Public Services and Procurement Canada

Requisition No: EZ899-210904

DRAWINGS & SPECIFICATIONS

For:
Km 140.3 East Cache Creek Culvert Replacement, Alaska Highway, BC

Project No.

R.109448.002 June 19, 2020

APPROVED BY:

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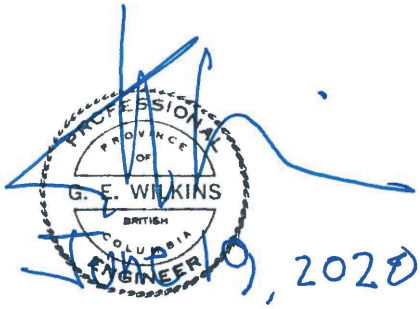

DIVISION 31 – EARTHWORKS

DIVISION 32 – EXTERIOR IMPROVEMENTS

DIVISION 33 – SPECIALTY

APPENDICES

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

Land Development Guidelines for the Protection of Aquatic Habitat, Fisheries and Oceans – September 1993.
Available online at:
http://www.dfo-mpo.gc.ca/Library/165353.pdf

Manual of Standard Traffic Signs & Pavement Markings, BC Ministry of Transportation and Highways – September 2000
Available online at:
http://www.th.gov.bc.ca/publications/eng_publications/electrical/most_pm.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:
http://www2.gov.bc.ca/gov/content/transportation/transportation-infrastructure/engineering-standards-guidelines/trafficmanagementmanual

2016 Standard Specifications for Highway Construction, BC Ministry of Transportation and Infrastructure – July 1, 2016 – 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

BC Ministry of Transportation and Infrastructure, Recognized Product List.
Available online at:
http://www2.gov.bc.ca/gov/content/transportation/transportation-infrastructure/engineering-standards-guidelines/recognized-products-list

Public Services and Procurement 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

LIST OF CONTRACT DRAWINGS

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1	Cover Page		
2	Project Location Plan, Key Plan, Drawing Index, Legend & Control Monuments	C001	-
3	General Arrangement Plan	C101	-
4	Plan / Profiles – Culvert Inlet	C102	-
5	Plan / Profiles – Culvert Outlet	C103	-
6	Profiles – 914 mm ∅ Steel Pipe Liner	C104	-
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8	Typical Outlet Sections	C301	-
9	Inlet Concrete Headwall Details (1 of 2)	C401	-
10	Inlet Concrete Headwall Details (2 of 2)	C402	-
11	Outlet Concrete Headwall Details (1 of 2)	C501	-
12	Outlet Concrete Headwall Details (2 of 2)	C502	-
13	Fish Baffle Details & Culvert Backfill Details	C601	-
14	Cross Sections (1 of 3)	C701	-
15	Cross Sections (2 of 3)	C702	-
16	Cross Sections (3 of 3)	C703	-
17	Environmental Construction Staging – Plan View	C801	-
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SECTION INCLUDES

PART 1 – GENERAL:

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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 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.

.3 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 trenchless installation of one new culvert, modifications to an existing culvert, installation of concrete headwalls, and installation of erosion protection upstream and downstream. The site is located at Km 140.3 on 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 Project Management including all requirements of Section 01 31 00 – Project Management and Coordination.

.2 Contract submittals (using "CentralCollab") prior to and during the work (see 3.8 – Contract Submittals, Section 01 25 20 – Mobilization and Demobilization and Section 01 33 00 – Submittal Procedures).

.3 Supply and maintain all traffic management for the duration of the works.

.4 Quality Management.

.5 Clearing, removal and disposal of trees, brush and other riparian vegetation within the construction footprint as necessary to facilitate construction of the works.

.6 Development of construction access to facilitate construction in the dry. Restoration of the disturbed areas following construction.

.7 Transport of 2800 mm diameter, 60 m length Steel

Pipe Culvert (supplied by PSPC) from PSPC Wonowon Maintenance Yard (Km 162 of the Alaska Highway) to site (Km 140.3).

.8 Installation of one 2800 mm diameter Steel Pipe Culvert (supplied by PSPC) using trenchless technologies, including supply and installation of fish baffles and Natural Substrate. Culvert installation via cut and cover construction techniques will not be accepted.

.9 Partial removal (ends) of existing 914 mm diameter steel pipe culvert, existing 1400 mm CSP culvert, and existing grout in the void space between the two culverts to facilitate the install of the concrete headwalls.

.10 Construction of Concrete Headwalls using Cast-in-Place Concrete at the inlet and outlet of the drainage structures with required crushed base gravel and topsoil.

.11 Regrading, excavation, and offsite disposal associated with the construction of riprapped drainage channels and supply and placement of Riprap erosion protection.

.12 Supply of temporary pumps, construction of berms and implementation of other measures as necessary to ensure all work is completed in the dry, to environmental best practices, the accepted environmental protection plan, and the provided environmental construction staging drawings.

.13 Restoration to pre-construction conditions and Hydraulic Seeding of all disturbed areas.

.14 Surveys (construction layout, payment quantities, as-built survey, and others as required).

.15 Environmental protection and monitoring.

.16 Archaeological monitoring.

1.3 Codes .1 Meet or exceed requirements of:

.1 Contract Documents.

.2 Specified standards, applicable legislation, codes, and

referenced documents.

.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 instream work and riparian work in accordance with the Ministry of Forests, Lands, Natural Resource Operations, and Rural Development (FLNRORD) Section 11 Approval for Instream Work (to be provided to the Contractor prior to the start of construction), and the Contract requirements.

1.4 Contractor's Use of Site

.1 Restrict work to within the construction footprint shown on the Contract Drawings and as agreed to by the Departmental Representative.

.2 Contractor shall consult with the Departmental Representative should the Contractor require additional area outside the construction footprint shown on the Contract Drawings, the Alaska Highway Right-of-Way, or lands owned by PSPC. Any costs associated with the use, preparation and rehabilitation of additional lands, as approved by the Departmental Representative, shall be the Contractor's responsibility.

.3 Assume full responsibility for protection and safekeeping of products under this Contract.

1.5 Owner Supplied Materials

.1 PSPC is providing the 2794 mm (110') outside diameter Steel Pipe Culvert, supplied in 14 × 4.29 m long segments with 31.75 mm (1.25") wall thickness. See Section 33 42 13 – Pipe Culverts for more details. The steel pipe culvert sections will be stockpiled within PSPC's Wonowon Maintenance Yard (turn off at Km 161.9 of the Alaska Highway).

.2 PSPC is providing access to in-situ materials from Trutch Quarry (Km 319 of the Alaska Highway, 9 Km haul from highway on an unmaintained road). Various sizes of riprap may be available for use by the Contractor as riprap or the Contractor may have to manufacture riprap from the in-situ materials. The Contractor will be responsible for sorting through and stockpiling rock and selecting the appropriate rock size or manufacturing the appropriate rock size (see Section 31 37 00 – Riprap for more details). Should the Contractor choose to manufacture the rock using blasting, the Contractor shall be responsible to obtain all necessary permits.

Should the Contractor choose to use in-situ materials from Trutch Quarry, the Contractor will be responsible to ensure the selected materials achieve the gradation and other product

requirements as detailed in the Contract Drawings and in accordance with Section 31 37 00 – Riprap.

1.6 Use of Owner Quarries and Maintenance Yards

.1 When the Contractor is using PSPC's quarry (if desired) and maintenance yards as detailed elsewhere within the specifications for the purposes of extraction / manufacture of riprap and the loading and/or unloading of PSPC-owned materials the Contractor shall be aware of the following:

.1 Other Contractors may be working in the quarry and maintenance yards completing similar or different types of work. Coordination with these other Contractors will be required.

.2 Laydown areas for equipment and stockpiles may be restricted due to other works ongoing or the existing size of the quarry and maintenance yards.

.3 The Contractor is responsible to provide all equipment required to excavate, manufacture (as necessary), load / unload, and haul materials and/or equipment to or from PSPC's quarry and maintenance yards.

.4 The security of equipment parked and material manufactured and stockpiled in the quarry and maintenance yards along with the safety of the Contractor's personnel remains the Contractor's responsibility.

.5 The Contractor shall be responsible for maintaining access roads into the quarry and for haul roads required to access the aggregate sources for the duration of the work required at the quarry. At a minimum, maintaining and developing access may include grading and snow removal. At the conclusion of the works, all access roads and haul roads shall be left in an equal to or better condition than when work started at the quarry.

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 Achieve Substantial Performance by March 24, 2021.

.3 Achieve Completion by March 31, 2021.

.4 The instream construction on this project shall be completed within the dates indicated on the FLNRORD Section 11 Approval for Instream Work" (to be provided to the Contractor prior to the start of construction).

.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 creek water level or poor weather conditions adversely affect the Contractor's 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 be possible to achieve the environmental requirements due to 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 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.

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 by others prior to or 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. The Contractor shall allow the utility company the opportunity to locate and assess the potential proposed work / fibre optic line conflicts within the limits of the work. Where the fibre optic line interferes with the work the utility company may abandon the existing fibre optic line and install a new fibre optic line beyond the limits of work. See Contract Specifications Section01 14 00 – Work Restrictions, Access Development, Construction Staging, and Restoration, Item 1.3 – Utilities for further details.

.3 Existing structures, utilities, asphalt, culverts, cut / fill slopes, ditches, 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 Sequence of Work .1 Unless preapproved by the Departmental Representative, the sequencing of the work shall be in accordance with Item 1.9 Construction Staging in Section 01 14 00 – Work Restrictions, Access Development, Construction Staging, and Restoration and the Environmental Construction Staging Contract Drawings (C801, C802 & C803).

3.5 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 not measured for payment.

.3 All layout surveys, quantity surveys, and quantity calculations for the purposes of progress payments shall be completed by a Professional Engineer, an Applied Science Technologist or Certified Engineering Technician, or other qualified surveyor, with the knowledge, skills and abilities acceptable to the Departmental Representative. The surveyor or person(s) used for these tasks shall have a minimum of 5 years' experience working on projects of similar size, scope and cost. A resume detailing this experience shall be provided to the Departmental Representative for review and acceptance if requested.

.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.

.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.

.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 Contractor's 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.

3.6 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" hardcopy contract drawing sets. Preparation and plotting of the hardcopy drawing sets may take up to 14 days (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.

3.7 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 hardcopy Contract Drawings be discovered at any time during the work, the hardcopy 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 hardcopy Contract Drawings. The Departmental Representative shall not be responsible for updating or correcting any discrepancies between the electronic Contract Drawings and the hardcopy Contract Drawings identified by the Contractor.

3.8 Contract Submittals

.1 Complete and submit for Departmental Representative 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 Appendix 1 – Preliminary Hazard Assessment Form.

.2 Appendix 2 – Confirmation of Prime Contractor's Main Responsibilities Under the WorkSafeBC Occupational Health and Safety Regulations and

Worker's Compensation Act form.

.4 Environmental Protection Plan (see Section 01 35 43).

.5 Quality Management Plan and related Quality Management documentation (see Section 01 45 00).

.6 Tunneling Methodology Report (see Section 33 42 13 – Pipe Culverts).

.7 Ground Movement Monitoring Plan (see Section 33 42 13 – Pipe Culverts).

.8 Canadian Welding Bureau (CWB) Form 107 Engineer's Report (1 per each steel pipe culvert weld), (see Section 33 42 13 – Pipe Culverts and Appendix I).

.9 Concrete reinforcing shop drawings (see Section 03 20 00 – Concrete Reinforcing).

.10 Concrete Mix Design (see Section 03 30 00 – Cast-in-Place Concrete).

.11 Methodology for Adverse Weather Conditions (see Section 03 30 00 – Cast-in-Place Concrete).

.12 As-built Survey, As-built Drawing mark-ups, and Shop Drawing mark-ups (see Section 01 78 00).

.13 Shop Drawings (if applicable, including professional seal for design work required).

.14 Progress Payment Request Form (see Appendix E).

.15 General Contractor / Sub-contractor Construction Equipment List (See Section 01 52 00 – Construction Facilities and Equipment).

3.9 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.

.4 Quality Control Manager.

.5 Environmental Monitor(s).

.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 work day 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).

.5 Environmental Monitors: shall be a P.Biol, RPBio or Qualified Environmental Professional (QEP) (see Section 01 35 43 – Environmental Protection for further requirements).

3.10 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 work on this project commences. See Section 01 14 00 – Work Restrictions, Access Development, Construction Staging, and Restoration for further details.

3.11 Contractor's Personnel

.1 Upon request by the Departmental Representative, the

Contractor shall remove any personnel from the project work site who, in the opinion of the Departmental Representative, is incompetent or has been guilty of improper conduct.

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 may be set up in the locations 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 area and premises in sanitary

condition.

.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 complete onsite highway work during daylight hours only, 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 to have utility locates completed in advance of the work.

.2 The locations of Utilities shown 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 rerouted temporarily on the native ground surface outside the limits of the work or the utility will be raised

/ 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 PSPC.

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 asphalt unless measures are taken to protect the existing 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 PSPC. 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 Alaska 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 shown on the Contract Drawings shall be submitted to the Departmental Representative for approval. 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 their Sub-Contractors shall not perform any onsite 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 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 The project shall be completed per the dates provided in Item 3.2 – Work Completion of Section 01 11 00 – Summary of Work and the following construction sequence:

.1 The Contractor's accepted Environmental Protection Plan (EPP) shall be provided to the Departmental Representative a minimum of 15 days prior to the start of Construction within 30 m of the Km 140.3 Culvert. The Contractor shall allow time in their schedule for the review of the EPP by the Departmental Representative and revisions to the EPP following receipt of any comments.

.2 The Contractor to complete the work listed in the Unit Price Table in sequence as follows:

.1 Clearing and Grubbing.

.2 Steel Pipe Culvert trenchless installation.

.3 Concrete Headwall installations.

.4 Inlet and Outlet Channel Realignment and Erosion Protection.

.5 Restoration and Hydraulic Seeding.

.3 The Contractor may propose to the Departmental Representative an alternative construction sequence, which will be subject to review and preapproval by the Departmental Representative prior to incorporating into the works.

.2 The Contractor shall stage the work ensuring that:

.1 All design requirements as specified in the Contract Drawings, contractor prepared Shop 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 date 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 these requirements.

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, and acceptable to the Departmental Representative, by:

.1 Restoring organic soils (if removed or damaged during access development or other works).

.2 Eliminating uneven areas and low spots.

.3 Restoring existing and proposed drainage patterns as shown on the Contract Drawings.

.4 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.

.5 Reinstalling fences (see Section 31 37 00 – Riprap).

.6 Hydraulically Seed all disturbed areas and areas designated for Hydraulic Seeding (see 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, 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 and 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 Services and Procurement Canada – Acquisition Forms within the Reference Documentation section of the Table of Contents).

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 Request 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 Contract 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 – Mobilization and Demobilization). Survey may be required to verify the work is completed to the design requirements (thickness, 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).

.6 Any work called for in the Contract 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 (thickness, length, grade, volume, area, etc.). Survey shall be considered incidental to the work and not measured for payment.

.2 All quantity surveys, quantity calculations for the purposes of progress payments, and surveys to verify the work is completed

to the design requirements shall be completed by a Professional Engineer, an Applied Science Technologist or Certified Engineering Technician, or other qualified surveyor, with the knowledge, skills and abilities acceptable to the Departmental Representative. The surveyor or person(s) used for these tasks shall have a minimum of 5 years' experience working on projects of similar size, scope and cost. A resume detailing this experience shall be provided to the Departmental Representative for review and acceptance if requested.

.3 Survey data collected shall be of sufficient density to fully characterize the work. Survey methods and the location of surveyed cross sections is subject to prior approval from the Departmental Representative. At a minimum, the Contractor shall survey all features at 10 m station intervals (may be reduced to 5 m in locations with grade changes at the discretion of Departmental Representative) and the location of all treatment boundaries including changes in material type / placement, changes in surface treatment, and changes in the terrain.

.4 A survey of the existing ground surfaces, stream banks, stream bed, stream channels, other topographic features and existing infrastructure shall be undertaken by the Contractor prior to initiation of construction, but in areas designated for Clearing and Grubbing after the Clearing and Grubbing has been completed to the satisfaction of the Departmental Representative. The survey shall be provided to the Departmental Representative for review and acceptance. 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. At the Departmental Representative's sole discretion, payment for work completed and measured by survey may not be made should the Contractor fail to complete necessary surveys, or the surveys be of insufficient quality or detail.

.5 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.

.6 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 preapproved by the Departmental Representative.

.3 A list of all point descriptors used in the survey data.

.7 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.

.8 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, Surveyor, Quality Control Manager, and Environmental Monitor, 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 (3) 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.

.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 five (5) work 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.

.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 approximately 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, Deputy Project Superintendent, Health and Safety Coordinator, Quality Control Manager, Surveyor, and Environmental Monitor 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 (3) days prior to the meeting. The Contractor shall notify all concerned parties of the meeting.

.4 The meetings may be held onsite provided teleconference capabilities are available. 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 Maintenance of quality standards.

.12 Review proposed changes for effect on construction schedule and on completion date.

.13 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) work days.

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 information (RFI) of Contract Documents and obtain instructions through Departmental Representative via PSPC's cloud-based document filling system "CentralCollab". 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	Close-out procedures in accordance with Section 01 77 00 – Closeout Procedures.

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 Quality Management Plan.

.5 Project Specific Health and Safety Plan, including MSDS sheets.

.6 Hazardous Materials Management Plan (if requested by the Departmental Representative).

.7 Shop Drawings and Product Samples (if applicable).

.8 As-built Survey and As-Built Drawing Mark-ups.

.9 Test results.

.4 Mobilization.

.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 work day 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 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 (e.g. Microsoft Project format) if requested by the Departmental Representative.

.3 If requested submit two (2) hardcopies to be retained by the Departmental Representative.

.4 The Departmental Representative will review the schedule and return any comments within 10 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.

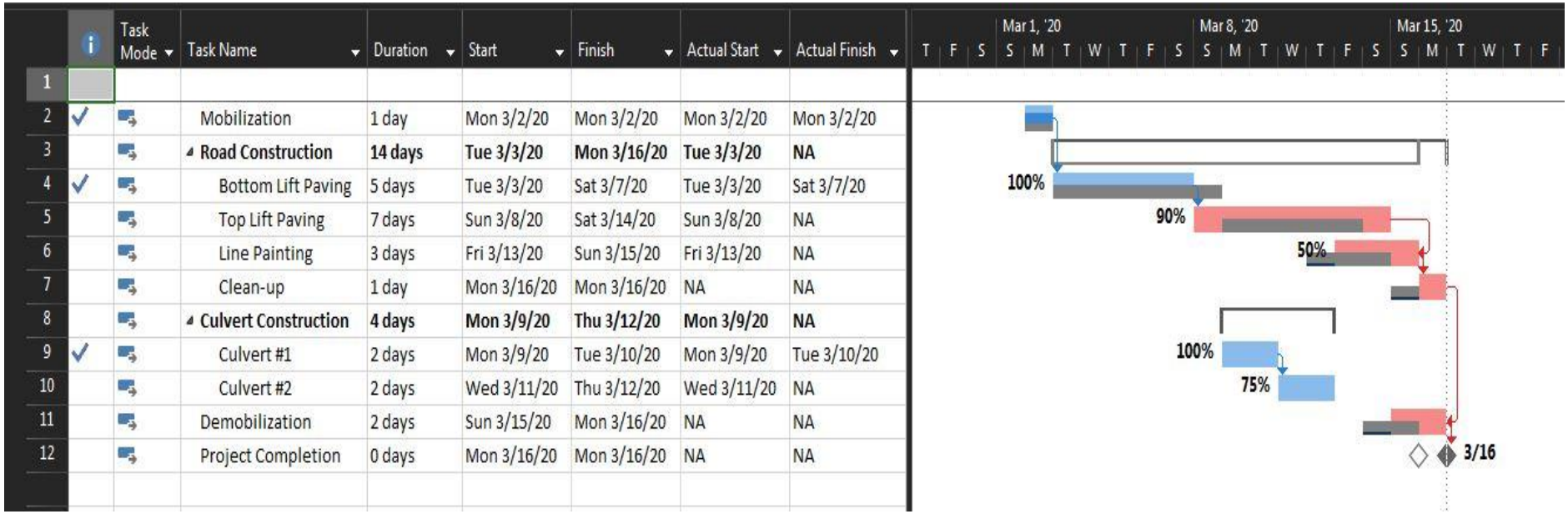
.3 Other concerned parties.

.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 monthly or with each progress payment (whichever is more frequent) reflecting activity changes and completions, as well as activities in progress.

.2 Include as a baseline each line item and details from the initial project schedule accepted by the Departmental Representative at the start of the project. On an adjacent line indicate progress of each activity started and completed to the date of schedule submission by including actual start date / end date / percent complete. See example Figure 01 32 16 – 01 (example in Microsoft Project) and Figure 01 32 16 – 02 (example in Microsoft Excel) for further details.



	Task Mode	Task Name	Duration	Start	Finish	Actual Start	Actual Finish
1							
2	✓	Mobilization	1 day	Mon 3/2/20	Mon 3/2/20	Mon 3/2/20	Mon 3/2/20
3		**Road Construction**	**14 days**	**Tue 3/3/20**	**Mon 3/16/20**	**Tue 3/3/20**	**NA**
4	✓	Bottom Lift Paving	5 days	Tue 3/3/20	Sat 3/7/20	Tue 3/3/20	Sat 3/7/20
5		Top Lift Paving	7 days	Sun 3/8/20	Sat 3/14/20	Sun 3/8/20	NA
6		Line Painting	3 days	Fri 3/13/20	Sun 3/15/20	Fri 3/13/20	NA
7		Clean-up	1 day	Mon 3/16/20	Mon 3/16/20	NA	NA
8		**Culvert Construction**	**4 days**	**Mon 3/9/20**	**Thu 3/12/20**	**Mon 3/9/20**	**NA**
9	✓	Culvert #1	2 days	Mon 3/9/20	Tue 3/10/20	Mon 3/9/20	Tue 3/10/20
10		Culvert #2	2 days	Wed 3/11/20	Thu 3/12/20	Wed 3/11/20	NA
11		Demobilization	2 days	Sun 3/15/20	Mon 3/16/20	NA	NA
12		Project Completion	0 days	Mon 3/16/20	Mon 3/16/20	NA	NA

Figure 01 32 16 – 01: Microsoft Project

ID	Task Name	Duration	Start	Finish	Actual Start	Actual Finish
1	Mobilization	1 day	3/2/2020	3/2/2020	3/2/2020	3/2/2020
2	**Road Construction**	**14 Days**	**3/3/2020**	**3/16/2020**	**3/3/2020**	**NA**
3	Bottom Lift Paving	5 Days	3/3/2020	3/8/2020	3/3/2020	3/7/2020
4	Top Lift Paving	7 Days	3/9/2020	3/14/2020	3/8/2020	NA
5	Line Painting	3 Days	3/13/2020	3/15/2020	3/12/2020	NA
6	Clean-up	1 Day	3/15/2020	3/16/2020	NA	NA
7	**Culvert Construction**	**4 Days**	**3/9/2020**	**3/12/2020**	**3/9/2020**	**NA**
8	Culvert #1	2 Days	3/9/2020	3/10/2020	3/9/2020	3/10/2020
9	Culvert #2	2 Days	3/11/2020	3/12/2020	3/11/2020	NA
10	Demobilization	3 Days	3/14/2020	3/16/2020	NA	NA
11	Project Completion	0 Days	3/16/2020	3/16/2020	NA	NA

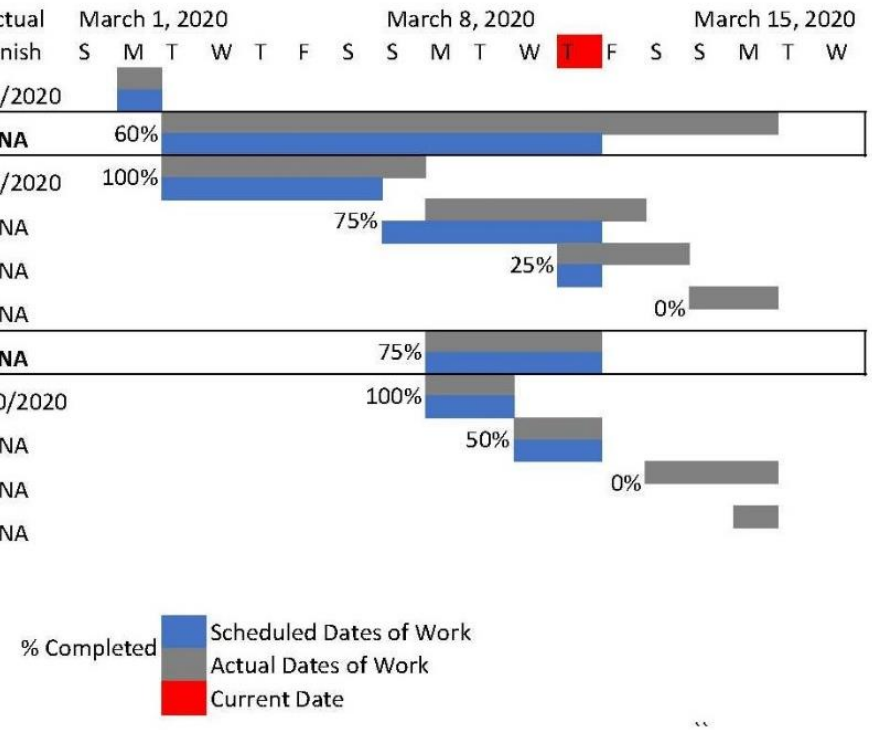


Figure 01 32 16 – 02: Microsoft Excel

.3 Show changes occurring since previous submission of schedule including:

.1 Major changes in scope.

.2 Activities modified since previous submission.

.3 Revised projections of progress and completion.

.4 Other identifiable changes.

.4 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 Contractors.

.5 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 "CentralCollab" (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 (1) 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 hardcopies 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.

.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 same procedure 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 in 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 Management and Access Development will be made on the basis of the Price per Unit Bid for Traffic Management and Access Development in the Bid and Acceptance Form. The Price per Unit Bid shall include the completion of the Traffic Management Plan, construction signage, traffic flaggers, pilot vehicles (if required), temporary concrete barriers and privacy fence (if required), access development (including access points, roads, pads, etc.), restoration of all access development areas, detours (if required), and all other items necessary for the successful completion of the task.

.2 Measurement for Payment for completion of the Traffic Management and Access Development will be made by Lump Sum based on the percentage of the work completed and accepted by the Departmental Representative.

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).

.2 Transportation Association Canada.

.1 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 in conjunction with the Professional Engineer whom seals the Traffic Management Plan 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 or automated traffic control devices 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 3.2.1.7 – Traffic Management (10 minutes).

.2 Limits of Work: The limits of work for this project are defined as Km 139+800 and Km 140+800 as shown on the Contract Drawings.

.3 Drop-off: An abrupt change in elevation created by construction activity such as milling, paving, or excavation that is steeper than 3H:1V.

.4 Long-Duration Work: For Traffic Management purposes and applicable signage requirements, all work on the project shall be considered Long Duration as defined by the BC Ministry of Transportation Traffic Management Manual for Work on Roadways – 2020 Office Edition.

1.5 Submittals

.1 Traffic Management Plan

.1 Submit to the Departmental Representative for review and acceptance a Traffic Management Plan. The Traffic Management Plan shall function as a standalone document, be signed / sealed by a P.Eng. and 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.

.4 Developed and conform to the standards for Category 3 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. As defined by Section 3.4.2, the Category 3 Traffic Management Plan shall be signed and sealed by a Professional Engineer who is licensed in British Columbia and qualified and experienced in traffic management.

.5 Shall, at a minimum, include all headings, sub-headings, details, and presentation format as provided in the Traffic Management Plan 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 Traffic Management Plan as deemed necessary. PSPC has the right to reject the Traffic Management Plan if the headings from this document are not used in the Contractor's Traffic Management Plan.

.6 Shall include procedures for the review and analysis of work zone incidents and near misses per the requirements of Section 3.6 – Analysis of Work Zone Incidents and Near Misses and for the documentation of 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.

.7 Shall include traffic signage to be used on side access roads within the limits of the work.

.8 If DMS message signs are required or used by the Contractor, include in an appendix of the Traffic Management Plan a list of DMS messages which will be displayed on the DMS throughout the project. Messages 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 required or anticipated to be required on the project.

.9 Shall include details of the procedures, processes, and sequencing used to determine the layout of the signs in the field and the order of installation and order of removal of the signs in the field. Refer to Section 6: Traffic Control Layouts – General Instructions of the BC Ministry of Transportation Traffic Management Manual for Work on Roadways – 2020 Office Edition for further details. At a minimum the text and figures included in Item 6.7.4 – Two-Lane, Two-Way Roadways shall be included within the Contractor's Traffic Management Plan for reference during the work (in main body of the plan or in Appendices of the plan with reference to applicable Appendix in main body of the plan). The Contractor shall customize the details of the steps for the project as required.

.10 Shall include a table or list of each element of work on the project and the applicable traffic accommodation strategies and layout drawing(s) which will be used during that element of work throughout all project locations. Example elements of work are to include but are not limited to unloading of equipment and materials, loading materials for offsite disposal, culvert installation, etc. The table or list of each element of work on the project shall also include the applicable traffic

accommodation strategies and layout drawing(s) to be used during non-work hours.

.11 If using Traffic Control Persons (TCP) during non-daylight hours (i.e. before sunrise, after sunset), shall include details of the overhead lighting which will be used at each TCP location. 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.

.12 Shall include graphical representation of the sign supports planned for use on the project; Post Mounted Supports found in Figure 01 35 00 – 01 and or the Wind Resistant Sign Stand found in Figure 01 35 00 – 02.

.13 Shall include a copy of the "Daily Sign Check Form" as found in the appendices of the Traffic Management Plan template (Appendix B of the specifications).

.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, daily check sheets, daily reports, etc. shall be distributed to the Departmental Representative in electronic format via "CentralCollab" 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 (AFAD) 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.

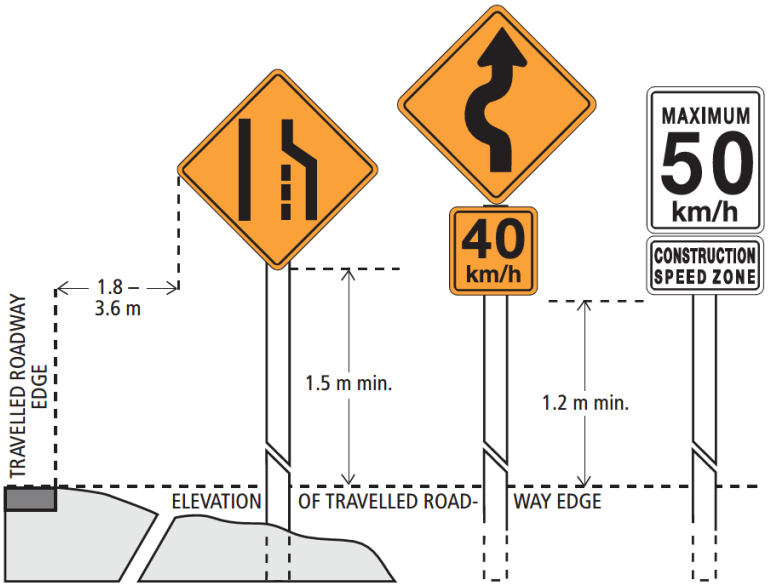


Figure 01 35 00 - 01: Post Mounted Supports

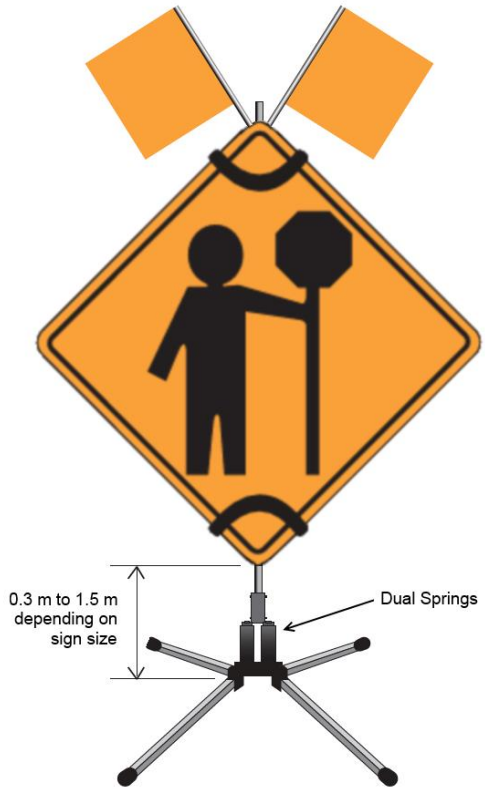


Figure 01 35 00 - 02: Wind Resistant Sign Stand

.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 sand bags 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.

.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.

.4 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. Any additional snow clearing and sanding desired by the Contractor for safety or other reasons shall be the responsibility of the Contractor to undertake.

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 (see Section 1.5 - Submittals).

.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 within 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-off's 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 Drop-offs $\geq$ 150 mm between 1.5 m and 3.0 m of the travel lane shall be signed with Low Shoulder (C-013) signs at least once every 1 Km for as long as the condition persists.

.2 A lane width of 3.7 m shall be used at all times.

.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 Construction Speed Zone Signing – Two Lane, Two-Way Roadway (see Item 3.2 – Traffic Management, subsection .1.5 of this specification) within the Limits of Construction.

.1 Section 7: Legend, Table A, and Table B.

.2 7.1 General Information – Two-Lane, Two Way Roadways shall apply subject to the following:

.1 A buffer space shall be used for all traffic control layouts.

.2 The use of a buffer vehicle when workers are present shall be at the Contractor's discretion.

.3 If used by the Contractor, the portable dynamic message sign (DMS) shall be positioned in the location identified in 7.2 Typical Construction Speed Zone Signing – Two-Lane, Two-way Roadway (see Item 3.2 – Traffic Management, subsection .1.5.3 of this specification).

.3 7.2 Typical Construction Speed Zone Signing – Two-Lane, Two-way Roadway shall be used subject to the following:

.1 If used by the Contractor, a DMS shall be positioned approximately 300 m prior to the sign C-018-2A.

.2 The sign C-035 shall be replaced with signs C-035-C and C-035-CT with the Contractor's name and phone number. Signs C-035-C and C-035-CT shall be in accordance with Figure 01 35 00 – 3.

Sign Item Number	Dimensions (W x H) mm	Reflectivity ASTM Type	Approval	Comment
C-035-C	2440 x 610	1	-	
C-035-CT	2440 x 305	1	-	

Figure 01 35 00 – 03: Sign C-035-C and C-035-CT Details

.3 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.

.4 7.5 Work on Shoulder – Short and Long Duration can be used during the following:

.1 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.

.2 When work activities do not include unloading or loading equipment or supplies on part or all of the shoulder area.

.3 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.

.3 The use of a vehicle-mounted DMS or flashing arrow board can be omitted at the Contractor's discretion should the work be within the "Work Activity Area" as defined by Figure 7.2 – Typical Construction Speed Zone Signing – Two Lane, Two Way Roadway of the BC Ministry of Transportation Traffic Management Manual for Work on Roadways – 2020 Office Edition (see Item 3.2 – Traffic Management, subsection .1.5.3 of this specification).

.4 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 spacings as required).

.5 7.8 Lane Closure with Traffic Control Persons – Single Lane Alternating Traffic – Short and Long Duration can be used. 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).

.6 Existing conditions for traffic may be restricted for the following work:

.1 Work as preapproved by the Departmental Representative may be restricted to single-lane alternating traffic (3.5 m wide lane with 1.0 m shoulder each side) with a speed limit reduced to during these times to 30 km/h (or 50 km/h, at the Contractor's discretion).

.2 Maintain 3H:1V or flatter embankment and gravel side slopes within the highway clear zone on both sides of all two way or single lane traffic lanes. Should the Contractor choose to use temporary side slopes steeper than 3H:1V, temporary precast concrete barriers shall be installed with a minimum distance of 0.3 m from the back of the barrier to the top of the slope. All slopes shall be in conformance with WorkSafeBC regulations.

.3 During non-work hours, all construction hazards shall be removed from within the clear zone of the highway and access roads (cross streets) and the posted speed and all regular traffic movements shall be re-established.

.7 The Contractor may use the C-082 sign ("Minimum $196 Fine – Speeding in Work Zones" sign) as a speed management tool in areas where drivers have been failing to adjust speed or are failing to adhere to the regulatory or construction speed limit. When used in work zones in which a Construction Speed Zone exists, the C-082 sign should be posted in the advance warning area ahead of the work activity area. The C-082 sign may also be installed ahead of TCP locations and/or used as standalone sign for speed management throughout the work zone, at the Contractor's discretion or as directed by the Departmental Representative.

.8 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.

.9 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.

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 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 did the checks. Submit completed "Daily Sign Check Form" to the Departmental Representative weekly or more frequently as required by the Departmental Representative.

.2 Ensure that all vehicles can safely travel and traverse the entire length of the project (including detours) without damage to vehicles regardless of the material type placed and used as a driving surface.

.3 Protect passing vehicles from damage caused by extraneous materials from construction activities at the site.

.4 Keep travelled way and detours graded, free of potholes, and of sufficient width for required number of lanes of traffic.

.5 Provide well graded, signed, and maintained temporary traffic lanes and detours to facilitate passage of vehicles through limits of construction.

.6 Provide dust control, (if necessary).

.7 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.

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

1.1 References.

1.2 Workers' Compensation Coverage.

1.3 Compliance with Regulations.

1.4 Definitions.

1.5 Submittals.

1.6 Project Specific Health and Safety Plan.

1.7 Contractor's Responsibility.

1.8 Health and Safety Coordinator.

1.9 General.

1.10 Project / Site Conditions.

1.11 Regulatory Requirements.

1.12 Work Permits.

1.13 Filing of Notice.

1.14 Emergency Procedures.

1.15 Hazardous Products.

1.16 Overloading.

1.17 Hot Work and Fire Safety Requirements.

1.18 Unforeseen Hazards.

1.19 Posted Documents.

1.20 Correction of Non-Compliance.

1.21 Medical.

1.22 Accidents and Accident Reports.

1.23 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 Electrical Code (CE Code) as amended.

.4 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.

.5 National Fire Code of Canada 2015 as amended:

.1 Part 5 – Hazardous Processes and Operations and Division B as applicable and required.

.6 Fire Protection Engineering Services, HRSDC:

.1 FCC No. 301, Standard for Construction Operations.

.2 FCC No. 302, Standard for Welding and Cutting.

.7 American National Standards Institute (ANSI):

.1 ANSI A10.3, Operations – Safety Requirements for Powder-Actuated Fastening Systems.

.8 Province of British Columbia:

.1 Workers Compensation Act Part 3-Occupational

Health and Safety (as amended).

.2 Occupational Health and Safety Regulation (as amended).

.9 Project Specific Health and Safety Plan Template (Appendix B).

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

.11 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, refuses to 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 Definitions

.1 Workplace: As defined by WorkSafeBC Occupational Health and Safety Guidelines. The project shall be considered as having separate workplaces should the WorkSafeBC Occupational Health and Safety Guidelines - Location Factors provide "Yes" to "Indication of Separate Workplaces" including but not limited to "Locations of one employer are more than 20 minutes apart from each other".

.2 Hot Work: Includes cutting / melting with use of a torch, flame, or other flame devices and grinding equipment which produces a spark.

1.5 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 fourteen (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.

.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.

1.6 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. To include confined space entry requirements when working within the Steel Pipe Culvert.

.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 Polices / Procedures manual. Including confined space entry requirements when working within the Steel Pipe Culvert.

.4 Identify personal protective equipment (PPE) to be used by workers.

.5 Identify personnel training requirements and training plan, including site orientation for new workers and personnel designated by the Departmental Representative as needing to visit the site.

.6 Identification of the first aid requirements for each "workplace" on the project including:

.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 (i.e. ETV), if required by Contractor or WorkSafeBC requirements. Details of where the ETV will be located / parked relative to the location of the first aid attendant(s) during the work.

.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.

.3 Develop the plan in collaboration with all subcontractors. Ensure that work/activities of subcontractors 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.

1.7 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.

1.8 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 that personnel that do not successfully complete the required training are not permitted to enter the site to perform work.

.2 Be responsible for implementing, daily 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.

1.9 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, meetings 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.

.4 Design and construct falsework in accordance with CSA S269.1-1975 (R2003) as amended.

.5 Carry out work in confined spaces in accordance with current Provincial requirements.

.6 Use powder-actuated devices in accordance with ANSI A10.3 (as amended) only after receipt of written permission from the Departmental Representative.

1.10 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.

.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.

.6 Working from heights.

1.11 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.

1.12 Work Permits

.1 Obtain specialty permit(s) related to project before start of work.

1.13 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.

1.14 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.

.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.

1.15 Hazardous Products

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) 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.

.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 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 are 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.

.4 All explosive materials (if required) shall be stored, handled, and used as per Natural Resources Canada Explosives Act.

1.16 Overloading	.1	Ensure no part of the work is subject to a load which will endanger its safety or will cause permanent deformation.
1.17 Hot Work and 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.
1.18 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.
1.19 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.

.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.

1.20 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".

1.21 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 hand held 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.

1.22 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 territorial 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.

1.23 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 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 Measurement and Payment Procedures.

1.2 Definitions.

1.3 References.

1.4 Regulatory Overview.

1.5 Submittals.

1.6 Environmental Protection Plan (EPP).

1.7 Breeding Bird and Bird Nest Survey.

1.8 Environmental Site Inspection Memo.

1.9 Notification

PART 2 – PRODUCTS:

2.1 Products.

PART 3 – EXECUTION:

3.1 Environmental Monitoring.

3.2 Archaeological Monitoring.

3.3 Site Access and Parking.

3.4 Protection of Work Limits.

3.5 Erosion Control.

3.6 Pollution Control.

3.7 Equipment Maintenance, Fueling, and Operation.

3.8 Operation of Equipment.

3.9 Managing Invasive Plant Vegetation.

3.10 Fires and Fire Prevention and Control.

3.11 Wildlife.

3.12 Relics and Antiquities.

3.13 Waste Materials Storage and Removal.

3.14 Wastewater Discharge Criteria.

3.15 Drainage.

3.16 Site Clearing, Plant Protection, and Nesting Bird Protection.

3.17 Environmental Protection Supplies.

PART 1 – GENERAL

1.1 Measurement and Payment Procedures

.1 Payment for the cost of Environmental Monitoring and Water Management will be made on the basis of the Price per Unit Bid for Environmental Monitoring and Water Management in the Bid and Acceptance Form. The Price per Unit Bid shall include the preparation of the Environmental Protection Plan, obtaining a fish salvage permit, environmental monitoring, water management including staging of the work and necessary pumps and berms as shown on the Environmental Construction Staging drawings, and all other items necessary for the successful completion of the task.

.2 Measurement for Payment for completion of the Environmental Monitoring and Water Management will be made by Lump Sum based on the percentage of the work completed and accepted by the Departmental Representative.

1.2 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

1.3 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).

.3 Environmental Protection Plan (EPP) – Checklist (Appendix F).

.4 Responsibility Checklist For Authorizations /Approvals / Notifications / Permitting (Appendix G).

.5 Relevant Environmental Publications (Appendix H).

1.4 Regulatory Overview

.1 The Departmental Representative has obtained the environmental Change Approval permitting under Section 11 of the provincial Water Sustainability Act (See Appendix J). All project work shall be undertaken in accordance with the requirements of this permit. The Contractor shall be aware that submission of the Contractor's Environmental Protection Plan (EPP) to the Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD is a requirement of the permit. The Departmental Representative approved EPP shall be provided to the Departmental Representative for submission a minimum of 15 days prior to the start of any construction within 30 m of any fisheries sensitive zone.

.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).

.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.

1.5 Submittals

.1 The Contractor's EPP, Breeding Bird and Bird Nest Survey Memo, and Environmental Site Inspection Memos, shall be submitted to the Departmental Representative. Each plan / memo / report 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, and Environmental Site Inspection Memos, (first submission and if required all subsequent re-submissions) within 14 days of submission and the Breeding Bird and Bird Nest Survey (first submission and if required all subsequent re-submissions) within three (3) weekdays of submission. Upon review of the plan / memo / report, the Departmental Representative will do one of the following:

.1 Accept the plan / memo / report.

.2 Accept portions of the plan / memo / report 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 / memo / report for review.

.3 Reject the plan / memo / report and provide comments outlining required changes or additional information needed before the plan / memo / report will be reviewed in detail. Following completion of edits by the Contractor, the Contractor shall re-submit the complete plan / memo / report 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 and Breeding Bird and Bird Nest Survey by the Departmental Representative.

.4 Upon Departmental Representative acceptance of the Contractor's EPP, the Departmental Representative will submit the EPP as part of the environmental approval / permitting process to FLNRORD.

.5 The review of the EPP, Breeding Bird and Bird Nest Survey memo, and Environmental Site Inspection Memos, 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.

.6 Should deficiencies in the Contractor's EPP or Breeding Bird and Bird Nest Survey 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 or Breeding Bird and Bird Nest Survey to ensure the correction of any deficiencies.

1.6 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 FLNRORD and provided in Appendix G, 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 EPP shall be completed by a P.Biol. or RPBio., or other qualified professional, and shall, at a minimum include the following:

.1 The specifics of a detailed environmental monitoring program (to be completed by the Contractor). This includes details and rationale concerning sampling locations, timing, duration, and methods, and identification of the person(s) who will be carrying out the monitoring program. Include resumes of proposed environmental monitors and personnel responsible for the preparation of the EPP. See Item 3.1 – Environmental Monitoring of this specification for further details of the required environmental monitoring.

.2 The specifics of a detailed archaeological monitoring program (to be completed by the Contractor). This includes details of the scheduling and identification of the person(s) who will be carrying out the monitoring program. Include a resume(s) of proposed archaeological monitors. See Item 3.2 – Archaeological Monitoring of this specification for further details of the required archaeological monitoring.

.3 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.

.4 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 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.

.5 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 concrete from entering waterway). The Contractor

may utilize marked-up contract drawings within the EPP to show the locations of the proposed activities.

.6 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Plan to include measures for marking limits of use areas including methods for protection of features to be preserved within authorized work areas.

.7 Spill Control Plan including procedures, instructions, and reports to be used in the event of unforeseen spill of regulated substance.

.8 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.

.9 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.

.10 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 requirements provided in FLNRORD Approval or Notifications for Instream Work, NWPA Approval for Instream Work, DFO Fisheries Act requirements, etc.) and these Contract Specifications.

.11 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.

.12 The procedures for stopping work should the Contractor encounter archaeological anomalies or human remains.

1.7 Breeding Bird and Bird Nest Survey

.1 The Contractor is required to complete a Breeding Bird and Bird Nest Survey prior to the completion of any clearing and grubbing operations completed between April 19 and August 29. The results of the Breeding Bird and Bird Nest Survey shall be compiled in a memo. The Breeding Bird and Bird

Nest Survey and memo shall achieve the following:

.1 Be completed by P.Biol., RPBio., or Qualified Environmental Professional (QEP). If a QEP completes the field component of the Breeding Bird and Bird Nest Survey and or memo, the memo must be signed off by a P.Biol. or RPBio.

.2 Be completed within seven (7) days of the commencement of the clearing and grubbing. Should the clearing and grubbing work stop for any reason longer than 24 hours, a new a Breeding Bird and Bird Nest Survey shall be completed.

.3 Be conducted in accordance with the Active Migratory Bird Nest Survey Program outlined by CWS (2008) and the Inventory Methods for Forest and Grassland Birds (RISC 1999).

.2 The Contractor shall contact the Departmental Representative for further instruction should a concern be identified during the Breeding Bird and Bird Nest Survey that would, in the opinion of the QEP, P.Biol., or RPBio., give cause for the delay or cancellation of the clearing and grubbing. Details of the concerns shall be described and itemized in the memo by the QEP, P.Biol., or RPBio.

1.8 Environmental Site Inspection Memo

.1 The Contractor shall submit an Environmental Site Inspection Memo within three (3) weekdays of each site visit or week of full-time site inspections by the P.Bio. or RPBio. or other Qualified Professional. The Environmental Site Inspection Memo shall include the following:

.1 Date and times when Environmental Monitor was onsite.

.2 General site conditions and construction activities ongoing at the time of the inspection.

.3 Findings, non-conformances with EPP, and items requiring correction by the Contractor from the environmental monitor's review and inspection of environmentally sensitive activities including but not limited to:

.1 Fuel and Oil Storage and Fueling Practices.

.2 Care and Maintenance of Construction Equipment.

.3 Spill Response Preparedness.

.4 Construction Activities and Construction Site Management.

.5 Erosion and Sediment Issues.

.6 Wildlife Observations / Mitigation and Sensitive Habitat.

.7 Culvert / In-Stream Work.

.8 Camp management.

.9 Other / Comments.

.4 Photos of any concerns, non-conformances with EPP, or items requiring attention.

1.9 Notification

.1 The Departmental Representative will notify the Contractor in writing of observed non-compliance with Federal, Provincial or Municipal environmental laws or regulations, permits, etc.

.2 The Contractor, after receipt of such notice, shall inform the Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.

.3 The Departmental Representative will issue a stop work order until satisfactory corrective action has been taken.

.4 No time extensions shall be 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 environmental monitoring shall be completed by P.Biol, RPBio, or Qualified Environmental Professional (QEP). If a QEP completes the monitoring, the QEP must work under the direction of the P.Biol or RPBio who completes the Environmental Protection Plan.

.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 At a minimum, the Environmental Monitor shall be onsite and visit all areas of active construction as follows:

.1 Be onsite full-time during all stages of the project when work is being completed on the highway embankment slopes, within the wetted perimeter of the creek, and work within 30 m of the creek.

3.2 Archaeological Monitoring

.1 The archaeological monitoring shall be completed by an Archaeologist registered to practice in the province of British Columbia.

.2 At a minimum the archaeologist shall be onsite full time during all excavation work or other work which has the potential to disturb native ground on the outlet side of the culvert (south side of the highway, including work on private property).

3.3 Site Access and Parking

.1 The Contractor shall review both short and long-term access requirements with the Departmental Representative, both at the start-up and on an on-going basis. In consultation with the Departmental Representative, the Contractor shall formulate an agreement for worker transportation to and from the work site and where workers shall park their private vehicles. Generally, personal vehicles shall be parked at least ten (10) meters from any water course.

.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.

3.4 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.

3.5 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. The Contractor's Erosion Control Plan shall incorporate the sediment and erosion control features as outlined on the Environmental Construction Staging Drawings (C801 – C803).

.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).

3.6 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 m 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 m 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. The site will be inspected to ensure completion to the pre-spill condition to the satisfaction of the Departmental Representative.

3.7 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) outside 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 m 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 be not be parked within 100 m 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 3.6 - Pollution Control, Subsection .4 of this specification.

.5 Equipment use 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.

.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 hire a security person employed to prevent vandalism.

.9 Equipment shall use environmentally sensitive / biodegradable hydraulic fluid in case of accidental loss.

3.8 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, the Contractor is required to stage the work and employ the mitigation measures shown on the Environmental Staging Drawings (C801 – C803) and undertake other measures as deemed necessary by the Contractor to ensure fugitive materials (e.g. rocks, soil, branches) and especially deleterious substances (e.g. chemicals) do 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 the Departmental Representative, negligence on the part of the Contractor results in damage or destruction of vegetation, or other environmental or aesthetic features beyond the designated work area, the Contractor shall be responsible, at his or her expense, for complete restoration including the replacement of trees, shrubs, topsoil, grass, etc. to the satisfaction of the Departmental Representative.

.4 Restrict vehicle movements to the work limits.

.5 Workers vehicles are to remain within the construction footprint.

3.9 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.

.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.

3.10 Fires and Fire Prevention and .1 Fires or burning of waste materials is not permitted.

Control

.2 A fire extinguisher shall be carried and available for use on each of the Contractor's construction equipment in the event of fire.

.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.

3.11 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.

.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.

3.12 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 as defined by GC6.3 shall be reported to the Departmental Representative immediately. The Contractor and workers shall wait for instruction before proceeding with their work as per GC6.3.

	.2	All historical or archaeological objects found in the project site 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 as per GC6.3.
	.3	Human remains must be reported immediately to the local RCMP and Departmental Representative per GC6.3.
3.13 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.
3.14 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 m from natural drainage courses and 100 m 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.
3.15 Drainage	.1	Provide temporary drainage and pumping as necessary to keep excavations and site free from water. Stage the work and complete excavation work and placement of all erosion protection materials in the dry. Provide temporary drainage,

pumping, hoses, temporary coir logs and wood posts, fish stop nets, and check dams as shown on the Environmental Staging Drawings (C801 – C803) as necessary to keep excavations and the culvert work area 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.

.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 m from natural drainage

courses and 100 m 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.

3.16 Site Clearing, Plant Protection, and Nesting Bird Protection

.1 Prior to any clearing done during nesting season between April 19 – August 29, the Contractor shall have a Breeding Bird and Bird Nest survey completed first per the requirements of Item 1.6 Breeding Bird and Bird Nest Survey.

.2 Protect trees and plants on site and adjacent properties where indicated.

.3 Wrap in burlap, trees and shrubs adjacent to construction Work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2 m.

.4 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.

.5 Minimize stripping of topsoil.

.6 Restrict tree removal to areas indicated or designated by Departmental Representative and shown on Contract Drawings.

3.17 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 material required by the manufacture'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, 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 Check Sheets.

1.10 QC Testing / Survey Inspection.

1.11 Non-Conformance Reports (NCR).

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 – 2016 Standard Specifications for Highway Construction.

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

.1 ASTM A252, Standard Specifications for Welded and Seamless Steel Pipe Products.

.2 ASTM C131, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

.3 ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.4 ASTM C143, Standard Test Method for Slump of Hydraulic-Cement Concrete.

.5 ASTM C173, Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.

.6 ASTM C39, Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.

.7 ASTM D4318, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

.8 ASTM D5519, Standard Test Methods for Particle Size Analysis of Natural and Man-Made Riprap Materials.

.9 ASTM D6938, Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

.10 ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 [600 kN-m/m^3]).

.3 Canadian Standards Association (CSA International), latest edition:

.1 CSA W59, Welded Steel Construction (metal arc welding).

.2 CSA W48, Filler metals and allied materials for metal arc welding.

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.

.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 (NCR): 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.

.4 Work failing to meet the conditions of the Contract shall be considered a non-conformance. A Non-Conformance Report (NCR) 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 Non-Conformance Report (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 Quality Management Plan.

.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.

.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.

.2 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 hardcopies of the same documents, forms, and test results if requested.

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. compaction, gradation, and 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 and daily reports.

.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 and survey agencies (if any) 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.

.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 Contactor'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 NCR.

.7 Respond to NCR 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 Check Sheets

.1 Check sheets to verify and document conformance of the work to the quality requirements of the Contract are fundamental to the Quality Control 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. The check sheets shall be prepared assuming the Departmental Representative will only be providing spot checks of the work throughout the project and thus Quality Control shall check all elements of the work for conformance with the requirements of the Contract Documents. Where the Contract Documents provide a requirement but then also indicate that the Departmental Representative may also accept an alternative (ex. "as approved by the Departmental Representative"), the check sheets shall assume that the requirement listed governs and the Quality Control process shall check these requirements unless directed otherwise during the project by the Departmental Representative.

.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).

.3 All check sheets shall be reviewed and signed by the Quality Control Manager prior to submission to the Departmental Representative.

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 – Common Fill	Survey Inspection	Final lift, one (1) shot every 2 m²
Compaction of Common Fill and Crushed Base Gravel	In-Place Density	Count of the number of passes with compaction equipment per lift

Moisture Content – Crushed Base Gravel	Moisture Content (ASTM D2216)	The more stringent of 2 per source or as required by the Departmental Representative should a change in the material properties be detected
Cast-In-Place Concrete	Compressive Strength Test (ASTM C39)	For each day of concrete pour: Minimum one (1) set of four (4) (one 7-day and three 28-day) cylinders for the first load of concrete then minimum one (1) set of four (4) (one 7-day and three 28-day) cylinders for every second load of concrete delivered to the site
Cast-In-Place Concrete	Concrete Slump (ASTM C143)	For each day of concrete pour: Minimum one (1) test for the first load of concrete then minimum one (1) test every second load of concrete delivered to the site
Cast-In-Place Concrete	Air Content (ASTM C173)	For each day of concrete pour: Minimum one (1) test for the first load of concrete then minimum one (1) test every second load of concrete delivered to the site
Placement / Site Tolerance – Culverts	Survey Inspection	One (1) survey point (invert or obvert of culvert) for every 5 m length of culvert section installed
Screening / Sorting / Manufacture – Riprap	Particle Size Analysis (ASTM D5519)	One (1) Test per every one (1) day of production
Placement / Site Tolerance – Riprap	Survey Inspection	One (1) survey point every 5 m² or design change in grade or Riprap Class of placed material

.3 As defined in the BC MoTI 2016 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.

.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 (NCR)

.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 immediately corrected and substandard product remains or becomes part of the work, an internal NCR shall be prepared by the Quality Control Manager and issued to the Contractor within 24 hrs. of the occurrence, with a copy to the Departmental Representative in accordance with Item 1.6 – Submittals of this specification. 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 (starting with the second similar occurrence) and 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 issue an internal procedural NCR to the Contractor within 24 hrs. of the occurrence, with a copy to the Departmental Representative in accordance with Item 1.6 – Submittals of this specification. 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 Departmental Representative's Office Trailer.

1.11 Power.

1.12 Communications.

1.13 Temporary Heating, Ventilation, and Lighting.

1.14 Fire Protection.

1.15 Construction Equipment.

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.

.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 potion 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 Departmental Representative's Office Trailer .1 Provide Departmental Representative with office space within the Contractor's trailer or a standalone office trailer set up at a location preapproved by the Departmental Representative.

.2 The office space within the Contractor's Trailer or standalone office trailer shall be:

.1 A minimum of 3.0 m long × 3.0 m wide × 2.4 m high, with floor 0.3 m above grade.

.2 Insulation and heating system to maintain 22°C inside temperature at -10°C outside temperature.

.3 Equip office with 1 m × 2 m table, and 2 chairs.

.4 Install electrical lighting system to provide minimum 750 lx using surface mounted, shielded commercial fixtures with 10% upward light component.

.5 Power for the on-site trailer shall be available at all times when work at the site is ongoing by means of a generator or connection to power utility, supplied and maintained by the Contractor, or by other hook-ups as accepted by the Departmental Representative.

1.11 Power

.1 Provide and pay for power as required for the completion of the works and operations of construction offices.

1.12 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.

1.13 Temporary Heating, Ventilation, and Lighting

.1 Provide temporary heating, ventilation, and lighting as required during construction period to facilitate construction of the works.

1.14 Fire Protection

.1 Provide and maintain temporary fire protection equipment during performance of work.

1.15 Construction Equipment

.1 The Departmental Representative has the right to request additional equipment be brought to site should the work appear to be delayed due to lack of equipment.

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	.1	Provide protection for finished and partially finished structure

Finishes

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 Decide 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. Reinstate 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 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 Sub-Contractors 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 GC 5.5.

.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 by the Contractor up 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 as-built survey shall include.

.1 Topo of all areas disturbed and modified during construction (between limits of clearing including cut and fill slopes, embankment and gravels placed).

.2 Culverts, including inverts at inlet and outlet, size and type.

.3 Concrete headwall extents and dimensions.

.4 Edge of existing asphalt.

.5 Gravel Shoulder.

.6 Riprap.

.7 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 10 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 reference / tie into 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 format 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 Submit to the Departmental Representative a current Material Safety Data Sheet (MSDS) for each hazardous material required prior to bringing hazardous material on site.

.3 If requested by the Departmental Representative, submit a Hazardous Materials Management Plan to the Departmental Representative that identifies all hazardous materials, their use, their location, personal protective equipment requirements, and disposal arrangements.

1.3 Storage and Handling

.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 Measurement and Payment Procedures.

1.2 Reference Standards.

PART 2 – PRODUCTS:

2.1 Formwork Materials.

2.2 Form Ties.

2.3 Form Release Agent.

PART 3 – EXECUTION:

3.1 Delivery, Storage, and Handling.

3.2 Fabrication and Erection.

3.3 Removal of Formwork.

3.4 Cleaning.

PART 1 – GENERAL

1.1 Measurement and Payment Procedures

.1 Payment for the completion of Concrete Form Work shall not be made and shall be considered incidental to the applicable payment item found in Section 03 30 00 – Cast In-Place Concrete of these specifications.

1.2 Reference Standards

.1 Canadian Standards Association (CSA International)

.1 CSA-A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CSA-O86S1, Supplement No. 1 to CAN/CSA-O86-01, Engineering Design in Wood.

.3 CSA O121, Douglas Fir Plywood.

.4 CSA O151, Canadian Softwood Plywood.

.5 CSA O153, Poplar Plywood.

.6 CAN/CSA-O325.0, Construction Sheathing.

.7 CSA O437 Series, Standards for OSB and Waferboard. CSA S269.1, Falsework for Construction Purposes.

.8 CAN/CSA-S269.3, Concrete Formwork, National Standard of Canada

.2 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S701, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

PART 2 – PRODUCTS

2.1 Formwork Materials

.1 Formwork materials shall be in accordance with CSA-0121 with waterproof adhesive and smooth finish on face in contact with concrete.

2.2 Form Ties

.1 Form ties shall be removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm diameter in concrete surface.

2.3 Form Release Agent

.1 Form Release Agent shall be a non-staining compound, effective in preventing adhesion of concrete to forms and providing clean, oil and grease-free contact surfaces.

PART 3 – EXECUTION

3.1 Delivery, Storage, and Handling

.1 Deliver, store and handle forming materials such to prevent warping, twisting and other damage.

.2 Waste Management and Disposal:

.1 Separate waste materials for reuse and recycling.

.2 Dispose of waste forming materials at a disposal facility approved by Departmental Representative.

3.2 Fabrication and Erection

.1 Verify lines, levels, and centres before proceeding with formwork and ensure dimensions are in accordance with the Contract Drawings.

.2 Construct formwork in accordance with CAN3-A23.1.

.3 Complete excavation for form work in accordance with Section 31 23 33 – Excavation and Backfill.

.4 Erect formwork true to line, brace and strut to prevent deformation under the weight and pressure of wet concrete, construction loads, wind and other forces. Ensure deflection

does not exceed 3 mm.

.5 Erect formwork such that variation in location, elevation and alignment from established position / dimension on Contract Drawings is as follows:

.1 Of the contract work area in relation to the established benchmark and reference points: +/- 50 mm.

.2 Within the contract work area in relation to the proposed culverts: +/- 20 mm.

.3 Variations in plumb: 10 mm per 3 m, but not more than 15 mm overall.

.4 Variation in elevation and level or grade shown on drawings: 10 mm per 3 m but not more than 15 mm overall.

.6 Install all inserts including anchors, ties, bolts, nailers, anchor bolts and embedded plates as required.

.7 Provide all voids, openings, and block-outs required by the Contract Documents.

.8 Apply form-releasing agent to faces of formwork in contact with concrete.

.9 In general, make plywood forms from full sheets. Cut sheets should only be used where specifically indicated or necessary due to the configuration of the structure.

.10 Carefully arrange panels and form screws so that joints are in continuous straight lines as far as possible.

.11 Butt and cover panel joints on the outside by whalers or wood strips to prevent leakage of fines.

.12 Ensure faces of formwork for contact with concrete are clean and free from splits, projecting nails and other defects.

.13 The strength and rigidity of formwork shall be such that they will not leak mortar or result in visible irregularities in the finished concrete.

3.3 Removal of Formwork

.1 Remove formwork not structurally supporting concrete only after a period of not less than 24 hours, or a longer period as necessary to ensure that the concrete is sufficiently hard and with a surface temperature of 10˚C so as not to damage the

concrete by removing formwork and curing and protection operations are maintained.

.2 Use proper tools recommended by the manufacturer for the removal of form ties.

.3 Remove formwork with care to prevent marring of concrete surfaces.

3.4 Cleaning

.1 Thoroughly clean surfaces and remove fins and laitance.

.2 Clean up debris to the satisfaction of the Departmental Representative.

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

1.1 Measurement and Payment Procedures.

1.2 References.

1.3 Submittals.

PART 2 – PRODUCTS:

2.1 Materials.

2.2 Fabrication.

PART 3 – EXECUTION:

3.1 Delivery, Storage, and Handling.

3.2 Field Bending.

3.3 Placing Reinforcement.

PART 1 – GENERAL

1.1 Measurement and Payment Procedures

.1 Payment for Concrete Reinforcing shall not be made and shall be considered incidental to the applicable payment item found in Section 03 30 00 – Cast In-Place Concrete of these specifications.

1.2 References

.1 Canadian Standards Association (CSA International):

.1 CSA-A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CAN/CSA-G30.18-M92 (R2002), Billet-Steel Bars for Concrete Reinforcement, A National Standard of Canada.

.2 Reinforcing Steel Institute of Canada (RSIC).

.1 RSIC-2004, Reinforcing Steel Manual of Standard Practice.

1.3 Submittals

.1 Prepare and submit for acceptance approval concrete reinforcement shop drawings including placement of reinforcement. Shop drawings to indicate bar bending details, lists, quantities of reinforcement, sizes, spacing, locations of reinforcement and mechanical splices, if approved by the Departmental Representative, with

identifying code marks to permit correct placement without reference to structural drawings. Prepare reinforcement drawings in accordance with RSIC Manual of Standard Practice and ACI 315.

.2 The Contractor's concrete reinforcement shop drawings shall be submitted to the Departmental Representative as one single PDF document per submittal (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 submittal (first submission and if required all subsequent re-submissions) within seven (7) days of submission. Upon review of the submittal the Departmental Representative will do one of the following:

.1 Accept the submittal.

.2 Accept portions of the submittal and provide comments outlining required changes or additional information in other sections. Following completion of edits by the Contractor, re-submit the complete submittal for review.

.3 Reject the submittal and provide comments outlining required changes or additional information needed before the submittal will be reviewed in detail. Following completion of edits by the Contractor, re-submit the completed submittal for review.

.3 The Contractor shall allow time in the schedule for the reviews, and subsequent edits / re-submission.

.4 No reinforcing shall be ordered prior to receiving the Departmental Representative's acceptance of the concrete reinforcement shop drawing submittal.

.5 Provide record drawings of reinforcement placement, including:

.1 Bar bending details.

.2 Lists.

.3 Quantities of reinforcement.

.4 Sizes, spacing, and locations of reinforcement.

.6 Submit for acceptance approval Mill Test report of reinforcing steel, showing analysis of physical and chemical properties.

PART 2 – PRODUCTS

2.1 Materials

.1 Reinforcing steel shall be billet steel, grade 400, deformed bars to CAN/CSA-G30.18, unless indicated otherwise.

.2 Chairs, bolsters, bar supports, spacers shall be in accordance with CSA-A23.1/A23.2.

2.2 Fabrication

.1 Fabricate reinforcing steel in accordance with CSA-A23.1/A23.2 ACI 315 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.

PART 3 – EXECUTION

3.1 Delivery, Storage, and Handling

.1 Store and handle reinforcing steel so as not to alter the shape or dimensions.

.2 Prevent contamination of reinforcing steel.

.3 Do not end dump materials when unloading or handling.

3.2 Field Bending

.1 Do not field bend or field weld reinforcement except where pre-approved by the Departmental Representative.

.2 Should field bending be approved, provide written proposal of field bending methodology to the Departmental Representative prior to undertaking. Approval and acceptance of field bending methodology shall be provided by the Departmental Representative prior to field bending.

.3 If approved, complete field bending in accordance with industry standards and best practices.

.4 Replace bars which develop cracks or splits during field bending.

3.3 Placing Reinforcement

.1 Place reinforcing steel in accordance with the Contract Drawings and CSA-A23.1/A23.2.

.2 Prior to placing concrete, obtain Departmental Representative's approval of reinforcing material and placement.

.3 Ensure cover to reinforcement is per requirements listed on contract drawings and is maintained during concrete pour.

.4 Secure bars at every intersection (unless noted on Contract Drawings) by using black tie wire of not less than No. 16 gauge.

.5 Utilize minimum reinforcement splice length on contract drawings.

.6 Supply and install carrier bars to ensure no movement in reinforcing during concrete placement and compaction with vibratory equipment.

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

1.1 Measurement and Payment Procedures.

1.2 References.

1.3 Submittals.

1.4 Quality Management.

PART 2 – PRODUCTS:

2.1 Concrete.

2.2 Concrete Mix.

2.3 Concrete Reinforcing.

2.4 Formwork / Falsework Materials.

2.5 Form Ties.

2.6 Form Release Agent.

PART 3 – EXECUTION:

3.1 Site Preparation.

3.2 Delivery, Storage, and Handling.

3.3 Environmental Requirements.

3.4 Formwork / Falsework Fabrication and Erection.

3.5 Concrete Placement and Finishing.

3.6 Field Quality Control.

3.7 Curing.

3.8 Removal of Formwork / Falsework.

3.9 Cleaning.

PART 1 – GENERAL

1.1 Measurement and Payment Procedures

.1 Payment for Concrete Headwalls will be made on the basis of the Price per Unit Bid for Inlet Concrete Headwall and Outlet Concrete Headwall in the Bid and Acceptance Form. The Price per Unit Bid shall include all costs for:

- Cutting, removal and offsite disposal of excess length of existing steel pipe liner, CSP culvert, and Grout;
- Removal and offsite disposal of existing precast concrete barrier;
- Removal of existing beaver grate and transport to PSPC's Fort Nelson Maintenance Yard (Airport Drive, Fort Nelson, BC);
- Excavation and offsite disposal of native material to facilitate concrete form work and crushed base gravel installation;
- Supply, placement and compaction of Crushed Base Gravel;
- Supply, transport, and installation of concrete form work and reinforcement;
- Supply and placement cast-in-place concrete;
- Placement of topsoil and restoration; and
- All other items necessary for successful completion of the work.

.2 Measurement for Payment for Inlet Concrete Headwall and Outlet Concrete Headwall will be made by Lump Sum based on the percentage of the work completed and accepted by the Departmental Representative. Survey to verify work is completed to design lines, grades and thicknesses.

1.2 References

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

.1 ASTM C39, Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.

.2 ASTM C143, Standard Test Method for Slump of Hydraulic-Cement Concrete.

.3 ASTM C173, Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.

.4 ASTM C309, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

.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.

.2 CSA-A23.2, Methods of Test for Concrete.

.3 CSA-A5, Portland Cement.

.4 CSA A283, Qualification Code for Concrete Testing Laboratories.

.5 CSA A363, Cementitious Hydraulic Slag.

.6 CAN/CSA-S269.3-M92, Concrete Formwork, National Standard of Canada.

.7 CSA-O86S1, Supplement No. 1 to CAN/CSA-086-01, Engineering Design in Wood.

.8 CSA-0121, Douglas Fir Plywood.

1.3 Submittals

.1 Undertake the Concrete Mix Design and pay for all costs associated with the development, testing, and submissions of the mix design. Additional requirements of the mix design:

.1 Expected method of batching, transporting, and placing concrete.

.2 Distance and expected travel time from batch plant location to project site.

.2 Prior to placing concrete in adverse weather conditions or when air temperatures are less than 5°C or greater than 30°C, prepare and submit to the Departmental Representative for review and acceptance proposed methodology for protection of concrete to conform with requirements of CSA-A23.1/A23.2.

.3 The Contractor's Concrete Mix Design submittal and proposed Methodology for Adverse Weather Conditions submittal shall be submitted to the Departmental Representative as one single PDF document per submittal (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 submittal (first submission and if required all subsequent re-submissions) within seven (7) days of submission. Upon review of the submittal the Departmental Representative will do one of the following:

.1 Accept the submittal.

.2 Accept portions of the submittal and provide comments outlining required changes or additional

information in other sections. Following completion of edits by the Contractor, re-submit the complete submittal for review.

.3 Reject the submittal and provide comments outlining required changes or additional information needed before the submittal will be reviewed in detail. Following completion of edits by the Contractor, re-submit the completed submittal for review.

.4 The Contractor shall allow time in the schedule for the reviews, and subsequent edits / re-submission.

.5 No Concrete shall be placed prior to receiving the Departmental Representative's acceptance of the submittals.

.6 Acceptance of the submittals by the Departmental Representative does not constitute acceptance of the Concrete. Acceptance of the Concrete will be based upon the test results and the performance and quality of the Concrete and concrete components placed on the project.

1.4 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: Minimum QC Testing Frequencies unless advised otherwise by the Departmental Representative following a review of the Concrete Mix Design but in advance of the work.

.3 In the case of ambiguity whether the product or work conforms to the applicable standard, the Departmental Representative reserves the right to have such product tested or re-inspected to ascertain the conformance.

PART 2 – PRODUCTS

2.1 Concrete

.1 Sulphate resistant Portland cement: to CAN3-A23.1-M

.2 Water: to CAN3-A23.1-M

.3 Aggregates: to CAN3-A23.1-M

.4 Air entraining Admixtures: to CAN3-A266.1-M

.5 In no case will batch adjustment relieve the Contractor of the responsibility for the durability, strength, or acceptability of Concrete concerned. The Departmental Representative reserves the right to reject any batch in case of confirmed

unacceptability and to require immediate removal of any Concrete from this batch from the work.

2.2 Concrete Mix

.1 Proportion Concrete in accordance with CAN3-A23.1 to yield the following properties:

.1 Max water to cement ratio 0.4.

.2 Minimum compressive strength at 28 days: 35 MPa.

.3 Nominal size of coarse aggregate: 20 mm.

.4 Slump at time and point of discharge: 130 mm, +/- 30 mm.

.5 Air content: Category 1.

.6 Concrete exposure class: C-1

.7 Calcium Chloride or admixtures containing chloride ions shall not be permitted.

.8 Consistency that will result in a flowable product at the time of placement which does not require manual means to move it into place.

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

2.3 Concrete Reinforcing

.1 Concrete Reinforcing shall be in accordance with Section 03 20 00 – Concrete Reinforcing.

2.4 Formwork / Falsework Materials

.1 Formwork / Falsework materials in accordance with CSA-0121, with waterproof adhesive and smooth finish on face in contact with concrete, and Section 03 10 00 – Concrete Form Work.

2.5 Form Ties

.1 Form ties shall be removeable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm diameter in concrete surface.

2.6 Form Release Agent

.1 Non-staining compound, effective in preventing adhesion of concrete to forms and providing clean, oil, and grease-free contact surfaces.

PART 3 – EXECUTION

3.1 Site Preparation

.1 Obtain the Departmental Representative's approval before placing concrete.

.1 Provide the Departmental Representative 24 hours' minimum notice prior to each concrete pour.

3.2 Delivery, Storage, and Handling

.1 Deliver, store, and handle forming materials such to prevent warping, twisting, and other damage.

.2 Concrete 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 strength and other requirements are achieved. Regardless of the proposed methodology submitted, the Departmental Representative is under no obligation to deviate from this requirement.

.3 Concrete delivery: ensure that continuous Concrete delivery from plant meets CSA A23.1/A23.2.

.4 Waste Management and Disposal:

.1 Separate waste materials for reuse and recycling.

.2 Dispose of waste forming materials at a disposal facility approved by the Departmental Representative.

.3 Divert unused Concrete materials to a local landfill facility approved by the Departmental Representative.

.4 Provide an appropriate area on the job site where concrete trucks can be safely washed.

.5 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.

.6 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.

3.3 Environmental Requirements	.1	Concrete will follow BC Ministry of Environment and Climate Change Strategy (MoE) Standards and Best Practices for Instream Works Section 14.6 Concrete Materials Use.
	.2	Concrete, concrete fines, sediments, debris, or wash shall not be deposited or contact water into or about any watercourse, directly or indirectly. Concrete materials cast in place will remain inside formed structure.
	.3	A carbon dioxide (CO_2) tank with regulator, hose and gas diffuser will be readily available during concrete work. Carbon dioxide gas will be released into the affected area to neutralize pH levels should a spill occur.
	.4	The Contractor shall provide containment facilities for the wash-down water from concrete delivery trucks, concrete pumping equipment and other tools and equipment.
	.5	All spills will be reported to Emergency Management BC (1-800-663-3456) and where possible, immediate removal of materials from the water and implementation of emergency mitigation and cleanup measures will be initiated.
	.6	Isolation of all concrete work from any water within or entering into any watercourse.
	.7	Monitoring of pH levels in the watercourse immediately downstream of the works will be conducted if the stream is not iced. Isolate and hold any water that contacts uncured or partly cured concrete until the pH is between 6.5 and 8.0 pH units.
3.4 Formwork / Falsework Fabrication and Erection	.1	Complete excavation and backfill to facilitate construction of formwork / falsework in accordance with Section 31 23 33 – Excavation and Backfill.
	.2	Construct Formwork / Falsework in accordance with CAN3-A23.1 and Section 03 10 00 – Concrete Form Work.
3.5 Concrete Placement and Finishing	.1	Prior to placing concrete, submit and obtain approval for Concrete Mix design written submission (see Item 1.3 – Submittals).
	.2	Prior to placing concrete, obtain approval from the Departmental Representative for proposed method of protection of concrete when placing in adverse weather conditions or when air temperatures are less than 5°C or greater than 30°C.

.3 Comply with hot / cold weather Concrete fabrication, placement, and curing requirements in accordance with CSA-23.1-09.

.4 Convey the Concrete at the site utilizing equipment of the design, size, and condition to deposit a continuous and adequate supply of Concrete of the specified mix and consistency without segregation at the required locations.

.5 During concreting operations:

.1 Development of cold joints is not permitted.

.2 Ensure concrete delivery and handling facilitates placing with minimal re-handling and without damage to existing structures or work.

.3 Addition of water to the batch is not permitted.

.4 One adjustment of air onsite may be permitted provided the adjustment is done under the supervision of a qualified personnel.

.6 Ensure Concrete Reinforcing and inserts are not disturbed during Concrete placement.

.7 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature, and test samples taken.

.8 Ensure Concrete is placed in accordance with the Contract Drawings and has filled all areas of the void space. If required, use manual means to move Concrete into all areas of the void space.

.9 Honeycombed concrete should be cut out and replaced.

.10 Ensure minimum cover to Concrete Reinforcing is maintained during Concrete pour.

.11 The Departmental Representative may request the Contractor prove that all void spaces have been filled, through actions such as drilling, at the Contractor's expense.

3.6 Field Quality Control

.1 Conduct the following site tests and submit reports to the Departmental Representative in accordance with Section 01 33 00 – Submittal Procedures.

.1 Concrete pours.

.2 Slump tests.

.3 Air content.

.4 Temperature.

.5 Compressive strength.

.2 Inspection and testing of concrete and concrete materials will be carried out by the Contractor in accordance with CSA-A23.1/A23.2.

.1 Ensure that the testing laboratory is certified in accordance with CSA A283.

.3 The frequency of testing shall be as outlined in the Quality Management Plan but at a minimum achieve the frequency requirements of Section 01 45 00 – Quality Management.

.4 The Contractor will take additional test cylinders during cold weather concreting.

.5 Inspection or testing by the Departmental Representative will not augment or replace the Contractor's Quality Control nor relieve the Contractor of their contractual responsibility.

3.7 Curing

.1 Maintain moist curing in accordance with CAN3-23.1 and subject to the approval of the Departmental Representative.

.2 Curing compounds may only be applied at the acceptance of the Departmental Representative. Only curing compounds which meet the requirements of ASTM C309 will be accepted for use.

.3 Protect concrete from freezing in accordance with CSA-A23.1/A23.2.

3.8 Removal of Formwork / Falsework

.1 Remove Formwork / Falsework in accordance with Section 03 10 00 – Concrete Form Work.

3.9 Cleaning

.1 Thoroughly clean surfaces, remove fins, and laitance.

.2 Clean up debris to the satisfaction of the Departmental Representative.

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

1.1 Measurement and Payment Procedures.

1.2 References.

1.3 Submittals.

1.4 Quality Management.

PART 2 – PRODUCTS:

2.1 Aggregate Source.

2.2 Aggregates General.

2.3 Riprap.

2.4 Natural Substrate.

2.5 Crushed Base Gravel.

2.6 Common Fill.

PART 3 – EXECUTION:

3.1 Preparation.

3.2 Processing.

3.3 Handling and Transportation.

3.4 Stockpiling.

3.5 Cleaning.

PART 1 – GENERAL

1.1 Measurement and Payment Procedures

.1 Measurement and Payment for Aggregate Materials shall not be paid separately and shall be incidental to other works. Measurement and Payment for Aggregate Materials shall be per the applicable work included in Section 33 42 13 – Pipe Culverts, Section 03 30 00 – Cast-in-Place Concrete, and any other section as required by these specifications.

1.2 References

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

.1 ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.2 ASTM D4318, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

.3 ASTM C131, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

.2 British Columbia Motor Vehicle Act, Motor Vehicle Act Regulations, Division 19 – Miscellaneous, latest edition.

1.3 Submittals

.1 Submittals in accordance with Section 01 33 00 – Submittal Procedures.

1.4 Quality Management

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

.2 In addition to the Quality Control undertaken by the Contractor, the Departmental Representative may undertake, through an independent testing firm, random sampling, inspection, and testing for the purpose of Quality Assurance.

.3 Provide access to all portions of the work for sampling by the Departmental Representative.

PART 2 – PRODUCTS

2.1 Aggregate Source

.1 The Contractor shall provide their own source(s) for all aggregate materials for this project. The Contractor will be solely responsible for 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 PSPC is providing access to in-situ materials from Trutch Quarry (Km 319 of the Alaska Highway, 9 Km haul from highway on an unmaintained road). Various sizes of riprap may be available for use by the Contractor as riprap or the Contractor may have to manufacture riprap from the in-situ materials. See Section 31 37 00 – Riprap for further information.

.3 A minimum of seven (7) calendar days prior to supply or commencement of manufacture of materials from the Contractor's selected aggregate source(s), provide to the Departmental Representative for review and acceptance the location, name, and owner of material source.

2.2 Aggregates General

.1 All aggregate materials on the project shall at a minimum achieve the following requirements. Should more stringent

requirements for a specific aggregate be provided elsewhere in this Contract Specification, the more stringent requirement shall apply.

.1 Aggregate quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material, clay lumps or minerals or other substances that would act in deleterious manner for use intended.

.2 Flat and elongated particles of coarse aggregate (ASTM D4791) to:

.1 Flat and elongated particles are those whose greatest dimension exceeds five times their least dimension.

2.3 Riprap

.1 Riprap shall be in conformance with Section 31 37 00 – Riprap.

2.4 Natural Substrate

.1 Natural Substrate shall be placed within the proposed 2800 mm diameter steel pipe culvert and shall be imported from an offsite source and achieve the following requirements.

.1 Natural Substrate shall be a 150 mm minimum material comprised of rounded aggregates produced from sorting, screening, and/or blending of materials. The materials shall have a generally uniform gradation conforming to the following gradation limits:

Table 31 05 16 – 03: Gradation Limits: Natural Substrate

Sieve Designation (mm)	Percent Passing by Weight
150.0	100
75.0	50 – 80
50.0	30 – 60
25.0	20 – 50
9.5	0 – 5

.2 Existing rock material that achieves the requirements for Natural Substrate may be set aside by the Contractor for re-use as Natural Substrate.

2.5 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 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 fractured face.

2.6 Common Fill

.1 Common Fill shall be in accordance with Section 31 23 33 – Excavation and Backfill.

PART 3 – EXECUTION

3.1 Preparation

.1 Prior to excavating materials for aggregate production, strip off and stockpile unsuitable surface material.

.2 Strip area ahead of quarrying of excavating operation sufficient to prevent contamination of aggregate by deleterious material.

3.2 Processing

.1 Process aggregate uniformly using methods that prevent contamination, segregation, and degradation.

.2 Blend aggregates, if required, to obtain gradation requirements, percentage of crushed particles, or particle shapes, as specified in these Specifications. Use methods and equipment approved by Departmental Representative.

.3 Wash aggregates with clean water, if required, to achieve

requirements of these specifications. Use only equipment approved by Departmental Representative.

.4 When operating in stratified deposits, use excavation equipment and methods that produce a uniform, homogeneous aggregate.

3.3 Handling and Transportation

.1 Avoid segregation, contamination, and degradation of aggregate 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 The Contractor shall be responsible for all haul roads required to access aggregate sources. All haul roads used shall be maintained at the Contractor's expense and at the conclusion of the works, left in a condition acceptable to the haul road owner.

3.4 Stockpiling

.1 Should stockpiles on highway right-of-way or on PSPC property be required, stockpile aggregates in locations directed by Departmental Representative. Do not stockpile on completed pavement surfaces.

.2 Stockpile aggregates in sufficient quantities to meet project schedules.

.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.

.5 Separate different aggregates by strong, full depth bulkheads, or stockpile far enough apart to prevent intermixing.

.6 Do not use intermixed or contaminated materials. Remove and dispose of rejected materials as directed by Departmental Representative.

.7 Uniformly spot-dump aggregates delivered to stockpile in trucks and build up stockpiles as required to prevent segregation.

.8 Do not cone piles or spill material over edges of piles.

.9 Prevent ice and snow from becoming mixed into stockpile or in material being removed from stockpile.

3.5 Cleaning

.1 Any stockpiles temporarily placed on the highway right-of-way or on PSPC property will be completely removed and the site restored to its natural condition.

.2 The Contractor shall be responsible for any cleanup of aggregate sources.

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

1.1 Measurement and Payment Procedures.

1.2 Definitions.

1.3 Protection.

PART 2 – PRODUCTS:

2.1 Products.

PART 3 – EXECUTION:

3.1 Preparation.

3.2 Clearing and Grubbing.

3.3 Removal and Disposal.

3.4 Finished Surface.

PART 1 – GENERAL

1.1 Measurement and Payment Procedures

.1 Payment for Clearing and Grubbing will be made on the basis of the Price per Unit Bid for Clearing and Grubbing in the Bid and Acceptance Form. The Price per Unit Bid shall include all costs for clearing of trees and brush, removal of all stumps and roots, disposal, and all other items necessary for successful completion of the work.

.2 Measurement for Payment for Clearing and Grubbing will be made by Lump Sum based on the percentage of the work completed and accepted by the Departmental Representative. Survey to verify work is completed to design lines, grades and thicknesses.

1.2 Definitions

.1 Clearing: cutting off trees, brushing vegetative growth to ground level and disposing of felled trees, previously uprooted trees and stumps, and surface debris.

.2 Grubbing: excavating and disposing stumps and roots to 150 mm below existing ground surface.

.3 License to Cut: License required under Province of British Columbia's Forest Act that authorizes a Contractor to salvage and remove timber from Crown Land.

.4 Flush Cut: removal of trees and brush such that stumps are cut flush with ground elevation and root structure is

undisturbed.

1.3 Protection	.1	Prevent damage to natural features and man-made structures which are to remain.
	.2	Repair any damaged caused by clearing and grubbing operations and if damaged, replace any tress designated to remain.

PART 2 – PRODUCTS

2.1 Products	.1	Not Used.

PART 3 – EXECUTION

3.1 Preparation	.1	Inspect the site and verify with the Departmental Representative the limits of the clearing and grubbing and items designated to remain.
	.2	Unless advised otherwise, receive from the Departmental Representative the License to Cut prior to undertaking the work.
3.2 Clearing and Grubbing	.1	Clear trees, brush, and other vegetation designated for removal within the limits of Clearing and Grubbing shown on the Contract Drawings and as directed by the Departmental Representative. In areas designated for clearing and grubbing where the native material is not being excavated and removed in preparation for riprap erosion construction, flush cut trees and brush only and forgo grubbing.
	.2	Cut off branches and cut down trees overhanging area cleared.
	.3	Where grubbing is required, grub out stumps and wood debris including roots and embedded logs to not less than 200 mm below ground surface.
3.3 Removal and Disposal	.1	Dispose offsite cleared materials by chipping, mulching or other means such that no cleared materials remain onsite. Dispose of vegetative materials offsite at a location pre-approved by the Departmental Representative.
	.2	Burning of cleared material shall not be permitted.
3.4 Finished Surface	.1	Leave ground surface in a condition suitable for stripping of topsoil / excavation.
	.2	In areas of flush cutting, leave stumps cut flush with ground elevation and root structure undisturbed.

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

1.1 Measurement and Payment Procedures.

1.2 Definitions

1.3 References.

PART 2 – PRODUCTS:

2.1 Common Fill.

2.2 Topsoil.

2.3 Crushed Base Gravel.

PART 3 – EXECUTION:

3.1 Excavation – Trenchless Culvert Installation and Concrete Headwalls.

3.2 Excavation – Channel Re-alignment and Erosion Protection.

3.3 Disposal of Excavated Material.

3.4 Culvert and Concrete Headwall Backfill.

3.5 Placement of Crushed Base Gravel.

3.6 Placement of Common Fill.

PART 1 – GENERAL

1.1 Measurement and Payment Procedures

.1 Payment for the completion of Excavation and Backfill shall not be made and shall be considered incidental to the applicable payment item found in Section 31 37 00 – Riprap, Section 33 42 13 – Pipe Culverts, Section 03 30 00 – Cast-in-Place Concrete, and any other section as required by these specifications.

1.2 Definitions

.1 Common Fill: native materials excavated onsite and meeting the material properties for Embankment and thus suitable for reuse as fill material as indicated on the Contract Drawings.

.2 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 materials 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.

.3 Excavation: removal of materials that are not rock excavation or stripping.

.4 Organic Material: soil in which plants can grow, comprising primarily of mineral particles mixed with decayed organic matter and having the capability of retaining water. Typically dark brown or black in colour.

.5 Stripping: excavation of organic material covering the original ground.

.6 Topsoil: organic material derived from stripping free of rocks > 150 mm in diameter and other debris hindering good vegetative growth.

1.3 References

.1 American Society for Testing and Materials International, (ASTM).

.1 ASTM D698-00a, Test method for Laboratory Characteristics of Soil Using Standard Effort (12,000 ft-lbf/ft3 [600 kN-m/m3]).

.2 ASTM D6938, Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

.2 British Columbia MoT – 2016 Standard Specifications for Highway Construction.

PART 2 – PRODUCTS

2.1 Common Fill

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

2.2 Topsoil

.1 Material meeting the definition of Topsoil derived from stripping on the project. Should insufficient quantities of topsoil be available from stripping, topsoil may comprise of other materials from excavation as accepted by the Departmental Representative. The need to import topsoil from other sources outside the project area is not anticipated on the project.

2.3 Crushed Base Gravel

.1 Crushed Base Gravel shall be in accordance with Section 31 05 16 – Aggregates: General.

PART 3 – EXECUTION

3.1 Excavation – Trenchless Culvert Installation and Concrete Headwalls

.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 2800 mm diameter (minimum) culvert, and concrete headwalls. 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 stripping materials which are suitable and required as topsoil. Temporarily stockpile excavation required as common fill for 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 per Item 3.3 – Disposal of Excavated Material.

.5 Cover excavation stockpiled for reuse as Common Fill with an impermeable tarp to protect the embankment material from the weather (snow).

3.2 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).

.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 stream bed and stream slopes to the lines, grades, elevations, and dimensions in preparation for channel realignment and Riprap erosion protection 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.

	.4	Dispose of excess excavated material from channel re-alignment and erosion protection works at an offsite disposal facility outside PSPC's Right-of-Way, selected by the Contractor and pre-approved by the Departmental Representative.
3.3 Disposal of Excavated Material	.1	Excavated material classified by the Departmental Representative as unsuitable for re-use as Common Fill and or 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.
3.4 Culvert and Concrete Headwall Backfill	.1	Complete excavation and dewater excavation as necessary, to allow backfill of the culvert and concrete headwalls with Crushed Base Gravel in a dry condition.
	.2	Excavate the embankment / native material to facilitate the install of the crushed base gravel below the Concrete Headwall as shown on the Contract Drawings. Dispose of Excavated materials classified by the Departmental Representative as unsuitable for re-use and/or excess excavated material shall be disposed of per Item 3.3 – Disposal of Excavated Material. Backfill excavation with Crushed Base Gravel and compacted per the requirements of Item 3.5 – Placement of Crushed Base Gravel of this specification.
	.3	Any and all embankment / native material excavated or disturbed to facilitate the install of the Concrete Headwalls or steel pipe culvert shall be removed and the excavation backfilled with Crushed Base Gravel per the requirements of Item 3.5 – Placement of Crushed Base Gravel of this specification.
3.5 Placement of Crushed Base Gravel	.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 1000 LB or larger. When compacting around the steel pipe culvert alternate on each side of the culvert, so as not to allow movement of uplift of the culvert. Take special care to obtain required density under haunches of culvert. Hand tamp where necessary to obtain compaction. Keep Crushed Base Gravel free from snow and ice during placement.
	.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 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.

.4 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 3.5.2.

3.6 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 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 finsihed 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.

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

1.1 Measurement and Payment Procedures.

1.2 References.

PART 2 – PRODUCTS:

2.1 Riprap.

2.2 Nonwoven Geotextile.

2.3 Fence.

PART 3 – EXECUTION:

3.1 Fence Removal.

3.2 Placement of Nonwoven Geotextile.

3.3 Placement of Riprap.

3.4 Fence Reinstallation.

PART 1 – GENERAL

1.1 Measurement and Payment Procedures

.1 Payment for the completion of Inlet and Outlet Channel Re-alignment and Erosion Protection will be made on the basis of the Price per Unit Bid for Inlet Channel Re-alignment and Erosion Protection and Outlet Channel Re-alignment and Erosion Protection in the Bid and Acceptance form. The Price per Unit Bid shall include all costs for excavation and offsite disposal of excess excavated material, the placement and compaction of suitable excavation as common fill, the supply and installation of nonwoven geotextile, the manufacture, supply, transport and placement of Riprap, ditch regrading, fence removal, supply and install of new fence, and all other items necessary for the successful completion of the work.

.2 Measurement for Payment for Inlet Channel Re-alignment and Erosion Protection and Outlet Channel Re-alignment and Erosion Protection will be made at the Lump Sum based on the percentage of work completed and accepted by the Departmental Representative. Survey to verify work is completed to design lines, grades and thicknesses.

1.2 References

.1 British Columbia MoT – 2016 Standard Specifications for Highway Construction.

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

.1 ASTM D5519, Standard Test Methods for Particle Size Analysis of Natural and Man-Made Riprap Materials.

PART 2 – PRODUCTS

2.1 Riprap

.1 The Contractor shall be solely responsible to choose a source(s) of riprap for the project from the following options:

.1 PSPC's Trutch Quarry (Km 319, 9 Km Haul from the highway on an unmaintained road). Various sizes of may be available for use by the Contractor as riprap or the Contractor may have to manufacture riprap from the in-situ materials. The Contractor will be responsible for sorting through and stockpiling rock and selecting the appropriate rock size or manufacturing the appropriate rock size. Should the Contractor choose to manufacture the rock using blasting, the Contractor shall be responsible to obtain all necessary permits.

.2 Alternative sources outside the highway ROW.

.2 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:

Table 31 37 00 – 01: 50 Kg Class Riprap		
Mass (kg) *	**Nominal Diameter @ 2640 kg/m³ (mm)**	**Percent Greater Than**
300	560	0
150	450	15
50	310	50
5	150	85
1	90	100

Table 31 37 00 – 02: 100 Kg Class Riprap

Mass (kg) *	Nominal Diameter @ 2640 kg/m^3 (mm)	Percent Greater Than
750	760	0
300	560	15
100	390	50
10	180	85
1	90	100

* Mass governs the gradation of Riprap. Nominal diameter is provided for informational purposes only. Nominal size is defined according to the following expression: Nominal Size (mm) = 1150 times the cube root of the mass (kg) divided by the density of the rock (kg/m^3).

.3 Neither the breadth or the thickness of any individual piece of Riprap material is to be less than on 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.

.3 The Riprap shall be stockpiled at the site for inspection by the Departmental Representative prior to placement. Stockpiles for inspection shall contain a minimum of 10 tonnes of material.

2.2 Nonwoven Geotextile

.1 The Nonwoven Geotextile shall achieve or exceed the following minimum requirements:

Table 31 37 00 – 03: 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/m^2 (gpm/ft^2)	3056 (75)
UV Resistance	ASTM-D4355	% retained at 500 hrs	70

2.3 Fence

.1 Fence shall be Type ‘C’ Fence (Barbed Wire) in accordance with BC MoTI 2016 Standard Specification for Highway Construction, Section 741 Fence Construction, Drawing SP741-02.01, and Section 909 Treated Wood Fence Posts, and the following requirements:

.1 The fence posts shall be pressure treated round wood posts, minimum 100 mm diameter pointed for driving. Wood posts shall be Lodge Pole Pine (Western Jack Pine) cut from growing trees, or a suitable alternative preapproved by the Departmental Representative.

.2 Fence posts shall be free of defects, including but not limited to decay, cracks, splits, spike knots, and knot clusters. Fence posts shall be inspected and approved for use by the Departmental Representative prior to installation.

PART 3 – EXECUTION

3.1 Fence Removal

.1 Prior to placing Nonwoven Geotextile and Riprap, remove and dispose existing fence posts, droppers and wire to the limits acceptable to the Departmental Representative.

3.2 Placement of Nonwoven Geotextile

.1 Install temporary drainage and pumping and construct berms as outlined in the Contract Drawings and accepted EPP to keep excavations and the work area free from water to the maximum extent possible (see Section 01 35 46 – Environmental Protection).

.2 Complete excavation work in accordance with Section 31 23 33 – Excavation and Backfill.

.3 Place Nonwoven Geotextile on a clean surface, properly shaped per the lines and grades shown in the Contract Drawings and free from debris, snow and ice or other deleterious material.

.4 Place Nonwoven Geotextile material by unrolling onto excavated / graded surface in orientation, manner and locations indicated on Contract Drawings and retain in position with pins. All Nonwoven Geotextile placed on a slope shall at a minimum be secured with pins a minimum 300 mm long every 2 m² of Nonwoven Geotextile.

.5 Place Nonwoven Geotextile material smooth and free of tension stress, folds, wrinkles and creases.

.6 Place Nonwoven Geotextile on sloping surfaces in one continuous length from toe of slope to upper extent of Nonwoven Geotextile.

.7 Overlap each successive strip of Nonwoven Geotextile 1000 mm over previously laid strip. When Nonwoven Geotextile are placed on a slope, ensure overlap is as follows:

.1 Nonwoven Geotextile placed higher on slope is placed above Nonwoven Geotextile placed lower on slope.

.8 Pin successive strips of Nonwoven Geotextile with securing pins at 1000 mm interval at midpoint of lap.

.9 Protect installed Nonwoven Geotextile material from displacement, damage or deterioration before, during and after placement of material layers.

.10 Replace damaged or deteriorated Nonwoven Geotextile to approval of the Departmental Representative.

.11 Construction equipment is not permitted on the Nonwoven Geotextile at any stage of construction.

.12 Upon acceptance by the Departmental Representative, place succeeding material as shown on the Contract Drawings.

3.3 Placement of Riprap

.1 Install temporary drainage and pumping and construct berms as outlined in the Contract Drawings and 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 The Riprap material shall be loaded, transported, and placed with care to ensure that material does not break or reduce in size smaller than the actual material size requirements when placed.

.3 Place Riprap materials on a clean surface, properly shaped per the lines and grades shown in the Contract Drawings and free from debris, snow and ice or other deleterious material.

.4 Riprap materials shall be placed to the lines and thickness shown on the Contract Drawings. The finished surface of the Riprap shall be within +200 mm / -100 mm of the finished design grades but not uniformly high or low.

.5 Place Riprap material using methods that do not lead to segregation or degradation of aggregate. Do not place by end dumping from haul units.

.6 Do not drop Riprap from a height greater than 0.5 m vertically from its final position.

.7 Place Riprap commencing at the toe of the slope and proceeding up the slope. Material shall be densely placed and

individual stones shall be worked with placement equipment to form a well-keyed surface.

.8 Riprap not conforming to the requirements of this section shall be removed from the project site with the expense of the removal borne by the Contractor.

.9 The Contractor shall ensure that the construction methods adopted produces a finished surface that is comprised of the full spectrum of particle sizes continuously throughout its length and breadth.

.10 Dress all Riprap voids so that the final surface is well keyed, densely placed, and uniform. The Departmental Representative will require that all surface voids be filled into which a rock having a mass equal or greater than 25% of the maximum stone mass can be placed.

.11 Construction equipment is not permitted on the Riprap at any stage of construction.

.12 Maintain finished material surfaces in a condition conforming to these specifications until acceptance.

3.4 Fence Installation

.1 Install Standard Barbed Wire Fence to the locations shown on the Contract Drawings, and in the locations where fencing was removed to facilitate construction access, such that there are no gaps in the fencing except above the outlet concrete headwall as shown on the Contract Drawings. Supply and installation of the standard barbwire fence shall be in accordance with BC MoTI 2016 Standard Specifications for Highway Construction, Section 741, Drawing SP741-02.01 Type ‘C’ Fence (Barbed Wire), and to the satisfaction of the Departmental Representative.

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, topsoil, cut slopes, excavation, and other disturbed areas as described in these specifications (excluding finished riprap surfaces) 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.

.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:

Table 32 93 21 – 01: Grass Seed Mix

% 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 Endomycrrhizae.

.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 HECP 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, guiderails, plant material, finished riprap surfaces, 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.

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 Measurement and Payment Procedures.

1.2 References.

1.3 Definitions.

1.4 Submittals.

1.5 Environmental.

1.6 Delivery, Storage, and Handling.

PART 2 – PRODUCTS:

2.1 Steel Pipe Culverts (Trenchless Culvert Installation).

2.2 Welding Materials.

2.3 Concrete.

2.4 Concrete Form Work.

2.5 Concrete Reinforcing.

2.6 Common Fill.

2.7 Fish Baffles.

2.8 Natural Substrate.

2.9 Nonwoven Geotextile.

2.10 Riprap.

2.11 Crushed Base Gravel.

PART 3 – EXECUTION:

3.1 Trenchless Culvert Installation.

3.2 Existing Lined CSP Culvert Improvements.

3.3 Concrete Headwalls.

3.4 Fish Baffle and Natural Substrate Installation.

3.5 Channel Realignment and Erosion Protection.

3.6 Clean-up.

PART 1 – GENERAL

1.1 Measurement and Payment Procedures

.1 Payment for Culvert Installation (Trenchless) – 2800 mm Diameter will be made on the basis of the Price per Unit Bid for Culvert Installation (Trenchless) – 2800 mm Diameter in the Bid and Acceptance Form. The Price per Unit Bid shall include all costs for:

- Transport of the Steel Pipe Culvert from PSPC Wonowon Maintenance Yard (Km 162) to site.
- Trenchless installation of the Owner supplied Steel Pipe Culvert and required welding;
- Preparation of working gravel pad to accommodate pipe jacking equipment and length of Steel Pipe Culvert;
- Removal and offsite disposal of earth material inside the steel pipe;
- Fabrication and installation of fish baffles via welding to the Steel Pipe Culvert once the Steel Pipe Culvert has been installed;
- Supply and install of natural substrate material;
- 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;
- Restoration of the disturbed areas; and
- All other items necessary for successful completion of the work.

.2 Measurement for Payment for Culvert Installation (Trenchless) – 2800 mm Diameter will be made on the length of culvert installed surveyed in lineal metres, measured parallel to the direction of the culvert along the invert of the culvert, completed in accordance with the Contract Drawings and to the satisfaction of the Departmental Representative.

1.2 References

.1 Canadian Standards Association (CSA International), latest edition:

.1 CSA W59, Welded Steel Construction (metal arc welding).

.2 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 A252, Standard Specification for Welded and Seamless Steel Pipe Products.

.2 ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ [600 kN-m/m³]).

1.3 Definitions

.1 Trenchless: Culvert installation through the existing ground within strict alignment and grade tolerances using hydraulic equipment, without the need for the excavation of the existing ground above the culvert.

.2 Obstruction: Rock or other material which must be removed prior to the continuation of the Pipe Jacking work.

1.4 Submittals

.1 Submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit to the Departmental Representative for review and acceptance the following submittals prior to undertaking the work:

.1 A Tunneling Methodology report, containing sufficient detail 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 jacking equipment and cushioning.

.6 Identify critical utility crossings and special precautions proposed.

.7 Slurry injection system details (if required).

.2 A Monitoring Plan for assessing ground movement (settlement and heave) due to Trenchless Culvert Installation operations. The plan shall identify the location of settlement monitoring points, reference

benchmarks, survey frequency and procedures, instrument monitoring, and reporting formats.

.3 Submit to the Departmental Representative for review and acceptance the following submittals during the work:

.1 Within 48 hrs of the completion of each pipe culvert weld, the Contractor shall provide to the Departmental Representative the Canadian Welding Bureau Group (CWB) Form 107 Engineer's Report (see Appendix I) to certify completed weld conforms with CSA W48 and W59. Submitted CWB Form 107 shall be signed by a person accredited with the CWB.

.4 Submit to the Departmental Representative for review and acceptance immediately following the installation of the steel pipe culvert and prior to the installation of the concrete headwalls and Inlet and Outlet Channel realignment and erosion protection works.

.1 An as-built survey of the trenchless culvert installation to the Departmental Representative to allow verification of the installation with respect to the Contract Drawings and the tolerances outlined in the specifications. The as-built survey shall be in accordance with the requirements of Section 01 78 00 – Closeout Submittals, Item 1.3 As-Built Survey.

1.5 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 Contract Specification Section 01 11 10 – Summary of Work, Item 3.2 – Work Completion, Sub-Section .5 through .7 for further information.

1.6 Delivery, Storage, and Handling

.1 Handle and store pipe culvert products in a manner to avoid damage, alteration, deterioration and spoiling.

.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 (Trenchless Culvert Installation)

.1 PSPC is providing the 2794 mm (110') outside diameter steel pipe culvert for use by the Contractor with the following properties:

.1 Seamless / welded (spiral or seam) conforming with the requirements of ASTM A252, Grade 3 with a minimum yield strength of 310 MPa.

.2 Wall thickness: 31.75 mm (1.25").

.3 Culvert supplied in 4.29 m long segments (total of 14 segments), complete with beveled ends for a Complete Penetration weld.

PSPC will provide the Contractor with the steel pipe culvert producer's mill certificates for the steel pipe culverts.

The steel pipe culvert sections will be stockpiled within PSPC's Wonowon Maintenance Yard (turn off at Km 161.9 of the Alaska Highway). The Contractor shall be responsible to inspect the steel pipe culvert sections prior to pick-up and report any damage or concerns to the Departmental Representative. The contractor shall be responsible for loading and transport of the culvert sections to the project site.

.2 The Contractor shall be responsible for selection of appropriate trenchless installation equipment to not unduly damage or distort the ends of the Steel Pipe Culverts during the installation process.

2.2 Welding Materials

.1 Welding materials to CSA W59.

.2 Welding electrodes to CSA W48 Series.

2.3 Concrete

.1 Concrete shall be in accordance with Section 03 30 00 – Cast-in-Place Concrete.

2.4 Concrete Form Work

.1 Concrete Form Work shall be in accordance with Section 03 10 00 – Concrete Form Work.

2.5 Concrete Reinforcing

.1 Concrete Reinforcing shall be in accordance with Section

03 20 00 – Concrete Reinforcing.

2.6 Common Fill .1 Common Fill (backfill to facilitate the riprap placement) shall be in accordance with Section 31 23 33 – Excavation and Backfill.

2.7 Fish Baffles .1 Fish baffles shall be 9.5 mm thick plate steel cut to match shape of 2800 mm diameter culvert at the locations, angles, and spacing shown on the Contract Drawings.

2.8 Natural Substrate .1 Natural Substrate shall be in accordance with Section 31 05 16 – Aggregates: General.

2.9 Nonwoven Geotextile .1 Nonwoven Geotextile shall be in accordance with Section 31 37 00 – Riprap.

2.10 Riprap .1 Riprap for the Culvert end protection shall be in accordance with Section 31 37 00 – Riprap.

2.11 Crushed Base Gravel .1 Crushed Base Gravel shall be in accordance with Section 31 05 16 – Aggregates: General.

PART 3 – EXECUTION

3.1 Trenchless Culvert Installation

.1 Equipment:

.1 The Contractor shall be solely responsible for selection of trenchless installation capable of handling the culvert size, ground conditions and existing soils. Additionally, the equipment shall provide satisfactory support of the excavated face.

.2 Installation:

.1 Complete all work in accordance with the Environmental Requirements as outlined in Section 01 35 43 – Environmental Protection and the Contractor's accepted EPP.

.2 Use trenchless installation methods that will minimize movement of the ground in front of and surrounding the Steel Pipe Culvert.

.3 Perform trenchless installation so as to avoid interference with the operation of the vehicles travelling the highway.

.4 Excavation diameter should be a minimum size to permit trenchless culvert installation with an allowance for bentonite injection into the annular

space (if necessary for installation, see Item .12 below).

.5 Install gravel pad and/or thrust reaction blocks as required suitable for trenchless installation equipment. Complete excavation as necessary for installation of the pipe lengths while keeping the construction footprint to the minimum extent possible.

.6 Divert stream water, drainage, and discharge from dewatering away from the trenchless installation operations to a location in compliance with the Contractor's accepted EPP.

.7 Install steel pipe culvert to +/- 1.0 m horizontal and +/- 0.5 m vertical of the alignment and vertical gradient shown on the Contract Drawings. 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. Steel pipe culvert installation outside of these tolerances may be considered defective work by the Departmental Representative and subject to the conditions of GC3.11.3

.8 Monitor ground movement (settlement and heave) throughout the trenchless installation operation using survey points installed prior to the work and sampled at regular intervals throughout the work. Halt all operations and take immediate remedial action (including notification to the Departmental Representative) if ground movements greater than +/- 50 mm are detected.

.1 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 installation of the steel pipe culverts can only commence again following approval from the Departmental Representative.

.9 Cushion pipe joints as necessary to transmit the trenchless installation forces without damage to the steel pipe or steel pipe joints.

.10 Prior to welding steel pipe culvert section and install

via pipe jacking, rotate the steel pipe culvert sections to find the best match/alignment between adjacent culvert sections. Install "Alignment Dogs" on the steel pipe culver to align adjacent sections of the steel pipe culvert as necessary.

.11 Fuse Steel Pipe Culvert sections using Complete Penetration Groove welds. Complete all welds, including overhead welds, in accordance with CSA W59 and CSA W48, and provide weld certification in accordance with Item 1.4.3 of this specification section. The Departmental Representative will conduct random visual inspection and/or nondestructive testing of completed welds during trenchless culvert installation. Should any cracks in the welds develop either immediately following the welding or upon further installation of the pipe via pipe jacking, the weld will be considered rejected and require replacement.

.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 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 operation, or joint failure occurs, as evident by inspection, visible ground water inflow or other observations, the Contractor shall submit for approval their methods for repair or replacement of the steel pipe culvert. Any steel pipe culvert damage or misalignment of the steel pipe culvert shall be removed and replaced by the Contractor at no additional costs to PSPC.

.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 installation process, notify the

Departmental Representative immediately. Await further instruction from the Departmental Representative before proceeding.

.17 Install Crushed Base Gravel (see Section 31 23 33 – Excavation and Backfill) around any length of pipe installed using Trenchless Method that upon installation is not completely encircled with native, undisturbed embankment material (e.g. end of steel pipe at jacking pit or steel pipe which has been exposed to remove obstruction).

.18 Remove soil materials from within the steel pipes using appropriate equipment. Temporarily stockpile materials for later re-use as Common Fill or dispose off-site, at the discretion of the Departmental Representative.

.19 Trim ends of steel pipe culverts to the lines shown on the Contract Drawings.

.20 Submit to the Departmental Representative an As-Built Survey of the trenchless culvert installation in accordance with Section 01 33 00 – Submittal Procedures and Section 01 78 00 – Closeout Submittals. The Departmental Representative will review the As-Built Survey to compare the trenchless culvert installation against the requirements of the Contract Drawings and these specifications, specifically the tolerances outlined in Item 3.1.2.7.

.21 Upon review of the As-Built Survey, the Departmental Representative may redesign portions of the work to address variances between the trenchless culvert installation and the Contract Drawings (including but not limited to inlet / outlet location / elevation, extent / alignment of inlet / outlet erosion protection, positioning of concrete reinforcement in the concrete headwalls, positioning of concrete headwalls). The Departmental Representative will respond to the Contractor with required redesign information (if necessary) within two (2) work days of receipt of As-Built Survey. Any increase in construction costs as a result of the Concrete Headwall redesign shall be the responsibility of the Contractor.

3.2 Existing Lined CSP Culvert Improvements

.1 Remove existing beaver grate from culvert inlet and transport to PSPC's Fort Nelson Maintenance Yard, Airport Drive, Fort Nelson, BC. Contractor to provide minimum of three (3)

days' notice to Departmental Representative prior to delivering beaver grate to PSPC's Fort Nelson Maintenance Yard. Ensure beaver grate is protected from damage during removal, transportation and offloading.

.2 Remove existing precast concrete barriers, sandbags, Nonwoven Geotextile, soil pins, and other fittings and dispose at an offsite disposal facility acceptable to the Departmental Representative.

.3 Excavate highway embankment at inlet and outlet of existing 1400 mm diameter CSP culvert and 914 mm diameter steel pipe liner to facilitate trimming of the culvert inlets and outlets. Complete excavations in accordance with Section 31 23 33 – Excavation and Backfill.

.4 Trim existing CSP culvert and steel pipe liner inlets and outlets to the lengths shown on the Contract Drawings, and remove existing grout as required. Dispose of excess lengths of CSP culvert and steel pipe liner and grout at an offsite disposal facility acceptable to the Departmental Representative.

.5 Infill any void space between the existing 1400 mm diameter CSP culvert and 914 mm diameter steel pipe liner as a result of the work with Concrete in accordance with Section 03 30 00 – Cast-in-Place Concrete and to the satisfaction of the Departmental Representative.

.6 Install Crushed Base Gravel (see Section 31 23 33 – Excavation and Backfill) around any length of pipe that upon installation is not completely encircled with native, undisturbed embankment material (e.g. end of existing 1400 mm diameter CSP or 914 mm diameter steel pipe).

3.3 Concrete Headwalls

.1 Prior to commencing Concrete Headwall installations, submit to the Departmental Representative for review and acceptance As-Built Survey of Steel Pipe Culvert trenchless installation, in accordance with Item 1.4.4.

.2 Upon receiving notice to proceed and revised design drawings (if required) from the Departmental Representative, install the Concrete Headwalls around the outside of the existing 1400 mm diameter CSP and 914 mm diameter steel pipe liner and 2800 mm diameter Steel Pipe Culvert in accordance with the Contract Drawings, and Section 03 10 00 – Concrete Form Work, Section 03 20 00 – Concrete Reinforcing, and Section 03 30 00 – Cast-in-Place Concrete of these specification.

	.3	Install Crushed Base Gravel (see Section 31 23 33 – Excavation and Backfill) in areas adjacent to the concrete headwalls requiring fill and where native embankment material has been removed to facilitate construction (e.g. backside of the concrete headwall where existing embankment has been removed to facilitate access to concrete slab and allow for form work installation).
3.4 Fish Baffle and Natural Substrate Installation	.1	Install fish baffles to the locations and spacings shown on the Contract Drawings. Fuse fish baffles to the Steel Pipe Culvert using fillet stitch welds as indicated on the Contract Drawings. Welding of the fish baffles to the Steel Pipe Culvert to be undertaken once the Steel Pipe Culvert has been installed via pipe jacking. Complete welding in accordance with CSA W48 and W59.
	.2	Install Natural Substrate in the bottom of the steel pipe culvert to the depths and locations shown on the Contract Drawings. See Section 31 05 16 – Aggregates – General for further details.
3.5 Channel Realignment and Erosion Protection	.1	Re-establish channel to the alignment, widths, grades, and sideslopes shown on the Contract Drawings. Complete stream realignment in accordance with Section 31 23 33 – Excavation and Backfill.
	.2	Excavate ground to the lines and grades shown on the Contract Drawings to facilitate the installation of the Inlet and Outlet Protection. Ensure excavation will allow for positive drainage upon placement of Riprap. Complete inlet and outlet erosion protection in accordance with Section 31 37 00 - Riprap.
3.6 Clean-up	.1	Clean-up all disturbed areas to an equal or better condition to that prior to construction (refer to Section 01 74 11 – Cleaning for further details).
	.2	Complete Hydraulic Seeding of all disturbed areas (refer to Section 32 93 21 – Hydraulic Seeding for further details).

END OF SECTION

R.109448.002
Appendix A

Written Communication / Document Management Protocol

Alaska Highway Km 140.3 Culvert (East Cache Creek) Drainage Improvements, Alaska Highway, BC Project: Written Communication / Document Management Protocol

Communication for the Alaska Highway Km 140.3 Culvert (East Cache Creek) Drainage Improvements, Alaska Highway, BC Project (R.109448.002) will occur using CentralCollab, email, telephone, and through the delivery of hardcopy documents (if requested by PSPC). CentralCollab 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

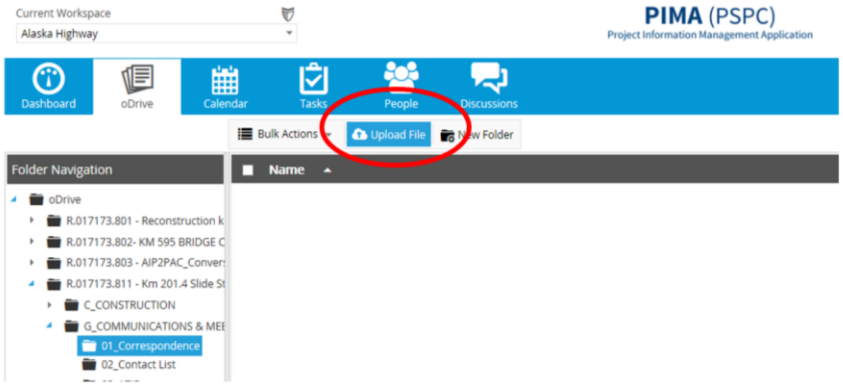
CentralCollab is a web-based collaborative platform that is used to submit and store project documentation. It is the responsibility of the submitting party to upload documents to CentralCollab in the correct folder and with the correct file naming convention.

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.

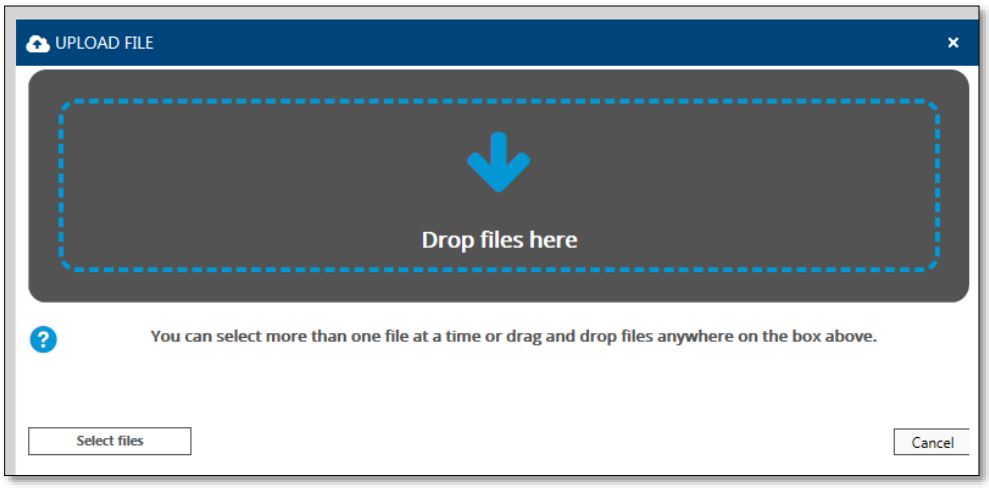
1 Uploading to CentralCollab

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**:

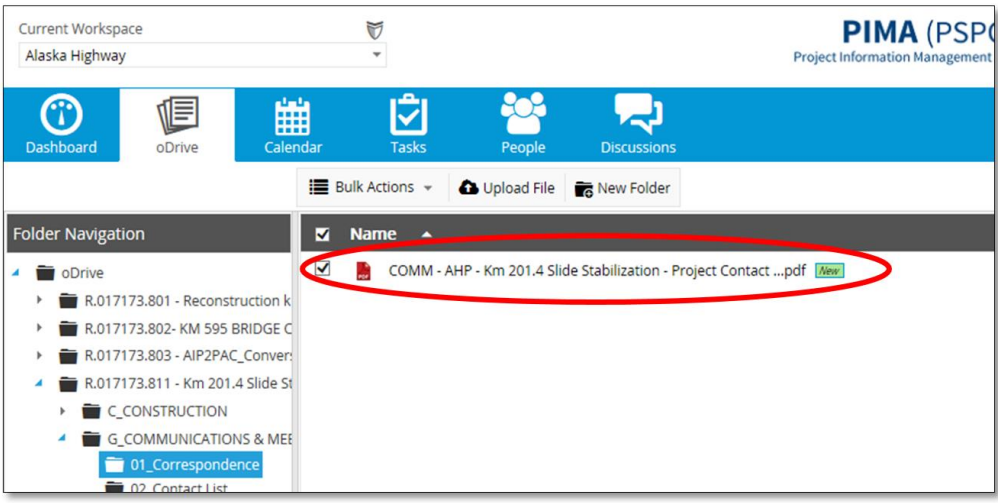


Drag and drop your document(s), then press Save.

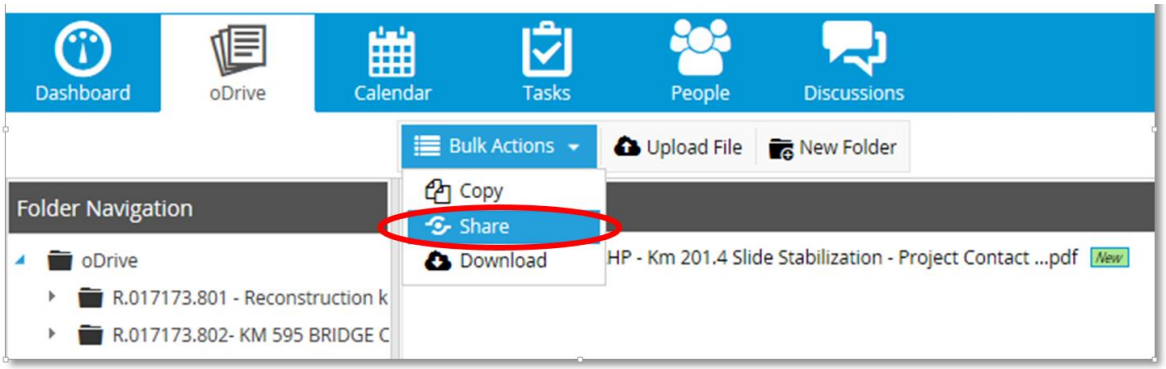
NOTE: Make sure you have named your document correctly, as explained in Section 2.2 CentralCollab File Naming Convention.



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

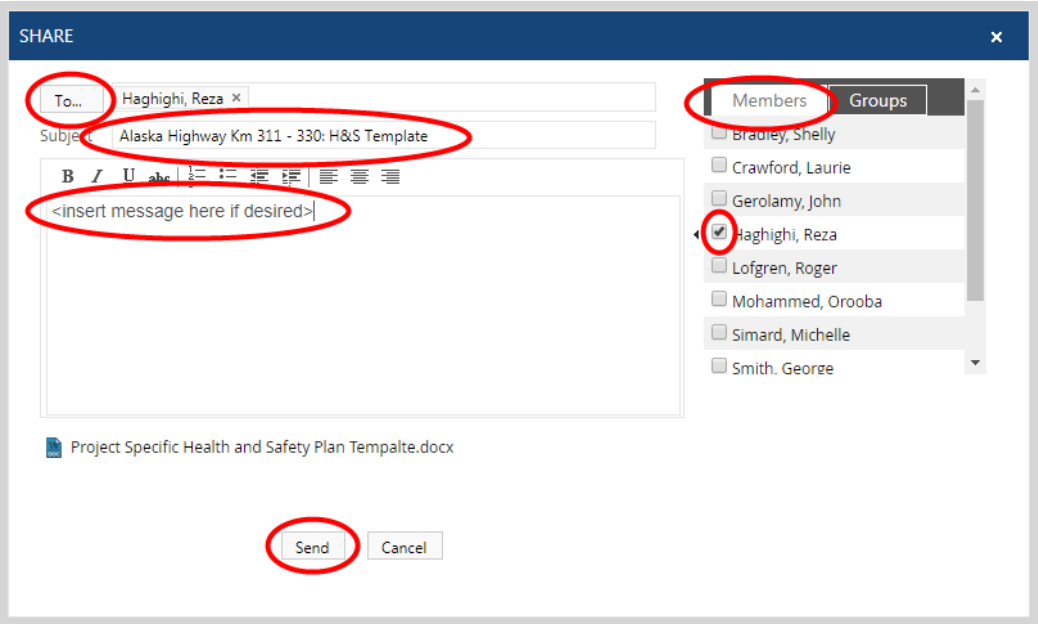


To **notify members** of the new document, check the box next to the document √ then click **Bulk Actions > Share** :

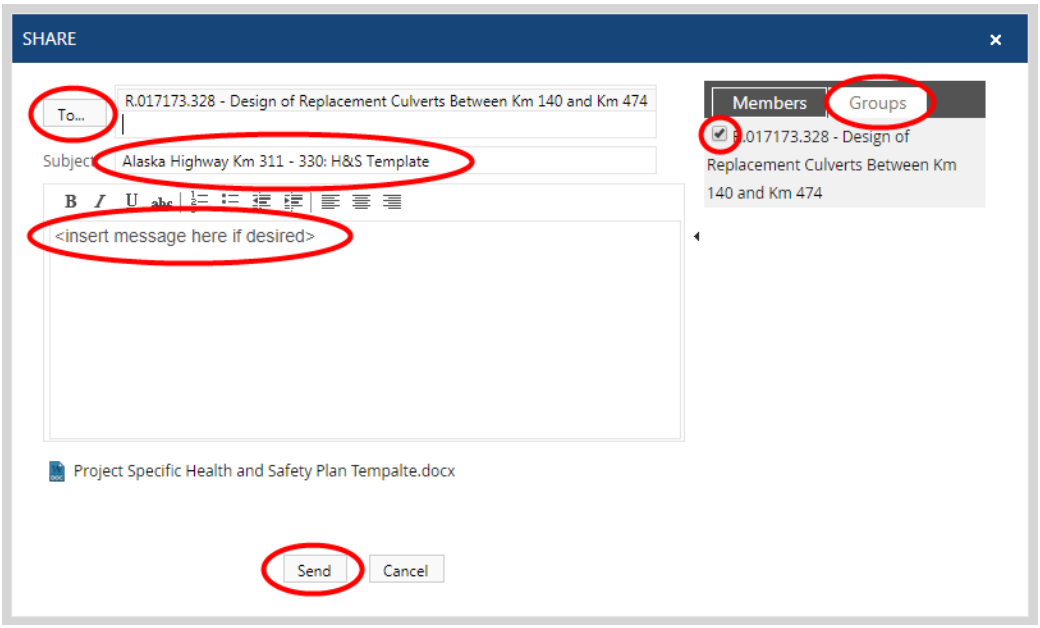


Once the new window opens, select **To,** and then select the **Members** tab and all Members from whom you wish to notify (as directed during the pre-constriction meeting or otherwise by PSPC) or select the **Groups** tab and select the pre-set group:

Example – Notification Members:



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 140.3 Project – File Description or Document Name – YYYY MM DD

Example file names:

- Plan – AHP – Km 140.3 Project – Quality Management Plan – 2020 02 15
- Schedule – AHP – Km 140.3 Project – Project Schedule – 2020 02 20
- Finance – AHP – Km 140.3 Project – Progress Payment 01 – 2020 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.109448.002 – Km 140.3 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
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: • 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

Table 2: Common Document Filing / Folder Locations	
Folder Names	**Description of Typical Documents**
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: • 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 • Quality Management Plan • Check Sheets • Daily Reports • NCR's
CentralCollab folder: R.109448.002 – Km 140.3 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.109448.002 – Km 140.3 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.109448.002
Appendix B

Project Specific Health and Safety Plan Template

<insert company logo/information>

PROJECT SPECIFIC HEALTH AND SAFETY PLAN

<Name of Project>
<PROJECT No.>

<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

Appendix 6: Incident/Accident Report Template

Appendix 7: Key Member Resumes and Safety Certifications

Appendix 8: Local Hospital Maps

Appendix 9: Safe Work Procedures

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 (including confined space entry);*
- *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>*

<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>

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 (including confined space entry). 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.>

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 were 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

<*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 - Operations Manager, Alaska Highway	250.774.6956	250.321.0174	600.700.6263
T.B.D. – 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
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.*>

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:	R.109448.002
Location:	Km 140.3 (East Cache Creek), Alaska Highway, BC
Date:	Winter 2019-2020
Name of Departmental Representative:	Alex Taheri
Name of Client:	PSPC
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
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.	**PSPC, OGD's, or tenants**		**General Public or other contractors**		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.
	Yes	**No**	**Yes**	**No**	

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			

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

Public Services and Procurement Canada | Services publics et Approvisionnement Canada

Confirmation of Prime Contractor's Main Responsibilities Under the WorkSafeBC Occupational Health and Safety Regulations and *Worker's Compensation Act*

Name of Project: Km 140.3 Culvert (East Cache Creek) Drainage Improvements, Alaska Highway, BC

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	☐	☐
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.	☐	☐
3. The Prime Contractor understands that in any conflict of directions, WCB OH&S Regulations and/or the Worker's Compensation Act shall prevail.	☐	☐
4. The Prime Contractor understands and will direct that all supervisors/coordinators must immediately report any apparent conflict as described above.	☐	☐
5. The Prime Contractor agrees that their supervisor shall immediately notify the consulting Engineer's representative of any reported conflict.	☐	☐
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.	☐	☐
7. The Prime Contractor has conducted an inspection of the workplace to verify the presence of any hazards.	☐	☐
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.	☐	☐
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.	☐	☐
10. The Prime Contractor will confirm that all workers are suitably trained and competent to perform the duties for which they have been assigned.	☐	☐
11. The Prime Contractor confirms that safety orientation of all new workers will be conducted.	☐	☐
12. The Prime Contractor's written Safety Program has been provided to the Owner's representative.	☐	☐
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.	☐	☐
14. The Prime Contractor confirms that before the commencement of work, crews will attend a daily crew safety meeting.	☐	☐
15. The Prime Contractor confirms that their supervisor has assessed and will coordinate the workplace first-aid requirements	☐	☐
16. The Prime Contractor confirms that the procedure to transport injured workers is established	☐	☐

Prime Contractor Representative's

Name:_____

Title:_____ Signature:_____

Date:_____

Prime Contractor's OH&S Coordinator

Name:_____

Title:_____ Signature:_____

Date:_____

Canada

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

Appendix 4: Contractor Daily Toolbox Meeting Form

<provided by the Contractor>

Appendix 5: Site Safety Orientation Form

<provided by the Contractor>

Appendix 6: Incident/Accident Report Template

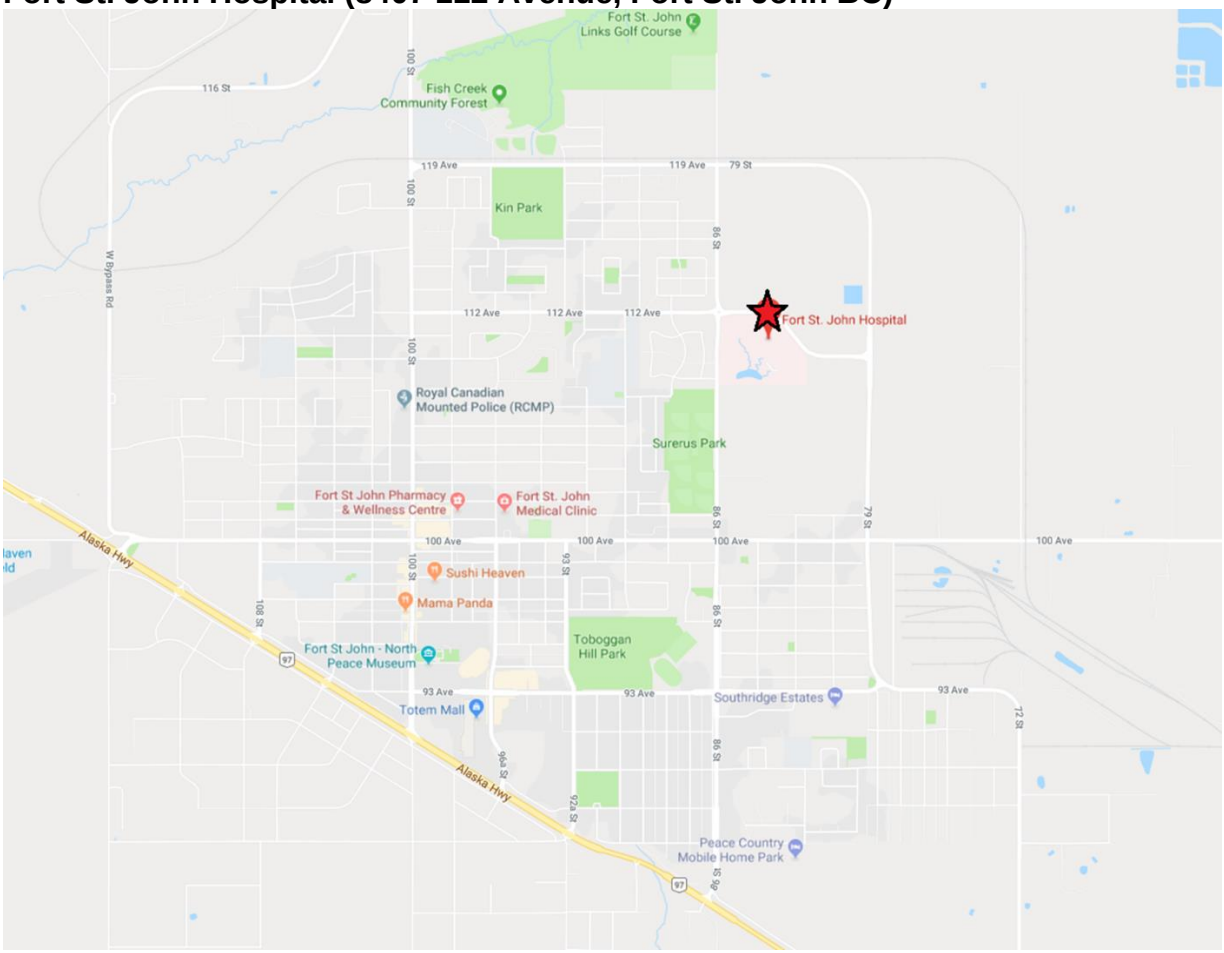
<*provided by the Contractor*>

Appendix 7: Key Member Resumes and Safety Certifications

<*provided by the Contractor*>

Appendix 8: Hospital Maps

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

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

R.109448.002
Appendix C

Category 3
Traffic Management Plan Template

<insert company logo/information>

Category *<2 or 3>*
Traffic Management Plan

<Name of Project>
<PSPC Project No.>

<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.>

Table of Contents

1. Category Definition

Based on the steps outlined in Section 3.2: Project Category Determination in BC MoTI's Traffic Management Manual for Work on Roadways – 2020 Office Edition, the <Project Name> Project calls for at Category <#> Traffic Management Plan.

A Category <#> Traffic Management Plan is characterized by:

-
-
-
-

<Add as many points as deemed required for the project>

A Category <#> Traffic Management Plan consists of:

-
-
-
-

<Add as many points as deemed required for the project>

The aim of the Category <#> Traffic Management Plan is to minimize the site-specific risks that were identified for the project.

2. Traffic Control Plan

See also Appendix A: Traffic Control Plan Drawings in this Traffic Management Plan for the proposed layouts of the traffic control devices for the project. A list of the drawings is provided in Section 2.4 Drawing List.

Plan Date	*<Date when plan was initiated.>*
Latest Revision	*<Date of latest revision.>*
Site Name	*<Name of project.>*
Plan Developed By	*<Name of person who developed the plan.>*
Exact location, direction, and distance to nearest landmarks	*<Highway number and name of location, etc.>*
Project Supervisor	*<Name of Project Supervisor.>*
Prime Contractor	*<Name of Prime Contractor.>*
Traffic Control Manager	*<Name of Traffic Control Manager (if applicable).>*
Traffic Engineer	*<Name of Traffic Engineer (if applicable).>*
Traffic Control Supervisor	*<Name of Traffic Control Supervisor and company.>*
Traffic Control Persons	*<Names of TCPs and company.>*
Project Start Date	*<Date>*
Project Completion Date	*<Date>*

2.1 Traffic Control Provisions

Traffic Control Supervisor	<*Name of Traffic Control Supervisor and company.*>
Traffic Control Persons	<*Name of TCPs and company.*> Automated Flagger Assistance Devices will not be used on the project.
Off-Hours Traffic Control	<*Types of traffic control devices.*>
Illumination	Traffic Control Persons (TCPs) will be used during non-daylight hours (before sunrise after sunset). Details of the overhead lighting to be used at each TCP location are included in <*Report Section/Appendix*>. Details shown 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.
Means of Communication	<*How will TCPs communicate?*>
Signage	<*Are signs installed for short-duration or long-duration work?*> <*Are the signs spaced in accordance with posted speed?*> <*Are details provided for the procedures, processes, and sequencing used to determine the layout of the signs in the field and the order of installation and order of removal of the signs in the field? Refer to Section 6: Traffic Control Layouts – General Instructions of the BC Ministry of Transportation Traffic Management Manual for Work on Roadways – 2020 Office Edition for further details. At a minimum the text and figures included in Item 6.7.4 – Two-Lane, Two-Way Roadways shall be included within the Contractor's Traffic Management Plan for reference during the work (in main body of the plan or in Appendices of the plan with reference to applicable Appendix in main body of the plan). The Contractor shall customize the details of the steps for the project as required.*> <*Are graphical representation of the sign supports planned for use on the project shown; including Post Mounted Supports found in Figure 01 35 00 – 01 and or the Wind Resistant Sign Stand found in Figure 01 35 00 – 02 (both shown below)?*> All sign supports shall either be a post mounted support per the requirements of Figure 01 or Wind Resistance Sign Stand per the requirements of Figure 02.

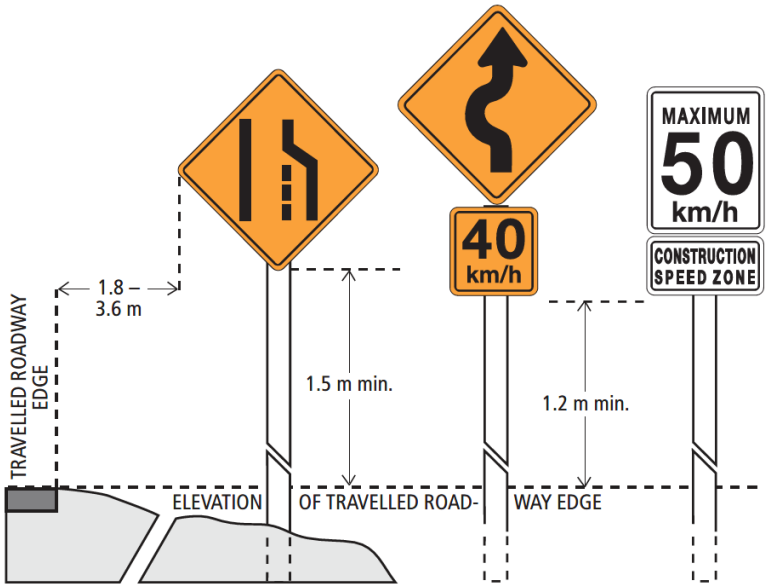


Figure 01: Post Mounted Supports

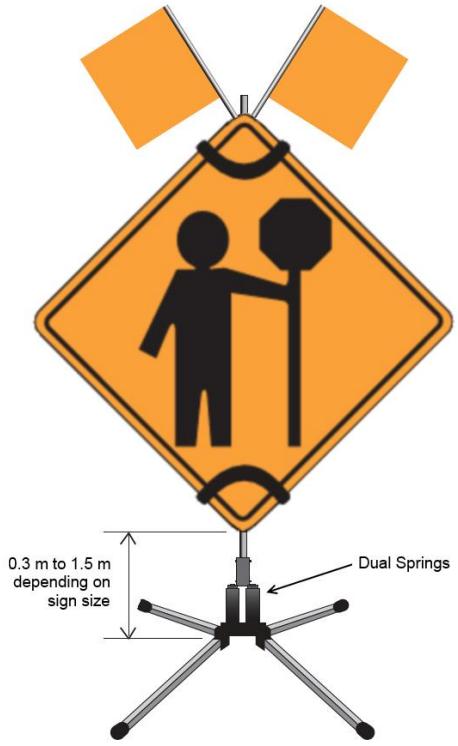


Figure 02: Wind Resistant Sign Stand

Flags will 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). Unless pre-approved by the Departmental Representative, one or more sand bags or weights will be in used at all times to further stabilize all Wind Resistance Sign Stands. Where an option for a sign size is available, the sign size used will 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. Signs will be positioned so that they do not block the sight lines of drivers entering a roadway from side roads or other access points.
Portable Dynamic Message Signs (DMS)	*<Are DMS required? Where will they be located?>* Two (2) portable dynamic message signs (DMS) will be used for the duration of the work. The DMS will have a minimum of 3 lines with 8 characters per line (minimum 450 mm character size) A portable dynamic message sign (DMS) will be used in the location identified in 7.2 Typical Construction Speed Zone Signing – Two-Lane, Two-way Roadway (Item 3.2 – Traffic Management, subsection .1.5.3 of the contract specification). A list of DMS messages which will be displayed on the DMS throughout the project is shown in Appendix D. Messages that will be used on the DMS are 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.
PSPC Permanent Variable Message Signs	PSPC will assist <*Name of 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. <*Name of Contractor*> will inform PSPC a minimum 7 days in advance of any scheduled work to be posted. 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 has been included in the Traffic Management Plan and will be undertaken / implemented <*Name of Contractor*> prior to commencing work.
Intersections affected by work zone or traffic control devices	*<Are intersections affected by the work zone or traffic control devices?>* *<If so, how will the intersections be controlled?>*

	<*Will additional traffic control devices be required?*>
Flexible Drums	<*Will flexible drums be used to delineate lane drops?*> <*Will they be used to identify construction accesses to the work activity area?*> 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 will be used.
Traffic Stoppages	<*Are there any anticipated traffic stoppages?*> <*If so, for how long?*> <*Will there be single lane alternating traffic?*>
Layout of Devices	<*Identify spacing between traffic control devices.*>
Emergency Vehicles	<*Will emergency vehicles have clear, unobstructed access to the site.*> <*What procedures will be in place to ensure that emergency vehicles are able to access the site without delay?*>
Pilot Cars	Pilot cars will not be used on this project un pre-approved by the Departmental Representative.
Drop-offs	Drop-off's are defined as an abrupt change in elevation created by construction activity such as milling, paving, or excavation that is steeper than 3H:1V. Drop-off's will 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, drop-offs ≥ 150 mm between 1.5 m and 3.0 m of the travel lane will be signed with Low Shoulder (C-013) signs at least once every 1 kilometer for as long as the condition persists.

2.2 Work Activity Specific Risk Assessment and Traffic Plan

<A separate table and traffic control plan drawing (Table in Section 2.4 and drawings in Appendix A) is required for each unique element of work. Example elements of work are to include but are not limited to unloading of equipment, paving, line painting, rumble strip installation, excavation on highway, excavation off highway, culvert installation, etc. The Contractor is to add additional tables as necessary.>

Work Activity	*<Type of work: stationary, slow-moving, emergency, brief, short-duration, or long-duration work?>*
Station / Location	
Traffic Control Drawing	Appendix A – Drawing *<Drawing number of associated traffic control set-up>*
Identified Risks	*<What potential risks associated with the work have been identified?>*
Work On/Off Roadway	*<Is the work on or off the roadway?>*
Site Access/Egress	*<How will equipment access and exit from the site?>*
Intersections affected by work zone or traffic control devices	
Delays, Closures, Diversions, and Detours	*<Will delays, closures, diversions, and/or detours be in place?>* *<If so, illustrate in Appendix B: Detour Traffic Control Plan Drawing.>* *<What is the design speed for the detour?>* *<Can it withstand the traffic that will be using the road?>* *<For what duration will these be in place?>*
Hours of Work	*<The hours during which the work will occur.>* *<The time period during which the work will affect traffic.>*
Dump Site	*<Location of dump site and access/exit requirements.>*
Construction Equipment	*<How will construction equipment be protected during working hours? During off-hours?>*

2.3 Drawing List

Below is a table summarizing the of drawing(s) showing the applicable traffic accommodation strategies which will be used during specific elements of the work.

<Include a table or list of each element of work on the project and the applicable traffic accommodation strategies and layout drawing(s) which will be used during that element of work throughout all project locations. The table or list of each element of work on the project shall also include the applicable traffic accommodation strategies and layout drawing(s) to be used during non-work hours.>

Traffic Control Drawing(s)	Corresponding Tender Drawing(s)	Project Location(s)	Construction Element(s)
<Drawing No.>	*<Drawing No.>*	*<Station Range, ex.283+360 to 308+905>*	*<ex. Equipment loading / unloading within the clearzone, Loading trucks, Material delivery / hauling, Culvert Installation outside the clearzone, etc.>*

3. Incident Management Plan

The Incident Management Plan defines processes for responding to unplanned events or traffic incidents in the work zone so that incident response operations within the work site are managed effectively.

The Incident Management Plan requirements are partially determined by the project category (see Section 3.2: Traffic Management Plan Sub-Plans and Section 3.4: Traffic Management Plan Requirements by Category in the **Traffic Management Manual for Work on Roadways).**

Traffic Control Supervisor and Qualifications	*<Name and qualifications.>*
Traffic Control Manager and Qualifications	*<Name and qualifications.>*
Emergency Response Agencies and Contact Information	*<Name and contact information (may be listed in Section 6: Contact List).>*
Types of traffic incident that could occur within work zone	*<Motor vehicle incident, motor vehicle incident with injuries, vehicle stalls, emergency vehicle transit of work zone, dangerous goods incident, wide load passing, etc.>*
Procedures for responding to traffic incident that occurs within work zone	*<Will there be a radio announcement?>* *<Who will evaluate the incident?>* *<Who will call 911?>* *<Will traffic be stopped, or will there be single lane alternating traffic?>* *<Who will assist the emergency responders through the site, and how?>* *<Who will assist if it is necessary to clear vehicles, and how?>*
Procedures to restore traffic flow around incident site as quickly as possible	*<How will traffic movement be restored?>* *<Will traffic control devices be used?>* *<If so, how?>*
Procedures to clear incident and restore normal project traffic	*<How will the incident be cleared to restore traffic movement?>* *<How many TCPs are required?>*

operations as soon as possible	
Procedure to inform and update PSPC regarding incident in work zone	*<What is the procedure for advising the PSPC that an incident occurred, what response measures are being taken, what clearance measures are required, and what the estimated clearance time will be?>*
Procedure to inform travelling public of estimated duration of delay and alternative routes (if applicable)	*<Will DMS be used to display information?>*
Incident Reporting	*<Who will provide details to the PSPC?>* *<What is the process for incident follow-up?>*
Investigation Process	*<Who will lead the incident investigation?>* *<What investigation process will be used to assess the incident and those involved?>*
Review and Continuous Improvement Process	*<How incidents will be reviewed and followed up to reduce the severity and frequency of future incidents?>*

4. Public Information Plan

The Public Information Plan identifies actions and procedures for informing the travelling public, project stakeholders, and the PSPC of current traffic operations and planned changes to traffic operations.

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: Traffic Management Plan Sub-Plans and Section 3.4: Traffic Management Plan Requirements by Category in 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.

Process for routinely notifying PSPC of changes to scheduled work plans	<*Who will be responsible for the changes?*> <*What is the person's title?*>
Process for notifying travelling public of scheduled traffic delays and project duration	<*Identify the forms of communication to be used [radio, project signs, Permanent Dynamic Message Signs), Portable Dynamic Message Signs, public meetings, etc.].*>
Process for notifying travelling public of unscheduled traffic delays	<*Identify the forms of communication to be used [project signs, Permanent Dynamic Message Signs, Portable Dynamic Message Signs, public meetings, etc.].*>
Major user groups for alternating lane closures or road closures	<*Identify the major user groups (BC Trucking Association, BC Transit, emergency response agencies, school districts, etc.).*

5. Implementation Plan

The Implementation Plan identifies responsibilities and procedures for ensuring that traffic management sub-plans are developed and implemented in a coordinated manner.

It identifies the qualifications, responsibilities, and duties of supervisory and management personnel responsible for implementing the Traffic Management Plan and includes the designation of a Traffic Control Manager and a Traffic Control Supervisor.

See also Section 3.2: Traffic Management Plan Sub-Plans and Section 3.4: Traffic Management Plan Requirements by Category in the Traffic Management Manual for Work on Roadways.

Traffic Control Manager and Responsibilities	*<Name, qualifications, responsibilities, and duties.>*
Traffic Control Supervisor and Responsibilities	*<Name, qualifications, responsibilities, and duties.>*
Person who will manage emergency traffic control operations	*<Name and title.>*
Person who will maintain daily traffic control logs	*<Name and title.>*
Person who will manage Incident Management Plan	*<Name and title.>*
Person who will manage Public Information Plan	*<Name and title.>*
Person who will monitor inactive work site	*<Name, title, and responsibilities.>*

6. Contact List

6.1 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	

Provincial Emergency Program **24 hr** (Ground Search & Rescue)	**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	

6.2 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 #>

6.3 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 #>

Appendix A: Traffic Control Plan Drawings

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.>

Appendix B: Detour Traffic Control Plan Drawings

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

Daily Sign Check Form

Project Name and Number	**Project Location**
Type of Work	**Highway Location**

Date yyyy/mm/dd	Time of Inspection	Location and Deficiency Type	Comments	Initials

Date yyyy/mm/dd	Time of Inspection	Location and Deficiency Type	Comments	Initials

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

Onsite Construction Start-up Form

Public Services and Procurement Canada | Services publics et Approvisionnement Canada

On-site Construction Start-up Form

Project Name:	Km 140.3 Culvert (East Cache Creek) Drainage Improvements, Alaska Highway, BC
Project Number:	R.109448.002
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	☐		
Health & Safety Plan	☐		
Traffic Management Plan	☐		
Environmental Protection Plan	☐		
Project Construction Schedule	☐		
Quality Management Plan	☐		
Construction Staging Plan	☐		
Construction Equipment List	☐		
Other:	☐		
Other:	☐		

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: _____

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Appendix E

Progress Payment Request Form

Progress Payment Submittal Form

Project Name:	Km 140.3 Culvert (East Cache Creek) Drainage Improvements, Alaska Highway, BC
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	☐	
Statutory Declaration	☐	
WorkSafeBC Clearance Letter	☐	
Project Schedule (with baseline tasks and updates showing completion dates and % complete)	☐	
Other:	☐	
Other:	☐	

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				
Project Description	A brief description of the project and its location is provided.			
Environmental Sensitivities	Sensitive or protected features that could be impacted as a result of the Contractor's activities are described.			
Site Activities	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				
Project Schedule	A project schedule is provided, including scheduled shut-downs and restricted work periods due to environmental requirements.			
Site Drawing	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				
Potential Environmental Issues and Impacts	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).			
Permits, Approvals, and Authorizations	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.			
Mitigation Strategies	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".			
Erosion and Sediment	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 (E.g. 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: • 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 (i.e.. 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	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). 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			

[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 FrontCounterBC at MoE who then send off to the appropriate departments for approval/notification/permitting – this does not apply to the archeological.**				
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.			

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*	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.			
BC Parks	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).			
Canada-British Columbia Agreement for Environmental Assessment Cooperation http://www.ceaa.gc.ca/default.asp?lang=En&n=04A20DBC-1	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.			
BC Ministry of Environment – BC Species and Ecosystems Explorer http://a100.gov.bc.ca/pub/eswp/	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.			
Consultant Responsibility				
Provincial				
BC Parks ***Ministry of Forests, Lands, Natural Resource Operations, and Rural Development*** http://www.env.gov.bc.ca/bcparks/permits/	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.			
Water Act – Regulation's Protection of Habitat - Section 42(1)	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			

	salvage – in conjunction with the BC Parks permitting.			
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". **http://www.env.gov.bc.ca/pasb/applications/process/scientific_fish_collect.html#a5**				
Contractor Responsibility				
Federal				
DFO – End of Pipe Guidelines	End-of- pipe guidelines for freshwater intake to avoid fish entrainment.			
Provincial				
Water Act - MoE	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	***Land Development Guidelines for the Protection of Aquatic Habitat - 1993***	This document is a good reference guide for any works that are occurring in or around the water.
	Canada's Fish Habitat Law	Document explaining the fish and fish habitat laws under the Fisheries Act.
	Riparian Revegetation	Information on minimizing, stabilizing and revegetating construction areas.
	Freshwater Intake End-of Pipe Fish Screen Guideline - 1995	Provides guidelines for the contractor to follow to ensure fish screens are used during freshwater intake operations at construction sites.
	Operational Statements Stream Crossings by Roads: • 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 *Fisheries Act*. 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	***Fish-stream Crossing Guidebook - 2002***	Guidelines in protection of fish and fish habitat and the safe passage of fish during construction at/on stream crossings.
	Standards and Best Practices for Instream Works - 2004	Guide to planning and carrying out the proposed construction activities to comply with relevant legislation, regulations and policies.
	A User's Guide to Working In and Around Water - 2005	Understanding the regulation under British Columbia's Water Act.
	Fish-Stream Identification Guidebook - 1998	Assists in providing information on determining fish streams.
	The Streamkeepers Handbook	A practical guide to stream and wetland care in regards to rehabilitation planting.

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Appendix I

Canadian Welding Bureau Group (CWB) Form 107 Engineer's Report

cwbgroup

COMPANY CODE

CWB FORM 107E/2018-1

STANDARD

ENGINEER'S REPORT

REPORT FOR THE PERIOD	
FROM	TO
MONTH / YEAR	MONTH / YEAR

Company Name: _____

Address: _____

In the space below please list the dates when visits were made to the company's design office, shop and/or field sites.

Design Office: _____

Shop: _____

Field Sites: _____

1 Check each welding process currently in use in the shop. ☐ **SMAW** ☐ **FCAW** ☐ **MCAW** ☐ **GMAW** ☐ **SAW** ☐ **GTAW** ☐ **Other** _____

2 Check each welding process currently in use for field operators. ☐ **SMAW** ☐ **FCAW** ☐ **MCAW** ☐ **GMAW** ☐ **SAW** ☐ **GTAW** ☐ **Other** _____

3 Does the company have CWB approved welding procedure specifications and data sheets covering all types of work currently performed? (CWB approval N/A for W55.3. WPS and WPDS approved through internal procedures qualification test.) ☐ **YES** ☐ **NO**

4 Was the work in progress performed in accordance with CWB approved welding procedure specifications and data sheets? (For W55.3: As above, work performed in accordance with internally approved WPS and WPDS.) ☐ **YES** ☐ **NO**

5 If the answer to question 3 and/or 4 is "NO" specify reasons and what action has been taken.

6 Is the storage of electrodes in accordance with CSA Standards? ☐ **YES** ☐ **NO**

7 Is the level of workmanship in conformance with CSA Standards? ☐ **YES** ☐ **NO**

8 Are all welders currently employed qualified by CWB to the pertinent certification standard for the work they are doing? (N/A for W55.3) ☐ **YES** ☐ **NO**

9 Have all welding supervisors currently directing the company's welding operations completed the qualifying examinations of the pertinent certification standard? ☐ **YES** ☐ **NO**

10 Are all welding supervisors sufficiently familiar with the company's CWB approved welding procedures and CSA Standards to apply their requirements to the company's welding operations? ☐ **YES** ☐ **NO**

11 Are copies of the company's welding procedures available in the shop and at all field locations to those personnel who require them? ☐ **YES** ☐ **NO**

12 Are all consumables currently being used certified by the CWB? ☐ **YES** ☐ **NO**

13 Do the drawings used for fabrication and/or erection contain sufficient notes, weld details and welding symbols conforming to the applicable design standards needed to produce the desired weld? ☐ **YES** ☐ **NO**

14 Has the latest CWB audit been reviewed with the company? ☐ **YES** ☐ **NO**

15 For companies certified to CSA W47.2, is an OCP (Operation Control Procedure) developed and implemented? ☐ **YES** ☐ **NO**

16 This report has been reviewed with _____ of the subject company.

COMMENTS (Additional space on Page 2)

It is my opinion that, on the basis of information made available to me (and subject to the conditions set out below) the requirements of pertinent standards with respect to welding design and practice ☐ Have been met ☐ Have not been met

In submitting this report it is understood that my verification of the above conditions is based on periodic inspections only.

DATE: _____ _____

(MM / DD / YYYY) **Engineer's Signature**

A COPY OF THIS REPORT MUST BE MADE AVAILABLE TO THE CWB GROUP'S REPRESENTATIVE

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Appendix J

Environmental Change Approval Permitting under Section 11 of the Water Sustainability Act (April 15, 2020)

File: 9000493

April 15, 2020

Public Service and Procurement Canada
800 Burrard Street
Vancouver BC V6Z 0B9

Dear Laurie Crawford

Re: Change Approval Application – 9000493

Approval for the above work has been granted and the approval document verifying this is attached. The approval is valid until March 31, 2021.

Please note that an Environmental Protection Plan (EPP) must be provided 15 days prior to the commencement of instream work

The permit holder is required to adhere to all other applicable provincial, federal and/or municipal legislation and regulations; including, but not limited to, the *Water Sustainability Act* and the *Water Sustainability Regulation*. It is also expected that all work will be consistent with the Standards and Best Practices for Instream Works.

The *Water Sustainability Act* gives the recipient of this notice the right to appeal my decision. You may file an appeal within 30 days of the date indicated on this letter. Information on filing an appeal can be found on the Environmental Appeal Board website at http://www.eab.gov.bc.ca/.

If you have any questions or concerns regarding the document issued, please contact Lenore Mallis at 250-787-3307.

Yours truly,

Brian Farwell
Assistant Water Manager

Enc. Approval 9000493

Ministry of Forests, Lands, Natural Resource Operations and Rural Development
Water Stewardship
Mailing Address:
100-10003-110th Ave
Fort St John BC V1J 6M7
Telephone: (250) 787-3415
Facsimile: (250) 261-2084

Province of British Columbia
Water Sustainability Act

Change Approval
Section 11 (1)

Public Service and Procurement Canada 800 Burrard Street Vancouver BC V6Z 0B9 is hereby authorized to make changes in and about a stream as follows:

1) The stream on which the rights are granted is East Cache Creek.

2) The location of the approved works is KM 140.3 (56.6294480, -121.5424240) culvert on the Alaska Highway.

3) Authorized works are described in the document titled *Km 140.3 Culvert (East Cache Creek) Drainage Improvements Alaska Highway, BC Environmental Overview Assessment* prepared by Tetra Tech Canada Inc. dated November 22, 2019.

4) The following document shall be provided to the Assistant Water Manager, 15 days prior to the commencement of instream work:
   - Environmental Protection Plan (EPP)

5) The holder of this Approval must comply with all other applicable Provincial and Federal Legislation prior to commencement of work.

6) The instream works authorized shall be completed by March 31, 2021.

7) All reasonable efforts shall be made to avoid any negative impacts to the stream's ecosystem including the riparian area.

8) All instream works in fish-bearing streams must be completed in the dry.

9) Measures shall 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, can enter the wetted perimeter as a result of project activities.

10) Equipment operating near the stream shall be free of external grease, oil or fluid leaks and an emergency spill response kit shall be kept on-site. Refueling of machinery shall be conducted 30m from all water bodies to ensure that deleterious substances do not enter the watercourse.

11) The changes shall be completed to the satisfaction of the Assistant Water Manager under the *Water Sustainability Act.*

12) This Approval does not authorize entry onto private land. It is the responsibility of the holder of this Approval to obtain appropriate landowner permissions / agreements prior to the works occurring.

13) All instream works will be completed under the supervision of an appropriately qualified environmental monitor.

14) A fish and amphibian salvage within areas of site isolation, authorized under separate permit issued under the *Wildlife Act*, shall be conducted prior to the start of works.

15) All work shall be done in accordance with the "Standards and Best Practices for Instream Works" (MWLAP 2004).

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

17) Care shall be exercised during all phases of construction to minimize siltation.

18) Ambient water quality guidelines for turbidity must be met prior to discharge of water back into any stream.

19) All disturbed areas of the banks and the stream channel must be restored and provided with long-term protection from erosion. All excavated material and debris shall be placed in a stable area above the high water mark of the stream and protected from erosion by planting grass and/or vegetation.

20) The Assistant Water Manager must be notified if the work plan changes significantly from those outlined in the documents identified in clause (2). The changes shall be completed to the satisfaction of the Assistant Water Manager under the *Water Sustainability Act*.

21) This Approval, or a copy of it, must be kept or posted on the work site so that it may be shown to a Ministry official upon request.

Brian Farwell
Assistant Water Manager

Date Issued: April 15, 2020 **Approval/File No. 9000493**