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C	Category 1 Traffic Management Plan Template <i>Note: The Category 1 Traffic Management Plan Template is provided to assist the Contractor. PSPC takes no responsibility for the completeness of this template. The Contractor is responsible for verifying that all required information is provided in their Traffic Management Plan.</i>
D	On-site Construction Start-up Form
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G	Responsibility Checklist for Authorizations / Approvals / Notifications / Permitting
H	Relevant Environmental Publications
I	Environmental Management Plan (EMP)
J	Caribou Protection Plan (CPP)
K	British Columbia Ministry of Forests, Lands, Natural Resource Operations, and Rural Development (FLNRORD) Section 11 Approval for Instream Work – Date: April 6, 2021

REFERENCE DOCUMENTATION

Standards and Best Practices for Instream Works, British Columbia Ministry of Land and Air Protection Ecosystem Standards and Planning Biodiversity Branch – March 2004.

Available online at:

<http://www.env.gov.bc.ca/wld/documents/bmp/iswstdsbpsmarch2004.pdf>

Manual of Standard Traffic Signs & Pavement Markings, BC Ministry of Transportation and Highways – September 2000

Available online at:

https://www2.gov.bc.ca/assets/gov/driving-and-transportation/transportation-infrastructure/engineering-standards-and-guidelines/traffic-engineering-and-safety/traffic-engineering/traffic-signs-and-pavement-markings/manual_signs_pavement_marking.pdf

BC Ministry of Transportation and Infrastructure, Traffic Management Manual for Work on Roadways (Office Edition) – 2020 Edition and applicable Amendments available at time of tender closing.

Available online at:

<https://www2.gov.bc.ca/gov/content/transportation/transportation-infrastructure/engineering-standards-guidelines/traffic-engineering-safety/trafficmanagementmanual>

2020 Standard Specifications for Highway Construction, BC Ministry of Transportation and Infrastructure – November 1, 2020 – Volume 1 and 2 and applicable Amendments available at time of tender closing.

Available online at:

<http://www2.gov.bc.ca/gov/content/transportation/transportation-infrastructure/engineering-standards-guidelines/standard-specifications-for-highway-construction>

Public Works and Government Services Canada – Acquisition Forms

Available online at:

<http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/formulaires-forms-eng.html>

Canadian Construction Association, COVID-19 – Standardized Protocols for All Canadian Construction Sites, Version 5, May 26, 2020

Available online at:

<https://www.cca-acc.com/wp-content/uploads/2020/06/CCA-COVID-19-Standardized-Protocols-for-All-Canadian-Construction-Sites-05-26-20.pdf>

WorkSafeBC Construction and COVID-19 Safety

Available online at:

<https://www.worksafebc.com/en/about-us/covid-19-updates/covid-19-industry-information/construction>

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2	PROJECT LOCATION PLAN AND PROJET KEY PLAN	C0001	0
3	DRAWING INDEX, LEGEND, CONTROL MONUMENT LOCATIONS AND CULVERT SUMMARY TABLE	C0002	0
4	TYPICAL CHANNEL DETAILS	C1001	0
5	TYPICAL CULVERT DETAILS	C1002	0
6	PROPOSED CULVERT: ENVIRONMENTAL STAGING DRAWINGS - STAGE 1 PLAN VIEW	C1011	0
7	PROPOSED CULVERT: ENVIRONMENTAL STAGING DRAWINGS - STAGE 2 PLAN VIEW	C1012	0
8	PROPOSED CULVERT: ENVIRONMENTAL STAGING DRAWINGS - CHECK DAM DETAILS	C1013	0
9	PROPOSED CULVERT: ENVIRONMENTAL STAGING DRAWINGS - FISH STOP NET DETAILS	C1014	0
10	KM 325.08 CULVERT PLAN / PROFILE	C2101	0
11	KM 325.08 CULVERT PROPOSED CHANNEL CROSS SECTIONS (1 OF 2)	C2102	0
12	KM 325.08 CULVERT PROPOSED CHANNEL CROSS SECTIONS (2 OF 2)	C2103	0
13	KM 329.84 CULVERT PLAN / PROFILE	C2111	0
14	KM 329.84 CULVERT PROPOSED CHANNEL CROSS SECTIONS	C2112	0
15	KM 330.50 CULVERT PLAN / PROFILE	C2121	0
16	KM 330.50 CULVERT PROPOSED CHANNEL CROSS SECTIONS (1 OF 2)	C2122	0
17	KM 330.50 CULVERT PROPOSED CHANNEL CROSS SECTIONS (2 OF 2)	C2123	0

18	KM 331.26 CULVERT PLAN / PROFILE	C2131	0
19	KM 331.26 CULVERT PROPOSED CHANNEL CROSS SECTIONS	C2132	0
20	KM 332.05 CULVERT PLAN / PROFILE	C2141	0
21	KM 332.05 CULVERT PROPOSED CHANNEL CROSS SECTIONS	C2142	0
22	KM 333.18 CULVERT PLAN / PROFILE	C2151	0
23	KM 333.18 CULVERT PROPOSED CHANNEL CROSS SECTIONS	C2152	0
24	KM 335.06 CULVERT PLAN / PROFILE	C2161	0
25	KM 335.06 CULVERT PROPOSED CHANNEL CROSS SECTIONS	C2162	0
26	KM 339.66 CULVERT PLAN / PROFILE	C2171	0
27	KM 339.66 CULVERT PROPOSED CHANNEL CROSS SECTIONS	C2172	0
28	KM 340.16 CULVERT PLAN / PROFILE	C2181	0
29	KM 340.16 CULVERT PROPOSED CHANNEL CROSS SECTIONS	C2182	0
30	KM 344.88 CULVERT PLAN / PROFILE	C2191	0
31	KM 344.88 CULVERT PROPOSED CHANNEL CROSS SECTIONS (1 OF 2)	C2192	0
32	KM 344.88 CULVERT PROPOSED CHANNEL CROSS SECTIONS (2 OF 2)	C2193	0
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34	KM 347.67 CULVERT PROPOSED CHANNEL CROSS SECTIONS	C2202	0
35	KM 355.02 CULVERT PLAN / PROFILE	C2211	0
36	KM 355.02 CULVERT PROPOSED CHANNEL CROSS SECTIONS	C2212	0

SECTION INCLUDES:

PART 1 – GENERAL:

- 1.1 Order of Precedence.
- 1.2 Work Covered by Contract Documents.
- 1.3 Codes.

PART 2 – PRODUCTS:

- 2.1 Products

PART 3 – EXECUTION:

- 3.1 Site Inspection.
- 3.2 Work Completion.
- 3.3 Special Precautions.
- 3.4 Survey.
- 3.5 Contract Drawings.
- 3.6 Electronic Contract Drawings.
- 3.7 Contract Submittals.
- 3.8 Supervisory Personnel.
- 3.9 Work by Others.

PART 1 – GENERAL

1.1 Order of Precedence

- .1 In the event of any discrepancy or conflict, order of precedence shall be in accordance with GC1.2.2 – Order of Precedence and as follows:
 - .1 The Division 1 Sections of these Specifications take precedence over the other sections of the Specifications.
 - .2 In the event that two or more plans show conflicting information, the information on the most recently dated plan shall govern.
 - .3 If conflict arises between an item in the main body of these Specifications (Division 1 – Division 33) and an item found in one of the Appendices (Reference Documents), the main body of the Specifications (Division 1 – Division 33) shall govern.

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- .4 Any technical and manufacturer's standard, Government Act, Regulation or Code of practice referred to in the Contract documents shall be the version current (including applicable Amendments) available at the time of tender closing.
- 1.2 Work Covered by Contract Documents
- .1 The project includes installation of twelve pipe culverts, excavation/ditching and riprap end protection, placement of grout in abandoned previously used CSP culverts, and hydraulic seeding of disturbed areas. The sites are located between Km 325.08 to 355.02 of the Alaska Highway between Fort St. John and Fort Nelson, BC.
- For reference, Dawson Creek is at Km 0, Fort St. John is at approximately Km 75, Fort Nelson is at approximately Km 455, and Watson Lake is at approximately Km 986 on the Alaska Highway.
- .2 The work under this contract generally comprises of the following but is not limited to:
- .1 Contract submittals (using "CentralCollab") prior to and during the work (see 3.9 – Contract Submittals, Section 01 25 20 – Mobilization and Demobilization and Section 01 33 00 – Submittal Procedures).
- .2 Supply and maintain of all traffic control for the duration of the works.
- .3 Quality Management.
- .4 Development of construction access and temporary earthworks to facilitate construction (during winter conditions and frozen ground as applicable). Restoration of the disturbed areas to pre-construction conditions following the construction.
- .5 Installation of various sized diameter Steel Pipe Culverts using trenchless technologies (during winter conditions and frozen ground as applicable). Culvert installation via cut and cover construction techniques will not be accepted.
- .6 Removal and onsite disposal of waste material from the inside of the installed culverts.
- .7 Culvert ditching including excavation, transport, and disposal of excess material (waste) onsite.
- .8 Culvert end protection including supply and installation of riprap and bentonite.

- .9 Decommissioning of existing culverts via supply and placement of grout inside the abandoned culvert.
 - .10 Hydraulic Seeding of disturbed areas.
 - .11 Surveys (construction layout, payment quantities, as-built survey, and others as required).
 - .12 Environmental protection.
 - .13 Work completed by Change Order (if required and approved by Departmental Representative).
- 1.3 Codes
- .1 Meet or exceed requirements of:
 - .1 Contract Documents;
 - .2 Specified standards, applicable legislation, codes, and referenced documents; and,
 - .3 Other codes of Local, Provincial, or Federal application (in the case of conflict or discrepancy, the more stringent requirements shall apply).
 - .2 Perform all work in accordance with the Environmental Management Plan (Appendix I), Caribou Protection Plan (Appendix J) and the contract requirements.

PART 2 – PRODUCTS

- 2.1 Products
- .1 Not used.

PART 3 – EXECUTION

- 3.1 Site Inspection
- .1 Submission of tender is deemed to be confirmation that the Contractor has inspected the site and is conversant with all conditions affecting execution and completion of the work.
- 3.2 Work Completion
- .1 Preparation of required submittals to commence immediately upon receipt of notice to proceed and to be completed prior to commencement of work (unless specified otherwise).
 - .2 On-site project work may not start until the application for Notification Approval under the provincial Water Sustainability Act, and all other environmental permits applied for by the Departmental Representative have been approved by the applicable regulatory authorities and the necessary documentation has been received by the Departmental Representative. Should the environmental permits not be approved by the applicable regulatory authorities within the timelines desired by the Departmental

Representative, the Departmental Representative may, at their sole discretion, undertake changes to the work as per GC6.1 – Changes in the Work and or termination of the Contract as per GC7.3 – Termination of Contract.

- .3 Achieve Substantial Performance by March 24, 2022.
- .4 Achieve Completion by March 31, 2022
- .5 Works may need to be temporally shut down during high flow, heavy rain events, or other adverse weather conditions. The works may be stopped by the following processes:
 - .1 The Contractor with approval from the Departmental Representative shall suspend works should the stream water level or poor weather conditions adversely affect the Contractors ability to achieve the contract specifications for quality of work.
 - .2 The Contractor’s Environmental Monitor, with approval from the Departmental Representative, may suspend work should they feel it is not possible to achieve the environmental requirements due to the high-water flows or adverse weather conditions.
 - .3 The Departmental Representative, in conjunction with representatives from the British Columbia Ministry of Environment and Climate Change Strategy (MoE), may suspend instream works should they feel that it is not possible to achieve the environmental requirements, or the contract specifications for quality of work due to the high water flows or adverse weather conditions.
- .6 Regardless of who suspends the work, the Contractor will be responsible for maintaining the site and protecting the works throughout the suspension period to ensure the site is in an acceptable condition safe to the public.
- .7 The Contractor shall account for the possibility of not being able to complete work due to high water flows or adverse weather conditions in the construction schedule and in the unit prices. No payment for temporary work stoppages due to high water flows or adverse weather conditions will be made.
- .8 The Contractor shall account for possible impacts of COVID-19 in the construction schedule and the unit prices. The Contractor shall keep informed with the latest Federal and Provincial recommendations and protocols regarding COVID-19 at all times during construction and shall modify their construction approach accordingly to ensure adherence to these recommendations and protocols.

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- 9 If Federal and/or Provincial recommendations require that the project work be stopped, the Contractor shall consult with the Departmental Representative and the Departmental Representative will advise as to the course of action the Contractor shall take. Any monetary impact to the Contractor from the work being stopped due to Federal and/or Provincial recommendations will be addressed in accordance with the contract general conditions.
- 3.3 Special Precautions
- .1 The Contractor's attention is drawn to the possibility of impacting utilities, etc., within the limits of work. The Contractor shall confirm the locations of all such utilities. All costs for utility locates shall be incidental to the work. The Contractor shall notify the Departmental Representative should utilities be located in areas other than those shown on the drawings or if they conflict with the construction and await instructions from the Departmental Representative before proceeding with work in the vicinity of such encountered services and utilities.
- .2 Relocation of the existing fibre optic utility will be undertaken before and during the project work if it is determined that the fibre optic line interferes with the permanent work or if it may be damaged by the works. See Section 01 14 00 – Work Restrictions, Access Development, Construction Staging, and Restoration, Item 1.3 Utilities and the following for further details:
- .1 The Contractor shall allow the utility company (Northwestel) the opportunity to locate and assess the potential fibre optic line conflicts within the limits of the proposed work. A representative of the utility company will be onsite during works with the potential to impact the fibre optic line. The Contractor shall provide a minimum of seven (7) calendar days' notice to the Departmental Representative and the utility company prior to commencing work that has the potential to impact the existing fibre optic line.
- .2 Where the fibre optic line interferes with the proposed work, the utility company may temporarily relocate the existing fibre optic line beyond the limits of work and reinstall the existing fibre optic line during the work. The Contractor shall assist the utility company to expose the existing fibre optic line, and lower and backfill the utility trench as directed by the utility company, using the Contractor's equipment as required, and in accordance with these specifications.

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- .3 Existing structures, signs, utilities, asphalt, Bituminous Surface Treatment (BST), culverts, cut & fill slopes, ditches, bridges, street furniture and all other structures, services, piping or equipment within the limits of work shall be properly protected from any injury or damage, direct or indirect. Any damage that is caused as a result of the operations of the Contractor shall be repaired and made good at the Contractor's expense to the satisfaction of the Departmental Representative.
- 3.4 Survey
- .1 The Contractor shall be responsible for all layout surveys to complete the work per the design lines and grades, survey of construction for measurement for payment (see Section 01 29 00 – Payment Procedures), Survey Monitoring (see Section 01 14 00 – Work Restrictions, Access Development, Construction Staging, and Restoration), and as-built surveys (see Section 01 78 00 – Closeout Submittals). All surveys shall achieve the following:
- .1 Be completed / collected to an accuracy of +/-0.02 m horizontal and +/-0.02 m vertical or better and shall be referenced / tie into the PSPC's monument / coordinate system as shown on the Contract Drawings.
- .2 Use industry standards, methods, equipment, and the survey requirements of Section 01 29 00 – Payment Procedures, and other approaches (if necessary) as preapproved by the Departmental Representative.
- .2 All layout surveys, quantity surveys, and as-built surveys shall be considered incidental to the work and will not be measured for payment.
- .3 The Contractor shall utilize a qualified surveyor acceptable to the Departmental Representative to perform all the required surveying on the project. Submit the name and address of surveyor to the Departmental Representative upon request.
- .4 Prior to starting on-site construction work, complete a check of the survey control monument coordinates and elevations provided by the Departmental Representative via a static survey of each monument. Provide results to the Departmental Representative for review and acceptance. If deemed necessary by the Departmental Representative, design adjustments may be made by the Departmental Representative to suit the findings of the monument survey checks.

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- .5 Prior to starting affected work, complete a check of the survey control monument coordinates and elevations for any discrepancies relative to the design and existing conditions. Provide results to the Departmental Representative for review and acceptance as soon as they are discovered. Should a discrepancy be found, await written approval from the Departmental Representative prior to proceeding. If deemed necessary by the Departmental Representative, design adjustments may be made by the Departmental Representative to suit the findings of the survey checks undertaken.
 - .6 Establish working control points based on survey control monuments provided (other monuments not listed shall not be used). Report to the Departmental Representative when a working control point is lost or destroyed because of necessary work. Replace working control points from the project survey control monuments.
 - .7 Establish / layout the proposed alignment(s) and grades using paint lines and survey stakes based on working control points and survey control monuments provided.
 - .8 The Departmental Representative may elect to verify surveys. Verification of the survey by the Departmental Representative does not abdicate the Contractor's responsibility for the correctness and accuracy of the survey.
 - .9 Maintain a complete, accurate log of control and survey work as it progresses. On request of the Departmental Representative, submit documentation to verify the accuracy of the field engineering work.
 - .10 The Contractor shall regularly monitor the condition of the Work Site and of property on and adjoining the Work Site throughout the construction period and shall immediately notify the Owner if any deterioration in condition is detected. Such monitoring shall cover all pertinent features and property including, but not limited to, buildings, structures, roads, walls, fences, slopes, sewers, culverts and landscaped areas.
 - .11 The Departmental Representative may, but shall not be obligated to, survey and record the condition of the Work Site and of property on or adjoining the Work Site prior to the commencement of construction by the Contractor. If a survey is undertaken and if requested by the Contractor, the Departmental Representative will provide a copy of the survey records to the Contractor for reference.

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- .12 Whenever supplied with survey records, the Contractor shall satisfy itself as to the accuracy and completeness of the survey records provided by the Departmental Representative for any area before commencing construction in that area. Commencement of construction in any area shall be interpreted to signify that the Contractor has accepted such survey records as being a true record of the existing conditions prior to construction.
- .13 The provision of the records of a survey of existing conditions by the Departmental Representative shall in no way limit or restrict the Contractors responsibility to exercise proper care to prevent damage to all property within or adjacent to the Work Site, whether all such property is covered by the survey or not.
- 3.5 Contract Drawings
- .1 Upon award of the project, PSPC will, at the request of the successful Contractor, provide the successful Contractor with up to 4 sets of 609.6 mm x 914.4 mm (24" x 36") and 6 sets of 279.4 mm x 431.8 mm (11" x 17") "Issued for Construction" or "Issued for Tender" hard copy contract drawing sets. Preparation and plotting of the hard copy drawing sets may take up to 14 days to prepare (excluding shipping).
- .2 Upon award of the project, PSPC will provide the successful Contractor with a digital PDF version of the "Issued for Construction" or "Issued for Tender" Contract Drawings. Preparation of the PDF drawing file may take up to 14 days to prepare.
- 3.6 Electronic Contract Drawings
- .1 If requested by the Contractor, the Departmental Representative will provide the Contractor with available Contract Drawings in electronic format for the Contractor to reference throughout the work.
- .2 The format and software of the electronic Contract Drawings shall be at the Departmental Representative's discretion.
- .3 The Departmental Representative accepts no responsibility for the accuracy or completeness of the electronic Contract Drawings. Should the Contractor choose to reference the electronic Contract Drawings, the Contractor shall satisfy itself as to the accuracy and completeness of the electronic contract drawings before commencing construction. Should a discrepancy between the electronic Contract Drawings and the hard copy Contract Drawings be discovered (at any time during the work), the hard copy Contract Drawings shall govern. The Contractor will be responsible for all costs associated with any corrections to ensure the work is in conformance with the hard copy Contract Drawings. The Departmental Representative shall not be responsible for updating or correcting any discrepancies between the

electronic Contract Drawings and the hard copy Contract Drawings identified by the Contractor.

3.7 Contract Submittals

- .1 Complete and submit for the Departmental Representative's review, all required contract submittals as detailed in the relevant sections of the contract specifications. Work affected by the submittals shall not proceed until the submittal is accepted by the Departmental Representative. Allow for submittal review periods as required for each submittal and as detailed in Section 01 33 00 – Submittal Procedures. Required submittals include, but are not limited to the following:
 - .1 Project Schedule (see Section 01 32 16).
 - .2 Traffic Management Plan (see Section 01 35 00).
 - .3 Project Specific Health and Safety Plan (see Section 01 35 33) including:
 - .1 Preliminary Hazard Assessment Form (Appendix 1 of Project Specific Health and Safety Plan template, see Appendix B).
 - .2 Confirmation of Prime Contractor's Main Responsibilities Under the WorkSafeBC Occupational Health and Safety Regulations and Worker's Compensation Act form (Appendix 2 of Project Specific Health and Safety Plan template, see Appendix B).
 - .3 Contractor's COVID-19 Safe Work Plan
 - .4 Environmental Protection Plan (see Section 01 35 43).
 - .5 Quality Management Plan and related Quality Management documentation (see Section 01 45 00).
 - .6 As-built Survey, As-built Drawing mark-ups, and Shop Drawing mark-ups (see Section 01 78 00).

3.8 Supervisory Personnel

- .1 Within five days of contract award notification, the Contractor shall submit to the Departmental Representative confirmation of the names of the supervisory personnel and other key staff designated for assignment on the Contract. At a minimum, the following personnel shall be included on the list:
 - .1 Project Superintendent.
 - .2 Deputy Project Superintendent.
 - .3 Health and Safety Coordinator.

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- .4 Quality Control Manager.
 - .2 The above personnel shall perform the following duties:
 - .1 Project Superintendent: shall be employed full time and shall be present on the Work Site each and every workday that Work is being performed, from the commencement of work to Substantial Performance and Completion of the Work.
 - .2 Deputy Project Superintendent: shall have the authority of the Project Superintendent during the latter's absence for short periods of time.
 - .3 Health and Safety Coordinator: shall possess safety experience in general construction. Duties shall encompass all matters of safety activities from commencement of work until Substantial Performance and Completion of the Work (see Section 01 35 33 – Health and Safety for further requirements).
 - .4 Quality Control Manager: shall be experienced in Quality Management, available to address quality matters from commencement of work until Substantial Performance and Completion of the Work, and remain onsite at all times the Contractor is performing work which must be tested or inspected in-process (see Section 01 45 00 – Quality Management for further requirements).
 - 3.9 Work by Others
 - .1 The Contractor is advised that concurrent with this project there may be other Contractors working in nearby adjacent projects. Should other Contractors be working in nearby adjacent projects, the Contractors shall coordinate his operations with the other Contractors, including traffic management.
 - .2 The Contractor is advised that utility relocations within the limits of the work will be undertaken by others before and during work on this project. See Section 01 14 00 – Work Restrictions, Access Development, Construction Staging, and Restoration, Item 1.3 Utilities for further details.
 - .3 If the work is to be completed during winter conditions, PSPC through their maintenance contractor will maintain “typical” snow plowing and sanding operations through the length of the project worksite for the duration of the project. “Typical” snow plowing and sanding will be completed to the level and standard that would be undertaken in this area should there not be an active, ongoing construction project. The Contractor shall account for the possibility that highway snow clearing

operations will result in snow being plowed off the highway
and into the area of work.

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

- 1.1 Use of Work Site.
- 1.2 Work Conducted in and Adjacent to Waterways.
- 1.3 Utilities.
- 1.4 Protection of Persons and Property.
- 1.5 Use of Public Areas.
- 1.6 Construction Signage.
- 1.7 Access Development.
- 1.8 Construction Start-up.
- 1.9 Construction Staging.
- 1.10 Restoration.

PART 1 – GENERAL

- 1.1 Use of Work Site
 - .1 The Work Site will be specified by the Departmental Representative and shall only be used for the purposes of the Work. The Work Site will be made available to the Contractor for its exclusive use for the duration of the Work, unless otherwise provided in the Contract Documents.
 - .2 The Contractor's office trailer may be set up in the locations identified in Section 01 52 00 – Construction Facilities and Equipment. The Contractor's construction camp will not be permitted within PSPC's ROW or other lands owned or leased by PSPC as identified in Section 01 59 10 – Construction Camp.
 - .3 While the Work Site is under the Contractor's control, the Contractor shall be entirely responsible for the security of the Work Site and of the Work.
 - .4 The Contractor shall keep the Work Site clean and free from accumulation of waste materials and rubbish regardless of the source. Snow/ice shall be removed by the Contractor as necessary for the performance and inspection of the Work.
 - .5 The Contractor shall provide sanitary facilities for the work force in accordance with governing regulations and the Environmental Procedures for this project. The Contractor shall post notices and take such precautions as required by local health authorities and keep the area and premises in sanitary condition.

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- .6 Any damage to the Work Site caused by the Contractor shall be repaired by the Contractor at the Contractor's expense.
 - .7 The Contractor may work 24 hours per day, seven days per week with the following restrictions.
 - .1 Work in excess of 12 hrs per day shall require pre-approval from the Departmental Representative. At a minimum, pre-approval shall require a plan from the Contractor to ensure all necessary QC work per the contract requirements is completed during all times of work. The Departmental Representative may withdraw approval for the extended work hours at any time should the Contractor fail to achieve all necessary QC requirements or any other contractual requirement as a result of the extended work hours.
 - .2 Request for approval to work in excess of 12 hrs per day must be submitted in writing to the Departmental Representative a minimum of five (5) days in advance of the planned change in working hours.
 - .3 Work during non-daylight hours shall be lit with Contractor supplied lighting such that none of the work is being completed in darkness.
 - .4 No hauling of material during inclement weather.
 - 1.2 Work Conducted in and Adjacent to Waterways
 - .1 All components of the work shall be conducted in accordance with Section 01 35 43 – Environmental Protection.
 - 1.3 Utilities
 - .1 There are active utilities within the Highway Right of Way. The Contractor shall be responsible for completing utility locates in advance of the work.
 - .2 The locations of Utilities shown on the Contract Drawings are not necessarily exact nor is there any guarantee that all Utilities in existence within the limits of the Work Site have been shown on the Contract Drawings.
 - .3 The Contractor shall allow the utility company the opportunity to locate and assess the potential proposed work /utilities conflicts within the limits of the work. If it is determined by the Departmental Representative and utility owner that the utilities are affected by the permanent Work, the utilities will be abandoned in place a new utility cable placed on the native ground surface outside the limits of the work or the utility lowered / relocated at the time of construction by Other Contractors. The Contractor shall cooperate and coordinate as

required with Other Contractors engaged in Utility relocation operations on the Work Site.

- .4 The Contractor shall notify the Departmental Representative and the Utility companies at least seven (7) Days in advance of any activities which may interfere with the operation of such Utilities.
- .5 Whenever working in the vicinity of Utilities, the Contractor shall locate such Utilities and expose those that may be affected by the Work, using hand labour as required.
- .6 The Contractor shall assess the possible impact of its operation on all utilities and shall protect, divert, temporarily support or relocate, or otherwise appropriately treat such Utilities to ensure that they are preserved.
- .7 The Contractor shall immediately report any damage to Utilities to the Departmental Representative and to the Utility company or authority affected and shall promptly undertake such remedial measures as are necessary at no additional cost to the Owner.

1.4 Protection of Persons and Property

- .1 The Contractor shall comply with all applicable safety regulations of WorksafeBC including, but not limited to the, Workers Compensation Act, Occupational Health and Safety Regulations, Industrial First Aid Regulations, and Workplace Hazardous Materials Information System Regulations (see Section 01 35 33 – Health and Safety for additional requirements).
- .2 The Contractor shall take all necessary precautions and measures to prevent injury or damage to persons and property on or near the Work Site.
- .3 The Contractor shall promptly take such measures as are required to repair, replace or compensate for any loss or damage caused by the Contractor to any property.

1.5 Use of Public Areas

- .1 Off-road construction equipment (including equipment which exceeds legal highway load limits or dimensions) will not be allowed on the Alaska Highway. Steel tracked equipment with cleats will not be allowed on BST or asphalt unless measures are taken to protect the existing BST or asphalt road surface against any damage.
- .2 The Contractor shall ensure that its vehicles and equipment do not cause nuisance in public areas. All vehicles and equipment leaving the Work Site and entering public roadways shall be cleaned of mud, dirt, snow, and ice clinging to the body and wheels of the vehicle. All vehicles arriving at or leaving the

Work Site and transporting materials shall be loaded in a manner which will prevent dropping of materials or debris on the roadways, and, where contents may otherwise be blown off during transit, such loads shall be covered by tarpaulins or other suitable covers. Spills of material, including rocks and debris from loaded trucks, shall be removed or cleaned immediately by the Contractor at no cost to the Owner. All activities shall be in accordance with Section 01 35 43 – Environmental Protection and the Environmental Protection Plan prepared by the Contractor for the project. The traveled lanes of the Alaska Highway shall remain a Public Highway subject to the rules and laws of Public Highways in the Province of British Columbia. The Contractor is responsible for ensuring all equipment accessing the Highway meets all requirements for vehicles traveling on Public Highways in the Province.

1.6 Construction Signage

- .1 No Signs or advertisements, other than regulatory or warning signs, PSPC supplied signage, and portable electrically illuminated message signs are permitted on site.
- .2 Signs and notices for Safety and instruction shall be provided by the Contractor (see Section 01 35 00 – Traffic Management for additional details).
- .3 Maintain approved signs and notices in good condition for duration of Project and dispose of off-site on completion of Project or earlier as directed by the Departmental Representative.
- .4 Signage shall be coordinated with other Contractors working in the area as needed.

1.7 Access Development

- .1 The Contractor is required to develop access to the required work areas. The Contractor is fully responsible for the selection and implementation of all methods to accomplish this requirement. Any access roads or trails extending outside the limits of the work shall be submitted to the Departmental Representative for approval on the Construction Staging / Traffic Management Drawings. All construction access shall be completed in conformance with the requirements of Section 01 35 43 – Environmental Protection and the Contractor's Environmental Protection Plan.

1.8 Construction Start-up

- .1 The Contractor or his Sub-contractors shall not perform any on site work until all necessary submittals have been provided, reviewed, and accepted by the Departmental Representative and the Contractor has received from the Departmental Representative a completed version of the "On-site Construction Start-up Form" (see Appendix D) which has been completed and signed by PSPC's the Departmental Representative. PSPC

reserves the right to refuse payment for any on-site work performed prior to issuing the completed and signed “On-site Construction Start-up Form”.

1.9 Construction Staging

- .1 Onsite project work may not start until the application for Notification Approval under the provincial Water Sustainability Act, and all other environmental permits applied for by the Departmental Representative have been approved by the applicable regulatory authorities, and the necessary documentation has been received by the Departmental Representative.
- .2 The Contractor shall stage the work ensuring that:
 - .1 All design requirements as specified in the Contract Drawings and contract specifications are achieved.
 - .2 All requirements of Section 01 35 00 – Traffic Management are achieved.
 - .3 All requirements of the Section 01 35 43 – Environmental Protection and the Contractor’s Environmental Protection Plan are achieved.
 - .4 The work is completed in accordance with the dates for Substantial Performance and Completion provided in Section 01 11 10 – Summary of Work.

The Contractor is fully responsible for the selection and implementation of all methods to accomplish this requirement.

1.10 Restoration

- .1 Remove access points, roads, detours, laydown areas, pads, and all other works installed during access development and construction staging. Re-instate the worksite to a condition equal to or better than the site condition prior to construction by:
 - .1 Restoring organic soils (if removed or damaged during access development or other works).
 - .2 Restoring existing and proposed drainage patterns as shown on the Contract Drawings.
 - .3 Removal of all gravels, other materials, and structures placed to create access points, temporary detour roads, or pads. Dispose of gravels, other materials, or structures at an off-site disposal facility acceptable to the Departmental Representative.

- .4 Hydraulically Seed all disturbed areas and areas designated for Hydraulic Seeding, per Section 32 93 21 – Hydraulic Seeding.

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

- 1.1 Definitions.
- 1.2 Measurement and Payment Procedures.

PART 1 – GENERAL

- 1.1 Definitions
 - .1 Mobilization and Demobilization: Consists of preparatory work and operations, including but not limited to:
 - .1 Preparation and acceptance of submittals (Construction Schedule, Traffic Management Plan, Quality Management Plan, Environmental Protection Plan, Project Specific Health and Safety Plan, and any other submittals required prior to starting work).
 - .2 Work and costs incurred necessary for the movement of personnel, equipment, supplies and incidentals to/from the work site.
 - .3 Work and cost incurred in the establishment and operation of offices, camps, and other facilities necessary to undertake the work.
 - .4 Work and costs incurred in the completion of clean-up and project completion.
 - .5 All other work and costs incurred in the successful completion of mobilization and demobilization.
- 1.2 Measurement and Payment Procedures
 - .1 Payment for Mobilization and Demobilization will be made on the basis of the Price per Unit Bid for Mobilization and Demobilization in the Bid and Acceptance Form. The Price per Unit Bid shall include all costs associated with the items of work listed in 1.1 Definitions above.
 - .2 Measurement for Payment for completion of Mobilization and Demobilization will be made at the Lump Sum price and will be scheduled as follows:
 - .1 50% of the Lump Sum bid price to a maximum of 5% of the Total Tender price at the beginning of construction after the Contractor's required submittals (including Construction Schedule, Traffic Management Plan, Quality Management Plan, Environmental Protection Plan, Construction Staging Drawings, Project Specific Health and Safety Plan, and any other submittals noted in the specifications as being required prior to starting work) have been submitted for review,

accepted for the work in its entirety, and work onsite has commenced to the satisfaction of the Departmental Representative. Should the Departmental Representative allow the work to start prior to submission or acceptance by the Departmental Representative of any of submittals listed above, the Departmental Representative may choose to hold back a minimum of 5% of the 50% Mobilization & Demobilization payment for each outstanding submittal until an acceptable submission is provided.

- .2 50% once the project has achieved “Completion” and all equipment has been demobilized from the site, the site has been cleaned to the satisfaction of the Departmental Representative, remaining deficiencies identified during final inspection (Section 01 77 00 – Closeout Procedures) are corrected, and all closeout submittals are provided and accepted by the Departmental Representative.

END OF SECTION

SECTION INCLUDES:

PART 1 – GENERAL:

- 1.1 Terms of Payment.
- 1.2 Basis of Payment.
- 1.3 Survey.

PART 1 – GENERAL

1.1 Terms of Payment

- .1 The project's terms of payment shall be per General Conditions (GC) 5 – Terms of Payment. Progress payments shall be submitted by the Contractor on a monthly basis unless accepted otherwise by the Departmental Representative. The progress payment shall use PSPC's Request for Progress Payment – Construction Contracts form: PWGSC-TPSGC 1792, found online (see link to Public Works and Government Services Canada – Acquisition Forms within the Reference Documentation section of the Table of Contents for link).

With each progress payment, provide to the Departmental Representative the required documentation as listed below. Upon receipt of this required documentation, PSPC will commence a review of the progress payment request in accordance with General Conditions (GC) 5 – Terms of Payment.

- .1 Documentation required by General Conditions (GC) 5 – Terms of Payment including signed statutory declaration.
- .2 Progress Payment Submittal Form (see Appendix E) completed and signed by the Contractor's representative. Upon receipt of this form and all other required documentation, PSPC will commence review of the progress payment request in accordance with General Conditions (GC) 5 – Terms of Payment.
- .3 WorkSafeBC Clearance Letter, indicating the Contractor is in active and good standing per the end date of the progress payment in accordance with Section 51 of the Workers Compensation Act (Departmental Representative may waive this requirement).
- .4 Updated construction progress schedule (accepted project schedule shown as the baseline and actual start dates / completion dates / percent complete shown for each task, see Section 01 32 16 – Construction Progress Schedules – Bar (Gantt) Chart).

- .5 All survey information (digital csv file with xyz data and breaklines in DXF file format) for each payment item claimed on the progress payment and measured by survey as defined in the Contract Specifications.
- 1.2 Basis of Payment
- .1 Basis of payment shall be per the Measurement and Payment Procedures in the applicable specification section. Where not specified, basis of payment for all work included in these specifications or Contract Drawings not specifically mentioned is considered incidental to other work and is part of the Total Contract Amount. No additional payment will be made for incidental work.
- .2 Payment for work shall be made per the Price per Unit as shown in the Unit Price Table.
- .3 For unit price items in the Bid and Acceptance Form, progress payments shall be made based on the quantities of work in place (prior to excavation or following placement and compaction), compacted (if required) surveyed, and accepted by the Departmental Representative in the field.
- .4 For lump sum items in the Bid and Acceptance Form, progress payments shall be made based on the percent of work completed and accepted by the Departmental Representative at the time of the monthly progress payment (Excluding Mobilization and Demobilization which is paid per Item 1.2 – Measurement and Payment Procedures of Section 01 25 20). Survey will be required to verify the work is completed to the design requirements (thickness of the riprap, length, grade, volume, area, etc.).
- .5 The Contractor must support any claims for products purchased, manufactured, or delivered to the place of work but not yet incorporated into work. The support for such claims must include such evidence as may be required by the Departmental Representative to establish value and the percentage of the work completed. During or at the completion of the work any products purchased, manufactured, or delivered to the place of work but not incorporated into the work shall be removed from the site at the Contractor's cost and no payment (including adjustment to quantities on previous progress payments, see GC5.2 – Amount Payable) shall be made (excluding items resulting from changes to the work made by the Departmental Representative during the work and brought to the attention of the Departmental Representative by the Contractor at the time of the change).

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- .6 Any work called for in the specifications or shown on the Contract Drawings but not specifically mentioned as an item for which payment will be made, will be considered incidental to the items of work listed. No additional payment will be made for this incidental work.
 - .7 All equipment, materials, and labour necessary to complete any item of work shall be included in the cost of that work.
 - .8 Materials shall be excavated or placed within the specified tolerances of the design lines and grades shown on the Contract Drawings but not uniformly high or low. Materials excavated or placed outside the specified tolerances will not be measured for payment unless preapproved by the Departmental Representative.
 - .9 Measurement for Payment will be at the Departmental Representative's discretion using one or more of the following methods:
 - .1 Based upon the survey data collected by the Contractor – when the materials have been excavated or placed within the specified tolerances of the design lines and grades shown on the Contract Drawings but not uniformly high or low.
 - .2 Based upon the survey data collected by the Contractor – when the Contractor's or Departmental Representative's survey data indicates that less materials were excavated or placed than called for by the design lines and grades on the Contract Drawings.
 - .3 By the design grade / design drawing neat lines – when the Contractor's or Departmental Representative's survey data indicates that materials were excavated or placed outside / beyond the specified tolerances of the design lines and grades on the Contract Drawings.
 - .10 At any point throughout the project, the Departmental Representative may compile and review the survey data (individual surveys or multiple surveys of particular items of work) to reconcile the total quantities of items of work to date on the project. Adjustments to quantities on future progress payments may then be made per GC5.2 – Amount Payable.
- 1.3 Survey
- .1 Surveys shall be undertaken by the Contractor to verify quantities for payment purposes, or in the case of lump sum items to verify that work has been completed to the design requirements. Survey shall be considered incidental to the work and not measured for payment.

- .2 All quantity surveys, and quantity calculations for the purposes of progress payments shall be completed by a qualified surveyor, with the knowledge, skills and abilities acceptable to the Departmental Representative. A resume detailing the surveyor's experience may be required by the Departmental Representative for review and acceptance if requested.
- .3 A survey of the existing ground surfaces and other topographic features shall be undertaken by the Contractor prior to initiation of construction. The survey shall be provided to the Departmental Representative for review and acceptance prior to starting work. Additionally, during construction no material shall be placed unless the applicable surveys on the completed surfaces have been carried out and the data accepted by the Departmental Representative, and the completed surface has been inspected and accepted by the Departmental Representative.
- .4 Survey data shall be collected at an accuracy of +/-0.02 m horizontal and +/-0.02 m vertical or better and shall be referenced / tie into the PSPC's monument / coordinate system as shown on the Contract Drawings.
- .5 Survey data for each payment line item in the unit price table and area of work shall be provided to the Departmental Representative as follows:
 - .1 Digital csv files with the xyz data and an appropriate descriptor code as to the type of material surface or feature being surveyed.
 - .2 Breaklines for all survey data in DXF file formation or another format pre-approved by the Departmental Representative.
 - .3 A list of all point descriptors used in the survey data.
- .6 Where surveys of an item of work or location of work have been completed multiple times (ex. multiple progress payments), compile individual survey point files into one complete survey file free of overlapping points and other inconsistencies resulting from the completion of individual surveys.
- .7 If requested by the Departmental Representative, the Contractor shall complete detailed volume calculations using average end area determination or electronic surface to surface comparisons. Details of volume calculations shall be provided to the Departmental Representative for review upon request.

- .9 Surveys may be subject to verification by the Departmental Representative. In case of discrepancy, the Departmental Representative's survey will govern.

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

- 1.1 Pre-Construction Meeting.
- 1.2 On-Site Documents.
- 1.3 Schedules.
- 1.4 Construction Progress Meetings.
- 1.5 Written Communication / Document Management.
- 1.6 Submittals.
- 1.7 Close-Out Procedures.

PART 1 – GENERAL

- 1.1 Pre-Construction Meeting
 - .1 Following tender closing and prior to the construction start, attend in person or via teleconference a pre-construction meeting organized by the Departmental Representative.
 - .2 Departmental Representatives and senior representatives of the Contractor, including but not necessarily limited to the Project Superintendent, Deputy Project Superintendent, Health and Safety Coordinator, Quality Control Manager, and major subcontractors shall attend in person or via teleconference.
 - .3 The Departmental Representative shall establish a time, location, and teleconference number for the meeting and notify the Contractor a minimum of three days prior to the meeting. The Contractor shall notify all concerned parties of the meeting.
 - .4 The agenda is to include but is not limited to the following:
 - .1 Appointment of the official representative of participants in the work and lines of communication.
 - .2 Project schedule, proposed hours of work per day and number of working days per week.
 - .3 Contractor submissions (requirements and submissions schedule).
 - .4 Requirements for temporary facilities, site signage, offices, construction camp, storage sheds, utilities, and fences.
 - .5 Permitting and Environmental requirements.

- .6 Site security in accordance with Section 01 52 00 – Construction Facilities and Equipment.
 - .7 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, and administrative requirements.
 - .8 As-built drawings in accordance with Section 01 78 00 – Closeout Submittals.
 - .9 Take-over procedures, acceptance, and warranties in accordance with Section 01 77 00 – Closeout Procedures.
 - .10 Monthly progress claims, administrative procedures, photographs, and holdbacks.
 - .11 Contractor’s Quality Management and Quality Assurance undertaken by the Departmental Representative.
 - .12 Insurances and transcript of policies.
 - .13 Contractor’s Project Specific Health and Safety Plan.
 - .14 Maintenance in accordance with Section 01 78 00 – Closeout Submittals.
 - .15 Other business as required by the Departmental Representative or Contractor.
- .5 Within fourteen (14) days of the pre-construction meeting, the Departmental Representative shall distribute meeting minutes to the Contractor. The Contractor shall review the meeting minutes and provide any comments within 5 working days.
- 1.2 On-Site Documents
- .1 Maintain at job site, one copy each of the following:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Reviewed and accepted submittals.
 - .5 Change orders.
 - .6 Other modifications to Contract.

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- .7 Field test reports.
 - .8 Copy of approved work schedule.
 - .9 Manufacturer's installation and application instructions (if applicable).
 - .10 All permits (FLNRORD, MoE, DFO, NWPA, and/or others as required for the project).
 - .11 Meeting minutes.
 - .12 Contractor's Project Specific Health and Safety Plan.
 - .13 Contractor's Environmental Protection Plan (EPP).
 - .14 Contractor's Traffic Management Plan.
 - .15 Current construction standards of workmanship listed in the contract specifications.
 - .16 One set of "Issued for Construction" Contract Drawings (or "Issued for Tender" if being used for construction), contract specifications, and Shop Drawings for as-built purposes.
- 1.3 Schedules
- .1 Submit preliminary construction progress schedule in accordance with Section 01 32 16 – Construction Progress Schedules – Bar (Gantt) Chart to the Departmental Representative.
 - .2 After review by Departmental Representative, revise project schedule to comply with comments given.
 - .3 During progress of work, provide schedule with original tasks shown as the baseline and actual work progress updated with each submission (see Section 01 32 16 – Construction Progress Schedules – Bar (Gantt) Chart, subsection 1.4).
- 1.4 Construction Progress Meetings
- .1 During the course of work the Departmental Representative may schedule construction progress meetings every week or every two (2) weeks.
 - .2 Departmental Representatives and senior representatives of the Contractor, including but not necessarily limited to the Project Superintendent and major subcontractors, the Deputy Project Superintendent, Health and Safety Coordinator, Quality Control Manager shall attend in person or via teleconference.
 - .3 The Departmental Representative shall establish a time, location, and teleconference number for the meeting and notify

the Contractor a minimum of three days prior to the meeting. The Contractor shall notify all concerned parties of the meeting.

- .4 The meetings may be held on site provided teleconference capabilities are available or at PSPC's office in Fort Nelson. If held on site, the Contractor shall provide physical space and make arrangements for the meetings.
- .5 Agenda to include the following:
 - .1 Review and approval of minutes of previous meeting.
 - .2 Health and Safety Incidents and Concerns.
 - .3 Review of work progress since previous meeting.
 - .4 Field observations, problems, conflicts.
 - .5 Problems which impede construction schedule.
 - .6 Review of off-site fabrication delivery schedules (if applicable).
 - .7 Corrective measures and procedures to regain projected schedule.
 - .8 Revision to construction schedule and project submittals.
 - .9 Progress schedule, during succeeding work period.
 - .10 Review submittal schedules: expedite as required.
 - .11 Cash flow forecasting including monthly updates.
 - .12 Maintenance of quality standards.
 - .13 Review proposed changes for effect on construction schedule and on completion date.
 - .14 Other business.
- .6 Within fourteen (14) days of the construction progress meeting, the Departmental Representative shall distribute meeting minutes to the Contractor. The Contractor shall review the meeting minutes and provide any comments within five (5) working days.

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| 1.5 Written Communication / Document Management | .1 | Written communication and document management shall be completed per the Written Communication / Document Management Protocol prepared by the Departmental Representative following award of the contract. The Written Communication / Document Management Protocol will resemble the template provided in Appendix A. |
| 1.6 Submittals | .1 | Provide submittals, Shop Drawings, product data and samples in accordance with Section 01 33 00 – Submittal Procedures for review for compliance with Contract Documents, field dimensions and clearances, compatibility and available space, and for relation to work of other contracts. If requested, after receipt of Departmental Representative comments, revise and resubmit. |
| | .2 | Submit requests for payment through the Departmental Representative via email or, if requested by the Departmental Representative or if desired by the Contractor, PSPC’s cloud-based document filing system “CentralCollab”. Support claims for payment with survey data and other evidence as required by the Departmental Representative. |
| | .3 | Submit requests for interpretation of Contract Documents and obtain instructions through Departmental Representative. If required by the Departmental Representative, provide supporting documents for proposed substitutions via PSPC’s cloud-based document filing system “CentralCollab”. |
| | .4 | Process substitutions through Departmental Representative. If required by the Departmental Representative, provide supporting documents for proposed substitutions via PSPC’s cloud-based document filing system “CentralCollab”. |
| | .5 | Process change orders through Departmental Representative via PSPC’s cloud-based document filing system “CentralCollab”. |
| | .6 | Deliver closeout submittals for review and preliminary inspections, for transmittal to Departmental Representative via PSPC’s cloud-based document filing system “CentralCollab”. |
| 1.7 Close-Out Procedures | .1 | Notify Departmental Representative when work is considered ready for Substantial Performance. |
| | .2 | Accompany Departmental Representative on preliminary inspection to determine items listed for completion or correction. |

- .3 Comply with Departmental Representative's instructions for correction of items of work listed in executed certificate of Substantial Performance.
- .4 Notify Departmental Representative of instructions for completion of items of work determined in Departmental Representative's final inspection.

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

- 1.1 Project Schedule.
- 1.2 Schedule Format.
- 1.3 Submission of Schedules.
- 1.4 Project Schedule Reporting During the Work.

PART 1 – GENERAL

1.1 Project Schedule

- .1 Develop detailed Project Schedule conforming to the project completion dates found in Section 01 11 10 – Summary of Work and the Construction Staging requirements outlined in Section 01 14 00 – Work Restrictions, Access Development, Construction Staging, and Restoration.
- .2 Ensure detailed Project Schedule includes as a minimum, all relevant milestone activity types as follows:
 - .1 Project Award.
 - .2 Receipt of Necessary Permits.
 - .3 Submittal Schedule:
 - .1 Pre-construction survey
 - .2 Environmental Protection Plan.
 - .3 Traffic Management Plan
 - .4 Construction Staging Plan / Site Access.
 - .5 Quality Management Plan.
 - .6 Project Specific Health and Safety Plan, including MSDS sheets.
 - .7 Hazardous Materials Management Plan.
 - .8 Shop Drawings and Product Samples (if applicable).
 - .9 As-built Survey and As-Built Drawing Mark-ups.
 - .4 Mobilization.

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- .5 Work activities and material purchases by segment / locations (unless accepted otherwise, at a minimum each line item of work identified in the unit price table shall be identified separately on the project schedule).
 - .6 Interim inspections.
 - .7 Site Clean-up / De-mobilization.
 - .8 Project Substantial Completion and Project Completion dates.
- .3 Indicate dates for submitting, review time, resubmission time, and last date for meeting fabrication schedule.
- .4 Include dates when reviewed submittals will be required from the Departmental Representative.
- 1.2 Schedule Format
- .1 Prepare schedule in form of a horizontal Gantt bar chart.
 - .2 Provide a separate bar for each item of work identified on the unit price table or if acceptable to the Departmental Representative, each operation.
 - .3 Provide horizontal time scale identifying first workday of each week.
 - .4 Format for listings: the chronological order of start of each item of work.
 - .5 Include complete sequence of construction activities and identify critical path and critical path work items in identifying colour.
 - .6 Include dates for commencement and completion of each major element of construction.
- 1.3 Submission of Schedules
- .1 Submit initial format of schedules within fifteen (15) days after award of Contract, but in all cases prior to starting onsite work.
 - .2 Submit schedules in electronic format via PSPC’s cloud-based document filing system “CentralCollab” (login details to be provided by Departmental Representative at time of submission following contract award). Provide schedules as a single PDF file format document (multiple files will not be accepted) and native file format (ex. Microsoft Projects format) if requested by the Departmental Representative.
 - .3 If requested submit two (2) hard copies to be retained by the Departmental Representative.

- .4 The Departmental Representative will review the schedule and return any comments within ten days after receipt.
 - .5 Resubmit finalized schedule within seven (7) days after return of review copy. Once accepted by the Departmental Representative, the accepted schedule shall form a baseline which all schedule updates shall be compared against.
 - .6 Distribute copies of revised schedule to:
 - .1 The Contractor's team including Project Superintendent, Deputy Project Superintendent, and others as required.
 - .2 Subcontractors.
 - .3 Other concerned parties.
 - .7 Instruct recipients to report to Contractor within seven (7) days any problems anticipated by timetable shown in the schedule.
- 1.4 Project Schedule Reporting During the Work
- .1 Update project schedule on a monthly basis or with each progress payment (whichever is more frequent) reflecting activity changes and completions, as well as activities in progress.
 - .2 Provide a narrative report to define:
 - .1 Problem areas, anticipated delays, and impact on schedule.
 - .2 Corrective action recommended and its effect.
 - .3 Effect of changes on schedules of other Prime Contractor's.
 - .3 Discuss project schedule at Construction Progress Meetings, identify activities that are behind schedule and provide measures to regain slippage. If requested by the Departmental Representative, provide a schedule recovery plan with details of the approach and changes the Contractor is planning on implementing to bring the project back on schedule.

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

- 1.1 General Requirements.
- 1.2 Shop Drawings and Product Data.
- 1.3 Samples.

PART 1 – GENERAL

1.1 General Requirements

- .1 Submit to the Departmental Representative submittals listed for review. Submit with reasonable promptness (per the timelines indicated, if applicable) and in an orderly sequence so as to not cause delay in work. Failure to submit in ample time is not considered sufficient reason for an extension of contract Substantial Completion Date, and no claim for extension by reason of such default will be allowed.
- .2 Unless specified otherwise or requested by the Departmental Representative, submittals shall be submitted to the Departmental Representative in electronic format via PSPC’s cloud-based document filing system (login details to be provided by Departmental Representative at time of submission following contract award). Submittals shall be named and filed on “CentralCollab” in accordance with the Written Communication / Document Management Protocol (see template Appendix A). Each submittal shall be compiled into a single PDF document (multiple files will not be accepted).
- .3 The Departmental Representative will review the project submittals for accuracy against the appropriate project specifications and contract requirements, and endeavor to complete the reviews within the review time specified for each particular submittal. However, a longer review period may be required. If a longer review period is required, the Contractor will be notified prior to the passing of the specified review period. Upon completion of the submittal reviews by the Departmental Representative, comments and or acceptance of the submittals will be given. Upon review by the Departmental Representative, should comments be provided, the Contractor shall revise the submittal as required and re-submit the complete revised submittal back to the Departmental Representative for review within one week (or within a time preapproved by the Departmental Representative). The submittals will not be accepted until all comments from all reviews have been addressed to the satisfaction of the Departmental Representative. Despite acceptance of a particular submittal, the Departmental Representative reserves

- the right to provide additional comments to ensure the correction of any deficiencies with particular submittals at any time during the project.
- .4 Work affected by a submittal shall not proceed until the submittal is completed, reviewed, and accepted by the Departmental Representative.
 - .5 Present all necessary drawings, Shop Drawings, product data, samples, and mock-ups in SI Metric units.
 - .6 Where items or information is not produced in SI Metric units, converted values are acceptable.
 - .7 Review submittals prior to submission to the Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with the requirements of work and Contract Documents. Submittals not stamped, signed, dated, and identified as to a specific project will be returned without being examined and shall be considered rejected.
 - .8 Notify the Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents and stating reasons for deviations.
 - .9 Prior to any submission, verify field measurements and affected adjacent work included on the submission are coordinated.
 - .10 Contractor's responsibility for errors and omissions in submission is not relieved by the Departmental Representative's review of submittals.
 - .11 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.
 - .12 Keep one reviewed copy of each submission on site.
 - .13 Comments made from review of submittals are intended to ensure conformance with contract requirements and not intended to change contract price. If the Contractor feels the comments include requirements not required by the contract, the Contractor shall respond in writing to the Departmental Representative prior to undertaking the work.

- 1.2 Shop Drawings and Product Data
- .1 The term “Shop Drawings” means drawings, diagrams, illustrations, schedules, performance charts, brochures, and other data that are to be provided by the Contractor to illustrate details of a portion of work.
 - .2 Indicate materials, methods of construction, and attachment or anchorage, erection diagrams, connections, explanatory notes, and other information necessary for completion of work or as indicated elsewhere in the specifications. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of the section under which adjacent items will be supplied and installed. Indicate cross-references to design drawings and specifications.
 - .3 Adjustments made on Shop Drawings by the Departmental Representative are not intended to change the Contract Price. Should the Contractor feel that the adjustments affect the value of work and are outside the contract requirements, the Contractor shall state such in writing to the Departmental Representative prior to proceeding with the work.
 - .4 Make changes in Shop Drawings as the Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify the Departmental Representative in writing of any revisions other than those requested.
 - .5 Accompany submissions with a transmittal letter, in duplicate, containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor’s name and address.
 - .4 Identification and quantity of each Shop Drawing, product data, and sample.
 - .5 Other pertinent data.
 - .6 Submissions shall include:
 - .1 Date and revision dates.
 - .2 Project title and number.

- .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
- .4 Contractor's stamp, signed by the Contractor's authorized representative certifying approval of submissions, verification of field measurements, and compliance with Contract Documents and requirements.
- .5 Details of appropriate portions of work as applicable:
 - .1 Fabrication.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Capacities.
 - .5 Performance characteristics.
 - .6 Standards.
 - .7 Operating weight.
 - .8 Single line and schematic diagrams.
 - .9 Relationship to adjacent work.
- .6 Professional seal and signature of the engineer certifying approval of the work (if required).
- .7 After the Departmental Representative's review and acceptance, distribute copies.
- .8 Submit an electronic copy of the Shop Drawing for each requested within the specification sections. Submit hard copies as requested by the Departmental Representative.
- .9 Submit electronic copies of product data sheets or brochures for requirements requested in specification sections and as requested by the Departmental Representative where Shop Drawings will not be prepared due to standardized manufacture of product.

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- .10 Delete information not applicable to project.
 - .11 Supplement standard information to provide details applicable to the project.
 - .12 If upon review by the Departmental Representative no errors or omissions are discovered or if only minor corrections are made, copies will be returned, and fabrication and installation of work may proceed. If Shop Drawings are rejected, noted copy will be returned. Resubmission of corrected Shop Drawings, through the same procedure as indicated above, must be performed before fabrication and installation of work may proceed.
 - .13 The review of Shop Drawings by the Departmental Representative is for the sole purpose of ascertaining conformance with general concept. This review shall not mean the Departmental Representative approves the detail design inherent in Shop Drawings. Responsibility for detail design of Shop Drawings shall remain with the Contractor, and as such, reviews by the Departmental Representative shall not relieve the Contractor of responsibility for errors or omissions in Shop Drawings, or of responsibility for meeting all requirements of construction and Contract Documents. Without restricting generality of the foregoing, the Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation, and for coordination of work of all sub-trades.
 - .14 Work affected by Shop Drawing shall not proceed until the Shop Drawing is reviewed and accepted by the Departmental Representative.
- 1.3 Samples
- .1 Submit for review samples in duplicate, as requested in respective specification sections. Label samples with origin and intended use.
 - .2 Deliver samples prepaid to Departmental Representative's site office or to a location as directed by the Departmental Representative.
 - .3 Notify Departmental Representative in writing, at time of submission, of deviations in samples from requirements of Contract Documents.
 - .4 Where colour, pattern or texture is criterion, submit full range of samples.

- .5 Adjustments made on samples by Departmental Representative are not intended to change Contract Price. If adjustments affect value of work, state such in writing to Departmental Representative prior to proceeding with work.
- .6 Make changes in samples which Departmental Representative may require, consistent with Contract Documents.
- .7 Reviewed and accepted samples will become standard of workmanship and material against which installed work will be verified.
- .8 Work affected by the sample shall not proceed until the sample is reviewed and accepted by the Departmental Representative.

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

- 1.1 Measurement and Payment Procedures.
- 1.2 References.
- 1.3 General.
- 1.4 Definitions.
- 1.5 Submittals.

PART 2 – PRODUCTS:

- 2.1 Temporary Traffic Control Devices.

PART 3 – EXECUTION:

- 3.1 General.
- 3.2 Traffic Management.
- 3.3 Protection of Public Traffic.

PART 1 – GENERAL

1.1 Measurement and Payment
Procedures

- .1 Payment for the cost of Traffic Control will be made on the basis of the Price per Unit Bid for Traffic Control in the Bid and Acceptance Form. The Price per Unit Bid shall include the completion of the Traffic Management Plan, construction signage, traffic flaggers, and all other items necessary for the successful completion of the task.
- .2 Measurement for Payment for completion of the Traffic Control will be made by Lump Sum based on the percentage of the total costs of the work completed and accepted by the Departmental Representative. For example, should the work be completed such that the total costs (quantities × unit rates) equal 90% of the total estimated tender costs, 90% of the Lump Sum payment item for Traffic Control will be paid. Similarly, should the work be completed such that the total costs (quantities × unit rates) equal 110% of the total estimated tender costs, 110% of the Lump Sum payment item for Traffic Control will be paid. When calculating the percentage of work undertaken, the lump sum items Mobilization and Demobilization, Traffic Control, Quality Management, and Departmental Representative's Office Trailer shall all be excluded from the percentage of work undertaken calculation (percentage work undertaken and maximum total estimated costs for the work).

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- 1.2 References
- .1 British Columbia Ministry of Transportation and Infrastructure.
 - .1 Traffic Management Manual for Work on Roadways – 2020 Office Edition.
 - .2 B.C. Supplement to TAC Geometric Design Guide for Canadian Roads (latest edition).
- 1.3 General
- .1 The traffic management standards and requirements included in these specifications shall be considered the minimum requirements which shall be achieved. The Contractor shall be responsible for ensuring the traffic management used on the project achieves these Traffic Management specifications, is appropriate for the project requirements, and achieves the requirements of WorkSafeBC OHS Regulation Part 18: Traffic Control.
- 1.4 Definitions
- .1 Delay: The total amount of time vehicles are stopped by all flaggers due to the Contractor’s operations while driving through the limits of the work. The delay time includes the time for a vehicle to come to a stop position behind a queue of vehicles and then start moving again following a long queue of vehicles. The maximum allowable delay on this project is defined below in Section 3.2.1.10 – Traffic Management.
- 1.5 Submittals
- .1 Traffic Management Plan:
 - .1 Submit a Traffic Management Plan to the Departmental Representative for review and acceptance. The Traffic Management Plan shall function as a standalone document, provide a complete and unambiguous plan of the traffic accommodation strategies proposed for use during the work, and incorporate the following requirements:
 - .1 Fully integrated with the Contactor’s plan and schedule.
 - .2 Shall provide a complete and unambiguous plan for the traffic accommodation strategies proposed for use during the work, using the allowed products, strategies, layouts, and management techniques as described in Part 2 – Products and Part 3 – Execution of this specification.

- .3 Shall be in accordance with Section 3: Traffic Management Plans of the BC Ministry of Transportation Traffic Management Manual for Work on Roadways – 2020 Office Edition, excluding Sections 3.4.2 and 3.4.3.
- .4 Developed and conform to the standards for Category 1 Traffic Management Plans as defined in Section 3: Traffic Management Plans of the BC Ministry of Transportation Traffic Management Manual for Work on Roadways – 2020 Office Edition. The Traffic Management Plan shall include a Category 1 Incident Management Plan and Category 1 Public Information Plan, as defined by Section 3.4.1. The Traffic Control Plan shall further include the sign size used for each individual sign (see Item 2.1 – Temporary Traffic Control Devices, subsection .2 of this specification), the sign support used (see Item 2.1 – Temporary Traffic Control Devices, subsection .1.4 of this specification), and details of when flags are used with which signs (if applicable, see Item 2.1 – Temporary Traffic Control Devices, subsection .1.5 of this specification).
- .5 Shall at a minimum include all headings, sub-headings, details, and presentation format as provided in the Template for Category 1 Traffic Management Plans, found in Appendix C: Templates for Traffic Management Plans in the BC Ministry of Transportation Traffic Management Manual for Work on Roadways – 2020 Office Edition. The Contractor shall add additional headings to allow for additional required content as deemed necessary. PSPC has the right to reject the Traffic Management Plan if the correct headings from this document are not used by the Contractor.
- .6 Traffic Control Plan shall include traffic signage to be used on side access roads within the limits of the work (if applicable).
- .7 Shall include a Traffic Control Plan / Site Diagram for each traffic accommodation strategy implemented during the work and details of when each strategy will be used.

- Examples of when each strategy may be used includes such activities as unloading of equipment, excavation off highway, culvert installation, etc.
- .8 Shall include details of the overhead lighting which will be used at each Traffic Control Person (TCP) location if using TCPs during non-daylight hours. Details to include the location, direction, height, brightness, and use of shields on the lights to suitably illuminate the TCP but not obstruct the visibility of drivers approaching the TCP.
 - .9 Shall include a copy of the “Daily Sign Check Form”, as found in Appendix C: Templates for Traffic Management Plans in the BC Ministry of Transportation Traffic Management Manual for Work on Roadways – 2020 Office Edition.
 - .2 The Contractor’s Traffic Management Plan shall be submitted to the Departmental Representative as a single PDF document (multiple files will not be accepted) for review and acceptance in accordance with the procedures outlined in Section 01 33 00 – Submittal Procedures. The Departmental Representative will review the plan (first submission and if required all subsequent re-submissions) within 14 days of submission. Upon review of the plan the Departmental Representative will do one of the following:
 - .1 Accept the plan.
 - .2 Accept portions of the plan and provide comments outlining required changes or additional information in other sections. Following completion of edits by the Contractor, the Contractor shall re-submit the complete plan for review.
 - .3 Reject the plan and provide comments outlining required changes or additional information needed before the plan will be reviewed in detail. Following completion of edits by the Contractor, the Contractor shall re-submit the complete plan for review.

- .3 The Contractor shall allow time in the schedule for the reviews, and subsequent edits / re-submission.
 - .4 Work affected by the Traffic Management Plan (as determined by the Departmental Representative) shall not proceed until acceptance of the Traffic Management Plan by the Departmental Representative.
 - .5 The review of the Traffic Management Plan by the Departmental Representative shall not relieve the Contractor of responsibility for errors or omissions in the accepted Traffic Management Plan, or of responsibility for meeting all requirements of construction and Contract Documents, or for ensuring safe and appropriate traffic management.
 - .6 Should deficiencies in the Contractor's Traffic Management Plan be noted following acceptance of the submittal by the Departmental Representative but during the project work, the Departmental Representative reserves the right to provide additional comments to the Contractor and require re-submission of the Traffic Management Plan to ensure the correction of any deficiencies.
- .2 Daily Sign Check Form:
- .1 Submit to the Departmental Representative for review the "Daily Sign Check Form" as found in Appendix C: Templates for Traffic Management Plans in the BC Ministry of Transportation Traffic Management Manual for Work on Roadways – 2020 Office Edition. Submit via CentralCollab in accordance with the procedures outlined in Section 01 33 00 – Submittal Procedures.
- .3 Other Submittals:
- .1 Any other traffic control related documents, such as incident reports and traffic control records, shall be distributed to the Departmental Representative in electronic format via "CentralCollab" ["SharePoint"], as discussed in Section 01 33 00 – Submittal Procedures of these specifications.

PART 2 – PRODUCTS

- 2.1 Temporary Traffic Control Devices .1 Temporary Traffic Control Devices shall be in accordance with Section 4: Temporary Traffic Control Devices of the BC Ministry of Transportation Traffic Management Manual for Work on Roadways – 2020 Office Edition, and the following requirements.
- .1 Unless preapproved by the Departmental Representative, where 45 cm, 70 cm, or 90 cm cones are called for by the BC Ministry of Transportation Traffic Management Manual for Work on Roadways – 2020 Office Edition, 100 cm tubular markers shall be used.
 - .2 Automated Flagger Assistance Devices (AFADs) or Portable Traffic Signals shall not be used on the project.
 - .3 All sign supports shall either be a post mounted support per the requirements of Figure 01 35 00 – 01 or Wind Resistance Sign Stand per the requirements of Figure 01 35 00 – 02.

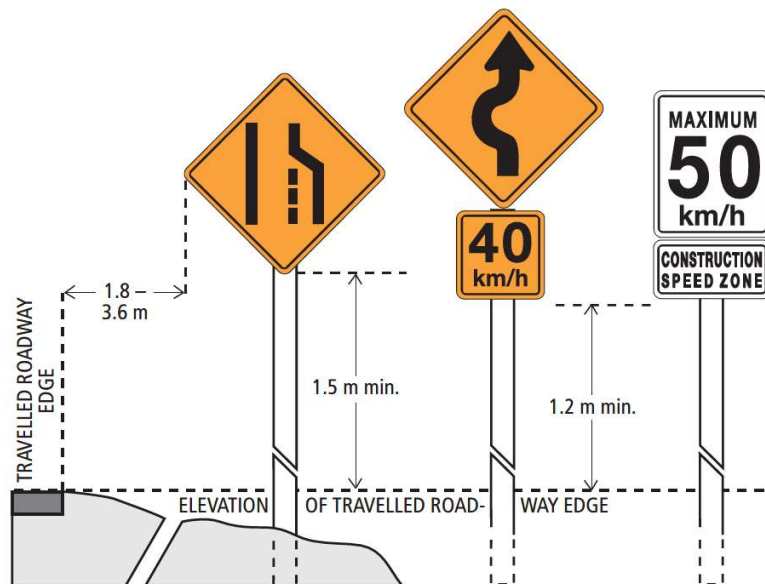


Figure 01 35 00 - 01: Post Mounted Supports

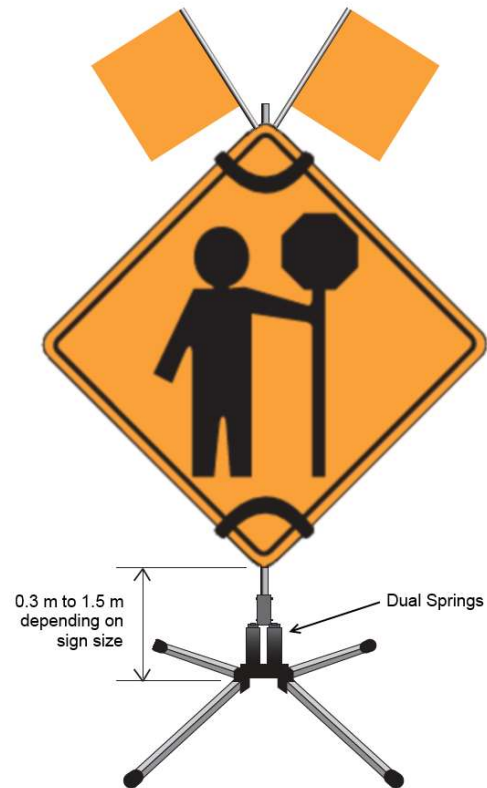


Figure 01 35 00 - 02: Wind Resistant Sign Stand

- .4 Flags shall be used on the following signs:
 - .1 Traffic Control Person Ahead (C-001-1).
 - .2 Survey Crew Ahead (C-003).
 - .3 Crew Working Ahead (C-004).
 - .4 Accident Scene (C-058).
- .5 Unless pre-approved by the Departmental Representative, one or more sandbags or weights shall be in used at all times to further stabilize all Wind Resistance Sign Stands.
- .2 Where an option for a sign size is available, the sign size used shall be the larger dimension sign as listed in Appendix B.2: Sizes and Applications of Individual Signs of the BC Ministry of Transportation Traffic Management Manual for Work on Roadways – 2020 Office Edition.

PART 3 – EXECUTION

- 3.1 General
- .1 All traffic control on the project shall be undertaken in accordance with Section 1.1.3 – Applying the Principles in the Manual as defined in the BC Ministry of Transportation Traffic Management Manual for Work on Roadways – 2020 Office Edition.
 - .2 Responsibilities for traffic control shall be undertaken in accordance with Section 1.2.3 – Traffic Control Responsibilities of the BC Ministry of Transportation Traffic Management Manual for Work on Roadways – 2020 Office Edition and as follows.
 - .1 Road Authority shall be Public Services and Procurement Canada (PSPC).
 - .2 Prime Contractor shall be the Contractor as defined by GC1.1.2 – Terminology.
 - .3 Management and site supervision shall be the responsibility of the Contractor including the:
 - .1 Site Supervisor/Foreman/Superintendent;
 - .2 Traffic Control Manager; and
 - .3 Traffic Control Supervisors and Traffic Control Persons.
 - .3 PSPC will assist the Contractor with the Public Information Plan by notifying DriveBC of the work and posting notice of the project on PSPC’s permanent variable message signs along the highway. All other requirements of the Public Information Plan (Section 3.2.3 of the BC Ministry of Transportation Traffic Management Manual for Work on Roadways – 2020 Office Edition shall be included in the Traffic Management Plan and by undertaken / implemented by the Contractor prior to commencing work.
- 3.2 Traffic Management
- .1 Traffic management shall be undertaken in accordance with the requirements of:
 - .1 The reviewed and accepted Traffic Management Plan prepared by the Contractor for this project (see Item 1.5 – Submittals of this specification).
 - .2 Section 2: Fundamentals of Traffic Management and Traffic Control of the BC Ministry of Transportation Traffic Management Manual for Work on Roadways – 2020 Office Edition and as follows.

- .1 Section 2.5.3 – Road Authority Acceptance shall be replaced with the requirements of Section 1.5 – Submittals of this specification.
- .2 References to Ministry shall be replaced with PSPC.
- .3 Section 5: Traffic Control Persons of the BC Ministry of Transportation Traffic Management Manual for Work on Roadways – 2020 Office Edition.
- .4 Section 6: Traffic Control Layouts – General Instructions of the BC Ministry of Transportation Traffic Management Manual for Work on Roadways – 2020 Office Edition and as follows:
 - .1 Per section 6.3 of the BC Ministry of Transportation Traffic Management Manual for Work on Roadways – 2020 Office Edition, traffic management shall be managed as one continuous work zone where the work is one kilometer apart or less.
 - .2 Drop-offs shall be treated in accordance with Section 6.5 of the BC Ministry of Transportation Traffic Management Manual for Work on Roadways – 2020 Office Edition whenever the drop-off is within 1.5 m of the edge of the travel lane. Additionally, the following requirements shall be achieved.
 - .1 Barrier Removed (C-013) sign shall be installed in all instances when a barrier is removed.
 - .2 Should temporary barriers be used, distance between the front of the barrier and the edge of the travel lane shall be 1.0 m.
- .5 Section 7: Traffic Control Layouts – Two-Lane, Two-Way Roadways of the BC Ministry of Transportation Traffic Management Manual for Work on Roadways – 2020 Office Edition. The traffic control layouts, revisions, and details, as listed below shall be used in conjunction with 7.2 Typical Speed Zone Signing – Two-Lane, Two-Way Roadway (Construction Project C-035 sign not required).

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- .1 Section 7: Legend, Table A, and Table B.
 - .2 7.1 General Information – Two-Lane, Two Way Roadways shall apply as follows:
 - .1 A “buffer space” shall be used for all traffic control layouts.
 - .2 The use of a portable dynamic message sign (DMS) shall be at the Contractor’s discretion.
 - .3 7.5 Work on Shoulder – Short and Long Duration can be used during the following:
 - When work activities on part or all of the shoulder area (including parked vehicles, equipment, and equipment with components within reach of the shoulder) are on one side of the highway and do not encroach onto the driving lane.
 - When work activities do not include unloading or loading of equipment, or supplies on part or all of the shoulder area.

The use of 7.5 Work on Shoulder – Short and Long Duration is subject to the following:

 - .1 Advanced warning signs (Men Working (C-004) and Construction Ahead (C-018-1A)) shall be installed in the opposing direction of travel.
 - .2 Tubular markers shall replace cones and tubular markers can be used as a replacement for drums.
 - .4 7.8 Lane Closure with Traffic Control Persons – Single Lane Alternating Traffic – Short and Long Duration can be used when the length of the single lane alternating traffic does not exceed 300 m and access through the work area is not dangerous thus not requiring a pilot vehicle. The traffic control signage layout shall include the Men Working (C-004) sign in advance of the Construction Ahead (C-018-1A) sign, using the applicable Construction Sign Spacing (Dimension A as defined in Table B of Section 7 of the BC Ministry of

- Transportation Traffic Management Manual for Work on Roadways – 2020 Office Edition) for the applicable speed (adjust all other sign spacing as required).
- .5 Any duplicate signage resulting from the use of Section 7.2 Typical Speed Zone Signing – Two-Lane, Two-Way Roadway and other Section 7 traffic control layouts shall be removed.
- .6 Section 15: Traffic Control Layouts – Surveying of the BC Ministry of Transportation Traffic Management Manual for Work on Roadways – 2020 Office Edition. The following are minimum requirements if the Contractor’s surveyor will be on site prior to the Contractor setting up signage as per Section 7.2 of the above manual.
- .1 Section 15: Legend, Table A, and Table B.
- .2 15.2: Surveying on shoulder.
- .3 15.3: Surveying on centerline.
- .7 C-172-L/R signs shall be installed in advance of any gravel pit accesses, lay down area access, or other access road where long or slow-moving trucks frequently enter or leave the highway and the access is located outside the “Limits of Construction” signage.
- .8 Maintain existing conditions for traffic throughout the period of contract except when required for contract construction, and when measures have been taken as specified herein and reviewed by Departmental Representative to protect and control public traffic. Existing conditions for traffic may be restricted to single lane (minium 3.5 m lane width with 1.0 m shoulder on both sides) alternating traffic during completion of on-highway work, including unloading and loading of equipment or other works as preapproved by the Departmental Representative. Speed limit may be reduced during these times to 30 km/h (or 50 km/h, at the Contractor’s discretion).
- .9 During non-work hours, the work area shall be cleared of construction hazards within the highway clear zone, construction signage removed or covered, two-way traffic restored, and the posted speed (typically 100 km/hr) restored.

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- .10 The maximum allowable delay to any individual motorist travelling through the project limits as a result of the Contractor's operations will be 10 minutes.
 - .11 Load limit restrictions will be in accordance with British Columbia Highway Traffic Act, pertaining to registered weight limits and vehicle size both within and outside Contract Limits.
 - .12 For sites with access roads / intersections, the following shall be used:
 - .1 At a minimum, a C-004 (or C-018-1A) sign shall be placed in front of a C-029 sign, followed by a C-001-1 sign (if traffic flaggers are used). Depending on the traffic volumes, flaggers may be necessary at all access road intersections. The need for flaggers shall be determined on site following discussion and acceptance by the Departmental Representative.
 - .2 Signs should be positioned so that they do not block the sight lines of drivers entering a roadway from side roads or other access points.
 - .3 The maximum allowable delay to any individual motorist travelling through the project limits from an access road / intersection as a result of the Contractor's operations will be 10 minutes.
- 3.3 Protection of Public Traffic
- .1 Ensure traffic control and other measures as necessary are in place for the duration of the works to protect and accommodate public traffic as follows:
 - .1 Contractor shall monitor and inspect the work zone frequently to identify and analyze evidence of traffic incidents and conflicts. Should a traffic incident, near miss, or conflict occur, investigate and undertake changes to the traffic control measures per the requirements of Section 3.6 – Analysis of Work Zone Incidents and Near Misses, as provided in the BC Ministry of Transportation Traffic Management Manual for Work on Roadways – 2020 Office Edition.

- .2 Contractor to complete and document checks of the signage using the “Daily Sign Check Form” found in Appendix C: Templates for Traffic Management Plans in the BC Ministry of Transportation Traffic Management Manual for Work on Roadways – 2020 Office Edition. Complete checks a minimum of 3 times a day (start of workday, midday, and at completion of workday). Documentation / sign-off shall be completed by the person who performed the checks. Submit completed “Daily Sign Check Form” to the Departmental Representative weekly, or more frequently as required by the Departmental Representative.
- .3 Contractor to maintain traffic control records per the requirements of Section 3.7 – Traffic Control Records, as provided in the BC Ministry of Transportation Traffic Management Manual for Work on Roadways – 2020 Office Edition.
- .4 Ensure that all vehicles can safely travel and traverse the entire length of the project without damage to vehicles regardless of the material type placed and used as a driving surface.
- .5 Protect passing vehicles from damage caused by extraneous materials from construction activities at the site.
- .6 Provide and maintain reasonable access to property in vicinity of work under contract and in other area as indicated, unless other reasonable means of road access exist that meet approval of Departmental Representative.
- .7 All existing signage that conflicts with the Contractor’s temporary construction signage shall be covered over by the Contractor for the duration of the conflict.

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

- 1.1 References.
- 1.2 Workers' Compensation Coverage.
- 1.3 Compliance with Regulations.
- 1.4 Submittals.
- 1.5 Project Specific Health and Safety Plan.
- 1.6 Contractor's Responsibility.
- 1.7 Health and Safety Coordinator.
- 1.8 General.
- 1.9 Project / Site Conditions.
- 1.10 Regulatory Requirements.
- 1.11 Work Permits.
- 1.12 Filing of Notice.
- 1.13 Emergency Procedures.
- 1.14 Hazardous Products.
- 1.15 Overloading.
- 1.16 Fire Safety Requirements.
- 1.17 Unforeseen Hazards.
- 1.18 Posted Documents.
- 1.19 Correction of Non-Compliance.
- 1.20 Medical.
- 1.21 Accidents and Accident Reports.
- 1.22 COVID-19.

PART 1 – GENERAL

1.1 References

- .1 Government of Canada:
 - .1 Canada Labour Code – Part II as amended.
 - .2 Canada Occupational Health and Safety Regulations as amended.
- .2 National Building Code of Canada (NBC) as amended:
 - .1 Part 8, Safety Measures at Construction and Demolition Sites.
- .3 Canadian Standards Association (CSA) as amended:
 - .1 CSA Z797-2009 Code of Practice for Access Scaffold.
 - .2 CSA S269.1-1975 (R2003) Falsework for Construction Purposes.
 - .3 CSA S350-M1980 (R2003) Code of Practice for Safety in Demolition of Structures.
 - .4 CSA Z1006-10 Management of Work in Confined Spaces.
 - .5 CSA Z462-19 Workplace Electrical Safety Standard.
- .4 Fire Protection Engineering Services, HRSDC:
 - .1 FCC No. 301, Standard for Construction Operations.
 - .2 FCC No. 302, Standard for Welding and Cutting.
- .5 American National Standards Institute (ANSI):
 - .1 ANSI A10.3, Operations – Safety Requirements for Powder-Actuated Fastening Systems.
- .6 Province of British Columbia:
 - .1 Workers Compensation Act Part 3 – Occupational Health and Safety (as amended).
 - .2 Occupational Health and Safety Regulation (as amended).

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- .7 Project Specific Health and Safety Plan Template (Appendix A).
 - .8 Canadian Construction Association, COVID-19 – Standardized Protocols for All Canadian Construction Sites, Version 5, May 26, 2020.
 - .9 WorkSafeBC Construction and COVID-19 Safety
- 1.2 Workers' Compensation Coverage
- .1 Comply fully with the Workers' Compensation Act, regulations and orders made pursuant thereto, and any amendments up to the completion of the work.
 - .2 Maintain Workers' Compensation Board coverage during the term of the Contract, until and including the date that the Certificate of Final Completion is issued.
- 1.3 Compliance with Regulations
- .1 PSPC may terminate the Contract without liability to PSPC where the Contractor, in the opinion of PSPC, does not comply with a requirement of the Workers' Compensation Act or the Occupational Health and Safety Regulations.
 - .2 It is the Contractor's responsibility to ensure that all workers are qualified, competent and certified to perform the work as required by the Workers' Compensation Act or the Occupational Health and Safety Regulations.
- 1.4 Submittals
- .1 The Contractor's Project Specific Health and Safety Plan shall be submitted to the Departmental Representative as a single PDF document (multiple files will not be accepted) for review and acceptance in accordance with the procedures outlined in Section 01 33 00 – Submittal Procedures. The Departmental Representative will review the plan (first submission and if required all subsequent re-submissions) within 14 days of submission. Upon review of the plan the Departmental Representative will do one of the following:
 - .1 Accept the plan.
 - .2 Accept portions of the plan and provide comments outlining required changes or additional information in other sections. Following completion of edits by the Contractor, the Contractor shall re-submit the complete plan for review.
 - .3 Reject the plan and provide comments outlining required changes or additional information needed before the plan will be reviewed in detail.

Following completion of edits by the Contractor, the Contractor shall re-submit the complete plan for review.

- .2 Submit the following to the Departmental Representative in accordance with the procedures outlined in Section 01 33 00 – Submittal Procedures:
 - .1 Copies of reports or directions issued by Federal and Provincial health and safety inspectors.
 - .2 Copies of incident and accident reports.
 - .3 Complete set of Material Safety Data Sheets (MSDS), and all other documentation required by Workplace Hazardous Materials Information System (WHMIS) requirements.
 - .4 Emergency Procedures.
 - .5 Medical surveillance: Where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of work, and submit additional certifications for any new site personnel to Departmental Representative.
 - .6 If requested, complete versions of the Contractor's corporate Health and Safety Policies / Procedures manual.
- .3 The Contractor shall allow time in the schedule for the reviews, and subsequent edits / re-submission.
- .4 Work affected by the submittal (as determined by the Departmental Representative) shall not proceed until acceptance of the submittal by the Departmental Representative.
- .5 Submission of the Project Specific Health and Safety Plan, and any revised version, to the Departmental Representative are for information and reference purposes only. It shall not:
 - .1 Be construed to imply approval by the Departmental Representative.
 - .2 Be interpreted as a warranty of being complete, accurate and legislatively compliant.

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- .3 Relieve the Contractor of his legal obligations for the provision of health and safety on the project.
- .6 Should deficiencies in the Contractor's Project Specific Health and Safety Plan be noted following acceptance of the submittal by the Departmental Representative but during the project work, the Departmental Representative reserves the right to provide additional comments to the Contractor and require re-submission of the Project Specific Health and Safety Plan to ensure the correction of any deficiencies.
- 1.5 Project Specific Health and Safety Plan
- .1 The Contractor shall prepare and comply with the Project Specific Health and Safety Plan. The preparation and details of the Project Specific Health and Safety Plan shall include conducting a site-specific hazard assessment based on review of Contract Documents, required work, and project site(s). The Project Specific Health and Safety Plan shall address all concerns / requirements identified in the Contract Documents, and identify any known and potential health risks and safety hazards.
- .2 The Project Specific Health and Safety Plan shall, at a minimum include all headings, sub-headings, details, and presentation format as provided in the template found in Appendix B (provided to the Contractor as a Word file upon award of contract). The Contractor shall add additional headings and content to the Project Specific Health and Safety Plan as deemed necessary. PSPC has the right to reject the Project Specific Health and Safety Plan if the headings from this document are not used in the Contractor's Project Specific Health and Safety Plan. Minimum requirements for the Project Specific Health and Safety Plan includes:
- .1 Contractor's safety policy / statement.
- .2 Identification of applicable compliance obligations.
- .3 Identify personnel and alternates responsible for project site safety and health. List of health and safety responsibilities for all personnel listed.
- .4 General safety rules for project and actions which will be taken by the Contractor should these safety rules be broken by the any workers on the project (includes workers employed by the General Contractor, sub-contractor, or sub-consultants).

- .5 Identify health and safety risks / hazards and engineering and administrative control measures to be implemented at each “workplace” for managing identified risks / hazards, including:
 - .1 Summary of health risks and safety hazards resulting from hazard assessment analysis, with respect to site tasks and operations which must be performed as part of the work and hazard rating assignment (low, moderate, or high) for each “workplace”, as defined by WorkSafeBC and applicable to the application of G3.16 of WorkSafeBC Occupational Health and Safety Regulations.
 - .2 List hazardous materials to be brought on site as required by the work.
 - .3 Job-specific safe work procedures that are not already included in the Contractor’s corporate Health and Safety Policies / Procedures manual.
- .6 Inspection policy and procedures.
- .7 Incident reporting and investigation policy and procedures.
- .8 Occupational Health and Safety Committee / Representative procedures.
- .9 Occupational Health and Safety meetings.
- .10 Occupational Health and Safety communications and record keeping procedures.
- .11 Emergency contact information, including PSPC project personnel (including Consultants), Contractor office and field staff, fire, police, ambulance, air ambulance, and forest fire reporting.
- .12 Identify employee training plans for wildlife encounters and prevention.
- .13 Identify fire safety, fire reporting, and fire evacuation procedures.

- .14 Confirmation through the review and signatures from the Contractor's Project Manager, Superintendent, Health and Safety Manager, Quality Control Manager, representatives from all major Sub-Contractor's, and other project roles that may be applicable, that they have reviewed the Project Specific Health and Safety plan, agree with its contents, and will be enforced by them for the duration of the project.
 - .15 Completed "Preliminary Hazard Assessment Form" (see Appendix 1 of the Project Specific Health and Safety Plan template).
 - .16 Completed "Confirmation of Prime Contractor's Main Responsibilities Under the WorkSafeBC Occupational Health and Safety Regulations and Worker's Compensation Act" form (see Appendix 2 of the Project Specific Health and Safety Plan template).
 - .17 Blank copy of Contractor's daily toolbox meeting form.
 - .18 Blank copy of the Contractor's Site Safety Orientation Form.
 - .19 Blank copy of the Contractor's Incident/Accident Report template.
 - .20 Resume(s) or certification(s) of Health and Safety Coordinator(s) responsible for site safety and onsite First Aid Attendants.
 - .21 Maps identifying the location of the nearest hospital(s) to the project site. The maps shall be of appropriate scale and sufficient detail allowing for their use to navigate to the hospital(s) in the event of an emergency.
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- .3 Develop the plan in collaboration with all Sub-Contractors. Ensure that work / activities of Sub-Contractors are included in the hazard assessment, and are reflected in the plan.
 - .4 Should health and safety requirements change throughout the project and require information not included in the Project Specific Health and Safety Plan, revise and update Project Specific Health and Safety Plan as required and re-submit to the Departmental Representative.

- .5 Departmental Representative's review: the review of the Project Specific Health and Safety Plan by Public Services and Procurement Canada (PSPC) shall not relieve the Contractor of responsibility for errors or omissions in final Project Specific Health and Safety Plan or of responsibility for meeting all requirements of construction and Contract Documents.
 - .6 Contractor's COVID-19 Safe Work plan, describing the protocols and procedures the Contractor shall implement throughout the duration of the work to mitigate the spread and risk of exposure to COVID-19, in accordance with Federal and Provincial COVID-19 guidelines, WorkSafeBC and Canadian Construction Association.
 - .7 Should Federal and/or Provincial guidelines change during the project, the Contractor shall update the Project Specific Health and Safety Plan and the Contractor's COVID-19 Safe Work Plan accordingly and submit to the Departmental Representative for review and acceptance.
- 1.6 Contractor's Responsibility
- .1 Assume responsibility as the Prime Contractor for work under this Contract.
 - .2 Be responsible for health and safety of persons on site, safety of property on site, and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of work.
 - .3 Comply with and enforce compliance by employees with safety requirements of Contract documents, applicable Federal, Provincial, Territorial and local statutes, regulations, and ordinances, and with Project Specific Health and Safety Plan.
 - .4 The protection of persons off-site and the environment such that they may be affected by the conduct of the work.
- 1.7 Health and Safety Coordinator
- .1 Employ and assign to work, a competent and authorized representative as Health and Safety Coordinator. The Health and Safety Coordinator shall:
 - .1 Be responsible for completing all health and safety training, site orientations, and ensuring personnel who do not successfully complete the required training are not permitted to enter the site to perform work.

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- .2 Be responsible for implementing, enforcing, and monitoring the Project Specific Health and Safety Plan.
 - .3 Be on site during execution of critical elements of the work or as required by the Contractor.
 - .4 Have a minimum of two (2) years site-related working experience specific to activities associated with Construction.
 - .5 Have working knowledge of occupational safety and health regulations.
 - .6 Attend pre-construction and construction progress meetings as required, or as requested by the Departmental Representative.
- 1.8 General
- .1 Provide safety barricades and lights around work site as required to provide a safe working environment for workers and protection for pedestrian and vehicular traffic.
 - .2 Ensure that non-authorized persons are not allowed to circulate in designated construction areas of the work site.
 - .1 Provide appropriate means by use of barricades, fences, warning signs, traffic control persons, and temporary lighting as required.
 - .2 Secure site during non-work hours at night time, or provide security guard as deemed necessary to protect site against entry.
 - .3 Conduct daily safety meetings and task specific meetings (toolbox) as required by special work. At a minimum meeting shall include refresher training for existing equipment and protocols, review ongoing safety issues and protocols, and examine new site conditions as encountered. Keep records of meetings and post to PSPC's cloud-based document filing system "CentralCollab" on a weekly or more frequent basis.
- 1.9 Project / Site Conditions
- .1 Work at the site will, at a minimum, involve contact with:
 - .1 Utilities.
 - .2 General public (including large transport trucks) and PSPC maintenance personnel travelling the highway.

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- .3 Local wildlife.
 - .4 Unpredictable and adverse weather conditions.
 - .5 Hazards, see “Preliminary Hazard Assessment Form” in the appendices of the Project Specific Health and Safety Plan template in Appendix B.
- 1.10 Regulatory Requirements
- .1 Comply with specified codes, acts, bylaws, standards and regulations to ensure safe operations at site.
 - .2 In event of conflict between any provisions of the above authorities, the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, the Departmental Representative will advise on the course of action to be followed.
- 1.11 Work Permits
- .1 Obtain specialty permit(s) related to project before start of work.
- 1.12 Filing of Notice
- .1 The Contractor is to complete and submit an Advance Notice of Project as required by the Worker’s Compensation Board and any other authority in effect at the place or work.
 - .2 Provide copies of all notices to the Departmental Representative.
- 1.13 Emergency Procedures
- .1 List standard operating procedures and measures to be taken in emergency situations. Include an evacuation plan and emergency contacts (i.e. names/telephone numbers) of:
 - .1 Designated personnel from Contractor’s company.
 - .2 Regulatory agencies applicable to work and as per legislated regulations.
 - .3 Local emergency resources.
 - .4 Departmental Representative.
 - .2 Include the following provisions in the emergency procedures:
 - .1 Notify workers and the first-aid attendant, of the nature and location of the emergency.
 - .2 Evacuate all workers safely.
 - .3 Check and confirm the safe evacuation of all workers.

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- .4 Notify the fire department or other emergency responders.
 - .5 Notify adjacent workplaces or residences which may be affected if the risk extends beyond the workplace.
 - .6 Notify Departmental Representative.
 - .3 Provide written rescue / evacuation procedures as required for, but not limited to:
 - .1 Work at high angles.
 - .2 Work in confined spaces or where there is a risk of entrapment.
 - .3 Work with hazardous substances.
 - .4 Underground work.
 - .5 Work on, over, under and adjacent to water.
 - .6 Workplaces where there are persons who require physical assistance to be moved.
 - .7 Work in areas where sudden movement of native or placed materials may occur.
 - .4 Design and mark emergency exit routes to provide quick and unimpeded exit.
 - .5 Emergency drills must be held at least once each year for all projects lasting longer than one year. The purpose of these drills is to ensure awareness and effectiveness of emergency exit routes and procedures. A record of the drills must be kept by the Contractor.
 - .6 Revise and update emergency procedures as required and re-submit to the Departmental Representative.
 - 1.14 Hazardous Products
 - .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS 2015) regarding use, handling, storage and disposal of hazardous materials, and regarding labeling and provision of Material Safety Data Sheets (MSDS) acceptable to the Departmental Representative and in accordance with the Canadian Labour Code.

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- .2 Where use of hazardous and toxic products cannot be avoided:
 - .1 Advise Departmental Representative beforehand of the product(s) intended for use. If requested, submit applicable MSDS and WHMIS 2015 documents as per Section 01 33 00 – Submittal Procedures. Keep documents available for review on the project site as close as practical to where the hazardous and toxic product is being used.
 - .2 Provide adequate means of ventilation acceptable to the Departmental Representative and suitable for the hazard.
 - .3 The Contractor shall ensure that the product is applied as per manufacturers' recommendations, and ensure only pre-approved products are brought onto the work site in an adequate quantity to complete the work.
 - .3 All asbestos-containing materials are prohibited from use and shall not be incorporated into the work by the Contractor.
 - 1.15 Overloading
 - .1 Ensure no part of the work is subject to a load which will endanger its safety or will cause permanent deformation.
 - 1.16 Fire Safety Requirements
 - .1 Obtain Departmental Representative's authorization before undertaking any welding, cutting or other hot work operations on site. If requested by the Departmental Representative, provide hot works permits for any hot works activities.
 - .2 Store oily / paint-soaked rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
 - .3 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.
 - .4 Obtain approval from the Departmental Representative prior to bringing any portable gas and/or diesel fuel tanks on site.

- 1.17 Unforeseen Hazards
- .1 Should any unforeseen or peculiar safety-related factor, hazard or condition become evident during performance of the work, immediately stop work and advise the Departmental Representative verbally and in writing.
 - .2 Should contaminated site conditions be encountered when completing the work, refer to GC4.4 – Contaminated Site Conditions for procedures which the Contractor shall undertake.
- 1.18 Posted Documents
- .1 Post legible versions of the following documents on site:
 - .1 Project Specific Health and Safety Plan.
 - .2 Sequence of work.
 - .3 Emergency procedures.
 - .4 Corporate Health and Safety Policies and Procedures manual(s).
 - .5 Site drawing showing project layout, locations of the first-aid station, evacuation route and marshaling station, and the emergency transportation provisions.
 - .6 Notice of Project.
 - .7 Floor plans or site plans.
 - .8 Notice as to where a copy of the Workers' Compensation Act and Regulations are available on the work site for review by employees and workers.
 - .9 Workplace Hazardous Materials Information System (WHMIS) documents.
 - .10 Material Safety Data Sheets (MSDS).
 - .11 List of names of Joint Health and Safety Committee members, or Health and Safety Representative, as applicable.
 - .2 Post all Material Safety Data Sheets (MSDS) on site, in a common area, visible to all workers and in locations accessible to tenants when work of this Contract includes construction activities adjacent to occupied areas.

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- .3 Postings should be protected from the weather, and visible from the street or the exterior of the principal construction site shelter provided for workers and equipment, or as approved by the Departmental Representative.
- 1.19 Correction of Non-Compliance
- .1 Immediately address health and safety non-compliance issues identified by the Departmental Representative.
 - .2 Provide Departmental Representative with written report of action taken to correct non-compliance with health and safety issues identified.
 - .3 The Departmental Representative may issue a "stop work order" if non-compliance of health and safety regulations is not corrected immediately or within posted time. The General Contractor/subcontractors will be responsible for any costs arising from such a "stop work order".
- 1.20 Medical
- .1 Provide and maintain first aid facilities for all workers as required by the Workers' Compensation Act or the Occupational Health and Safety Regulations.
 - .2 Provide the appropriate first aid kit, based on the number of workers, in accordance with the Workers' Compensation Act or the Occupational Health and Safety Regulations.
 - .3 Establish an emergency response plan acceptable to Departmental Representative, for the removal of any injured person to medical facilities or a doctor's care in accordance with applicable legislative and regulatory requirements.
 - .4 Provide proof of First Aid credentials to Departmental Representative prior to the start of construction. Provide the appropriate number of first aid attendants on site in accordance with Workers' Compensation Act or the Occupational Health and Safety Regulations.
 - .5 Emergency and First Aid Equipment:
 - .1 Locate and maintain emergency and first aid equipment in appropriate location on site including first aid kit to accommodate number of site personnel; portable emergency eye wash; fire protection equipment as required by legislation.
 - .2 Locate sufficient blankets and towels, stretcher, and one handheld emergency siren in all confined access locations.

- .3 Provide a minimum of one qualified first aid attendant as per Workers' Compensation Act or the Occupational Health and Safety Regulations on site at all times when Work activities are in progress; duties of first aid attendant may be shared with other light duty Work related activities.
- 1.21 Accidents and Accident Reports
- .1 Immediately report, verbally, followed by a written report within 24 hours, to Departmental Representative, all accidents of any sort arising out of or in connection with the performance of the Work, giving full details and statements of witnesses. If death or serious injuries or damages are caused, report the accident promptly to Departmental Representative by telephone in addition to any report required under Federal and Provincial laws and regulations.
- .2 If a claim is made by anyone against Contractor or Sub-Contractor on account of any accident, promptly report the facts in writing to Departmental Representative, giving full details of the claim.
- 1.22 COVID-19
- .1 The Contractor shall keep informed with the latest Federal and Provincial recommendations and protocols regarding COVID-19 at all times during construction and shall modify their construction approach accordingly to ensure adherence to these recommendations and protocols.
- .2 If Federal and/or Provincial recommendations require that the project work be stopped, the Contractor shall consult with the Departmental Representative and the Departmental Representative will advise as to the course of action the Contractor shall take.

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

- 1.1 Definitions.
- 1.2 References.
- 1.3 Regulatory Overview.
- 1.4 Submittals.
- 1.5 Environmental Protection Plan (EPP).
- 1.6 Notification

PART 2 – PRODUCTS:

- 2.1 Products.

PART 3 – EXECUTION:

- 3.1 Environmental Monitoring.
- 3.2 Site Access and Parking.
- 3.3 Protection of Work Limits.
- 3.4 Erosion Control.
- 3.5 Pollution Control.
- 3.6 Equipment Maintenance, Fueling, and Operation.
- 3.7 Operation of Equipment.
- 3.8 Managing of Invasive Plant Vegetation.
- 3.9 Fires and Fire Prevention and Control.
- 3.10 Wildlife.
- 3.11 Relics and Antiquities.
- 3.12 Waste Materials Storage and Removal.
- 3.13 Wastewater Discharge Criteria.
- 3.14 Drainage.
- 3.15 Environmental Protection Supplies.

PART 1 – GENERAL

1.1 Definitions

- .1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally and/or historically.
- .2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.
- .3 Wetted Perimeter: area of stream where water is currently running or pooled.
- .4 In-stream Work: any work performed below the high water mark, either within or above the Wetted Perimeter of any Fisheries Sensitive Zone.
- .5 Fisheries Sensitive Zone: in-stream aquatic habitats and out of stream habitat features such as side channels, wetlands, and riparian areas.
- .6 Invasive plants: are any alien plant species that have the potential to pose undesirable or detrimental impacts on humans, animals or ecosystems. Invasive plants have the capacity to establish quickly and easily on both disturbed and un-disturbed sites, and can cause widespread negative economic, social and environmental impacts.
- .7 Noxious weeds: are invasive plants that have been designated under the BC Weed Control Act. This legislation imposes a duty on all land occupiers to control a set list of identified invasive plants.
<https://www.for.gov.bc.ca/hra/plants/legislation.htm>

1.2 References

- .1 Standards and Best Practices for Instream Works, British Columbia Ministry of Land and Air Protection Ecosystem Standards and Planning Biodiversity Branch – March 2004 (See Reference Documentation – Table of Contents).
- .2 Land Development Guidelines for the Protection of Aquatic Habitat, Fisheries and Oceans – September 1993 (See Reference Documentation – Table of Contents).

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- .3 Environmental Protection Plan (EPP) – Checklist (Appendix F).
 - .4 Responsibility Checklist For Authorizations /Approvals / Notifications / Permitting (Appendix G).
 - .5 Relevant Environmental Publications (Appendix H).
 - .6 Environmental Management Plan (EMP) (Appendix I).
 - .7 Caribou Protection Plan (CPP) (Appendix J).
 - .8 FLNRORD Section 11 Approval for Instream Work – Date: April 6, 2021 (Appendix K).
- 1.3 Regulatory Overview
- .1 The Departmental Representative will complete the environmental Notification / permitting required under Provincial regulations (Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD) and or British Columbia Ministry of Environment and Climate Change Strategy (MoE)), prior to the start of the project. The Contractor shall be aware that submission of the Contractor’s Environmental Protection Plan (EPP) to FLNRORD / MoE may be required as part of the permitting process.
 - .2 Comply with all applicable environmental laws, regulations and requirements of Federal, Provincial, and other regional authorities, and acquire and comply with such permits, approvals and authorizations as may be required.
 - .3 Comply with and be subject to those permits and approvals obtained from the Departmental Representative to conduct the Work.
 - .4 Pay specific attention to the provincial BC Land Use Permit, Water License and Quarry Permit.
 - .5 Pay specific attention to the Migratory Birds Convention Act, as amended in 1994.
 - .6 Pay specific attention to the provincial BC guidelines under Peace Region Least Risk Timing Windows: Biological Rational (2009).
 - .7 Pay specific attention to provincial standards for instream works, refer to British Columbia Ministry of Land and Air Protection Ecosystem Standards and Planning Diversity Branch publication, Standard and Best Practices for Instream Works – March 2004 (see Reference Documentation – Table of Contents).

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- .8 The Contractor is required to apply for and obtain a fish salvage permit from the applicable regulatory authorities for use on the project as needed.
- 1.4 Submittals
- .1 The Contractor's EPP shall be submitted to the Departmental Representative. Each report/ memo shall be submitted as a single PDF documents (multiple files will not be accepted) for review and acceptance in accordance with the procedures outlined in Section 01 33 00 – Submittal Procedures. The Departmental Representative will review the EPP (first submission and if required all subsequent re-submissions) within 14 days of submission. Upon review of the plan / report / memo the Departmental Representative will do one of the following:
- .1 Accept the plan / report / memo.
 - .2 Accept portions of the plan / report / memo and provide comments outlining required changes or additional information in other sections. Following completion of edits by the Contractor, the Contractor shall re-submit the complete plan / report / memo for review.
 - .3 Reject the plan / report / memo and provide comments outlining required changes or additional information needed before the plan / report / memo will be reviewed in detail. Following completion of edits by the Contractor, the Contractor shall re-submit the complete plan / report / memo for review.
- .2 The Contractor shall allow time in the schedule for the reviews, and subsequent edits / re-submission.
- .3 Work affected by the submittal (as determined by the Departmental Representative) shall not proceed until acceptance of the EPP by the Departmental Representative.
- .4 Upon Departmental Representative acceptance of the Contractor's EPP, the Departmental Representative may submit the EPP as part of the environmental notification / permitting process to British Columbia Ministry of Forests, Lands, Natural Resource Operations, and Rural Development (FLNRORD).
- .5 The review of the EPP by the Departmental Representative shall not relieve the Contractor of responsibility for errors or omissions in the accepted submittals or of responsibility for meeting all requirements of the Contract Documents.

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- .6 Should deficiencies in the Contractor's EPP be noted following acceptance of the submittal by the Departmental Representative but during the project work, the Departmental Representative reserves the right to provide additional comments to the Contractor and require re-submission of the EPP to ensure the correction of any deficiencies.
- 1.5 Environmental Protection Plan (EPP) .1
- The Contractor is required to prepare an EPP. The EPP should include and address all relevant environmental impacts/issues at the site as indicated by the EPP Checklist (Appendix F), environmental permitting approvals as provided by FLNRORD, and as identified in this Section of the specifications. The EPP will require the Contractor to carefully think through the entire project, including identifying what activities and works will be occurring, both generally and at specific sites, and by what methods. The Environmental Protection Plan shall be signed as being complete and appropriate for this project by a P.Biol or RPBio, and shall, at a minimum include the following:
- .1 The process and protocol for ensuring that supervisors and individual staff employed by the Contractor are very clear on which environmental standards need to be achieved, how they will be achieved, and establishing how the Contractor will ensure that this is successfully occurring.
 - .2 Erosion, drainage, and sediment control plan which identifies type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with the requirements of the applicable provincial regulatory requirements (FLNRORD / MoE) approval or notification for instream work or under FLNRORD / MoE guidelines, and all other applicable regulations including the requirements of these specifications. The Contractor may utilize marked-up contract drawings within the EPP to show the locations of the proposed activities.
 - .3 Typical drawings showing the locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of any excess or spoil materials including methods to control runoff and to contain materials on site (including grout from entering waterway). The Contractor may utilize marked-up contract drawings within the EPP to show the locations of the proposed activities.

- .4 Spill Control Plan: including procedures, instructions, and reports to be used in the event of unforeseen spill of regulated substance.
 - .5 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
 - .6 Contaminant prevention plan that: identifies potentially hazardous substances to be used on job site; identifies intended actions to prevent introduction of such materials into air, water, or ground; and details provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.
 - .7 Outline the avoidance and mitigate measures which the Contractor will undertake and implement to ensure compliance with the environmental regulations applicable to the project (which may include MoE, FLNRORD, these contract specifications, and other applicable legislation).
 - .8 The procedures for stopping the work and implementing changes to the construction methods should the Contractor not be achieving the environmental requirements as outlined in these specifications.
 - .9 The procedures for stopping work should the Contractor encounter archaeological anomalies or human remains.
- 1.6 Notification
- .1 Departmental Representative will notify Contractor in writing of observed non-compliance with Federal, Provincial or Municipal environmental laws or regulations, permits, etc.
 - .2 Contractor: after receipt of such notice, shall inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.
 - .3 Departmental Representative will issue stop order of Work until satisfactory corrective action has been taken.
 - .4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

PART 2 – PRODUCTS

2.1 Products .1 Not used.

PART 3 – EXECUTION

3.1 Environmental Monitoring .1 At a minimum the Contractor’s site superintendent and or other onsite personnel shall be responsible for monitoring of environmental concerns or violations. The P.Biol or RPBio or other qualified professional whom prepared the Contractor’s EPP shall be available to respond to queries from the Contractor, Departmental Representative, or environmental regulators and make revisions to the EPP throughout the project as needed. Should the Contractor, Departmental Representative, environmental regulators, or P.Biol or RPBio or other qualified professional whom prepared the Contractor’s EPP determine that the Contractor is in violation of applicable regulatory requirements or these environmental specifications, the P.Biol or RPBio or other qualified professional whom prepared the Contractor’s EPP shall visit the site (unless accepted otherwise by the Departmental Representative) at the Contractor’s expense to oversee the implementation of the corrective measures to bring the work back into compliance with applicable regulatory requirements or these environmental specifications.

.2 The monitoring program must be anticipatory and responsive to construction practices or environmental changes, reflecting the site-specific conditions, level of sensitivity of the receiving environment, potential adverse effects, and level of environmental risk. Submitted documents regarding the proposed monitoring program should clearly identify how monitoring will adhere to this approach.

.3 The monitoring program shall satisfy all regulatory requirements and terms of these specifications. The onus is on the Contractor to monitor and ensure compliance, to identify arising problems, and to subsequently take responsibility and all necessary measures in response. At a minimum, the environmental monitor shall be onsite during all instream works and all works within 30 m of a waterway.

3.2 Site Access and Parking .1 Generally, personal vehicles shall be parked the maximum practical distance from any watercourse. If less than a distance of 10 m, the location shall be preapproved by the Departmental Representative.

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- .2 The Contractor shall ensure that the environment beyond the work limits is not negatively impacted or damaged by workers' vehicles or construction machinery and shall instruct workers so that the "footprint" of the project is kept within defined boundaries.
- 3.3 Protection of Work Limits .1 The Contractor shall include in the EPP details on the work limits, how these shall be marked and what procedures will be employed to ensure trespass outside these limits does not occur, to the satisfaction of the Departmental Representative.
- 3.4 Erosion Control .1 Erosion control measures that prevent sediment from entering any waterway, water body or wetland in the vicinity of the construction site are a critical element of the project and shall be implemented by the Contractor.
- .2 On-site sediment control measures shall be constructed and functional prior to initiating activities associated with the construction activities. The Contractor shall prepare an Erosion Control Plan, to be part of the EPP, to the satisfaction of the Departmental Representative.
- .3 The regular monitoring and maintenance of all erosion control measures shall be the responsibility of the Contractor. If the design of the control measures is not functioning effectively they are to be repaired. The Departmental Representative will monitor the Contractor's erosion control performance.
- .4 Erosion control measures must be in compliance with both Federal and Provincial legislation where required. Contractors should be referencing the provincial MoE Standards and Best Practices for Instream Works (2004).
- 3.5 Pollution Control .1 The Contractor shall prevent any deleterious and objectionable materials from entering streams, rivers, wetlands, water bodies or watercourses that would result in damage to aquatic and riparian habitat. Hazardous or toxic products shall be stored no closer than 100 metres to any surface water.
- .2 A Spill Response Plan will be prepared as part of the EPP and shall detail the containment and storage, security, handling, use and disposal of empty containers, surplus product or waste generated in the application of these products, to the satisfaction of the Departmental Representative, and in accordance with all applicable federal and provincial legislation. The EPP shall include a list of products and materials to be used or brought to the construction site that are considered or defined as hazardous

- or toxic to the environment. Such products include, but are not limited to, waterproofing agents, grout, cement, concrete finishing agents, hot poured rubber membrane materials, asphalt cement and sand blasting agents.
- .3 The containment, storage, security, handling, use, unique spill response requirements and disposal of empty containers, surplus product or waste generated in the use of any hazardous or toxic products shall be in accordance with all applicable federal and provincial legislation. Hazardous products shall be stored no closer than 100 metres from any surface water.
 - .4 An impervious berm shall be constructed around fuel tanks and any other potential spill area. The berms shall be capable of holding 110% of tank storage volumes and shall be to the satisfaction of the Departmental Representative. Measures such as collection/drip trays and berms lined with occlusive material such as plastic and a layer of sand, and double lined fuel tanks can prevent spills into the environment.
 - .5 The Contractor shall prevent blowing dust and debris by covering and/or providing dust control for temporary roads and on-site work such as rock drilling and blasting by methods that are approved by the Departmental Representative.
 - .6 The Contractor shall provide spill kits, to the satisfaction of the Departmental Representative, at refueling, lubrication and repair locations that will be capable of dealing with 110% of the largest potential spill and shall be maintained in good working order on the construction site. The Contractor and site staff shall be informed of the location of the spill response kit(s) and be trained in its use.
 - .7 Timely and effective actions shall be taken to stop, contain and clean-up all spills as long as the site is safe to enter. The Departmental Representative shall be notified immediately of any spill as well as the provincial authorities. Basic instructions and phone numbers shall be part of the Contractor's EPP.
 - .8 In the event of a major spill, the Contractor shall prioritize the cleanup and all other work shall be stopped, where appropriate, and personnel devoted to spill containment and cleanup.
 - .9 The costs involved in a major spill incident (control, clean up, disposal of contaminants, and site remediation to pre-spill conditions), shall be the responsibility of the Contractor.

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- The site will be inspected to ensure completion to the pre-spill condition to the satisfaction of the Departmental Representative.
- 3.6 Equipment Maintenance, Fueling, and Operation
- .1 The Contractor shall ensure that all soil, seeds and any debris attached to construction equipment to be used on the project site shall be removed (e.g. power washing) before delivery to the work site.
 - .2 Equipment fueling sites will be identified by the Contractor to the satisfaction of the Departmental Representative. Except for chain saws, any fueling closer than 100 metres to any surface water (streams, wetlands, water bodies or watercourses) shall require discussion with the Departmental Representative. Regardless of fueling location, personnel shall maintain a presence during refueling with immediate attention to the fueling operations.
 - .3 Diesel and gasoline delivery vehicles, including bulk tankers shall not be parked within 100 metres from any surface water unless actively being used for refueling. Immediately following refueling, bulk tankers shall be moved to a location 100 m or greater from any surface water. Gravity fed fuel systems are not allowed. Manual or electric pump delivery systems shall be used.
 - .4 Mobile fuel containers (e.g. slip tanks, small fuel carboys) shall remain in the service vehicle at all times. Protection and containment of approved fuel storage sites is addressed in Item 3.5 - Pollution Control, subsection .4 of this specification.
 - .5 Equipment used on the project shall be fueled with E10, and low sulphur diesel fuels where available, and shall conform to local emission requirements. The Contractor is to ensure that unnecessary idling of the vehicles is avoided.
 - .6 Oil changes, lubricant changes, greasing and machinery repairs shall be performed at locations satisfactory to the Departmental Representative. Waste lubrication product (e.g. oil filters, used containers, used oil, etc.) shall be secured in spill-proof containers and properly recycled or disposed of at an approved facility. No waste petroleum, lubricant products or related materials are to be discarded, buried or disposed of in borrow pits, turnouts, picnic areas, viewpoints, etc. or anywhere within the work area.
 - .7 The Contractor shall ensure that all equipment is inspected daily for fluid/fuel leaks and maintained in good working condition. Maintenance certificates or maintenance logs for all equipment shall be available on site during work.

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- .8 Fuel containers and lubricant products shall be stored only in secure locations to the satisfaction of the Departmental Representative. Fuel tanks or other potential deleterious substance containers shall be secured to ensure they are tamperproof and cannot be drained by vandals when left overnight. Alternatively, the Contractor may employ a security person to prevent vandalism.
- .9 Equipment shall use environmentally sensitive / biodegradable hydraulic fluid in case of accidental loss.
- 3.7 Operation of Equipment
- .1 Equipment movements shall be restricted to the “footprint” of the construction area. The work limits shall be identified by stake and ribbon or other methods to the satisfaction of the Departmental Representative. No machinery will enter, work in or cross over streams, rivers, wetlands, waterbodies or watercourse, nor damage aquatic and riparian habitat or trees and plant communities outside the identified work limits if working in the water. Where construction activities require working close to surface water or in the water, the Contractor is required to ensure fugitive materials (e.g. rocks, soil, branches) and especially deleterious substances (e.g. chemicals) does not enter any surface water areas.
- .2 The Contractor shall instruct workers to prevent pushing, placement, raveling, storage or stockpiling of any materials (e.g. slash, rock, fill or top soils) in the trees bordering the right-of-way or into surface water.
- .3 When, in the opinion of PSPC, negligence on the part of the Contractor results in damage or destruction of vegetation, or other environmental or aesthetic features beyond the designated work area, the Contractor shall be responsible, at his or her expense, for complete restoration including the replacement of trees, shrubs, topsoil, grass, etc. to the satisfaction of the Departmental Representative.
- .4 Restrict vehicle movements to the work limits.
- .5 Workers vehicles are to remain within the construction footprint.
- 3.8 Managing Invasive Plant Vegetation
- .1 Keep equipment clean and avoid parking, turning around or staging equipment in known invasive species infested areas, or mow prior to use.
- .2 Wash equipment prior to mobilization to site.
- .3 Minimize unnecessary disturbance of roadside aggregates or soil and retain desirable roadside vegetation whenever possible.

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- .4 Where possible, begin mowing or brushing in “invasive plant free” areas and end in infested areas.
- .5 Where possible, use only clean fill material from an “invasive plant free” source.
- .6 Whenever possible, re-seed with grass mixtures that are free of weeds, locally adapted, non-invasive, and quick to establish. Spread seed in the early spring or late fall to ensure successful establishment. Refer to Section 32 93 21 – Hydroseeding for additional requirements.
- 3.9 Fires and Fire Prevention and Control
- .1 Fires or burning of waste materials is not permitted.
- .2 A fire extinguisher shall be carried and available for use on each of the Contractor’s construction equipment in the event of a fire. The Contactor’s staff shall receive basic training in early response to wildfire events during the “environmental briefing” presented by the Contractor.
- .3 Construction equipment shall be operated in a manner and with all original manufacturers’ safety devices to prevent ignition of flammable materials in the area.
- .4 Care shall be taken while smoking on the construction site to ensure that the accidental ignition of any flammable material is prevented.
- .5 In case of fire, the Contractor or worker shall take immediate action to extinguish the fire provided it is safe to do so. The Departmental Representative shall be notified of any fire immediately as well as the applicable Provincial Authorities. Basic instruction and phone numbers will be provided on site by the Contractor and will be discussed in the project pre-construction meeting.
- .6 Where fires or burning is permitted, prevent staining or smoke damage to structures, materials or vegetation which is to be preserved. Restore, clean and return to new condition stained or damaged Work.
- .7 Provide supervision, attendance and fire protection measures as directed by the Departmental Representative or other authorities.
- 3.10 Wildlife
- .1 Avoid or terminate activities on site that attract or disturb wildlife and vacate the area and stay away from bears, cougars, wolves, elk, moose, or bison, or other animals that display aggressive behavior or persistent intrusion. Extra care to control materials that might attract wildlife (e.g. lunches and food scraps) must be exercised at all times.

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- .2 Notify the Departmental Representative immediately about dens, litters, nests, carcasses (road kills), bear activity or encounters on or around the site or crew accommodations. Other wildlife related encounters are to be reported within 24 hours.
- 3.11 Relics and Antiquities .1 Artifacts, relics, antiquities, and items of historical interest such as cornerstones, commemorative plaques, inscribed tablets and any objects found on the work site that may be considered artifacts shall be reported to the Departmental Representative immediately. The Contractor and workers shall wait for instruction before proceeding with their work.
- .2 All historical or archaeological objects found in the rock quarry are protected under federal and provincial Acts and regulations. The Contractor and workers shall protect any articles found and request direction from the Departmental Representative.
- .3 Human remains must be reported immediately to the local RCMP.
- 3.12 Waste Materials Storage and Removal .1 The Contractor and workers shall dispose of hazardous wastes in conformance with the applicable federal and provincial regulations and should be part of the EPP. All waste materials shall be disposed of at a disposal facility acceptable to the Departmental Representative. No waste materials shall be buried onsite.
- .2 All wastes originating from construction, trade, hazardous and domestic sources, shall not be mixed, but will be kept separate.
- .3 Construction, trade, hazardous waste and domestic waste materials shall not be burned, buried, or discarded at the construction site. These wastes shall be contained and removed in a timely and approved manner by the Contractor and workers, and disposed of at an appropriate waste landfill site located outside the work area.
- .4 A concerted effort shall be made by the Contractor and workers to reduce, reuse and recycle materials where possible.
- .5 Sanitary facilities, such as portable container toilets, shall be provided by the Contractor and maintained in a clean condition.

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- 3.13 Wastewater Discharge Criteria .1 Wash water, meltwater collection, rinse water resulting from the cleaning of fuel tanks and pipelines, contaminated groundwater, and/or any other liquid effluent stream will be released onto the ground at a location that is a minimum of 30 metres from natural drainage courses and 100 metres from fish bearing waters, and will conform to the discharge requirements set out in provincial regulations.
- .2 Contractor must obtain approval from the provincial Water Act Officer prior to discharging any treated wastewater.
- 3.14 Drainage .1 Provide temporary drainage and pumping as necessary to keep excavations and site free from water. Drainage plans shall be part of the EPP.
- .2 Do not pump water containing suspended materials into waterways, sewer or drainage systems.
- .3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements such as the provincial Water Act.
- .4 Provide an erosion and sediment control plan that identifies type and location of erosion and sediment controls to be provided. Plan to include monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.
- .5 As part of the EPP, submit details of proposed erosion, sediment and drainage control to Departmental Representative for review and approval prior to commencing work in fisheries sensitive areas or in areas that may affect fisheries sensitive areas and specifically address the protection of water bodies, water courses, and the following:
- .1 Details of grading Work to prevent surface drainage into or out of Work areas.
- .2 Details of erosion control works and materials to be used, including the deployment of coir logs, floating silt curtains and containment booms during construction and excavation activities.
- .3 Work schedule including the sequence and duration of all related Work activities.
- .4 The treatment of site runoff to prevent siltation of watercourses.

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- .5 Dewatering procedures for excavated materials including silt removal procedures prior to discharge.
 - .6 Stabilizing procedures during excavation.
 - .7 Maintenance of filters and sedimentation traps.
- .6 Any dewatering activities will be released onto the ground at a location that is a minimum of 30 metres from natural drainage courses and 100 metres from fish bearing waters.
 - .7 Have on hand sufficient pumping equipment, machinery, and tankage in good working condition for ordinary emergencies, including power outage, and competent workers for operation of pumping equipment.
- 3.15 Environment Protection Supplies
- .1 Comply with federal and provincial fisheries and environmental protection legislation, including preventing the loss or destruction of fish habitat, and minimizing the impact of sedimentation, siltation or otherwise causing a degradation in water quality.
 - .2 Provide a minimum of 30 m, and as required, of biodegradable coir logs, sized accordingly for use (minimum diameter of 0.3 m), and the necessary stakes (minimum 1 stake per 1 m of coir log) and materials required by the manufacturer's installation specification. Prior to purchase of coir logs, submit manufacturer's product data and installation instructions to the Departmental Representative for review and acceptance. Store and handle in strict compliance with the manufacturer's instructions and recommendations. This will be used as necessary to prevent sediment transport into water bodies.
 - .3 Provide a minimum of 50 lineal metres or more and as required of 200 mm diameter hydrophobic, sorbent booms. This will be used as necessary to prevent the migration of hydrocarbons.
 - .4 Supply, transport, install and maintain erosion, sediment and drainage controls necessary to complete the Work in accordance with the requirements of Departmental Representative.
 - .5 At the completion of construction, leave coir logs in place if requested by the Departmental Representative.
 - .6 Unused Erosion, Sediment and Drainage Control supplies will remain the property of Departmental Representative until the completion of the Contract.

- .7 Provide inventory of environmental protection supplies prior to mobilization.

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

- 1.1 Measurement and Payment Procedures.
- 1.2 References.
- 1.3 Definitions.
- 1.4 Responsibilities.
- 1.5 General.
- 1.6 Submittals.
- 1.7 Quality Management Plan.
- 1.8 Quality Control Personnel.
- 1.9 QC Documentation and Submittal to Departmental Representative.
- 1.10 QC Testing / Survey Inspection.
- 1.11 Non-Conformance Reports.
- 1.12 Departmental Representative Inspection and Audits.

PART 1 – GENERAL

- 1.1 Measurement and Payment Procedures .1 Payment for Quality Management will not be made and shall be considered incidental to the applicable payment item of work.
- 1.2 References .1 British Columbia MoTI – 2020 Standard Specifications for Highway Construction.
- 1.3 Definitions .1 Quality Control (QC): The process of checking specific product or services to determine if they comply with the contract documents and relevant quality standards and identifying ways to eliminate causes of unsatisfactory product or service performance.
.2 Quality Assurance (QA): The process of ensuring that the Contractor's Quality Management Plan (QMP) (QC, non-conformances, etc.) are being followed. The results of the QA are provided as feedback to the QC team. Where required the Contractor shall implement changes to the project based on the feedback received from the QA process.

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- .3 Quality Management Plan (QMP): The complete details of the Contractor's plans and processes to ensure quality on the project.
 - .4 Deficiency / Non-conformance: Work or product failing to meet the conditions or requirements of the contract (general conditions, specifications, drawings, or other section(s) forming the project contract).
- 1.4 Responsibilities
- .1 The quality management responsibilities for this project are as follows:
 - .1 Quality Control: The Contractor's responsibility.
 - .2 Quality Assurance: The Departmental Representative's responsibility.
 - .3 Quality Management Plan: Prepared by the Contractor.
 - .4 Non-conformance Report: Prepared by the Contractor's QC in conjunction with the Contractor and if necessary prepared by the Departmental Representative.
- 1.5 General
- .1 The Contractor shall be responsible for ensuring the product meets the contractual quality requirements and that Quality Control measuring and documenting the quality of the work is completed by qualified person or persons from the Contractor's organization or hired by the Contractor. Quality Control work includes monitoring, inspecting, testing, and documenting the means, methods, materials, workmanship, processes and products of all aspects of the work as necessary to ensure conformance with the Contract.
 - .2 The Contractor shall provide unrestricted access to all Quality Control operations and documentation produced by or on behalf of the Contractor and shall allow the Departmental Representative full access at any time during working hours.
 - .3 The Departmental Representative will review the Contractor's performance of the work and determine the acceptability of the work based on the Departmental Representative's Quality Assurance results and, where deemed appropriate by the Departmental Representative, supplemented by the Contractor's Quality Control results. If needed, the Departmental Representative may request further testing.

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- .4 Work failing to meet the conditions of the Contract shall be considered a non-conformance. A non-conformance report will then be issued by the Contractor's Quality Manager. Non-conforming work shall be removed / replaced from the work unless an exception to the contract documents is accepted by the Owner.
- .5 The Contractor shall not be entitled to payment for work that lacks the appropriate Quality Control documentation, verified by the Quality Control Manager, as required by the Contract or is subject to an unresolved NCR.
- .6 The Contractor shall implement a well-coordinated approach to all operations related to the work and will organize its team and operations in keeping with the goal of doing things right the first time.
- 1.6 Submittals
- .1 The Contractor's Quality Management Plan shall be submitted to the Departmental Representative as a single PDF document (multiple files will not be accepted) for review and acceptance in accordance with the procedures outlined in Section 01 33 00 – Submittal Procedures. The Departmental Representative will review the plan (first submission and if required all subsequent re-submissions) within 14 days of submission. Upon review of the plan the Departmental Representative will do one of the following:
- .1 Accept the plan.
- .2 Accept portions of the plan and provide comments outlining required changes or additional information in other sections. Following completion of edits by the Contractor, re-submit the complete plan for review.
- .3 Reject the plan and provide comments outlining required changes or additional information needed before the plan will be reviewed in detail. Following completion of edits by the Contractor, re-submit the complete plan for review.
- .2 The Contractor shall allow time in the schedule for the reviews, and subsequent edits / re-submission.
- .3 No work shall be undertaken on any element of Project Work (including payments, incidental work, or submittals for review) for which the applicable portions of the Quality Management Plan have not been accepted by the Departmental Representative.

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- .4 The review of the Quality Management Plan by the Departmental Representative shall not relieve the Contractor of responsibility for errors or omissions in the accepted Quality Management Plan or of responsibility for meeting all requirements of the Contract Documents.
 - .5 Should deficiencies in the Contractor's Quality Management Plan be noted following acceptance of the submittal by the Departmental Representative but during the project work, the Departmental Representative reserves the right to provide additional comments to the Contractor and require re-submission of the Quality Management Plan to ensure the correction of any deficiencies.
- 1.7 Quality Management Plan
- .1 The Contractor shall prepare a Quality Management Plan. The purpose of the plan is to ensure the performance of the work in accordance with Contract requirements.
 - .2 The Quality Management Plan is required to cover the work in its entirety, including without limitation all materials the Contractor and Subcontractors are supplying, monitoring and testing of the construction, documentation, and all items and phases of construction on the Project. At a minimum this shall include:
 - .1 Testing and Survey (including minimum frequencies) to be completed by the Contractor (e.g. tolerances of the work completed).
 - .2 Procedures for verifying and documenting conformance of the work to the contract requirements including but not limited to review of the work and completion of check sheets.
 - .3 The Quality Management Plan shall include the following information:
 - .1 The name and qualifications of the Quality Control Staff/Manager and their assigned roles and work scheduling in performing Quality Control duties.
 - .2 The name of Quality Control testing personnel (and agency, if being subcontracted) and survey personnel (and agency, if being subcontracted), and details of their qualifications and relevant experience to provide the specific services required for the Project.
 - .3 A list of testing and survey equipment to be used for the work.

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- .4 The Contractor shall ensure that all workers are familiar with the Quality Management Plan, its goals, and their role under it, as well as the Contract Specifications associated with the work they are to undertake.
- 1.8 Quality Control Personnel .1 The Contractor shall appoint a qualified and experienced Quality Control Manager and if necessary other staff who are responsible for quality matters, and who will report regularly to the Contractor's management at a level which shall ensure that Quality Management requirements are not subordinated to manufacturing, construction or delivery. The Quality Control Manager shall be a qualified Professional Engineer, Certified Engineering Technician, or Applied Science Technologist, or other person with knowledge, skills and abilities acceptable to the Departmental Representative.
- .2 The Quality Control Personnel (including Quality Control Manager) shall remain on site at all times the Contractor is performing work which must be tested or inspected in-process and must be readily accessible and able to return when off-site.
- .3 At a minimum the Quality Control Manager shall:
- .1 Be responsible to measure conformance of the work with the contract requirements and ensure that quality is not being compromised by production measures.
 - .2 Be empowered by the Contractor to resolve Quality Control matters.
 - .3 Direct and monitor Quality Control work completed by Quality Control testing agencies and Quality Control Staff.
 - .4 Review, sign, and be responsible for all reports (material and testing results).
 - .5 Immediately notify the Contractor's management so work can be stopped and corrective action taken when material, product, processes or submittals are deficient or non-compliant with the contract requirements.
 - .6 Complete internal Non-conformance Reports (NCR's).

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- .7 Respond to NCR's issued by the Departmental Representative.
 - .8 Attend pre-construction and construction progress meetings.
 - .4 PSPC reserves the right to reject one or more of the Contractor's Quality Control Personnel and require the Contractor to find alternative Quality Control Personnel prior to or during the work should the Quality Control Personnel not have the necessary qualifications as listed in this specification or not provide quality control services as required by this specification during the work. Should Quality Control Personnel be rejected, any work which cannot undergo complete quality control as outlined in these specifications shall stop while the Contractor finds replacement Quality Control Personnel.
- 1.9 QC Documentation and Submittal to Departmental Representative
- .1 Check sheets:
 - .1 Check sheets to verify and document conformance of the work to the quality requirements of the contract are fundamental to the QC process. The check sheets prepared as part of the Quality Management Plan shall include all components of the project work and all checks required to ensure the components of the work are completed in conformance with the requirements of the Contract Documents.
 - .2 The frequency of check sheets completed by the Quality Control Staff to verify and document conformance of the work to the quality requirements of the contract shall be established by the Quality Control Manager to ensure the quality of the work is thoroughly documented. At a minimum, the frequency of check sheets shall achieve the following:
 - .1 Daily (relative to the work being performed).
 - .2 All check sheets shall be reviewed and signed by the Quality Control Manager prior to submission to the Departmental Representative.
 - .4 Check sheets, NCR's, test results, and other documents and forms prepared as part of the Quality Management Plan and completed throughout the project to verify conformance with the contract requirements shall be distributed to the Departmental Representative in electronic format via

PSPC’s cloud-based document filing system “CentralCollab” within 24 hrs. of the completion. Submit to the Departmental Representative hard copies of the same documents, forms, and test results if requested.

1.10 QC Testing / Survey Inspection

- .1 QC testing and survey inspection required to assure that the work strictly complies with the Contract requirements shall be completed by the Contractor as follows:
 - .1 Be completed using a fully equipped laboratory (a field laboratory may be used at the Contractor’s discretion) during times of construction activity and gravel manufacturing.
 - .2 Include all testing and survey inspection specified in the Contract Documents.
 - .3 Any other testing or survey inspection required as a condition for deviation from the specified Contract procedures.
- .2 The frequency of testing / survey inspections shall be outlined in the Quality Management Plan. At a minimum the Contractor shall achieve the most stringent Quality Control testing / survey inspection frequencies as follows:
 - .1 The specific frequencies defined elsewhere in these specifications.
 - .2 The minimum QC testing / survey inspection frequencies as defined in Table 01 45 00 – 01.

Table 01 45 00 - 01: Minimum QC Testing / Survey Inspection Frequencies		
Activity	Test / Survey Inspection	Frequency
Placement / Site Tolerance – Culverts	Survey Inspection	1 survey shot (invert of culvert) at inlet and outlet ends, and along the length of the culvert as necessary to confirm the culvert is not reverse graded and within +/- 300 mm of the true line and level along the culvert.
Placement / Site Tolerance – Riprap, Channel	Survey Inspection	One (1) survey point every 5 m ² or design change in grade or Riprap Class of placed material
Compaction – Crushed Base Gravel (unfrozen conditions)	In-Place Density (ASTM D6938)	Three (3) randomly located tests over the full width of material placed every 20 m station, per each lift of placed material

Compaction – Crushed Base Gravel (frozen conditions)	Method Specification	Count of the number of passes with compaction equipment per lift. Refer to Section 33 42 13 – Pipe Culverts for requirements.
Compaction –Common Fill (frozen and unfrozen condition)	Method Specification	Count of the number of passes with compaction equipment per lift. Refer to Section 33 42 13 – Pipe Culverts for requirements.
Moisture Content – Crushed Base Gravel (for frozen condition where water cannot be added during the compaction process to bring the material up to the optimum moisture content)	Moisture Content (ASTM D2216)	The more stringent of two (2) per source or as required by the Departmental Representative should a change in the material properties be detected
Manufacture - Grout	Compressive Strength (ASTM C1019)	1 set of 3 (one 7 day and three 28 day) cubes for every culvert filled with grout
Screening / sorting riprap	ASTM D5519, Particle Size Analysis of Natural and Man-Made Riprap Materials	1 Test per every 1 day of production

.3 As defined in the BC MoTI 2020 Standard Specifications for Highway Construction (Volumes 1 and 2, and applicable Amendments available at time of tender closing). Should one of these specifications be silent on a particular testing frequency the testing frequencies shall be as defined in the Alberta Transportation Standard Specification for Highway Construction (latest edition and applicable Amendments available at time of tender closing). Wherever these standard specifications refer to standards (e.g. CSA, ASTM, and others) the minimum testing frequencies in these standards shall be utilized.

.4 If not specified elsewhere, one test per each individual area / location the material is utilized.

.3 Quality Control testing agencies, their inspectors, and their representatives are not authorized to revoke, alter, relax, or release any requirement of the Contract Documents, nor to approve or accept any part of the work.

.4 The Contractor shall complete testing in the following manner:

.1 Provide testing facilities and personnel for the tests and inform the Departmental Representative in advance to enable the Departmental Representative to witness the tests if so desired.

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- .2 Notify the Departmental Representative when sampling will be conducted.
 - .3 Submit the test results to the Departmental Representative in accordance with Item 1.6 – Submittals of this specification.
 - .4 Identify test reports with the name and address of the organization performing all tests, and the date of the tests.
 - .5 Immediately after completion of tests, provide all test results on Contractor-supplied forms acceptable to the Departmental Representative or on forms used by the BC Ministry of Transportation and Infrastructure.
 - .6 Initiate other Quality Control tests or procedures as necessary for ensuring production of a quality product and include them in the Quality Control Plan. Tests or procedures may also be introduced after the start of work as necessary as amendments to the Quality Control Plan.
- 1.11 Non-Conformance Reports
- .1 The Contractor shall, and the Departmental Representative may review the work to determine conformance with the contract requirements.
 - .2 Should the Contractor's Quality Control reporting indicate that the work, product, or methodology is not in conformance with the contract requirements (including the Contractor's submitted plans (Project Specific Health and Safety Plan, Traffic Management Plan, Environmental Protection Plan, Quality Control Plan, etc.)), the Quality Control Manager shall:
 - .1 Inform the Contractor of the deficiency. The Contractor shall then take appropriate action to correct the deficiency.
 - .2 Ensure that the action taken by the Contractor corrected the deficiency and any substandard product was eliminated from the work. If the deficiency was not corrected and substandard product remains or becomes part of the work, an internal Non-Conformance Report (NCR) shall be issued to the Contractor, with a copy to the Departmental Representative. Included as part of the NCR will be a required response time.

The Contractor shall then respond to the NCR (within the specified response time) by notifying the Quality Control Manager and the Departmental Representative of the proposed resolutions and corrective actions. The Contractor and/or the Quality Control Manager may consult with the Departmental Representative on the resolutions but is not required to do so.

Payment for the work for which the NCR has been issued may be withheld until the NCR issue is resolved.

- .3 Should the Contractor's Quality Control reporting indicate that an aspect of the Contractor's work is continually deficient, the Quality Control Manager shall issue an internal procedural Non-Conformance Report (NCR) to the Contractor, with a copy to the Departmental Representative. Included as part of the NCR will be a required response time.

The Contractor shall then respond to the NCR (within the specified response time) by notifying the Quality Control Manager and the Departmental Representative of the proposed resolutions and corrective actions. The Contractor and/or the Quality Control Manager may consult with the Departmental Representative on the resolutions but is not required to do so.

Payment for the work for which the NCR has been issued may be withheld until the NCR issue is resolved.

- .4 Should the Departmental Representative Quality Assurance reporting indicate that the work is not in conformance, the Departmental Representative may issue to the Contractor an NCR with a required response time or direct the Quality Control Manager to prepare an NCR.

The Contractor shall then respond to that NCR, within the specified response time, with proposed resolutions and corrective actions. The Departmental Representative will accept or reject the proposed resolution and corrective action proposal. If the proposed resolution is rejected by the Departmental Representative, the Contractor shall resubmit with an alternative response until a solution acceptable to the Departmental Representative is found.

Quality Assurance testing and inspection may be performed by the Departmental Representative to determine if the corrective action has provided an acceptable product.

Acceptance and rejection will continue until the Departmental Representative determines that a quality product has been achieved.

Payment for the work for which the NCR has been issued may be withheld until the NCR issue is resolved.

- .5 Should the Departmental Representative find that any component of the Contractor's submitted plans (Project Specific Health and Safety Plan, Traffic Management Plan, Environmental Protection Plan, Quality Control Plan, etc.) are not being adhered to by the Contractor or any member of the Contractor's team, the Departmental Representative may issue an NCR to the Contractor.

Payment for the work for which the NCR has been used may be withheld until the NCR issue is resolved.

- .6 If in the opinion of the Departmental Representative it is not viable to correct non-conforming work or work not performed in accordance with Contract Documents, the Departmental Representative may deduct from the Contract Price the difference in value between work performed and that called for by Contract Documents, the amount of which shall be determined by the Departmental Representative.

1.12 Departmental
Representative Inspection
and Audits

- .1 The Departmental Representative may perform quality assurance audits as desired. Such audits will not relax the responsibility of the Contractor to perform work in accordance with Contract Documents.
- .2 Allow the Departmental Representative access to work. If part of the work is in preparation at locations other than the place of work, allow access to such work whenever it is in progress.
- .3 If Contractor covers, or permits to be covered, work that has been designated for Quality Assurance testing, inspections, or approvals before such is made, uncover such work, have inspections or tests satisfactorily completed, and make good such work.
- .4 Independent Inspection/Testing Agencies may be engaged by the Departmental Representative for the purpose of Quality Assurance inspection and/or testing portions of the work. Costs of such services will be borne by the Departmental Representative.

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

- 1.1 Installation and Removal.
- 1.2 Scaffolding.
- 1.3 Hoisting.
- 1.4 Site Storage/Loading.
- 1.5 Security.
- 1.6 Equipment, Tool, and Materials Storage.
- 1.7 Sanitary Facilities.
- 1.8 Construction Signage.
- 1.9 Construction Laydown Area, Construction Parking, and Site Office.
- 1.10 Power.
- 1.11 Communications.
- 1.12 Temporary Heating, Ventilation, and Lighting.
- 1.13 Fire Protection.

PART 1 – GENERAL

- 1.1 Installation and Removal
 - .1 Provide construction facilities in order to execute work expeditiously.
 - .2 Remove from site all such work after use.
- 1.2 Scaffolding
 - .1 Provide and maintain scaffolding, ramps, ladders, swing staging, platforms, and temporary stairs as necessary to carry out work.
- 1.3 Hoisting
 - .1 Provide, operate, and maintain hoists and cranes as necessary for moving of workers, materials, and equipment.
 - .2 Hoists and cranes shall be operated by qualified operators.
- 1.4 Site Storage/Loading
 - .1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.

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| | .2 | Do not load or permit to load any part of work with a weight or force that will endanger the work or existing infrastructure. |
| 1.5 Security | .1 | Provide and pay for responsible security personnel as required. |
| 1.6 Equipment, Tool, and Materials Storage | .1 | If required by the Contractor provide and maintain, in a clean and orderly condition, lockable weather proof sheds for storage of tools, equipment and materials. |
| | .2 | Locate materials not required to be stored in weatherproof sheds on site in a manner to cause least interference with public. |
| 1.7 Sanitary Facilities | .1 | Provide sanitary facilities for work force in accordance with governing regulations and ordinances. |
| | .2 | Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition. |
| 1.8 Construction Signage | .1 | No other signs or advertisements, other than those required by Section 01 35 00 – Traffic Management, are permitted on site. |
| 1.9 Construction Laydown Area, Construction Parking, and Site Office | .1 | Confine construction laydown areas, site office locations, and construction parking to the locations identified below in compliance with Section 01 35 43 – Environmental Protection and as preapproved by the Departmental Representative. |
| | .1 | Within highway right of way, in areas previously disturbed, off the traveled portion of the highway, off travel portions of all nearby side roads such that access is not impeded, and outside the highway clear zone. |
| | .2 | Other areas as preapproved by the Departmental Representative. |
| 1.10 Power | .1 | Provide and pay for power as required for the completion of the works and operations of construction offices. |
| 1.11 Communications | .1 | Ensure Contractor's onsite representatives have suitable onsite phone communications allowing the Departmental Representative reliable communication to the Contractor's onsite representative when onsite. |

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| 1.12 Temporary Heating,
Ventilation, and Lighting | .1 | Provide temporary heating, ventilation, and lighting as required during construction period to facilitate construction of the works. |
| 1.13 Fire Protection | .1 | Provide and maintain temporary fire protection equipment during performance of work. |

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

- 1.1 Installation and Removal.
- 1.2 Hoarding.
- 1.3 Guiderails and Barricades.
- 1.4 Access to Site.
- 1.5 Public Traffic Flow.
- 1.6 Fire Routes.
- 1.7 Protection for Off-site and Public Property.
- 1.8 Protection of Structure Finishes.

PART 1 – GENERAL

- 1.1 Installation and Removal
 - .1 Provide temporary controls in order to execute Work expeditiously.
 - .2 Remove from site all such work after use.
- 1.2 Hoarding
 - .1 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures (see Section 01 35 43 – Environmental Protection for more information).
- 1.3 Guiderails and Barricades
 - .1 Provide secure, rigid guiderails and barricades around deep excavations and open shafts.
 - .2 Provide as required by governing authorities.
- 1.4 Access to Site
 - .1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.
- 1.5 Public Traffic Flow
 - .1 Provide and maintain competent signal flag persons, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect the Public.
- 1.6 Fire Routes
 - .1 Maintain access to property for use by emergency response vehicles.
- 1.7 Protection for Off-site and Public Property
 - .1 Protect surrounding private and public property from damage during performance of Work.
 - .2 Be responsible for damage incurred.

1.8 Protection of Structure
Finishes

- .1 Provide protection for finished and partially finished structure finishes and equipment during performance of Work.
- .2 Provide necessary screens, covers and hoardings.
- .3 Confirm with Departmental Representative locations and installation schedule three (3) days prior to installation.

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

- 1.1 General Requirements.
- 1.2 Requirements of Regulatory Agencies.

PART 2 – PRODUCTS:

- 2.1 Products.

PART 3 – EXECUTION:

- 3.1 Mobilization.
- 3.2 Maintenance.
- 3.3 Demobilization.

PART 1 – GENERAL

1.1 General Requirements

- .1 The Contractor to provide its own construction camp as necessary. Obtain approval from landowner should Contractor choose to setup construction camp. The construction camp shall not be located within PSPC's right-of-way, PSPC's maintenance yards, PSPC's gravel pits / quarries, or on any other land owned or leased by PSPC.
- .2 The Contractor shall be responsible for all utility services to the construction camp. The construction camp to be established and operated in accordance with local regulations.

1.2 Requirements of Regulatory Agencies

- .1 Obtain necessary licenses and approvals required by Authority having Jurisdiction for authorized use of water and disposal of domestic sewage and other waste.
- .2 Comply with Environmental regulations.

PART 2 – PRODUCTS

2.1 Products

- .1 Not used.

PART 3 – EXECUTION

3.1 Mobilization

- .1 Mobilize equipment, personnel, and materials as necessary to establish temporary construction camp and offices. Obtain necessary licenses and approvals from authorities having jurisdiction prior to mobilization. Camp and service area location and layout plan to be submitted to Departmental Representative for review and acceptance.

- .2 Temporary construction camps to be established and operated in accordance with local regulations.
- 3.2 Maintenance .1 Maintain construction camp and offices in a neat and tidy condition.
- 3.3 Demobilization .1 Upon vacating the construction camp, offices and temporary services, clean-up and leave site in a condition satisfactory to the Departmental Representative and the authorities having jurisdiction.

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

- 1.1 Project Cleanliness.
- 1.2 Final Cleaning.

PART 1 – GENERAL

1.1 Project Cleanliness

- .1 Maintain work in a tidy condition, free from accumulation of waste products and debris.
- .2 Remove waste materials from site at regularly scheduled times or dispose of as directed by the Departmental Representative.
- .3 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .4 Provide wildlife resistant containers for collection of waste materials and debris.
- .5 Dispose of waste materials and debris off site.
- .6 Clear snow and ice from areas of work.
- .7 Ensure work site cleaning and worker hygiene practices are in accordance with the Contractor's COVID-19 Safe Work Plan.

1.2 Final Cleaning

- .1 When work is substantially performed, remove surplus products, tools, construction machinery, and equipment not required for performance of remaining work.
- .2 Remove waste products, debris, and materials used in construction. Reinststate the work site to the conditions pre-existing and to the satisfaction of the Departmental Representative.
- .3 Prior to final review, remove surplus products, tools, construction machinery, and equipment.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Inspect finishes and fitments and ensure specified workmanship and operation.
- .6 Remove dirt and other disfiguration from exterior surfaces.
- .7 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.
- .8 Sweep and wash clean paved or Bituminous Surface Treatment (BST) finished areas.
- .9 Clean drainage systems.

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

- 1.1 Substantial Performance.
- 1.2 Completion

PART 1 – GENERAL

- 1.1 Substantial Performance
 - .1 Project “Substantial Performance” shall be attained through the following process:
 - .1 When the project work has achieved Substantial Performance as defined by GC1.1.4, the Contractor and all subcontractors shall conduct an inspection of work, identify deficiencies and defects and repairs as required to conform to Contract Documents. Correct deficiencies and defects and complete repairs identified.
 - .2 Notify the Departmental Representative in writing of completion of the Contractor’s Inspection, correction of deficiencies, defects, and repairs, and request the Departmental Representative’s Substantial Performance inspection.
 - .3 Upon request from the Contractor, the Departmental Representative will complete a Substantial Performance inspection. If requested by the Departmental Representative, the Contractor shall accompany Departmental Representative during the Substantial Performance inspection.
 - .4 Unless stated otherwise by the Departmental Representative, the Contractor shall correct all deficiencies, defects, and repairs identified during the Substantial Performance inspection by the Departmental Representative prior to the preparation of the “Certificate of Substantial Performance”.
 - .5 Should the Departmental Representative determine that Substantial Performance as defined by GC1.1.4 has been achieved, the Contractor shall prepare a “Request for Progress Payment” with the final project quantities and all Progress Payment submissions as outlined in Section 01 29 00 – Payment Procedures. The Departmental Representative will use the submitted “Request for Progress Payment” to prepare a “Certificate of Substantial Performance” in accordance with GC5.5.

- .6 Should the “Certificate of Substantial Performance” include remaining defects, faults, and incomplete work etc. the Contractor shall provide to the Departmental Representative a schedule for the completion / correction of each remaining defect, fault, and incomplete work etc. The “Certificate of Substantial Performance” will not be processed for payment until the Contractor’s schedule has been provided, reviewed and accepted by the Departmental Representative. The Contractor’s schedule shall be provided in writing as follows:
 - .1 Include the completion / correction dates for all items of defects, faults, incomplete work etc. identified by the Departmental Representative.
 - .2 Be provide in a letter with company letter head and be signed by an authorized representative of the Contractor.

1.2 Completion

- .1 The project shall be deemed to have reached “Completion” when all requirements of GC1.1.5 have been achieved. The “Certificate of Completion” shall then be prepared by the Departmental Representative in accordance with GC5.6.

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

- 1.1 Submissions.
- 1.2 Recording As-built Conditions (As-Built Drawings).
- 1.3 As-Built Survey.

PART 1 – GENERAL

- 1.1 Submissions
 - .1 Submit submissions for Departmental Representative review. Following each review, the submission will be returned with the Departmental Representative’s comments. Revise and re-submit submission per the comments provided.
 - .2 Provide the following submissions to the Departmental Representative within two (2) weeks of substantial performance:
 - .1 As-built drawing and Shop Drawing mark-ups.
 - .2 As-built survey.
- 1.2 Recording As-built Conditions (As-built Drawings)
 - .1 The Departmental Representative will provide one set of Issued for Construction (or Issued for Tender) drawings for use by the Contractor to record as-built conditions and submit at the completion of the project as the “As-built Drawings”.
 - .2 Record information concurrently with construction progress on the Issued for Construction (or Issued for Tender) drawings. Do not conceal work until the required information is recorded.
 - .3 Legibly mark each item on the Issued for Construction (or Issued for Tender) drawings and Shop Drawings in red ink to record actual construction conditions and any changes made by addenda and change orders.
 - .4 Maintain record documents in clean, dry, and legible condition.
 - .5 Keep record documents available for inspection by the Departmental Representative.
 - .6 Submit to the Departmental Representative one copy of Issued for Construction (or Issued for Tender) drawings which have been marked up by the Contractor to include all “as-built” conditions.

- 1.3 As-Built Survey
- .1 At the completion of the work complete an as-built survey of the works. At a minimum the survey shall include.
 - .1 Topo of all areas disturbed and modified during construction.
 - .2 Culverts (inverts at inlet and outlet), size, length and type.
 - .3 Riprap.
 - .4 Any other feature or elements of work incorporated into the project.
 - .2 The survey to include sufficient point density to adequately characterize the work. Survey methods and point density is subject to prior approval of the Departmental Representative. At a minimum the Contractor shall survey all features at 20 m station intervals and the location of all treatment boundaries including changes in material type / placement, changes in surface treatment, and changes in terrain.
 - .3 Survey data shall be collected at an accuracy of +/- 0.020 m horizontal and +/- 0.020 m vertical or better and shall be referenced / tie into the PSPC's monument / coordinate system as shown on the Contract Drawings.
 - .4 The following files shall comprise the as-built survey provided to the Departmental Representative:
 - .1 Digital csv file with the xyz data and an appropriate descriptor code as to the type of material surface or feature being surveyed.
 - .2 Breaklines for all survey data in DXF file formation or another format pre-approved by the Departmental Representative.
 - .3 A list of all point descriptors used in the survey data.

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

- 1.1 Definitions.
- 1.2 Submittals.
- 1.3 Storage and Handling.
- 1.4 Transportation.

PART 2 – PRODUCTS:

- 2.1 Materials.

PART 3 – EXECUTION:

- 3.1 Disposal.

PART 1 – GENERAL

1.1 Definitions

- .1 Dangerous Goods: Product, substance, or organism that is specifically listed or meets the hazard criteria established in Transportation of Dangerous Goods Regulations.
- .2 Hazardous Material: Product, substance, or organism that is used for its original purpose and that is either dangerous goods or a material that may cause adverse impact to the environment or adversely affect health of persons, animals, or plant life when released into the environment.
- .3 Hazardous Waste: Any hazardous material that is no longer used for its original purpose and that is intended for recycling, treatment, or disposal.
- .4 Workplace Hazardous Materials Information System (WHMIS): A Canada-wide system designed to give employers and workers information about hazardous materials used in the workplace. Under WHMIS, information on hazardous materials is to be provided on container labels, material safety data sheets (MSDS), and worker education programs. WHMIS is put into effect by a combination of federal and provincial laws.

1.2 Submittals

- .1 Submit product data in accordance with Section 01 33 00 – Submittal Procedures.
- .2 If requested by the Departmental Representative, submit to the Departmental Representative a current Material Safety Data Sheet (MSDS) for each hazardous material required prior to bringing hazardous material on site.

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- 1.3 Storage and Handling
- .3 If requested by the Departmental Representative, submit Hazardous Materials Management Plan to the Departmental Representative that identifies all hazardous materials, their use, their location, personal protective equipment requirements, and disposal arrangements.
 - .1 Abide by internal requirements for labeling and storage of materials and wastes. If required coordinate storage of hazardous materials with the Departmental Representative.
 - .2 Store and handle hazardous materials and wastes in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.
 - .3 Store and handle flammable and combustible materials in accordance with current National Fire Code of Canada requirements.
 - .4 Store all flammable and combustible liquids in approved safety cans bearing the Underwriter's Laboratory of Canada or Factory Mutual seal of approval.
 - .5 Transfer of flammable and combustible liquids is prohibited within buildings.
 - .6 Transfer of flammable and combustible liquids will not be carried out in the vicinity of open flames or any type of heat-producing devices.
 - .7 Flammable liquids having a flash point below 38°C, such as naphtha or gasoline, will not be used as solvents or cleaning agents.
 - .8 Store flammable and combustible waste liquids for disposal in approved containers located in a safe, ventilated area. Keep quantities to a minimum.
 - .9 Observe smoking regulations at all times. Smoking is prohibited in any area where hazardous materials are stored, used, or handled.
 - .10 Abide by the following storage requirements for quantities of hazardous materials and wastes in excess of 5 kg for solids, and 5 L for liquids:
 - .1 Store hazardous materials and wastes in closed and sealed containers that are in good condition.

- .2 Label containers of hazardous materials and wastes in accordance with WHMIS.
 - .3 Store hazardous materials and wastes in containers compatible with that material or waste.
 - .4 Segregate incompatible materials and wastes.
 - .5 Ensure that different hazardous materials or hazardous wastes are not mixed.
 - .6 Store hazardous materials and wastes in a secure storage area with controlled access.
 - .7 Maintain a clear egress from storage area.
 - .8 Store hazardous materials and wastes in a manner and location which will prevent them from spilling into the environment.
 - .9 Have appropriate emergency spill response equipment available near the storage area, including personal protective equipment.
 - .10 Maintain an inventory of hazardous materials and wastes, including product name, quantity, and date when storage began.
 - .11 Ensure personnel have been trained in accordance with WHMIS requirements.
 - .12 Report spills or accidents involving hazardous materials immediately to the Provincial Emergency Program 24 hour phone line at 1-800-663-3456, other local authority having jurisdiction, and the Departmental Representative. Submit a written spill report to the Departmental Representative within 24 hours of incident.
 - .13 Store and handle all hazardous materials away from any water course as outlined in Section 01 35 43 – Environmental Protection.
- 1.4 Transportation
- .1 Transport hazardous materials and wastes in accordance with federal Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations.
 - .2 If exporting hazardous waste to another country, ensure compliance with federal Export and Import of Hazardous Waste Regulations.

PART 2 – PRODUCTS

- 2.1 Materials
- .1 Only bring on site the quantity of hazardous materials required to perform work.
 - .2 Maintain MSDS in proximity to where the materials are being used. Communicate this location to personnel who may have contact with hazardous materials.

PART 3 – EXECUTION

- 3.1 Disposal
- .1 Dispose of hazardous waste materials in accordance with applicable federal and provincial acts, regulations, and guidelines. Costs for disposal to be considered incidental to the work.
 - .2 Recycle hazardous wastes for which there is an approved, cost-effective recycling process available.
 - .3 Send hazardous wastes only to authorized hazardous waste disposal or treatment facilities.
 - .4 Burning, diluting, or mixing hazardous wastes for purpose of disposal is prohibited.
 - .5 Disposal of hazardous materials in waterways, storm or sanitary sewers, or in municipal solid waste landfills is prohibited.
 - .6 Dispose of hazardous wastes in a timely fashion in accordance with applicable provincial regulations.

END OF SECTION

SECTION INCLUDES:

PART 1 – GENERAL:

- 1.1 General.
- 1.2 Measurement and Payment.
- 1.3 References.
- 1.4 Definitions.
- 1.5 Submittals.
- 1.6 Quality Management.

PART 2 – PRODUCTS:

- 2.1 Grout.
- 2.2 Grout Mix.

PART 3 – EXECUTION:

- 3.1 General.
- 3.2 Environmental Requirements.
- 3.3 Site Preparation.
- 3.4 Delivery, Storage, and Handling.
- 3.5 Placement.
- 3.6 Curing and Finishing.

PART 1 – GENERAL

- 1.1 General .1 Install Grout within the existing CSP culverts at all 12 culvert locations (Km 325.08, Km 329.84, Km 330.50, Km 331.26, Km 332.05, Km 333.18, Km 335.06, Km 339.66, Km 340.16, Km 344.88, Km 347.67, Km 355.02) which are to receive a new steel pipe culvert with the existing CSP culvert to be abandoned as indicated on the Contract Drawings.
- 1.2 Measurement and Payment .1 Measurement and Payment for Grout installed in all culverts to be abandoned shall not be paid separately and shall be incidental to culvert work as defined in Section 33 42 13 – Pipe Culverts.
- 1.3 References .1 American Society for Testing and Materials (ASTM), latest edition.

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- .1 ASTM C1019, Standard Test Methods for Sampling and Testing Grout.
 - .2 ASTM C940, Standard Test Method for Expansion and Bleeding of Freshly Mixed Grouts for Preplaced-Aggregate Concrete in the Laboratory.
 - .2 Canadian Standards Association (CSA International), latest edition.
 - .1 CSA 23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
 - .3 Ministry of Water, Land, and Air Protection, Standards and Best Practices for Instream Works, 2004
- 1.4 Definitions
- .1 Grout: Ready-mix controlled low strength material used as an alternative to compacted soil, and is also known as controlled density fill, and several other names, some of which are trademark names of material suppliers. Grout differs from Portland cement concrete as it contains a low cementitious content to reduce strength development for possible future removal.
- 1.5 Submittals
- .1 Undertake the Grout mix design and pay for all costs associated with the development, testing, and submissions of the mix design. Grout mix design documentation shall include all components of the mix and quantities of the materials used. Additional details required for the mix design shall include:
 - .1 Expected method of batching, transporting, and placing Grout.
 - .2 Distance and expected travel time from batch plant location to project site.
 - .2 Prepare a written Grout Installation Memo that will include the proposed methodology / procedures that will ensure the entire void space within each culvert is filled with Grout and no void space is remaining at the conclusion of the work. The submittal shall include sufficient details of all aspects of the proposed plan such that the Departmental Representative can ascertain the effectiveness of the proposed plan.
 - .3 Prepare a written submittal with drawings (as necessary) of Grout Formwork/Falsework Containment which will be used during the installation to prevent any Grout from entering the

adjacent water course. The submittal shall include sufficient details of all aspects of the proposed plan for the various culvert locations and sizes such that the Departmental Representative can ascertain the effectiveness of the proposed plan upon completion of the work (i.e. prove that all void spaces are filled).

- .4 The Contractor's Grout mix design, submittal of Grout Installation Memo , and Grout Formwork/Falsework Containment submittal shall be submitted to the Departmental Representative as a single PDF document (multiple files will not be accepted) for review and acceptance in accordance with the procedures outlined in Section 01 33 00 – Submittal Procedures. The Departmental Representative will review the mix design (first submission and if required all subsequent re-submissions) within 7 days of submission. Upon review of the mix design the Departmental Representative will do one of the following:
 - .1 Accept the mix design.
 - .2 Accept portions of the mix design and provide comments outlining required changes or additional information in other sections. Following completion of edits by the Contractor, re-submit the complete plan for review.
 - .3 Reject the plan and provide comments outlining required changes or additional information needed before the plan will be reviewed in detail. Following completion of edits by the Contractor, re-submit the complete plan for review.
- .5 The Contractor shall allow time in the schedule for the reviews, and subsequent edits / re-submission.
- .6 No Grout shall be placed prior to receiving Departmental Representative's acceptance of the Grout mix design, Grout Installation Memo, and Grout Formwork / Falsework Containment submittal.
- .7 Acceptance of the Grout mix design by the Departmental Representative does not constitute acceptance of the Grout. Acceptance of the Grout will be based upon the test results and the performance and quality of the Grout and concrete components placed on the project.

1.6 Quality Management

- .1 Quality Control and Quality Assurance in accordance with Section 01 45 00 – Quality Management.

- .2 Quality Control testing frequency: Minimum test frequency as described in Table 01 45 00 – 01 unless advised otherwise by the Departmental Representative following a review of the Grout Mix Design but in advance of the work.

PART 2 – PRODUCTS

2.1 Grout

- .1 Provide Grout containing, at minimum, cementitious materials and water. Cementitious materials shall be Portland cement, pozzolanic materials, or other self-cementing materials, or combinations thereof, at the Contractor's option. The Grout mix design may also contain, fine aggregate or filler provided the final product meets the strength, flow consistency, and shrinkage requirements included in this specification.
- .2 Portland cement: to CAN3-A23.1-M
- .3 Water: to CAN3-A23.1-M
- .4 Aggregates: to CAN3-A23.1-M
- .5 Air entraining Admixtures: to CAN3-A266.1-M
- .6 In no case will batch adjustment relieve the Contractor of the responsibility for the durability, strength, or acceptability of Grout concerned. The Departmental Representative reserves the right to reject any batch in case of confirmed unacceptability and to require immediate removal of any Grout from this batch from the work.

2.2 Grout Mix

- .1 Proportion Grout to yield the following properties.
 - .1 Maximum cementitious content of 90 kg/m³.
 - .2 Minimum compressive strength at 28 days: 2 MPa.
 - .3 Maximum compressive strength at 28 days: 5 MPa.
 - .4 Consistency that will result in a flowable product at the time of placement which does not require manual means to move it into place.
 - .5 Maximum evaporation of bleed water shall not result in shrinkage of more than 10.4 mm per m of Grout depth. Measurement of a final bleeding shall be as measured in Section 10 of ASTM C940.

- .2 Do not change Grout Mix without prior approval of the Departmental Representative. Should change in material source be proposed, a new Grout mix design to be submitted to the Departmental Representative for compliance acceptance.

PART 3 – EXECUTION

3.1 General

- .1 Provide 24 hours' notice and Obtain the Departmental Representative's approval before placing Grout.
- .2 Prior to placing Grout obtain approval from the Departmental Representative of proposed method of protection of Grout during placing and curing in adverse weather or when air temperatures are less than 5 degrees Celsius or greater than 30 degrees Celsius.

3.2 Environmental Requirements

- .1 Take all necessary precautions as outlined in Section 01 35 43 – Environmental Protection and the Contractor's EPP to mitigate against environmental pollution or damage during Grout installation.
- .2 Concrete and grouting will follow Section 14.6 Concrete Materials Use under the British Columbia Ministry of Water, Land and Air Protection, Standards and Best Practices for Instream Works.
- .3 Grout fines, wash, or any other substance shall not be deposited or contact, either directly or indirectly, any water or watercourse. Grout materials shall remain inside Formwork / Falsework (see Item 3.3 – Site Preparation, Subsection .1 of this specification).
- .4 A carbon dioxide (CO₂) tank with regulator, hose and gas diffuser shall be readily available during Grout work. Should a spill occur, carbon dioxide gas will be released into the affected area to neutralize pH levels.
- .5 The Contractor shall provide containment facilities for the wash-down water from concrete delivery trucks, concrete pumping equipment and other tools and equipment.
- .6 All spills must be reported to the Provincial Emergency Program 24 hour phone line at 1-800-663-3456 and where possible, immediate removal of materials from the water and implementation of emergency mitigation and clean-up measures will be initiated.

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- .7 Monitoring the pH in the watercourse immediately downstream of the works shall be conducted should the stream not be frozen. Isolate and hold any water that contacts uncured or partly cured concrete or grout until the pH is between 6.5 and 8.0.
- 3.3 Site Preparation
- .1 Prepare formwork / falsework containment on ends of the existing culvert as per Grout Formwork / Falsework Containment written and accepted submission (see 1.5 – Submittals, subsection .2 and .3 of this specification) to ensure Grout does not escape the existing culvert.
- .2 Use pumps and other means to ensure the existing culvert is clear of ice and/or standing water and other debris until the Grout is placed. Removal of ice by melting may be required.
- 3.4 Delivery, Storage, and Handling
- .1 Grout shall be fully discharged and placed within 3 hours after water and cement have been combined. Any proposed deviation from this requirement must be pre-approved by the Departmental Representative. To obtain pre-approval the contractor shall submit in writing the proposed methodology to ensure all concrete / grout strength and other requirements are achieved. Regardless of the proposed methodology submitted, the Departmental Representative is under no obligation to deviate from this requirement.
- .2 Grout delivery: ensure that continuous Grout delivery from plant meets CSA A23.1/A23.2.
- .3 Waste Management and Disposal:
- .1 Divert unused Grout materials to a local landfill facility approved by the Departmental Representative.
- .2 Provide an appropriate area on the job site where concrete trucks can be safely washed.
- .3 Unused admixtures and additive materials must not be disposed of into sewer systems, into lakes, streams, onto ground, or in other locations where it could pose a health or environmental hazard.
- .4 Prevent admixtures and additive materials from entering drinking water supplies or streams. Using appropriate safety precautions, collect liquid or solidify liquid with inert, non-combustible material and remove for disposal. Dispose of waste in accordance with applicable local, provincial/territorial, and national regulations.

- 3.5 Placement
- .1 Prior to placing Grout, submit and obtain approval for Grout Mix design, Grout Installation memo, and Grout Formwork / Falsework Containment written submission (see Item 1.5 – Submittals of this specification).
 - .2 Comply with hot/cold weather Grout fabrication, placement, and curing requirements as per CSA-23.1-09.
 - .3 Convey the Grout at the site utilizing equipment of the design, size, and condition to deposit a continuous and adequate supply of Grout of the specified mix and consistency without segregation at the required locations.
 - .4 Ensure Grout has filled all areas of the existing culvert. If required use manual means to move Grout into areas of the culverts void of Grout.
- 3.6 Curing and Finishing
- .1 Protect exposed surfaces of Grout from premature drying, wash by rain or running water, wind, mechanical injury, and excessively hot or cold temperatures. Curing method shall be subject to approval by the Departmental Representative.
 - .2 Ensure ends of existing culvert and Grout are encased with minimum 0.3 m of embankment through the import and placement of embankment over each culvert end or the shortening of the culvert into the embankment and then replacement of embankment.
 - .3 Complete applicable excavation / ditching work per contract drawings and Section 33 42 13 – Pipe Culverts.
 - .4 Hydraulic Seeding of all disturbed areas per Section 32 93 21 – Hydraulic Seeding.

END OF SECTION

SECTION INCLUDES:

PART 1 – GENERAL:

1.1 Measurement and Payment Procedures.

1.2 References.

PART 2 – PRODUCTS:

2.1 Riprap.

PART 3 – EXECUTION:

3.1 Handling and Transportation.

3.2 Stockpiling.

3.2 Placement.

PART 1 – GENERAL

1.1 Measurement and Payment
Procedures

.1 Measurement and Payment for Riprap shall not be paid separately. Measurement and Payment for Riprap shall be per the applicable work included in Section 33 42 13 – Pipe Culverts and any other section as required by these specifications.

1.2 References

.1 American Society for Testing and Materials (ASTM), latest edition:

.1 ASTM C127, Standard Test Method for Relative Density (Specific Gravity) and Absorption of Course Aggregate.

PART 2 – PRODUCTS

2.1 Riprap

.1 The Contractor shall provide his own source(s) for all aggregate materials for this project. The Contractor will be solely responsible for the ensuring that the aggregate source(s) selected by the Contractor continuously achieves all aggregate material properties, quality, and gradation requirements as outlined in this contract specification for the materials intended use.

.2 A minimum of seven (7) calendar days prior to supply or commencement of manufacture of materials from the Contractor's selected riprap source(s), provide to the Departmental Representative for review and acceptance the following.

.1 Location, name, and owner of material source.

- .3 Regardless of the riprap source, the Riprap shall conform with the following requirements:
- .1 Crushed / blasted angular stone consisting of hard durable particles free from clay lumps, frozen material and other deleterious materials, and free from splits, seams or defects likely to impair its soundness during handling or under action of water.
- .2 Is a graded material conforming with the following gradation limits:
- .1 50 Kg Class Riprap:

Table 31 37 00 – 01: 50 Kg Class Riprap		
Mass (kg)	Nominal Diameter (mm) @ 2650 kg/m ³	Percent Larger Than
300	600	0
150	500	15
50	350	50
5	160	85
1	95	100

- .3 Neither the breadth or the thickness of any individual piece of material is to be less than one-third of its length. A maximum of 2.0 percent by weight of such pieces will be permitted.
- .4 Have a relative density: to ASTM C127, not less than 2.65.

PART 3 – EXECUTION

- 3.1 Handling and Transportation .1 Avoid segregation, contamination, and degradation of riprap during handling and transporting.
- .2 Load limit restrictions will be in accordance with British Columbia Highway Motor Vehicle Act pertaining to registered weight limits and vehicle size.
- 3.2 Stockpiling .1 Stockpiling of riprap shall be in accordance with Section 33 42 13 – Pipe Culverts.
- 3.3 Placement .1 Placement of Riprap shall be in accordance with Section 33 42 13 – Pipe Culverts.

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

- 1.1 Measurement and Payment Procedures
- 1.2 Product Data.
- 1.3 Scheduling.
- 1.4 Product Handling and Storage.

PART 2 – PRODUCTS:

- 2.1 Materials.
- 2.2 Equipment.

PART 3 – EXECUTION:

- 3.1 Workmanship.
- 3.2 Protection of Surfaces.
- 3.3 Preparation of Slurry.
- 3.4 Slurry Application.
- 3.5 Warranty and Maintenance.

PART 1 – GENERAL

1.1 Measurement and Payment
Procedures

- .1 Payment for the completion of Hydraulic Seeding will be made on the basis of the Price per Unit Bid for Hydraulic Seeding in the Bid and Acceptance Form. The Price per Unit Bid shall include all costs for supply, placement, and maintenance of the Hydraulic Seeding in all areas of cut slopes, excavation, and other disturbed areas as detailed in these specifications or as directed by the Departmental Representative.
- .2 Measurement for Payment for completion of Hydraulic Seeding will be made by Lump Sum based on the percentage of the work completed and accepted by the Departmental Representative.

1.2 Product Data

- .1 Provide product data, prior to seeding for:
 - .1 Seed:
 - .1 Shipping Bill: issued by supplier of material, identifying manufacturer and supplier, material, and net mass or volume in each container.

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- .2 Biotic Soil Media.
 - .1 Shipping Bill: issued by supplier of material, identifying manufacturer and supplier, material, and net dry-air mass in each container.
 - .3 Hydraulic Erosion Control Product (HECP).
 - .1 Shipping Bill: issued by supplier of material, identifying manufacturer and supplier, material, and net dry-air mass in each container.
 - .4 Fertilizer
 - .1 Shipping Bill: issued by supplier of material, identifying manufacturer and supplier, material, and net dry-air mass in each container.
 - .2 Guarantees.
 - .3 Chemical Analysis.
 - .2 Unless advised otherwise in advance of the work by the Departmental Representative, submit in writing to the Departmental Representative 14 days prior to commencing work:
 - .1 Volume capacity of hydraulic seeder in litres.
 - .2 Amount of material to be used per tank based on volume.
 - .3 Number of tank loads required per hectare to apply specified slurry mixture per hectare.
 - 1.3 Scheduling
 - .1 Schedule Hydraulic Seeding to coincide with the completion of surface on which the hydraulic seeding shall be applied and Construction Staging requirements as outlined in Section 01 14 00 - Work Restrictions, Access Development, Construction Staging, and Restoration.
 - 1.4 Product Handling and Storage
 - .1 Deliver and store seed in original containers individually labeled in accordance with “Seeds Regulations” and indicating name of supplier.
 - .2 Deliver and store seed and fertilizer out of adverse weather.
 - .3 Protect all product as required during transportation and storage.

- .4 Remove from project area, product that has become wet or otherwise damaged during transportation or storage, or does not meet requirements specified.

PART 2 – PRODUCTS

2.1 Materials

- .1 Seed: “Canada pedigreed grade” in accordance with Government of Canada Seeds Act and Regulations.

- .1 Grass Mixture: “Certified”, Canada No. 1 seed for common cultivars in accordance with Government of Canada Seeds Act and Regulations and shall conform to the following seed mixes for the applicable project locations:

% By Weight	Species
30%	Creeping Red Fescue
20%	Slender Wheatgrass
10%	Alsike Clover
10%	Timothy
10%	Canada Bluegrass
15%	Smooth Brome Grass
5%	Sheep Fescue

- .2 Fall rye.

- .2 Biotic Soil Media shall be a Wood Fibre Based Product certified for use in Canada containing the following ingredients:

- .1 Renewable Thermally Refined Bark and Wood Fibers
- .2 Biochar
- .3 Cross-Linked Polysaccharide Biopolymers
- .4 Soil Building Components Containing Seaweed Extract, Humic Acid, and Endomycorrhizae.

- .3 Hydraulic Erosion Control Product (HECP) shall be a Wood Fibre Product certified for use in Canada with the following properties as detailed in Table 32 93 21 – 03:

Table 32 93 21 – 03: HECP		
Physical Properties ⁽¹⁾	Test Method	Test Value
Thickness	ASTM D6525 ⁽²⁾	≥ 4 mm
Ground Cover	ASTM D6567 ⁽²⁾	≥ 98%
Mass/Unit Area	ASTM D6566 ⁽²⁾	≥ 390 g/m ²
Water Holding Capacity	ASTM D7367	≥ 1,400%
Material Color	Observed	Green
Physical Properties ⁽¹⁾	Test Method	Test Value
Cover Factor ⁽³⁾	Large Scale ⁽⁵⁾	≤ 0.05
Percent Effectiveness ⁽⁴⁾	Large Scale ⁽⁵⁾	≥ 95%
Cure Time	Observed	4 – 24 Hours
Vegetation Establishment	ASTM D7322 ⁽²⁾	≥ 600%
Functional Longevity	ASTM 5338	≤ 12 Months
Environmental Properties ⁽¹⁾	Test Method	Test Value
Ecotoxicity	EPA 2021.0	48-hr LC ₅₀ > 100%
Biodegradability	ASTM D5338	Yes
Product Composition		Typical Value
Thermally Processed ⁽⁷⁾ (within a pressurized vessel) Virgin Wood Fiber		77%
Wetting Agents - including high-viscosity, colloidal polysaccharides, crossed-linked biopolymers and water absorbents (>10% of total formulation)		18%
Crimped, Biodegradable Interlocking Fibers		2.5%
Micro-Pore Granules		2.5%

Notes:

- (1) When uniformly applied at a rate of 3,500 pounds per acre (3,900 kilograms/hectare) under laboratory conditions.
- (2) ASTM test methods developed for Rolled Erosion Control Products that have been modified to accommodate Hydraulic Erosion Control Products.
- (3) Cover Factor is calculated as soil loss ratio of treated surface versus an untreated control surface.
- (4) % Effectiveness = One minus Cover Factor multiplied by 100%.
- (5) Large scale testing conducted at Utah Water Research Laboratory and Texas Transportation Institute. For specific testing information please contact a Profile technical service representative at 800-508-8681.
- (6) Functional Longevity is the estimated time period, based upon ASTM

D5338 testing and field observations, that a material can be anticipated to provide erosion control and agronomic benefits as influenced by composition, as well as site-specific conditions, including; but not limited to — temperature, moisture, light conditions, soils, biological activity, vegetative establishment and other environmental factors.

(7) Heated to a temperature greater than 380 degrees Fahrenheit (193 degrees Celsius) for 5 minutes at a pressure greater than 50 psi (345 kPa) in order to be Thermally Refined®/Processed and to achieve phytosanitization.

.4 Water: free of impurities that would inhibit germination and growth.

.5 Fertilizer:

.1 To Canada Fertilizers Act and Regulations.

.2 Complete synthetic, ratio: 18:18:18.

2.2 Equipment

.1 Capable of mixing and evenly distributing seed, fertilizer, Biotic Soil Media, and HECF mixtures for efficient treatment of areas to be seeded.

.2 Agitation system:

.1 To be built-in.

.2 To have sufficient capacity to agitate, suspend and homogeneously mix slurry of materials in amounts specified using slurry recirculation or mechanical agitation method.

.3 To be capable of operating during seeding and charging of the tank.

.3 Slurry tank to have working capacity of at least 4,500 litres with pump capable of maintaining continuous, nonfluctuating stream of slurry. Distribution lines to be equipped with appropriate nozzles and of sufficient diameter to prevent blockage. Tank volume to be certified by certifying authority and identified by authorities with the Volume Certification Plate.

.4 Capable of seeding by 50 m hand operated hose or tower with appropriate nozzles.

PART 3 – EXECUTION

- 3.1 Workmanship
- .1 Apply Hydraulic Seeding in all areas of topsoil, cut/fill slopes, disturbed areas, or other areas as detailed in these specifications or as directed by the Departmental Representative.
 - .2 Do not spray onto structures, signs, guardrails, plant material, and other than surfaces intended.
 - .3 Clean-up immediately, any material sprayed where not intended, to satisfaction of Departmental Representative.
 - .4 Do not perform work under adverse field conditions such as wind speeds that will carry product beyond area designed for hydraulic seeding or not uniformly applied, frozen ground or ground covered with snow, ice or standing water, or other adverse conditions unless otherwise pre-approved by the Departmental Representative.
 - .5 Protect seeded areas from trespass until plants are established.
- 3.2 Protection of Surfaces
- .1 Fine grade areas to be seeded free of humps and hollows. Ensure areas are free of deleterious and refuse materials.
 - .2 Obtain Departmental Representative's review of grade, finished surface, and topsoil depth before starting to seed.
- 3.3 Preparation of Slurry
- .1 Measure quantities of materials by weight or weight-calibrated volume measurement. Supply equipment required for this work.
 - .2 Calculate amount of material to be used and area to be covered for each tank load utilizing size of slurry tank and carrying capacities of water.
 - .3 Charge required water into seeder. Add material into hydraulic seeder under agitation. Pulverize Biotic Soil Media and HECP and charge slowly into seeder. Use optimum carrying capacity of water relative to Biotic Soil Media, and HECP as follows:
 - .1 Biotic Soil Media: 55kg/1000 L.
 - .2 HECP: 43kg/1000 L.
 - .4 Mix thoroughly to complete the slurry once all other material is in the seeder.

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- 3.4 Slurry Application
- .1 Hydraulic seeding equipment:
 - .1 Slurry tank.
 - .2 Agitation system for slurry to be capable of operating during charging of tank and during seeding, consisting of recirculation of slurry and /or mechanical agitation method.
 - .3 Capable of seeding by 50 m hand operated hoses or tower with appropriate nozzles.
 - .2 The hydraulic seeding slurry mixture shall be applied in two separate applications. The second application shall be applied within 24 hours of the first application. The slurry mixture per hectare of each application shall be as follows:
 - .1 Application 1 (Biotic Soil Media and Seed):
 - .1 Biotic Soil Media: 3500 kg
 - .2 Fall rye: 110 kg.
 - .3 Fertilizer: 360 kg.
 - .2 Application 2 (HECP):
 - .1 HECP: 3900 kg.
 - .2 Grass Seed Mixture: 125 kg.
 - .3 Thoroughly mix and uniformly apply slurry, at optimum angle of application for adherence to surfaces and germination of seed over area to be seeded.
 - .1 Using correct nozzle for application.
 - .2 Using hoses for surfaces difficult to reach and to control application.
 - .4 Blend application 300 mm into adjacent grass areas previous applications to form uniform surfaces.
 - .5 Re-apply where application is not uniform.
 - .6 Immediately remove slurry from items and areas not designated to be sprayed.
 - .7 Protect seeded areas from trespass and damage.

- .8 Remove protection devices.
- 3.5 Warranty and Maintenance .1 The Contractor shall warranty the Hydraulic Seeding free of defects in accordance with General Conditions (GC3.13), for one full growing season or 12 months from the date of Substantial Performance whichever is greater.
- .2 It is the responsibility of the Contractor to complete maintenance as the Contractor deems necessary on the Hydraulic Seeding such that a 90% survival rate is achieved at the end of the warranty period.
- .3 If at the end or prior to the end of the warranty period a 90% survival rate is not achieved the Contractor shall at his own expense replace Hydraulic Seeding not surviving or in poor condition except when the loss or damage can be proven to be due to abnormal weather, or any causes beyond the control of the Contractor.
- .4 An end-of-warranty inspection will be conducted by the Departmental Representative.

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

- 1.1 General.
- 1.2 Measurement and Payment Procedures.
- 1.3 References.
- 1.4 Definitions.
- 1.5 Submittals.
- 1.6 Environmental.
- 1.7 Delivery, Storage, and Handling.

PART 2 – PRODUCTS:

- 2.1 Steel Pipe Culverts.
- 2.2 Welding.
- 2.3 Grout
- 2.4 Nonwoven Geotextile.
- 2.5 Riprap.
- 2.6 Crushed Base Gravel.
- 2.7 Common Fill.
- 2.8 Bentonite.

PART 3 – EXECUTION:

- 3.1 Equipment.
- 3.2 Excavation – Trenchless Culvert Installation.
- 3.3 Excavation – Channel Re-alignment and Erosion Protection.
- 3.4 Disposal of Excavated Material.
- 3.5 Stockpiling.
- 3.6 Installation – Steel Pipe Culvert.
- 3.7 Culvert Ditching, End Protection, and Abandon Existing Culvert.

- 3.8 Placement of Crushed Base Gravel.
- 3.9 Placement of Common Fill.
- 3.10 Clean-up.

PART 1 – GENERAL

- 1.1 General
 - .1 The replacement / install of 900 mm Km 330.50, Km 332.05, Km 335.06, Km 339.66, Km 344.88, Km 347.67, Km 355.02), 1050 mm (Km 331.26, Km 333.18, Km 340.16), and 1500 mm (Km 325.08, Km 329.84) diameter culverts shall be installed by the Contractor using the trenchless method by hydraulically installing adjacent to the existing culvert, followed by decommissioning of the existing culvert and drainage works necessary to divert water flow into and out of the new culvert location as shown on the Contract Drawings.
 - .2 Complete pipe culvert installation work in the dry. Provide temporary drainage, pumping, hoses, temporary silt fencing and wood posts, fish stop nets, and check dams as shown on the Environmental Staging Drawings (C1011 – C1014) and the Contractor’s EPP.
- 1.2 Measurement and Payment Procedures
 - .1 Payment for the supply and install of varying sizes of new culverts will be made on the basis of the Price per Unit Bid for Culvert Replacement (Varying Diameters) in the Bid and Acceptance Form. The Price per Unit Bid shall include all costs included with the work, including:
 - .1 Supply, transportation to site and installation of the Steel Pipe Culvert by trenchless technologies (i.e. pipe jacking) and required welding. Culvert installation by Open Cut Methods will not be accepted at this location.
 - .2 Excavation and dewatering (if required) to facilitate trenchless culvert installation.
 - .3 Locating and exposing the existing fibre optic cable as directed by and with the assistance of the Onsite Utility Owner Representative, if required.
 - .4 Preparation of working gravel pad to accommodate pipe jacking equipment and length of Steel Pipe Culvert.

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- .5 Removal and offsite disposal of earth material inside the new Steel Pipe Culvert. If an obstruction is encountered during the installation process which prevents further installation of the pipe via pipe jacking, PSPC shall be responsible for the obstruction removal costs.
 - .6 Supply, placement, and compaction of Crushed Base Gravel in any areas around the outside of the culvert where native materials were removed to facilitate the work.
 - .7 Restoration of the disturbed areas.
 - .8 All other items necessary for the successful completion of the work.
- .2 Measurement for Payment for completion of Culvert Replacement (Varying Diameters) will be made on the length of culvert surveyed in lineal metres, measured parallel to the direction of the culvert along the invert of the culvert, and accepted by the Departmental Representative.
 - .3 Payment for the culvert ditching (excavation), end protection, and abandonment of existing culvert will be made on the basis of the Price per Unit Bid for Km (station varies) Culvert Ditching, End Protection, Abandonment of Existing Culvert in the Bid and Acceptance Form. The price per Unit Bid shall include all costs for dewatering (as required), excavation, loading, hauling, and disposal of excavated materials, supply and placement of the bentonite, supply and placement of the riprap, supply and placement of the nonwoven geotextile (channel and ditch), supply and placement of the crushed base gravel, supply and installation of the Grout (and any associated removal of ice, standing water and any other debris), placement of common fill (when required), and all other items necessary for successful completion of the work.
 - .4 Measurement for Payment for completion of Km (station varies) Culvert Ditching, End Protection, Abandonment of Existing Culvert will be made by Lump Sum based on the percentage of the work completed and accepted by the Departmental Representative.
- 1.3 References
- .1 Canadian Standards Association (CSA International), latest edition:
 - .1 CSA-G401, Corrugated Steel Pipe Products.

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- .2 CSA W59, Welded steel construction (metal arc welding).
 - .3 CSA W48, Filler metals and allied materials for metal arc welding.
 - .2 The Pipe Jacking Association – Guide to Best Practices for the Installation of Pipe Jacks and Microtunnels.
 - .3 American Society for Testing and Materials (ASTM), latest edition:
 - .1 ASTM D4832, Standard Test Methods for Preparation and Testing of Controlled Low Strength Material (CLSM) Test Cylinders.
 - .2 ASTM A252, Standard Specification for Welded and Seamless Steel Pipe Piles.
 - .3 ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
- 1.4 Definitions
- .1 Trenchless: Culvert installation through existing ground within strict alignment and grade tolerances using hydraulic equipment without the need for the excavation of the existing ground.
 - .2 Obstruction: Rock or other material which must be removed prior to the continuation of the trenchless culvert installation work.
 - .3 Grout: Ready-mix Controlled Low Strength Material used as an alternative to compacted soil, and is also known as controlled density fill, and several other names, some of which are trademark names of material suppliers. Grout differs from Portland cement concrete as it contains a low cementitious content to reduce strength development for possible future removal.
 - .4 Embankment: gravels and rock material containing no more than 3% organic matter by mass and free from weeds, sod, roots, logs, stumps, frozen lumps, snow, ice, or any other unsuitable material as determined by the Departmental Representative. The maximum size of embankment rock placed within 300 mm of final grade of embankment material shall be 200 mm in diameter.

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- .5 Common Fill: native materials excavated onsite and meeting the material properties for embankment and thus suitable for re-use as fill material as indicated on the contract drawings.
 - .6 Frozen Condition: conditions where the temperature is below zero degrees Celsius and / or in which there is presence of frozen soil or frozen precipitation.
 - .7 Unfrozen Condition: conditions where the temperature is above zero degrees Celsius and which there is no presence of frozen soil or frozen precipitation.
- 1.5 Submittals
- .1 Submittals shall be in accordance with Section 01 33 00 – Submittal Procedures.
 - .2 The following submittals are required:
 - .1 Submit to the Departmental Representative for review and acceptance the steel producer’s certificates for the steel pipe culverts in accordance with ASTM A252.
 - .2 Unless advised otherwise in advance of the work by the Departmental Representative, submit to the Departmental Representative for review and acceptance a Tunneling Methodology report. The report shall be sufficient to convey the following:
 - .1 Proposed method of tunnel construction and type of face support.
 - .2 Manufacturer and type of tunneling equipment proposed.
 - .3 Sequence of operations.
 - .4 Method of spoil transportation from the face and surface storage.
 - .5 Capacity of trenchless equipment and cushioning.
 - .6 Identify critical utility crossings and special precautions proposed.
 - .7 Proposed methodology to remove any obstructions encountered.
 - .8 Slurry injection system details (if required).

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- .3 Submit to the Departmental Representative for review and acceptance a Grout mix design as per Section 03 40 00 – Grout.
- 1.6 Environmental
- .1 Complete culvert installation and related works in conformance with the requirements of Section 01 35 43 – Environmental Protection, the Contractor’s accepted Environmental Protection Plan (EPP).
- .2 The Contractor shall account for the possibility of not being able to complete work due to high flows or adverse weather conditions in the construction schedule and in the unit prices. No payment for temporary work stoppages due to high flows or adverse weather conditions will be made. See Item 3.2 – Work Completion, Subsection .5 through .7 inclusive of Contract Specification Section 01 11 10 – Summary of Work for more information.
- 1.7 Delivery, Storage, and Handling
- .1 Handle and store pipe products in a manner to avoid damage, alteration, deterioration and soiling.
- .2 Where the material supplied is damaged, the Contractor shall immediately separate nested sections of the plate or pipe to facilitate more detailed inspection by the Departmental Representative. Culvert material designated by the Departmental Representative as unacceptable, due to damage or failure to meet specified requirements, shall be immediately repaired or replaced by the Contractor to the acceptance of the Departmental Representative.

PART 2 – PRODUCTS

- 2.1 Steel Pipe Culverts
- .1 Provide steel pipe culverts of required diameter, minimum 12.7 mm wall thickness, and length as shown on the Contract Drawings. The Contractor shall obtain pre-approval from the Departmental Representative should the Contractor choose to substitute pipe culverts with larger diameter or thicker wall thickness than what is specified in the Contract. The substitution of pipe with smaller diameter or thinner wall thickness will not be permitted.
- .2 Steel pipe culverts shall be seamless or welded pipe (spiral or seam) conforming with the requirements of ASTM A252 with a minimum yield strength of 310 MPa.
- .3 Steel pipe culverts shall be delivered to the site in uniform lengths.

- .4 The Contractor shall be responsible for selection of appropriate pipe, pipe joints, and pipe wall thickness to carry the thrust of any trenchless installation forces or any other construction loads in combination with overburden, earth and hydrostatic loads. The trenchless installation equipment shall not unduly damage or distort the ends of the steel pipe culverts during the installation process.
- 2.2 Welding .1 Welding materials to CSA W59.
- .2 Welding electrodes to CSA W48 Series.
- 2.3 Grout .1 The existing abandoned pipe culvert shall be backfilled with Grout in accordance with Section 03 40 00 – Grout.
- 2.4 Nonwoven Geotextile .1 The Nonwoven Geotextile shall achieve or exceed the minimum requirements outlined in Table 33 42 13 - 02.

Table 33 42 13 – 02: Nonwoven Geotextile			
Property	Test	Unit	Value
Grab Tensile Strength	ASTM-D4632	N (lb)	1335 (300)
Elongation	ASTM-D4632	%	50
CBR Puncture	ASTM-D6241	N (lb)	3671 (825)
Trapezoidal Tear	ASTM-D4533	195	512 (115)
Apparent Opening Size	ASTM-D4751	Mm (US Sieve)	0.150 (100)
Permittivity	ASTM-D4491	sec ⁻¹	1.0
Water Flow Rate	ASTM-D4491	l/m ² (gpm/ft ²)	3056 (75)
UV Resistance	ASTM-D4355	% retained at 500 hrs	70

- 2.5 Riprap .1 The riprap for the culvert end protection shall be accordance with Section 31 37 00 – Riprap.
- 2.6 Crushed Base Gravel .1 Crushed Base Gravel shall be manufactured by the Contractor to ensure the material conforms with the following requirements:
- .1 The material shall consist of hard durable particles free from clay lumps, frozen material, organic matter, and other deleterious materials.

- .2 When tested in accordance to ASTM C136/C136M, the material shall have a gradation conforming to the following gradation limits:

Table 31 05 16 - 01: Gradation Limits: Crushed Base Gravel	
Sieve Designation (mm)	Percent Passing by Weight
19	100
12.5	70 – 100
4.75	40 - 70
2.00	23 - 50
0.425	7 - 25
0.075	3 - 8

- .3 If compaction is being completed in frozen condition where water cannot be added during the compaction process to bring the material up to the optimum moisture content, the material shall have a moisture content when tested in accordance with ASTM D2216, less than or equal to 4%.
- .4 Liquid limit when tested in accordance to ASTM D4318, maximum 25.
- .5 Plasticity index when tested in accordance to ASTM D4318, maximum 6.
- .6 Los Angeles degradation when tested in accordance to ASTM C131/C131M, maximum percent loss by weight 35.
- .7 Fracture, at least 60% of particles by mass retained on 4.75 mm sieve to have at least one freshly fractured face.
- .8 Asphalt millings shall not be used as Crushed Base Gravel unless pre-approved by the Departmental Representative.

2.7 Common Fill

- .1 Common Fill shall be native materials designated for excavation and achieving the material properties of embankment.

2.8 Bentonite

- .1 The Contractor shall propose to the Departmental Representative a sodium bentonite product for use as self-sealing low permeability barrier. The sodium bentonite shall be provided in powder form, insoluble in water, and have a low thickening and good binding properties.

PART 3 – EXECUTION

- 3.1 Equipment .1 The Contractor shall be solely responsible for selection of trenchless installation equipment capable of handling the culvert size, ground conditions (including frozen ground and winter temperatures), and existing soils.
- 3.2 Excavation – Trenchless Culvert Installation .1 Install temporary drainage, pumping and construct berms as outlined in the accepted EPP to keep excavations and the work area free from water to the maximum extent possible (see Section 01 35 43 – Environmental Protection).
- .2 Complete all work in accordance with the environmental requirements as outlined in Section 01 35 43 – Environmental Protection and the Contractor’s accepted EPP.
- .3 Complete stripping and excavate highway embankment to facilitate trenchless installation of the new culvert. Minimize excavation of native materials to the extent possible but still allow for the completion of construction. Complete the excavations in compliance with the Occupational Health and Safety Regulations applicable to the location of the work. Where excavation limits require use shoring or take other means necessary to provide a safe excavation.
- .4 Temporarily stockpile excavation to be used as common fill upon inspection by the Departmental Representative. Excavated materials classified by the Departmental Representative as unsuitable for re-use and/or excess excavated material shall be disposed of onsite at locations indicated on the Contract Drawings and pre-approved by the Departmental Representative.
- .5 Cover excavation stockpiled for reuse as Common Fill with an impermeable tarp to protect the embankment material from the weather (snow).
- .6 Any and all embankment / native material excavated or disturbed to facilitate the install of the steel pipe culvert shall be removed and the excavation backfilled with Crushed Base Gravel per the requirements of Item 3.6 – Placement of Crushed Base Gravel of this specification.
- 3.3 Excavation – Channel Re-alignment and Erosion Protection .1 Install temporary drainage, pumping and construct berms as outlined in the accepted EPP to keep excavations and the work area free from water to the maximum extent possible (see Section 01 35 43 – Environmental Protection).

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- .2 Complete all work in accordance with the environmental requirements as outlined in Section 01 35 46 – Environmental Protection and the Contractor’s accepted EPP.
 - .3 Excavate the proposed channel bed and channel slopes to the lines, grades, elevations, and dimensions to facilitate the proposed channel/ditch realignment and Riprap erosion protection at both the inlet and outlet ends as indicated on the Contract Drawings. Excavation to be completed to within +/- 100 mm of the line, grades, and elevations measured normal to the finish surface but not uniformly high or low. Ensure excavation will allow for positive drainage upon placement of riprap.
 - .4 Temporarily stockpile excavated material for later disposal or reuse as Common Fill provided the material excavated achieves the criteria for Embankment and fill is required as per the Contract Drawings.
 - .5 Dispose of excess excavated material from channel re-alignment and erosion protection works onsite at location(s) as indicated on Contract Drawings and pre-approved by the Departmental Representative.
- 3.4 Disposal of Excavated Material
- .1 Excavated material classified by the Departmental Representative as unsuitable for re-use as Topsoil or Embankment Fill and excess excavation shall be disposed of offsite outside PSPC’s Right-of-Way at a disposal facility selected by the Contractor and pre-approved by the Departmental Representative.
- 3.5 Stockpiling
- .1 Should stockpiles on highway right-of-way or on PSPC property be required, stockpile material in locations directed by Departmental Representative. Do not stockpile on completed pavement surfaces.
 - .2 Stockpile material in sufficient quantities to meet project schedules and achieve the requirements of Item 1.9 – Sequence of Work and Item 1.10 - Construction Staging of Section 01 14 00 – Work Restrictions, Access Development, Construction Staging, and Restoration.
 - .3 Stockpile sites to be level, well drained, and of adequate bearing capacity and stability to support stockpiled materials and handling equipment.
 - .4 Except where stockpiled on acceptably stabilized areas, provide compacted Crushed Base Gravel not less than 300 mm in depth to prevent contamination of aggregate. Do not incorporate compacted base of pile into work.

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- .5 Separate stockpiles of different materials by strong, full depth bulkheads, or stockpile far enough apart to prevent intermixing.
- .6 Do not use intermixed or contaminated materials. Remove and dispose of rejected materials as directed by Departmental Representative.
- .7 Do not cone piles or spill material over edges of piles.
- .8 Prevent ice and snow from becoming mixed into stockpile or in material being removed from stockpile.
- 3.6 Installation – Steel Pipe Culvert
- .1 Divert the existing flows from the area of work using a berm or pumps as required and prevent sediment-laden water from entering the water course.
- .2 Use trenchless methods that will minimize movement of the ground in front of and surrounding the steel pipe culverts.
- .3 Perform the trenchless installation as to avoid interference with the operation of the vehicles travelling the highway.
- .4 Install new culvert such that the outside edge is 1.5 m or less in distance from the outside edge of the existing culvert.
- .5 Install suitable gravel pad and or thrust reaction blocks as required for trenchless equipment. Complete excavation as necessary for install of the pipe lengths while minimizing the construction footprint to the extent possible.
- .6 Divert stream water, drainage, and discharge from dewatering away from the trenchless operations to a location in compliance with the Contractor's accepted Environmental Protection Plan (EPP).
- .7 Install steel pipe culvert ensuring the culvert is not reverse graded at any point along the culvert and within +/- 300 mm of the true design line and level at any point along the culvert. Adjustments to the line and level should be gradual to ensure that the steel pipe or joints are not damaged. Monitor line and level of the culvert with appropriate instruments.
- .8 Monitor ground movement (settlement and heave) throughout the trenchless installation. Halt all operations, take immediate remedial action (including notification of the Departmental Representative) if ground movements greater than +/- 50 mm are detected.

- .9 If ground movements in excess of +/- 50 mm are detected, the Departmental Representative will consult with the Contractor and others if required to determine the most appropriate course of action. The install of the steel pipe culverts can only commence again following approval from the Departmental Representative.
- .10 Cushion pipe joints as necessary to transmit the jacking forces without damage to the steel pipe or steel pipe joints.
- .11 Fuse Steel Pipe Culverts sections using Full Penetration Butt welds. Complete welding in accordance with CSA W59.
- .12 If necessary, maintain an envelope of bentonite slurry around the exterior of the pipe during the trenchless installation to reduce the exterior friction and reduce the possibility of the pipe seizing in place.
- .13 If the steel pipe culvert seizes in place and Contractor elects to construct a recovery access shaft, pre-approval must first be obtained from the Departmental Representative.
- .14 In the event a section of pipe is damaged during the trenchless installation, or joint failure occurs, as evident by inspection, visible ground water inflow or other observations, the Contractor shall submit for approval his methods for repair or replacement of the steel pipe culvert. Any steel pipe damage or misalignment of the steel pipe culvert (except as caused by an unanticipated obstruction) shall be removed and replaced by the Contractor at no additional costs to the owner.
- .15 Ensure no voids between the outside of the steel pipe culvert and ground result from the trenchless installation process. Any voids which form shall be filled with pressure grouting. If pressure grouting is necessary, submit pressure grouting materials and procedures to the Departmental Representative for review and acceptance prior to undertaking the work.
- .16 In the event an obstruction is encountered during the trenchless less installation process, notify the Departmental Representative immediately. Await further instruction from the Departmental Representative before proceeding.
- .17 Remove soil materials from within the steel pipes using appropriate equipment. Temporarily stockpile materials for off-site disposal.

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| 3.7 Culvert Ditching, End Protection, and Abandon Existing Culvert | .1 | Place Common Fill in 150 mm lifts. Compact each lift with a minimum of 2 passes of the entire lift area using a Plate Compactor with a nominal operating weight of 454 kg (1000 LB) or larger. Hand tamp where necessary to obtain compaction. Keep Common Fill free from snow and ice during placement. |
| | .2 | Place Bentonite and Crushed Base Gravel on the inlet end of each culvert to the thicknesses and locations shown on the Contract Drawings. |
| | .3 | Install 50 Kg Class Riprap and Nonwoven Geotextile to the lines and grades shown on the Contract Drawings. Ensure positive drainage following riprap placement. |
| | .4 | Dress all riprap voids to ensure that the final surface is well keyed, densely placed, uniform, and allows for positive drainage. Ensure that all surface voids are filled and nonwoven geotextile is concealed by the riprap. |
| | .5 | Following the completion of the steel pipe culvert installation using Trenchless Method, abandoned the existing pipe culvert via the installation of Grout in accordance with Section 03 40 00 – Grout. |
| | .6 | Ensure ends of existing culvert and Grout are encased and not visible at the conclusion of the work in accordance with Section 03 40 00 – Grout. |
| | .7 | Construct ditching to the lines and grades shown on the Contract Drawings. Ensure positive drainage. |
| 3.8 Placement of Crushed Base Gravel | .1 | Compact Crushed Base Gravel in accordance with the following: <ul style="list-style-type: none">.1 Where Crushed Base Gravel is free of frozen material and the air temperature during placement and compaction is greater than 0°C:<ul style="list-style-type: none">.1 Place Crushed Base Gravel in 150 mm lifts and compacted to 98% of the standard maximum dry density in accordance with ASTM D698 or as accepted by the Departmental Representative. When compacting around the steel pipe culvert alternate on each side of the culvert, so as not to allow movement or uplift of the culvert. Take special care to obtain required density under haunches of culvert. Hand tamp where necessary to obtain compaction |

Apply waster as necessary during compaction to obtain specific density. If Crushed Base Gravel is excessively moist, take remedial action as directed by the Departmental Representative.

- .2 Where Crushed Base Gravel contains some frozen material acceptable to the Departmental Representative and/or the air temperature during placement and compaction is less than or equal to 0°C, the moisture content of Crushed Base Gravel when tested in accordance with ASTM D2216 shall be less than or equal to 4%, and compaction shall be undertaken as follows:
 - .1 Place Crushed Base Gravel in 150 mm lifts. Compact each lift with a minimum of 5 passes of the entire lift area using a Plate Compactor with a nominal operating weight of 454 kg (1000 LB) or larger. When compacting around the steel pipe culvert alternate on each side of the culvert, so as not to allow movement or uplift of the culvert. Take special care to obtain required density under haunches of culvert. Hand tamp where necessary to obtain compaction.
 - .2 Finished surfaces of Crushed Base Gravel to be within +/- 100 mm of the lines and grades shown in the Contract Drawings but not uniformly high or low.
 - .3 Finished surfaces of Crushed Base Gravel to be within +/- 100 mm of the lines and grades shown in the Contract Drawings but not uniformly high or low.
 - .4 Unless covered by Common Fill, Hydraulically Seed areas of Crushed Base Gravel and all disturbed areas within the construction limits (see Section 32 93 21 – Hydraulic Seeding for details) excluding finished riprap surfaces.
 - .5 Should settlement of the Crushed Base Gravel occur following placement and compaction (including if working during winter conditions), the resulting settlement is to be corrected under warranty to the tolerances noted in above section 3.6.2.

- 3.9 Placement of Common Fill
- .1 Place Common Fill in 150 mm lifts to full width of excavation / limits shown on the contract drawings. Compact each lift with a minimum of 5 passes of the entire lift area using a Plate Compactor with a nominal operating weight of 453.6 kg (1000 LB) or larger. Keep Common Fill free from snow and ice during placement.
 - .2 Finished surfaces of Common Fill to be within +/- 100 mm of the lines and grades shown in the Contract Drawings but not uniformly high or low.
 - .3 Hydraulically Seed Common Fill and all disturbed areas within the construction limits (see Section 32 93 21 – Hydraulic Seeding for details) excluding finished riprap surfaces.
 - .4 Should settlement of the Common Fill occur following placement and compaction (including if working during winter conditions), the resulting settlement is to be corrected under warranty to the tolerances noted in above section 3.6.2.
- 3.10 Clean-up
- .1 Remove and dispose offsite the half culvert on the outlet of Km 339.66 and Km 355.02 culvert.
 - .2 Clean-up all disturbed areas to an equal or better condition to that prior to construction.
 - .3 Hydraulic Seeding of all disturbed areas per Section 32 93 21 – Hydraulic Seeding.

END OF SECTION

R.115075.003
Appendix A

Written Communication / Document Management Protocol

Alaska Highway Km 325 – 355 Drainage Improvements Project: Written Communication / Document Management Protocol

Communication for the Alaska Highway Km 325 – 355 Drainage Improvements Project (R.115075.003) will occur using CentraCollab, email, telephone, and through the delivery of hardcopy documents (if requested by PSPC). CentraCollab will act as the primary communication and document management tool throughout the project. It will act as the central file storage location for all project documents, allows for retrieval of these documents at any time during the project by group members and is capable of storing and sharing large electronic files.

Email and telephone may be used for general communication, transitory information and other communications where a record is not considered necessary (e.g. day-to-day coordination, in-depth discussion of project elements, etc.). Email shall not be used for the submission of deliverables or other project documentations. Email contact information for project members is provided in the project contact list.

Hardcopy documents are to only be provided if specifically requested by PSPC. The Departmental Representative will provide the Contractor with the necessary address information at the time of the request. Material samples shall be provided directly to the testing lab specified by the Departmental Representative for Quality Assurance purposes or be delivered to the project site.

CentralCollab

CentralCollab is a web-based collaborative platform that is used to submit and store project documentation. It is the responsibility of the submitting party to upload documents to CentralCollab in the correct folder and with the correct file naming convention.

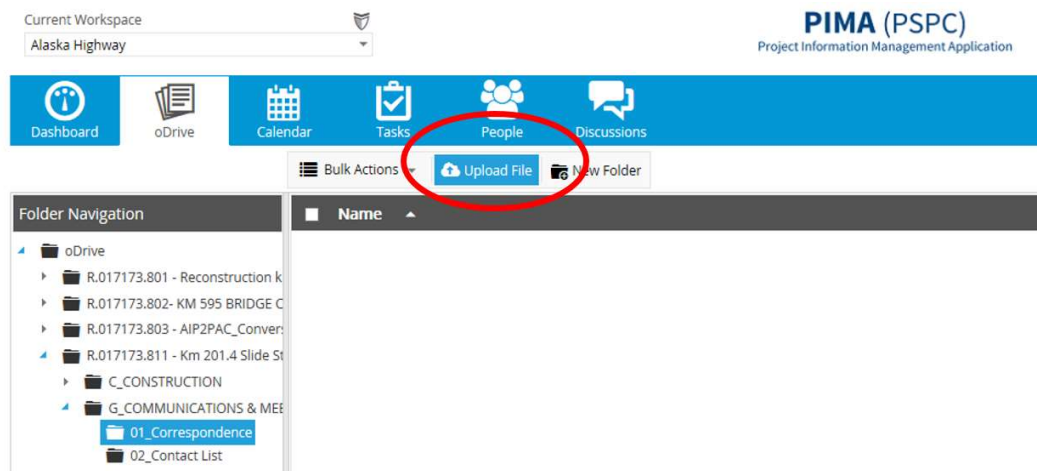
CentralCollab can be accessed at the following address: <https://app.centralcollab.com/>

The contractor is encouraged to have CentralCollab accounts for project team members who are involved with accessing or posting project documentation. Accounts can be created by PSPC throughout the project by contacting the PSPC project team.

Project documentation includes but is not limited to: submittals, deliverables, drawings, reports, meeting minutes, project schedules, notifications, contemplated change notices, change orders, etc.

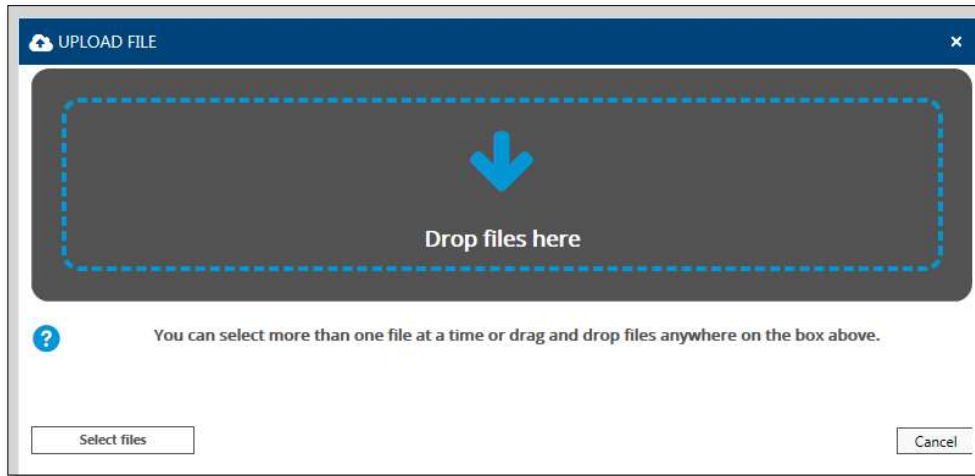
1 Uploading to CentralCollab

Upload individual documents to the appropriate folder on CentralCollab. For folder names, refer to Table 2 of this document. To add files, click on Upload File:

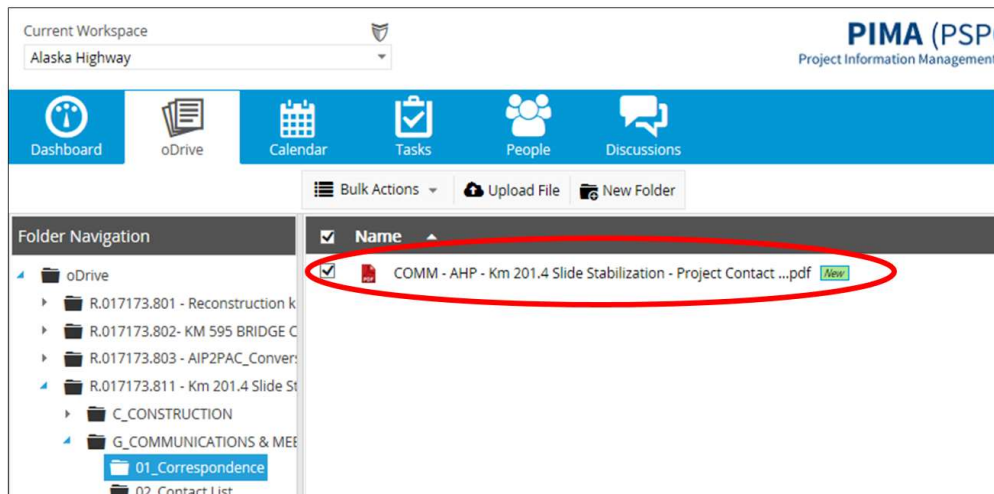


Drag and drop your document(s), then press Save.

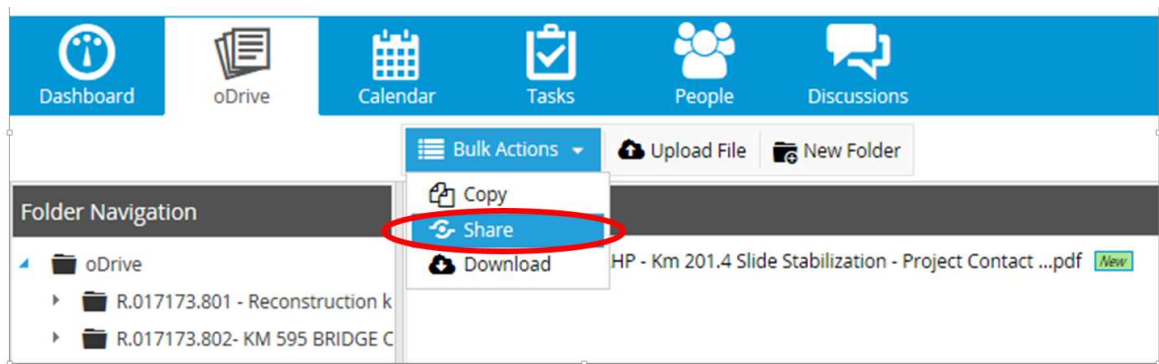
NOTE: Make sure you have named your document correctly, as explained in Section 2.2 CentralCollab File Naming Convention.



Once saved, you will see your new document (circled below), but no one else will be notified until you share it.



To **notify members** of the new document, check the box next to the document ✓ then click **Bulk Actions > Share** :



Once the new window opens, select **To**, and then select the **Members** tab and all Members from whom you wish to notify (as directed during the pre-constriction meeting or otherwise by PSPC) or select the **Groups** tab and select the pre-set group:

Example – Notification Members:

SHARE [Close]

To... Haghighi, Reza x

Subject: Alaska Highway Km 311 - 330: H&S Template

B *I* U abc [List Icons]

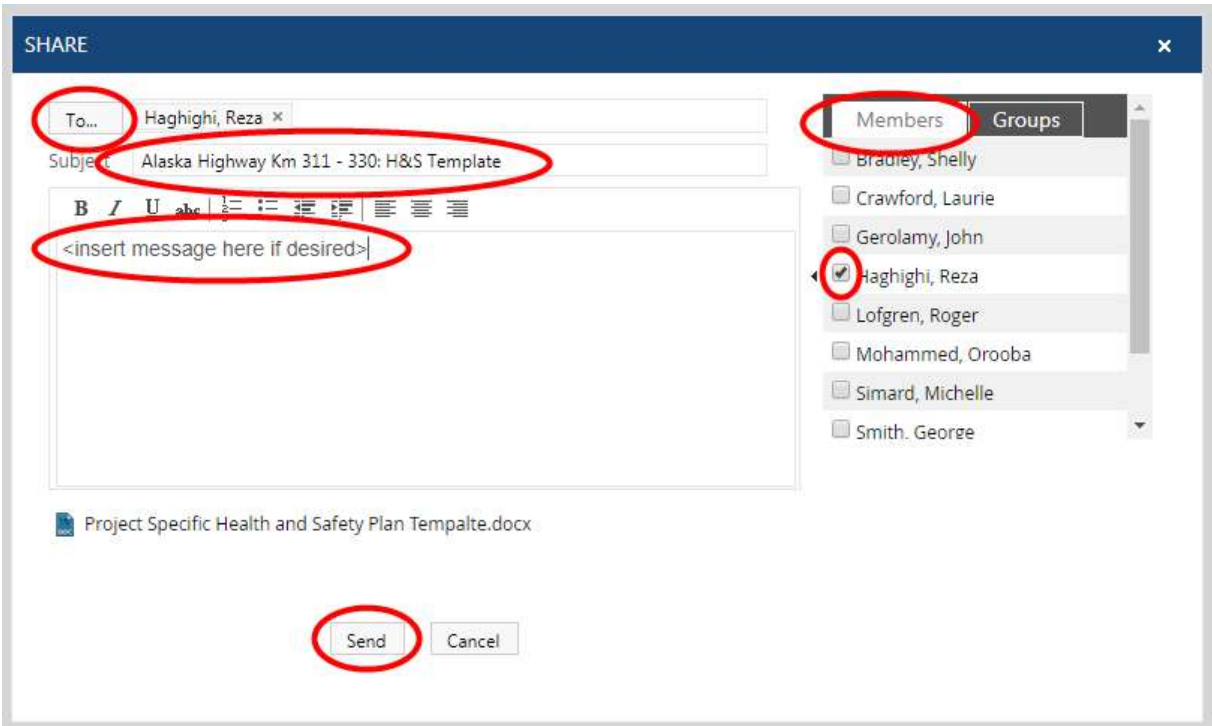
<insert message here if desired>

Project Specific Health and Safety Plan Tempalte.docx

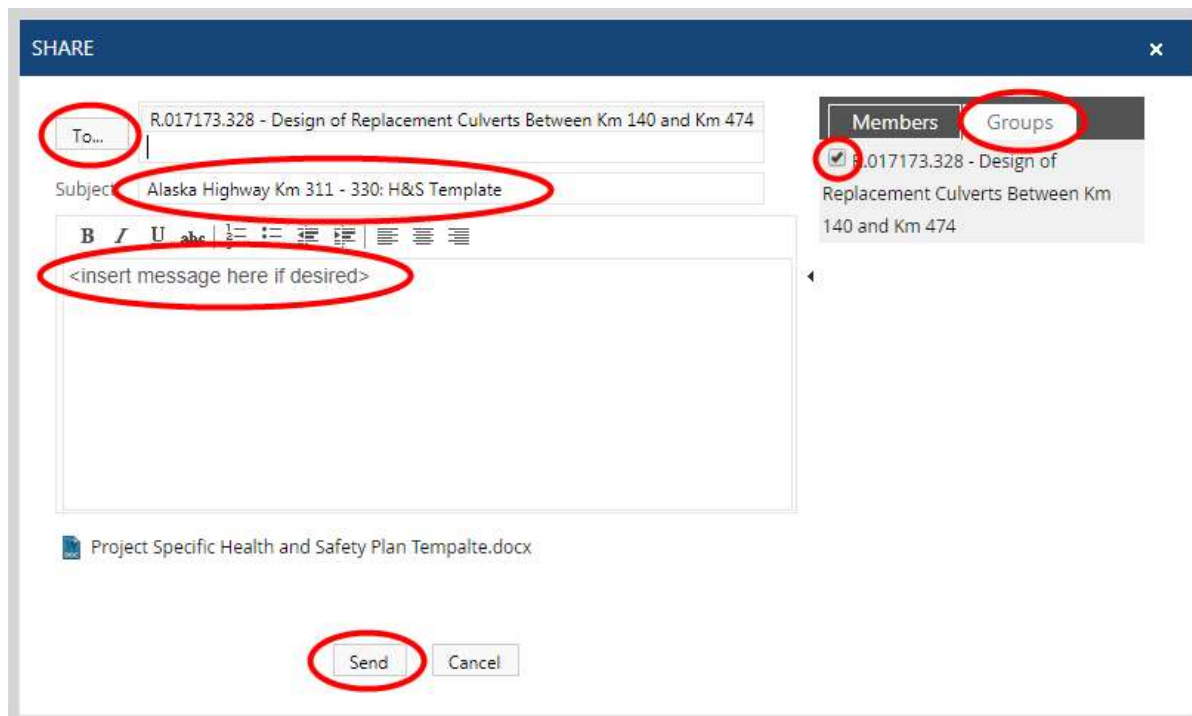
Members **Groups**

- Brauley, Shelly
- Crawford, Laurie
- Gerolamy, John
- Haghighi, Reza
- Lofgren, Roger
- Mohammed, Orooba
- Simard, Michelle
- Smith, George

Send **Cancel**



Example – Notification Pre-set Group (if available):



Insert a message related to the uploaded submittal in the subject line and if desired in the form before sending. Then press **Send**. An email with the link to the document will then provide to all individuals notified with a copy of this email provided to the sender.

2. CentralCollab File Naming Convention:

All CentralCollab users shall upload files named according to the following convention:

Doc Type – AHP – Km XXX Project – File Description or Document Name – YYYY MM DD

Example file names:

- Plan – AHP – Km XXX Project – Quality Management Plan – 2017 02 15
- Schedule – AHP – Km XXX Project – Project Schedule – 2017 02 20
- Finance – AHP – Km XXX Project – Progress Payment 01 – 2017 02 26

The file description should clearly identify the document. The Document type should be selected from the options provided in Table 1:

Table 1: Document Type Options	
Document Type Acronym	Description
Comm	Communication related docs; correspondence, letters, memos, briefing notes, contact lists
Contract	Request for Information (RFI), Contemplated Change Notices (CCN), Change Orders (CO)
Email	Emails
Draw	Drawings and site plans
Finance	Project financial documentation
Image	All non-drawing images, photos etc.
Minutes	Meeting minutes, agendas, and associated documents
Plan	Planning documents, BMPs, SOPs, workplans
Report	Reports of all types- most frequently used for consultant deliverables
Schedule	Any project related schedules
Specs	Specs and terms of references
Other	Other document types, project specific, one-off documents

3. CentralCollab Folder Arrangement:

All files must be uploaded to the correct folder in CentralCollab. To aid in the filing of documents, a listing of common filing / folder locations has been prepared as shown in Table 2.

Table 2: Common Document Filing / Folder Locations	
Folder Names	Description of Typical Documents
CentralCollab folder: R.115075.003 – Km 325 – 355 Drainage Improvements Project > C_CONSTRUCTION > Contract >	
01_Contract	Contract Documents (typically related to documents posted to Buyandsell.gc.ca)
02_Request for Information	Request for Information from Contractor
03_Permits	Permits obtained by Contactor or PSPC
04_Site Instructions	Site Instructions (typically generated by PSPC)
05_CCN	Contemplated Change Notice forms generated by PSPC and pricing responses from Contractor

Table 2: Common Document Filing / Folder Locations	
Folder Names	Description of Typical Documents
06_Change Orders	Change Orders (typically generated by PSPC)
07_Progress Payments	Progress Payment documents (as instructed by PSPC)
08_Field Reviews	Field Review forms (typically generated by PSPC)
09_Health & Safety	Health and Safety related documentation including Project Specific Health and Safety Plan, Tailgate Safety Meeting documentation, and other Health and safety related submittals.
10_Testing Services	Testing Reports completed by Contractor's QC
11_Environmental Plan	Environmental Protection Plan and other environmental related documents
12_Environmental Reporting	Environmental monitoring reports generated by the Contractor's environmental monitor
13_Shop Drawings	Shop drawing submissions provided by the Contractor as required by the contract specifications
14_Deliverables	Contractor Deliverables as required by the contract specifications throughout the project including such items as: <ul style="list-style-type: none"> • Project Schedule • Traffic Management Plan • Construction Staging Drawings • Culvert Mill Certificates • Other supplier information as needed
15_Deficiency List	Deficiency lists (typically generated by PSPC)
16_Certificate of Substantial Performance	Certificate of Substantial Performance as generated by PSPC
17_Certificate of Completion	Certificate of Completion as generated by PSPC
18_Claims	Documentation related to any claims on the project
19_Contract Close out	Documentation related to contract closeout including closeout submittals such as: <ul style="list-style-type: none"> • As-built Surveys • As-built Redline Drawing Mark-ups • Warranties • Instruction Manuals
20_Advisory	Advisories in response to RFIs or other notices as generated by PSPC.
21_Quality Management	Quality control and Quality Assurance documentation generated by the Contractor and PSPC <ul style="list-style-type: none"> • Quality Management Plan • Check Sheets • Daily Reports • NCR's

Table 2: Common Document Filing / Folder Locations	
Folder Names	Description of Typical Documents
CentralCollab folder: R.115075.003 – Km 325 - 355 Drainage Improvements Project > G_COMMUNICATIONS & MEETINGS >	
01_Correspondence	Emails and other correspondence requiring posting to CentralCollab, generated by the Contractor or PSPC
02_Contact List	Project contact list generated by PSPC
03_ATIP	
04_Communications Plan	Communication plan generated by PSPC
05_Supporting Documents	
06_Meeting Minutes	Meeting minutes as generated by PSPC
07_Inquiries	
08_Public Notices	
09_Other	
CentralCollab folder: R.115075.003 – Km 325 – 355 Drainage Improvements Project > Z_BASE DATA>	
01_Base Data	Digital drawings and other documentation required by the Contractor (typically generated by PSPC)

Typical folders Users are encouraged to create sub-folders and categorize documents of similar or related data.
Example sub-folders:

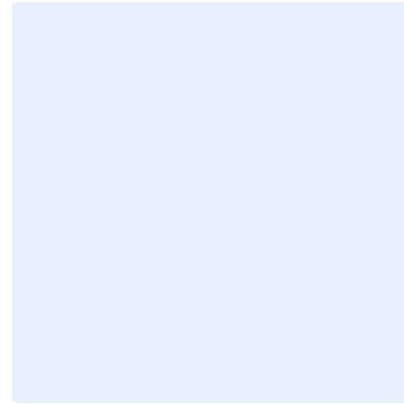
- 09_Health & Safety > **Tailgate Meetings** > **February**
- 14_Deliverables > **Project Schedule**
- 21_Quality Management > **Check Sheets** > **February**

R.115075.003

Appendix B

Project Specific Health and Safety Plan Template

Note: The Project Specific Health and Safety Plan Template is provided to assist the Contractor. PSPC takes no responsibility for the completeness of this template. The Contractor is responsible for verifying that all required information is provided in their Project Specific Health and Safety Plan.



<insert company logo/information>

PROJECT SPECIFIC HEALTH AND SAFETY PLAN

Alaska Highway Km 325 – 355 Drainage Improvements
Project
R.115075.003

<Date>

<Rev. Number>

Prepared for:



Public Services and
Procurement Canada

Services publics et
Approvisionnement Canada

The Contractor shall ensure that this document is available on site for the project duration and available to all workers.

<This template is provided to aid the Contractor in preparing their project specific health and safety plan according to the contract requirements. It is the responsibility of the Contractor to ensure that all required information is presented in their project specific health and safety plan to meet the requirements of the project specifications and WorkSafeBC's health and safety obligations. The Contractor shall review all aspects of this template and make changes and additions as needed to suit the project requirements.>

Table of Contents

- 1. Contractors Safety Policy / Statement..... **XX**
- 2. Project Health and Safety Compliance Obligations **XX**
- 3. Definition of Responsibilities **XX**
- 4. General Project Safety Rules **XX**
- 5. Health and Safety Risks / Hazards and Engineering and Administrative Control Measures **XX**
 - 5.1 Workplace Hazard Assessment – Health and Safety Risks Identified **XX**
 - 5.2 Hazardous Materials **XX**
 - 5.3 Job Specific Work Procedures **XX**
 - 5.4 Required PPE and Training **XX**
 - 5.5 First Aid Requirements **XX**
- 6. Inspection Policy and Procedures **XX**
- 7. Incident Reporting and Investigation Policy **XX**
- 8. Occupational Health and Safety **XX**
 - 8.1 Representative/Committee Procedures **XX**
 - 8.2 Meetings **XX**
 - 8.3 Communications and Record Keeping Procedures **XX**
- 9. Emergency Contact Information **XX**
- 10. Wildlife Management **XX**
- 11. Fire Safety, Reporting and Evacuation **XX**
- 12. Contractor Review and Acceptance **XX**

Appendix 1: Preliminary Hazard Assessment Form

Note: The Preliminary Hazard Assessment Form is provided for the Contractor’s reference only and is not necessarily a comprehensive list of all hazards. PSPC takes no responsibility for the completeness or any misrepresentation by the Contractor of the on-site hazards based on the information found in the Preliminary Hazard Assessment Form. The Contractor shall remain responsible for the identifying and mitigating against all hazards on the project.

Appendix 2: Confirmation of Prime Contractor’s Main Responsibilities Under the WorkSafeBC Occupational Health and Safety Regulations and Worker’s Compensation Act Form

Appendix 3: Contractor’s COVID-19 Safe Work Plan

Appendix 4: Contractor Daily Toolbox Meeting Form

Appendix 5: Site Safety Orientation Form

<Project Name>

<Contractor>

<Date>

Project Specific Health and Safety Plan

<Revision Number>

Appendix 6: Incident/Accident Report Template

Appendix 7: Key Member Resumes and Safety Certifications

Appendix 8: Local Hospital Maps

Appendix 9: Safe Work Procedures

<Project Name>
<Contractor>
<Date>

Project Specific Health and Safety Plan
<Revision Number>

1. Contractor Safety Policy / Statement

<A statement about the Contracting companies' policy regarding health and safety on the project site.>

2. Project Health and Safety Compliance Obligations

The submission of the Project Specific Health and Safety Plan indicates <Contracting Company Name> commitment to comply with all health and safety related obligations from the following:

- All procedures, rules and policies from this Project Specific Health and Safety Plan
- WorkSafeBC Requirements
- Project Specifications
- <Other, add any other requirements that apply>

3. Definition of Responsibilities

<A clear description of the health and safety related responsibilities for key members of the Contractor's project team. The table below is provide to assist with presenting this information.>

Position	Name(s)	Description of Health and Safety Responsibilities
Project Manager		
Project Superintendent		
Health and Safety Coordinator		
First Aid Attendant(s)		
Supervisors		
Workers		
Sub-Contractors		

4. General Project Safety Rules

<A list of general construction safety rules and regulations that the company will adhere to. Additionally, a description of the disciplinary action procedure for disregard or negligence of the provide rules.>

5. Health and Safety Risks / Hazards and Engineering and Administrative Control Measures

5.1 Workplace Hazard Assessment – Health and Safety Risks Identified

<Summary of health risks and safety hazards resulting from hazard assessment analysis of the circumstances of each "workplace" including:

- The number of workers who may require first aid at any time;
- The nature and extent of the risks and hazards in the workplace;
- The types of injuries likely to occur;
- Any barriers to first aid being provided to an injured worker or member of the public; and
- The time that may be required to obtain transportation and to transport an injured worker to medical treatment>

<Project Name>
<Contractor>
<Date>

Project Specific Health and Safety Plan
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<Statement from the Contractor indicating the hazard rating assignment (low, moderate, or high) for each "workplace" as defined by WorkSafeBC and applicable to the application of G3.16 of WorkSafeBC Occupational Health and Safety Regulations>

<The table below can be used as a template for the format of this section. Three workplaces are shown as an example, but the Contractor may extend or trim the table as applicable to the proposed work in the Contract.>

Workplace 1	
Number of Workers	
Risks / Hazards Descriptions	
Type of Injuries	
Barriers to First Aid	
Time to Obtain Transport	
WorksafeBC Hazard Rating Assessment	Low, Medium or High
Workplace 2	
Number of Workers	
Risks / Hazards Descriptions	
Type of Injuries	
Barriers to First Aid	
Time to Obtain Transport	
WorksafeBC Hazard Rating Assessment	Low, Medium or High
Workplace 3	
Number of Workers	
Risks / Hazards Descriptions	
Type of Injuries	
Barriers to First Aid	
Time to Obtain Transport	
WorksafeBC Hazard Rating Assessment	Low, Medium or High

<WorksafeBC Hazard Assessment Rating: The following links to the specific sections of the WorksafeBC OHS regulations will assist in determining the Hazard Rating Assessment for each workplace.

<https://www.worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/ohs-guidelines/guidelines-part-03#SectionNumber:G3.16>

<https://www.worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/ohs-regulation/part-03-rights-and-responsibilities#Schedule3A>

>

5.2 Hazards Materials

<List of hazardous materials to be brought onsite as required by the work>

5.3 Job Specific Safe Work Procedures

<Review your company safe work procedures to ensure that there are procedures for all tasks relevant to the project. In the case that your company does not have an existing safe work procedure for a specific task please provide this procedure in appendix 8.>

<Project Name>
<Contractor>
<Date>

Project Specific Health and Safety Plan
<Revision Number>

All job specific safe work procedures are available in <Contracting Company Name> corporate Health and Safety Plan and are available to all employees on site and the PSPC team upon request. Procedures that are not available in <Contracting Company Name> corporate Health and Safety Plan can be found in Appendix 8. <remove last sentence if not required>.

5.4 Required PPE and Training

<Identification of the PPE and description of the training required for any members of the contractor's project team and PSPC's team visiting the site.>

5.5 First Aid Requirements

<Identification of the First Aid Requirements for each "workplace" in compliance with WorkSafeBC and project requirements as follows:

- .1 Estimated travel time from the "workplace" to the nearest hospital.
- .2 Maximum numbers of workers at any time per "workplace".
- .3 The first aid supplies, equipment, and facilities which will be available at each "workplace".
- .4 The first aid attendant certificate level onsite at each "workplace".
- .5 The first aid transportation which will be used on the project (ie. ETV), if required by Contractor or WorkSafeBC requirements. Details of where the ETV will be located / parked relative to the locations of the first aid attendant(s) during the work.>

6. Inspection Policy and Procedures

<A description of the site inspection policy and procedure. The procedure should include identification of investigator, completion of a site inspection form and how the findings of the inspection will be presented to the remainder of the construction team.>

7. Incident Reporting and Investigation Policy

<A description of the procedure completed following an incident occurring on site. The procedure should include the completion of an incident/accident report (template to be provided by the contractor in Appendix 5)>

8. Occupational Health and Safety

8.1 Representative/Committee Procedures

<A description of the procedures that will be completed regularly throughout the project to keep the project site safe for all contractor's personnel, travelling public and PSPC's project team members.>

8.2 Meetings

<A description of the health and safety meetings that will be completed throughout the project. This section could include the frequency of meetings and the agenda that will be followed.>

8.3 Communications and Record Keeping Policies

<Project Name>
 <Contractor>
 <Date>

Project Specific Health and Safety Plan
 <Revision Number>

<A description of the policies related to health and safety communications and record keeping. This needs to include a description of the files that will be kept and how communication regarding health and safety will proceed with the entire project team, including the owner's team, the prime contractor's team and all sub-contractors.>

9. Emergency Contact Information

9.1 Key Project Contact Numbers

Contractor's Team			
Name and Position	Office Number	Cell Phone Number	Sat Phone (If Used)
Project Superintendent			
Health and Safety Coordinator			
First Aid Attendant(s)			
Key Sub-Contractor Representatives			
PSPC Team			
Name and Position	Office Number	Cell Phone Number	Satellite Phone
George Smith – Contract Asset Performance Manager, Alaska Highway	250.774.6956	250.321.0174	600.700.0131
XXX – Onsite Inspection and QA Representative			

9.2 Emergency Response Agencies/Assistance

<Note: The contractor is responsible for verifying that all the numbers listed below are correct and up to date and that all required numbers are presented. Please remove any emergency numbers that are not in the project vicinity. **911** is not available in the Fort Nelson Northern Rockies Regional Municipality. Contractor shall confirm if **911** is available in the project location. If not available in project location, make note in table as not available at project site>

Agency/Assistance	Contact
RCMP	911
Local Police – Fort Nelson (emergency)	250.774.2777
Local Police – Fort Nelson (non-emergency)	250.774.2700
Local Police – Fort St. John (emergency)	250.787.8100
Local Police – Fort St. John (non-emergency)	250.787.8140
Local Police – Watson Lake (emergency)	867.536.5555

<Project Name>
 <Contractor>
 <Date>

Project Specific Health and Safety Plan
 <Revision Number>

Local Police – Watson Lake (non-emergency)	867.536.2677
BC Ambulance (BC Emergency Health Services)	911 / 1.800.461.9911 / 250.374.5937
Ambulance – Fort Nelson	250.774.2344
Ambulance – Fort St. John	250.785.5559
Ambulance – Watson Lake	867.536.4444
S.T.A.R.S Ambulance	1.888.888.4567
Hospitals	
Local Hospital – Fort Nelson	250.774.8100
Local Hospital – Fort St. John	250.262.5200
Local Hospital – Watson Lake	867.536.4444
Fire and Rescue	911
Fire and Rescue – Fort St. John	250.785.4333
Fire and Rescue – Fort Nelson (emergency)	250.774.2222
Fire and Rescue – Fort Nelson (non-emergency)	250.774.3955
Fire and Rescue – Watson Lake (emergency)	867.536.2222
Fire and Rescue – Watson Lake (non-emergency)	867.536.8008
BC Forest Fire Reporting	1.800.663.5555 / *5555 (Cell)
Yukon Forest Fire Reporting	1.888.798.3473
WorkSafeBC Work Site Emergency 24 hr	1.888.621.7233
WorkSafeBC Regional Office	1.800.663.4630 / 250.785.1283
HazMat 24 hr	1.800.663.3456
BC Environmental - PEP 24 hr	1.800.663.3456
BC Environmental Regional Office	250.787.3411
BC Hydro – Power (emergency) 24 hr	911
BC Hydro – Power (non-emergency)	1.800.224.9376
Fortis BC – Natural Gas Emergencies 24 hr	1.800.663.9911
Northwestel – Corporate Office (Whitehorse)	867.668.5300
BC One Call	1.800.474.6886 / *6868 (Cell)
Poison Control	1.800.567.8911 / *311 (Cell)
Commercial Vehicle Inspection and Standards (CVSE)	
Reporting Safety Violations 24 hr	1.888.775.8785
Peace River Regional Office	250.784.2363

10. Wildlife Management

<Identify any training and processes for project members regarding wildlife encounters and prevention.>

11. Fire Safety, Reporting and Evacuation

<Identify any fire safety policies, project specific reporting and evacuation procedures.>

<Project Name>
<Contractor>
<Date>

Project Specific Health and Safety Plan
<Revision Number>

12. Contractor's Team Review and Acceptance

This document has been prepared through discussions with the Contractor's entire project team <including sub-contractors (if applicable)>, and will be enforced by the contractor for the duration of the project. By signing this document, the signee confirms that they have reviewed the document and agree with its contents.

Project Manager

_____	_____	_____
Name	Signature	Date

Site Superintendent

_____	_____	_____
Name	Signature	Date

Health and Safety Manager

_____	_____	_____
Name	Signature	Date

Quality Control Manager

_____	_____	_____
Name	Signature	Date

<Major Sub-Contractor Representatives>

_____	_____	_____
Name	Signature	Date

<Major Sub-Contractor Representatives>

_____	_____	_____
Name	Signature	Date

Appendix 1: Preliminary Hazard Assessment Form



PRELIMINARY HAZARD ASSESSMENT FORM

Project Number:	
Location:	
Date:	
Name of Departmental Representative:	
Name of Client:	
Name of Client Project Co-ordinator	George Smith PH: 250.774.6956

Site Specific Orientation Provided at Project Location Yes No

Notice of Project Required Yes No

NOTE:
PSPC REQUIRES A Notice of Project FOR ALL CONSTRUCTION WORK RELATED ACTIVITIES

NOTE:
OHS law is made up of many municipal, provincial, and federal acts, regulations, bylaws and codes. There are also many other pieces of legislation in British Columbia that impose OHS obligations.

Important Notice: This hazard assessment has been prepared by PSPC for its own project planning process, and to inform the service provider of actual and potential hazards that may be encountered in performance of the work. PSPC does not warrant the completeness or adequacy of this hazard assessment for the project and the paramount responsibility for project hazard assessment rests with the service provider.

TYPES OF HAZARDS TO CONSIDER	Potential Risk for:				COMMENTS
	PSPC, OGD's, or tenants		General Public or other contractors		
Examples: Chemical, Biological, Natural, Physical, and Ergonomic Listed below are common construction related hazards. Your project may include pre-existing hazards that are not listed. Contact the Regional Construction Safety Coordinator for assistance should this issue arise.	Yes	No	Yes	No	Note: When thinking about this pre-construction hazard assessment, remember a hazard is anything that may cause harm, such as chemicals, electricity, working from heights, etc; the risk is the chance, high or low, that somebody could be harmed by these and other hazards, together with an indication of how serious the harm could be.

Typical Construction Hazards					
Concealed/Buried Services (electrical, gas, water, sewer etc)					
Slip Hazards or Unsound Footing					
Working at Heights					
Working Over or Around Water					
Heavy overhead lifting operations, mobile cranes etc.					
Marine and/or Vehicular Traffic (site vehicles, public vehicles, etc.					



Fire and Explosion Hazards					
High Noise Levels					
Excavations					
Blasting					
Construction Equipment					
Pedestrian Traffic (site personnel, tenants, visitors, public)					
Multiple Employer Worksite					Example: Contractor working in an occupied Federal Employee space.

Electrical Hazards					Comments
Contact With Overhead Wires					
Live Electrical Systems or Equipment					
Other:					
Physical Hazards					
Equipment Slippage Due To Slopes/Ground Conditions					
Earthquake					
Tsunami					
Avalanche					
Forest Fires					
Fire and Explosion Hazards					
Working in Isolation					
Working Alone					
Violence in the Workplace					
High Noise Levels					
Inclement weather					
High Pressure Systems					
Other:					
Hazardous Work Environments					
Confined Spaces / Restricted Spaces					Review and provide confined space assessment(s) from PSPC or client confined space inventories. Refer to PSPC Standard on Entry into Confined Spaces. Contact the Regional Construction Safety Coordinator.
Suspended / Mobile Work Platforms					
Other:					
Biological Hazards					
Mould Proliferations					
Accumulation of Bird or Bat Guano					
Bacteria / Legionella in Cooling Towers / Process Water					
Rodent / Insect Infestation					
Poisonous Plants					
Sharp or Potentially Infectious Objects in Wastes					
Wildlife					
Chemical Hazards					



Asbestos Materials on Site					If "yes" a pre-project asbestos survey report is required. Provide Contractor with DP – 057 ELF Form 16 "Contractor Notification and Acknowledgement"
Designated Substance Present					If "yes" a pre-project designated substance survey report is required.
Chemicals Used in work					
Lead in paint					If "yes" a pre-project lead survey report is required.
Mercury in Thermostats or Switches					If "yes" a pre-project mercury survey report is required.
Application of Chemicals or Pesticides					
PCB Liquids in Electrical Equipment					
Radioactive Materials in Equipment					
Other:					
Contaminated Sites Hazards					
Hazardous Waste					
Hydrocarbons					
Metals					
Other:					

Security Hazards					Comments
Risk of Assault					
Other:					
Other Hazards					

Other Compliance and Permit Requirements ¹	YES	NO	Notes / Comments ²
Is a Building Permit required?			
Is an Electrical permit required?			
Is a Plumbing Permit required?			
Is a Sewage Permit required?			
Is a Dumping Permit required?			
Is a Hot Work Permit required?			
Is a Permit to Work required?			Mandatory for ALL AFD managed work sites.
Is a Confined Space Entry Permit required?			Mandatory
Is a Confined Space Entry Log required			Mandatory for all Confined Spaces
Discharge Approval for treated water required			

Notes:

- (1) Does not relieve Service Provider from complying with all applicable federal, provincial, and municipal laws and regulations.
- (2) TBD means To Be Determined by Service Provider.



Service Provider Acknowledgement: We confirm receipt and review of this Pre-Project Hazard Assessment and acknowledge our responsibility for conducting our own assessment of project hazards, and taking all necessary protective measures (which may exceed those cited herein) for performance of the work.

Service Provider Name			
Signatory for Service Provider		Date Signed	
RETURN EXECUTED DOCUMENT TO PSPC DEPARTMENTAL REPRESENTATIVE PRIOR TO ANY WORK COMMENCING			

<Project Name>
<Contractor>
<Date>

Project Specific Health and Safety Plan
<Revision Number>

**Appendix 2: Confirmation of Prime Contractor's Main Responsibilities Under
WorkSafeBC Occupational Health and Safety Regulations and Worker's Compensation
Act Form**



Confirmation of Prime Contractor's Main Responsibilities Under the Worksafe B.C. Occupational Health and Safety Regulations and *Worker's Compensation Act*

Name of Project: _____

Owner: Public Services and Procurement Canada

Contractor: _____

Consulting Engineer: Tetra Tech

	YES	NO
1. The Contractor acknowledges appointment as Prime Contractor on the construction project noted below	<input type="checkbox"/>	<input type="checkbox"/>
2. The name of the Prime Contractor's Qualified Coordinator of occupational health and safety activities for this project has been submitted to the Owner and is as shown below.	<input type="checkbox"/>	<input type="checkbox"/>
3. The Prime Contractor understands that in any conflict of directions, WCB OH&S Regulations and/or the Worker's Compensation Act shall prevail.	<input type="checkbox"/>	<input type="checkbox"/>
4. The Prime Contractor understands and will direct that all supervisors/coordinators must immediately report any apparent conflict as described above.	<input type="checkbox"/>	<input type="checkbox"/>
5. The Prime Contractor agrees that their supervisor shall immediately notify the consulting Engineer's representative of any reported conflict.	<input type="checkbox"/>	<input type="checkbox"/>
6. The Prime Contractor has requested and received information from the Owner regarding any known hazards to the health and safety of persons pre-existing at the workplace.	<input type="checkbox"/>	<input type="checkbox"/>
7. The Prime Contractor has conducted an inspection of the workplace to verify the presence of any hazards.	<input type="checkbox"/>	<input type="checkbox"/>
8. The Prime Contractor will communicate hazards information to any persons who may be affected and ensure that appropriate measures are taken to effectively control or eliminate the hazards.	<input type="checkbox"/>	<input type="checkbox"/>
9. The Prime Contractor accepts that written documentation such as notes, records, inspections, meeting minutes, etc., on all health and safety issues must be available upon request to the PSPC departmental representatives and/or to a WCB officer at the workplace.	<input type="checkbox"/>	<input type="checkbox"/>
10. The Prime Contractor will confirm that all workers are suitably trained and competent to perform the duties for which they have been assigned.	<input type="checkbox"/>	<input type="checkbox"/>
11. The Prime Contractor confirms that safety orientation of all new workers will be conducted.	<input type="checkbox"/>	<input type="checkbox"/>
12. The Prime Contractor's written Safety Program has been provided to the Owner's representative.	<input type="checkbox"/>	<input type="checkbox"/>
13. The Prime Contractor confirms that meetings to exchange information on any safety issues, concerns, hazards or safety directives will be conducted weekly or more often if required.	<input type="checkbox"/>	<input type="checkbox"/>
14. The Prime Contractor confirms that before the commencement of work, crews will attend a daily crew safety meeting.	<input type="checkbox"/>	<input type="checkbox"/>
15. The Prime Contractor confirms that their supervisor has assessed and will coordinate the workplace first-aid requirements	<input type="checkbox"/>	<input type="checkbox"/>
16. The Prime Contractor confirms that the procedure to transport injured workers is established	<input type="checkbox"/>	<input type="checkbox"/>

Prime Contractor Representative's

Name: _____

Title: _____ Signature: _____

Date: _____

Prime Contractor's OH&S Coordinator

Name: _____

Title: _____ Signature: _____

Date: _____

<Project Name>
<Contractor>
<Date>

Project Specific Health and Safety Plan
<Revision Number>

Appendix 3: Contractor's COVID-19 Safe Work Plan
<provided by the Contractor>

<Project Name>
<Contractor>
<Date>

Project Specific Health and Safety Plan
<Revision Number>

Appendix 4: Contractor Daily Toolbox Meeting Form
<provided by the Contractor>

<Project Name>
<Contractor>
<Date>

Project Specific Health and Safety Plan
<Revision Number>

Appendix 5: Site Safety Orientation Form
<provided by the Contractor>

<Project Name>
<Contractor>
<Date>

Project Specific Health and Safety Plan
<Revision Number>

Appendix 6: Incident/Accident Report Template
<provided by the Contractor>

<Project Name>
<Contractor>
<Date>

Project Specific Health and Safety Plan
<Revision Number>

Appendix 7: Key Member Resumes and Safety Certifications
<provided by the Contractor>

<Project Name>
<Contractor>
<Date>

Project Specific Health and Safety Plan
<Revision Number>

Appendix 8: Local Hospital Maps

<Project Name>
<Contractor>
<Date>

Project Specific Health and Safety Plan
<Revision Number>

<remove unnecessary maps>

Fort Nelson General Hospital (5315 Liard St, Fort Nelson)



Directions

<If Project Site South of Fort Nelson>

<Head Northbound on the Alaska Highway

Turn Right onto Liard St.>

<If Project Site North of Fort Nelson>

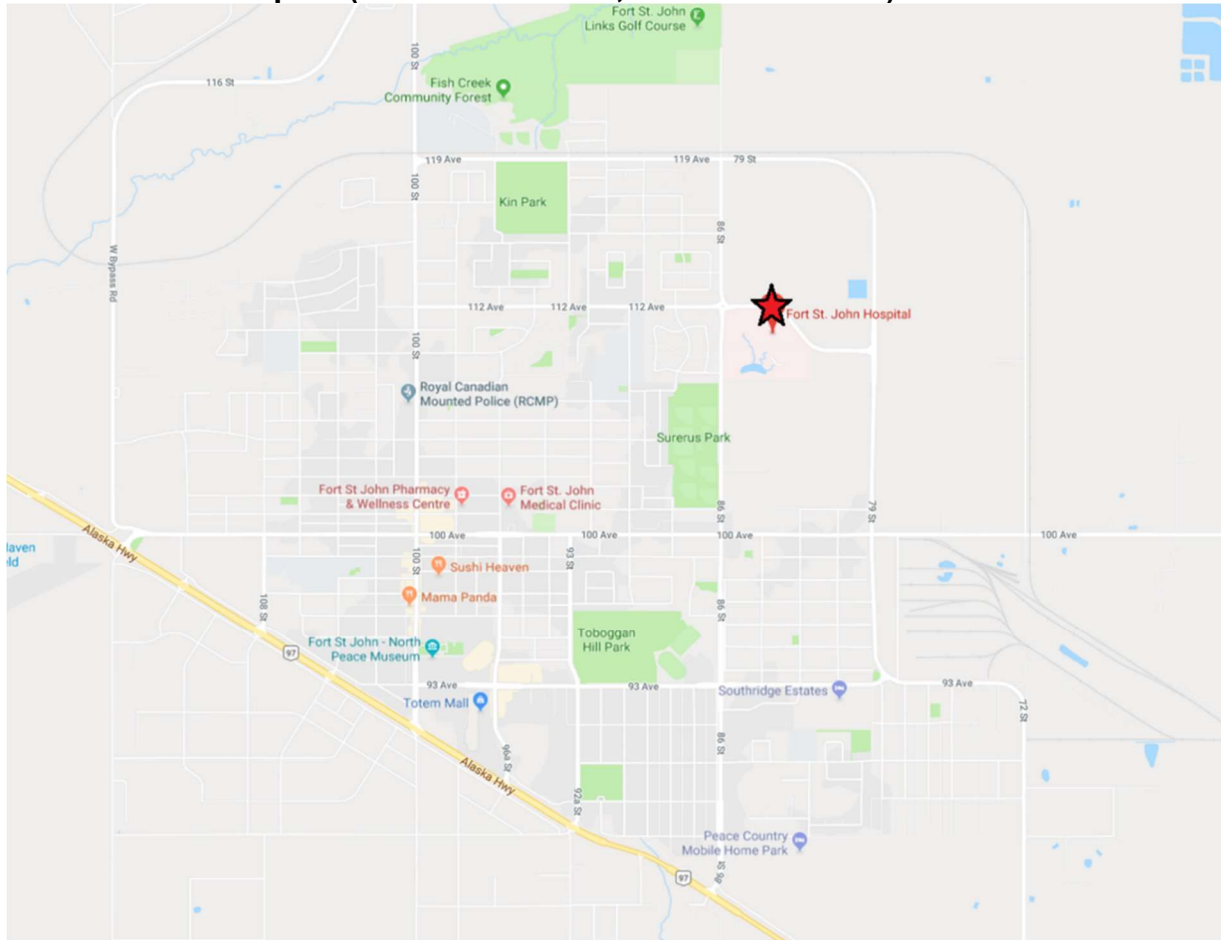
<Head Southbound on the Alaska Highway

Turn Left onto Liard St.>

<Project Name>
<Contractor>
<Date>

Project Specific Health and Safety Plan
<Revision Number>

Fort St. John Hospital (8407 112 Avenue, Fort St. John BC)



Directions

Head Southbound on the Alaska Highway

Turn Left onto 100 Ave.

Turn Left onto 86 St.

At the roundabout, take the 1st exit onto 112 Avenue

Turn Right toward Drop-off Loop

Continue straight onto Drop-off Loop

<Project Name>
<Contractor>
<Date>

Project Specific Health and Safety Plan
<Revision Number>

Appendix 9: Safe Work Procedures *<if required>*

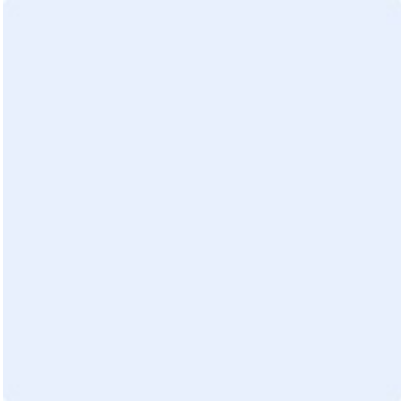
R.115075.003

Appendix C

Category 1

Traffic Management Plan Template

Note: The Category 1 Traffic Management Plan Template is provided to assist the Contractor. PSPC takes no responsibility for the completeness of this template. The Contractor is responsible for verifying that all required information is provided in their Traffic Management Plan.



<insert company logo/information>

Category 1 Traffic Management Plan

Alaska Highway Km 325 – 355
Drainage Improvements Project
R.115075.003

<Date>

Rev. <Number>

Prepared for:



Public Services and
Procurement Canada

Services publics et
Approvisionnement Canada

The Contractor shall ensure that this document is available on site to all workers for the project duration.

<This template is provided to aid the Contractor in preparing their traffic management plan according to the contract requirements. It is the responsibility of the Contractor to ensure that all required information is presented in their traffic management plan to meet the requirements of the project specifications and British Columbia Ministry of Transportation and Infrastructure's Traffic Management Manual for Work on Roadways – 2020 Office Edition. The Contractor shall review all aspects of this template and make changes and additions as needed to suit the project requirements.>

<Project Name>
<Contractor>
<Date>

Traffic Management Plan
<Revision Number>

Site Diagram	

<Project Name>
 <Contractor>
 <Date>

Traffic Management Plan
 <Revision Number>

Contact List

Emergency Response Agencies/Assistance

Agency/Assistance	Contact 1	Contact 2
RCMP	911	
Local Police – Fort Nelson (emergency)	250.774.2777	
Local Police – Fort Nelson (non-emergency)	250.774.2700	
Local Police – Fort St. John (emergency)	250.787.8100	
Local Police – Fort St. John (non-emergency)	250.787.8140	
Local Police – Watson Lake (emergency)	867.536.5555	
Local Police – Watson Lake (non-emergency)	867.536.2677	
BC Ambulance		
Ambulance – Fort Nelson	250.774.2344	
Ambulance – Fort St. John	250.785.5559	
Ambulance – Watson Lake	867.536.4444	
S.T.A.R.S Ambulance	1.888.888.4567	
Fire and Rescue		
Fire and Rescue – Fort St. John	250.785.4333	
Fire and Rescue – Fort Nelson (emergency)	250.774.2222	
Fire and Rescue – Fort Nelson (non-emergency)	250.774.3955	
Fire and Rescue – Watson Lake (emergency)	867.536.2222	
Fire and Rescue – Watson Lake (non-emergency)	867.536.8008	
BC Forest Fire Reporting	1.800.663.5555	*5555 (Cell)
Yukon Forest Fire Reporting	1.888.798.3473	
WorkSafeBC Work Site Emergency 24 hr	1.888.621.7233	1.800.663.4630 250.785.1283 (Non-emergency)
HazMat 24 hr	1.800.663.3456	
BC Environmental Provincial Emergency Program 24 hr	1.800.663.3456	
BC Environmental Regional Office	250.787.3411	
BC Hydro – Power (Emergency) 24 hr	911	1.800.224.9376 (Non-emergency)
Fortis BC – Natural Gas Emergencies 24 hr	1.800.663.9911	
BC One Call	1.800.474.6886	*6868 (Cell)
Northwestel (Corporate Office Whitehorse)	1.867.668.5300	
Poison Control	1.800.567.8911	*311 (Cell)
Reporting Safety Violations 24 hr	1.888.775.8785	
Peace River Regional Office	250.784.2363	

<Project Name>
 <Contractor>
 <Date>

Traffic Management Plan
 <Revision Number>

Provincial Emergency Program (Ground Search & Rescue)	24 hr	1.800.663.3456	
Commercial Vehicle Inspection and Standards (CVSE)		1.888.775.8785	
Towing Company		<Contact #>	
Road Maintenance Contractor – White Bear Industries		250.635.3169	
Other			
Northern Rockies Regional Municipality		250.774.2541	
School District 60		250.262.6000	
School District 81		250.774.2591	
Media			
Peace Sun / 101.5 The Bear		250.787.0669 (Studio)	250.785.6334 (Reception)
1001. Moose FM		250.787.2222 (Control Room)	250.787.100 (Office)
Alaska Highway News		250.785.5631	

<Project Name>
<Contractor>
<Date>

Traffic Management Plan
<Revision Number>

Prime Contactor's Contact Numbers

Name and Position	Office Number	Cell Phone Number
<Name>, Project Superintendent	<Contact #>	<Contact #>
<Name>, Health and Safety Coordinator	<Contact #>	<Contact #>
<Name>, First Aid Attendant(s)	<Contact #>	<Contact #>
<Name>, Traffic Control Supervisor	<Contact #>	<Contact #>
<Name>, Traffic Control Company	<Contact #>	<Contact #>
<Name>, Key Subcontractor Representatives	<Contact #>	<Contact #>

PSPC Contact Numbers

Name and Position	Office Number	Cell Phone Number
George Smith – Operations Manager, Alaska Highway	250.774.6956	250.321.0174 600.700.0131 (Satellite Phone)
<Name> – Onsite Inspection and QA Representative	<Contact #>	<Contact #>

<Project Name>
<Contractor>
<Date>

Traffic Management Plan
<Revision Number>

Appendix A: Traffic Control Plan Drawings

<Project Name>
<Name of Contractor>
<Date>

Traffic Management Plan
<Revision Number>

Appendix A: Traffic Control Plan Drawings

Site Diagram

<Use additional pages as necessary>

<Show all site factors affecting traffic control, traffic control devices, spacing, signs (including sizes), explanatory notes, North arrow, etc.>

<Per section 6.3 of the BC Ministry of Transportation Traffic Management Manual for Work on Roadways – 2020 Office Edition, traffic management shall be managed as one continuous work zone where the work is one kilometer apart or less.>

<Project Name>
<Contractor>
<Date>

Traffic Management Plan
<Revision Number>

Appendix B: Detour Traffic Control Plan Drawings

<Project Name>
<Contractor>
<Date>

Traffic Management Plan
<Revision Number>

Appendix B: Detour Traffic Control Plan Drawings

Site Diagram

<Use additional pages as necessary>

<Show all site factors affecting traffic control, traffic control devices, spacing, signs (including sizes), explanatory notes, North arrow, etc.>

<Per section 6.3 of the BC Ministry of Transportation Traffic Management Manual for Work on Roadways – 2020 Office Edition, traffic management shall be managed as one continuous work zone where the work is one kilometer apart or less.>

Appendix C: Daily Sign Check Form

Appendix D: DMS Message Library

Appendix D: DMS Message Library

<Provide a list of DMS messages which will be displayed on the DMS throughout the project. Messages that will be used on the DMS shall be per Section 4 – Temporary Traffic Control Devices (Table 4.5 and Table 4.2) of the BC Ministry of Transportation Traffic Management Manual for Work on Roadways – 2020 Office Edition plus other messages anticipated to be required on the project.>

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Appendix D

On-site Construction Start-up Form



On-site Construction Start-up Form

Project Name:	
Project Number:	
Departmental Representative:	Ph:
Contractor:	
Contractor Representative:	Ph:

The Contractor or its subcontractors shall not perform any on-site work until they receive a completed version of this form which has been signed by PSPC's Departmental Representative.

PSPC reserves the right to refuse payment for any on-site work performed prior to the receipt of the completed and signed form.

The list below is meant to be a guide and is not intended to be a comprehensive list of required submittal items for the project. Refer to Contract Documents and Contract Specifications for a Complete List.

Submission Item	Reviewed & Accepted by PSPC	Date (yyyy-mm-dd)	Comments / Exclusions
Contract, Bonding and Insurance	<input type="checkbox"/>		
Health & Safety Plan	<input type="checkbox"/>		
Traffic Management Plan	<input type="checkbox"/>		
Environmental Protection Plan	<input type="checkbox"/>		
Project Construction Schedule	<input type="checkbox"/>		
Cash Flow Plan	<input type="checkbox"/>		
Quality Management Plan	<input type="checkbox"/>		
Construction Staging Plan	<input type="checkbox"/>		
Construction Equipment List	<input type="checkbox"/>		
Other:	<input type="checkbox"/>		
Other:	<input type="checkbox"/>		

Below to be completed by the Departmental Representative and returned to the Contractor

Has the Contractor submitted all required documents for construction work to commence? Yes No

Have all listed documents required prior to construction commencement been accepted by PSPC? Yes No

Comments: _____

Name of Departmental Representative: _____

Signature: _____

Date: _____

PSPC

Appendices

KM 325 – 355 Drainage Improvements, Alaska Highway, BC

Project No. R.115075.003

R.115075.003

Appendix E

Progress Payment Submittal Form



Progress Payment Submittal Form

Project Name:	
Progress Payment Number:	
Departmental Representative:	Ph:
Contractor:	
Contractor Representative:	Ph:

This form, completed and signed by the Contractor's Representative, shall be submitted with all documentation listed below for each progress payment request.

Upon receipt of this form and all documents, PSPC will commence review of the progress payment request in accordance with General Conditions 5 – Terms of Payment.

The list below is meant to be a guide and is not intended to be a comprehensive list of required submittal items for each progress payment. PSPC may request additional documentation not listed below.

Submission Item	Submitted	Comments
Progress Payment	<input type="checkbox"/>	
Statutory Declaration	<input type="checkbox"/>	
WorkSafeBC Clearance Letter	<input type="checkbox"/>	
Project Schedule (with baseline tasks and updates showing completion dates and % complete)	<input type="checkbox"/>	
Updated Cash Flow Forecast	<input type="checkbox"/>	
Survey Details for each quantity claimed	<input type="checkbox"/>	
Other:	<input type="checkbox"/>	
Other:	<input type="checkbox"/>	

Prime Contractor Representative:

Name: _____

Title: _____ Signature: _____

Date: _____

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Appendix F

Environmental Protection Plan (EPP) – Checklist

Environmental Protection Plan (EPP) — Checklist

Note: This checklist was developed to assist the Contractor in determining and mitigating environmental issues at site. It is considered a generic checklist and it is in the Contractor's best interest to review the PSPC Environmental Management Plan (EMP) or the Environmental Assessment (EA) as supporting documents in the completion of the site Environmental Protection Plan (EPP). This EPP Checklist does not need to be submitted for review by the Departmental Representative.

EPP Framework	Content Requirements	No	Yes	N/A
Project Setting and Site Activities				
<i>Project Description</i>	A brief description of the project and its location is provided.			
<i>Environmental Sensitivities</i>	Sensitive or protected features that could be impacted as a result of the Contractor's activities are described.			
<i>Site Activities</i>	A scope of work and a list of all construction or related activities to be undertaken during the project are provided.			
Project Schedule and Site Drawings				
<i>Project Schedule</i>	A project schedule is provided, including scheduled shut-downs and restricted work periods due to environmental requirements.			
<i>Site Drawing</i>	One or more site drawings(s) are provided, indicating the site location; site set-up and layout; erosion and sediment controls; in-stream work areas; and environmental sensitivities.			
Potential Environmental Impacts and Controls				
<i>Potential Environmental Issues and Impacts</i>	The potential environmental issues and impacts that may result from the construction activities are described. Environmental Reports (Environmental Assessments; Fish Habitat and Compensation, etc.) will be provided to the contractor especially with respect to any in-stream work procedures that will be required. For example, in-stream works will impact fish and fish habitat in the surrounding ecosystem. It is the Contractor's responsibility to ensure the work is completed in a manner that causes the least impact on the ecosystem (see section on Mitigation).			
<i>Permits, Approvals, and Authorizations</i>	List required permits, approvals and authorizations. As applicable, environmental mitigation measures prescribed by regulatory agencies and included in project permits, approvals and authorizations are described. NOTE: DFO, MoE and NWPA approvals and authorizations for in-stream works are PSPC's responsibility however, the Contractor must be aware of the requirements of these approvals/authorizations. Permitting for water withdrawal from the waterbody as part of construction activities is part of the Contractor's responsibility.			
<i>Mitigation Strategies</i>	Procedures, controls or best management practices (BMPs) to prevent or reduce adverse impacts on the environment are provided. All work in BC must adhere to the BC MoE "Standards and Best Practices for Instream Works".			
<i>Erosion and Sediment</i>	Erosion and sediment controls are provided, as appropriate for the jurisdiction.			

Waste Management and Hazardous Materials				
Waste Management and Hazardous Materials	Hazardous materials that will be used and/or stored on site are listed. Expected hazardous and non-hazardous waste materials along with proper handling, containment, storage, transportation and disposal methods are listed. As appropriate for the jurisdiction, estimated waste quantities and specific handling procedures are also provided. For example, refueling of equipment will be conducted at least 100m away from any active drainage courses.			
EPP Implementation				
Site Representative	Name(s) and contact details for the person(s) who will be the Contractor's Site Representative(s) are provided.			
Training and Communication	Training and communication details are provided.			
Monitoring and Reporting	Monitoring and inspection procedures, including a schedule of monitoring activities and reporting procedures are provided. For example, this would include downstream monitoring activities for increased siltation during in-stream works.			
Documentation	Information and/or records that will be maintained relating to the EPP and end environmental matters on the project site are described.			
EPP Update	EPP review and update procedures are provided.			
Environmental Emergency Response Procedures				
Environmental Emergency Response Procedures	Potential incidents that may impact the environment are identified, and emergency response procedures to prevent and respond to incidents are provided. An environmental emergency response contact list is also provided.			

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Appendix G

**Responsibility Checklist for Authorizations / Approvals /
Notifications / Permitting**

Responsibility Checklist For Authorizations/Approvals/Notifications/Permitting

Project Title	
Project Description	
Project Type	
Comments	

Issued By	Document Type	Yes	No	N/A
PSPC Responsibility				
Federal				
DFO - Fisheries Act http://laws.justice.gc.ca/en/F-14/	Section 35(2) Authorization for Harmful Alteration Disruption or Destruction (HADD) to fish habitat (Eg. new bridges that are not clear span; erosion protection works that extend into the river channel).			
	Section 32 Authorization for Destruction of Fish (when explosives are used). Protects fish from being destroyed except by fishing or as Authorized by DFO.			
	Section 20 Approval – The Need for Safe Fish Passage – Every obstruction across or in any stream where DFO determines it necessary that a fish-pass should exist requires either a fish way or canal around the obstruction.			
	Notification process required for culverts and those works that fall under DFO Operational Statements. Stream Crossings by Roads: <ul style="list-style-type: none"> • Clear Span Bridges • Temporary Ford Stream Crossing • Ice Bridges and Snow Fills • Bridge Maintenance • Maintenance of Riparian Vegetation in Existing Rights-of Way 			
	Section 36 – under this Section of the Fisheries Act the proponent can be FINED resulting from deposition of substances deleterious to fish in waters frequented by fish – this includes release of silt laden waters from construction activities.			

Transport Canada NWPA http://laws.justice.gc.ca/en/N-22/text.html	Section 5(1) Formal Approval for construction of new structures (new bridges, culverts, scour protection).			
	Section 5(2) Work Assessment for work resulting in insignificant impacts on navigability.			
	Section 6(4) Formal Approval for existing structures (existing bridges).			
	Minor Works and Waters Order – This is an amendment to the NWPA that streamlines the federal review process by establishing classes of waters and works (projects) that do not require an Application or Approval through the NWPP because they are "minor" in nature. These would include such "works" as repairs to riprap (no groynes) or "waters" that are not large enough for vessel traffic (ie. Contact Creek). http://www.tc.gc.ca/eng/marinesafety/oep-nwpp-minorworks-menu-1743.htm			
Indian and Northern Affairs Canada – Indian Act	Approval for activities on lands under their jurisdiction. This is addressed under the EA review process in most cases. If the project is exempt from an EA it must be addressed by the PM or ES personnel.			
Migratory Birds Convention Act (MBCA)	Environment Canada is responsible for implementing the Migratory Birds Convention Act , which provides for the protection of migratory birds through the Migratory Birds Regulations . This is addressed under the EA review process in most cases. If the project is exempt from and EA it must be addressed by the PM or ES personnel.			
ECMP	<p>Has taken over for our old CEAA form. The ECMP Checklist and the Preliminary Identification of Environmental Support Required (PIESR) Form have been developed to ensure that applicable environmental legislation and relevant aspects are identified during a project. The ECMP Checklist replaces the PSPC CEAA Checklist, and will be the mechanism by which project information is submitted to PSPC Environmental Services to determine whether environmental support is required. The ECMP Checklist is located in ELF (Form 183_e).</p> <p>By completing and submitting the ECMP Checklist to Environmental Services, PSPC project managers¹ will ensure that their projects are systematically evaluated for compliance with environmental</p>			

¹ Project Manager refers to anyone who leads, manages or delivers a project

	legislation, policies and sustainable development requirements			
Species at Risk Act (SARA) http://www.sararegistry.gc.ca/default_e.cfm	A list of federally-listed species at risk likely to occur at a given subject site must be compiled in order to identify potential impacts & propose mitigation measures for minimizing impacts to these species as a result of project activities. In cases where suitable habitat for a given species exists at/near the project site, mitigation measures are recommended, including avoidance of areas containing said habitat and informing site workers of these issues to prevent incidents.			
First Nations Notifications and Consultations http://clss.nrcan.gc.ca/googledata-donneesgoogle-eng.php	Natural Resources Canada has developed an overlay to be used with Google Earth & Google Maps to identify First Nations lands throughout the country. Notifications of projects within 5 km of such lands and/or directly upstream from such lands should be submitted to the relevant First Nations for a determination of their interest in a given project and/or to request any traditional knowledge they may have to offer.			
Provincial – Note one submission package for instream works is sent to FrontCounter BC at MoE who then send off to the appropriate departments for approval/notification/permitting – this does not apply to the archaeological.				
Wildlife Act – WLAP – MoE http://www.qp.gov.bc.ca/statreg/stat/W/96488.01.htm	Wildlife Act – Section 34 – Birds, Nests and Eggs – vegetation clearing should not occur during critical bird nesting periods, which typically occur in the spring and summer. Contact the local WLAP for vegetation clearing timing windows.			
Water Act - Water Stewardship Division - Ministry of Forests, Lands, Natural Resource Operations, and Rural Development	Section 11 – regulates changes in or about a stream and ensure that water quality, riparian habitat, and the rights of licensed water users are not compromised. This is an approval process and takes approximately 140 days. An application fee is also required. Works requiring approval include channel realignment, retaining wall or bank protection stabilization etc.			
Environmental Stewardship Division - MoE	Notification process for such works as replacement and maintenance of culverts and outfalls; temporary stream diversions around a worksite and takes approximately 45 days to receive notification approval. In general, those works requiring a notification are those that do not involve any diversion of water.			
Fish Protection Act – MoE http://wlapwww.gov.bc.ca/habitat/fishprotectionact/	This Act was passed in 1997 and is reviewed as part of the Water Act under Section 11 when applying for approval.			

<p>Ministry of Forests, Lands, Natural Resource Operations, and Rural Development Archaeological http://www.for.gov.bc.ca/archaeology/requesting_archaeological_site_information/process_steps.htm Contact: Hayley Bond (250) 953-3343</p>	<p>When completing projects such as quarry pits and new highway alignments, a request is put into the archaeological branch of MFLNSO via the EA process to search the data base. An archaeological assessment may be required on those areas that are previously undisturbed or undeveloped.</p>			
<p>BC Parks</p>	<p>Various permits are required when completing construction activities within the Parks. Please note that all works within 150 feet of the centreline of the highway (Right-of-Way) are NOT subject to construction permitting. (this does not include permitting for fish surveys).</p>			
<p>Canada-British Columbia Agreement for Environmental Assessment Cooperation http://www.ceaa.gc.ca/default.asp?lang=En&n=04A20DBC-1</p>	<p>Most Alaska Highway Projects will not trigger this agreement, as both the Vancouver CEAA office and the Victoria BC Environmental Assessment Office (EAO) have confirmed that the types and scopes of the projects are not described in the BC Environmental Assessment Act – Reviewable Projects Regulation. However, for due diligence, it is recommended that notifications for all Alaska Highway projects be submitted to CEAA (info@ceaa-acee.gc.ca) for review and, if necessary, a determination of whether or not CEAA and/or the BC EAO should be involved.</p>			
<p>BC Ministry of Environment – BC Species and Ecosystems Explorer http://a100.gov.bc.ca/pub/eswp/</p>	<p>A list of provincially-listed species at risk likely to occur at a given subject site must be compiled in order to identify potential impacts & propose mitigation measures for minimizing impacts to these species as a result of project activities. This process involves conducting a search of the BC Species and Ecosystems Explorer inventory for the specific area of BC containing the proposed project site.</p>			
Consultant Responsibility				
Provincial				
<p>BC Parks Ministry of Forests, Lands, Natural Resource Operations, and Rural Development http://www.env.gov.bc.ca/bcparks/permits/</p>	<p>Permit to Collect Fish for a Scientific Purpose - Regulation Research activities in parks and protected areas, including: collection; monitoring; survey and inventory; and, other research trigger a Park Permit - Ministry of Forests, Lands, Natural Resource Operations, and Rural Development is responsible for the administration of fish and wildlife permits. Note that these permits are taking approx. 6 months to receive due to recent involvement and subsequent consultation with Treaty 8.</p>			
<p>Water Act – Regulation’s Protection of Habitat - Section 42(1)</p>	<p>Permit to Collect Fish for a Scientific Purpose – Subsection 42(1)(e) – It is the responsibility of the salvage crew to obtain the necessary permit required to complete a fish and amphibian</p>			

	salvage – in conjunction with the BC Parks permitting.			
<p>Note: research projects and inventory projects are under the same Permit and are applied for under the “Application to Collect Fish for a Scientific Purpose”.</p> <p>http://www.env.gov.bc.ca/pasb/applications/process/scientific_fish_collect.html#a5</p>				
Contractor Responsibility				
Federal				
<i>DFO – End of Pipe Guidelines</i>	End-of- pipe guidelines for freshwater intake to avoid fish entrainment.			
Provincial				
<i>Water Act - MoE</i>	Schedule A – Water License Applications – use of water from waterbody for road maintenance.			

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Appendix H

Relevant Environmental Publications

Relevant Environmental Publications

The below list of documents are those commonly used when determining how to design and advance a project with the potential to impact a waterbody.

Agency	Publications	Summary
DFO	<i>Land Development Guidelines for the Protection of Aquatic Habitat - 1993</i>	This document is a good reference guide for any works that are occurring in or around the water.
	<i>Canada's Fish Habitat Law</i>	Document explaining the fish and fish habitat laws under the Fisheries Act.
	<i>Riparian Revegetation</i>	Information on minimizing, stabilizing and revegetating construction areas.
	<i>Freshwater Intake End-of Pipe Fish Screen Guideline - 1995</i>	Provides guidelines for the contractor to follow to ensure fish screens are used during freshwater intake operations at construction sites.
	<i>Operational Statements</i> Stream Crossings by Roads: <ul style="list-style-type: none"> • Clear Span Bridges • Temporary Ford Stream Crossing • Ice Bridges and Snow Fills • Bridge Maintenance • Maintenance of Riparian Vegetation in Existing Rights-of Way 	Fisheries and Oceans Canada has developed a series of Operational Statements to streamline the undertaking of low risk activities. The Operational Statements outline conditions and measures for avoiding harmful alteration, disruption and destruction (HADD) of fish habitat, and applying them will ensure the project complies with subsection 35(1) of the <i>Fisheries Act</i> . You are NOT required to submit a proposal for review by Fisheries and Oceans Canada when you incorporate the measures and conditions outlined in an appropriate Operational Statement into your plans. http://www.pac.dfo-mpo.gc.ca/habitat/os-eo/index-eng.htm
MoE	<i>Fish-stream Crossing Guidebook - 2002</i>	Guidelines in protection of fish and fish habitat and the safe passage of fish during construction at/on stream crossings.
	<i>Standards and Best Practices for Instream Works - 2004</i>	Guide to planning and carrying out the proposed construction activities to comply with relevant legislation, regulations and policies.
	<i>A User's Guide to Working In and Around Water - 2005</i>	Understanding the regulation under British Columbia's Water Act.
	<i>Fish-Stream Identification Guidebook - 1998</i>	Assists in providing information on determining fish streams.
	<i>The Streamkeepers Handbook</i>	A practical guide to stream and wetland care in regards to rehabilitation planting.

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Appendix I

Environmental Management Plan (EMP)

Environmental Management Plan Alaska Highway Culvert Replacements KM 325.08 to 355.02



PRESENTED TO
Public Services and Procurement Canada

JANUARY 12, 2021
ISSUED FOR USE
FILE: 704-TRN.VHWY03100-01

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APPENDIX SECTIONS

APPENDICES

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Appendix 2	Archaeology Chance Find Protocol
Appendix 3	Spill Response Plan
Appendix 4	Environmental Incident Report Form

ACRONYMS & ABBREVIATIONS

Acronyms/Abbreviations	Definition
BCAWQG	BC Aquatic Water Quality Guidelines
BC ENV	Ministry of Environment and Climate Change Strategy
BMP	Best Management Practices
CFP	Chance Find Protocol
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
DFO	Fisheries and Oceans Canada
EC	Environmental Coordinator
ECCC	Environment and Climate Change Canada
EIR	Environmental Incident Report
EM	Environmental Monitor
EMA	<i>Environmental Management Act</i>
EMBC	Emergency Management BC
EMP	Environmental Management Plan
EPP	Environmental Protection Plan
EOA	Environmental Overview Assessment
ESC	Erosion and Sediment Control
FLNRORD	BC Ministry of Forests, Lands and Natural Resource Operations and Rural Development
HADD	Harmful Alternation, Disturbance or Destruction of Fish Habitat
km	kilometre
m	metre
MBCA	<i>Migratory Birds Convention Act</i>
MSDS	Material Safety Data Sheet
PSPC	Public Services and Procurement Canada
QEP	Qualified Environmental Professional
SAR	Species at Risk
SARA	<i>Species at Risk Act</i>
TDG	Transport of Dangerous Goods
WHMIS	Workplace Hazardous Materials Information System
WSA	<i>Water Sustainability Act</i>

LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Public Services and Procurement Canada and their agents. Tetra Tech Canada Inc. (Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Public Services and Procurement Canada or for any Project other than the proposed work at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this document is subject to the Limitations on the Use of this Document attached in the Appendix 1 or Contractual Terms and Conditions executed by both parties.

1.0 INTRODUCTION

Tetra Tech Canada Inc. (Tetra Tech) has been retained by Public Services and Procurement Canada (PSPC) to prepare an Environmental Management Plan (EMP) for the planned replacement of twelve culverts located between KM 325.08 and KM 355.02 of the Alaska Highway (herein referred to as the “Project”).

The EMP is the primary document that guides overall environmental management practices that are to be implemented by the Contractor during all phases of the Project. Developed from federal, provincial, and industry standards and regulations, EMPs provide guidance, general mitigation measures and best management practices (BMPs) to protect the receiving environment. They are based on the known environmental conditions along the Alaska Highway and the nature of the Project; and make recommendations to mitigate Project-related effects to the receiving environment during construction.

It will be the responsibility of the successful Contractor to develop activity-specific mitigation measures in an Environmental Protection Plan (EPP). That is, the EMP identifies the features that must be protected during the Project and provides recommendations for how to protect them in terms of “industry standards,” while the Contractor’s EPP will detail exactly how the recommendations will be implemented based on the specific designs and construction methodology/equipment used. For example, an EMP may recommend that refuelling occurs more than 30 m from a watercourse and the EPP will identify exactly where the refuelling will occur for the project, while meeting that recommendation.

It is recommended that the successful contractor read this EMP in full, to ensure that they will meet the environmental requirements of this Project and that the EMP requirements are met in the EPP.

2.0 PROJECT INFORMATION

The following subsections include relevant Project information as it relates to this EMP.

2.1 Project Location

Since 1964, PSPC has been the federal custodian for the Alaska Highway and is responsible for the maintenance of the current highway. PSPC’s current operational jurisdiction of the Alaska Highway extends from KM 133 (north of Fort St. John) to the British Columbia-Yukon border at KM 968.

PSPC is replacing twelve culverts between KM 325.08 and KM 355.02 that are undersized and/or are failing. PSPC is concerned that the reduced capacities and functioning of the culverts will pose increased risk to the highway and potentially to highway users during spring freshet, resulting in a potential emergency situation. Several culvert locations have already experienced flooding and/or erosion following heavy rains that occurred in early-mid June 2020.

2.2 Project Activities

The culvert replacement works at each location generally includes:

- Isolate and dewater work area (install fish stop nets, conduct salvage, install check dams and pumps, dewater). Dewatering may not be necessary if work is conducted in winter and watercourses are frozen to bottom;
- Localized excavations around the culvert inlet and outlet to prepare the work site;

- Install new culvert through pipe jacking underneath the road and excavation of material from within the jacked culvert;
- Minor channel realignment solely at the inlet and outlet of the culvert to direct water through new culvert;
- Place erosion protection (e.g., rip rap) around culvert inlet and outlet, including construction of an armoured outlet pool;
- Backfilling the existing culvert with concrete, removing culvert ends, and covering culvert ends with soil; and
- Channel regrading to tree line (in most locations) to facilitate drainage and mowing by PSPC maintenance Contractor.

Table 2-1: Culverts to be Replaced Between KM 325.08 and KM 355.02

Culvert ID	UTM Coordinates (at Inlet)		Existing Culvert Size (mm)	Proposed Culvert Size (mm)	Construction Footprint ¹
	Easting	Northing			
Km 325.08	505551.202m	6403467.193m	1200	1500	Inlet: 240 m ² Outlet: 280 m ² Riprap: 110 m ²
Km 329.84	507206.207m	6407848.338m	900	1500	Inlet: 70 m ² Outlet: 140 m ² Riprap: 100 m ²
Km 330.50	507496.900m	6408445.918m	600	900	Inlet: 220 m ² Outlet: 200 m ² Riprap: 65 m ²
Km 331.26	507876.638m	6409105.964m	900	1050	Inlet: 70 m ² Outlet: 60 m ² Riprap: 80 m ²
Km 332.052	508265.774m	6409784.605m	600	900	Inlet: 70 m ² Outlet: 70 m ² Riprap: 75 m ²
Km 333.182	508510.096m	6410887.251m	900	1050	Inlet: 60 m ² Outlet: 100 m ² Riprap: 70 m ²
Km 335.06	508831.348m	6412737.977m	600	900	Inlet: 60 m ² Outlet: 110 m ² Riprap: 60 m ²
Km 339.662	510783.242m	6416829.441m	600	900	Inlet: 60 m ² Outlet: 260 m ² Riprap: 90 m ²

Culvert ID	UTM Coordinates (at Inlet)		Existing Culvert Size (mm)	Proposed Culvert Size (mm)	Construction Footprint ¹
	Easting	Northing			
Km 340.16	511000.000m	6417273.161m	900	1050	Inlet: 120 m ² Outlet: 160 m ² Riprap: 75 m ²
Km 344.88	510756.156m	6421865.184m	600	900	Inlet: 120 m ² Outlet: 210 m ² Riprap: 80 m ²
Km 347.672	512254.236m	6424161.490m	600	900	Inlet: 60 m ² Outlet: 90 m ² Riprap: 60 m ²
Km 355.022	516294.820m	6430004.299m	600	900	Inlet: 60 m ² Outlet: 70 m ² Riprap: 70 m ²

¹ Construction footprints given for the inlet and outlet include the temporary construction footprint at the inlet and outlet (i.e. laydown area, equipment access, etc.) and the permanent footprint of the ditching/channel. The construction footprints given for the riprap includes the total permanent footprint of the riprapped areas of both the inlet and outlet.

² These culvert locations convey road runoff only and are not considered to be watercourses (see “Instream Works, Table 3-1).

2.3 Project Schedule

Construction for this Project is scheduled to occur in February/March of 2021.

3.0 ENVIRONMENTAL SENSITIVITIES

This Project entails work within environmentally sensitive areas, including Woodland Caribou habitat, watercourses, and riparian areas. In particular, the culvert replacements will require instream works and may pose a risk to fish or fish habitat. In addition, there is the potential that Species at Risk (SAR) will be encountered during construction. As such, it is important that the Contractor is aware of these sensitivities and is diligent in regard to environmental planning and mitigation to avoid deleterious effects to the environment. The most likely environmental concerns and potential impacts related to the Project are summarized in Table 3-1.

A full review of the existing environment at the Project location can be found in Tetra Tech’s (2021) Environmental Overview Assessment (EOA) report: *Environmental Overview Assessment, KM 325.08 to 355.02 Culvert Replacements*.

Table 3-1: Project-specific Environmental Considerations

Environmental Concern	Project-Specific Considerations	Mitigation Summary*
Wildlife and Wildlife Habitat		
Woodland Caribou	<p>The populations and critical habitats of Woodland Caribou are protected under federal legislation. Northern Mountain Caribou are provincially blue-listed and designated as ‘special concern’ under the Federal <i>Species At Risk Act</i> (SARA).</p> <p>There is potential for Woodland Caribou to be encountered during construction since the Project is located within the provincially-mapped range of Northern Mountain Caribou (Muskwa Herd).</p> <p>Best Management Practices specific to working within caribou habitat and a figure showing mapped caribou range within the Project area are provided in the Caribou Protection Plan (Appendix C of the Environmental Overview Assessment [EOA]).</p>	<ul style="list-style-type: none"> ▪ Implement the mitigation measures outlined in the Caribou Protection Plan. ▪ Retain an Environmental Monitor (EM) to monitor for Caribou within the Project area during construction. ▪ If Caribou are observed within the Project area, cease all Project activities until they have left the area. ▪ See Section 5.4 and the Caribou Protection Plan for further mitigation strategies.
Wildlife and Species at Risk (SAR)	<p>The BC Conservation Data Centre (CDC) iMap search revealed four documented occurrences of wildlife SAR within 5 km of the Project, one of which, Woodland Caribou (Special Concern) are listed under the SARA. A total of 29 SAR were identified as having potential to be present at or near one of more of the Project locations based on their habitat requirements and range (See section 5.6 of the EOA for more details).</p> <p>If the Project is conducted in non-frozen conditions, instream works may negatively impact amphibians that utilize these habitats for part or all of their life cycle, such as Western Toad. As such, prior to instream works, the impacted area should be isolated and amphibians should be salvaged and relocated by the contractor’s EM. A General Wildlife Permit will have to be obtained from FrontCounter under the <i>Wildlife Act</i>.</p>	<ul style="list-style-type: none"> ▪ Inspect culverts for wildlife (especially for bats and birds) prior to their removal. ▪ Wildlife salvages should be conducted prior to conducting instream works in non-frozen conditions. ▪ Should a rare or sensitive species be identified at the site at any time during the Project, the EM should be notified immediately for further direction. ▪ See Section 5.4 for further mitigation strategies.
Birds and Their Nests	<p>Section 34 of the BC <i>Wildlife Act</i> protects nests when occupied by a bird or an egg and the nests of Eagles, Peregrine Falcons, Gyrfalcons, Osprey, Herons, and Burrowing Owls year-round, regardless of whether they are active. The <i>Migratory Bird Convention Act</i> (MBCA) prohibits the disturbance or destruction of migratory birds and their nests or eggs.</p> <p>If vegetation removal is required during construction, it is important that these clearing activities do not disturb birds or their nests.</p>	<ul style="list-style-type: none"> ▪ Minimize vegetation clearing ▪ When possible, clear vegetation outside of the breeding bird nesting period for the region which extends from April 30 until August 20. If this is not possible, a QEP-led nest survey will be required prior to clearing. ▪ See Section 5.4 for further mitigation strategies.

Environmental Concern	Project-Specific Considerations	Mitigation Summary*
Fish and Fish Habitat		
<p>Instream Works</p>	<p>This Project will require instream works such as minor channel realignment and placement of riprap to stabilize stream channels near the culvert inlets and outlets.</p> <p>Five of the 12 culverts (KM 332.05, KM 333.18, KM 339.66, KM 347.67 and 355.02) that will be replaced as part of the Project are drainage culverts that simply convey slope seepage and road run-off during periods of precipitation from one side of the road to the other. As such, these five culverts do not meet the definition of a ‘stream’ under the <i>Water Sustainability Act (WSA)</i> and do not connect to fish-bearing watercourses. However, when replacing these five drainage culverts, Best Management Practices outlined below in Section 5.0 (i.e., erosion and sediment control (ESC) measures; isolation of the work area; wildlife salvage etc.) must still be applied during construction.</p> <p>The remaining seven culverts to be replaced are considered to be ‘streams’ under the WSA. Based on the Project activities, Tetra Tech anticipates that a Notification under the WSA will have to be obtained by PSPC for these seven culverts. If there is water within the watercourse at the time of construction, the work area must be isolated from flowing water and fish and wildlife must be salvaged from the work area before instream works can begin. If there is no water in the watercourse at the time of instream works, no isolation will be required. To avoid deleterious effects to the affected watercourses within the Project area, the mitigation measures outlined in this EMP must be followed.</p>	<ul style="list-style-type: none"> ▪ Any work within 30 m of water requires the close oversight of the Environmental Monitor (EM). ▪ Five drainage culverts: <ul style="list-style-type: none"> – Proper ESC measures should be implemented during construction; – If there is flow through the culvert at the time of construction, the work area must be isolated from flow under the oversight of the EM; – If necessary, amphibians must be salvaged from the work zone by the EM. ▪ Seven “Stream” Culvert Replacements <ul style="list-style-type: none"> – Proper ESC measures should be implemented during construction; – Any work conducted below the high-water mark of streams containing water must occur in isolation of flow. – If there is water within the watercourse during the instream works (i.e., it is not frozen or dry), a qualified EM must conduct fish and amphibian salvage operations. ▪ See Section 5.3, 5.7 and 5.10 for further mitigation strategies.
<p>Disturbance to Fish</p>	<p>The five drainage culverts are not located on fish-bearing watercourses and do not have connectivity to downstream fish-bearing watercourses. As such, disturbance to fish is not anticipated and fish salvage is not required for these replacements.</p> <p>The remaining seven have documented occurrences of fish but are tributaries to known fish-bearing watercourses downstream and must be treated as if there is the potential for fish to be present. As such, they are still considered “Fish Habitat” under the <i>Fisheries Act</i>. If there is flowing water within these seven watercourses at the time of construction (i.e., they are not frozen to the stream bed), the work area must be isolated, and a concurrent fish salvage must be conducted to avoid potential harm to fish prior to dewatering. To perform fish salvages, a scientific fish collection permit will be required from FLNRORD.</p>	<ul style="list-style-type: none"> ▪ In the event flow is present at the time of the culvert replacements, prior to construction, an Aquatic Biologist should evaluate the seven ‘stream’ culvert locations to identify the potential presence of Bull Trout redds as per the methods outlined in Decker et al. (2005). If no redds are present, construction may continue as planned. If redds are identified, construction must be delayed until the Bull Trout juveniles have emerged from their redds and can be safely salvaged from the area, or until the next Reduced Risk Timing Window.

Environmental Concern	Project-Specific Considerations	Mitigation Summary*
		<ul style="list-style-type: none"> ▪ Ideally, instream work should be timed to occur within the window of least risk for fish in the Project Area (July 15 – August 15) or when water is frozen or at its lowest levels. ▪ Tetra Tech understands that the Project activities are proposed to occur outside of the Reduced Risk Timing Window. It is unlikely that the Project would negatively impact fish or fish habitat if works are conducted outside the reduced risk windows as long as the mitigation detailed within this EMP is applied. ▪ Fish salvages must be conducted at the seven “stream” locations after isolation of the work site and before dewatering (if water is present or not frozen to the stream bed). An EM must be on-site to conduct the fish salvage operations. ▪ See Section 5.3, 5.7 and 5.10 for further mitigation strategies.
<p>Erosion and Sediment Control</p>	<p>This Project has the potential to create sediment-laden runoff which if introduced into a stream, could harm fish or fish habitat. The contractor must complete the Project works in such a manner that the risk of releasing sediment-laden water into nearby streams is minimized.</p>	<ul style="list-style-type: none"> ▪ ESC measures should be implemented at all twelve culvert replacement locations. ▪ Avoid construction during periods of poor weather and phase work appropriately. ▪ The Contractor should prepare an Erosion and Sediment Control (ESC) Plan and ensure proper installation of ESC structures (i.e., silt fences). ▪ In the event flow is occurring at the time of the culvert replacements, frequent field water quality monitoring at pre-determined stations or as required by weather conditions. ▪ See Section 5. 6 and 5.7 for further mitigation strategies.

Environmental Concern	Project-Specific Considerations	Mitigation Summary*
Accidental spills	<p>There is potential for accidental spills or releases of deleterious substances to occur as a result of the Project. Equipment with engines and/or hydraulics have a potential for leaks and spills (May include: diesel/gas, hydraulic fluids, lubricating oil, glycols.). If released to water, these substances can cause harm to fish and fish habitat.</p>	<ul style="list-style-type: none"> ▪ Any work conducted below the high-water mark of streams containing water must occur in isolation of flow and under the supervision of an EM. ▪ Machinery and equipment should be clean and in good operating condition. ▪ The Contractor is responsible for ensuring that a project-specific Spill Response Plan is prepared and that it is on-site at all times ▪ See Section 5.10 for further mitigation strategies.
Vegetation and Invasive Species Management		
Vegetation	<p>The EOA identified three vegetation SAR that have potential to occur near or at the Project location; however, due to the disturbed nature of the highway ROW, it is unlikely that these species will be found at the Project area.</p> <p>Minimal vegetation removal is expected as a result of this project since the construction will be contained within the existing highway ROW. The majority of vegetation along the sides of the highway are grasses, herbs and small shrubs. After construction is complete, any disturbed and exposed soils will be seeded with a native grass mixture.</p>	<ul style="list-style-type: none"> ▪ Limit vegetation removal. ▪ Contain construction activities within the existing highway right-of-way (ROW) ▪ Machinery and vehicles should be restricted to defined travel routes to avoid excess trampling/compaction of vegetation. ▪ Disturbed vegetated areas should be restored through seeding or planting as soon as possible. ▪ Implement standard ESC measures and dust-suppression measures during construction to minimize impacts to surrounding vegetation. ▪ See Section 5.5 for further mitigation strategies.
Non-native or invasive plant spread.	<p>Many invasive species grow well in disturbed areas, and can be spread through vehicle traffic, making them commonly found along roadways. Therefore, there is potential for invasive species to be found along the highway at the Project location. Measures must be taken to prevent spread of invasive species between sites.</p>	<ul style="list-style-type: none"> ▪ Vehicles and equipment must be inspected prior to arriving on site to ensure they are free of soil and plant material. ▪ In areas of known invasive plant infestations, matting should be laid down prior to mobilization of machinery to the work area. ▪ See Section 5. 5 for further mitigation strategies.

Environmental Concern	Project-Specific Considerations	Mitigation Summary*
Soil Management		
Erosion and Sediment Control	This Project has the potential to disturb soils which could result in erosion and/or sediment mobilization. The contractor must complete the culvert maintenance work in such a manner that minimizes disturbances during construction and remediates exposed soils post-construction.	<ul style="list-style-type: none"> ▪ Avoid construction during periods of poor weather (i.e., heavy rainfall) and phase work appropriately. ▪ The Contractor should prepare an ESC Plan and ensure proper installation of ESC structures (i.e., silt fences). ▪ See Section 5.6 for further mitigation strategies.
Accidental spills	There is potential for accidental spills or releases of deleterious substances to occur as a result of the Project. Equipment with engines and/or hydraulics have a potential for leaks and spills (May include: diesel/gas, hydraulic fluids, lubricating oil, glycols, uncured concrete). Release of these substances could result in soil contamination.	<ul style="list-style-type: none"> ▪ Machinery and equipment should be clean and in good operating condition. ▪ See Section 5.4 for further mitigation strategies.
Archaeological Resources		
Damage to historical or archaeological artifacts.	There is potential to encounter archaeological sites and artifacts during project activities (i.e. excavations and culvert removals) which are protected under the <i>Heritage Conservation Act</i> .	<ul style="list-style-type: none"> ▪ Follow the Chance Find Protocol (CFP) included in Appendix 2. ▪ See Section 5.13 for further mitigation strategies.
*This summary of mitigation measures is not comprehensive. For a full list of mitigation measures, please refer to Environmental Mitigation Measures in Section 5.0.		

4.0 ENVIRONMENTAL REGULATORY REQUIREMENTS

The Project will be subject to the terms and conditions of any regulatory permit or approval obtained. At the time this EMP was prepared, all permits/approvals for the Project were in the process of being secured from the applicable regulatory agencies. The Project is subject to various environmental legislation, as described in the subsections below.

4.1 Federal

Fisheries Act

The *Fisheries Act* is the main federal legislation providing protection for all fish, fish habitat, and water quality. The *Act* is administered federally by Fisheries and Oceans Canada (DFO) and Environment Canada. The new Federal *Fisheries Act* came into force on August 28, 2019. It includes amendments to restore lost protections and incorporate modern safeguards. This *Act* provides protection against the ‘death of fish, other than by fishing’ and the ‘harmful alteration, disruption or destruction of fish habitat’ (HADD), unless authorized by DFO.

Fish habitat is defined as spawning grounds and nursery, rearing, food supply, and migration areas on which fish depend directly or indirectly in order to carry out their life processes. This definition indicates that a watercourse (which includes but is not limited to streams, ditches, ponds and wetlands), which provides water, food or nutrients to a fish-bearing stream, is considered fish habitat even if it does not contain fish and/or if it only has temporary or seasonal flows. The definition also indicates that not only the watercourse itself but also the vegetated stream side or riparian areas which provide nutrients and shade to the stream are considered fish habitat.

DFO encourages all project proponents to avoid and mitigate the impacts of projects to fish. A self-assessment process to be carried out by a Qualified Environmental Professional includes the documentation of measures and best practices to avoid or minimize impacts to fish and fish habitat. If impacts can be avoided or mitigated the project does not require further review from DFO. If impacts cannot be mitigated, a Request for Review must be submitted to the Fisheries Protection Program office and DFO will work with the proponent to find additional ways to reduce those impacts. If the project cannot be designed to avoid a HADD, a *Fisheries Act* authorization is required.

Based on Tetra Tech’s understanding of the Project and based on our assessment of the proposed activities, it is unlikely that the Project will cause death of fish or a HADD if, at a minimum, standard best management practices and mitigation as presented in this EMP are implemented. The seven “stream” locations will be treated as if they are fish-bearing and will undergo isolation of the work area and concurrent fish salvages if there is flowing water present within the channel. Tetra Tech does not consider a Request for Review to DFO necessary for this Project.

Species at Risk Act

The *Species at Risk Act* (SARA) prohibits the killing, harming, harassing, capturing or taking of species at risk, or destruction of their critical habitats. Species are designated ‘at risk’ by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), an independent body of experts that assesses species according to a broad range of scientific data. The federal Cabinet then decides whether those species should receive legal protection under the *Act*.

The SARA protects listed mammals, reptiles, amphibians, molluscs, lepidopterans, and plants on federally managed areas, migratory songbirds (as listed under the *Migratory Birds Convention Act* [MBCA]) and fish in all areas in Canada. Species that are legally protected under SARA are those listed as Endangered or Threatened and are listed in Schedule 1 of the *Act*. Those species listed as Special Concern and all species listed in Schedule 3, regardless of their status, are not legally protected by SARA.

A permit is required when works either affect a migratory bird or aquatic species or its residence, that is listed as 'Endangered' or 'Threatened' or 'Extirpated' on Schedule 1 of SARA; or affect any Schedule 1 'Endangered' or 'Threatened' or 'Extirpated' species or its residence on federal land.

Several occurrences of species at risk (SAR) have been identified within 5 km of the Project location or have the potential to be found in the area. Should a SARA-listed species or any other rare species be identified by the EM prior to or during works, the Canadian Wildlife Service and the British Columbia Ministry of Environment and Climate Change Strategy (BC MOE) should be notified immediately for direction on appropriate action as measures employed would vary greatly with the species encountered, its sensitivity to the Project and its proximity to the works.

Migratory Birds Convention Act

The MBCA restricts the disturbance or destruction of migratory birds and their nests, eggs, and shelters, except in accordance with a permit. The *Act* (1994) prohibits the taking or killing of migratory bird nests and eggs, and the deposition of harmful substances in areas frequented by migratory birds. Vegetation removal that will affect trees used by all birds and other wildlife should be avoided while they are breeding, nesting, roosting or rearing young.

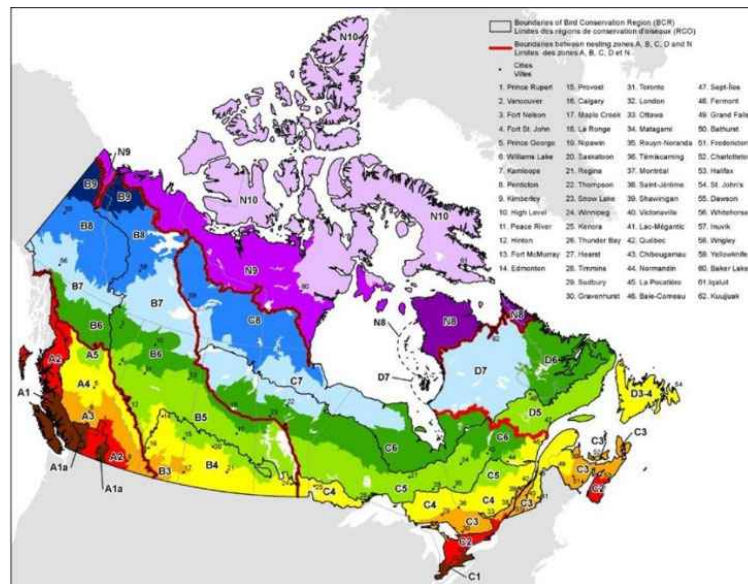


Figure 1. Map of Nesting Zones in Canada (ECCC 2018)

Vegetation removal/clearing should be conducted outside of the bird nesting season, which is considered April 30 to August 20 for the Project area (Zone B6) (ECCC 2018; Figure 1). If clearing is to occur within the bird nesting season (April 30 – August 20), a nest survey by the on-site EM will be required prior to clearing.

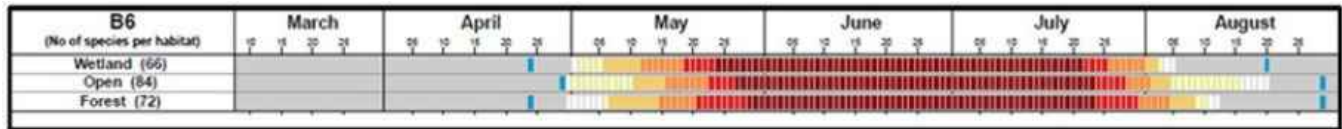


Figure 2. Nesting Calendars for Nesting Zone B6 (ECCC 2018)

Transportation of Dangerous Goods Act

The transportation of dangerous goods is regulated by the BC *Transport of Dangerous Goods Act* and Transport of Dangerous Goods (TDG) Regulation. The transportation of dangerous goods is also regulated federally by the Transportation of Dangerous Goods Program and Regulations, administered by Transport Canada. The provincial TDG program is limited to transportation via roads. Nine categories of substances are regulated within the provincial TDG Regulation: explosives, gases, flammable and combustible liquids, flammable solids, oxidizing substances, poisonous and infectious substances, radioactive material, corrosive substances and miscellaneous substances.

It is the responsibility of Contractor to ensure that all materials within the TDG Schedule are transported in accordance with TDG Regulations.

4.2 Provincial

Water Sustainability Act

Previously known as the *Water Act*, the British Columbia (BC) *Water Sustainability Act (WSA)* was brought into force on February 29, 2016. The WSA is the main provincial statute regulating water resources in British Columbia. Under the WSA, it is an offence to divert or use water, or alter a stream, without formal approval from the Province. The WSA defines “stream” as a natural watercourse or source of water supply, whether usually containing water or not, and a lake, river, creek, spring, ravine, swamp or gulch. “Stream” is used to describe any watercourse that is considered to be fish habitat, including channelized streams, and ditches that provide fish habitat. Under the WSA, the *Water Sustainability Regulation* addresses the requirements to allocate both ground and surface water and identifies the requirements for using water or making changes to a stream.

Change Approvals, issued under Section 11 of the WSA, are written authorization required for complex works with substantial impacts. *Notifications* are typically used for low-risk works that do not include permanent water diversion, can be completed in a short period of time, and have minimal impacts. Submitted notifications are subject to a 45 day review period. If there is no response from the assigned habitat officer within this time period, the proponent may proceed with the project. Notifications must meet the requirements of the Water Sustainability Regulation and comply with any additional conditions set out by a habitat officer.

Based on communication with the BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD) and recent experience with similar projects, Tetra Tech anticipates that the culvert replacements on the seven “stream” locations will require a *Notification*. It was determined that the remaining five drainage culvert replacements were not located on ‘streams’ as defined by the WSA (See the EOA report for more detail) and therefore the replacement of these culverts does not trigger the need to secure an approval (Notification)

under the WSA. However Best Management Practices outlined below in Section 5.0 (i.e., erosion and sediment control measures; isolation of the work area etc.) must still be applied during construction. Until the 45-day Notification period has passed without comment from FLNRORD on the seven “stream” culvert replacements, no Project works should be conducted.

Wildlife Act

The BC *Wildlife Act* protects most vertebrate animals from direct harm or harassment except as allowed by regulation (e.g., hunting or trapping). Section 34 of the BC *Wildlife Act* specifically protects the nests of Eagles, Peregrine Falcons, Gyrfalcons, Osprey, Herons, and Burrowing owls year-round. This means that a tree or other structure containing such a nest must not be felled, even outside of the breeding season. Section 34 of the *Wildlife Act* also protects the nests of all species of birds when birds or eggs are present in the nest.

The Project will require construction works to be conducted within watercourses that may provide habitat for fish and wildlife. To avoid undue harm to fish and wildlife under the *Wildlife Act*, fish and wildlife salvages must be completed to remove animals, from the construction area. As such, a General *Wildlife Act* Permit will have to be obtained through FrontCounter BC to allow for the capture and relocation of numerous potential wildlife species (at all locations). In addition, a Fish Collection Permit must be obtained through FrontCounter BC for the capture and relocation of all potential fish species in the streams affected by construction activities. Acquisition of this permit will be pursuant to the Angling and Scientific Collection Regulations of the *Wildlife Act*. For both of these permits, at minimum, 30 days should be allowed for permit processing.

Weed Control Act

The BC *Weed Control Act* consists of legislation that states private landowners, private companies, utility companies, regional districts and municipalities, and provincial government agencies or anyone in physical possession of land, except federal lands, have a responsibility to manage weeds in the province (ISBC 2007). Therefore, the *Weed Control Act* does not apply to the lands occupied by the Alaska Highway. Nonetheless, land stewardship principles and practices advocate that PSPC should implement weed and invasive species best practices during construction and operation of the Alaska Highway given federal involvement in multi-jurisdictional strategies and planning sessions (ISBC 2007).

Therefore, this information is provided to educate and address the potential for the spread of invasive species from federal lands to provincial lands adjacent to it. The BC *Weed Control Act* currently designates 39 plant species as noxious weeds within all regions of the province (Table 4-1). Eleven of the culverts are located in the Peace River Regional District (PRRD); the culvert at KM 355.02 is located in the Northern Rockies Regional Municipality (NRRM). There are no additional noxious weeds listed for the NRRM but there are 11 additional noxious weeds identified for the PRRD (Table 4-2).

Table 4-1: Noxious Weeds Regulated in all Regions of Province

Annual Sow Thistle (<i>Sonchus oleraceus</i>)	Bohemian Knotweed (<i>Fallopia bohemica</i>)	Bur Chervil (<i>Anthriscus caucalis</i>)	Canada Thistle (<i>Cirsium arvense</i>)
Common Crupina (<i>Crupina vulgaris</i>)	Common Reed (<i>Phragmites australis subsp. australis</i>)	Common Toadflax (<i>Linaria vulgaris</i>)	Dalmatian Toadflax (<i>Linaria dalmatica</i>)
Dense Flowered Cordgrass (<i>Spartina densiflora</i>)	Diffuse Knapweed (<i>Centaurea diffusa</i>)	Dodder (<i>Cuscuta spp.</i>)	English Cordgrass (<i>Spartina angelica</i>)
Flowering Rush (<i>Butomus umbellatus</i>)	Garlic Mustard (<i>Alliaria petiolata</i>)	Giant Hogweed (<i>Heracleum mantegazzianum</i>)	Giant Knotweed (<i>Fallopia sachalinensis</i>)
Giant Mannagrass/Reed Sweetgrass (<i>Glyceria maxima</i>)	Gorse (<i>Ulex europaeus</i>)	Himalayan Knotweed (<i>Polygonum polystachyum</i>)	Hound's-tongue (<i>Cynoglossum officinale</i>)
Japanese Knotweed (<i>Fallopia japonica</i>)	Jointed Goatgrass (<i>Aegilops cylindrica</i>)	Leafy Spurge (<i>Euphorbia esula</i>)	Milk Thistle (<i>Silybum marianum</i>)
North Africa Grass (<i>Ventenata dubia</i>)	Perennial Sow-thistle (<i>Sonchus arvensis</i>)	Purple Loosestrife (<i>Lythrum salicaria</i>)	Purple Nutsedge (<i>Cyperus rotundus</i>)
Rush Skeletonweed (<i>Chondrilla juncea</i>)	Saltmeadow Cordgrass (<i>Spartina patens</i>)	Scentless Chamomile (<i>Matricaria maritima</i>)	Smooth Cordgrass (<i>Spartina alterniflora</i>)
Spotted Knapweed (<i>Centaurea stoebe</i>)	Tansy Ragwort (<i>Senecio jacobaea</i>)	Velvetleaf (<i>Abutilon theophrasti</i>)	Wild Oats (<i>Avena fatua</i>)
Yellow Flag Iris (<i>Iris pseudacorus</i>)	Yellow Nutsedge (<i>Cyperus esculentus</i>)	Yellow Starthistle (<i>Centaurea solstitialis</i>)	

Table 4-2: Noxious Weeds Regulated in the Peace River Regional District

Burdock (<i>Arctium spp.</i>)	Cleavers (<i>Galium aparine</i>)	Green Foxtail (<i>Setaria viridis</i>)	Kochia (<i>Kochia scoparia</i>)
Night-flowering catchfly (<i>Silene noctiflora</i>)	Oxeye Daisy (<i>Chrysanthemum leucanthemum</i>)	Quackgrass (<i>Agropyron repens</i>)	Russian Thistle (<i>Salsola kali</i>)
Tartary Buckwheat (<i>Fagopyrum tataricum</i>)	White Cockle (<i>Lychnis alba</i>)	Wild Mustard (<i>Sinapsis arvensis</i>)	

These species are non-native plants that create problems for agriculture and/or natural habitats. Therefore, Contractors should ensure that any identified invasive species are controlled and not allowed to spread. Information related to the control and management of invasive species can be found on the Invasive Plant Council of British Columbia's website (<http://www.invasiveplantcouncilbc.ca/>).

Environmental Management Act

The BC *Environmental Management Act* (EMA) governs solid waste and manages introduction of waste into the environment by providing an authorization framework and environmental management tools to protect human health and environmental quality.

Under the Waste Discharge Regulations of the EMA, certain industries, trades, businesses and operations require authorization to discharge waste into the environment. However, even if an industry, trade, business or operation does not require an authorization, waste discharge must not cause pollution [EMA, Section 6 (4)].

The Spill Reporting Regulations of the EMA establishes a protocol for reporting the unauthorized release of substances into the environment as well as a schedule detailing reportable amounts for certain substances. A **Spill Response Plan**, including reportable quantities for spills, is provided below.

The Hazardous Waste Regulations of the EMA ensures that the generators, carriers and receivers of hazardous waste handle, store, transport, treat and dispose of hazardous waste in a safe manner. Hazardous wastes must be disposed of properly to ensure human health and environmental protection.

Heritage Conservation Act

The BC *Heritage Conservation Act* confers automatic protection upon archaeological and historic heritage sites that meet the definitions within section 13(2) of the Act. These include:

- All sites pre-dating AD1846;
- All sites of unknown age or origin which may pre-date AD1846;
- All burial places and rock art sites of historical or archaeological value; and
- All vessels or aircraft wrecked for two or more years.

All areas within the boundaries of a heritage site are protected under the Act, including areas without archaeological deposits or other kinds of heritage remains (e.g., land without archaeological deposits between several culturally modified trees at one site, or between several storage pits at one site).

A Chance Find Protocol (CFP) has been developed for this Project in the event that cultural artifacts or anthropogenic deposits (e.g., remains of hearths, dwellings, storage pits) are uncovered during construction. It is the responsibility of the Contractor to follow the CFP should this occur. The CFP has been included as Appendix 2.

There is always a limited possibility for unknown archaeological sites to exist. Archaeological sites (both recorded and unrecorded) are protected under the *Heritage Conservation Act* and must not be altered or damaged without a site alteration permit from the Archaeology Branch. If an archaeological site is encountered during Project works, activities must be halted, the CFP enacted, and the BC Archaeology Branch contacted at **250-953-3334** for direction.

5.0 ENVIRONMENTAL MITIGATION MEASURES

The BMPs and mitigation measures included in the EMP provide general instructions for managing Project activities to minimize potential environmental effects by limiting their duration, frequency, and intensity. Throughout all phases of the Project, the Contractors are expected to comply with all federal, provincial, and municipal regulations, conditions, and agreements with respect to environmental protection. Additional guidance for project-related environmental management practices and activities will be determined by the terms and conditions of relevant permits, licenses and approvals as they are acquired. It should be recognized that the employment of site personnel experienced in implementation of BMPs, particularly at the Site Superintendent level, is integral to the successful implementation of the Project EPP.

This EMP, in its current form, has been prepared in advance of a Contractor being identified. Therefore, following selection of the successful Contractor, the Contractor should prepare an EPP to meet all legislative requirements detailed above. Additionally, the EPP should specifically, in relation to the work methods proposed and equipment used during construction, incorporate DFO's measures to avoid causing the death of fish or a HADD, and detail the measures that will be taken to protect Woodland Caribou and other Species at Risk.

General requirements of applicable environmental legislation, regulations, standards, guidelines, and BMPs will be adhered to throughout the duration of the Project. Supplementary environmental standards, guidelines, and BMPs are also contained in the following documents:

- DFO. 1992. Land Development Guidelines for the Protection of Aquatic Habitat.
- DFO. 2018. Measures to Avoid Causing Harm to Fish and Fish Habitat.
- FLNRORD. 2014. A Compendium of Wildlife Guidelines for Industrial Development Projects in the North Area, British Columbia – Interim Guidance.
- FLNRORD. 2019. Terms and Conditions for Water Sustainability Act Changes in and about a Stream as specified by the Ministry of Forests, Lands & Natural Resource Operations (FLNRORD) Habitat Officers, Northeast Region.
- BC MOE. 2014. Develop with Care: Environmental Guidelines for Urban and Rural Land Development in British Columbia.
- BC MOE. 2005. A User's Guide to Working In and Around Water: Understanding the Regulation under British Columbia's *Water Act*. Water Management Branch.
- BC MOE. 2004. Standards and Best Management Practices for Instream Works.
- BC MOE. 2016. Best Management Practices for Bats in British Columbia.
- Northwest Response Ltd. 2018. BC Fuel Guidelines (8th Edition).
- Tetra Tech. 2020b. Caribou Protection Plan (Appendix C of the EOA).

It is the responsibility of the Contractor to acquire and familiarize themselves with the requirements of the guideline documents and of the legislation discussed in Section 4.0.

The following sections outline general best management practices and mitigation measures that should be implemented to minimize the potential environmental impacts discussed in Section 3.0. Unless otherwise specified, the following sections are applicable to all twelve culvert locations. Activity specific mitigation measures should be developed by each contractor in an EPP specific to the culvert replacement work.

5.1 General

5.1.01	The successful contractor must review this EMP and the applicable guidelines prior to starting construction
5.1.02	The Contractor is responsible for ensuring that a Qualified Environmental Professional (QEP) prepares an EPP following the provisions outlined in this EMP.
5.1.03	All relevant federal and provincial acts, regulations, guidelines, and BMPs will apply to all work and activities associated with the Project.
5.1.04	The Contractor must be aware of and implement all permitting and approval requirements/conditions. No work should commence until all permits have been obtained for the projects (e.g., WSA Notification acknowledgement or following review period of 45 days).
5.1.05	Contractors must hold a pre-construction meeting that includes the EM and all persons undertaking work on site to facilitate a common understanding of the contents of this EMP, the EPP and all BMPs for the Project.
5.1.06	Daily tailboard meetings should make reference to environmental issues that may arise and inform new employees about environmental compliance on site.
5.1.07	Plan and schedule project activities for dry weather whenever possible to minimize potential ESC issues.
5.1.08	Ensure Contractor employees know how to properly install any protection measure and understand BMPs used on the Project. Improperly installed measures/BMPs do not perform their intended functions and will not achieve desired environmental protection outcomes.
5.1.09	Adopt an “adaptive management” management strategy for the Project. Adaptive management evaluates and adjusts management decisions (i.e., mitigation measures) to reflect the actual interactions. Contractors should be prepared to change existing measures and BMPs should they fail or in the event additional measures are warranted. The EM should be notified of any changes to assess that they are adequate and installed properly.
5.1.10	All construction will be maintained within the existing Alaska Highway alignment. Upon completion of activities, all equipment, supplies, materials and waste will be removed from the work site.
5.1.11	All environmental incidents must be reported to the EM, the Contractor Site Superintendent, and PSPC’s Project Manager and Environmental Coordinator as soon as possible.
5.1.12	The work area should be established and clearly marked. Orange construction (snow) fence installed on rebar stakes or highly visible flagging can be used to delineate the active work area. Ensure all Contractor employees are familiar with the marking system and are given clear instructions/training before work begins. Augment and replace field markers as needed.

5.2 Site Access, Mobilization, and Laydown Areas

5.2.01	Mobilization should be planned to minimize the number of trips to and from the site.
5.2.02	A laydown area for storage of equipment and materials must be established. It should be located on a flat, stable area at least 30 m from the top of bank any nearby watercourses.
5.2.03	Ensure all equipment is brought to site clean (power washed) and in good working order free of sediment, oil and grease staining/leaks, weeds/seeds. Equipment servicing with environmentally sensitive hydraulic fluids is recommended.

5.3 Protection of Fish, Fish Habitat and Aquatic Resources

All the aquatic mitigation measures detailed in the section below need to be considered when working in and around the seven “stream” culverts (KMs 325.08, 329.84, 330.50, 331.26, 335.06, 340.16 and 344.88). Only when indicated in the text below, do these mitigation measures apply to all twelve sites, including the five drainage culverts.

5.3.01	The Contractor is responsible for implementing the terms and conditions outlined in the forthcoming WSA Notification documentation (should FLNRORD provide such documentation). No work can occur before securing the permits, or after the permits expire.
5.3.02	Ideally, instream work should be timed to occur within the window of least risk for fish in the Project Area (July 15 to August 15) or when water is frozen or at its lowest levels. The current plan is to undertake the work in February and March of 2021 when the watercourses may be frozen to the stream beds. If work is planned to occur outside the window of least risk for fish, the Contractor must work with a QEP to develop proper mitigation to avoid harm to fish. If the streams are dry (i.e. no flow) at the time of the construction, instream work can occur outside of the least risk window for fish without consultation of a QEP.
5.3.03	The EM must be on-site when work is occurring within 30 m of water, during site isolation and implementation of ESC measures, during instream works, and during fish/wildlife salvage operations, if required.
5.3.04	Any work conducted below the high-water mark must occur in isolation of flow (including at the five drainage locations). Flow isolation can be achieved by constructing temporary dams upstream and downstream of the work area, and then pumping or temporarily redirecting the stream around this isolation area. Flow must be maintained upstream and downstream of the work area at all times. Flow isolation can only occur after fish salvage activities are complete. Additional guidance for stream diversion can be found in DFO’s (2020a) “Interim Code of Practice: Temporary Cofferdams and Diversion Channels”. Engineering design drawings, complete with environmental staging drawings for site isolation and stream diversion can be found in Appendix E of the Environmental Overview Assessment (EOA) prepared for this project.
5.3.05	If a “dam and pump” system is used to isolate instream work areas, all water intakes must be screened according to DFO’s (2019) “Interim Code of Practice: End-of-pipe Fish Protection Screens for Small Water Intakes in Freshwater” to prevent entrainment or impingement of fish and other aquatic organisms. (Available at: https://www.dfo-mpo.gc.ca/pnw-ppe/codes/screen-ecran-eng.html)
5.3.06	Follow the applicable BMPs outlined in DFO’s Measures to Avoid Causing Harm to Fish and Fish Habitat (Available at: https://www.dfo-mpo.gc.ca/pnw-ppe/measure-mesures-eng.html) and; BC MOE’s (2004) Standards and Best Management Practices for Instream Works (Available at: https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/best-management-practices/iswstdsbpsmarch2004.pdf).
5.3.07	All fish must be salvaged (i.e., captured and relocated to appropriate upstream habitat) by QEPs prior to dewatering. A Scientific Fish Collection Permit must be obtained from FLNRORD prior to conducting salvage activities.
5.3.08	Equipment and vehicles should avoid crossing watercourses (including the five drainage locations). If crossing is unavoidable, every effort should be made to limit machinery crossing to a one-time event (i.e., over and back). If crossings are necessary, a temporary crossing structure will have to be built to facilitate these movements. All temporary stream crossings must be conducted according to DFO’s (2020b) “Interim Code of Practice: Temporary Stream Crossings”.
5.3.09	Equipment should operate above the high-water mark of any watercourse. While working instream, equipment should work from a dry location, such as above the bank or from an area that has been isolated. Minimize the area of disturbance below the high-water mark as much as possible. Limit equipment movement and ensure it is situated on stable surfaces (e.g., coarse substrates or rig mats).
5.3.10	Refuelling and maintenance of equipment as well as the storage of any excess fuels, oils, lubricants or other petrochemical products should occur at least 30 m from water (including the five drainages).

5.3.11	Equipment and machinery used in or near a watercourse should be inspected daily to ensure they are in good operating condition and free of leaks, excess oil, grease and invasive or noxious weeds and seeds (power wash off site if necessary).
5.3.12	If feasible, machinery used in proximity to any watercourse should use environmentally friendly fluids (i.e., non-toxic, biodegradable or vegetable oil based).
5.3.13	No water should be extracted from any watercourse for Project use (including the five drainages locations).
5.3.14	The Project involves activities, such as soil disturbance and excavation, that have potential to contribute sediments to nearby watercourses, which may either contain fish or drain into streams that contain fish. Transportation of sediments or sediment-laden runoff downstream should be prevented by implementing the appropriate ESC measures as discussed below (see Section 5.6) and detailed more fully within the Contractor's ESC Plan.
5.3.15	If flow is occurring at the time of the culvert replacements, water quality will be frequently monitored by the Contractor's EM to ensure TSS/turbidity are maintained at an acceptable level (see Section 5.7 for additional details).
5.3.16	No deleterious materials or Project-related debris are allowed to enter any watercourse (including the nine drainage locations). Debris generated from the Project must be contained, collected and disposed of properly off-site.
5.3.17	In the event of any fluid spills or leaks into water (including the five drainage locations), the Spill Response Plan (Appendix 3) must be enacted and notifications are to begin immediately.
5.3.18	Prior to construction, an aquatic biologist will evaluate the seven watercourses that meet the definition of a 'stream' (i.e., (KMs 325.08, 329.84, 330.50, 331.26, 335.06, 340.16 and 344.88) before any in-stream work occurs to identify potential spawning beds (i.e., redds). If no redds are present, construction may continue as planned. If redds are identified, construction must be delayed until the Bull Trout juveniles have emerged from their redds and can be safely salvaged from the area, or until the next Reduced Risk Timing Window.

5.4 Protection of Wildlife and Wildlife Habitat

5.4.01	The SARA protects rare and sensitive wildlife species. Should a rare or sensitive species be identified at the site at any time during the Project, the EM should be notified immediately for further direction. The BMPs to be employed to mitigate the potential effects would vary greatly depending on the identified species, its sensitivity to the activities, and its proximity of habitat to the Project footprint.
5.4.02	To avoid and minimize impacts to Woodland Caribou, it is recommended that caribou mitigation efforts follow the guidelines presented in FLNRORD's Compendium of Wildlife Guidelines for Industrial Development Projects in the North Area, British Columbia (2014). (Available at: http://a100.gov.bc.ca/pub/eirs/finishDownloadDocument.do?subdocumentId=9921)
5.4.03	For construction occurring within known Caribou ranges, the Contractor is responsible for implementing the provisions outlined in the Caribou Protection Plan (Appendix C of the EOA).
5.4.04	An EM should be on site to give a stop work order if caribou, or any other SARA-listed species are observed nearby during construction.
5.4.05	The MBCA (1994) prohibits the taking or killing of migratory bird nests and eggs, and the deposition of harmful substances in areas frequented by migratory birds. Likewise, the Wildlife Act also prohibits the possession, taking, injury, molestation or destruction of a bird or its eggs. No vegetation removal or disturbance is anticipated to occur within the breeding bird nesting period (generally April 30 to August 20). If vegetation clearing occurs in this period, pre-clearing bird nest surveys will be required to minimize the potential that active nests are destroyed. If an active nest of any bird species is found, a no-disturbance zone will be established, and the area will remain undisturbed until young have fledged.

5.4.06	Any active nests or roosts of species protected by the SARA or the MBCA detected on-site must not be disturbed and consultation with the EM will occur to determine appropriate mitigation. Under the <i>Wildlife Act</i> , heron and raptor nests are protected all year round, regardless of whether they are active or inactive, and must not be disturbed.
5.4.07	Wildlife species have been known to roost/den in culverts and structures. Prior to removal, all culverts and collapsed structures should be inspected (both inside and outside) for denning wildlife. If any denning, roosting or nesting wildlife is detected on-site, work should be stopped until a QEP can be consulted.
5.4.08	All food waste and other materials that may attract wildlife are to be removed from the site daily. Lunches, coolers, and food products, including waste food products should be securely stored to prevent access by animals.
5.4.09	Notify the EM immediately if dens, burrows, or nests, are detected within the Project area or if there are encounters with bears, coyotes, cougars, or any species at risk. The following should be reported to the EM: (i) aggressive encounters involving any species, (ii) nuisance wildlife, (iii) sightings of large carnivores, (iv) wildlife deaths or (v) observations of carcasses.
5.4.10	Feeding, harassment, or destruction of any wildlife is strictly prohibited. Wildlife encountered at or near the Project should be allowed to passively disperse without undue harassment.
5.4.11	If works occur in non-frozen conditions, all wildlife (e.g., amphibians) must be salvaged (i.e., captured and relocated to appropriate upstream habitat) from the work area by QEPs prior to dewatering. Wildlife salvage must be done at all twelve culvert locations. A General Wildlife Permit must be obtained from FLNRORD prior to conducting salvage activities.

5.5 Vegetation and Soil Management

5.5.01	Any vegetation to be removed should be surveyed by the EM, or other QEP, to identify any breeding, nesting, roosting or rearing birds and determine the appropriate BMPs.
5.5.02	Vegetation removal that will affect trees, low shrubs and aquatic plants used by all birds and other wildlife should be avoided while they are breeding, nesting, roosting, or rearing young. Adherence to the nesting windows for clearing activities is required (see Section 5.4).
5.5.03	To prevent the spread of invasive plant species, vehicles and equipment must be inspected prior to arriving on site to ensure they are free of soil and plant material (power washed if necessary).
5.5.04	In areas of invasive plant infestations identified by the EM, rig matting should be laid down prior to mobilization of machinery to the work area. The bottom of the rig mats should be fully inspected and cleaned of any vegetative matter or soils before being moved from each location.
5.5.05	Machinery and vehicles should be restricted to defined travel routes to avoid excess trampling/compaction of vegetation and soil. Construction should be contained within the existing Alaska Highway ROW.
5.5.06	To minimize the establishment and spread of invasive plants, a post-construction vegetation monitoring and control program should be developed as part of the EPP.
5.5.07	Vegetated areas disturbed by Project related works (including laydown sites, temporary work sites, and material stockpile sites) should be restored as quickly as possible. Disturbed areas should be restored by replacing any excavated topsoil, recontouring and seeding with an approved seed mix appropriate to the site and following approval by PSPC. A revegetation and site restoration plan should be included in the Contractor's EPP.
5.5.08	To prevent soil compaction around the root zone, avoid storing machinery within the drip-line of trees.
5.5.09	Minimize use of equipment on exposed soils and when possible, restrict vehicle traffic to existing roadways or disturbed areas to avoid unnecessary soil compaction.
5.5.10	A fire prevention plan should be developed as part of the EPP. The fire prevention plan should comply with applicable fire prevention policies.

5.6 Erosion and Sediment Control

The following Erosion and Sediment Control measures are applicable at all twelve culvert locations.

5.6.01	The Contractor is responsible for developing an Erosion and Sediment Control Plan as part of their EPP prior to starting construction.
5.6.02	ESC devices (such as, but not limited to, silt fencing, geotextiles, polyethylene sheeting, straw, mulch, approved grass seed, gravel for check dams, etc.) should be available for use on-site. The Site should be prepared to quickly install devices and Project members should be trained in the installation and use of the devices. The EM should confirm appropriate use and location of ESC measures prior to start of Project activities.
5.6.03	Sediments must not be tracked off site. Contractors should ensure that materials tracked onto public roadways adjacent to the Project area are swept at the end of each workday. Tracked materials should be removed by sweeping, shoveling, or vacuuming; materials should not be removed by hosing or sweeping sediments into drainage channels.
5.6.04	All instream works must occur in the dry, isolated from flowing water. Erodible materials should not be used in construction of the isolation structure.
5.6.05	Prior to starting work, appropriate ESC measures should be implemented to prevent sediment from entering into any surface water feature or watercourse within the Project area.
5.6.06	Construction works are anticipated to occur during frozen conditions. Excavated soils should be placed above the top of bank in a location such that sediments will not runoff into a watercourse during the spring melt. Soils should not be placed on top of ice surface at any time.
5.6.07	Periods of heavy precipitation are unlikely during the proposed construction schedule but could occur. As much as possible, earthworks should be scheduled to be conducted and completed during dry weather. Excavation activities should be halted during heavy or prolonged rainfall events resulting in evident sediment mobilization such as sloughing of exposed soils or overland flow of sediment-laden water. Work may be stopped completely or works may require the implementation of additional ESC measures to permit work to continue. <i>A rainfall event is considered significant when 25 mm or greater falls within a 24-hour period, or when 10 mm or greater falls within a one-hour period.</i>
5.6.08	All ESC measures should be routinely inspected, especially during or after intense or prolonged rainfall events, to ensure proper function. A quick response to assess and correct damages of the controls is required, especially before subsequent precipitation events. The integrity of the structural components should be verified, and the accumulated sediment be measured. Generally, if sediment levels exceed half the volume or one-third the height of a sediment barrier, the sediments should be removed to ensure continued operating effectiveness. Any structural failures should be repaired, and any major defective sections replaced upon detection.
5.6.09	Soil stockpiling, if necessary, will occur within designated areas that are a reasonable distance (i.e., > 30 m) from high-water mark of any flowing watercourse. The designated location(s) should be approved by the EM. Stockpile volume and area should be minimized where possible and should not be placed on sloped terrain.
5.6.10	Stockpiles required to remain in place for an extended period will be protected by covering them with polyethylene sheeting and a sediment barrier, such as silt fencing or a lined, sandbag berm, should be installed within 1 m around the perimeter.
5.6.11	All ESC structures will be decommissioned once the Project area has been reclaimed to a level where surface erosion and sedimentation have been stabilized, and potential adverse effects to receiving aquatic systems during peak precipitation events are deemed unlikely by the EM. Non-degradable materials will be removed and disposed of off-site.
5.6.12	Vegetation outside of the work area should be protected. Surface disturbance should be kept to within the limits of work area and the amount of time surfaces are exposed should be minimized.
5.6.13	Any exposed soils created as a result of the Project must be protected from erosion by implementing the appropriate ESC measures (i.e., ESC blanket, straw etc.).

5.7 Water Quality

5.7.01	In the event flow is present at the time of the culvert replacements, water quality should be frequently monitored downstream of the work area during instream works to ensure turbidity is at an acceptable level. When turbidity exceeds the established acceptable levels outlined in BC MOE’s (2018) Approved Water Quality Guidelines (BCAWQG) for Aquatic Life, the EM must direct activities, such as requiring additional sediment control measures be installed or halting work.
5.7.02	Establishing a background level of turbidity in the affected watercourses is necessary to ensure that guidelines are not exceeded. According to BC MOE’s Technical Appendix Addendum Sampling Strategy for Turbidity, Suspended and Benthic Sediment baseline (or background) conditions can be established before project activities commence or by establishing appropriate upstream sites that can be referenced throughout the Project.
5.7.03	The BCAWQG for Turbidity state that turbidity should not increase from background levels by more than 8 NTU at any one time in a 24-hour period during low/clear flows (i.e., dry weather).
5.7.04	The BCAWQG state that turbidity should not increase from background levels by more than 5 NTU at any one time when background is 8 to 50 NTU during high/turbid flows (i.e., wet weather).
5.7.05	The BCAWQG state that turbidity should not increase from background levels by greater than 10% at any one time when background is over 50 NTU during high/turbid flows (i.e., wet weather).
5.7.06	Proper ESC measures should be installed prior to starting construction to protect adjacent watercourses from sediment runoff. If sediment-laden runoff is observed entering nearby watercourses, the EM should be notified and water quality measurements (i.e., turbidity) obtained.
5.7.07	Debris from the Project must not enter adjacent watercourses. Generated debris must be contained, collected and disposed of properly off site.
5.7.08	Any spill into or nearby a watercourse, of a substance that is toxic, polluting, or deleterious to aquatic life must immediately be reported to Emergency Management BC (EMBC) 24-hour phone line at 1-800-663-3456. For proper spill response procedures, refer to the Spill Response Plan (Appendix 3).

5.8 Waste Management (Including Hazardous Wastes and Potentially Contaminated Soils)

5.8.01	The Contractor is expected to adhere to all applicable legislation with respect to the handling, transportation, and/or disposal of all materials related to this Project (waste or otherwise). This legislation may include (but not be limited to) the BC Environmental Management Act, BC Hazardous Waste Regulations (HWR), Spill Reporting Regulations, Workers Compensation Board Regulations, TDG Regulations, BC Contaminated Site Regulation (CSR) in the event contaminated soil is generated or encountered, etc.
5.8.02	The Contractor is expected to abide by the general ‘leave no trace’ rule. All Project personnel are responsible for removing all litter, domestic garbage, recyclables and organic wastes that are brought to site for appropriate off-site disposal. General housekeeping should be monitored by the EM.
5.8.03	Should garbage containers be required on site, they should be made inaccessible to wildlife, including bear-proof lids.
5.8.04	Non-hazardous construction waste should be collected at designated areas on the site and removed to appropriate facilities on a regular basis.
5.8.05	Maintain a tidy work area to minimize loose waste from leaving the site. The site should be cleaned upon the completion of work daily.
5.8.06	Recycle materials whenever possible.
5.8.07	Waste materials must not be buried or burned.
5.8.08	Sanitary facilities must be utilized by all personnel on-site, located 30 m from any watercourse, stable and secured to avoid tipping, and emptied on a regular basis.

5.8.09	Hazardous wastes generated could include waste petroleum products (engine oils, lubricants) from machinery and equipment, spent batteries, solvents and cleaning agents, etc. The Contractor should provide labelled separate container(s) for potentially hazardous waste such as oily rags and hydrocarbon absorbent pads.
5.8.10	All hydrocarbon products and other hazardous wastes potentially present during project activities should be identified and the associated Workplace Hazardous Materials Information System (WHMIS) and Materials Safety Data Sheets (MSDS) made available to all Project members.
5.8.11	If hazardous or contaminated material (including suspect soils) is encountered, stop work immediately and report it to the Site Superintendent and EM who will determine appropriate BMPs. Hazardous materials should only be handled by appropriately trained personnel.
5.8.12	Any waste considered to be hazardous will be labelled and disposed of off-site according to the WHMIS criteria and the <i>BC Environmental Management Act</i> and TDG Regulations.
5.8.13	All work sites must have emergency spill kits (stocked with pads and sorbent booms) available on site. The kits should be suitable for the quantities and types of material in use and stored at the site. All mobile equipment must contain fully stocked, dedicated spill kits. Contractors must be trained in the proper use of the kits in case of a spill.
5.8.14	Soils suspected of contamination, should be sampled in accordance with accepted soil sampling procedures. The sample(s) should be submitted via Chain of Custody protocol to an accredited analytical laboratory to confirm it is not contaminated. If parameter concentrations exceed applicable standard(s), the contaminated soil should be remediated in accordance with the applicable standards and/ or guidelines under the supervision of an appropriately Qualified Environmental Professional or disposed of at a licensed facility in accordance with the CSR and/or HWR.

5.9 Concrete

5.9.01	Keep materials out of the rain. Store both dry and wet materials under cover, protected from rainfall and runoff. Also, protect dry materials from the wind.
5.9.02	Wash large concrete handling equipment, such as concrete trucks, chutes, pumps, and internals at an approved off-site location or in designated concrete washout areas only. Do not wash out concrete trucks onto the ground or into storm drains, open ditches, streets, or streams. Wash small concrete handling equipment, such as hand tools, screens, shovels, rakes, floats, trowels, and wheelbarrows into designated concrete washout areas.
5.9.03	Designated concrete washout areas, if required on site, should be located as far from the high-water mark and catch basins as possible (preferably at least 30 m). Appropriate containment facilities for wash-down water must be available to ensure the runoff does not enter the aquatic environment.
5.9.04	Cast in place concrete must remain isolated from water inside sealed formed structures until cured (approximately 48-72 hours), as concrete leachate is highly toxic to fish and other aquatic life.
5.9.05	A carbon dioxide (CO ₂) tank with regulator, hose and gas diffuser must be available on site during concrete work to neutralize pH levels should a concrete spill to water occur. Project members must be trained in its proper use.
5.9.06	Prevent any water that contacts deleterious uncured or partly cured concrete (during activities like exposed aggregate wash-off, wet curing, or equipment washing) from directly or indirectly entering any watercourse or stormwater system.
5.9.07	Hold any water that contacts uncured or partly cured concrete until the pH is between 6.5 and 8.0 pH units and the turbidity is less than 25 nephelometric turbidity units (NTU), measured to an accuracy of +/- 2 NTU.
5.9.08	Use biodegradable release oil on the forms, where possible. Ensure that the form release oil does not enter the aquatic environment when applying it.

5.10 Fuel Storage and Spill Response

5.10.01	Handle, store and transfer fuel in accordance with the BC Fuel Guidelines (Available at: http://www.northwestresponse.ca/resources/2018%20BC%20Fuel%20Guidelines.pdf)
5.10.02	Equipment and machinery should be inspected on a daily basis to ensure that they are in good operating condition, free of leaks, and excess oil and grease.
5.10.03	If feasible, machinery used in proximity to watercourses should use environmentally friendly hydraulic fluids (i.e., biodegradable or vegetable oil based).
5.10.04	When vehicles and equipment are not in use and/or left on site overnight, place drip trays or absorbent pads should be placed beneath the vehicle/equipment to capture any drips or leaks.
5.10.05	Refuelling and maintenance of equipment as well as the storage of any excess fuels, oils, lubricants or other petrochemical products should occur at least 30 m from any watercourse and/or drainage system. Topographic features and slope should be considered; flat surfaces are recommended.
5.10.06	Hydrocarbon and coolant storage, if required on site, should be within a secondary impermeable containment facility capable of holding 110% of the storage tank contents. This may be achieved through the use of double-walled storage tanks. These containment basins should be inspected daily for leaks and wear points, kept clean and any measurable rainwater removed and disposed of appropriately. If practical, the containment area should be covered to prevent infilling with rainwater. Where leaks and/or wear points are found, they should be repaired promptly to restore full containment.
5.10.07	Tanks, hoses, and connections should be inspected before fuel transfers. All hose connections should be wrapped and secured with absorbent pads during fuel/oil transfers and remain wrapped, contained, and in an upright orientation during all other times. All hoses, valves, and equipment should be kept in a containment area whenever possible. Minimize hose length and the number of connections - use dripless connections if possible. Drain hoses when finished.
5.10.08	Contractors should ensure that small containers (i.e., jerry cans) will be stored within secondary containment in a secure location, protected from weather. These containers must be designed solely for the purpose of storing and pouring fuel and should not be more than 5 years old. Containers must not leak and must be sealed with a proper fitting cap or lid.
5.10.09	The Contract is responsible for ensuring that site-specific Spill Response Plan is prepared and on-site at all times (see Appendix 3 which presents an Example Spill Response Plan).
5.10.10	All spill containment kits should be readily accessible both on-site and on each piece of equipment in the event of a release of a deleterious substance to the environment. Spill kits should be capable of dealing with 110% of the largest potential spill.
5.10.11	All Project personnel should be trained in the use of spill kit materials and supplies and be aware of their location. Any spill to water of a substance that is toxic, polluting, or deleterious to aquatic life must immediately be reported to the EMBC 24-hour phone line at 1-800-663-3456 (see Spill Response Plan, Appendix 3). A spill to ground of reportable quantities (as detailed in Appendix 3) of a substance that is toxic, polluting, or deleterious to life must immediately be reported to the EMBC 24-hour phone line.
5.10.12	A pre-construction meeting should be held to identify all materials of a deleterious nature that could be spilled. The Contractor's EPP should provide a list of all materials that may be hazardous or of a deleterious nature and include the WHMIS paperwork.
5.10.13	Hazardous materials and wastes should be stored in covered containers and in secondary containment.
5.10.14	Minimize the potential for spills through proper use, handling, storage, and disposal of products. If a spill occurs, stop work immediately to respond and follow the protocol outlined in the Spill Response Plan (Appendix 3). Action should be taken to contain the spill and then, if necessary, reported.

5.11 Air Quality

5.11.01	All equipment, vehicles and stationary emission sources should be well-maintained and operated at optimum rated loads and be turned off when not in use to minimize exhaust emissions.
5.11.02	Vehicles or equipment producing excessive exhaust pollution should be repaired or replaced.
5.11.03	Dust-generating activities will be minimized as much as possible, especially during windy periods and dry weather, to minimize airborne dust emissions. Given the habitat sensitivity of the area, water is considered the only appropriate dust suppressant (e.g., a sprinkler system) and should be used as needed. Unless PSPC holds a permit that allows water extraction from certain locations, water must not be withdrawn from surrounding watercourses for this purpose. Only that amount of water necessary to suppress dust must be utilized so as to avoid causing overland flow of sediment-laden water.
5.11.04	When hauling materials with the potential to generate dust, loads should be tarped to avoid blow-off.
5.11.05	The burning of oils, rubber, tires and any other material is not permitted to take place at the site.
5.11.06	Stationary emission sources (e.g., portable diesel generators, compressors, etc.) should be used only as necessary and turned off when not in use.
5.11.07	Equipment and vehicles should be turned off when not in active use so to reduce idling.

5.12 Noise and Vibration

5.12.01	Noise exposure levels should comply with Part 7, Division 1 of the Occupational Health and Safety Regulation. WorkSafeBC has several publications regarding noise in the workplace and are available at: <ul style="list-style-type: none"> ▪ http://www.worksafebc.com/publications/health_and_safety/by_topic/assets/pdf/basic_noise_calculations.pdf ▪ http://www.worksafebc.com/publications/health_and_safety/by_topic/assets/pdf/occupational_noise_surveys.pdf
5.12.02	All equipment should be properly maintained to limit noise emissions and fitted with functioning exhaust and muffler systems. Machinery covers and equipment panels should be well fitted and remain in place to muffle noise. Bolts and fasteners should be tight to avoid rattling.
5.12.03	Engines should be turned off when not in use or reduced to idle, and equipment operators should avoid unnecessary revving and use of engine breaks.

5.13 Archaeological Resources and Historical Sites

5.13.01	A Chance Find Procedure (CFP) has been developed by Tetra Tech and should be part of the Contractor's EPP, in the event that cultural artifacts or anthropogenic deposits (e.g., remains of hearths, dwellings, storage pits) are uncovered during construction (Appendix 2).
5.13.02	If an archaeological site is encountered during construction, activities must be halted within 30 m of the find, and the Contractor must follow the CFP. The Archaeology Branch should be contacted at 250-953-3334 for direction.

6.0 ENVIRONMENTAL MANAGEMENT ROLES AND RESPONSIBILITIES

The effective environmental management of this Project requires a coordinated effort from all individuals involved. The following sections outline the responsibilities of key personnel involved with the Project.

6.1 Key Project Personnel

The Project contact list (Table 6-1) for the works proposed in this EMP should be completed as soon as the information is known and made available to all parties. The successful contractor should provide details to complete and update this list as part of their EPP.

Table 6-1: Project Contact List

Name	Role	Phone Number	Email
TBD	Contractor Site Superintendent	TBD	TBD
TBD	Contractor's Environmental Monitor (EM)	TBD	TBD
TBD	Construction Inspector	TBD	TBD
Alex Taheri	PSPC Project Manager	(778) 939-6704	Alex.Taheri@pwgsc-tpsgc.gc.ca
Laurie Crawford	PSPC Environmental Coordinator	(780) 497-3892	Laurie.Crawford@pwgsc-tpsgc.gc.ca
Colin Eriks	Tetra Tech Project Manager	(778) 945-5739	Colin.Eriks@tetrattech.com

6.2 Contractor Responsibilities

The successful contractor will review Tender Specifications for environmental compliance and this EMP with their staff and subcontractors and prepare an EPP prior to undertaking any work. The Contractor is responsible for ensuring that all the activities related to the Project are conducted in such a way that impacts to the environment are either avoided or minimized.

- Contractors will comply with all laws, orders, rules, regulations, and codes of any provincial or federal environmental agency or like authority, which are applicable to the Project.
- Contractors are responsible for implementing the BMPs and mitigation measures outlined in the EMP.
- Contractors will cooperate with the EM appointed for the work. They must comply with written or verbal instructions with respect to execution of the proposed work in compliance with the mitigation measures outlined in the Tender Specifications, this EMP and their EPP, which are at a minimum, consistent with the regulatory agencies having jurisdiction over the area of the Project. Prior to construction the Contractor must retain the EM to evaluate the seven “stream” locations (i.e., KMs 325.08, 329.84, 330.50, 331.26, 335.06, 340.16 and 344.88) for the presence of Bull Trout redds.
- Contractors must complete their work in such a fashion that all watercourses, including any ditches and swales, where works are to occur, are effectively isolated from downstream habitat. The Contractor will coordinate with the EM prior to and during the installation of the isolation measures in order that the EM can arrange for the concurrent salvage of fish and other aquatic wildlife (if the watercourses are not frozen to the stream bed) within the isolated work areas. Environmental staging drawings for site isolation and stream diversion can be found in Appendix E of the Environmental Overview Assessment (EOA) prepared for this project.
- Contractors will correct deficiencies and any non-compliance upon direction from the EM whether written or verbal. Corrections should be made as soon as reasonably possible, ideally within 24 hours of directions.
- Contractors will arrange provision of appropriate on-site waste containers, if required.
- Contractors are responsible for the restoration of all disturbed areas resulting from any of the works they undertake. The Contractor is responsible for reinstatement of the Project area after construction, to the satisfaction of the Project Manager and the EM.
- If an archaeological site is detected, the Contractor is responsible for following the Chance Find Protocol (Appendix 2).

6.3 Environmental Monitor Responsibilities

On-site monitoring is a key component of ensuring that the mitigation measures recommended in the EMP (and ultimately the EPP) are implemented properly (e.g., appropriate location and correct installation) and function as intended. The Contractor should retain a full-time QEP as the EM to provide guidance on implementing the recommended measures and, if necessary, to develop additional mitigation measures if the need arises.

The key monitoring stages the EM is responsible for include:

- During start-up of the Project and installation of erosion and sediment control measures;
- During work that occurs within 30 m of water or within 30 m of the high-water mark of any watercourse. *For this Project, the EM is expected to be on-site full time during any work conducted within 30 m of the seven “stream” culverts (KMs 325.08, 329.84, 330.50, 331.26, 335.06, 340.16 and 344.88) and their associated watercourses.*

For the five drainage culverts (KM 332.05, KM 333.18, KM 339.66, KM 347.67 and 355.02), close oversight of the EM will only be required if there is flow through the culvert at the time of construction;

- During worksite isolation from flow, when fish and wildlife salvage operations are required, and during instream works (i.e., work below the high-water mark);
- During any accidents or malfunctions that affect the Project and following any significant rainfall events. It is equally important to take corrective action prior to inclement weather events rather than to react during or after the event; and
- During completion of the Project and decommissioning/removal of mitigation measures.

The primary responsibility of the EM is to confirm that the environmental protection objectives of the Project are met and that the requirements of this EMP and contractor's EPP are enacted. EM responsibilities include:

- Monitor compliance with the EMP, EPP, permits and other legal requirements.
- Securing Fish Collection Permits and General Wildlife Permits prior to conducting salvage work.
- Evaluating the seven "stream" locations (KMs 325.08, 329.84, 330.50, 331.26, 335.06, 340.16 and 344.88) for the presence of Bull Trout redds prior to construction.
- Communicate the requirements of the EMP and EPP to the contractors and their respective employees during pre-job and tailboard meetings.
- Be on site as per the schedule established between parties prior to Project start and remain on-call (via phone or email) during non-critical work periods to respond to emerging environmental issues or emergencies.
- Review the contractors work procedures to assess functionality and compliance with the EMP, the EPP and applicable regulations, standards and BMPs.
- Have the authority to modify and/or halt any construction activity at any time if deemed necessary for the protection of the environment or if SAR (e.g., Woodland Caribou) are observed in the Project area.
- Advise Project personnel if Project activities have caused or are likely to cause an environmental incident and make recommendations for corrective action.
- Liaise directly with Project personnel and provide technical advice to resolve situations that may impact the environment as they arise.
- Monitor all works conducted within watercourses to ensure downstream habitat is effectively isolated.
- In the event flow is occurring at the time of construction, conduct routine field water quality data collection (turbidity, pH, temperature, conductivity) using portable water quality meters prior to (baseline) and during construction activity within watercourses. Results will be compared to the British Columbia Approved Water Quality Guidelines for Aquatic Life. If a Guideline is exceeded, the EM will direct the contractor to undertake corrective measures or, as necessary, halt works until the EM deems the issue that caused the turbidity or pH non-compliance is effectively resolved.
- Maintain complete records of activities related to the implementation of the EPP. This should include any readings or measurements taken, photographs and incident reports.

- Complete and submit a monitoring report to PSPC and report any unanticipated adverse effects to the environment within 24 hours of occurrence. Such reports should include the nature of the effect, its cause, mitigation and/or remediation implemented, and whether a work stoppage was ordered, as well photographs, analyses, and measurements, if applicable.

6.4 Public Services and Procurement Canada Responsibilities

PSPC will delegate a Departmental Representative / Environmental Coordinator (EC) to oversee the Project to completion and to coordinate project activities between all parties involved. Throughout the duration of the Project, PSPC is committed to undertake the following:

- Require that the successful Contractor has an appropriate Environmental Protection Plan, and an EM in place prior to starting work.
- A Project-specific Environmental Protection Plan (EPP) will be prepared by the successful Contractor as part of the Tender requirements for the Project and provided to the PSPC EC for review prior to work commencing. The PSPC EC will review the Contractor's EPP for accuracy against the this EMP, appropriate Project specifications, and contract requirements. Work related to the EPP submittal (as determined by the PSPC EC) shall not proceed until acceptance of the EPP by the PSPC EC.
- Upon PSPC EC acceptance of the Contractor's EPP, the PSPC EC may submit the EPP as part of the environmental notification/permitting process.
- The PSPC EC monitors compliance with the contract specifications.
- The PSPC EC has the responsibility to notify Contractor verbally and in writing of observed non-compliance with environmental Project specifications and/or Federal, Provincial or Municipal environmental laws or regulations, permits, etc.
- The PSPC EC has the authority to issue a stop work order when an existing or potential environmental non-compliance is observed until satisfactory corrective action has been taken.
- The PSPC EC ensures that environmental incidents are reported.
- The PSPC EC liaises with regulatory agencies as required.

6.5 Environmental Auditor (Tetra Tech) Responsibilities

Tetra Tech will provide environmental oversight on behalf of PSCP for the Project. The role of Tetra Tech includes the following tasks:

- Prepare and update the Environmental Overview Assessment, Environmental Management Plan, Caribou Protection Plan and Chance Find Protocol as necessary;
- Confirm that the Contractor understands all requirements of the Chance Find Protocol;
- Apply for environmental permits on behalf of PSPC required for Project activities (with the exception of the Fish Collection and General Wildlife Act permits which are the responsibility of the Contractor's EM);
- Liaise with PSPC's Environmental Coordinator to meet Project objectives; and
- Prepare project design details, drawings, and specifications on PSPC's behalf.

7.0 ENVIRONMENTAL COMMUNICATION / REPORTING REQUIREMENTS

7.1 Environmental Protection Plan

A Project-specific EPP will be prepared by the successful Contractor as part of the Tender requirements for the Project and provided to the PSPC Environmental Coordinator for comment and review prior to work commencing. An appropriately qualified EM will be designated by the Contractor before the commencement of the Project to oversee the execution of the EPP. The EPP will:

- Be available to all staff during Project activities. The Contractor will be required to keep a copy of the EPP on-site during construction.
- Include an access plan including access routes, traffic safety, type of equipment used for various construction phases, and location of lay down areas in order to prevent/minimize disturbance to vegetation and soils. Lay down areas will occur on paved and/or hardened surfaces, where possible.
- Include spill response procedures and hazardous materials plan (e.g., fuels, lubricants, concrete etc.), including appropriate containment, storage, security, handling, and transportation of applicable materials/substances, spill kit requirements, and emergency response contacts. The Material Safety Data Sheets (MSDS) for all chemicals used will be made available on site.
- Include an Emergency Response Plan that outlines procedures to follow in case of emergency (e.g., wildlife encounter, equipment malfunction/failure, fire, avalanche).
- Details of environmental monitoring and rehabilitation.
- Includes an Erosion and Sediment Control Plan.
- Include provisions to reduce human-wildlife interactions.
- Integrate fully with the Traffic Management Plan, Quality Management Plan and Site-Specific Health and Safety Plan.

7.2 Environmental Monitoring Reports

The EM is responsible for completing and submitting environmental monitoring reports at a frequency acceptable to PSPC, detailing the construction activities that occurred during the days the EM was on-site and any observations of environmental non-compliance with the EMP or EPP. EM reports should include the following information:

- The name of the EM and the date, time and duration the EM was on site;
- A description of the weather during the site visit;
- A list of personnel on site;
- A summary and photo documentation of the construction activities that were taking place during the site visit, or that took place since the last site visit; and
- Water turbidity measurements and/or fish salvage results if works were being conducted in or around a watercourse (other than if the watercourse was dry at the time of the works).

- In cases where environmental non-compliance or environmental incidents are observed, the EM report should include:
 - The nature of the effect and its cause;
 - Whether a work stoppage was ordered;
 - Photographs;
 - Analyses, and measurements, if applicable;
 - Mitigation and/or remediation measures that were implemented or recommended; and
 - In subsequent site visits, the EM should document if non-compliances identified during previous EM visits had been resolved and/or addressed.

7.3 Emergency Response and Environmental Incident Reporting

All environmental incidents/emergencies should be reported to the EM, the Contractor Site Superintendent, and PSPC as soon as possible, so that appropriate notifications can be made, and Project management can ensure that incidents are handled appropriately. In the case of any environmental concern and/or incident, Project personnel are responsible for informing their Site Superintendent, who must then report to the EM. Contractors are responsible to ensure that all crew are adequately trained and equipped to deal with potential environmental incidents related to their work. Any concerns about preparedness for environmental incidents should be brought to the attention of the Site Superintendent or the EM.

The Emergency Contacts List (Table 7-1) should be updated as part of the EPP, as necessary.

Table 7-1: Emergency Contact List

Agency	Phone Number
Emergency Services	911 Please note that there is no 911 service in the NRRD.
Fort Nelson – Local Police (Non-emergency)	1.250.774.2700
Police Emergency (NRRD)	1.250.774.2777
Fort Nelson Fire Department (Non-emergency)	1.250.774.3955
Fire Emergency (NRRD)	1.250.774.2222
BC Wildfire Reporting Line	1 800 663 5555 or *5555 on cell
Emergency Management BC	1 800 663 3456
Conservation Officer Service (wildlife issues)	1 877 952 7277
DFO (aquatic habitat/fisheries issues, Record and Report 24-hour Hotline)	1 800 465 4336
FLNRORD – Fort Nelson Office	250 774-5511

An Environmental Incident Report (EIR) should be prepared as soon as possible following an incident. The Contractor is responsible for completing the EIR and the EM should follow-up with the Contractor to ensure it is filed. The target for reporting is within one (1) working day from the time of the incident. A sample EIR is included as Appendix 4. All significant emergencies (as determined by the EM) should be reported to Emergency Management BC (EMBC) at 1-800-663-3456.

Any incidents that result in non-compliance with a permit or environmental legislation such as the Fisheries Act must be reported within 12 hours to the BC MOE, DFO, and Emergency Management BC (EMBC) [formerly the Provincial Emergency Program (PEP); if reportable spill quantity].

If the incident results in severe environmental impact or involvement of the public, the media, or government representatives, PSPC must be notified immediately. The target for this type of notification is within one hour of the incident or its escalation to severe status.

An environmental incident is one that has caused, or has the potential to cause, one or more of the following:

- Deleterious effects to the environment including those affecting the air quality, aquatic resources, wildlife, including SAR or other environmental resources;
- Unauthorized discharge of deleterious substances into a watercourse;
- Disturbance or damage of heritage resources or archaeological sites
- Adverse publicity with respect to environment; and
- Legal action with respect to violation of legislation, regulation, policy or environmental damage.

Examples of Environmental Incidents include, but are not limited to:

- Spills of oil, fuel, hydraulic fluids, PCBs or chemicals;
- Discharge of deleterious substances (sediment, spills, concrete) into fish-bearing water;
- Mass wasting, landslides, erosion, or floods as they affect environmental or water quality;
- Activities that affect fish or fish habitat, wildlife or recreation;
- Violation of environmental regulations, permits, or approvals;
- Negative wildlife interactions;
- Forest fires related to activities; and
- Work and/or removal of vegetation in or near water bodies without regulatory approval.

8.0 CLOSURE

We trust this document meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully Submitted,
Tetra Tech Canada Inc.



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APPENDIX 1

TETRA TECH'S LIMITATIONS ON THE USE OF THIS DOCUMENT

LIMITATIONS ON USE OF THIS DOCUMENT

NATURAL SCIENCES

1.1 USE OF DOCUMENT AND OWNERSHIP

This document pertains to a specific site, a specific development, and a specific scope of work. The document may include plans, drawings, profiles and other supporting documents that collectively constitute the document (the "Professional Document").

The Professional Document is intended for the sole use of TETRA TECH's Client (the "Client") as specifically identified in the TETRA TECH Services Agreement or other Contractual Agreement entered into with the Client (either of which is termed the "Contract" herein). TETRA TECH does not accept any responsibility for the accuracy of any of the data, analyses, recommendations or other contents of the Professional Document when it is used or relied upon by any party other than the Client, unless authorized in writing by TETRA TECH.

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Where TETRA TECH has expressly authorized the use of the Professional Document by a third party (an "Authorized Party"), consideration for such authorization is the Authorized Party's acceptance of these Limitations on Use of this Document as well as any limitations on liability contained in the Contract with the Client (all of which is collectively termed the "Limitations on Liability"). The Authorized Party should carefully review both these Limitations on Use of this Document and the Contract prior to making any use of the Professional Document. Any use made of the Professional Document by an Authorized Party constitutes the Authorized Party's express acceptance of, and agreement to, the Limitations on Liability.

The Professional Document and any other form or type of data or documents generated by TETRA TECH during the performance of the work are TETRA TECH's professional work product and shall remain the copyright property of TETRA TECH.

The Professional Document is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of TETRA TECH. Additional copies of the Document, if required, may be obtained upon request.

1.2 ALTERNATIVE DOCUMENT FORMAT

Where TETRA TECH submits electronic file and/or hard copy versions of the Professional Document or any drawings or other project-related documents and deliverables (collectively termed TETRA TECH's "Instruments of Professional Service"), only the signed and/or sealed versions shall be considered final. The original signed and/or sealed electronic file and/or hard copy version archived by TETRA TECH shall be deemed to be the original. TETRA TECH will archive a protected digital copy of the original signed and/or sealed version for a period of 10 years.

Both electronic file and/or hard copy versions of TETRA TECH's Instruments of Professional Service shall not, under any circumstances, be altered by any party except TETRA TECH. TETRA TECH's Instruments of Professional Service will be used only and exactly as submitted by TETRA TECH.

Electronic files submitted by TETRA TECH have been prepared and submitted using specific software and hardware systems. TETRA TECH makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

1.3 STANDARD OF CARE

Services performed by TETRA TECH for the Professional Document have been conducted in accordance with the Contract, in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided. Professional judgment has been applied in developing the conclusions and/or recommendations provided in this Professional Document. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of the Professional Document.

If any error or omission is detected by the Client or an Authorized Party, the error or omission must be immediately brought to the attention of TETRA TECH.

1.4 DISCLOSURE OF INFORMATION BY CLIENT

The Client acknowledges that it has fully cooperated with TETRA TECH with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client further acknowledges that in order for TETRA TECH to properly provide the services contracted for in the Contract, TETRA TECH has relied upon the Client with respect to both the full disclosure and accuracy of any such information.

1.5 INFORMATION PROVIDED TO TETRA TECH BY OTHERS

During the performance of the work and the preparation of this Professional Document, TETRA TECH may have relied on information provided by persons other than the Client.

While TETRA TECH endeavours to verify the accuracy of such information, TETRA TECH accepts no responsibility for the accuracy or the reliability of such information even where inaccurate or unreliable information impacts any recommendations, design or other deliverables and causes the Client or an Authorized Party loss or damage.

1.6 GENERAL LIMITATIONS OF DOCUMENT

This Professional Document is based solely on the conditions presented and the data available to TETRA TECH at the time the data were collected in the field or gathered from available databases.

The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

The Professional Document is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site conditions present or variation in assumed conditions which might form the basis of design or recommendations as outlined in this report, at or on the development proposed as of the date of the Professional Document requires a supplementary investigation and assessment.

TETRA TECH is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.

1.7 ENVIRONMENTAL ISSUES

The ability to rely upon and generalize from environmental baseline data is dependent on data collection activities occurring within biologically relevant survey windows.

It is incumbent upon the Client and any Authorized Party, to be knowledgeable of the level of risk that has been incorporated into the project design or scope, in consideration of the level of the environmental baseline information that was reasonably acquired to facilitate completion of the scope.

1.8 NOTIFICATION OF AUTHORITIES

TETRA TECH professionals are bound by their ethical commitments to act within the bounds of all pertinent regulations. In certain instances, observations by TETRA TECH of regulatory contravention may require that regulatory agencies and other persons be informed. The client agrees that notification to such bodies or persons as required may be done by TETRA TECH in its reasonably exercised discretion.

APPENDIX 2

ARCHAEOLOGY CHANCE FIND PROTOCOL

To:	Public Services and Procurement Canada	Date:	January 12, 2021
c:		Memo No.:	
From:	Shawneen Walker	File:	704-TRN.VHWY03100-01
Subject:	Archaeological Site Chance Find Protocol Alaska Highway Culvert Replacement – KM 325.08 to KM 355.02		

1.0 INTRODUCTION

Tetra Tech Canada Inc. (Tetra Tech) has been retained by Public Services and Procurement Canada (PSPC) to provide engineering and environmental for the planned replacement of twelve culverts located between KM 325.08 and KM 355.02 of the Alaska Highway (herein referred to as the “Project”).

Throughout the Project, there is potential to encounter archaeological sites and artifacts that are protected under the *Heritage Conservation Act*. As such, Tetra Tech has been asked to provide archaeological services for the Project, including the preparation of a site-specific Chance Find Protocol (CFP).

The purpose of this Archaeological Site CFP is to provide guidance to PSPC employees and contractors on what to do if they come across or expose an archaeological site while conducting ground disturbing operations. This document provides a framework for recognizing archaeological artifacts and avoiding unforeseen disturbance to them. The Protocol, consisting of two parts, (1) informs employees and contractors about the legislation that protect archaeological sites from disturbance and what archaeological sites look like, and (2) what procedural steps to follow if a suspected archaeological or heritage resource is encountered during ground disturbing activities.

1.1 Project Contacts

Name	Role	Phone Number	Email
Alex Taheri	PSPC Project Manager / Representative	778.939.6704	Alex.Taheri@pwgsc-tpsgc.gc.ca
Charla Arnott	Archaeologist, Soriak Consulting & Research Ltd.	780.995.4859	Charla@soriakconsulting.com
Colin Eriks	Project Manager, Tetra Tech Inc.	778.945.5739	Colin.Eriks@tetratech.com

2.0 EDUCATION

This section informs Project personnel that archaeological sites are protected by law, provides examples of what archaeological sites look like and how they can be identified.

2.1 Heritage Conservation Act

The British Columbia (BC) *Heritage Conservation Act* confers automatic protection upon archaeological and historic heritage sites that meet the definitions within Section 13(2) of the Act. These include:

- All sites pre-dating AD1846;
- All sites of unknown age or origin which may pre-date AD1846;
- All burial places and rock art sites of historical or archaeological value; and
- All vessels or aircraft wrecked for two or more years.







All areas within the boundaries of a heritage site are protected under the Act, including areas without archaeological deposits or other kinds of heritage remains (e.g., land without archaeological deposits between several culturally modified trees at one site, or between several storage pits at one site).

There is always a limited possibility for unknown archaeological sites to exist, particularly in proximity to water sources; therefore, it is necessary that a CFP be developed in advance of construction, in the event that cultural artifacts or anthropogenic deposits (e.g., remains of hearths, dwellings, storage pits) are uncovered during Project-related activities.

Archaeological sites (both recorded and unrecorded) in British Columbia are protected under the *Heritage Conservation Act* and must not be altered or damaged without a site alteration permit issued by BC's Archaeology Branch, Ministry of Forests, Lands, Natural Resource Operations and Rural Development. If an archaeological site is encountered during development, activities must be halted, the discovery protocol provided in Section 3.0 should be followed, and the BC Archaeology Branch is to be contacted at 250-953-3334 for direction.

2.2 Artifact Identification

In northeast British Columbia, cultural material can widely range depending on location. Material is generally found in areas that were favorable to the needs of the area's earliest inhabitants. Examples of possible artifacts in the region may include, but are not limited to, the following:

Type:	Description
Stone Tools	<p>These were made for hunting or fishing, can be formed from a variety of materials, and can come in many different colours. Examples include projectile points, hide scrapers, as well as the material cast off when they are manufactured (lithic debitage):</p> <div style="display: flex; justify-content: space-around;">    </div>
<p>Culturally Modified Trees (CMTs):</p> <p>Trails:</p>	<p>Trees were modified in different ways and for different purposes, including bark stripping and trail marking.</p> <p>Trees with blazes on either side of them sometimes marked trails. These trails may also warrant protection.</p> 
Historic Structures	<p>Historic objects identified during construction should be inspected/documentated; however, depending on their antiquity, they may or may not be protected under the <i>Heritage Conservation Act</i>.</p> 
Burials:	<p>The BC government's <i>Found Human Remains</i> mandate details procedures to follow in the event human remains are identified.</p> <p>Burials traditionally occurred in elevated areas overlooking water.</p> <p>Unusual rock piles or soil depressions may be indicative that a burial is present.</p> 

3.0 DISCOVERY PROTOCOL

This section describes the necessary steps required when a suspected archaeological site is identified by an employee or contractor in the field. Section 6.3 of the Government of Canada's General Provisions for Construction Services outlines the responsibilities of the Contractor in the event that human remains, archaeological remains or items of historical or scientific interest are discovered (GOC 2018). These provisions have been incorporated into this protocol.

If materials are encountered during development that could be archaeological or heritage resources, the following steps will be taken:

1. Cease all forms of ground disturbance in the immediate vicinity of the find and leave all possible archaeological or heritage materials in place.
2. Establish a protective buffer of at least 30 m around the extent of the find area and demarcate the buffer in a highly visible and clear manner (e.g., with "No Work Zone" flagging).
3. Record the GPS location of the found materials, take photos and fill out the attached form.
4. Inform the Archaeological Monitor and the Project Manager of the possible archaeological site and submit the associated form and photos.
5. The Project Manager will contact PSPC and all personnel will await further instruction.
6. After consulting with PSPC, the Archaeological Monitor is to notify the BC Archaeology Branch at 250-953-3334 for direction.

3.1 Form

General Information		
Date of Discovery:		
Discovery Made By:		
Other Parties Present:		
Location (UTM):		
Site Description		
What is the closest waterbody (or other identifying feature – KM marker etc.)?		
Describe the site characteristics:		
Provide a sketch of the site with appropriate measurements:		
Photograph Summary		
Picture #:	Direction:	Description:
Picture #:	Direction:	Description:
Picture #:	Direction:	Description:
Picture #:	Direction:	Description:
Picture #:	Direction:	Description:
Picture #:	Direction:	Description:
Forward all information, pictures, maps and communications to the Project Manager:		<input type="checkbox"/> Yes <input type="checkbox"/> No Date:
Forward all information, pictures, maps and communications to Archaeological Monitor:		<input type="checkbox"/> Yes <input type="checkbox"/> No Date:
Forward all information, pictures, maps and communications to PSPC:		<input type="checkbox"/> Yes <input type="checkbox"/> No Date:

4.0 CLOSURE

We trust this technical memo meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,
Tetra Tech Canada Inc.



FILE: 704-TRN.VHWY03146-01
FILE: 704-TRN.VHWY03146-01
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FILE: 704-TRN.VHWY03146-01

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REFERENCES

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Heritage Conservation Act, RSBC 1996, c 187. Available at: <http://canlii.ca/t/52qv7>. Retrieved on Feb 11, 2019.

APPENDIX 3

EXAMPLE SPILL RESPONSE PLAN

EXAMPLE SPILL RESPONSE PLAN

The Contractor should ensure that the information provided in this Example Spill Response Plan is included within their prepared EPP.

The Contractor must be familiar with the Spill Response Plan and must ensure that the entire Project personnel understands it. Each member of the Project personnel should know what constitutes a “significant” spill which needs to be reported. In the case of any environmental concern and/or incident, the Project personnel is responsible for informing the Site Superintendent, who must then report to the EM and PSPC. The Site Superintendent is responsible to ensure that all Project personnel are adequately trained and equipped to deal with potential environmental incidents related to their work. Any concerns regarding preparedness for environmental incidents will be brought to the attention of the Site Superintendent or the EM.

1.0 KEY CONTACTS

Key contacts in the event of spill are presented in Table A1, which should be updated when information is available.

Table A1: Key Project Emergency Contacts

Contact	Name	Phone #	Contact Details
PSPC Project Manager	Alex Taheri	(778) 939-6704	Report all incidents to contact
PSPC Site Manager	TBD	TBD	Report all incidents to contact
PSPC Environmental Manager	Laurie Crawford	(780) 497-3892	Report all incidents to contact
Contractor Site Superintendent	TBD	TBD	Report all incidents to contact
Environmental Monitor (EM)	TBD	TBD	Report all incidents to contact
Fire, ambulance, police service		911	Emergency Assistance. Please note that there is no 911 service in the NRRD.
Emergency Management BC		1.800.663.3456	Report as required
Conservation Officer Service (wildlife issues)		1.877.952.7277	Wildlife issues
DFO (aquatic habitat/fisheries issues, Record and Report 24-hour Hotline)		1.800.465.4336	Aquatic habitat/ fisheries issues

2.0 BEST PRACTICES

The following measures/best practices should be implemented as part of the **Spill Response Plan**:

- The Contractor’s EPP should provide a list of all materials that may be hazardous or of a deleterious nature and include the Workplace Hazardous Materials Information System (WHMIS) paperwork.
- A pre-construction meeting should be held to identify all materials of a deleterious nature that could be spilled.
- Hazardous materials and wastes should be stored in covered containers and in secondary containment.
- Appropriate spill cleanup materials should be readily available and easily accessible. Project personnel should be aware of the specific materials required to clean-up various spills.
- Minimize the potential for spills through proper use, handling, storage, and disposal of products.

- Work should be undertaken and completed in such a manner as to prevent the release of silt, sediment-laden water, fuels or lubricants, uncured concrete or any other deleterious substance.
- All waste fuel, oil, petroleum products, other hydrocarbons and their storage containers must be disposed of off-site at an approved disposal site.
- Contractors should ensure that all construction machinery is to arrive on site in a clean, washed condition, in good operating condition and is to be maintained free of fluid leaks, excess oil, and grease.
- Hydraulic fluids for machinery used within around watercourses should be biodegradable in case of accidental loss of fluid.
- Contractors should ensure vehicles and equipment are not serviced or refuelled within 30 m of any watercourse or catch basins. Tanks, hoses, and connections should be inspected before use. All hose connections should be wrapped and secured with absorbent pads during fuel/oil transfers and remain wrapped, contained, and in an upright orientation during all other times. All hoses, valves, and equipment should be kept in a containment area whenever possible. Minimize hose length and the number of connections - use dripless connections if possible. Drain hoses when finished.
- Hazardous materials must be labelled and disposed of according to the WHMIS criteria and the TDG Regulations.
- Hydrocarbon and coolant storage, if required on site, should be within a secondary impermeable containment facility capable of holding 110% of the storage tank contents. This may be achieved through the use of double-walled storage tanks. These containment basins should be inspected daily for leaks and wear points, kept clean and any measurable rainwater removed and disposed of appropriately. If practical, the containment area should be covered to prevent infilling with rainwater. Where leaks and/or wear points are found, they should be repaired promptly to restore full containment.
- Contractors should ensure that small containers (i.e., jerry cans) will be stored in a secure location, protected from weather. These containers must be designed solely for the purpose of storing and pouring fuel and should not be more than 5 years old. Containers must not leak and must be sealed with a proper fitting cap or lid.
- All work sites must have emergency spill kits (stocked with pads and sorbent booms) available on site. The kits should be suitable for the quantities and types of material in use and stored at the site. All mobile equipment must contain fully stocked, dedicated spill kits. Contractors must be trained in the proper use of the kits in case of a spill.
- If a spill occurs, stop work immediately to respond. Action should be taken to contain the spill and then, if necessary, reported. When cleaning up the spill:
 - Use appropriate absorbent pads or other materials based on the type of substance spilled. The method of disposing of the waste is dependent on the amount and type of deleterious substance that was spilled.
 - Technical assistance is available from the EM on cleanup procedures and residue sampling.
 - All equipment and/or material used in cleanup (e.g. used sorbent, oil containment materials, etc.) must be disposed of properly.
 - Accidental spills may produce hazardous wastes (e.g., material with > 3% oil) and contaminated soil. All waste disposal must comply with the Environmental Management Act and Regulations.
 - Contaminated soil must be treated and dealt with as required on a site-specific basis.

3.0 SPILL RESPONSE PROCEDURES

1. Assess/Ensure Safety

- Ensure personal/public, electrical, and environmental safety.
- Ensure that people with proper training and equipment deal with the spill and unnecessary people are kept clear of the area.
- Wear appropriate Personal Protective Equipment (PPE) and consult Material Safety Data Sheets.
- Never rush in, always determine the product spilled before taking action.
- Warn people in the immediate vicinity.
- Ensure no ignition sources if spill is of a flammable material.

2. Stop the Source (When Possible)

- If required, and when it is safe to do so, stop the spill at its source. This may simply be righting an overturned container or sealing a hole.
- Act quickly to reduce the risk of environmental impacts.
- Close valves, shut off pumps or plug holes/leaks, set containers upright.
- Stop the flow of the spill at its source.

3. Secure the Area

- Limit access to the spill area.
- Prevent unauthorized entry onto the site.

4. Contain and Control the Spill

- The spill should be prevented from infiltrating into the ground or entering a watercourse.
- If the spill occurs to water, booms should be deployed to prevent its spread.
- Block off and protect drains and culverts.
- Prevent spilled material from entering drainage structures (ditches, culverts, drains).
- Use spill sorbent material to contain spill.
- If necessary, use a dyke or any other method to prevent any discharge off-site.
- Make every effort to minimize contamination.
- Contain as close to the source as possible.

5. Notify/Report Incident to Appropriate Authority

4.0 ENVIRONMENTAL INCIDENT REPORTING

All environmental incidents, including spills, must be reported to the EM, the Site Superintendent and PSPC as soon as possible by phone so that appropriate notifications can be made, and the incident is handled appropriately. Spills must be promptly cleaned up and subsequently reported. Make a note of what, how, and where the incident happened. An EIR should be prepared as soon as possible following an incident (Appendix 4). The target for reporting is within one (1) working day from the time of the incident occurs. All personnel on-site have a responsibility to report all environmental concerns or incidents regardless of magnitude. The Contractor will be responsible for completing and filing the EIR.

A. External Reporting:

For all spills in amounts requiring external notification/reporting or of any substance toxic to aquatic life, the person who had possession, charge or control of a substance immediately before its spill, or the person that discovers a spill, will report the spill to EMBC 24-hour phone line at **1800-663-3456**. This same person must also immediately report the spill details to the Site Superintendent and EM who will report the spill internally.

When reporting a spill, the caller should be prepared to provide the dispatcher the following information, if possible:

- Name and phone number of person reporting the spill;
- Name and phone number of person involved with the spill;
- Location, time, and date of spill;
- Type and quantity of material spilled;
- Cause and effect of the spill;
- Details of action taken or proposed to contain the spill and minimize its effect;
- Duration of occurrence;
- Weather conditions;
- Description of the spill location and surrounding area;
- Names of government agencies on scene, if any;
- Names of other persons or agencies advised or to be advised concerning the spill; and
- Planned follow-up.

*****ALL SPILLS TO WATER ARE REPORTABLE TO Emergency Management BC AND DFO*****

*****If in doubt as to whether or not to report a spill, err on the side of caution and report the spill*****

B. Reportable Spill Quantities

Table A2 outlines specific substances and reportable quantities according to the EMA Spill Reporting Regulation (includes amendments up to BC Reg. 376/2008, December 9, 2008):

Table A2: Reportable Spill Quantities

Item	Substance Spilled	Specific Amount
1	Class 1, Explosives as defined in Section 2.9 of the Federal Regulations*	Any quantity that could pose a danger to public safety or 50 kg
2	Class 2.1, Flammable Gases, other than natural gas, as defined in Section 2.14 (a) of the Federal Regulations	10 kg
3	Class 2.2 Non-Flammable and Non-Toxic Gases as defined in Section 2.14 (b) of the Federal Regulations	10 kg
4	Class 2.3, Toxic Gases as defined in Section 2.14 (c) of the Federal Regulations	5 kg
5	Class 3, Flammable Liquids as defined in Section 2.18 of the Federal Regulations	100 L
6	Class 4, Flammable Solids as defined in Section 2.20 of the Federal Regulations	25 kg
7	Class 5.1, Oxidizing Substances as defined in Section 2.24 (a) of the Federal Regulations	50 kg or 50 L
8	Class 5.2, Organic Peroxides as defined in Section 2.24 (b) of the Federal Regulations	1 kg or 1 L
9	Class 6.1, Toxic Substances as defined in Section 2.27 (a) of the Federal Regulations	5 kg or 5 L
10	Class 6.2, Infectious Substances as defined in Section 2.27 (b) of the Federal Regulations	1 kg or 1 L, or less if the waste poses a danger to public safety or the environment
11	Class 7, Radioactive Materials as defined in Section 2.37 of the Federal Regulations	Any quantity that could pose a danger to public safety and an emission level greater than the emission level established in Section 20 of the "Packaging and Transport of Nuclear Substances Regulations"
12	Class 8, Corrosives as defined in Section 2.40 of the Federal Regulations	5 kg or 5 L
13	Class 9, Miscellaneous Products, Substances or Organisms as defined in Section 2.43 of the Federal Regulations	25 kg or 25 L
14	Waste containing dioxin as defined in Section 1 of the Hazardous Waste Regulation	1 kg or 1 L, or less if the waste poses a danger to public safety or the environment
15	Leachable toxic waste as defined in Section 1 of the Hazardous Waste Regulation	25 kg or 25 L
16	Waste containing polycyclic aromatic hydrocarbons as defined in section 1 of the Hazardous Waste Regulation	5 kg or 5 L
17	Waste asbestos as defined in Section 1 of the Hazardous Waste Regulation	50 kg
18	Waste oil as defined in Section 1 of the Hazardous Waste Regulation	100 L
19	Waste containing a pest control product as defined in Section 1 of the Hazardous Waste Regulation	5 kg or 5 L
20	PCB Wastes as defined in Section 1 of the Hazardous Waste Regulation	25 kg or 25 L
21	Waste containing tetrachloroethylene as defined in Section 1 of the Hazardous Waste Regulation	50 kg or 50 L

Table A2: Reportable Spill Quantities

Item	Substance Spilled	Specific Amount
22	Biomedical waste as defined in Section 1 of the Hazardous Waste Regulation	1 kg or 1 L, or less if the waste poses a danger to public safety or the environment
23	A hazardous waste as defined in Section 1 of the Hazardous Waste Regulation and not covered under items 1 – 22	25 kg or 25 L
24	A substance, not covered by items 1 to 23, that can cause pollution	200 kg or 200 L
25	Natural gas	10 kg, if there is a breakage in a pipeline or fitting operated above 100 psi that results in a sudden and uncontrolled release of natural gas

**"Federal Regulations" means the Transportation of Dangerous Goods Regulations made under the Transportation of Dangerous Goods Act (Canada)

APPENDIX 4

ENVIRONMENTAL INCIDENT REPORT FORM

Environmental Incident Reporting (EIR) Form

Project Name _____ Project No. _____

Location _____

Date and Time of Spill _____

SEE guidelines on the reverse page for reporting protocols.

Person	Name	Number
Reporting Spill		
Involved in Spill		
Spill Cleanup		

Type and quantity of material spilled

Cause of spill

Action taken to contain and minimize effects

Notification to:					
PSPC Project Manager <input type="checkbox"/>	Phone/cell:		EM <input type="checkbox"/>	Phone/cell:	
PSPC Environmental Coordinator <input type="checkbox"/>	Phone/cell:		EMBC <input type="checkbox"/>	Phone/cell:	
Site Superintendent <input type="checkbox"/>	Phone/cell:		DFO <input type="checkbox"/>	Phone/cell:	
<input type="checkbox"/>	Phone/cell:			Phone/cell:	

What Incidents are Reportable?

All incidents must be reported to the Project team, in accordance with the EIR Communications Plan Section described in Section 7.0 of the EMP. Any environmental incidents of reportable quantities will be reported immediately to EMBC, according to the guidelines of the Spill Reporting Notification Chart (Below).

ALL SPILLS TO WATER ARE REPORTABLE TO THE EMERGENCY MANAGEMENT BC (EMBC) AND FISHERIES AND OCEANS CANADA (DFO).

If in doubt as to whether or not to report a spill, err on the side of caution and report the spill.

The following information must be reported to the project team and appropriate government agencies:

- Name and phone number of person reporting the spill.
- Name and phone number of person who witnessed or was involved with the spill.
- Location and time of the spill.
- Type and quantity of material spilled.
- Area or habitat effected.
- Cause, nature, and effect of spill.
- Details of action taken or proposed to contain the spill and minimize its effect or limit the activity causing the incident.
- Names of other persons or agencies advised.
- Aquatic, terrestrial and/or cultural resources affected.
- Mitigation measures taken to control.
- Additional recommended remedial or corrective actions.
- Communications held with Project personnel.
- Communications with regulatory agencies.

R.115075.003

Appendix J

Caribou Protection Plan (CPP)

Caribou Protection Plan Alaska Highway Culvert Replacements KM 325.08 to KM 355.02



PRESENTED TO
Public Services and Procurement Canada

JANUARY 11, 2021
ISSUED FOR REVIEW
FILE: 704-TRN.VHWY03100-01

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ACRONYMS & ABBREVIATIONS

Acronyms/Abbreviations	Definition
BMP	Best Management Practices
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CPP	Caribou Protection Plan
ECCC	Environment and Climate Change Canada
EMP	Environmental Management Plan
FLNRORD	BC Ministry of Forests, Lands and Natural Resource Operations and Rural Development
FRPA	<i>Forest, Range and Practices Act</i>
GWM	General Wildlife Measures
km	kilometre
m	metre
MOE	BC Ministry of Environment and Climate Change Strategy
PSPC	Public Services and Procurement Canada
SARA	<i>Species at Risk Act</i>
SAR	<i>Species at Risk</i>
UWR	Ungulate Winter Range
WHA	Wildlife Habitat Area

LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Public Services and Procurement Canada (PSPC) and their agents. Tetra Tech Canada Inc. (Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than PSPC or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this report is subject to the terms and conditions stated in Tetra Tech Canada Inc.'s Services Agreement. Tetra Tech's Limitations on the Use of this Document are provided in Appendix 1 of this report.

1.0 INTRODUCTION

Tetra Tech Canada Inc. (Tetra Tech) was retained by Public Services and Procurement Canada (PSPC) to prepare this Caribou Protection Plan (CPP) for the planned replacement of twelve culverts located between KM 325.08 and KM 355.02 of the Alaska Highway (herein referred to as the “Project”).

Woodland caribou (*Rangifer tarandus*) are federally designated as Species at Risk (SAR) under the *Species at Risk Act* (SARA), and as such, their populations and critical habitats are legally protected. The Project falls within the range of the Woodland Caribou and there is potential for the northern mountain ecotype (*Rangifer tarandus* pop. 15) to be present within the Project area (Figure 1). Caribou likely occur infrequently along the highway, especially in winter when lower elevation habitats are used more for foraging (COSEWIC 2014).

The CPP objectives are to provide strategies and best management practices to:

1. Avoid, where practical, and reduce potential Project-related effects on caribou and caribou habitat;
2. Support provincial caribou conservation objectives; and
3. Provide a practical construction planning and mitigation checklist.

This CPP includes the project overview, a description of proposed work, a summary of caribou management in British Columbia, mitigation measures to protect caribou and caribou habitat, and a map of the culvert replacement locations in relation to known caribou habitat. Mitigation considers reducing sources of human-related caribou mortality, reducing excessive predation on both calves and adults, limiting habitat loss, and reducing potential increases to alternate prey species abundance and distribution.

2.0 CARIBOU AND CARIBOU HABITAT PROTECTION

British Columbia is home to 54 herds of Woodland Caribou, which have been separated into four ecotypes, or populations, based on range and habitat use (Gov. of British Columbia 2018). The four ecotypes are as follows:

1. Southern mountain population (*Rangifer tarandus* pop. 1);
2. Boreal population (*Rangifer tarandus* pop. 14);
3. Northern mountain population (*Rangifer tarandus* pop. 15); and
4. Central mountain population (*Rangifer tarandus* pop. 18).

A map showing the distribution of each woodland caribou ecotype is presented in Appendix 2 (FLNRORD 2018a).

2.1 Conservation Status

Woodland Caribou (*Rangifer tarandus*) are federally designated under the SARA as either as ‘Threatened’ (boreal, southern mountain, and central mountain populations) or ‘Special Concern’ (northern mountain population) and as such, their populations and critical habitat are legally protected from harm. In 2012, the federal government released the *Recovery Strategy for the Woodland Caribou (Rangifer tarandus), Boreal Mountain Population in Canada* and the *Management Plan for the Northern Mountain Population of Woodland Caribou (Rangifer tarandus caribou)* in

Canada. These documents aim to recover, maintain, and or increase the size and distribution of self-sustaining local populations (ECCC 2012a; ECCC 2012b).

Provincially in British Columbia, the southern mountain, central mountain, and boreal caribou ecotypes are red-listed, and the northern mountain ecotype is blue-listed. The British Columbia Government is currently preparing a Caribou Recovery Program to meet the requirements outlined by the federal government (under the authority of the SARA) in the Federal Recovery Strategy for Woodland Caribou (FLNRORD 2018b).

Table 1: The Conservation Status of the Four Caribou Ecotypes in British Columbia

Ecotype	Population	BC List	COSEWIC	SARA
Southern mountain	Pop. 1	Red	Endangered	Threatened
Boreal	Pop. 14	Red	Threatened	Threatened
Northern mountain	Pop. 15	Blue	Special Concern	Special Concern
Central mountain	Pop. 18	Red	Endangered	Threatened

By definition, woodland caribou are likely to become endangered if factors leading to their decline are not reversed. Natural and human-related habitat loss and alteration (e.g., fragmentation, degradation) leading to an increase in predation is the primary factor contributing to caribou population declines (ECCC 2012a, GOA 2016).

2.2 Habitat Use and Distribution

All Project sites are located within 5 km of the provincially mapped range of the Muskwa and Pink Mountain herds, which is part of the Northern Mountain ecotype (*Rangifer tarandus* pop. 15) and the West Side Fort Nelson herd, which is part of the Boreal ecotype (*Rangifer tarandus* pop. 14). As such, there is potential for both ecotypes to be present within the Project area.

Northern mountain caribou spend the winter months in low-elevation pine-lichen stands or high-elevation alpine habitats, where they rely primarily on terrestrial lichens for forage. During calving season, female northern mountain caribou will migrate long distances to sub-alpine ridges, where they give birth to their calves at high elevation to avoid the threat of predation (FLNRORD 2014).

Boreal caribou are non-migratory and can be found at low-elevations in muskegs, peatlands and black spruce forests. Female boreal caribou calve in undisturbed swamps and wetlands and disturbance to these calving habitats can be highly detrimental to population numbers due to the site fidelity shown by reproducing females (FLNRORD 2014).

Caribou are most sensitive to disturbance during late winter (pre-calving season), due to the poor body condition of pregnant females, and during the calving season in the spring. FLNRORD has identified the period between January 15 and July 15 as a critical timing window for caribou. The fall rut, typically from September 15 to January 14, has been identified as a cautionary timing window.

2.3 Caribou Habitat Management in British Columbia

2.3.1 Critical Habitat Areas

Under SARA, critical habitat is defined as habitat that is “necessary for the survival or recovery of a listed wildlife species” and has been identified as such in the recovery strategy for that species (SARA 2002). Environment and

Climate Change Canada (ECCC) has determined that on federal lands managed outside of the jurisdiction of Parks Canada Agency “existing federal laws and regulations do not currently provide for mandatory, enforceable prohibitions against the destruction of boreal caribou critical habitat” (ECCC 2018). The Project is not located within critical caribou habitat (Figure 1).

2.3.2 Ungulate Winter Range

Ungulate Winter Ranges (UWR) are established under the *Forest and Range Practices Act* (FRPA) with the objective of meeting the winter habitat requirements of an ungulate species (BC MOE 2018a). Work that is to occur within a UWR must follow the General Wildlife Measures (GWM) outlined in the UWR order (FLNRORD 2011a). The Project is not located within UWR.

2.3.3 Wildlife Habitat Areas

As Species at Risk, Woodland Caribou are considered “Identified Wildlife” under the FRPA. Wildlife Habitat Areas (WHAs) are designated areas that the British Columbia Government considers critical habitat (i.e., necessary to fulfill the habitat requirements) of Identified Wildlife. To protect critical habitat within the WHAs, certain activities such as forestry and industrial developments are limited and/or prohibited within these areas (BC MOE 2018b). No WHAs for Woodland Caribou are located within the Project area.

3.0 PROJECT DESCRIPTION

Since 1964, PSPC has been the federal custodian for the Alaska Highway and is responsible for the maintenance of the current highway. PSPC’s current operational jurisdiction of the Alaska Highway extends from KM 133 (north of Fort St. John) to the British Columbia-Yukon border at KM 968.

PSPC is replacing twelve culverts between KM 325.08 and KM 355.02 that are undersized and/or are failing. PSPC is concerned that the reduced capacities and functioning of the culverts will pose increased risk to the highway and potentially to highway users during spring freshet, resulting in a potential emergency situation. Several culvert locations have already experienced flooding and/or erosion following heavy rains that occurred in early-mid June 2020.

3.1 Project Activities

Project activities will be restricted entirely within the Alaska Highway right-of-way. In general, habitat located immediately adjacent to roads is effectively lost to many species (Jalkotzy and Nasserden 1997), including caribou. Anticipated Project-related effects on caribou and caribou habitat are expected to be limited due to the Project’s location immediately adjacent to the Alaska Highway. Nonetheless PSPC is committed to mitigating Project-related effects to caribou and caribou habitat.

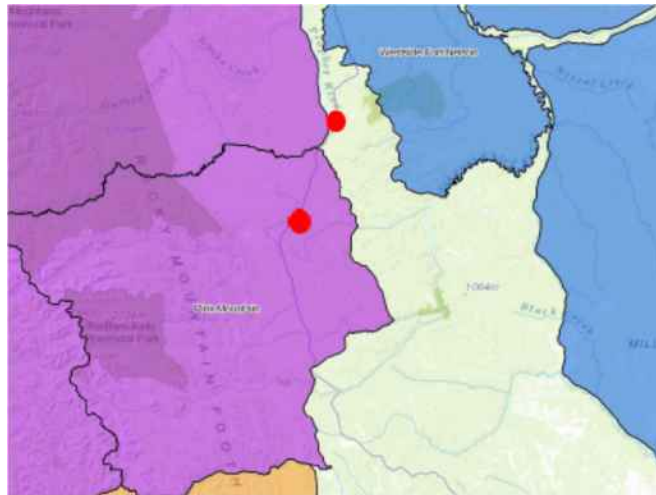
The proposed construction works at each culvert location generally includes:

- Isolate and dewater work area (install fish stop nets, conduct salvage, install check dams and pumps, dewater). Dewatering may not be necessary if work is conducted in winter and watercourses are frozen to bottom;
- Localized excavations around the culvert inlet and outlet to prepare the work site;
- Install new culvert through pipe jacking underneath the road and excavation of material from within the jacked culvert;
- Minor channel realignment solely at the inlet and outlet of the culvert to direct water through new culvert;

- Place erosion protection (e.g., rip rap) around culvert inlet and outlet, including construction of an armoured outlet pool;
 - Backfilling the existing culvert with concrete, removing culvert ends, and covering culvert ends with soil; and
- Channel regrading to tree line (in most locations) to facilitate drainage and mowing by PSPC maintenance Contractor.

3.2 Culvert Proximity to Caribou Range

All Project sites are located within 5 km of the provincially mapped range of the Muskwa and Pink Mountain herds of the Northern Mountain Ecotype of Woodland Caribou. Ten sites (KM 325.08 through 344.88) are directly within the mapped range of the Pink Mountain herd. The northern end of the Project, including the culverts at KM 355.02 and 359.30, are within approximately 10 km of the Westside Fort Nelson herd of the Boreal Ecotype. None of the culvert locations are within critical caribou habitat.



*Northern Mountain Ecotype (purple); Boreal Ecotype (blue);
General Project area limits indicated by red dots.*

3.3 Project Schedule

The Project is scheduled to occur in the February and March, 2021 which is during the critical risk periods for Woodland Caribou (see CPP #1.3 in Section 4.0). Special care should be taken for construction activities conducted during these times.

4.0 CARIBOU-RELATED MITIGATION COMMITMENTS

Caribou may be directly and indirectly affected by the proposed Project and its activities. There is the potential that some individuals from the surrounding caribou populations may be present near the Alaska Highway during the timing of proposed Project activities (February and March 2021). During this time, caribou may be directly or indirectly affected or disturbed to the point of avoiding the area as a result of Project activities such as sustained or repeated noise or light disturbances. Behavioral responses to Project activities may vary depending on the frequency, timing, and severity of the disturbing activity, as well as the receptor (e.g., bull vs. pregnant female). Caribou, especially pregnant cows and young calves are particularly sensitive to disturbances that might occur during late winter to early summer.

The Project might also indirectly affect caribou by changing habitat quality (e.g., through changes to local hydrology and increasing habitat fragmentation), quantity (through direct loss of habitat from disturbance), availability/accessibility to habitat, and potentially altering predator-prey dynamics. The localized nature of the activities associated with this Project, and their restriction to the existing highway right-of-way however, make these potential effects unlikely to occur.

Effects to caribou may include the following:

- Permanent habitat loss and/or alteration as a result of the Project footprint;
- Direct mortality from collisions with Project-related traffic (including equipment);
- Indirect mortality from increased predation risk if the following occur along linear corridors:
 - Caribou visibility to predators is enhanced;
 - Predator mobility is enhanced; or
 - Forage for other ungulate prey species is enhanced in revegetated areas.
- Sensory disturbance and restricted movement from equipment operation (i.e., noise and light disturbance) and human presence during all project activities.

4.1 Caribou Protection Plan

To mitigate potential caribou habitat, mortality, disturbance, and movement effects, various strategies in the form of best management practices (BMPs) should be implemented throughout the duration of the Project. Mitigations considered for this CPP follow those outlined the following documents:

- A Compendium of Wildlife Guidelines for Industrial Development Projects in the North Area, British Columbia (FLNRO 2014);
- Recovery Strategy for the Woodland Caribou (*Rangifer tarandus caribou*), Boreal population in Canada (EC 2014);
- Interim Operating Practices for Oil and Gas Activities in Identified Boreal Caribou Habitat in British Columbia (FLNRORD 2011b); and
- A Caribou Protection Plan that Tetra Tech prepared for a Project along Highway 40 in Alberta, following the caribou management guidelines and BMPs developed by the Alberta Government (Tetra Tech 2017).

Caribou-specific mitigation commitments that should be followed and implemented throughout the duration of the Project are summarized in Table 2.

Table 2: Best Management Practices for Working in Woodland Caribou Habitat

CPP #	Mitigation Measures
1.0 General Measures	
1.1	<ul style="list-style-type: none"> ▪ Adhere to approved Environmental Management Plan (EMP) for the Project. This includes requiring all contractors working within the caribou range to be responsible for retaining an Environmental Monitor and to provide adequate education and training to their employees of the mitigation commitments to address caribou and caribou habitat conservation (i.e., training and orientation programs, kickoff, and tailgate meetings).

CPP #	Mitigation Measures
1.2	<ul style="list-style-type: none"> Follow the BMPs for working in Woodland Caribou habitat that are outlined in the Compendium of Wildlife Guidelines for Industrial Development Projects in the North Area, British Columbia (FLNRORD 2014).
1.3	<ul style="list-style-type: none"> Be aware of the risk periods for Woodland Caribou and try to work outside of the critical-use periods. The late winter and calving period, occurring from mid-January to mid-July, is identified as critical for both northern and mountain caribou. The winter/rut period is identified as a cautionary timing window. The risk periods for Woodland Caribou in northern BC are as follows: <ul style="list-style-type: none"> Low risk: July 16 – September 14 Caution: September 15 – January 14 Critical: January 15 – July 15
1.4	<ul style="list-style-type: none"> Ensure caribou and caribou habitat mitigations are implemented throughout the Project by retaining an Environmental Monitor to be on-call during construction activities and to train the Contractor in caribou identification and mitigation.

2.0 Measures to Protect Caribou

2.1	<ul style="list-style-type: none"> Monitor for caribou presence during construction activities and report all caribou observed and worker/wildlife conflicts and incidents to the EM and PSPC.
2.2	<ul style="list-style-type: none"> If caribou are observed within the Project area, a stop-work order must be issued until the individual has left the area.
2.3	<ul style="list-style-type: none"> Limit collision related mortality by obeying speed restrictions and signage.
2.4	<ul style="list-style-type: none"> Equipment and truck traffic to yield the right-of-way to wildlife.
2.5	<ul style="list-style-type: none"> Sequence to avoid/reduce repeat operations or multiple entries in caribou range.
2.6	<ul style="list-style-type: none"> Prohibit workers feeding, harassing, and approaching wildlife.
2.7	<ul style="list-style-type: none"> Prohibit temporary work camps inside caribou range to minimize predator attraction.
2.8	<ul style="list-style-type: none"> Prohibit firearms or hunting and fishing by workers.
2.9	<ul style="list-style-type: none"> Avoid idling equipment and trucks.
2.10	<ul style="list-style-type: none"> Ensure all exhaust systems have mufflers and all equipment operates as per specifications.

3.0 Measures to Protect Caribou Habitat

3.1	<ul style="list-style-type: none"> Limit all Project-related footprints and activities to existing disturbances within the current Alaska High-way right-of-way.
3.2	<ul style="list-style-type: none"> Avoid constructing new linear features (i.e., roads) to facilitate access to the construction sites. Use existing access whenever possible. If needed, use helicopter access to avoid the creation of new access corridors.
3.3	<ul style="list-style-type: none"> If working in winter, avoid plowing or packing snow in caribou habitat.
3.4	<ul style="list-style-type: none"> Reduce the risk of wildfire by properly maintaining equipment and vehicles and regularly cleaning flammable material from the exhaust system. Similarly, have approved firefighting equipment (i.e., fire extinguishers and shovels) on hand.
3.5	<ul style="list-style-type: none"> Brief on-site personnel on proper cigarette (and match) field handling procedures.
3.6	<ul style="list-style-type: none"> Clean all construction equipment prior to on-site arrival to minimize the risk of weed or disease introduction.
3.7	<ul style="list-style-type: none"> Maintain proper waste handling and removal practices to minimize predator attraction and contaminating caribou habitat.

CPP #	Mitigation Measures
3.8	<ul style="list-style-type: none"> Avoid use of road salts or chemical dust control chemicals to prevent impacts to the water quality of surrounding watercourses.
3.9	<ul style="list-style-type: none"> Avoid or minimize vegetation clearing and wherever possible. Minimize the amount of physical disturbance to soil and vegetation.
3.10	<ul style="list-style-type: none"> Fell trees in a manner to avoid adjacent timber damage. No trees will be felled into watercourses or waterbodies.
3.11	<ul style="list-style-type: none"> Maintain the integrity of the root layer (i.e., avoid grubbing), to the extent possible.
3.12	<ul style="list-style-type: none"> Support the rapid natural revegetation of temporary disturbances immediately after Project completion.

5.0 CLOSURE

We trust this report meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully Submitted,
Tetra Tech Canada Inc.

ISSUED FOR REVIEW

FILE: 704-TRN.VHWY03146-01
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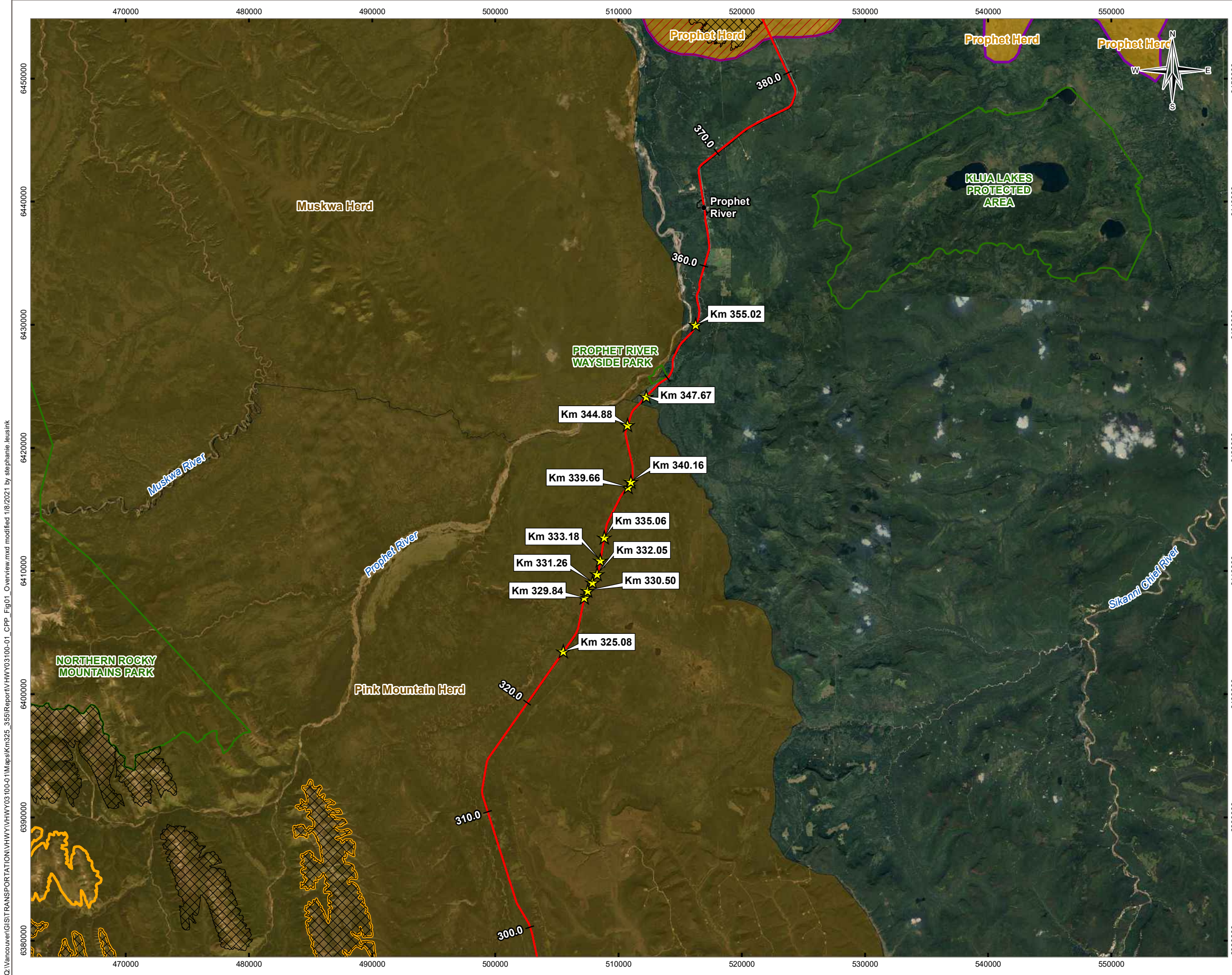
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FIGURES

Figure 1 Location Plan and Project Footprint within Caribou Range



LEGEND

- ★ Culvert Location
- Populated Place
- Alaska Highway
- Other Road
- ▭ Park or Protected Area

Ungulate Winter Range

- ▨ No Harvest Zone
- ▨ Conditional Harvest Zone

Critical Habitat for Species at Risk

- ▭ Boreal Caribou

Wildlife Habitat Area (WHA) for Caribou Species at Risk

- ▭ Northern Mountain Caribou WHA Core

Caribou Distribution

- ▭ Boreal Caribou Herd
- ▭ Northern Mountain Caribou Herd



NOTES
Base data source:
Imagery from Google Earth.

STATUS
ISSUED FOR REVIEW

ENVIRONMENTAL OVERVIEW ASSESSMENT CULVERT REPLACEMENTS KM 325.08 TO 355.02

Project Location Overview

PROJECTION UTM Zone 10		DATUM NAD83		CLIENT Public Services and Procurement Canada	
Scale: 1:300,000					
FILE NO. VHWY03100-01_CPP_Fig01_Overview.mxd					
OFFICE TL-VANC		DWN SL	CKD YL	APVD SW	REV 0
DATE January 8, 2021		PROJECT NO. TRN.VHWY03100-01			



Figure 1

Q:\Vancouver\GIS\TRANSPORTATION\HWY03100-01\Map\MapKm325_355\Report\HWY03100-01_CPP_Fig01_Overview.mxd modified 1/8/2021 by stephanie.leusink

APPENDIX 1

TETRA TECH'S LIMITATIONS ON THE USE OF THIS DOCUMENT

LIMITATIONS ON USE OF THIS DOCUMENT

GEOENVIRONMENTAL

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If any error or omission is detected by the Client or an Authorized Party, the error or omission must be immediately brought to the attention of TETRA TECH.

1.4 DISCLOSURE OF INFORMATION BY CLIENT

The Client acknowledges that it has fully cooperated with TETRA TECH with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client further acknowledges that in order for TETRA TECH to properly provide the services contracted for in the Contract, TETRA TECH has relied upon the Client with respect to both the full disclosure and accuracy of any such information.

1.5 INFORMATION PROVIDED TO TETRA TECH BY OTHERS

During the performance of the work and the preparation of this Professional Document, TETRA TECH may have relied on information provided by persons other than the Client.

While TETRA TECH endeavours to verify the accuracy of such information, TETRA TECH accepts no responsibility for the accuracy or the reliability of such information even where inaccurate or unreliable information impacts any recommendations, design or other deliverables and causes the Client or an Authorized Party loss or damage.

1.6 GENERAL LIMITATIONS OF DOCUMENT

This Professional Document is based solely on the conditions presented and the data available to TETRA TECH at the time the data were collected in the field or gathered from available databases.

The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

The Professional Document is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site conditions present, or variation in assumed conditions which might form the basis of design or recommendations as outlined in this report, at or on the development proposed as of the date of the Professional Document requires a supplementary investigation and assessment.

TETRA TECH is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.

1.7 NOTIFICATION OF AUTHORITIES

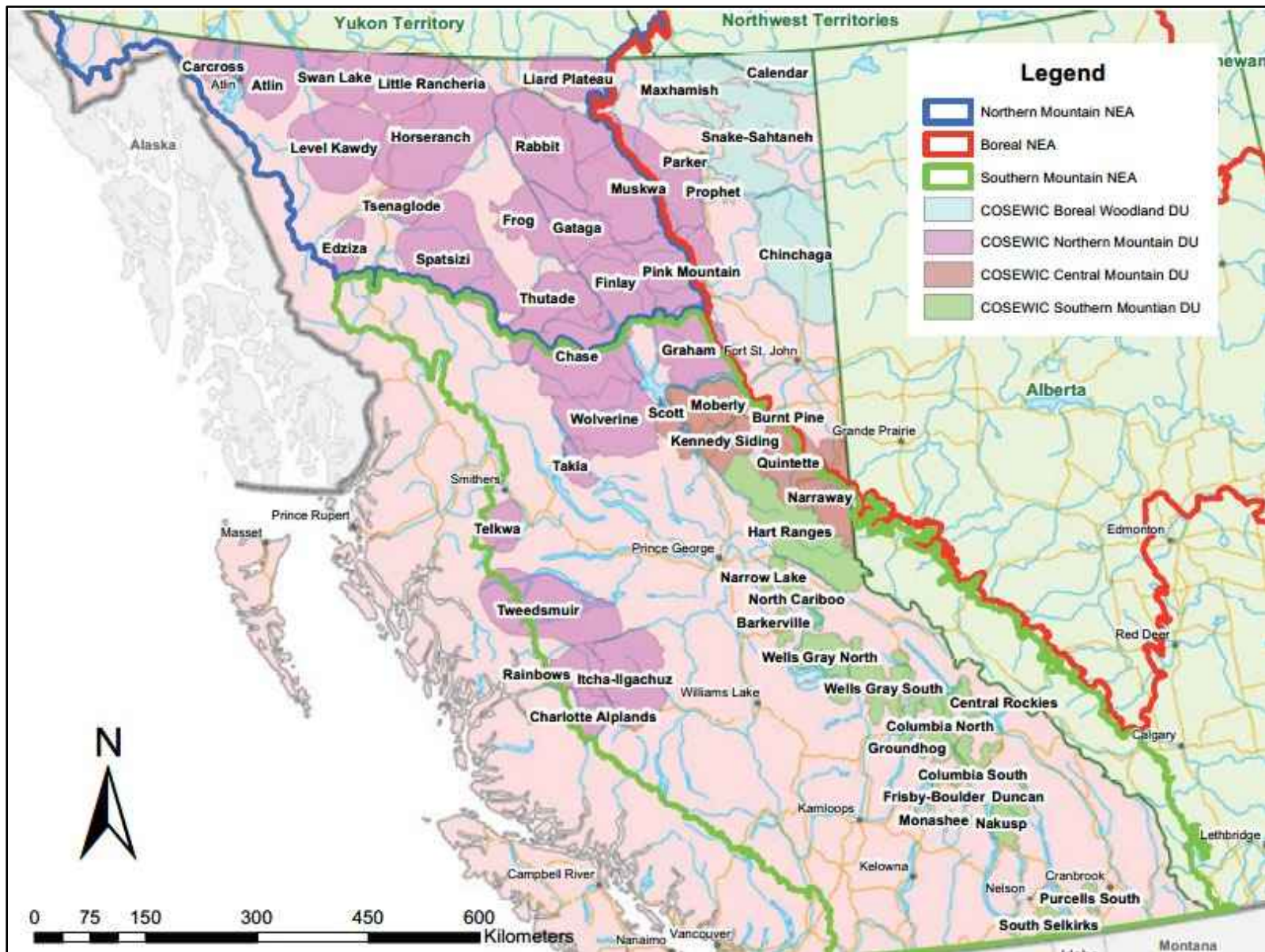
In certain instances, the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by TETRA TECH in its reasonably exercised discretion.

APPENDIX 2

MAP OF CARIBOU DISTRIBUTION IN BRITISH COLUMBIA BY ECOTYPE

Source:

BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development [FLNRORD]. 2018. Provincial Caribou Recovery Program – 2017/2018 Annual Report. Province of British Columbia. Available at:
https://www.for.gov.bc.ca/ftp/HTH/external/!publish/Caribou%20Recovery%20Program/Reports/17_18_Caribou%20Annual%20Report.pdf



Distribution of Caribou in British Columbia

R.115075.003
Appendix K

**British Columbia Ministry of Forests, Lands, Natural Resource
Operations, and Rural Development (FLNRORD) Section 11
Approval for Instream Work – Date: April 6, 2021.**



April 6, 2021

Job Number: 116679
vFCBC Tracking Number: 100336699

Public Services and Procurement Canada
219-800 Burrard ST
Vancouver, BC V6Z 0B9

Dear Public Services and Procurement Canada,

Notice of Authorized Changes - Changes In and About a Stream (File 9000594)

Thank you for your Authorized Change Application for changes in and about a stream regarding the 12 culvert replacements between Km 325.08 and Km 355.02 of the Alaska Highway, at the following stream crossing locations:

Unnamed stream at Km 325.08 (UTM 505551.202 m E, 6403467.193 m N)
Unnamed stream at Km 329.84 (UTM 507206.207 m E, 6407848.338 m N)
Unnamed stream at Km 330.50 (UTM 507496.900 m E, 6408445.918 m N)
Unnamed stream at Km 331.26 (UTM 507876.638 m E, 6409105.964 m N)
Drainage ditch at Km 332.05 (UTM 508265.774 m E, 6409784.605 m N)
Drainage ditch at Km 333.18 (UTM 508510.096 m E, 6410887.251 m N)
Unnamed stream at Km 335.06 (UTM 508831.348 m E, 6412737.977 m N)
Drainage ditch at Km 339.66 (UTM 510783.242 m E, 6416829.441 m N)
Unnamed stream at Km 340.16 (UTM 511000.000 m E, 6417273.161 m N)
Unnamed stream at Km 344.88 (UTM 510756.156 m E, 6421865.184 m N)
Drainage ditch at Km 347.67 (UTM 512254.236 m E, 6424161.490 m N)
Drainage ditch at Km 355.02 (UTM 516294.820 m E, 6430004.299 m N)

This letter acknowledges that the proposed activities meet the requirements as identified for Authorized Changes under the *Water Sustainability Act*.

As per Section 39(1)(a), you may make changes as per the regulation. It is recommended you review this section of the regulation to ensure your activities follow the noted requirements.

Should the work plan or scope of work change, you must notify the Habitat Officer. If the proposal is outside the authorized changes as described by Section 39 of the *Water Sustainability Regulation*, you will be directed to obtain an Approval under Section 11 of the *Water Sustainability Act*.

All works shall be completed in accordance with the:

- Notification submitted on January 12, 2021 (tracking number 100336699).
- Environmental Overview Assessment Alaska Highway Culvert Replacements KM 325.08 to KM 355.02 prepared for Public Services and Procurement Canada by Tetra Tech Canada Inc (File 704-TRN. VHWHY03100-01) on January 12, 2021. This includes the various mitigation plans attached as appendices in the assessment.
- Provincial "Standards and Best Practices for In-stream Works 2004" <http://www.env.gov.bc.ca/wld/documents/bmp/iswstdsbpsmarch2004.pdf> and "A Users' Guide to Working In and Around Water" https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/land-water-use/crown-land/working_around_water.pdf.

As the Habitat Officer under the *Water Sustainability Act*, I am requiring that the proposed changes in and about a stream be made in accordance with the following terms and conditions to protect fish, fish habitat, and/or water quality as per Section 42(2) of the *Water Sustainability Regulation*.

TERMS AND CONDITIONS:

a) THE TIMING WINDOW DURING WHICH THE CHANGE MAY BE MADE

The least risk fish window is between July 15 and August 15 to accommodate both spring and fall spawning fish that may be present.

As a Habitat Officer I authorize a variance for your instream works; permitting works from May 1, 2021 to March 31, 2022 with conditions:

Minimize the amount of time the work site is in a disturbed state by completing work as quickly as possible, while considering worker safety and minimizing environmental risk.

b) THE MINIMUM INSTREAM FLOW OR THE MINIMUM FLOW OF WATER THAT MUST REMAIN IN THE STREAM WHILE THE CHANGE IS BEING MADE

The natural rate of water flow must be maintained upstream and downstream of the worksite during all phases of instream activity.

c) THE REMOVAL OF MATERIAL FROM THE STREAM OR STREAM CHANNEL IN CONNECTION WITH THE CHANGE

The removal of material must not lead to stream channel instability or increase the risk of sedimentation into the watercourse.

Minimize the removal of stable, functioning woody debris. Retain, where possible, existing instream and riparian vegetation and other habitat features. These include trees, bushes, shrubs, weeds, or tall grasses along any stream bank, mats of floating vegetation, overhanging vegetation, natural, large woody debris that does not appear to be causing damage to the bottom, and large boulders.

Any spoil materials must be placed in a location which ensures that sediment or debris does not enter the watercourse.

d) THE ADDITION OF SUBSTANCE, SEDIMENT, DEBRIS OR MATERIAL TO THE STREAM OR STREAM CHANNEL IN CONNECTION WITH THE CHANGE

Instream activities must be conducted in the dry and the worksite must be isolated from water flowing in the stream channel.

All equipment must be located and operated in the dry, outside the wetted perimeter of the stream.

Equipment used in close proximity to the wetted perimeter must be free of deleterious material (e.g. hydrocarbons) and in good mechanical condition (e.g. no fuel or hydraulic leaks).

Ensure all hydraulic machinery working near a stream uses environmentally sensitive hydraulic fluids that are non-toxic to aquatic life and that are readily or inherently biodegradable.

Fuelling and servicing of vehicles and equipment must occur a minimum of 30 metres away from all streams, lakes and waterbodies. Keep a spill containment kit on site and train onsite staff in its use. Immediately report any spill of a substance that is toxic, polluting, or deleterious to aquatic life of reportable quantities to the Provincial Emergency Program 24-hour phone line at **1-800-663-3456**.

All rock used in the works shall be clean and free of sediment producing material, durable, non-acid generating and suitably graded.

Measures must be taken to ensure that no harmful material (e.g. fuel and other hydrocarbons, soil, road fill, or sediment) which could adversely impact water quality, fish and other aquatic life, and/or fish habitat, be allowed to enter the wetted perimeter as a result of the project activities.

Ensure that all works involving the use of concrete, cement, mortars, and other Portland cement or lime-containing construction materials will not deposit, directly or indirectly, sediments, debris, concrete, concrete fines, wash or contact water into or about any watercourse. Concrete materials cast in place must remain inside sealed formed structures.

Concrete leachate is alkaline and highly toxic to fish and other aquatic life. A CO₂ tank with regulator, hose and gas diffuser must be readily available during concrete work to neutralize pH levels should a spill occur. On-site staff must be trained to use this equipment.

Erosion and sediment control structures are to be available onsite and utilized as necessary.

Do not work in weather conditions likely to contribute to sediment production to the stream.

e) THE SALVAGE OR PROTECTION OF FISH OR WILDLIFE WHILE THE CHANGE IS BEING MADE OR AFTER THE CHANGE HAS BEEN MADE

If dewatering of the worksite is necessary, fish salvage must occur on a fish-bearing stream prior to commencing works. A fish salvage permit must be obtained <http://www.env.gov.bc.ca/pasb/>.

Do not disturb wildlife and/or their residences (e.g. beaver lodges) within the project area.

Measures must be taken to ensure that equipment (e.g. water pumps) does not harm aquatic life.

Given the potential for Bull Trout (a species at risk) to be present in these watersheds, prior to the commencement of instream works, and as recommended in the aforementioned environmental overview assessment, an Aquatic Biologist must evaluate each culvert replacement site to ensure no Bull Trout or their spawning habitat (redds) are present.

f) THE PROTECTION OF NATURAL MATERIALS AND VEGETATION THAT CONTRIBUTE TO THE AQUATIC ECOSYSTEM OR STREAM CHANNEL STABILITY

Minimize disturbance to natural materials (e.g. embedded logs) and vegetation that contribute to habitat or stream channel stability.

Minimize the disturbance to existing vegetation on and adjacent to the stream banks.

g) THE RESTORATION OF THE WORKSITE AFTER THE CHANGE HAS BEEN MADE

Protect disturbed soil areas on the banks and areas adjacent to the stream from surface erosion.

Revegetate any disturbed areas using appropriately selected species, as required. Riparian areas which are disturbed by the works shall be restored to their original condition and protected from erosion.

Remove any remaining sediment and erosion control measures.

Complete post-construction multi-year monitoring to ensure your revegetation meets full survival.

h) THE REQUIREMENT TO OBTAIN AN APPROVAL FROM THE FEDERAL DEPARTMENT OF FISHERIES AND OCEANS IN CONNECTION WITH THE CHANGES

Proponents are responsible for complying with the federal *Fisheries Act*. No serious harm to fish is authorized by this document, where serious harm is the death of fish or any permanent alteration to, or destruction of, fish habitat.

Proponents are responsible for determining whether Fisheries and Oceans Canada (FOC) must be consulted and whether an authorization from FOC is required prior to making the change.

i) OTHER

An Environmental Monitor must be on site while in-stream operations take place.

This Notification **does not** constitute a ***Wildlife Act Authorization***.

This letter does not cover works previously conducted without Authority.

This document does not supersede the requirements of the *Water Sustainability Act* and Regulations, *Federal Fisheries Act* or any other related legislation. The proponent is obligated to comply with all applicable federal, provincial or municipal enactments. For more information on the *Water Sustainability Act*, Section 11 Change Approval and Authorization for “Changes In and About a Stream” can be found at: <http://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-licensing-rights/working-around-water>.

Retain a copy of this document on site during construction of the works.

If you have any questions or concerns, please contact Kerry.Harvey@gov.bc.ca who can also be reached at 778-576-1136.

Sincerely,

A handwritten signature in black ink that reads "Kerry Harvey". The signature is written in a cursive style with a large initial 'K' and a long horizontal stroke at the end.

Kerry Harvey
Senior Ecosystems Biologist

Cc:
Enclosure(s)