMS		Project Officers		DIIMS and inform DTS-EA Manager for review purposes.
Ongoing	Public communications	Project Managers  INF Communications	Public	Email  Phone	As required and determined by the project context and accessibility of work to areas of the public.

## Incident Communication Protocol for GNWT INF Staff and its Contractors

This communication protocol establishes at the onset of a project to ensure any migratory bird information is immediately conveyed to the person in charge of the project or work site. Workers on a site can play an important role in the conservation of migratory birds by informing the project manager or supervisor of any migratory birds or nests observed within the work area.

This communication protocol allows for potential issues with migratory birds to be identified and addressed immediately, while reducing the risk of such incidents delaying the project schedule. A written record of all communications should be documented to establish the date, time, observer, observations, person(s) informed, as well as actions taken to address concerns regarding migratory birds.





# Beneficial Management Practices for Migratory Birds in the Northwest Territories

October 2020



Government of  
Northwest Territories

## Revision History

Revision #	Section(s) Revised	Description of Revision	Issue Date
0	-	Version 0 of the Migratory Bird Best Management Practices document	10 August 2020
1	Multiple	Incorporation of GNWT Edits	01 September 2020
2	Multiple	Formatting revisions	11 September 2020
3	Multiple	Incorporation of GNWT Edits	09 October 2020
4	Multiple	Incorporation of GNWT Edits	23 October 2020

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## APPENDICES

### APPENDIX A

Bird Families Protected Under the Migratory Bird Convention Act

### APPENDIX B

Nest Search Protocol, Avoiding and Monitoring Active Nests, Nest Search Data Sheet and Incident Reporting Guidelines

### APPENDIX C

Typical Migratory Bird Nests Activity Restriction Buffer Zones

## 1.0 INTRODUCTION

The purpose of this Migratory Bird Beneficial Management Practices (BMP) document is to minimize the risk of harm to migratory birds, nests and eggs, as per the federal *Migratory Birds Convention Act, 1994* (the “MBCA”) and the federal *Species At Risk Act* (“SARA”). It will also address other effects on migratory bird conservation. This document is intended to capture the majority of the Government of Northwest Territories’ Department of Infrastructure (GNWT-INF) interactions with migratory birds and will provide clear guidance for staff about how to minimize the risk of harm to migratory birds, nests and eggs.

This BMP document follows the Environment and Climate Change Canada (“ECCC”) *Guide for Developing Beneficial Management Practices for Migratory Bird Conservation* (ECCC 2018a).

## 2.0 DEFINITIONS

**Activity Restriction Buffer Zone:** a buffer zone is a setback on any nest or nesting activity found during the nesting period that should be protected until the young have permanently left the vicinity of the nest.

**Alert Distance:** the distance at which a nesting bird becomes vigilant (e.g., posture) to the observer or begins to produce alarm calls (TAC 2019).

**Beneficial Practices:** for the purposes of this document a “beneficial practice” is defined as an “action or activity to eliminate or mitigate the risk of causing adverse impacts to migratory birds during the creation, construction, operation, maintenance and rehabilitation of infrastructure or facilities”. Beneficial practices can be utilized singularly or in combination towards the conservation of migratory birds, their nests, and eggs.

**Bird Conservation Region:** a common, ecologically based set of 'ecoregions' appropriate to birds throughout North America.

**Critical habitat:** habitat that is necessary for the survival or recovery of species listed as extirpated, endangered, or threatened under SARA and that is identified as critical habitat in a recovery strategy or action plan.

**Endangered Species:** a wildlife species that is facing imminent extirpation or extinction.

**Extirpated Species:** a wildlife species that no longer exists in the wild in Canada but exists elsewhere in the wild.

**Fledge:** to acquire the feathers necessary for flight or independent activity and also the stage of development when a young bird leaves the nest.

**Flush Distance** – the distance at which a nesting bird takes flight, moves away from the observer, performs distraction displays or actively defends the nest (TAC 2019).

**General Migratory Bird Nesting Period:** nesting period as the period when nesting is most likely to occur for most species of migratory birds within a nesting zone.

**Incidental Take:** Incidental Take is defined by the Canadian Wildlife Service (CWS) as “The killing or harming of migratory birds, and/or the disturbance or destruction of their nests or eggs, resulting from human activities that do not aim to affect migratory birds, nests or eggs.” (CWS 2014). Incidental take is prohibited under the MBCA.

**Migratory Bird:** A migratory species of bird referred to in the *Migratory Birds Convention Act, 1994*, and includes the sperm, eggs, embryos, tissue cultures and parts of the bird.

**Nesting Zone:** Canadian nesting zones are broad, general areas, corresponding roughly to Bird Conservation Regions.

**Nest:** The nest of a migratory bird and includes parts of the nest (*Migratory Birds Convention Act, 1994*). A nest is a bed or receptacle prepared by an animal and especially a bird for its eggs and young.

**Residence:** a dwelling-place, such as a den, nest or other similar area or place, that is occupied or habitually occupied by one or more individuals during all or part of their life cycles, including breeding, rearing, staging, wintering, feeding or hibernating.

**Setback Distance:** The distance at which nesting birds react to human disturbance. The setback distance is determined based on the species, the level of the disturbance and the landscape context.

**Threatened species:** a wildlife species that is likely to become an endangered species if nothing is done to reverse the factors leading to its extirpation or extinction.

### 3.0 REGULATORY CONTEXT

The *Migratory Birds Convention Act 1994* (MBCA) and attendant *Migratory Birds Regulations* (“MBR”) protect migratory birds, their eggs and nests. The pertinent sections to reference are Section 5 of the MBCA and Section 6(a) of the MBR. The MBCA applies to most species of birds. Birds that are not protected under federal jurisdiction within Canada are covered under the Northwest Territories *Wildlife Act* (GNWT 2014). Migratory bird families and their protection status under the MBCA are presented in Appendix A. Some species are also protected under SARA.

The intent of SARA and the *Species at Risk (NWT) Act* are to protect species at risk from becoming extirpated or extinct as a result of human activity. SARA is enacted by the Government of Canada. The *Species at Risk (NWT) Act* is enacted by the Government of the Northwest Territories (“GNWT”) and applies only to wild animals and plants managed by the GNWT. In the Northwest Territories (“NWT”), the CWS within ECCC is responsible for administering the MBCA on behalf of the Federal Government. It is important to note that ECCC cannot provide authorization or permits for the incidental take of migratory bird nests or eggs. Activities affecting migratory birds and/or their nests and eggs, regardless of their scale, the level of detrimental effects on bird populations, or the nature of mitigation measures taken, can result in violations of the MBCA.

*Migratory Birds Convention Act:*

- Incidental Take is defined by the CWS as “The killing or harming of migratory birds, and/or the disturbance or destruction of their nests or eggs, resulting from human activities that do not aim to affect migratory birds, nests or eggs.”(CWS 2014). Incidental take is prohibited under the MBCA.
- As per Section 13 of the MBCA; offences, including incidental take, may result in fines or imprisonment:
  - Penalty — individual
    - (2) Every individual who commits an offence under subsection (1) is liable,
      - (a) on conviction on indictment,
        - (i) for a first offence, to a fine of not less than \$15,000 and not more than \$1,000,000 or to imprisonment for a term of not more than three years, or to both, and
        - (ii) for a second or subsequent offence, to a fine of not less than \$30,000 and not more than \$2,000,000 or to imprisonment for a term of not more than three years, or to both; or
      - (b) on summary conviction,



**(i)** for a first offence, to a fine of not less than \$5,000 and not more than \$300,000 or to imprisonment for a term of not more than six months, or to both, and

**(ii)** for a second or subsequent offence, to a fine of not less than \$10,000 and not more than \$600,000 or to imprisonment for a term of not more than six months, or to both.

**Marginal note: Penalty — other persons**

**(3)** Every person, other than an individual or a corporation referred to in subsection (4), that commits an offence under subsection (1) is liable,

**(a)** on conviction on indictment,

**(i)** for a first offence, to a fine of not less than \$500,000 and not more than \$6,000,000, and

**(ii)** for a second or subsequent offence, to a fine of not less than \$1,000,000 and not more than \$12,000,000; or

**(b)** on summary conviction,

**(i)** for a first offence, to a fine of not less than \$100,000 and not more than \$4,000,000, and

**(ii)** for a second or subsequent offence, to a fine of not less than \$200,000 and not more than \$8,000,000.

**Marginal note: Penalty — small revenue corporations**

**(4)** Every corporation that commits an offence under subsection (1) and that the court determines under section 13.02 to be a small revenue corporation is liable,

**(a)** on conviction on indictment,

**(i)** for a first offence, to a fine of not less than \$75,000 and not more than \$4,000,000, and

**(ii)** for a second or subsequent offence, to a fine of not less than \$150,000 and not more than \$8,000,000; or

**(b)** on summary conviction,

**(i)** for a first offence, to a fine of not less than \$25,000 and not more than \$2,000,000, and

**(ii)** for a second or subsequent offence, to a fine of not less than \$50,000 and not more than \$4,000,000

**GNWT Wildlife Act:**

- Raptor nests may not be intentionally destroyed, even if unoccupied (Wildlife Act Phase 2; GNWT 2019).

**Species at Risk Act (Sections 32(1), 33 and 58 (1)):**

The SARA protects wildlife species that are listed in Canada as Endangered, Threatened, or are Special Concern; meaning the animals listed in SARA have the potential of becoming further at risk or possibly even extirpated or extinct if preventative actions are not undertaken.

- Prohibits the killing, harming or harassing of threatened and endangered species.
- Prohibits the damage and destruction of residences of threatened and endangered species.

- Prohibits the destruction of critical habitat of threatened and endangered species.
- Species at risk may have risk factors associated with their critical habitat which extends the entire year (CEPA 2013).

A summary of the linkages between the MBCA and SARA, migratory bird biology and the importance of both the legislation and biology to the GNWT-INF is provided in Table 1

**Table 1: Linkage Between Migratory Bird Legislation, Migratory Bird Biology and the Importance to GNWT-INF <sup>1</sup>**

Legislation/Regulations	Migratory Bird Biology	Importance to GNWT-INF
<p>The <i>Migratory Birds Convention Act</i> protects:</p> <ul style="list-style-type: none"> <li>• Birds (includes eggs and any part of the bird)</li> <li>• Nests</li> <li>• Populations of migratory birds</li> </ul>	<p>Migratory birds may be found in every habitat available in Canada (including human-altered habitats).</p> <p>Nesting strategies, habitats and nest types are extremely varied. Some species build new nests each year while others reuse the same nest site year-after-year. All migratory birds are most vulnerable to impacts during nesting.</p> <p>Populations of birds in Canada may be widespread and common or may be rare and limited in their distribution and population size.</p>	<p>Under the <i>Act</i>, migratory birds, their nests and eggs are protected everywhere they occur. Migratory birds are found everywhere in Canada, inhabiting all habitats. The nests of migratory birds may also be found in a variety of habitats across Canada. Migratory bird populations rely on habitat found in Canada for nesting, migrating, staging and overwintering.</p>
<p>SARA protects:</p> <ul style="list-style-type: none"> <li>• Species listed as endangered, threatened, and special concern, wherever they occur</li> <li>• Residence of migratory birds</li> <li>• The Critical Habitat of endangered and threatened species, as defines in final recovery strategies</li> </ul>	<p>Some species of migratory bird are listed as endangered, threatened, or special concern. These species are of the highest conservation priority due to documented declines in their population in Canada. Population declines may be due to a variety of factors, including, but not limited to, habitat loss, increased mortality, and changes in food availability.</p> <p>The residence of migratory bird is generally considered the nest.</p> <p>As different migratory birds have different habitat requirements and general biology, recovery strategies define the most important habitat factors, critical to survival of the species, based on the best available scientific information.</p>	<p>SARA legislation protects migratory birds listed as endangered and threatened, wherever they are found. If a residence or Critical Habitat is defined for a species of migratory bird, then the residence and Critical Habitat are protected on federal lands and others lands, if prescribed under a specific order.</p>

<sup>1</sup> Transportation Association of Canada (TAC). 2019.

## 4.0 ENVIRONMENT CANADA AVOIDANCE GUIDELINES

To reduce the risk of incidental take ECCC has provided avoidance guidelines and supports the development of BMPs through their Guide for Developing Beneficial Management Practices for Migratory Bird Conservation (ECCC 2018a). The primary mitigation to achieve compliance with the MBCA is to conduct clearing of vegetation and construction activities outside of the migratory bird nesting period (Refer to Section 7.1.1). In general, this is April 30 to August 20 in the NWT.

If activities must be completed during the migratory bird season, the following beneficial management practices should be used to help achieve compliance with the MBCA based on general guidelines from ECCC (2019):

- Avoid tree and shrub clearing during the migratory bird nesting season.
- If clearing and construction activities are necessary during the migratory bird nesting season, a non-intrusive nest sweep survey, to search for evidence of bird nesting, needs to be completed by a biologist and/or GNWT-INF staff trained in migratory bird awareness and species recognition.
- The CWS does not advocate using nest search techniques to determine the presence of nests as the ability to detect nests is very low, the risk of disturbing active nests is very high and flushing nesting birds increases predation. Based on the CWS advice nest sweep surveys will consist of a focused search for birds exhibiting breeding behaviour, such as paired birds, birds carrying nesting material, birds carrying food, or territorial singing and point counts (a technique to locate singing territorial males) to provide a good indication of the presence of songbird nests (ECCC 2019).
- If active nests (i.e., nest under construction or constructed, with or without eggs present) are found or suspected to be present based on bird behaviour any work in the area will stop and the project officer or manager will be contacted. The project officer or manager will reach out to INF's Environmental Affairs team to determine the best course of action in collaboration with ECCC, and an avian expert if required. An appropriate activity restriction buffer zone may be established based on the bird's disturbance tolerance (e.g., alert distance and flush distance) and site-specific considerations such as noise, direct disturbance, chemical drift, and edge effect (TAC 2019) and will be confirmed by ECCC-CWS. Examples of setback distances are: 1 to 50 m or more for most nests of songbirds and other small birds; 10 to 50 m or more for swallow colonies, and 10 to 30m, up to 100m or more for most waterfowl nests. The shorter distances are more reflective of urban backyard birds and the longer distances are more reflective of rural or natural habitats (CWS 2014).
- Construction or work activities may not be conducted within the activity restriction buffer zone until all young have left the nest (fledged). A biologist should visit all active nests near the estimated fledge date for the nest to determine that the nest is no longer active and to check the area for any new nests that may have been established in the area since the initial visit.
- Federally listed species at risk (i.e., threatened and endangered species) may have species-specific timing restrictions that need to be observed.
- Non-intrusive nest sweep surveys should be timed to occur before any clearing or construction activities during the migratory bird nesting period. The lowest risk for clearing or construction to cause incidental take of new nests occurs immediately after the nest survey. Birds can establish nests in a matter of days, for example savannah sparrow (*Passerculus sandwichensis*) will build nests in one to three days (Wheelwright and Rising 2008).
- If active nests cannot be avoided, clearing or construction activities should be suspended until after the migratory bird nesting season is over.

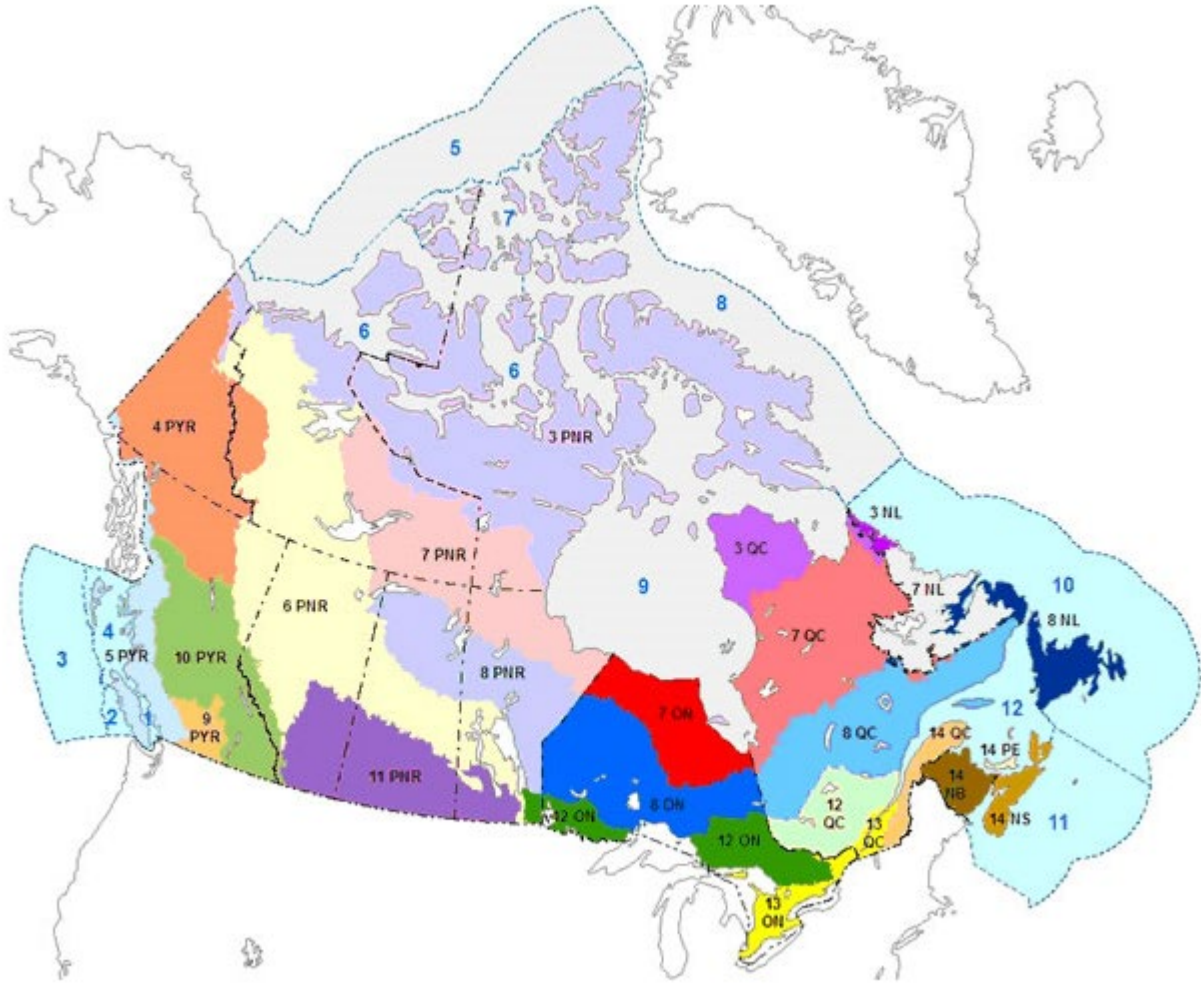
## 5.0 BIRD CONSERVATION REGIONS IN THE NWT

The nesting activities of migratory bird species that may breed in the NWT occur within four Bird Conservation Regions: Region 3 – Arctic Plains and Mountains, Region 4 – Northwestern Interior Forest, Region 6 – Boreal Taiga Plains and Region 7 – Taiga Shield and Hudson Plains (ECCC 2017a) (Figure 1, Table 2).

**Table 2: Bird Conservation Regions and Descriptions in the NWT**

Region	Description
Region 3 – Arctic Plains and Mountains	Region 3 encompasses the Arctic Ocean and because of the wetness of this region waterfowl and shorebirds dominate the avian community. The most abundant breeding birds in Region 3 include northern pintail ( <i>Anas acuta</i> ), king eider ( <i>Somateria spectabilis</i> ), long-tailed duck ( <i>Clangula hyemalis</i> ), American golden-plover ( <i>Pluvialis dominica</i> ), semipalmated sandpiper ( <i>Calidris pusilla</i> ), pectoral sandpiper ( <i>Calidris melanotos</i> ), red-necked phalarope ( <i>Phalaropus lobatus</i> ), and lapland longspur ( <i>Calcarius lapponicus</i> ) (ECCC 2017a).
Region 4 – Northwestern Interior Forest	Region 4 encompasses forested lowlands and uplands which support breeding shorebirds such as greater and lesser yellowlegs ( <i>Tringa melanoleuca</i> , <i>T. flavipes</i> ), solitary and spotted sandpipers ( <i>Tringa solitaria</i> , <i>Actitis macularius</i> ), Wilson's snipe ( <i>Gallinago delicata</i> ), American golden-plover, surfbird ( <i>Calidris virgata</i> ), boreal chickadee ( <i>Poecile hudsonicus</i> ), Swainson's and gray-cheeked thrush ( <i>Catharus ustulatus</i> , <i>C. minimus</i> ), white-crowned sparrow ( <i>Zonotrichia leucophrys</i> ), horned lark ( <i>Eremophila alpestris</i> ), lapland longspur, American tree sparrow ( <i>Spizelloides arborea</i> ), fox sparrow ( <i>Passerella iliaca</i> ), and common redpoll ( <i>Acanthis flammea</i> ). Western sandpiper ( <i>Calidris mauri</i> ), long-billed and short-billed dowitcher ( <i>Limnodromus scolopaceus</i> , <i>L. griseus</i> ), hudsonian godwit ( <i>Limosa haemastica</i> ), and dunlin ( <i>Calidris alpina</i> ) use stopover sites along the coast of Region 4 which is also primary wintering habitat for rock sandpiper ( <i>Calidris ptilocnemis</i> ) (ECCC 2017b).
Region 6 – Boreal Taiga Plains	Important migratory birds in Region 6 include whooping crane ( <i>Grus americana</i> ), marsh wren ( <i>Cistothorus palustris</i> ), Wilson's phalarope ( <i>Phalaropus tricolor</i> ), mountain bluebird ( <i>Sialia currucoides</i> ), and fox sparrow. Region 6 also encompasses the Mackenzie Valley which is one of North America's most traveled migratory bird corridors for waterfowl breeding along the Arctic Coast. Migratory birds in Region 7 include black scoter ( <i>Melanitta americana</i> ), northern shrike ( <i>Lanius borealis</i> ), whimbrel ( <i>Numenius phaeopus</i> ), gray-cheeked thrush, American tree sparrow, short-billed dowitcher, common redpoll, Harris' sparrow ( <i>Zonotrichia querula</i> ), blackpoll warbler ( <i>Setophaga striata</i> ) and fox sparrow (ECCC 2017c).
Region 7 – Taiga Shield and Hudson Plains	Region 7 includes Hudson and James Bay which provide critical shorebird staging habitat during fall migration. Representative birds include black scoter, whimbrel, rock and willow ptarmigan ( <i>Lagopus muta</i> , <i>L. lagopus</i> ), gray-cheeked thrush, American tree sparrow, short-billed dowitcher, common redpoll, Harris' sparrow, northern shrike, blackpoll warbler, fox sparrow, and rough-legged hawk ( <i>Buteo lagopus</i> ) (ECCC 2017d).

**Figure 1: Bird Conservation Regions in Canada**



Source: Environment and Climate Change Canada (2017)

Figure 1 outlines each of the 12 Canadian Bird Conservation Regions (BCR's) indicating individual subregions (e.g. Region three (3) contains 3 Prairies and North Region (PNR) and 3 Quebec Region (QC). Marine Biogeographic Units (the numbers without a pre-fix) are visible along the coasts e.g. 3).

## Regions

- Region 3 - Arctic Plains and Mountains
- Region 4 - Northwestern Interior Forest
- Region 5 - Northern Pacific Rainforest
- Region 6 - Boreal Taiga Plains
- Region 7 - Taiga Shield and Hudson Plains
- Region 8 - Boreal Softwood Shield
- Region 9 - Great Basin
- Region 10 - Northern Rockies
- Region 11 - Prairie Potholes
- Region 12 - Boreal Hardwood Transition
- Region 13 - Lower Great Lakes/St. Lawrence Plain
- Region 14 - Atlantic Northern Forests

## 6.0 SPECIES AT RISK

Several migratory bird species are listed as species at risk in the NWT (Table 1). For the purpose of this document, species at risk are migratory bird species that are considered to be of Special Concern, Threatened, or Endangered by ECCC under the SARA or by Committee on Status of Endangered Wildlife in Canada (COSEWIC). Bird species at risk that are not protected under the MBCA (e.g., birds of prey, blackbirds) are not listed in Table 3.

**Table 3: Migratory Bird Species at Risk that occur in the Northwest Territories**

Species		Federal Species at Risk Act Schedule 1 Status <sup>(a)</sup>	Committee on the Status of Endangered Wildlife in Canada Status <sup>(a)</sup>
Common Name	Scientific Name		
bank swallow	<i>Riparia riparia</i>	Threatened	Threatened
barn swallow	<i>Hirundo rustica</i>	Threatened	Threatened
Canada warbler	<i>Cardellina canadensis</i>	Threatened	Threatened
common nighthawk	<i>Chordeiles minor</i>	Threatened	Special Concern
eskimow curlew	<i>Numenius borealis</i>	Endangered	Endangered
horned grebe (western population)	<i>Podiceps auritus</i>	Special Concern	Special Concern
ivory gull	<i>Pagophila eburnea</i>	Endangered	Endangered
olive-sided flycatcher	<i>Contopus cooperi</i>	Threatened	Special Concern
red knot islandica subspecies	<i>Calidris canutus islandica</i>	Special Concern	Special Concern
red knot roselaari type	<i>Calidris canutus roselaari type</i>	Threatened	Threatened
red knot rufa subspecies	<i>Calidris canutus rufa</i>	Endangered	Endangered
yellow rail	<i>Coturnicops noveboracensis</i>	Special Concern	Special Concern
whooping crane	<i>Grus americana</i>	Endangered	Endangered

(a) Government of Canada (2019)

## 7.0 GNWT-INF MIGRATORY BIRD BENEFICIAL MANAGEMENT PRACTICE

A BMP is any kind of existing or new practise that avoids or mitigates risks to migratory birds or their habitats (ECCC 2018). This BMP applies specifically to GNWT-INF activities associated with construction and operations. Although there are several activities that can pose a serious risk to birds and their nests, this BMP focuses on vegetation clearing and ground preparation activities that pose a direct risk to birds and their nests.

This BMP provides guidance on how to mitigate the risk of incidental take during GNWT-INF construction and operation activities by providing:

- A planning list to reduce risk
- Guidelines for completing risk assessment to determine if nest sweeps are required
- A Mitigation Matrix to determine the level of mitigation actions required during construction and operation activities based on level of disturbance and timing

## 7.1 Planning

Planning is an essential component of the mitigation process to effectively reduce the risk of incidental take or negative effects to birds, their nests or to their habitats. The following list of recommended steps are intended as a first step in due diligence planning to reduce the risk of incidental take.

- Consider project timelines - avoid construction during the migratory bird nesting period (see step 1).

When construction during the breeding bird nesting season cannot be avoided, implementing effective avian mitigation and monitoring programs as a part of construction projects can reduce disturbance to breeding birds and minimize the risk of incidental take. Mitigation outlined below will increase due diligence to meet regulatory requirements:

- Consider habitat present within and adjacent to the work zone - careful planning involving pre-construction vegetation clearing and targeting areas containing poor-quality habitat during summer construction should be emphasized during project implementation.
- Consider scope of work including construction and operation activities (see Steps 2 and 3)
- A training event or tailgate meeting to raise the awareness and understanding of frontline staff members who may contribute to the prevention of adverse effects to migratory birds.
- Identify sensitive and migratory species with potential to occur in the Project area.
- Identify the highest priority suitable habitat for sensitive species within the Project area.
- Avoid or minimize construction within highest priority suitable habitat as much as possible. This includes all natural, undisturbed habitat, wetlands, and riparian areas.
- Prior to the migratory bird nesting season reduce the likelihood that bird's nest in Project area by modifying habitat attractant to birds. Depending on activity and location this could include:
  - dewatering
  - clearing vegetation
  - mowing and or/harrowing of project area
  - keeping vertical or near vertical surfaces at slopes less than 70 degrees
  - washing off undersurfaces of bridge decks
  - installing netting under bridge decks to deter nesting
  - deploying bird deterrents such as reflective tape, whirly birds, effigies, to deter nesting
  - contractor equipment should be thoroughly inspected and cleaned of any old nests, debris and mud prior to arrival on site.

During ongoing project activities occurring during the migratory bird nesting season implement the following:

- Prevent the accumulation of litter and debris during vegetation management, where possible.
- Keep habitat modified to simple habitat. This could be completed by weekly mowing or harrowing to reduce the attraction of birds to areas with dense vegetation cover.



- Contractor equipment should be thoroughly inspected daily to ensure birds have not applied mud or nest material overnight.
- Where bird habitat potential is high and bird activity is observed doors and windows on buildings or equipment should be closed and/or screens/plastic/tarps/bird netting strips placed in openings to discourage birds from entering the equipment to nest.
- Pre-construction nest sweeps during the migratory bird nesting period are recommended where vegetation is left on the ground or has re-grown and provides potential habitat for nest building, including woody debris.
- Pre-construction nest sweeps during the migratory bird nesting period are most effective within simple habitat.
- Nest sweeps should be conducted within 5 days from planned activities.

#### 7.1.1 Step 1 - Determine if Activity Timing Will Occur Within the Nesting Period

ECCC define the general migratory bird nesting period as the period when nesting is most likely to occur for most species of migratory birds within a nesting zone (ECCC 2018). Nesting Zones B6, B7, B8, B9, C7, C8, N9, N10 intersect the NWT (Figure 2). For these nesting zones, ECCC provides migratory bird nesting calendars estimating nesting dates for each nesting zone, broken out by habitat type as wetland, forest, and open habitats, nesting calendars can be accessed from the ECCC Website: <https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods/nesting-periods.html#toc0>. A nesting calendar query tool is available from Birds Canada website: <https://www.birdscanada.org/apps/rnest/index.jsp>

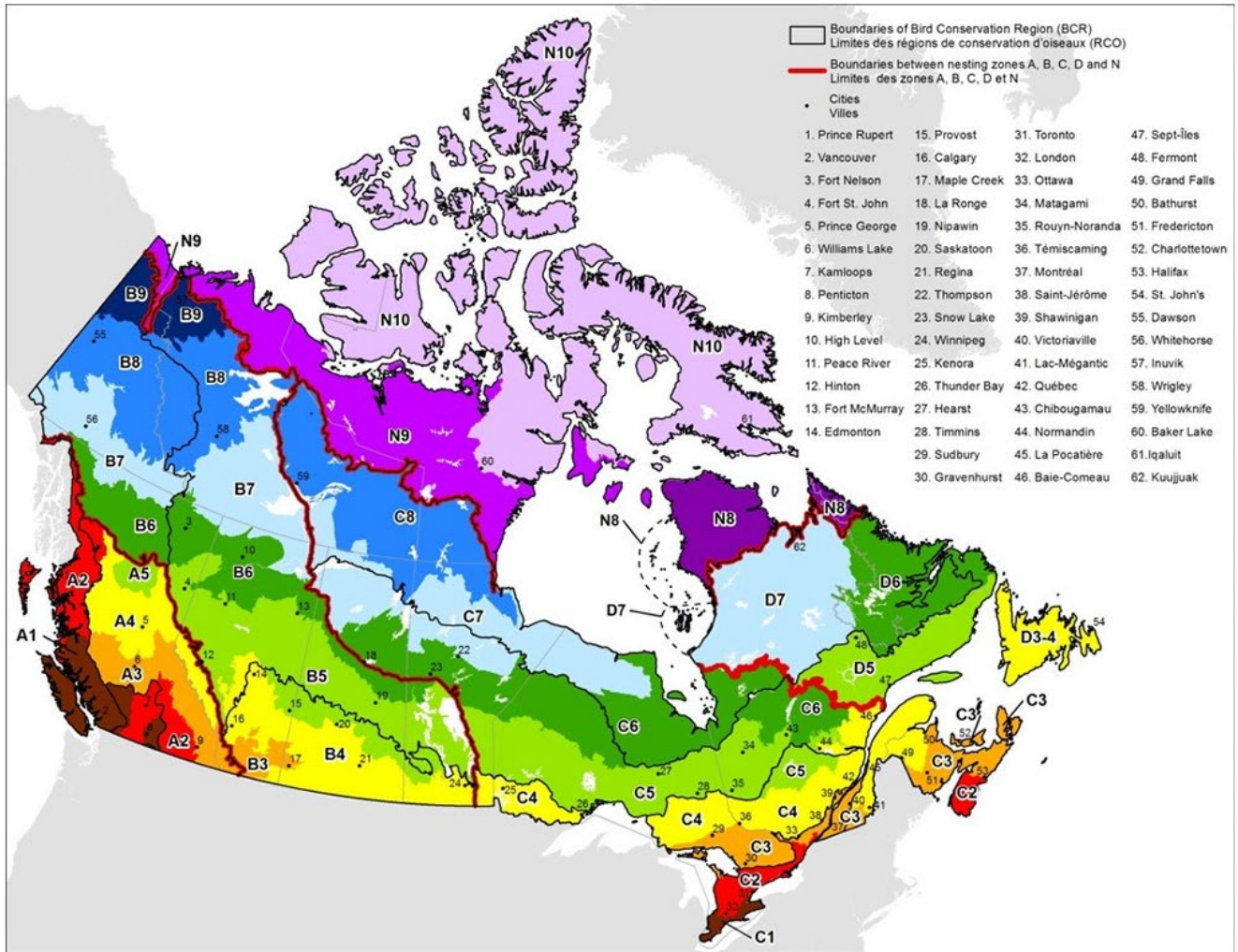
The General Nesting calendar dates and beneficial practices recommended by ECCC are not legal requirements. If recommendations are followed, however “they provide companies with a high degree of certainty” that they will be complying with the MBCA (OSLER 2013).

Nesting Zones and periods when 1% to 100% of species are nesting are as follows (Figure 2):

- Nesting zone B6: April 30 to August 20
- Nesting zone B7: May 2 to August 21
- Nesting zone B8: May 4 to August 22
- Nesting zone B9: May 15 to August 18
- Nesting zone C7: May 3 to August 18
- Nesting zone C8: May 9 to August 13
- Nesting zone N9: May 19 to August 18
- Nesting zone N10: May 25 to August 19



**Figure 2: Migratory Bird Nesting Zones in the Northwest Territories**



Source: Environment and Climate Change Canada (2018)

### 7.1.2 Step 2 – Determine Potential of Construction and Operations Activities Resulting in Incidental Take

A list of activities completed by GNWT-INF and potential interactions of these activities with migratory bird individuals and their nests is provided in Table 4. If there is a potential interaction of the GNWT-INF activity go to Step 3, if there is no interaction proceed with activity.

Table 4: GNWT-INF Activities and Potential Interactions with Migratory Birds

Potential Interactions	Activity									
	Road construction	Road maintenance	Geotechnical investigations	Gravel stockpile and quarrying operations	Government offices, maintenance garages, shelters, warehouses, schools and other structures	Bridge construction and maintenance	Culvert installation and maintenance	Ferry Operation	Fuel storage	Mobile equipment storage
Vegetation removal and soil alterations may result in destruction of nests, eggs, and individuals of migratory birds	●	●	●	●		●	●			
Noise, presence of people, smells, and other human-related sensory disturbances may result in disturbance to migratory birds and their nests	●	●	●	●	●	●	●	●	●	●
Blasting and associated fly rock may result in injury or mortality to migratory birds	●			●		●				
Improperly contoured gravel and soil stockpiles may be used by bank swallows and removal of material from these stockpiles may result in destruction of nests, eggs, and individuals	●			●		●	●			
Birds may nest on building, infrastructure or equipment and use of these buildings, infrastructure or equipment may result in disturbance to birds and their nests.					●	●	●	●	●	●
Hazardous materials may enter waterbodies used by migratory birds and may result in destruction of nests, eggs, and individuals	●	●	●			●	●	●	●	●

### 7.1.3 Step 3 – Determine Disturbance Level of Activity

Even when nests are avoided from direct disturbance or accidental removal, project activities can have a varying degree of indirect disturbance level to nesting birds. The disturbance level is an important consideration to understand the potential disturbance impact to a nest and therefore the mitigation to be applied. A list of activities common to GWNT-INF and relative disturbance levels for each activity are presented in Table 5.

Disturbance levels for each activity range from 1 (lowest) to 3 (highest). If more than one type of activity will occur that overlaps with timing in the same location the activity with the highest level of disturbance should be selected. If activities can be separated by timing and/or location, different disturbance levels for different activities will be selected.

**Table 5: Disturbance Level of Project Activities**

Activity	Disturbance Level
<ul style="list-style-type: none"><li>– Winter road construction</li><li>– Snow removal</li><li>– Ferry operation</li><li>– Government offices, maintenance garages, shelters, warehouses, and other structures</li><li>– Fuel storage</li><li>– Mobile equipment storage</li><li>– Bridge and culvert inspection</li></ul>	<b>1</b>
<ul style="list-style-type: none"><li>– Geotechnical investigations</li><li>– Road maintenance</li><li>– Culvert installation and maintenance</li><li>– Drainage control</li><li>– Bridge maintenance</li><li>– Bridge culvert maintenance</li></ul>	<b>2</b>
<ul style="list-style-type: none"><li>– Road construction</li><li>– Bridge construction</li><li>– Bridge culvert construction</li><li>– Brush clearing on highway embankments</li><li>– Gravel stockpile and quarrying operations</li><li>– Vegetation clearing in previously undisturbed areas (including right-of-ways)</li></ul>	<b>3</b>

### 7.1.4 Step 4 – Determine Nesting Potential

After the disturbance level for an activity has been determined (Step 3), GNWT-INF will determine the nesting potential using the ECCC nesting calendar colour (Refer to Step 1, Figure 2) to determine if the nesting potential ranks low, moderate, high or very high (Table 6).

**Table 6: Migratory Bird Nesting Potential**

Environment and Climate Change Canada Nesting Calendar Colour (see Step 1)	Percent of Species Nesting	Nesting Potential Rank
Grey - White - Yellow	0% to 10%	Low
Light Orange	11% to 20%	Moderate
Dark Orange	21% to 40%	High
Red - Dark Red	40% to 100%	Very High

### 7.1.5 Step 5 – Use of Mitigation Matrix

Using the disturbance level (Step 3) combined with the nesting potential (Step 4) refer to the mitigation matrix to determine the mitigation level to be applied to the activity (Table 7). Mitigation levels range from 1 to 5, with the increase of incidental take corresponding to the increase in mitigation level. Under each mitigation level, there are minimum mitigation strategies presented that need to be completed to limit disturbance to migratory birds (Table 8).

**Table 7: Mitigation Matrix to Determine Mitigation Level**

Disturbance Level	Nesting Potential			
	Low	Moderate	High	Very High
①	1	1	1	1
②	1	2	3	3
③	1	3	4	5

Table 8 outlines the minimum mitigation strategies based on each mitigation level as assigned from the mitigation matrix (Table 7). For all mitigation levels implement mitigation to minimize incidental take outlined in Section 7.2.

**Table 8: Minimum Mitigation Strategies for each Mitigation Level**

Mitigation Level	Minimum Mitigation Strategies
All Levels	Migratory bird awareness training, Implement mitigation to minimize incidental take outlined in Section 7.2
1	Migratory bird awareness training
2	Desktop review by a biologist to determine nesting habitat potential Potential nest sweep (i.e., in areas of high or moderate quality habitat) by a biologist or GNWT-INF staff trained in migratory bird awareness and species recognition
3	Nest sweep by a biologist and/or GNWT-INF staff trained in migratory bird awareness and species recognition
4	Nest sweep by a biologist and/or GNWT-INF staff trained in migratory bird awareness and species recognition
5	Nest sweep by a biologist and/or GNWT-INF staff trained in migratory bird awareness and species recognition

## 7.2 Beneficial Management Practices

The following beneficial management practices have been outlined according to the Transportation Association of Canada Beneficial Practices for Compliance with the Migratory Birds Convention Act and Regulations (TAC 2019), as applicable:

- Legal obligations under the MBCA and MBR should be known and understood (see Section 3.0).
- Project planning is necessary to assess the potential impacts to migratory birds, their eggs, and nests, from specific project activities and to contribute to planning of avoidance and mitigation measures prior to completing project activities (see Section 7.1)
- A risk assessment should be completed prior to the commencement of project activities (see Section 7.1.1 through 7.1.3).
- Avoidance should be considered during project planning activities including avoiding work during migratory bird nesting periods, in key locations and within or adjacent to protected or designated areas (see Section 4.0)
- The mitigation matrix (Table 7) outlines when engagement of a biologist is necessary (i.e. projects assessed as higher risk to migratory birds). The biologist will recommend an appropriate activity restriction Nest Buffer Zone and or monitoring based on the species, previous exposure the bird has had to disturbance, level of disturbance planned to occur, landscape surrounding the nesting area and the nesting birds' reaction to human disturbance.
- The mitigation matrix (Table 7) outlines when a biologist should complete a site assessment prior to commencing work. GNWT-INF staff members will stop work if migratory birds exhibiting nesting behaviour are observed or suspected. Immediately after halting work, they should contact the project officer or manager, who will notify INF-Environmental Affairs. Depending on the situation, a suitable activity restriction nest zone buffer may be established, and the area should be sectioned off in order to create a barrier between the work area and potential nesting site.
- Clear and effective communication must occur throughout planning and operations including:
  - All contracts will include language to identify responsibilities with respect to implementing mitigation measures to be compliant with the MBCA, the Northwest Territories *Wildlife Act*, and the SARA, and to follow any means necessary to prevent incidental take;
  - a training event or tailgate meeting to raise the awareness and understanding of frontline staff members who may contribute to the prevention of adverse effects to migratory birds;
  - a communication protocol should be established between all project participants (e.g., Project manager/officer, INF Environmental Affairs, contractor, ECCC, biologists);
  - signage should be used in areas accessible to the public or contractors to warn of any migratory birds present in the area;
  - written records should be maintained surrounding decisions made and actions taken to demonstrate effort and due diligence around conserving migratory birds, their eggs and nests.

- Temporary exclusion measures may be installed on culverts, bridges, or other structures to prevent birds from accessing a work area.
- Vegetation management (maintenance and minor clearing) may be completed outside of the bird nesting season.
- To reduce the risk of incidental take bird deterrent devices and techniques may be used, as appropriate.
- Harmful substances should be managed in such a way as to not result in a deposition of a substance that is harmful to migratory birds.
- Exposed soils, aggregate extraction areas, excavations and stockpiled materials should be managed to avoid creation of nesting habitat for bank swallows (see Section 7.4.2)
- Ensure no nesting activity occurring within water bodies prior to altering.
- Retention of bird habitat features after rehabilitation or replacement of existing infrastructure should be considered.
- Conservation of migratory birds through design elements (e.g., physical markers such as decals on bridges where bridge areas pose a collision risk).
- Install habitat features (e.g., bird boxes, nesting ledges, wetland creation) should be considered.
- Consider the use of physical barriers to physically block the line of site or noise transmission.

## 7.3 Species-Specific Mitigation Strategies for Swallows

The following section provides information on nesting behaviour and species-specific mitigation strategies for barn swallows and bank swallows, as they have potential to come into conflict with GNWT-INF activities. Bank and Barn Swallows have unique habitat features which can make these species a special case for management for GNWT-INF to avoid project interactions with nests.

### 7.3.1 Barn Swallow

Historically, barn swallow (*Hirundo rustica*) nesting habitat consisted of natural crevices and ledges. Modern nesting habitat now consists primarily of man-made structures; only an estimated 1% of barn swallows currently use natural sites for nesting activities (COSEWIC 2011; OMNRF 2017a). Man-made structures used for nesting include barns, bridges, and culverts greater than 1 m in diameter (OMNRF 2017a). Barn swallows are highly tolerant to human disturbance and will often return to nest in the same location year after year (OMNRF 2017a). Barn swallows have also been observed nesting inside accessible buildings, sea cans (shipping containers), under eaves, in a mine face, and on inactive or active equipment. If Barn Swallows build a nest in a building such as a warehouse, mechanic shop or sea-can, work may be allowed to continue as long as it does not directly impact the nest. Barn Swallows may also build nests on the underside of haul truck boxes or equipment such as bulldozers that have been stationary. If the swallows build a nest on equipment, the equipment may not be moved until the young swallows have fledged. Activity restriction buffer zone may be set if determined to be prudent for the situation and/or location. Barn Swallow nests in buildings or on equipment may be destroyed if there is clear evidence that the nest is not active.

It is strongly recommended that workers thoroughly inspect their equipment daily for evidence of Barn Swallow nest building activity during nesting season, and deterrent effigies and/or reflective tape be placed on equipment to discourage nesting.

Barn swallows will nest independently or in a small colony and will typically take 6 to 15 days to complete construction of a nest (COSEWIC 2011). Nests are constructed from mud pellets and are lined with grass or feathers (OMNRF 2017a). Barn swallows may have one to two broods per year and fledging will occur approximately 15 to 27 days from hatching (Brown and Brown 2020).

#### *Species-Specific Mitigation for Barn Swallows*

1. Existing barn swallow nests should be removed prior to May 1, when birds are expected to begin to return to nesting sites. **Nests that are actively being used must not be removed.** This includes washing mud off of equipment and buildings.
2. The preferred approach to preventing the harm or incidental take of barn swallow individuals is to implement exclusion methods outside of the species' active nesting season (OMNRF 2017a). Exclusion methods vary depending on site specific conditions and some examples are provided below. It should be noted that most bird deterrents are not effective at preventing birds from nesting, specifically when managing barn swallows (OMNRF 2017a). Some deterrents may work temporarily, but most bird species will adapt to scare devices, which will render them ineffective (OMNRF 2017a). For these reasons, deterrents may be considered in combination with other methods, but should not be used as the primary exclusion method (OMNRF 2017a).
  - a. Install solid barriers to prevent barn swallow access to interior and exterior building surfaces. Two methods are generally used: install flat materials (e.g., plywood sheets) on openings to prevent access; or cover exterior 90-degree angle surfaces (e.g., building overhangs) with materials that will result in a concave surface that is unsuitable for barn swallow nests.
  - b. Install flexible barriers such as mesh wire, tarps, geotextile fabric may be installed on exterior surfaces where potential barn swallow nesting habitat exists (i.e., 90-degree ledges).
  - c. Create a slick surface on surfaces that are suitable for barn swallow nesting such as installing polytetrafluoroethylene (PTFE) and polyethylene (PE) plastic sheeting. \*Any plastic installed must be removed after nesting season.
3. Pre-construction nest sweeps should occur as close as possible prior to the start of activities to determine the presence of active nests and potential barn swallow habitat in and near (i.e., within 50 m) the work area.
4. The areas in and around the work site should be checked frequently by a biologist and/or GNWT-INF staff trained in migratory bird awareness and species recognition to determine the presence of barn swallows. Specific attention should be given to searching culverts and man-made structures. If an active nest is established where any part of the activity may result in harm or harassment to the species, all activities must immediately be stopped to avoid adverse effects on the birds and their nests. The project officer or manager must be notified and will contact INF Environmental Affairs. They will coordinate with a biologist and/or ECCC to determine an appropriate activity restriction buffer zone around the nest, which will be based on the bird's disturbance tolerance and site-specific considerations.
5. Activities will not be allowed within the activity restriction buffer zone until the young leave the nest. If the recommended activity restriction buffer zone cannot be maintained around the active nest, ECCC-CWS) may need to be contacted to discuss additional site-specific measures. This may include having an environmental monitor on site during activities close to the nest to ensure birds do not become agitated or breeding activities harmed by the activity.
6. Signage should be used in areas accessible to the public or contractors to warn of any barn swallows present in the area.



### 7.3.2 Bank Swallow

Bank swallows (*Riparia riparia*) nest in stockpiles of sand and soil, road cuts, sandy banks along waterbodies, sandpits, and quarries (Garrison and Turner 2020). Primary nesting habitat for bank swallows consists of vertical or near vertical surfaces (slopes of at least 70 degrees) that are typically more than 2 m high, are composed of sand or silt, and are free of vegetation (Garrison and Turner 2020; COSEWIC 2013). Bank swallows are highly transitory because vertical banks that are not maintained (e.g., through natural erosion) will slump within several years and will no longer be suitable as bank swallow nesting habitat (COSEWIC 2013).

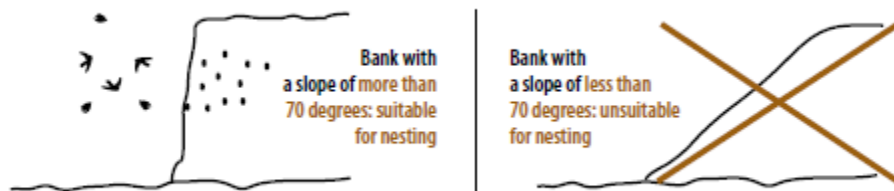
Bank swallows nest in colonies. Burrow excavation typically takes 4 to 8 days to complete (Garrison and Turner 2020). Egg incubation lasts for 12 to 16 days. After hatching, young are brooded for 18 to 21 days before the young leave the nest (fledge). Young will continue to occupy the nest up to a week after fledging takes place (OMNRF 2017b).

The presence of an active bank swallow colony in or near a work area can result in delays to work until young have fledged and have regulatory complications. It is recommended that discussions and mitigations take place early in the spring, prior the breeding period.

#### *Species-Specific Mitigations for Bank Swallows*

The following mitigations are suggested to minimize impacts to active nesting colonies and for minimizing the potential for new colony establishment in or near planned work areas.

1. Sites previously colonized by bank swallows, and sites determined to have high potential for bank swallow habitat (i.e., banks with slopes greater than 70 degrees), should be checked frequently for the presence of birds or possible nests. Frequent checks should begin ahead of the nesting season (early May) and continue until nesting season has ended (late August).
2. The beneficial management practice is to deter bank swallows from beginning to nest in suitable features is to contour suitable stockpiles, quarries, sandpits, and road cuts to maintain slopes of less than 70 degrees (Figure 3).



**Figure 3: Soil stockpile contouring to mitigate bank swallow nesting (Source: OMNRF 2017b)**

3. Deterrents can also be installed to deter bank swallows from establishing nesting colonies in work areas. Deterrents include installing netting, tarping or coco-matting over potential nesting habitat (e.g., soil piles) and plugging and filling old burrow holes. Installation of deterrents is recommended to be implemented prior to May 1 prior to when birds are expected to return to nesting areas.



4. As bank swallows are listed under Schedule 1 of the SARA, and they can reuse nesting colonies year after year, the nesting burrows are protected at all times of the year. As such, where existing bank swallow nesting colonies are present in or near planned work areas, it is recommended that ECCC-CWS be contacted to discuss the potential for removal of the burrows (e.g., flattening of the soil pile, removing the current angle) prior to May 1. Removing a bank swallow nesting site when vacant is a strategy that the Government of Canada (2017) does recognize for other industrial users, with compensation of nesting sites being provided at an alternative site that can support nesting in the following nesting season. However, permanent damage to nesting cavities should be avoided.
5. If suitable habitat exists in work areas where activities are not scheduled to occur (e.g., unused stockpiles), the habitat should be protected and avoided during the nesting season to allow bank swallows to create a nesting colony. The potential habitat should be clearly marked and an activity restriction buffer zone (i.e. 50 m) around the potential habitat should be maintained to minimize disturbance. If a bank swallow colony is established in the potential habitat, a biologist, or ECCC-CWS will help to determine an appropriate activity restriction buffer zone around the nest, which will be based on the disturbance tolerance of bank swallow individuals and site-specific considerations. The activity restriction zone may be increased to more than 50 m based on the recommendation of the biologist or ECCC-CWS.
6. If a bank swallow colony is established where any part of the activity may result in harm or harassment to the species, all activities must immediately be stopped to avoid adverse effects on the birds and their nests, immediately after halting work, the area should be sectioned off using pylons, construction tape and/or signage in order to create a physical barrier between the work area and nest site. GNWT-INF project officer or manager should be notified immediately, and that individual will contact INF- Environmental Affairs. Environmental Affairs will analyze the situation and consult with ECCC-CWS and/or a biologist as needed. Based on the birds' disturbance tolerance, project constraints, and site-specific considerations, Environmental Affairs will advise on the appropriate response plan and any activity restriction buffer zones.
7. Activities will not be allowed within the activity restriction buffer zone until all young leave the nests. If the recommended activity restriction buffer zone cannot be maintained around the active bank swallow colony, ECCC-CWS will need to be contacted to discuss additional site-specific measures. This may include having an environmental monitor on site during activities close to the bank swallow colony to ensure birds do not become agitated or breeding activities harmed by the activity.
8. Signage should be used in areas accessible to the public or contractors to warn of any bank swallows present in the area.

## 8.0 SUMMARY

Complete avoidance of areas with nesting birds should be the strategy of choice for limiting incidental take of birds during construction and maintenance projects. For new projects, consider the MBCA and the SARA and the potential impacts to construction early on in the planning phase. In considering bird and bird habitat issues as part of project planning, recognize that different species may have different sensitivities to development activities, and that regulatory requirements, and inherent risk around levels of incidental take, may vary (EDI 2014). For example, rare and endangered species have more rigorous legislated requirements and may be covered under the SARA (CPEC 2004). Although there is no legal requirement to report impacts to breeding birds to enforcement agencies, notifying regulatory agencies of mitigation and monitoring programs and keeping records of mitigation actions will form part of sound due diligence practices (CPEC 2004).

If avoidance of breeding bird nesting areas during the general nesting periods is not possible, careful planning involving pre-construction vegetation clearing and targeting areas containing poor-quality habitat during summer construction should be emphasized during project implementation. Conducting avian nest surveys using biologists and/or GNWT-INF staff trained in migratory bird awareness and species recognition is also an effective tool for reducing incidental take during construction. Communication between personnel conducting avian surveys and all project participants (e.g., Project manager/officer, contractor, ECCC) is essential to effectively track and avoid disturbing active nests within project footprints. By implementing effective avian mitigation and monitoring programs as a part of construction projects, GNWT-INF can reduce disturbance to breeding birds and ultimately limit their impact on breeding birds.

## 9.0 REFERENCES

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APPENDIX A

*Bird Families Protected Under the  
Migratory Bird Convention Act*



<b>Common Family Name</b>	<b>Scientific Family Name</b>
albatrosses	Diomedidae
augs, auklets, guillemots, murrea, and puffins	Alcidae
bitterna and herona	Ardeidae
bobolinka, meadowlark, and oriole, but not including Icterid blackbirda and cowbirda	Icteridae
cardueline finchea	Fringillidae
catbirda, mockingbirda, thrashera, and alliea	Mimidae
coota, gallinulea and raila	Rallidae
cranea	Gruidae
creepera	Certhiidae
cuckooa	Cuculidae
dippera	Cinclidae
dovea and wild pigeona.	Columbidae
ducka, geese and swana	Anatidae
emberizid sparrowa	Emberizidae
ganneta	Sulidae
gnatcatchera	Polioptilidae
goatuckera	Caprimulgidae
grebea	Podicipedidae
gulla and terna	Laridae
hummingbirda	Trochilidae
ibiea	Threakiornithidae
jaegera	Stercorariidae
kingleta	Regulidae
lapwinga and plovera	Charadriidae
larka	Alaudidae
longpura and buntinga	Calcariidae
long-tailed tita and buhtita	Aegithalidae
loona	Gaviidae
nuthatcha	Sittidae
Old World flycatchera	Muscicapidae
oystercatchera	Haematopodidae
petrela and shearwatera	Procellariidae
robina and thrusha	Turdidae
sandpiper and alliea	Scolopacidae
shrikea	Laniidae

<b>Common Family Name</b>	<b>Scientific Family Name</b>
stilts and avocets	Recurvirostridae
storks	Ciconiidae
storm petrels	Hydrobatidae
swallows	Hirundinidae
swifts	Apodidae
tanagers, cardinals, grosbeaks and buntings	Cardinalidae
titmice	Paridae
tyrant flycatchers and	Tyrannidae
vireos.	Vireonidae
wagtails and pipits	Motacillidae
waxwings	Bombycillidae
woodpeckers and allies	Picidae
wood-warblers	Parulidae
wrens	Troglodytidae

APPENDIX B

*Nest Search Protocol, Avoiding and  
Monitoring Active Nests, Nest Search  
Data Sheet and Incident Reporting  
Guidelines*





## 1 PURPOSE

Non-intrusive migratory bird nest sweeps are completed as environmental due diligence to minimize disturbance to migratory birds during the Restricted Activity Period of the MBCA. Non-intrusive migratory bird nest sweeps reduce the chance of incidental take of federally protected bird species due to clearing and construction activities.

## 2 DEFINITIONS

**Nest:** According to the MBCA, “nest” is defined as “the nest of a migratory bird and includes parts of the nest.” A broader definition includes any structure, ground scrape or part of the landscape (i.e., burrow, tree cavity, broken treetop, ground or floating vegetation) that a bird species uses for breeding, laying eggs or rearing young.

**Active nest:** A nest is considered active if it is under construction or in use for egg laying, incubating or rearing chicks. If a nest is found, but bird activity is not detected at the nest, professional judgment and expert knowledge must be used to determine whether the nest is likely to be in use or whether it has been abandoned. A nest is also considered active if its presence is suspected based on birds exhibiting breeding behaviour (i.e., paired birds, birds carrying nesting material, birds carrying food, or territorial singing) even if its precise location and condition cannot be verified. Dwellings (i.e., nests, cavities, burrows) that are used from one year to the next are generally protected year-round.

## 3 RESEARCH PERMIT

A Wildlife Research Permit for passive non-intrusive nest sweeps is not required in the Northwest Territories (NWT).

## 4 SURVEY PERSONNEL

Lead survey personnel must be biologists and/or GNWT-INF staff trained in migratory bird awareness and species recognition with experience conducting migratory bird surveys and with knowledge of migratory bird behavior. It is essential that each lead personnel conducting surveys be able to identify by sight and sound any federally or territorially listed species for which species-specific activity restriction buffer zones have been recommended.

## 5 WEATHER AND NOISE CONSIDERATIONS

Surveys should not be conducted at freezing temperatures, during more than very light precipitation, and when winds exceed 20 km/h (>Beaufort 3). These conditions can interfere with breeding behaviour (i.e., inhibit calling) and compromise observer ability. It is under the discretion of the field lead to determine if inclement weather should prevent a survey from continuing.

## 6 TIMING

The best time for conducting non-intrusive migratory bird nest surveys is in the early morning when birds are most active. The ideal time is from around dawn until 10:00 am; however, this time period need not be adhered to as stringently as when conducting point counts (e.g., during breeding bird surveys). The most important thing is to avoid periods of low activity, such as during the heat of the day or in rainy weather.

## 7 SURVEY AREA

The area to be surveyed will include the disturbance area (i.e., the work footprint) plus a buffer of 50 m buffer in terrestrial environments and 100 m around wetlands or waterbodies.

Non-intrusive migratory bird nest surveys will be conducted on lands having wildlife / nest potential (e.g., native grassland/tundra, treed areas, riparian areas and shrub). The area that is surveyed will be dependent on land use, landowner permissions, type of construction activity, and the potential for species presence, and NWT historical occurrence of species of concern provided from the Wildlife Management Information System Records:

<https://www.enr.gov.nt.ca/en/services/recherche-et-donnees/wildlife-management-information-system>

(Environment and Natural resources 2020).

## 8 SURVEY METHODS

The focus of the survey should be to search for birds exhibiting breeding behaviour, such as paired birds, territorial singing, alarm calls, distraction displays, or birds carrying food, fecal sacs, or nesting material (ECCC 2018). Depending on the time of year, cues for finding nests can vary. The following information on breeding bird behaviour and signs may be used as guidance:

- Surveys should be conducted by biologists and/or GNWT-INF staff trained in migratory bird awareness and species recognition quietly moving through vegetation, pausing intermittently to observe bird behaviour.
- Working in pairs can help with this process; however, minimal verbal communication should be made between observers.
- The more familiar an observer is with the habitat and the behaviour of the potential species in that habitat, the easier it is to locate females and observe breeding behaviour. It is recommended that observers spend some time prior to surveys determining which species are likely to occur in the area they are surveying and ensure familiarity with the identification and behaviours of those species prior to conducting the survey.
- The focus of the survey should be to search for birds exhibiting breeding behaviour, such as paired birds, birds carrying nesting material, birds carrying food, territorial singing, alarm calls, or distraction displays. Depending on the time of year, cues for finding nests can vary.

## 9 ACTIVE NESTS OR BREEDING BEHAVIOUR

If breeding bird nests or breeding bird behaviour are observed, the locations will be documented with coordinates determined from a hand-held Global Positioning System (GPS). Nest or breeding bird behaviour will have an activity restriction setback buffer flagged.

## 10 DETERMINING BUFFER ZONES

Setback buffers are determined by the species exhibiting breeding behaviour, degree of tolerance of the species to activities, previous exposure of birds to disturbance, level of disturbance, and the landscape context (Environment and Climate Change 2019). GNWT-INF staff who have completed the migratory bird awareness training will determine an appropriate activity restriction buffer zone around the nest, which will be based on the bird's disturbance tolerance (e.g., alert distance and flush distance) and site-specific considerations such as noise, direct disturbance, chemical drift, and edge effect (TAC 2019) and will be confirmed by an avian expert or ECCC-CWS. Examples of setback distances are: 1 to 50 m or more for most nests of songbirds and other small birds; 10 to 50 m or more for swallow colonies, and 10 to 30 m, up to 100 m or more for most waterfowl nests. The shorter distances are more reflective of urban backyard birds and the longer distances are more reflective of rural or natural habitats (CWS 2014).

- Alert Distance – the distance at which a nesting bird becomes vigilant (e.g., posture) to the observer or begins to produce alarm calls (TAC 2019).
- Flush Distance – the distance at which a nesting bird takes flight, moves away from the observer, performs distraction displays or actively defends the nest (TAC 2019).

Buffer zones may be no work zones, limited activity zones, or no-treatment zones (TAC 2019).

- No work zone - no activities are to occur and should be flagged or fenced for avoidance.
- Limited activity zone – some activities are permitted, but others are not acceptable and may be flagged or fenced for avoidance.
- No-treatment zone – an area in which types of vegetation management activities are individually prescribed.

## 11 MONITORING ACTIVE NESTS

In some circumstances, allowances may be made for construction activities to occur within activity restriction setback nest buffers under the direct supervision of a biologist as described in the Canadian Energy Pipeline Association (CEPA) BMPs (CEPA 2013) and/or GNWT-INF staff with input from ECCC-CWS where necessary. For example, equipment walk-throughs such as graders would need to be marshalled through the buffer, and time spent within the buffer should be minimized as much as possible.

## 12 MIGRATORY BIRD ACTIVITY DAILY INSPECTION FORM

The migratory bird activity daily inspection form will be used by GNWT-INF staff when conducting general site assessments for migratory bird activity.

Migratory Bird Activity Daily Inspection Form					
Project Title					
Geographic Location					
Date					
Time					
Surveyor Name					
Birds Exhibiting Breeding Behaviour	Yes	No	Approximate Location (UTM)		Notes
			Easting	Northing	
Paired birds					
Birds carrying nesting material					
Birds carrying food					
Birds displaying territorial singing/alarm calls or distraction displays					
Nest observed					

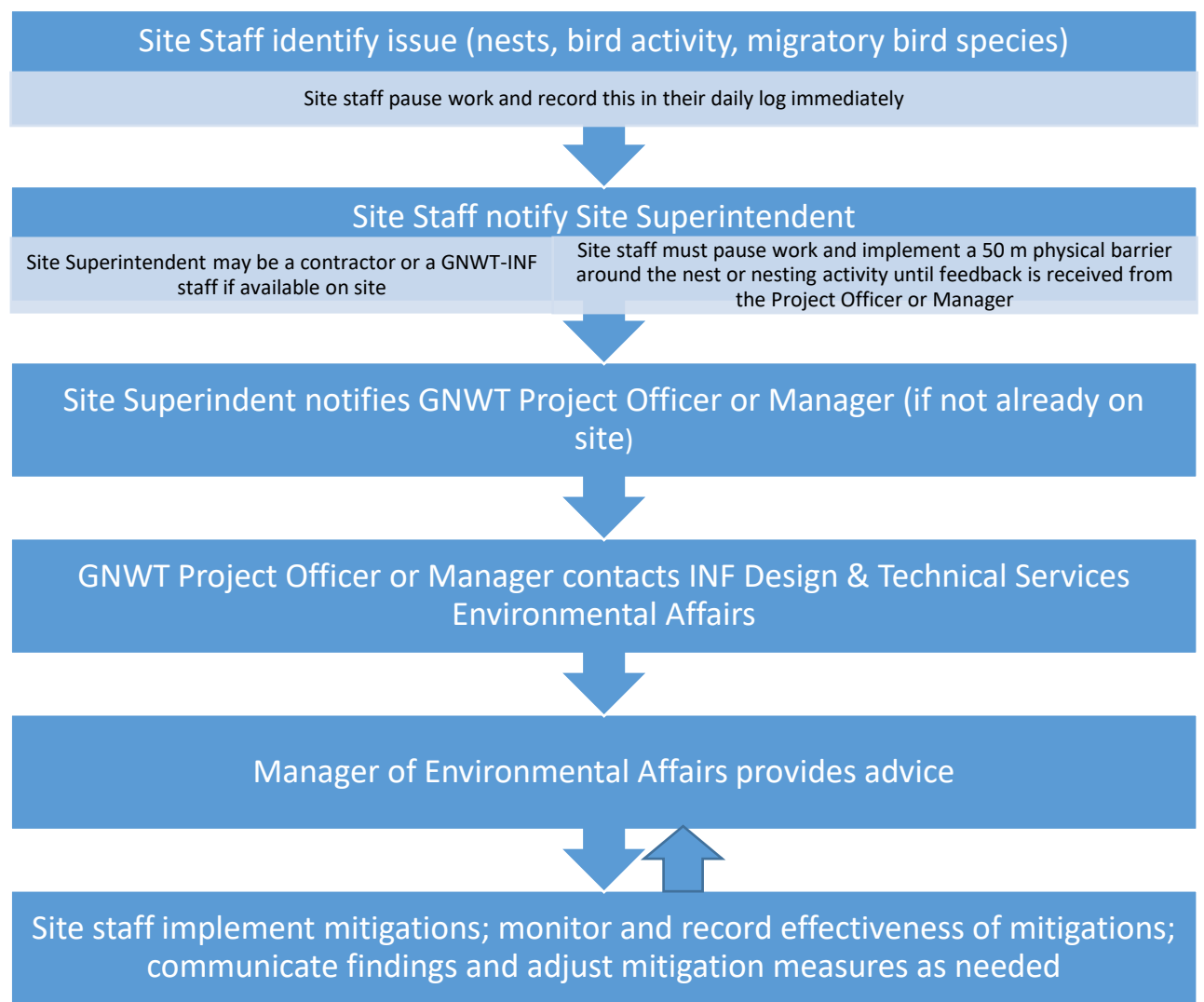
Migratory Bird Activity Daily Inspection Form					
Equipment Inspection	Yes	No	Approximate Location (UTM)		Notes
			Easting	Northing	
Nest building detected on equipment (e.g. mud or grasses applied by birds)					
Other Hazards to Birds Identified	Yes	No	Notes		
Where bird habitat potential is high and bird activity is observed are doors and windows on buildings and equipment closed					
Have temporary exclusion measures been installed on culverts, bridges, or other structures to prevent birds from accessing a work area					
Are harmful substances being managed in ways to not result in a deposition of a substance that is harmful to birds					
Are exposed soils, aggregate extraction areas, excavations and stockpiled materials being managed to avoid creation of nesting habitat for bank swallows					

**Notes:**

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### 13 INCIDENT REPORTING GUIDELINES

There is no reporting requirement under the MBCA. It is at the individual's discretion. However, self-reporting to enforcement (for example, in instances where there are multiple incidents, SARA, repeated event, intent, negligence, etc.) may be prudent. Where there are mortalities or contraventions of the MBCA, ECCC advises that individuals keep a record of the event, the circumstances of the event, and measures taken to prevent or reduce a repeated occurrence of the event (in case a complaint is filed and enforcement investigates). Where there are mortalities or contraventions of the MBCA, the GNWT-INF Project Officer or Project Manager will be notified immediately, who will then notify the Manager of the INF-Design & Technical Services Division's Environmental Affairs Section. The Manager of the Environmental Affairs Section will then determine what additional individuals should be notified.



APPENDIX C

*Typical Migratory Bird Nests Activity  
Restriction Buffer Zone*

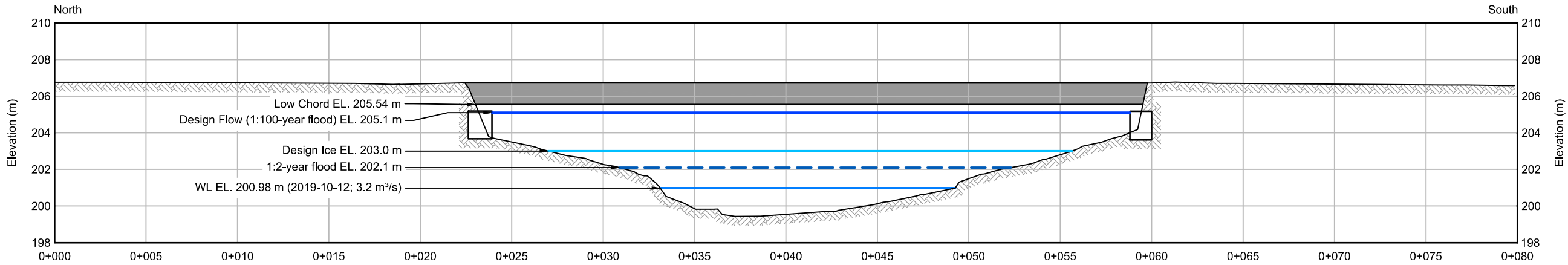
### Typical Migratory Bird Nests Activity Restriction Buffer Zones

Species Group	Activity Restriction Buffer Zone
Shorebirds (e.g. plovers, sandpipers, rails, yellowlegs)	100 m
Swans	500 m
Songbirds and other small birds (e.g. chickadees, warblers, vireos, flycatchers, sparrows)	50 m
Swallows colonies (e.g. bank swallow, barn swallow)	50 m
Upland game birds (e.g. grouse, ptarmigan)	100
woodpeckers (pileated, red-headed)	200 m
Waterfowl (e.g. loons, grebes, geese, ducks)	100 m
Swans	500 m
Sandhill Crane	1000 m

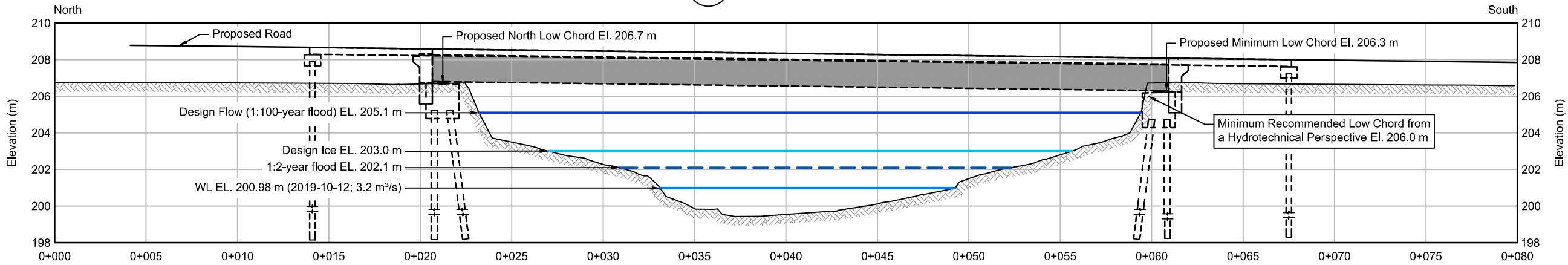
*\* These general examples can serve as an initial basis for review. A larger activity restriction buffer zone may be needed to minimize the risk for species at risk.*



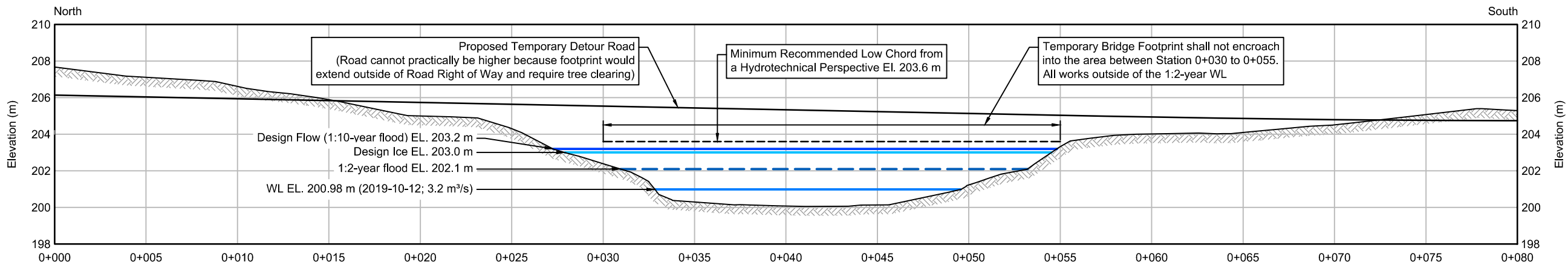
Plot 1:1 = Tabloid (L)



**A** Section - Existing Jean Marie River Bridge  
5 Scale 1:250



**B** Section - Proposed Jean Marie River Bridge  
5 Scale 1:250



**C** Section - Proposed Temporary Bridge  
5 Scale 1:250



Horizontal Clearance

Existing Bridge	35 m Clear-Span
New Single Span Bridge	37.4 m Clear-Span
Temporary Bridge	Minimum 25 m Clear-Span

Vertical Clearance

Flow Condition	Water Level (m)	Minimum Clearance (m)		
		Existing Bridge (Low Chord = 205.54 m)	New Bridge (Low Chord = 206.3 m)	Temporary Bridge (Low Chord = 203.6 m)
1:100-year	205.10	0.44	1.20	-1.50
1:50-year	204.40	1.14	1.90	-0.80
1:20-year	203.80	1.74	2.50	-0.20
1:2-year	202.10	3.44	4.20	1.40

Notes:

1. Elevations are in CGVD2013 Vertical Datum.

REVISION					
B	2024-03-01	Issued for Internal Client Review	TS	KC	GE
A	2024-02-02	Draft Issued for Review	TS	KC	MO
No.	DATE	DESCRIPTION	BY	CHK.	DRN.



Government of the Northwest Territories and Jacobs  
Jean Marie River Bridge Replacement - Highway 1 (Mackenzie Highway)

Bridge Cross-Sections and  
Navigation Clearances

Date: February 2024 Project: 35370-522 Submitter: T. Schaepsmeyer Reviewer: K. Curtis

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Figure 6

- References:
- Existing bridge as per 1968 Construction Drawings. Government of Northwest Territories.
  - Permanent Bridge from JACOBS. GENERAL LAYOUT DRAWING (SC-INF01-6081-S001). Dated October 6, 2023.
  - Temporary Bridge from JACOBS. L50 DETOUR PLAN AND PROFILE SHEET 1 AND 2 (SC-INF01-6081-C801 AND SC-INF01-6081-C802). Dated November 10, 2023.
  - 2019-10-12 flow from the Water Survey of Canada Real-Time data for Jean Marie River.
  - Surveyed water levels from Stantec.

F:\35370\Drafting\C30\2023 Jean Marie Bridge\Production\Figs\35370-BP.dwg - BP - March 1, 2024 9:04:32 AM - Gary Evenson