Public Services and Procurement Canada

Requisition No: EZ899-220494/A

DRAWINGS & SPECIFICATIONS

For:
Fort Nelson Salt Shed Replacement, Km 445, Alaska Highway

Project No. R.113313.001 May 2021

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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

Public Works and Government Services Canada – Acquisition Forms
Available online at:
http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/formulaires-forms-eng.html

Canadian Construction Association, COVID-19 – Standardized Protocols for All Canadian Construction Sites, Version 5, May 26, 2020
Available online at:
https://www.cca-acc.com/wp-content/uploads/2020/06/CCA-COVID-19-Standardized-Protocols-for-All-Canadian-Construction-Sites-05-26-20.pdf

WorkSafeBC Construction and COVID-19 Safety
Available online at:
https://www.worksafebc.com/en/about-us/covid-19-updates/covid-19-industry-information/construction

LIST OF CONTRACT DRAWINGS

Sheet No.	Title	Drawing Number	Revision Number
1	Cover Page	C000	0
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3	General Arrangement Plan and Control Monuments	C101	0
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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 to Division 31) and an item found in one of the Appendices (Reference Documents), the main body of the Specifications (Division 1 to Division 31) 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 the design and construction of a salt shed located at Km 445 in 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 Quality Management.

.4 The salt pile inside the existing salt shed will be removed by others. Contractor to coordination with Departmental Representative and highway maintenance personnel to support highway maintenance requirements.

.5 Demolition and disposal of the existing 'coverall' fabric salt shed located on the footprint of the proposed building

.6 Engagement of professional engineer(s) to complete the design of a new salt shed achieving the requirements detailed in the contract performance specifications and contract drawings.

.7 Supply and installation of the concreate foundation designed for the salt shed building loading.

.8 Supply and installation of the salt shed building

.9 Removal and reinstatement of lock blocks to permit construction, with procurement of new lock blocks as required

.10 Protection of the existing geomembrane liner and associated works, or reinstatement of the same if damaged, modified, removed, or otherwise required.

.11 Excavation, transport, and placement of backfill materials.

.12 Surveys (construction layout, as-build survey, and others as required).

.13 Environmental protection.

.14 Grading of the site as per drawings.

.15 Coordinate with BC Hydro for the power connection and commission of the facility.

.16 Work complete by Change Order (if required and approved by Departmental Representative).

1.3 Codes

.1 Meet or exceed requirements of:

.1 Contract Documents;

.2 Specified standards, applicable legislation, codes, and referenced documents; and,

.3 Other codes of Local, Provincial, or Federal application (in the case of conflict or discrepancy, the more stringent requirements shall apply).

PART 2 – PRODUCTS

2.1 Owner Supplied Materials (Outside Limits of Work)

.1 PSPC is providing access to the "as is" materials previously manufactured and stockpiled in the Km 445 Fort Nelson Gravel Pit for use by the Contractor (should the contractor choose) on this project. The following materials are available:

.1 Pit Run Gravel – Material is provided "as-is" and has not been screened or manufactured to achieve this project's Granular Backfill (Pit Run) gradation requirements.

.2 If the Contractor chooses to source material that is not from a PSPC quarry, the Contractor shall advise PSPC in a written submission and shall not use proposed source until accepted by the Departmental Representative.

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.

.2 There is no scheduled site visit. However, it is recommended that bidders make inquiries or investigations necessary to become thoroughly acquainted with the site, as well as the nature and extent 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 October 1, 2021.

.3 Achieve Completion by October 15, 2021.

.4 The Contractor shall account for possible impacts of COVID-19 in the construction schedule and the unit prices. The Contractor shall keep informed with the latest Federal and Provincial recommendations and protocols regarding COVID-19 at all times during construction and shall modify their construction approach accordingly to ensure adherence to these recommendations and protocols.

.5 If Federal and/or Provincial recommendations require that the project work be stopped, the Contractor shall consult with the Departmental Representative and the Departmental Representative will advise as to the course of action the Contractor shall take. Any monetary impact to the Contractor from the work being stopped due to Federal and/or Provincial recommendations will be addressed in accordance with the contract general conditions.

3.3 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 Any additional areas required by the Contractor outside the lands owned by the Departmental Representative and designated for use on this project, shall be the Contractor's responsibility to organize. Any costs associated with the use of these additional lands shall be the Contractor's responsibility.

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

3.4 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 locate 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 Existing structures, utilities, 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.

3.5 Survey

.1 The Contractor shall be responsible for all layout surveys to complete the work per the design lines and grades, 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 Unless specified otherwise in the Contract Specifications, all layout surveys and quantity surveys shall be considered incidental to the work and will not be 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 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.

.5 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.

.6 Establish / layout the proposed alignment(s) and grades using paint lines and survey stakes based on working control points and survey control monuments provided.

.7 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.

.8 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.

.9 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.

.10 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.

.11 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.

.12 The provision of the records of a survey of existing conditions by the Departmental Representative shall in no way limit or restrict the Contractors responsibility to exercise proper care to prevent damage to all property within or adjacent to the Work Site, whether all such property is covered by the survey or not.

3.6 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" hard copy contract drawing sets. Preparation and plotting of the hard copy drawing sets may take up to 14 days to prepare (excluding shipping).

.2 Upon award of the project, PSPC will provide the successful Contractor with a digital PDF version of the "Issued for Construction" or "Issued for Tender" Contract Drawings. Preparation of the PDF drawing file may take up to 14 days to prepare.

3.7 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 hard copy Contract Drawings be discovered (at any time during the work), the hard copy Contract Drawings shall govern. The Contractor will be responsible for all costs associated with any corrections to ensure the work is in conformance with the hard copy Contract Drawings. The Departmental Representative shall not be responsible for updating or correcting any discrepancies between the electronic Contract Drawings and the hard copy Contract Drawings identified by the Contractor.

3.8 Contract Submittals

.1 Complete and submit for the Departmental Representative's review, all required contract submittals as detailed in the relevant sections of the contract specifications. Work affected by the submittals shall not proceed until the submittal is accepted by the Departmental Representative. Allow for submittal review periods as required for each submittal and as detailed in Section 01 33 00 – Submittal Procedures. Required submittals include, but are not limited to the following:

.1 Project Schedule (see Section 01 32 16).

.2 Cash Flow Forecasting (see Section 01 31 00).

.3 Project Specific Health and Safety Plan (see Section 01 35 33) including:

.1 Preliminary Hazard Assessment Form (Appendix 1 of Project Specific Health and Safety Plan template, see Appendix B).

.2 Confirmation of Prime Contractor's Main Responsibilities Under the WorkSafeBC Occupational Health and Safety Regulations and Worker's Compensation Act form (Appendix 2 of Project Specific Health and Safety Plan template, see Appendix B).

.3 Contractor's COVID-19 Safe Work Plan

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

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

.6 Hazardous Materials Management Plan (see Section 02 61 33).

.7 Pre-Construction Survey (see Section 01 29 00).

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

.9 Shop Drawings (including professional seal for design work required), Product Data, / Samples, and Mix designs.

.10 Construction Staging Drawings (see Section 01 14 00).

.11 Progress Payment Submittal Form (see Appendix D).

.12 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.

.2 The above personnel shall perform the following duties:

.1 Project Superintendent: shall be employed full time and shall be present on the Work Site each and every workday that Work is being performed, from the commencement of work to Substantial Performance and Completion of the Work.

.2 Deputy Project Superintendent: shall have the authority of the Project Superintendent during the latter's absence for short periods of time.

.3 Health and Safety Coordinator: shall possess safety experience in general construction. Duties shall encompass all matters of safety activities from commencement of work until Substantial Performance and Completion of the Work (see Section 01 35 33 – Health and Safety for further requirements).

.4 Quality Control Manager: shall be independent from the Contractor, experienced in Quality Management, dedicated to quality matters from commencement of work until Substantial Performance and Completion of the Work, and remain onsite at all times the Contractor is performing work which must be tested or inspected in-process (see Section 01 45 00 – Quality Management for further requirements).

3.10 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 other works within Fort Nelson Maintenance Yard concurrent with this contract may limit the available laydown area available to the Contractor.

3.11 Contractor's Personnel	.1	Upon request of 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 the 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 work 24 hours per day, seven days per week with the following restrictions.

.1 Work in excess of 12 hrs per day shall require pre-approval from the Departmental Representative. At a minimum, pre-approval shall require a plan from the Contractor to ensure all necessary QC work per the contract requirements is completed during all times of work. The Departmental Representative may withdraw approval for the extended work hours at any time should the Contractor fail to achieve all necessary QC requirements or any other contractual requirement as a result of the extended work hours.

.2 Request for approval to work in excess of 12 hrs per day must be submitted in writing to the Departmental Representative a minimum of five (5) days in advance of the planned change in working hours.

.3 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 adjacent to or within the project limits.

.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 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 may be abandoned in place and a new utility cable placed on the native ground surface outside the limits of the work, or the utility may be lowered or relocated at the time of construction by Other Contractors. The Contractor shall cooperate and coordinate as required with Other Contractors engaged in Utility relocation operations on the Work Site.

.4 The Contractor shall notify the Departmental Representative and the Utility companies at least seven (7) Days in advance of any activities which may interfere with the operation of such Utilities.

.5 Whenever working in the vicinity of Utilities, the Contractor shall locate such Utilities and expose those that may be affected by the Work, using hand labour as required.

.6 The Contractor shall assess the possible impact of its operation on all utilities and shall protect, divert, temporarily support, or relocate, or otherwise appropriately treat such Utilities to ensure that they are preserved.

.7 The Contractor shall immediately report any damage to Utilities to the Departmental Representative and to the Utility company or authority affected and shall promptly undertake such remedial measures as are necessary at no additional cost to the Owner.

1.4 Protection of Persons and Property

.1 The Contractor shall comply with all applicable safety regulations of WorksafeBC including, but not limited to the, Workers Compensation Act, Occupational Health and Safety Regulations, Industrial First Aid Regulations, and Workplace Hazardous Materials Information System Regulations (see Section 01 35 33 – Health and Safety for additional requirements).

.2 The Contractor shall take all necessary precautions and measures to prevent injury or damage to persons and property on or near the Work Site.

.3 The Contractor shall promptly take such measures as are required to repair, replace, or compensate for any loss or damage caused by the Contractor to any property.

1.5 Use of Public Areas

.1 Off-road construction equipment (including equipment which exceeds legal highway load limits or dimensions) will not be allowed on the Alaska Highway. Steel tracked equipment with cleats will not be allowed on BST or asphalt outside the limits of the work or BST designated for future use.

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

Contractor for the project. The traveled lanes of the Alaska Highway shall remain a Public Highway subject to the rules and laws of Public Highways in the Province of British Columbia. The Contractor is responsible for ensuring all equipment accessing the Highway meets all requirements for vehicles traveling on Public Highways in the Province.

1.6 Construction Signage

.1 No Signs or advertisements, other than regulatory or warning signs, PSPC supplied signage, and portable electrically illuminated message signs are permitted on site.

.2 Signs and notices for Safety and instruction shall be provided by the Contractor.

.3 Maintain approved signs and notices in good condition for duration of Project and dispose of off-site on completion of Project or earlier as directed by the Departmental Representative.

.4 Signage shall be coordinated with other Contractors working in the area as needed.

1.7 Access Development

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

1.8 Construction Start-up

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

1.9 Construction Staging

.1 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 the Section 01 35 43 – Environmental Protection and the Contractor's Environmental Protection Plan are achieved.

.3 The work is completed in accordance with the dates for Substantial Performance and Completion provided in Section 01 11 10 – Summary of Work.

.4 Proceed with Optional Work items only after receiving direction by the Departmental Representative via a written Change Order.

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

1.10 Restoration

.1 Remove access points, roads, detours, laydown areas, pads, and all other works installed during access development and construction staging. Re-instate the worksite to a condition equal to or better than the site condition prior to construction by:

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

.2 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 Hand seed all disturbed areas per Section 31 23 33.01 Excavation, Trenching and Backfilling.

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, Construction Staging Plans, 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.

.6 Work and costs incurred in the completion of clean-up and project completion.

.7 All other work and costs incurred in the successful completion of mobilization and demobilization.

1.2 Measurement and Payment Procedures

.1 Payment for Mobilization and Demobilization will be made on the basis of the Price per Unit Bid for Mobilization and Demobilization in the Bid and Acceptance Form. The Price per Unit Bid shall include all costs associated with the items of work listed in 1.1 Definitions above.

.2 Measurement for Payment for completion of Mobilization and Demobilization will be made at the Lump Sum price and will be scheduled as follows:

.1 50% of the Lump Sum bid price to a maximum of 5% of the Total Tender price at the beginning of construction after the Contractor's required submittals (including Construction Schedule, Traffic Management Plan, Quality Management Plan, Environmental Protection Plan, Construction Staging Drawings, Project Specific Health and Safety Plan, and any other submittals noted in the specifications as being required

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

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

END OF SECTION

SECTION INCLUDES:

PART 1 – GENERAL:

1.1 Terms of Payment.

1.2 Basis of Payment.

1.3 Survey.

1.4 Measurement and Payment Details.

PART 1 – GENERAL

1.1 Terms of Payment

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

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

.1 Documentation required by General Conditions (GC) 5 – Terms of Payment including signed statutory declaration.

.2 Progress Payment Submittal Form (see Appendix D) 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).

1.2 Basis of Payment

.1 Basis of payment shall be per the Measurement and Payment Procedures in the applicable specification section. Where not specified, basis of payment for all work included in these specifications or Contract Drawings not specifically mentioned is considered incidental to other work and is part of the Total Contract Amount. No additional payment will be made for incidental work.

.2 Payment for work shall be made per the Price per Unit as shown in the Unit Price Table.

.3 For unit price items in the Bid and Acceptance Form, progress payments shall be made based on the quantities of work in place (prior to excavation or following placement and compaction), compacted (if required) surveyed, and accepted by the Departmental Representative in the field.

.4 For lump sum items in the Bid and Acceptance Form, progress payments shall be made based on the percent of work completed and accepted by the Departmental Representative at the time of the monthly progress payment (Excluding Mobilization and Demobilization which is paid per Item 1.2 – Measurement and Payment Procedures of Section 01 25 20).

.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 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 items of work) to reconcile the total quantities of items of work to date on the project. Adjustments to quantities on future progress payments may then be made per GC5.2 – Amount Payable.

1.3 Survey

.1 Surveys shall be undertaken by the Contractor to verify quantities for payment purposes, or in the case of lump sum items to verify that work has been completed to the design requirements. Survey shall be considered incidental to the work and not measured for payment.

.2 All quantity surveys, quantity calculations, and surveys to verify the work is completed to the design requirements for the purposes of verifying progress payment quantities (cu.m, sq.m, or L.S.) shall be completed to the design requirements 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 location of surveyed cross sections is subject to prior approval of the Departmental Representative. At a minimum the Contractor shall survey all features at 20 m station intervals (may be reduced to 10 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, infrastructure and other topographic features 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 pre-approved 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.

1.4 Measurement and Payment Details

.1 Payment for Salt Shed will be made on the basis of the Price per Unit Bid in the Bid and Acceptance Form. The Price per Unit Bid shall include all costs for supply, placement, and all other items necessary for successful completion of the work.

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

1.1 Pre-Construction Meeting.

1.2 On-Site Documents.

1.3 Schedules.

1.4 Cash Flow Forecasting.

1.5 Construction Progress Meetings.

1.6 Written Communication / Document Management.

1.7 Submittals.

1.8 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 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, 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 List of proposed suppliers and sub-contractor(s) and Design Engineer(s)

.16 Other business as required by the Departmental Representative or Contractor.

.5 Within fourteen (14) days of the pre-construction meeting, the Departmental Representative shall distribute meeting minutes to the Contractor. The Contractor shall review the meeting minutes and provide any comments within 5 working days.

1.2 On-Site Documents

.1 Maintain at job site, one copy each of the following:

.1 Contract Drawings.

.2 Specifications.

.3 Addenda.

.4 Reviewed and accepted submittals.

.5 Change orders.

.6 Other modifications to Contract.

.7 Field test reports.

.8 Copy of approved work schedule.

.9 Manufacturer's installation and application instructions (if applicable).

.10 All permits.

.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. Project schedule shall include proposed hours of work per day and number of working days per week.

.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 Cash Flow Forecasting

.1 Provide detailed cash flow forecasting derived from the project schedule and the agreed upon project payment schedule (project unit prices). The cash flow forecast shall be broken out by line item to coincide with the project schedule. Submit cash flow forecast to the Departmental Representative within fifteen

days after award of Contract but in all cases prior to starting onsite work.

.2 Update project cash flow forecasting on a monthly basis or for each submission of a progress payment reflecting changes to the schedule until project completion. Submit updated forecast to the Departmental Representative.

1.5 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 and major subcontractors shall attend in person. Other contractor representatives including the Deputy Project Superintendent, Health and Safety Coordinator, Quality Control Manager, Surveyor, and Environmental Monitor shall attend in person or via teleconference.

.3 The Departmental Representative shall establish a time, location, and teleconference number for the meeting and notify the Contractor a minimum of three days prior to the meeting. The Contractor shall notify all concerned parties of the meeting.

.4 The meetings may be held on site provided teleconference capabilities are available or at PSPC's office in Fort Nelson. If held on site, the Contractor shall provide physical space and make arrangements for the meetings.

.5 Agenda to include the following:

.1 Review and approval of minutes of previous meeting.

.2 Health and Safety Incidents and Concerns.

.3 Review of work progress since previous meeting.

.4 Field observations, problems, conflicts.

.5 Problems which impede construction schedule.

.6 Review of off-site fabrication delivery schedules (if applicable).

.7 Corrective measures and procedures to regain projected schedule.

.8 Revision to construction schedule and project submittals.

.9 Progress schedule, during succeeding work period.

.10 Review submittal schedules: expedite as required.

.11 Cash flow forecasting including monthly updates.

.12 Maintenance of quality standards.

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

.14 Other business.

.6 Within seven (7) days of the construction progress meeting, the Departmental Representative shall distribute meeting minutes to the Contractor. The Contractor shall review the meeting minutes and provide any comments within five (5) working days.

1.6 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.

1.7 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".

1.8 Close-Out Procedures .1 Close-out procedures as per 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 Construction Staging Plan.

.5 Quality Management Plan.

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

.7 Hazardous Materials Management Plan.

.8 Shop Drawings and Product Samples (if applicable)

.9 All structural design drawings and calculations.

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

.11 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 workday of each week.

.4 Format for listings: the chronological order of start of each item of work.

.5 Include complete sequence of construction activities and identify critical path and critical path work items in identifying colour.

.6 Include dates for commencement and completion of each major element of construction.

1.3 Submission of Schedules

.1 Submit initial format of schedules within fifteen (15) days after award of Contract, but in all cases prior to starting onsite work.

.2 Submit schedules in electronic format via PSPC's cloud-based document filing system "CentralCollab" (login details to be provided by Departmental Representative at time of submission following contract award). Provide schedules as a single PDF file format document (multiple files will not be accepted) and native file format (ex. Microsoft Projects format)

if requested by the Departmental Representative.

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

.4 The Departmental Representative will review the schedule and return any comments within ten days after receipt.

.5 Resubmit finalized schedule within seven (7) days after return of review copy. Once accepted by the Departmental Representative, the accepted schedule shall form a baseline which all schedule updates shall be compared against.

.6 Distribute copies of revised schedule to:

.1 The Contractor's team including Project Superintendent, Deputy Project Superintendent, and others as required.

.2 Subcontractors.

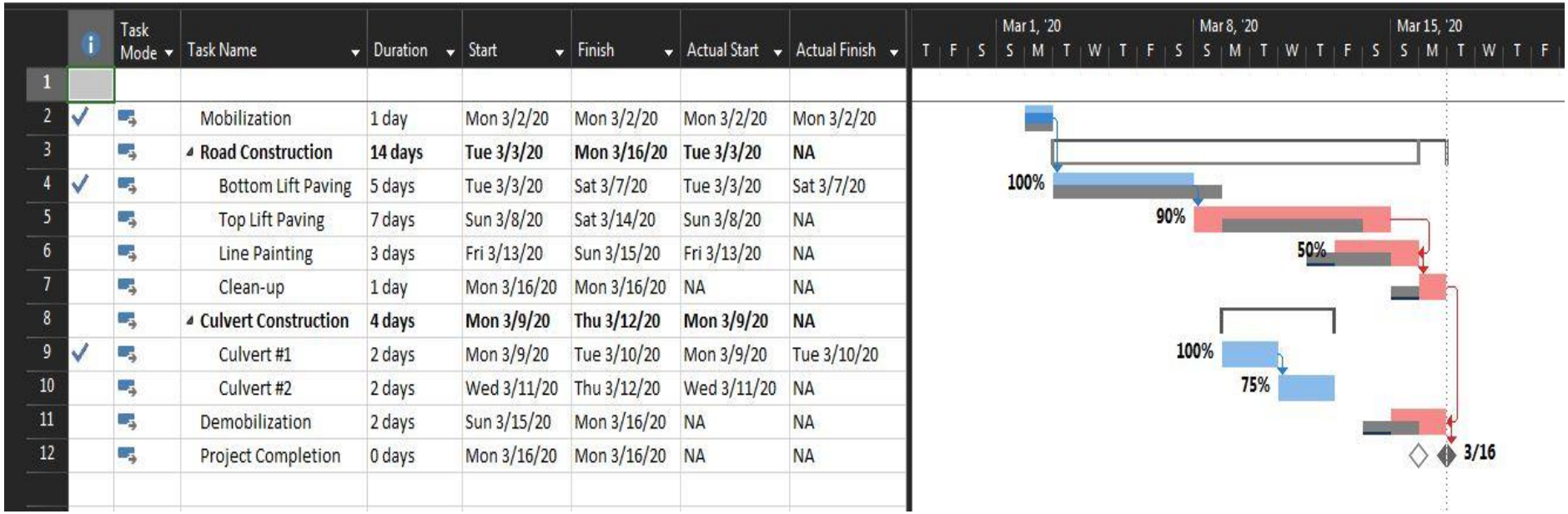
.3 Other concerned parties.

.7 Instruct recipients to report to Contractor within seven (7) days any problems anticipated by timetable shown in the schedule.

1.4 Project Schedule Reporting During the Work

.1 Update project schedule on a monthly basis or with each progress payment (whichever is more frequent) reflecting activity changes and completions, as well as activities in progress.

.2 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: Example in 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

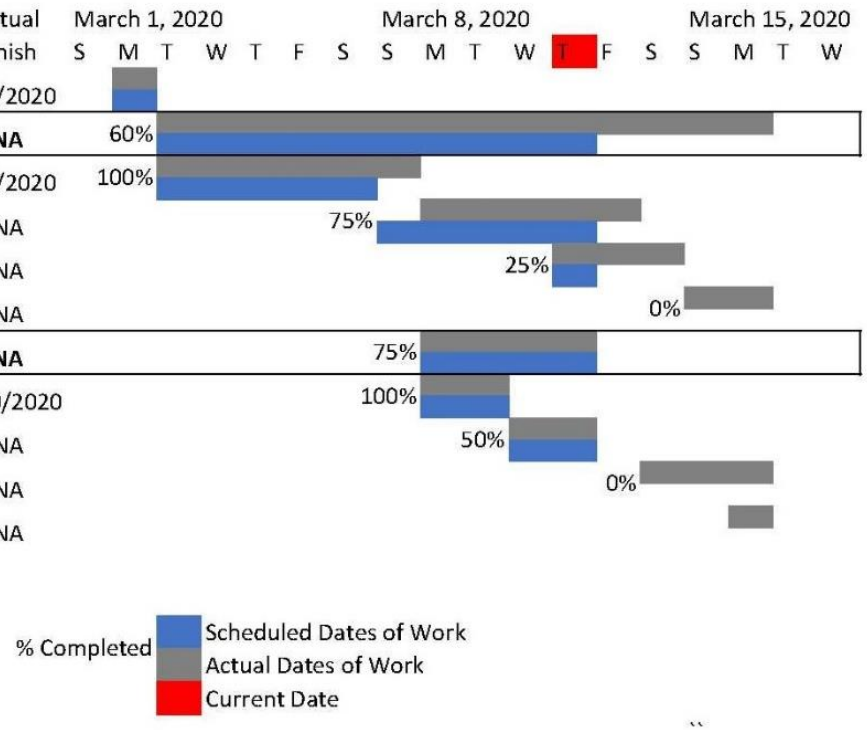


Figure 01 32 16 – 02: Example in Microsoft Excel

.3 Show changes occurring since previous submission of schedule:

.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 week (or within a time preapproved by the Departmental Representative). The submittals will not be accepted until all comments from all reviews have been addressed to the satisfaction of the Departmental Representative. Despite acceptance of a particular submittal, the Departmental Representative reserves the right to provide additional comments to ensure the

correction of any deficiencies with particular submittals at any time during the project.

.4 Work affected by a submittal shall not proceed until the submittal is completed, reviewed, and accepted by the Departmental Representative.

.5 Present all necessary drawings, Shop Drawings, product data, samples, and mock-ups in SI Metric units.

.6 Where items or information is not produced in SI Metric units, converted values are acceptable.

.7 Review submittals prior to submission to the Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with the requirements of work and Contract Documents. Submittals not stamped, signed, dated, and identified as to a specific project will be returned without being examined and shall be considered rejected.

.8 Notify the Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents and stating reasons for deviations.

.9 Prior to any submission, verify field measurements and affected adjacent work included on the submission are coordinated.

.10 Contractor's responsibility for errors and omissions in submission is not relieved by the Departmental Representative's review of submittals.

.11 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.

.12 Keep one reviewed copy of each submission on site.

.13 Comments made from review of submittals are intended to ensure conformance with contract requirements and not intended to change contract price. If the Contractor feels the comments include requirements not required by the contract, the Contractor shall respond in writing to the Departmental Representative prior to undertaking the work.

1.2 Shop Drawings and Product Data

.1 The term "Shop Drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures, and other data that are to be provided by the Contractor to illustrate details of a portion of work.

.2 Indicate materials, methods of construction, and attachment or anchorage, erection diagrams, connections, explanatory notes, and other information necessary for completion of work or as indicated elsewhere in the specifications. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of the section under which adjacent items will be supplied and installed. Indicate cross-references to design drawings and specifications.

.3 Adjustments made on Shop Drawings by the Departmental Representative are not intended to change the Contract Price. Should the Contractor feel that the adjustments affect the value of work and are outside the contract requirements, the Contractor shall state such in writing to the Departmental Representative prior to proceeding with the work.

.4 Make changes in Shop Drawings as the Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify the Departmental Representative in writing of any revisions other than those requested.

.5 Accompany submissions with a transmittal letter, in duplicate, containing:

.1 Date.

.2 Project title and number.

.3 Contractor's name and address.

.4 Identification and quantity of each Shop Drawing, product data, and sample.

.5 Other pertinent data.

.6 Submissions shall include:

.1 Date and revision dates.

.2 Project title and number.

.3 Name and address of:

.1 Subcontractor.

.2 Supplier.

.3 Manufacturer.

.4 Contractor's stamp, signed by the Contractor's authorized representative certifying approval of submissions, verification of field measurements, and compliance with Contract Documents and requirements.

.5 Details of appropriate portions of work as applicable:

.1 Fabrication.

.2 Layout, showing dimensions, including identified field dimensions, and clearances.

.3 Setting or erection details.

.4 Capacities.

.5 Performance characteristics.

.6 Standards.

.7 Operating weight.

.8 Single line and schematic diagrams.

.9 Relationship to adjacent work.

.6 Professional seal and signature of the engineer certifying approval of the work (if required).

.7 After the Departmental Representative's review and acceptance, distribute copies.

.8 Submit an electronic copy of the Shop Drawing for each requested within the specification sections. Submit hard copies as requested by the Departmental Representative.

.9 Submit electronic copies of product data sheets or brochures for requirements requested in specification sections and as requested by the Departmental Representative where Shop Drawings will not be prepared due to standardized manufacture of product.

.10 Delete information not applicable to project.

.11 Supplement standard information to provide details applicable to the project.

.12 If upon review by the Departmental Representative no errors or omissions are discovered or if only minor corrections are made, copies will be returned, and fabrication and installation of work may proceed. If Shop Drawings are rejected, noted copy will be returned. Resubmission of corrected Shop Drawings, through the same procedure as indicated above, must be performed before fabrication and installation of work may proceed.

.13 The review of Shop Drawings by the Departmental Representative is for the sole purpose of ascertaining conformance with general concept. This review shall not mean the Departmental Representative approves the detail design inherent in Shop Drawings. Responsibility for detail design of Shop Drawings shall remain with the Contractor, and as such, reviews by the Departmental Representative shall not relieve the Contractor of responsibility for errors or omissions in Shop Drawings, or of responsibility for meeting all requirements of construction and Contract Documents. Without restricting generality of the foregoing, the Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation, and for coordination of work of all sub-trades.

.14 Work affected by Shop Drawing shall not proceed until the Shop Drawing is reviewed and accepted by the Departmental Representative.

1.3 Samples

.1 Submit for review samples in duplicate, as requested in respective specification sections. Label samples with origin and intended use.

.2 Deliver samples prepaid to Departmental Representative's site office or to a location as directed by the Departmental Representative.

.3 Notify Departmental Representative in writing, at time of submission, of deviations in samples from requirements of Contract Documents.

.4 Where colour, pattern or texture is criterion, submit full range of samples.

.5 Adjustments made on samples by Departmental Representative are not intended to change Contract Price. If adjustments affect value of work, state such in writing to Departmental Representative prior to proceeding with work.

.6 Make changes in samples which Departmental Representative may require, consistent with Contract Documents.

.7 Reviewed and accepted samples will become standard of workmanship and material against which installed work will be verified.

.8 Work affected by the sample shall not proceed until the sample is reviewed and accepted by the Departmental Representative.

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

1.1 Measurement and Payment.

1.2 References.

1.3 Workers' Compensation Coverage.

1.4 Compliance with Regulations.

1.5 Definitions.

1.6 Submittals.

1.7 Project Specific Health and Safety Plan.

1.8 Contractor's Responsibility.

1.9 Health and Safety Coordinator.

1.10 General.

1.11 Project / Site Conditions.

1.12 Regulatory Requirements.

1.13 Work Permits.

1.14 Filing of Notice.

1.15 Emergency Procedures.

1.16 Hazardous Products.

1.17 Electrical Safety Requirements.

1.18 Electrical Lockout.

1.19 Overloading.

1.20 Hot Work and Fire Safety Requirements.

1.21 Unforeseen Hazards.

1.22 Posted Documents.

1.23 Correction of Non-Compliance.

1.24 Medical.

1.25 Accidents and Accident Reports.

1.26 COVID-19.

PART 1 – GENERAL

1.1 Measurement and Payment Procedures

.1 Payment for Health and Safety will not be made and shall be considered incidental to the applicable payment item of work.

1.2 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

1.3 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.

1.4 Compliance with Regulations

.1 PSPC may terminate the Contract without liability to PSPC where the Contractor, in the opinion of PSPC, does not comply with a requirement of the Workers' Compensation Act or the Occupational Health and Safety Regulations.

.2 It is the Contractor's responsibility to ensure that all workers are qualified, competent, and certified to perform the work as required by the Workers' Compensation Act or the Occupational Health and Safety Regulations.

1.5 Definitions

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

.2 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".

1.6 Submittals

.1 The Contractor's Project Specific Health and Safety Plan shall be submitted to the Departmental Representative as a single PDF document (multiple files will not be accepted) for review and acceptance in accordance with the procedures outlined in Section 01 33 00 – Submittal Procedures. The Departmental Representative will review the plan (first submission and if required all subsequent re-submissions) within 14 days of submission. Upon review of the plan the Departmental Representative will do one of the following:

.1 Accept the plan.

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

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

.2 Submit the following to the Departmental Representative in accordance with the procedures outlined in Section 01 33 00 – Submittal Procedures:

.1 Copies of reports or directions issued by Federal and Provincial health and safety inspectors.

.2 Copies of incident and accident reports.

.3 Complete set of Material Safety Data Sheets (MSDS), and all other documentation required by Workplace Hazardous Materials Information System (WHMIS) requirements.

.4 Emergency Procedures.

.5 Medical surveillance: Where prescribed by legislation, regulation, or safety program, submit certification of medical surveillance for site personnel prior to commencement of work, and submit additional certifications for any new site personnel to Departmental Representative.

.6 If requested, complete versions of the Contractor's corporate Health and Safety Policies / Procedures manual.

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

.4 Work affected by the submittal (as determined by the Departmental Representative) shall not proceed until acceptance of the submittal by the Departmental Representative.

.5 Submission of the Project Specific Health and Safety Plan, and any revised version, to the Departmental Representative are for information and reference purposes only. It shall not:

.1 Be construed to imply approval by the Departmental Representative.

.2 Be interpreted as a warranty of being complete, accurate and legislatively compliant.

.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.

1.7 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 A (provided to the Contractor as a Word file upon award of contract). The Contractor shall add additional headings and content to the Project Specific Health and Safety Plan as deemed necessary. PSPC has the right to reject the Project Specific Health and Safety Plan if the headings from this document are not used in the Contractor's Project Specific Health and Safety Plan. Minimum requirements for the Project Specific Health and Safety Plan includes:

.1 Contractor's safety policy / statement.

.2 Identification of applicable compliance obligations.

.3 Identify personnel and alternates responsible for project site safety and health. List of health and safety responsibilities for all personnel listed.

.4 General safety rules for project and actions which will be taken by the Contractor should these safety rules be broken by the any workers on the project (includes workers employed by the General Contractor, sub-contractor, or sub-consultants).

.5 Identify health and safety risks / hazards and engineering and administrative control measures to be implemented at each "workplace" for managing identified risks / hazards, including:

.1 Summary of health risks and safety hazards resulting from hazard assessment analysis, with respect to site tasks and operations which must be performed as part of the work and hazard rating assignment (low, moderate, or high) for

each "workplace", as defined by WorkSafeBC and applicable to the application of G3.16 of WorkSafeBC Occupational Health and Safety Regulations.

.2 List hazardous materials to be brought on site as required by the work.

.3 Job-specific safe work procedures that are not already included in the Contractor's corporate Health and Safety Polices / Procedures manual.

.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 (ie. 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 Sub-Contractors. Ensure that work / activities of Sub-Contractors are included in the hazard assessment and are reflected in the plan.

.4 Should health and safety requirements change throughout the project and require information not included in the Project Specific Health and Safety Plan, revise and update Project Specific Health and Safety Plan as required and re-submit to the Departmental Representative.

.5 Departmental Representative's review: the review of the Project Specific Health and Safety Plan by Public Services and Procurement Canada (PSPC) shall not relieve the Contractor of responsibility for errors or omissions in final Project Specific Health and Safety Plan or of responsibility for meeting all requirements of construction and Contract Documents.

.6 Contractor's COVID-19 Safe Work plan, describing the protocols and procedures the Contractor shall implement throughout the duration of the work to mitigate the spread and risk of exposure to COVID-19, in accordance with Federal and Provincial COVID-19 guidelines, WorkSafeBC and Canadian Construction Association.

.7 Should Federal and/or Provincial guidelines change during the project, the Contractor shall update the Project Specific Health and Safety Plan and the Contractor's COVID-19 Safe Work Plan accordingly and submit to the Departmental Representative for review and acceptance.

1.8 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.

1.9 Health and Safety Coordinator

.1 Employ and assign to work, a competent and authorized representative as Health and Safety Coordinator. The Health and Safety Coordinator shall:

.1 Be responsible for completing all health and safety training, site orientations, and ensuring personnel who do not successfully complete the required training are not permitted to enter the site to perform work.

.2 Be responsible for implementing, enforcing, and monitoring the Project Specific Health and Safety Plan.

.3 Be on site during execution of critical elements of the work or as required by the Contractor.

.4 Have a minimum of two (2) years site-related working experience specific to activities associated with Construction.

.5 Have working knowledge of occupational safety and health regulations.

.6 Attend pre-construction and construction progress meetings as required, or as requested by the Departmental Representative.

1.10 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 nighttime 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 Design, construct and maintain scaffolding in a rigid, secure, and safe manner, in accordance with CSA Z797-2009 (as amended) and BC Occupational Health and Safety Regulations (as amended).

.6 Carry out work in confined spaces in accordance with current Provincial regulations.

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

1.11 Project / Site Conditions

.1 Work at the site will, at a minimum, involve contact with:

.1 Utilities / energized electrical services.

.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.

1.12 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.

1.13 Work Permits

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

1.14 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.

1.15 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.

1.16 Hazardous Products

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS 2015) regarding use, handling, storage, and disposal of hazardous materials, and regarding labeling and provision of Material Safety Data Sheets (MSDS) acceptable to the Departmental Representative and in accordance with the Canadian Labour Code.

.2 Where use of hazardous and toxic products cannot be avoided:

.1 Advise Departmental Representative beforehand of the product(s) intended for use. If requested, submit applicable MSDS and WHMIS 2015 documents as per Section 01 33 00 – Submittal Procedures. Keep documents available for review on the project site as close as practical to where the hazardous and toxic product is being used.

.2 Provide adequate means of ventilation acceptable to the Departmental Representative and suitable for the hazard.

.3 The Contractor shall ensure that the product is applied as per manufacturers' recommendations and ensure only pre-approved products are brought onto the work site in an adequate quantity to complete the work.

.3 All asbestos-containing materials are prohibited from use and shall not be incorporated into the work by the Contractor.

.4 All explosive materials [if required on project] shall be stored, handled, and used as per Natural Resources Canada Explosives Act.

1.17 Electrical Safety Requirements

.1 Comply with authorities and ensure that, when installing new facilities, all electrical personnel are completely familiar with existing and new electrical circuits and equipment and their operation.

.1 Before undertaking any work, coordinate arc flash protection, required energizing and de-energizing of new and existing circuits with the Departmental Representative.

.2 Maintain electrical safety procedures and take necessary precautions to ensure safety of all personnel working under this Contract, as well as safety of other personnel on site.

1.18 Electrical Lockout

.1 Develop, implement, and enforce use of established procedures to provide electrical lockout and to ensure the health and safety of workers for every event where work must be done on any electrical circuit or facility.

.2 Prepare the lockout procedures in writing, listing step-by-step processes to be followed by workers, including how to prepare and issue the request / authorization form. The Contractor shall have electrical lockout procedures

available for review upon request by the Departmental Representative.

.3 Keep the documents and lockout tags at the site and list in a logbook for the full duration of the Contract. Upon request, make such data available for viewing by Departmental Representative or by any authorized safety representative.

1.19 Overloading

.1 Ensure no part of the work is subject to a load which will endanger its safety or will cause permanent deformation.

1.20 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.

1.21 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.

1.22 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.

1.23 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".

1.24 Medical

.1 Provide and maintain first aid facilities for all workers as required by the Workers' Compensation Act or the Occupational Health and Safety Regulations.

.2 Provide the appropriate first aid kit, based on the number of workers, in accordance with the Workers' Compensation Act or the Occupational Health and Safety Regulations.

.3 Establish an emergency response plan acceptable to Departmental Representative, for the removal of any injured person to medical facilities or a doctor's care in accordance with applicable legislative and regulatory requirements.

.4 Provide proof of First Aid credentials to Departmental Representative prior to the start of construction. Provide the appropriate number of first aid attendants on site in accordance with Workers' Compensation Act or the Occupational Health and Safety Regulations.

.5 Emergency and First Aid Equipment:

.1 Locate and maintain emergency and first aid equipment in appropriate location on site including first aid kit to accommodate number of site personnel; portable emergency eye wash; fire protection equipment as required by legislation.

.2 Locate sufficient blankets and towels, stretcher, and one handheld emergency siren in all confined access locations.

.3 Provide a minimum of one qualified first aid attendant as per Workers' Compensation Act or the Occupational Health and Safety Regulations on site at all times when Work activities are in progress; duties of first aid attendant may be shared with other light duty Work related activities.

1.25 Accidents and Accident Reports

.1 Immediately report, verbally, followed by a written report within 24 hours, to Departmental Representative, all accidents of any sort arising out of or in connection with the performance of the Work, giving full details and statements of witnesses. If death or serious injuries or damages are caused, report the accident promptly to Departmental Representative by telephone in addition to any report required under Federal and Provincial laws and regulations.

.2 If a claim is made by anyone against Contractor or Sub-Contractor on account of any accident, promptly report the facts in writing to Departmental Representative, giving full details of the claim.

1.26 COVID-19

.1 The Contractor shall keep informed with the latest Federal and Provincial recommendations and protocols regarding COVID-19 at all times during construction and shall modify their construction approach accordingly to ensure adherence to these recommendations and protocols.

.2 If Federal and/or Provincial recommendations require that the project work be stopped, the Contractor shall consult with the Departmental Representative and the Departmental Representative will advise as to the course of action the Contractor shall take.

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

1.1 Measurement and Payment

1.2 Definitions.

1.3 References.

1.4 Regulatory Overview.

1.5 Submittals.

1.6 Environmental Protection Plan (EPP).

1.7 Environmental Site Inspection Memo.

1.8 Notification

PART 2 – PRODUCTS:

2.1 Products.

PART 3 – EXECUTION:

3.1 Site Access and Parking.

3.2 Protection of Work Limits.

3.3 Erosion Control.

3.4 Pollution Control.

3.5 Equipment Maintenance, Fueling, and Operation.

3.6 Operation of Equipment.

3.7 Managing Invasive Plant Vegetation.

3.8 Fires and Fire Prevention and Control.

3.9 Wildlife.

3.10 Relics and Antiquities.

3.11 Waste Materials Storage and Removal.

3.12 Wastewater Discharge Criteria.

3.13 Drainage.

3.14 Site Clearing, Plant Protection.

3.15 Environmental Protection Supplies.

PART 1 – GENERAL

1.1 Measurement and Payment

.1 Payment for Environmental Protection will not be made and shall be considered incidental to the applicable payment item of work.

1.2 Definitions

.1 Qualified Environmental Professional (QEP): A qualified environmental professional as defined by Section 21 of the BC Riparian Areas Protection Regulations. An individual may serve as a qualified environmental professional if

.1 The individual is one of the following professionals:

.1 An agrologist;

.2 An applied technologist or technician;

.3 A professional biologist;

.4 A professional engineer;

.5 A professional forester;

.6 A professional geoscientist;

.7 A registered forest technologist,

.2 The individual is registered and in good standing in British Columbia with the appropriate professional association constituted under an Act for the individual's profession, and:

.3 When carrying out that part of the assessment, the individual is acting

.1 Within the individual's area of expertise,

.2 Within the scope of professional practice for the individual's profession, and

.3 Under the code of ethics of the appropriate professional association and is subject to disciplinary action by that professional association.

.2 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.

.3 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.

.4 Wetted Perimeter: area of stream where water is currently running or pooled.

.5 In-stream Work: any work performed below the high-water mark, either within or above the Wetted Perimeter of any Fisheries Sensitive Zone.

.6 Fisheries Sensitive Zone: in-stream aquatic habitats and out of stream habitat features such as side channels, wetlands, and riparian areas.

.7 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.

.8 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.
Invasive Plants - Province of British Columbia (gov.bc.ca)

.9 Heritage material: are objects, sites or locations of a traditional societal practice that is of historical, cultural, or archaeological significance to British Columbia, a community or an aboriginal people as determined by the Archaeological Monitor.

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).

.6 Archaeological Overview Assessment (Appendix I).

1.4 Regulatory Overview

.1 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.

.2 Comply with and be subject to those permits and approvals obtained from the Departmental Representative to conduct the Work.

.3 Pay specific attention to the provincial BC Land Use Permit, Water License and Quarry Permit.

.4 Pay specific attention to the Migratory Birds Convention Act, as amended in 1994.

.5 Pay specific attention to the provincial BC guidelines under Peace Region Least Risk Timing Windows: Biological Rational (2009).

.6 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).

1.5 Submittals

.1 The Contractor's EPP shall be submitted to the Departmental Representative. Each report/ memo shall be submitted as a single PDF documents (multiple files will not be accepted) for review and acceptance in accordance with the procedures outlined in Section 01 33 00 – Submittal Procedures. The Departmental Representative will review the EPP, (first submission and if required all subsequent re-submissions) within 14 days of submission. Upon review of the plan / report / memo the Departmental Representative will do one of the following:

.1 Accept the plan / report / memo.

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

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

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

.3 Work affected by the submittal (as determined by the Departmental Representative) shall not proceed until acceptance of the EPP and Breeding Bird and Bird Nest Survey by the Departmental Representative.

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

.5 The review of the EPP by the Departmental Representative shall not relieve the Contractor of responsibility for errors or omissions in the accepted submittals or of responsibility for meeting all requirements of the Contract Documents.

.6 Should deficiencies in the Contractor's be noted following acceptance of the submittal by the Departmental Representative but during the project work, the Departmental Representative reserves the right to provide additional comments to the Contractor and require re-submission of the EPP to ensure the correction of any deficiencies.

1.6 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), as identified in this Section of the specifications. The EPP will require the Contractor to carefully think through the entire project, including identifying what activities and works will be occurring, both generally and at specific sites, and by what methods. The Environmental Protection Plan shall be signed as being complete and appropriate for this project by a P.Biol or RPBio, and shall, at a minimum include the following:

.1 The process and protocol for ensuring that supervisors and individual staff employed by the Contractor are very clear on which environmental standards need to be achieved, how they will be achieved, and establishing how the Contractor will ensure that this is successfully occurring.

.2 Erosion, drainage, and sediment control plan which identifies type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with the requirements of the applicable provincial regulatory requirements (FLNRORD / MoE) approval or notification for instream work or under FLNRORD / MoE guidelines, and all other applicable regulations including the requirements of these specifications. The Contractor may utilize marked-up contract drawings within the EPP to show the locations of the proposed activities.

.3 Typical drawings showing the locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of any excess or spoil materials including methods to control runoff and to contain materials on site [(including concrete and grout from entering waterway)]. The Contractor may utilize marked-up contract drawings within the EPP to show the locations of the proposed activities.

.4 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.

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

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

.7 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.

.8 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.

.9 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.

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

1.7 Environmental Site Inspection Memo

.1 The Contractor shall submit an Environmental Site Inspection Memo within 3 weekdays of each site visit or week of full time site inspections by the P.Biol, 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 / 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 monitors 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.

1.8 Notification

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

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

.3 Departmental Representative will issue stop order of Work until satisfactory corrective action has been taken.

.4 No time extensions granted, or equitable adjustments allowed to Contractor for such suspensions.

PART 2 – PRODUCTS

2.1 Products

.1 Not used.

PART 3 – EXECUTION

3.1 Site Access and Parking

.1 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.

3.2 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.

3.3 Erosion Control

.1 Erosion control measures that prevent sediment from entering any waterway, water body or wetland in the vicinity of the construction site are a critical element of the project and shall be implemented by the Contractor.

.2 On-site sediment control measures shall be constructed and functional prior to initiating activities associated with the construction activities. The Contractor shall prepare an Erosion Control Plan, to be part of the EPP, to the satisfaction of the Departmental Representative

.3 The regular monitoring and maintenance of all erosion control measures shall be the responsibility of the Contractor. If the design of the control measures is not functioning effectively, they are to be repaired. The Departmental Representative will monitor the Contractor's erosion control performance.

.4 Erosion control measures must be in compliance with both Federal and Provincial legislation where required. Contractors should be referencing the provincial MoE Standards and Best Practices for Instream Works (2004).

3.4 Pollution Control

.1 The Contractor shall prevent any deleterious and objectionable materials from entering streams, rivers, wetlands, water bodies or watercourses that would result in damage to aquatic and riparian habitat. Hazardous or toxic products shall be stored no closer than 100 metres to any surface water.

.2 A Spill Response Plan will be prepared as part of the EPP and shall detail the containment and storage, security, handling, use and disposal of empty containers, surplus product or waste generated in the application of these products, to the satisfaction of the Departmental Representative, and in accordance with all applicable federal and provincial legislation. The EPP shall include a list of products and materials to be used or brought to the construction site that are considered or defined as hazardous or toxic to the environment. Such products include, but are not limited to, waterproofing agents, grout, cement, concrete finishing agents, hot poured rubber membrane materials, asphalt cement and sand blasting agents.

.3 The containment, storage, security, handling, use, unique spill response requirements and disposal of empty containers, surplus product or waste generated in the use of any hazardous or toxic products shall be in accordance with all applicable federal and provincial legislation. Hazardous products shall be stored no closer than 100 metres from any surface water.

.4 An impervious berm shall be constructed around fuel tanks and any other potential spill area. The berms shall be capable of holding 110% of tank storage volumes and shall be to the satisfaction of the Departmental Representative. Measures such as collection/drip trays and berms lined with occlusive

material such as plastic and a layer of sand, and double lined fuel tanks can prevent spills into the environment.

.5 The Contractor shall prevent blowing dust and debris by covering and/or providing dust control for temporary roads and on-site work such as rock drilling and blasting by methods that are approved by the Departmental Representative.

.6 The Contractor shall provide spill kits, to the satisfaction of the Departmental Representative, at refueling, lubrication and repair locations that will be capable of dealing with 110% of the largest potential spill and shall be maintained in good working order on the construction site. The Contractor and site staff shall be informed of the location of the spill response kit(s) and be trained in its use.

.7 Timely and effective actions shall be taken to stop, contain and clean-up all spills as long as the site is safe to enter. The Departmental Representative shall be notified immediately of any spill as well as the provincial authorities. Basic instructions and phone numbers shall be part of the Contractor's EPP.

.8 In the event of a major spill, the Contractor shall prioritize the cleanup and all other work shall be stopped, where appropriate, and personnel devoted to spill containment and cleanup.

.9 The costs involved in a major spill incident (control, clean up, disposal of contaminants, and site remediation to pre-spill conditions), shall be the responsibility of the Contractor. The site will be inspected to ensure completion to the pre-spill condition to the satisfaction of the Departmental Representative.

3.5 Equipment Maintenance, Fueling and Operation

.1 The Contractor shall ensure that all soil, seeds, and any debris attached to construction equipment to be used on the project site shall be removed (e.g. power washing) before delivery to the work site.

.2 Equipment fueling sites will be identified by the Contractor to the satisfaction of the Departmental Representative. Except for chain saws, any fueling closer than 100 metres to any surface water (streams, wetlands, water bodies or watercourses) shall require discussion with the Departmental Representative. Regardless of fueling location, personnel shall maintain a presence during refueling with immediate attention to the fueling operations.

.3 Diesel and gasoline delivery vehicles, including bulk tankers shall not be parked within 100 metres from any surface water unless actively being used for refueling. Immediately following refueling, bulk tankers shall be moved to a location 100 m or greater from any surface water. Gravity fed fuel systems are not allowed. Manual or electric pump delivery systems shall be used.

.4 Mobile fuel containers (e.g. slip tanks, small fuel carboys) shall remain in the service vehicle at all times. Protection and containment of approved fuel storage sites is addressed in Item 3.4 - Pollution Control, subsection .4 of this specification.

.5 Equipment used on the project shall be fueled with E10, and low sulphur diesel fuels where available, and shall conform to local emission requirements. The Contractor is to ensure that unnecessary idling of the vehicles is avoided.

.6 Oil changes, lubricant changes, greasing and machinery repairs shall be performed at locations satisfactory to the Departmental Representative. Waste lubrication product (e.g. oil filters, used containers, used oil, etc.) shall be secured in spill-proof containers and properly recycled or disposed of at an approved facility. No waste petroleum, lubricant products or related materials are to be discarded, buried, or disposed of in borrow pits, turnouts, picnic areas, viewpoints, etc. or anywhere within the work area.

.7 The Contractor shall ensure that all equipment is inspected daily for fluid/fuel leaks and maintained in good working condition. Maintenance certificates or maintenance logs for all equipment shall be available on-site during work.

.8 Fuel containers and lubricant products shall be stored only in secure locations to the satisfaction of the Departmental Representative. Fuel tanks or other potential deleterious substance containers shall be secured to ensure they are tamperproof and cannot be drained by vandals when left overnight. Alternatively, the Contractor may employ a security person to prevent vandalism.

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

3.6 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. Where construction activities require working close to surface water or in the water, the Contractor is required to stage the work and employ the mitigation measures to ensure fugitive materials (e.g. rocks, soil, branches) and especially deleterious substances (e.g. chemicals) does not enter any surface water areas.

.2 The Contractor shall instruct workers to prevent pushing, placement, raveling, storage or stockpiling of any materials (e.g. slash, rock, fill or topsoils) in the trees bordering the right-of-way or into surface water.

.3 When, in the opinion of PSPC, negligence on the part of the Contractor results in damage or destruction of vegetation, or other environmental or aesthetic features beyond the designated work area, the Contractor shall be responsible, at his or her expense, for complete restoration including the replacement of trees, shrubs, topsoil, grass, etc. to the satisfaction of the Departmental Representative.

.4 Restrict vehicle movements to the work limits.

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

3.7 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.

3.8 Fires and Fire Prevention and Control

.1 If burning timber and other organic material resulting from clearing operations, comply with the Open Burning Smoke Control Regulation within the British Columbia Environmental Management Act when burning timber and other organic material resulting from clearing operations. Onsite fires only permitted when approved by Departmental Representative. The burning of other waste products or materials generated as a result of the construction not permitted.

.2 If burning permitted, obtain all required burning permits from the province of British Columbia.

.3 Where fires or burning 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.

.4 A fire extinguisher shall be carried and available for use on each of the Contractor's construction equipment in the event of fire. Should the contractor choose to burn timber and organic materials resulting from clearing operations, firefighting equipment is required [recommended] [as follows] (e.g. a water truck; minimum 2000 Liters with 150 meters of fire hose and a pump capable of producing 300 kPa water pressure at the nozzle, three shovels, two Pulaski's, and two 20 liter backpack pumps) shall be maintained at the construction site at a location known and easily accessible to all Contractors' staff. The Contactor's staff shall receive basic training in early response to wildfire events during the "environmental briefing" presented by the Contractor.

.5 Construction equipment shall be operated in a manner and with all original manufacturers' safety devices to prevent ignition of flammable materials in the area.

.6 Care shall be taken while smoking on the construction site to ensure that the accidental ignition of any flammable material is prevented.

.7 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.

.8 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.

	.9	Provide supervision, attendance and fire protection measures as directed by the Departmental Representative or other authorities.
3.9 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.
3.10 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.
3.11 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.

3.12 Wastewater Discharge Criteria

.1 Wash water, meltwater collection, rinse water resulting from the cleaning of fuel tanks and pipelines, contaminated groundwater, and/or any other liquid effluent stream will be released onto the ground at a location that is a minimum of 30 metres from natural drainage courses and 100 metres from fish bearing waters, and will conform to the discharge requirements set out in provincial regulations.

.2 Contractor must obtain approval from the provincial Water Act Officer prior to discharging any treated wastewater.

3.13 Drainage

.1 Stage the work and complete excavation work and placement of all erosion protection materials in the dry. Provide temporary drainage, pumping, and construct berms as necessary to keep excavations and the 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 metres from natural drainage courses and 100 metres from fish bearing waters.

.7 Have on hand sufficient pumping equipment, machinery, and tankage in good working condition for ordinary emergencies, including power outage, and competent workers for operation of pumping equipment.

3.14 Site Clearing, Plant Protection .1 Protect trees and plants on site and adjacent properties where indicated.

.2 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.

.3 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.

.4 Minimize stripping of topsoil.

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

3.15 Environment Protection Supplies .1 Comply with federal and provincial fisheries and environmental protection legislation, including preventing the loss or destruction of fish habitat, and minimizing the impact of sedimentation, siltation or otherwise causing a degradation in water quality.

.2 Provide a minimum of 30 m, and as required, of biodegradable coir logs, sized accordingly for use (minimum diameter of 0.3 m), and the necessary stakes (minimum 1 stake per 1 m of coir log) and materials required by the 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 or more and as required of 200 mm diameter hydrophobic, sorbent booms. This will be used as necessary to prevent the migration of hydrocarbons.

.4 Supply, transport, install and maintain erosion, sediment, and drainage controls necessary to complete the Work in accordance with the requirements of Departmental Representative.

.5 At the completion of construction, leave coir logs in place if requested by the Departmental Representative.

.6 Unused Erosion, Sediment and Drainage Control supplies will remain the property of Departmental Representative until the completion of the Contract.

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

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

1.1 Measurement and Payment Procedures.

1.2 References.

1.3 Definitions.

1.4 Responsibilities.

1.5 General.

1.6 Submittals.

1.7 Quality Management Plan.

1.8 Quality Control Personnel.

1.9 Check Sheets.

1.10 QC Testing / Survey Inspection.

1.11 Non-Conformance Reports (NCRs).

1.12 Departmental Representative Inspection and Audits.

PART 1 – GENERAL

1.1 Measurement and Payment Procedures

.1 Payment for Quality Management will not be made and shall be considered incidental to the applicable payment item of work.

1.2 References

.1 British Columbia MoTI – 2020 Standard Specifications for Highway Construction.

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

.3 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)).

.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 C117, Standard Test Method for Materials Finer than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing.

.8 ASTM D5821, Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate.

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

.10 ASTM C142, Standard Test Method Clay Lumps and Friable Particles in Aggregates.

.11 ASTM D6928, Standard Test Method for Resistance of Coarse Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus.

.12 ASTM D4791, Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.

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

.14 ASTM D2419, Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.

.15 ASTM C566, Standard Test Methods for Total Evaporable Moisture Content of Aggregate by Drying.

.16 ASTM D2216, Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.

.17 ASTM D5581 - Standard Test Method for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus (6 inch-Diameter Specimen).

.18 ASTM D6307, Standard Test Method for Asphalt Content of Asphalt Mixture by Ignition Method.

.19 ASTM D5 / D5M, Standard Test Method for Penetration of Bituminous Materials.

.20 ASTM D2171, Standard Test Method for Viscosity of Asphalts by Vacuum Capillary Viscometer.

.21 ASTM D2726, Standard Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures.

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

.3 American Association of State Highway and Transportation Officials (AASHTO), latest edition.

.1 AASHTO T 245, Standard Method of Test for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus.

.2 AASHTO T 304, Standard Method of Test for Uncompacted Void Content of Fine Aggregate.

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: 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

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 hard copies 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 personnel (and agency, if being subcontracted) and survey personnel (and agency, if being subcontracted), and details of their qualifications and relevant experience to provide the specific services required for the Project.

.3 A list of testing and survey equipment to be used for the work.

.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 Non-conformance Reports (NCR's).

.7 Respond to NCR's issued by the Departmental Representative.

.8 Attend pre-construction and construction progress meetings.

.4 PSPC reserves the right to reject one or more of the Contractor's Quality Control Personnel and require the Contractor to find alternative Quality Control Personnel prior to or during the work should the Quality Control Personnel not have the necessary qualifications as listed in this specification or not provide quality control services as required by this specification during the work. Should Quality Control Personnel be rejected, any work which cannot undergo complete quality control as outlined in these specifications shall stop while the Contractor finds replacement Quality Control Personnel.

1.9 Check Sheets

.1 Check sheets to verify and document conformance of the work to the quality requirements of the contract are fundamental to the QC process. The check sheets prepared as part of the Quality

Management Plan shall include all components of the project work and all checks required to ensure the components of the work are completed in conformance with the requirements of the Contract Documents. The check sheets shall be prepared assuming the Departmental Representative will only be providing spot checks of the work throughout the project and thus QC 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 QC 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 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.

.3 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

.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 Non-Conformance Report (NCR) shall be prepared by the Quality Control Manager and issued to the Contractor within 24 hours 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 Non-Conformance Report (NCR) to the Contractor within 24 hours 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 Measurement and Payment.

1.2 Installation and Removal.

1.3 Scaffolding.

1.4 Hoisting.

1.5 Site Storage/Loading.

1.6 Security.

1.7 Equipment, Tool, and Materials Storage.

1.8 Sanitary Facilities.

1.9 Construction Signage.

1.10 Construction Laydown Area, Construction Parking, and Site Office.

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 Measurement and Payment Procedures

.1 Payment for Construction Facilities and Equipment will not be made and shall be considered incidental to the applicable payment item of work.

1.2 Installation and Removal

.1 Provide construction facilities in order to execute work expeditiously.

.2 Remove from site all such work after use.

1.3 Scaffolding	.1	Provide and maintain scaffolding, ramps, ladders, swing staging, platforms, and temporary stairs as necessary to carry out work.
1.4 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.
1.5 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.
1.6 Security	.1	Provide and pay for responsible security personnel as required.
1.7 Equipment, Tool, and Materials Storage	.1	If required by the Contractor provide and maintain, in a clean and orderly condition, lockable weatherproof 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.
1.8 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.
1.9 Construction Signage	.1	No other signs or advertisements, other than those required by Section 01 14 00 – Work Restriction, Access Development, Construction Staging, and Restoration, Sub-section 1.6 – Construction Signage, are permitted on site.
1.10 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	Km 445 Fort Nelson Gravel Pit.

.3 Other areas as preapproved 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 Contractors 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 Prior to commencement of construction and periodically throughout the work and whenever requested by the Departmental Representative, provide a detailed list of all construction equipment used on the project (including by sub-contractors). The list shall be as per the format of the General Contractor & Sub-Contractor Construction Equipment List found in Appendix E of these specifications and include the size, make, model, and year of manufacture of all equipment. This document should include all equipment used on the project site, including trucks for hauling material.

.2 The Departmental Representative has the right to request additional equipment and/or qualified operators be brought to site should the work appear to be delayed due to lack of equipment and/or operators.

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

1.1 Measurement and Payment.

1.2 Installation and Removal.

1.3 Hoarding.

1.4 Guiderails and Barricades.

1.5 Access to Site.

1.6 Public Traffic Flow.

1.7 Fire Routes.

1.8 Protection for Off-site and Public Property.

1.9 Protection of Structure Finishes.

PART 1 – GENERAL

1.1 Measurement and Payment Procedures .1 Payment for Temporary Barrier and Enclosures will not be made and shall be considered incidental to the applicable payment item of work.

1.2 Installation and Removal .1 Provide temporary controls in order to execute Work expeditiously.

.2 Remove from site all such work after use.

1.3 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).

1.4 Guiderails and Barricades .1 Provide secure, rigid guiderails and barricades around deep excavations and open shafts.

.2 Provide as required by governing authorities.

1.5 Access to Site .1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.

1.6 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.

1.7	Fire Routes	.1	Maintain access to property for use by emergency response vehicles.
1.8	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.
1.9	Protection of Structure Finishes	.1	Provide protection for finished and partially finished structure finishes and equipment during performance of Work.
		.2	Provide necessary screens, covers and hoardings.
		.3	Confirm with Departmental Representative locations and installation schedule three (3) days prior to installation.

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

1.1 Measurement and Payment.

1.2 General Requirements.

1.3 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 Measurement and Payment Procedures

.1 Payment for Construction Camp will not be made and shall be considered incidental to the applicable payment item of work.

1.2 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.

1.3 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 Measurement and Payment.

1.2 Project Cleanliness.

1.3 Final Cleaning.

PART 1 – GENERAL

1.1 Measurement and Payment Procedures

.1 Payment for Cleaning will not be made and shall be considered incidental to the applicable payment item of work.

1.2 Project Cleanliness

.1 Maintain work in a tidy condition, free from accumulation of waste products and debris.

.2 Remove waste materials from site at regularly scheduled times or dispose of as directed by the Departmental Representative.

.3 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.4 Provide wildlife resistant containers for collection of waste materials and debris.

.5 Dispose of waste materials and debris off site.

.6 Clear snow and ice from areas of work.

.7 Ensure work site cleaning and worker hygiene practices are in accordance with the Contractor's COVID-19 Safe Work Plan.

1.3 Final Cleaning

.1 When work is substantially performed, remove surplus products, tools, construction machinery, and equipment not required for performance of remaining work.

.2 Remove waste products, 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 or Bituminous Surface Treatment (BST) finished areas.

.9 Clean drainage systems.

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

1.1 Substantial Performance.

1.2 Completion

PART 1 – GENERAL

1.1 Substantial Performance

.1 Project "Substantial Performance" shall be attained through the following process:

.1 When the project work has achieved Substantial Performance as defined by GC1.1.4, the Contractor and all subcontractors shall conduct an inspection of work, identify deficiencies and defects and repairs as required to conform to Contract Documents. Correct deficiencies and defects and complete repairs identified.

.2 Notify the Departmental Representative in writing of completion of the Contractor's Inspection, correction of deficiencies, defects, and repairs, and request the Departmental Representative's Substantial Performance inspection.

.3 Upon request from the Contractor, the Departmental Representative will complete a Substantial Performance inspection. If requested by the Departmental Representative, the Contractor shall accompany Departmental Representative during the Substantial Performance inspection.

.4 Unless stated otherwise by the Departmental Representative, the Contractor shall correct all deficiencies, defects, and repairs identified during the Substantial Performance inspection by the Departmental Representative prior to the preparation of the "Certificate of Substantial Performance".

.5 Should the Departmental Representative determine that Substantial Performance as defined by GC1.1.4 has been achieved, the Contractor shall prepare a "Request for Progress Payment" with the final project quantities and all Progress Payment submissions as outlined in Section 01 29 00 – Payment Procedures. The Departmental Representative will use the submitted "Request for Progress Payment" to prepare a "Certificate of Substantial Performance" in accordance with GC5.5.

.6 Should the "Certificate of Substantial Performance" include remaining defects, faults, and incomplete work etc. the Contractor shall provide to the Departmental Representative a schedule for the completion / correction of each remaining defect, fault, and incomplete work etc. The "Certificate of Substantial Performance" will not be processed for payment until the Contractor's schedule has been provided, reviewed, and accepted by the Departmental Representative. The Contractor's schedule shall be provided in writing as follows:

.1 Include the completion / correction dates for all items of defects, faults, incomplete work etc. identified by the Departmental Representative.

.2 Be provided in a letter with company letter head and be signed by an authorized representative of the Contractor.

1.2 Completion

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

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

1.1 Submissions.

1.2 Recording As-built Conditions (As-Built Drawings).

1.3 As-Built Survey.

PART 1 – GENERAL

1.1 Submissions

.1 Submit submissions for Departmental Representative review. Following each review, the submission will be returned with the Departmental Representative's comments. Revise and re-submit submission per the comments provided.

.2 Provide the following submissions to the Departmental Representative within two (2) weeks of substantial performance:

.1 As-built drawing and Shop Drawing mark-ups.

.2 As-built survey.

1.2 Recording As-built Conditions (As-Built Drawings)

.1 The Departmental Representative will provide one set of Issued for Construction (or Issued for Tender) drawings for use by the Contractor to record as-built conditions and submit at the completion of the project as the "As-built Drawings".

.2 Record information concurrently with construction progress on the Issued for Construction (or Issued for Tender) drawings. Do not conceal work until the required information is recorded.

.3 Legibly mark each item on the Issued for Construction (or Issued for Tender) drawings and Shop Drawings in red ink to record actual construction conditions and any changes made by addenda and change orders.

.4 Maintain record documents in clean, dry, and legible condition.

.5 Keep record documents available for inspection by the Departmental Representative.

.6 Submit to the Departmental Representative one copy of Issued for Construction (or Issued for Tender) drawings which have been marked up by the Contractor to include all "as-built" conditions.

1.3 As-Built Survey

.1 At the completion of the work complete an as-built survey of the works. At a minimum the survey shall include.

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

.2 Culverts (inverts at inlet and outlet) and size and type.

.3 Signage (new or modified).

.4 Concrete barriers.

.5 Edge of asphalt / BST.

.6 Gravel Shoulder.

.7 Pavement Markings.

.8 Retaining walls.

.9 Riprap.

.10 Lock Blocks (shots at base and top).

.11 Any other feature or elements of work incorporated into the project.

.2 The survey to include sufficient point density to adequately characterize the work. Survey methods and point density is subject to prior approval of the Departmental Representative. At a minimum the Contractor shall survey all features at 20 m station intervals and the location of all treatment boundaries including changes in material type / placement, changes in surface treatment, and changes in terrain.

.3 Survey data shall be collected at an accuracy of +/- 0.020 m horizontal and +/- 0.020 m vertical or better and shall be referenced / tie into the PSPC's monument / coordinate system as shown on the Contract Drawings.

.4 The following files shall comprise the as-built survey provided to the Departmental Representative:

.1 Digital csv file with the xyz data and an appropriate descriptor code as to the type of material surface or feature being surveyed.

.2 Breaklines for all survey data in DXF file formation or another format pre-approved by the Departmental Representative.

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

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL

1.1 Measurement and Payment Procedures

PART 2 – PRODUCTS:

2.1 Products

PART 3 – EXECUTION:

3.1 Existing Salt Shed Structure Removal and Disposal

3.2 Lock Block Removal and Reinstatement

3.3 Disposal

PART 1 – GENERAL

1.1 Measurement and Payment

.1 Payment Selective Site Demolition will not be made and shall be considered incidental to the applicable payment item of work.

PART 2 – PRODUCTS

2.1 Products

.1 Not used.

PART 3 – EXECUTION

3.1 Existing Salt Shed Structure Removal and Disposal

.1 The contractor shall demolish the existing salt shed fabric cover-all structure, inclusive of all supporting frames and ancillary items.

.2 All items demolished as per the previous section shall be transported to an offsite disposal site acceptable to the Departmental Representative.

3.2 Lock Block Removal and Reinstatement

.1 Remove existing lock blocks to facilitate the construction of the salt shed as indicated on the Contract Drawings. The Contractor may reuse the existing lock blocks if they are deemed to be in acceptable condition for reuse by the Departmental Representative. The Contractor shall coordinate with the Departmental Representative to store the lock blocks temporarily before reinstatement. Where new lock blocks are required, they shall comply with the requirements noted in Section 13 34 24 – Pre-engineered Salt Shed.

.2 Contractor shall coordinate with Departmental Representative for an appropriate location to temporary store the lock blocks to be reused.

3.3 Disposal	.1	Disposed of damaged or surplus lock blocks by transporting them to an offsite disposal site acceptable to the Departmental Representative, or transport and stack the lock blocks in a location and manor acceptable to the Departmental Representative.

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

1.1 Definitions.

1.2 Submittals.

1.3 Storage and Handling.

1.4 Transportation.

PART 2 – PRODUCTS:

2.1 Materials.

PART 3 – EXECUTION:

3.1 Disposal.

PART 1 – GENERAL

1.1 Definitions

.1 Dangerous Goods: Product, substance, or organism that is specifically listed or meets the hazard criteria established in Transportation of Dangerous Goods Regulations.

.2 Hazardous Material: Product, substance, or organism that is used for its original purpose and that is either dangerous goods or a material that may cause adverse impact to the environment or adversely affect health of persons, animals, or plant life when released into the environment.

.3 Hazardous Waste: Any hazardous material that is no longer used for its original purpose and that is intended for recycling, treatment, or disposal.

.4 Workplace Hazardous Materials Information System (WHMIS): A Canada-wide system designed to give employers and workers information about hazardous materials used in the workplace. Under WHMIS, information on hazardous materials is to be provided on container labels, material safety data sheets (MSDS), and worker education programs. WHMIS is put into effect by a combination of federal and provincial laws.

1.2 Submittals

.1 Submit product data in accordance with Section 01 33 00 – Submittal Procedures.

.2 If requested by the Departmental Representative, submit to the Departmental Representative a current Material Safety Data Sheet (MSDS) for each hazardous material required prior to bringing hazardous material on site.

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

1.3 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 naptha 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 References

.1 ASTM International

.1 ASTM A 185/A 185M-[07], Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.

.2 ASTM D 260, Standard Specification for Boiled Linseed Oil.

.3 ASTM D 1751-[04], Standard Specification for Preformed Expansion Joint Filler for Concrete paving and structural Construction (Non extruding and Resilient Bituminous Types).

.2 Canadian General Standards Boards (CGSB)

.1 CAN/CGSB-19.24, Multicomponent, Chemical-Curing Sealing Compound.

.3 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 A3000, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

.3 CAN/CSA-G30.18, Billet-Steel Bars for Concrete Reinforcement.

1.2 Administrative Requirements

.1 Pre-installation Meetings: in accordance with Section 01 32 16 Construction Progress Schedule – BAR (GANTT) Chart, convene pre-installation meeting one (1) week prior to beginning concrete works.

.1 Ensure key personnel and Departmental Representative attends.

1.3 Action and Informational Submittals

.1 Provide submittals in accordance with Section 01 33 00 Submittal Procedures.

.2 Shop Drawings:

.1 Submit placing drawings prepared in accordance with approved design to clearly show size, shape, location, and necessary details of reinforcing.

.2 Submit drawings showing formwork and falsework design to CSA A23.1/A23.2.

.3 Submit Drawings stamped and signed by a professional engineer registered or licensed in the province of British Columbia, Canada.

.4 Submit concrete mix design or appropriate documentation showing supplier's compliance with exposure class criteria as established by the contractor's engineer

.3 At least two (2) weeks prior to beginning Work, inform Departmental Representative of source of fly ash.

.1 Do not change source of fly ash without written approval of Departmental Representative.

.4 Provide testing result and inspection reports for review by Departmental Representative and do not proceed without written approval when deviations from mix design or parameters are found.

.5 Concrete hauling time: provide for review by Departmental Representative deviations exceeding maximum allowable time as determined in the Design for concrete to be delivered to site of work and discharged after batching.

1.4 Quality Assurance

.1 Provide to Departmental Representative two (2) weeks minimum prior to starting concrete work, valid and recognized certificate from plant delivering concrete.

.1 Quality Control Plan: provide written report to Departmental Representative verifying compliance that concrete in place meets the performance requirements of the Design.

1.5 Delivery, Storage and Handling

.1 Delivery and Acceptance Requirements:

.1 Concrete hauling time: deliver to site of work and discharged within maximum amount of time specified in design after batching.

.1 Do not modify maximum time limit without receipt of prior written agreement from Departmental Representative and concrete producer as described in CSA A23.1/A23.2.

.2 Deviations to be submitted for review by the Departmental Representative.

.2 Concrete delivery: ensure continuous concrete delivery from plant meets CA A23.1/A23.2.

1.6 Measurement and Payment Procedures

.1 Payment for Cast In Place Concrete will not be made and shall be considered incidental to the applicable payment item of work.

PART 2 – PRODUCTS

2.1 Design Criteria

.1 All concrete must be designed, specified, and produced in accordance with CAN/CSA A23.1/23.2 and with CAN/CSA A23.3. For durability, the concrete is to be designed for exposure to de-icing salts.

.2 Ensure concrete supplier meets performance criteria of concrete as established in the Design and provide verification of compliance as described in Part 1 – Quality Assurance.

2.2 Mixes

.1 Concrete mixes to be specified by the designer.

PART 3 – EXECUTION

3.1 Preparation

.1 Provide Departmental Representative 24 hours notice before each concrete pour.

.2 Verify that concrete reinforcing was placed in accordance with Design.

.3 During concreting operations:

.1 Development of cold joints is not allowed.

.2 Ensure concrete delivery and handling facilitates placing with minimum of rehandling, and without damage to existing structure or Work.

.4 Protect previous work from staining.

.5 Clean and remove stains prior to application of concrete finishes.

3.2 Installation / Application

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

.2 Sleeves and inserts:

.1 Cast in sleeves, ties, slots, anchors, reinforcement, frames, conduits, bolts, waterstops, joint fillers and other inserts required to be built-in, unless otherwise specified by Design.

3.3 Finishes

.1 Formed surfaces exposed to view in accordance with CSA A23.1/A23.2.

.2 Exposed site concrete:

.1 Screed to plane surfaces.

.2 Provide round edges.

.3 Trowel smooth to provide lightly brushed non-slip finish.

3.4 Field Quality Control	.1	Concrete testing to CSA A23.1/A23.2 by CSA certified testing laboratory designated and paid for by the contractor. Provide results of testing within two (2) days of each test and include in the close-out documentation.
	.2	Slump tests and cylinders for compressive strength tests shall, at a minimum, be taken from every third truck
	.3	When cylinders are taken for compressive strength tests, a minimum of three cylinders shall be prepared. One shall be used for 7 day testing and the remaining two for 28 day testing.
	.4	Air tests shall be taken from every load for the first three loads and from every third load thereafter. If a test returns outside of the expected range, testing shall revert to being performed on every load until consistency is demonstrated to the satisfaction of the owner.
	.5	Contractor's foundation engineer shall perform field review of concrete works as necessary to prepare letter of assurance.
3.5 Cleaning	.1	Clean in accordance with Section 01 74 11 – Cleaning.
	.2	Use trigger operated spray nozzles for water hoses.
	.3	Designate cleaning area for tools to limit water use and runoff.
	.4	Cleaning of concrete equipment to be done in accordance with Section 01 35 43 – Environmental Protection.
3.6 Waste Management	.1	All unused concrete, concrete materials including but not limited to additives, curing compounds and wash water to be collected and disposed of off-site either at an approved landfill or to a concrete supplier equipped to dispose of all such material in accordance with applicable legislation. Provide certificate of acceptance of these materials indicating quantity and general condition of the materials accepted.
	.2	Provide appropriate are on job site where concrete trucks can be safely washed with collection of the wash water for appropriate disposal.
	.3	Do not dispose of unused concrete, wash water, admixtures and additive materials into sewer systems, lakes, streams, onto ground or in other location where it will pose health or environmental hazard.

END OF SECTION

SECTION INCLUDES:

PART 1 – GENERAL:

1.1 References

1.2 Action and Informational Submittals

1.3 Delivery, Storage and Handling

1.4 Measurement and Payment Procedures

PART 2 – PRODUCTS:

2.1 Design Requirements

2.2 Materials

2.3 Fabrication

2.4 Shop Painting / Coating

PART 3 – EXECUTION:

3.1 Application

3.2 Erection

3.3 Field Quality Control

3.4 Field Painting

3.5 Cleaning

PART 1 – GENERAL

1.1 References

.1 ASTM International

.1 ASTM A 325-07a, Standard Specification for Structural Bolts, steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.

.2 ASTM 325M-08, Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength.

.3 ASTM A 490M-04ae, Standard Specification for High-Strength Steel Structural Bolts, Classes 10.9 and 109.3, For Structural Steel Joints.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-95.10-99, Protective Coatings for Metals.

.3 Canadian Institute of Steel Construction (CISC)/Canadian Paint Manufacturers Association (CPMA)

.1 Handbook of the Canadian Institute of Steel Construction.

.2 CISC/CPMA Standard 2-75, Quick-Drying Primer for use on Structural Steel.

.4 Canadian Standards Association (CSA International)

.1 CSA G40.20G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.2 CAN/CSA-G164-M92, Hot Dip Galvanizing of Irregularly Shaped Articles.

.3 CAN/CSA-S16, Limit States Design of Steel Structures.

.4 CAN/CSA-S136, North American Specifications for the Design of Cold Formed Steel Structural Members.

.5 CSA W47.1, Certification of Companies for Fusion Welding of Steel.

.6 CSA W48, Filler Metals and Allied Materials for Metal Arc Welding.

.7 CSA W55.3, Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.

.8 CSA W59 Welded Steel Construction (Metal Arc Welding).

.5 Master Painters Institute

.1 MPI-INT 5.1, Structural Steel and Metal Fabrications.

.2 MPI-EXT 5.1, Structural Steel and Metal Fabrications.

.6 The Society for Protective Coatings (SSPC) and National Association of Corrosion Engineers (NACE) International

NACE No. 3/SSPCE SP-6, Commercial Blast Cleaning.

1.2 Action and Informational Submittals

.1 Provide submittals in accordance with Section 01 33 00 Submittal Procedures.

.2 Shop Drawings:

.1 Provide drawings stamped and signed by Professional Engineer registered or licensed in the Province of British Columbia, Canada.

.3 Erection Drawings:

.1 Submit erection drawings indicating details and information necessary for assembly and erection purposes including:

.1 Description of methods.

.2 Sequence of erection.

.3 Type of equipment used in erection.

.4 Temporary bracings.

.4 Fabrication drawings:

.1 Submit fabrication drawings showing designed assemblies, components and connections are stamped and signed by qualified Professional Engineer licensed in the Province of British Columbia, Canada.

.5 Source Quality Control Submittals:

.1 Submit copy of mill test reports two (2) weeks prior to fabrication of structural steel.

.1 Mill test reports to show chemical and physical properties and other details of steel to be incorporated in project, in accordance with approved design.

.2 Provide mill test reports certified by metallurgists qualified to practice in the Province of British Columbia, Canada.

.6 Fabricator Reports:

.1 Provide structural steel fabricator’s affidavit stating that materials and products used in fabrication

conform to applicable material and products standards specified and indicated in design.

1.3 Delivery, Storage and Handling

.1 Deliver materials in manufacturer's original, undamaged containers with identification labels intact.

.2 Deliver, store, and handle materials in accordance with Section 01 11 00 Summary of Work.

.3 Dispose of packaging waste in accordance with Section 01 11 00 Summary of Work and Section 01 35 43 Environmental Procedures.

1.4 Measurement and Payment Procedures

.1 Payment for Structural Steel for Buildings will not be made and shall be considered incidental to the applicable payment item of work.

PART 2 – PRODUCTS

2.1 Design Requirements

.1 Design structure, details, and connections in accordance with requirements of CAN/CSA-S16 and CAN/CSA-S136 to resist forces, moments, shears and allow for movements as indicated in design.

.2 Connections may be designed by the engineer responsible for the primary structure or be delegated to a specialty engineer (e.g. the fabricators engineer or other). In the case of delegated design, the primary structure engineer shall be responsible for establishing the design basis for all connections and for reviewing the delegated design for conformance with their design intent.

.3 Submit drawings and design calculations stamped and signed by qualified professional engineer licensed in the Province of British Columbia, Canada for design.

2.2 Materials

.1 As determined in design.

2.3 Fabrication

.1 Fabricate structural steel in accordance with CAN/CSA-S16, CAN/CSA-S136 and in accordance with design.

2.4 Shop Painting / Coating

.1 Clean, prepare surfaces and shop prime structural steel in accordance with applicable standards as specified in design.

.2 Paint exposed surfaces of the structure in accordance with applicable standards as specified in the design.

.1 Colour shall be Forest Green. Colour samples to be provided to Departmental Representative two (2) weeks prior to start of fabrication. Colour to be approved by Departmental Representative.

.2 Structural steel members inside building shall be hot dip galvanized due to the exposure to chlorine environment.

PART 3 – EXECUTION

3.1 Application

.1 Comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions and datasheets.

3.2 Erection

.1 Erect structural steel, as indicated and in accordance with CAN/CSA-S16, CAN/CSA-S136 and in accordance with erection drawings.

.2 Field cutting or altering of structural members to the approval of the Departmental Representative in consultation with the Design Engineer.

3.3 Field Quality Control

.1 Inspection and testing of materials and workmanship will be carried out by a certified testing laboratory approved by the Departmental Representative.

.2 Provide safe access and working areas for testing on site, as required by testing agency and as authorized by Departmental Representative.

.3 Submit test reports to Departmental Representative within one (1) week of completion of inspection.

.4 Contractor will pay costs of tests as specified in Section 01 11 00 Summary of Work and Section 01 45 00 Quality Management.

.5 Test shear studs in accordance with CSA W59.

.6 The structure engineer and any pertinent other discipline engineers or delegated engineers shall perform field review as they determine necessary to provide letters of assurance.

3.4 Field Painting

.1 Paint in accordance with specifications of design.

.1 Touch up damaged surfaces and surfaces without shop coat with primer and topcoat to NACE No. 3/SSPC-SP-6 except as specified otherwise by design.

3.5 Cleaning

.1 Clean in accordance with Section 01 74 11 Cleaning.

.2 Store and dispose of waste in accordance with Section 01 11 00 Summary of Work and Section 01 35 43 Environmental Protection.

END OF SECTION

SECTION INCLUDES:

PART 1 – GENERAL

1.1 Action and Information Submittals

.1 Submit in accordance with Section 01 11 00 – Summary of Work and 01 33 00 – Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for standard building assembly components and include product characteristics, performance criteria, physical size, finish, and limitations.

.3 Delegated Design Submittals:

.1 Indicate plans and grid lines, structural members, and connection details, bearing and anchorage details as necessary, framed openings accessories, schedule of

materials and finishes, camber and loadings, fasteners, and welds.

.2 Submit erection drawings to Departmental Representative, indicating erection dimensions and methods.

.4 Shop Drawings:

.1 Submit drawings stamped and signed by Professional Engineer registered in the Province of British Columbia who is taking responsibility for design.

.5 Manufacturer's Field Reports: submit manufacturer's written reports within three (3) days of review, verifying compliance of Work, as described in Field Quality Control.

.6 Letters of Assurance/Building Schedules: submit letters of assurance and building schedules as detailed in the BC Building Code and as further described in the requirements below.

1.2 Salt Shed Requirements

.1 Contractor shall design, supply and erect one pre-engineered, un-insulated steel structure, for the purpose of storing road salt and sand, over the existing liner system, as shown in the attached drawings, for reference only, in accordance with relevant standards specified in the design.

.2 The contractor shall supply all design professionals necessary for the completion of the building, foundation and any related electrical design. An appropriate professional shall be designated as "Coordinating Professional" and shall coordinate the various design components as well as preparation of code schedules, field review and letters of assurance in compliance with the BC Building Code. The contractor shall supply schedules A, B and C for all engineers of record as appropriate, as well as any schedules or similar assurances collected by the various discipline engineers from delegated engineers.

.2 Salt shed is to be located based on the attached drawings

.3 The structure shall be one of the following structural systems

.1 Gable-Symmetrical, continuous frame building with ridge in center of building. Rafters not to have interior columns.

.2 Mono-sloped structure, rafters not to have interior columns

.3 Alternative structures as pre-approved by PSPC

.4 Design of the building shall be in compliance with the current editions of the National Building Code of Canada and British Columbia Building Code. Where this specification or other references would prevent compliance with these codes, such a conflict shall be brought to the attention of the owner.

.5 Provide salt shed structure and enclosure to physical dimensions as indicated:

.1 28.0 m minimum (92') wide, clear span

.2 52.0 m minimum (170') clear length

.3 Minimum 12.2 m (40') clear height to eave, with a gable-type (or mono-sloped) roof or other alternative structures as pre-approved by PSPC.

.6 Provide a door opening on the endwall indicated on the drawings. Dimensions shall be as follows. No door is required.

.1 10.4 m (34') wide

.2 8.5 m (28') high

.7 Design Loads.

.1 The design engineer shall apply design loads as required by the governing codes

.2 Design loads include dead loads, floor live loads, roof live loads, roof snow loads, wind loads, seismic loads, collateral loads, auxiliary loads, floor live loads and any other specified loads as determined necessary by the engineer.

.3 Dead loads shall include lights and other fixtures installed by the contractor.

.4 A minimum collateral roof load of 0.25kPa shall be included in addition to snow and/or live loads. Collateral loads need not be applied to the roof decking or panels.

.8 Shed must be engineered to climatic conditions expected at the site and in accordance with the current editions of the National Building Code of Canada and the British Columbia Building Codes. The engineer shall be responsible for determining these loads.

.1 Climate data used shall be no less than that indicated on the included Environmental Design Criteria sheet for the site in question.

.9 Deflection Requirements

.1 Deflection limits shall be the more stringent of:

i. Recommended values in the current edition of the Canadian Institute for Steel Construction Handbook

ii. Recommended values in the current edition of the Metal Building Manufacturer's Association manual

iii. Requirements provided for in the specified design codes.

.2 Deflections and drifts shall not exceed that which can be accommodated by the cladding and building attachments.

.10 Thermal effects

.1 Design and assembly shall permit movement of components without buckling, failure of joint seals, undue stress on fasteners or other detrimental effects to the building when subject to thermal ranges present at the site in question

.2 Standing seam roof panels shall be free to move in response to the expansion and contraction forces resulting from temperature variation.

.11 Provide ventilation screens as shown on the contract drawings. Screens shall be no less than 1.25m x 1.25m in size and shall be of a material suitable for salt service.

.12 Provide lock blocks in the salt shed as indicated on drawings, fasten liner and complete with ¾ inch thick plywood fastened to the inside face. The contractor may reuse existing lock blocks if they are deemed to be in acceptable condition for reuse by the Departmental Representative. Refer to Section 02 41 13 – Selective Site Demolition for details of lock block reuse and disposal.

Where new lock blocks are required, they shall comply with the following requirements:

.1 Have a minimum compressive strength at 28 days of 20 MPa (verified by standard test cylinders with results conforming to CSA A23.1.17.6.7.2). Units shall be tagged to correlate with representative test results. Blocks manufactured from untraced waste concrete shall not be used.

.2 Be free of all cracks and other defects that would interfere with the placement, durability, and locking of the units. All shear keys shall be free of damage.

.3 Block dimensions shall be 0.75m in height, 0.75m in width and 1.50m in length. Allowable deviation from dimensions shall be +/-15mm in any direction.

.4 Blocks shall be provided with chamfered edges

.5 Lifting loops shall be designed to facilitate multiple lifts and shall be engineered to comply with WorkSafeBC requirements for lifting devices.

.13 The Salt Shed must be designed by a Professional Engineer registered in the Province of British Columbia. Contractor to provide engineered shop drawings of salt shed stamped, dated and signed by Professional Engineer.

.1 Provide all design calculations and design drawings to the Departmental Representative for review in accordance with Section 01 33 00 – Submittal Procedures.

1.3 Foundation Requirements

.1 Foundations shall be designed to support the salt shed. Design to be by a Professional Engineer registered in British Columbia.

.2 Foundations shall be designed based on geotechnical information provided in report titled Geotechnical Exploration Data Report, Fort Nelson Salt Shed, May 12, 2021

.3 Shallow foundations shall be founded below frost depth, unless otherwise indicated in the geotechnical report.

.4 All concrete works to be designed in accordance with the contract documents including Section 03 30 00 Cast In Place Concrete.

.5 Foundation shop drawings must be stamped and signed by the design Professional Engineer and submitted to the Departmental Representative for review. If the design Professional engineer for the foundation is not the coordinating

professional, then the coordinating professional is also to sign the documents to indicate the foundation design has been coordinated with the design of the rest of the structure.

.1 Provide all design calculations and design drawings to the Departmental Representative for review in accordance with Section 01 33 00 – Submittal Procedures.

.6 Contractor shall conduct concrete testing in accordance with Section 03 30 00 Cast In Place Concrete and provide results to the Departmental Representative if concrete is used in the foundation.

.7 The contractor shall select a suitable exposure class for the concrete used for salt shed foundations. Exposure class shall, at a minimum, include the chloride protection required for exposure class C1.

.7 Concrete compressive strengths for use in foundations shall be specified by the foundation engineer but shall not be no less than 25MPa at 28 days.

1.4 Delivery, Storage and Handling

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

.2 Delivery and acceptance requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and handling requirements:

.1 Store materials in accordance with manufacturer's recommendations.

.2 Store and protect fabricated components from damage.

.3 Replace defective or damaged materials with new.

1.5 Warranty

.1 Contractor warrants Work of this section is in accordance with the design and contract specifications for a period of 5 years.

1.6 Measurement and Payment Procedures

.1 Payment for the supply and install of Pre-engineered Salt Shed will be made on the basis of the Price per Unit Bid in the Bid and Acceptance Form. The Price per Unit Bid shall include all costs included with the work. Progress payments for this item will be entertained based on discussions with Departmental Representative at the pre-construction meeting.

PART 2 – PRODUCTS

2.1 Products

.1 Designer is responsible for the choice of materials and products unless otherwise specified.

.2 If the Contractor chooses to utilize treated wood in the design, it is to be in accordance with CSA 080-08 Wood Preservation.

PART 3 – EXECUTION

3.1 Examination

.1 Verify conditions of substrates previously installed are acceptable for salt shed installation in accordance with Design and manufacturer's instructions if applicable.

.1 Visually inspect substrate in presence of Departmental Representative.

.2 Inform Departmental Representative immediately of unacceptable conditions upon discovery.

.3 Proceed with salt shed installation only after unacceptable conditions have been remedied and receipt of written approval from Departmental Representative.

3.2 Foundation Installation

.1 Excavate required size and depth as determined in Design.

.2 Any concrete work for foundations to be in accordance with Section 03 30 00 Cast In Place Concrete.

3.3 Salt Shed Installation

.1 Salt shed to be assembled on site as determined in the Design and as stated in the erection plans which shall take into consideration coordination with Departmental Representative and highway maintenance to support highway maintenance requirements.

.2 Location to be as indicated in drawings attached to these specifications.

.3 The contractor is responsible for developing safe and reasonable erection plans. At in a minimum, these plans shall include the following:

.1 Fit members square against abutting components.

.2 Position members plumb, square, and level.

.3 Temporarily brace members until permanently fastened.

.4 Do not splice load bearing members.

.5 Align and adjust various members forming parts of a complete frame or structure after assembly but before fastening.

.6 Rigidly connect members using welds or bolts.

.7 Installation tolerances shall be no less than:

.1 Maximum variation from location: Plus or minus 6 mm (1/4 inch).

.2 Maximum variation from plane: 6mm in 3 m (1/4inch in 10 feet).

.4 Installation of metal panels

.1 Install in accordance with manufacturer's instructions and approved Shop Drawings.

.2 Install aligned, level, and plumb.

.3 Permanently fasten panels to supports in concealed locations. Exposed fasteners permitted on trim members only.

.4 Locate panel joints over supports.

.5 Lap end joints 100 mm (4 inches) minimum.

.6 Install trim to maintain visual continuity of system.

.7 Install joint sealers and gaskets to prevent water penetration.

.8 Flash penetrations through roofing with metal trim to match panels:

.1 Lap flashings over roof panels 300 mm (12 inches) minimum on all sides and seal with double bead of joint sealer.

.2 Install metal draw band and joint sealer at top of pipe penetrations, if any.

.3 Install water diverter at uphill side of square and rectangular penetrations.

3.4 Field Quality Control	.1	Coordinating Engineer shall verify compliance of work, in handling, installing applying, protecting and cleaning of product.
3.5 Cleaning	.1	Leave Work area clean at end of each day.
	.2	Upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 – Cleaning.
3.6 Waste Management	.1	Separate waste materials from salt shed fabrication and erection for reuse and recycling as necessary.
	2	Waste materials to be disposed of in accordance with Section 01 35 43 – Environmental Protection at landfills operating with all required provincial and environmental permits. Copies of Landfill's permits to be provided to the Departmental Representative five (5) days prior to initial disposal at landfill. Provide copies of certificates from landfill accepting each load of material indicating the quantity and general description of the materials accepted.

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL

1.1 General

.1 Work within this contract includes supply and installation all electrical components related to the new salt shed on Alaska Highway maintenance site located in Fort Nelson, BC.

.2 The word “Provide” shall mean “Supply and Install” the product and services indicated in the performance specifications herein.

1.2 Reference Codes, Standards and Guidelines

.1 The electrical systems for this facility shall be designed by a licensed Professional Engineer in conformance with all federal, provincial and municipal laws and regulations and shall conform to the latest edition or revision of the codes and standards of the following technical associations and organizations:

.1 CSA – Canadian Standards Association

.2 BC Building Code

.3 ULC – Underwriter's Laboratory of Canada

.4 Canadian Electrical Code (CEC), CSA-C22.1, latest edition and Provincial amendments and Bulletins.

.5 Provincial Electrical Safety Code

.6 Specific requirements listed in this document may exceed the minimum requirements stated in the codes, standards, etc. of the above organizations. The Design Build Contractor is advised that in all cases the most restrictive requirements shall apply.

1.3 Reference Drawings and Documents

.1 Design shall be based on the information contained in this specification. Design shall also be coordinated with the requirements of all other disciplines.

.2 Refer to Contract Drawing C101 for information related to proposed location of the building.

1.4 General Electrical Requirements

.1 General

.1 The Design Build Contractor shall include all design, documentation, labour, materials and equipment required for installing, testing and commissioning of electrical systems as detailed in all sub-sections of this Electrical Performance Specification.

.2 Existing Conditions: Investigate site and local conditions affecting work under this specification. Co-ordinate with Civil and Structural disciplines to ensure work can be performed in a seamless manner and without any interruption to the existing activities on site.

.3 Obtain approvals from Departmental Representative before commissioning systems and putting into service. System commissioning shall be performed in the presence of the Departmental Representative.

.4 Permits and Regulations: Obtain all regulatory permits and pay all fees for performing the work based on the approved final engineering drawings.

.5 Review approved drawings with Departmental Representative, and authorities having jurisdiction to ensure compliance with all applicable codes and bylaws.

.6 Submit drawings stamped and signed by a Professional Engineer registered in the Province of British Columbia who is taking responsibility for the design.

.2 Execution of Work

.1 Install all wiring and equipment neatly. Equipment installed improperly, to be removed and replaced at no cost to Departmental Representative.

.2 Protect and maintain work until all installation has been completed and accepted. Protect work against damage during installation. Cover with tarpaulins if necessary. Repair all damage to floor and wall surfaces resulting from carrying out work, without expense and to the satisfaction of the Departmental Representative.

.3 On completion of work, remove tools, surplus and waste material and leave work in clean, perfect condition.

.3 Voltage Utilization

.1 Electrical voltage shall be 120/240 VAC, 60 Hz, 1-phase, 3-wire.

.4 Laws, Rules, Ordinances, Permits, and Certifications

.1 Comply with requirements of the Electrical Supply Authority, the latest edition of the Canadian Electrical Code, with all Provincial and Municipal Laws, Rules and Ordinances, and to the satisfaction of those organizations having jurisdiction over same.

.2 Prepare and submit to the proper authorities all required drawings and obtain all necessary permits and pay all fees connected therewith.

.3 Be responsible for arranging, and pay all required fees, for inspection of the work by authorities having jurisdiction over same.

.4 Furnish certificates necessary as evidence that work installed conforms to the regulations of authorities having jurisdiction.

.5 Workmanship and Materials

.1 All equipment supplied under this contract shall be new and best of its respective kind, of uniform pattern throughout and be compatible with the environment in which it is located.

.6 Identification of Equipment

.1 Provide lamicoid label, black lettering on white background for all panelboards, disconnect switches, equipment cabinets, pull boxes, splitters, light switches and receptacles. All labels are to be fastened on to the devices using a 2-part epoxy; self-adhesive labels are not acceptable.

.2 Provide type written directory for any new panelboard or any existing panelboard that is affected during the work of this contract. All directories shall be securely mounted on the inside of the panel door and shall have a protective transparent cover.

.7 Copper Current Carrying Electrical Components

.1 All current carrying components of the electrical installation shall be copper. This shall include all conductors, bus work, interconnecting components, etc. No aluminum components will be allowed.

.8 Building Envelope Integrity

.1 Avoid penetrating through building envelope air barrier. Where penetrations are necessary, maintain the integrity of the air barrier using suitable materials and methods approved by building envelope contractor.

1.5 Requirements for Electrical Engineering

.1 General

.1 Electrical design and installation by Design-Build Contractor shall be coordinated by design and installation performed by other disciplines and submitted drawings shall clearly show such coordination.

.2 Drawings Requirements

.1 The construction drawings for submission shall include:

.1 Site plan

.2 Single Line diagram

.3 Details for underground conduits and wiring or cables (if any)

.4 Grounding details

.5 Luminaire schedule (on the drawings)

.6 Junction box and cabling installation details

1.6 Lighting

.1 Interior Lighting

.1 Provide high bay luminaires for interior of the building. Utilize aimable luminaires and install all in the middle section of ceiling structure for easy access. As an example, install three rows of luminaires; two rows to be aimed to the opposite sides of the space and one row to be aimed down for lighting middle section of the space. Refer to Contract Drawings C105 for an illustration of the example noted above.

.2 Maintained light level requirements: 5 footcandle Avg, 5:1 Max/Min and 3:1 Avg/Min. Submit a point-to-point lighting calculation c/w information for the proposed luminaire type for review.

.3 Lighting control shall be through a line voltage switch or switches adjacent to the building entrance. Provide suitable protection for light switch.

.4 All interior luminaires to be high efficiency LED type with rugged and durable construction, suitable for use in harsh environments and able to perform in temperatures as low as -40°C. Install luminaires as high as possible.

.5 All exterior lighting shall be 120 VAC.

.6 Provide one spare exterior luminaries.

1.7 Power

.1 Provide a weatherproof and lockable fused disconnect switch, rated 60A, 600Vac on the exterior wall of the building on the

side that is closest to proposed generator (confirm location of proposed generator with Departmental Representative prior undertaking the work).

.2 Provide wiring from the disconnect switch to a surface mounted panelboard with minimum of 12 circuits. Install the panelboard in a lockable aluminum cabinet to provide protection and locate as close as possible to the entrance. Panelboard to have minimum of three (3) spare 15A breakers. All breakers to be bolt-on type.

.3 Provide two (2) 30A GFCI receptacles each on a dedicated circuit immediately inside the building, one on either side of the entrance. Receptacles to be outdoor type c/w cover.

1.8 Wiring Methods

.1 Underground wiring, if any, is to be installed using RPVC conduit or in armored Teck cable. Transition to Rigid Galvanized Steel (RGS) conduit in exposed locations: e.g. where conduits or cables emerge from ground level slab. Provide warning tape in all trenches.

.2 All exterior wring installation shall be weatherproof, suitable for exterior installation and resistant to corrosion. All junction and pull boxes to be c/w gasket and cover. Utilize only weatherproof fittings. All wiring to be securely fastened to the building with appropriate CSA approved fasteners.

.3 Generally, use electrical metallic tubing (EMT) in the building interior and in above grade slabs except where subject to mechanical injury. EMT conduit fittings shall be steel type i.e. regular die-cast alloy fittings and couplings are not acceptable. Provide plastic bushings (insulated throat) for all connectors. Install pull boxes provided every 16 meters or less.

.4 Use RGS threaded conduit for all surface installations up to 1.5m [5’] above the slab.

.5 All wiring shall be RW90 copper, 600V rated with XLPE insulation. Minimum wire size shall be #12 gauge.

1.9 Outlet Boxes and Wiring Devices

.1 Surface mounted boxes shall be cast iron FS or FD with factory-threaded hubs and mounting feet. Sheet steel boxes with knockouts are not acceptable.

.2 All switches and receptacles shall be extra heavy-duty specification grade c/w metal heavy duty weatherproof cover.

1.10 Grounding and Bonding

.1 Grounding and bonding shall be installed in accordance with Canadian Electrical Code requirements.

.2 Ground wire shall be bare soft drawn, stranded copper.

.3 All conduit runs containing feeders and branch circuits shall be complete with an insulated green ground conductor bonded to all outlet boxes, junction boxes, equipment enclosures, etc. The conduit system shall be continuous but shall not be relied on to serve as the equipment grounding means.

.4 Multi conductor Teck cables shall utilize the integral ground conductor.

1.11 Seismic Restraints

.1 Provide restraint on all equipment, which is part of the building electrical services and systems, to prevent injury or hazard to persons and equipment in and around the structure. Restrain all such equipment in its normal position in the event of an earthquake. Restraints shall meet the requirements of the latest edition of BC Building Code and amendments.

.2 Contractor shall hire a professional structural engineer who specializes in the restraint of building elements and is registered with the local engineering association, herein referred to as the Seismic Engineer. Contractor shall allow for coordination, provision of seismic restraints, as well as all cost for the review services by the Seismic Engineer.

.3 After completion of the electrical installation, the Contractor's Seismic Engineer shall review the work and submit original signed National Building Code Letter of Assurance – Schedules B1, B2 and C-B – to the Departmental Representative.

1.12 Testing and Commissioning

.1 Provide testing and commissioning plan for review and acceptance by Departmental Representative. Testing and commissioning plan to include temporary energizing for testing purposes using Contractor's supplied generator or if available temporary connection to PSPC generator.

1.13 As-built Drawings and O&M Manuals

.1 At completion of construction, provide:

.1 CAD drafted as-built drawings to include:

.1 Size and routing of all conduits for main feeders and branch circuits including power and lighting.

.2 Number and size of conductors in raceways and cables.

.3 Location of all junction and pull boxes.

.4 Location of all devices, equipment and

luminaires.

.5 Location by accurate horizontal and vertical dimensions of the routes and terminations of all raceways and cables installed underground beyond the building.

.2 Operation and Maintenance Manuals to include:

.1 Technical and product data for all components used in the installation and name and addresses of the local suppliers.

.2 Approved shop drawings.

.3 Wiring and schematic diagrams.

.4 Spare parts list.

.5 Copies of warranties and certificates.

.3 The O & M manual shall be bound in a three "D-ring" hard back reinforced vinyl covered binder c/w index tab separators to divide the different sections. Provide three (3) hard copies of each as-built drawings and O & M manual. In addition, provide three (3) CDs containing all record as-built drawings and O & M manuals in pdf format.

1.14 Measurement and Payment Procedures

.1 Payment for Electrical shall not be made and shall be considered incidental to the applicable payment item of work.

PART 2 – PRODUCTS

2.1 Products Not Used

PART 3 – EXECUTION

3.1 Execution Not Used

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL:

1.1 References

1.2 Action and Informational Submittals

1.3 Delivery, Storage and Handling

1.4 Measurement and Payment Procedures

PART 2 – PRODUCTS:

2.1 Materials

2.2 Source Quality Control

PART 3 – EXECUTION:

3.1 Placement and Installation

3.2 Cleaning

PART 1 – GENERAL

1.1 References

.1 ASTM International

.1 ASTM D2487-17 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).

.2 ASTM D69l3/D69l3M-17 Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis.

1.2 Action and Informational Submittals

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

.2 Product Data:

.1 Submit printed product literature and data sheets for aggregate materials and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Samples:

.1 Submit 3 samples.

.2 Allow continual sampling by Departmental Representative during production.

.3 Provide Departmental Representative access to source and processed material for sampling.

.4 Install sampling facilities at discharge end of production conveyor, to allow Departmental Representative to obtain representative samples of items being produced. Stop conveyor belt when requested by Departmental Representative to permit full cross section sampling.

.5 Provide front end loader or other suitable equipment including trained operator for stockpile sampling as necessary. Move samples to storage place as directed by Departmental Representative.

.6 Supply new or clean sample bags or containers according appropriate to aggregate materials.

.7 Pay cost of sampling and testing of aggregates which fail to meet specified requirements.

.8 Provide water, electric power and propane to Departmental Representative laboratory trailer at production site.

.4 Sustainable Design Submittals:

.1 Construction Waste Management:

.1 Submit project Waste Management Plan highlighting recycling and salvage requirements.

.2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that minimum 50% of construction wastes were recycled or salvaged.

.2 Erosion and Sedimentation Control: submit copy of erosion and sedimentation control plan in accordance with authorities having jurisdiction.

1.3 Delivery, Storage, and Handling

.1 Transportation and Handling: handle and transport aggregates to avoid segregation, contamination and degradation.

.2 Storage: store washed materials or materials excavated from underwater 24 hours minimum to allow free water to drain and for materials to attain uniform water content.

1.4 Measurement and Payment Procedures

.1 Payment for Aggregate Materials shall not be made and shall be considered incidental to the applicable payment item of work.

PART 2 – PRODUCTS

2.1 Materials

.1 25mm minus and 50mm minus Open Graded Gravel.

.1 Aggregate quality: sound, hard, durable material free from soft, thin, elongated, or laminated particles, organic material, clay lumps or minerals, free from adherent coatings and injurious amounts of disintegrated pieces or other deleterious substances.

.2 Granular material shall be sourced from PSPC's Km 445 Gravel Pit, or other sources pre-approved by the Departmental Representative.

.2 Floor Sand

.1 Floor sand shall be a well graded material substantially free from clay lumps, organic matter, snow, ice, frozen material, and other extraneous material, and manufacturer/screened as necessary to achieve the required gradation.

.2 Floor Sand materials may be sourced from previously manufactured / screened material piles at PSPC's Km 445 Gravel Pit. Should the contractor choose to use an alternative source, the source shall be pre-approved by the Departmental Representative.

.3 Washed Gravel

.l Hard, durable particles, graded evenly in size from 25 to 9.5 mm, with no sharp edges, free from clay lumps, organic matter, snow, ice, frozen material, and other extraneous material. Materials may be provided from PSPC's Km 445 Gravel Pit.

.4 Gradation to be within limits specified when tested to ASTM C117. Sieve Size to BC Ministry of Transportation and Infrastructure Specifications.

.5 Table:

Sieve Size (mm)	Percent Passing			
	Floor Sand	25mm - minus	50mm - minus	Washed Gravel
75				
50			100	
37.5			75 - 100	
25		100		100
19		75 - 100	35 - 65	0 - 100
12.5	100			
9.5	90 - 100	30 - 63	5 - 35	0 - 5
6.3				
4.75	35 - 100	5 - 30	0 - 15	0
2.36	20 - 70	0 - 10	0 - 10	
1.18	13 - 15			
0.600	8 - 35			
0.300	5 - 25	0 - 8	0 - 8	
0.150	2 - 15			
0.075	2 - 6	0 - 5	0 - 5	

2.2 Source Quality Control;

.1 Inform Departmental Representative of proposed source of aggregates and provide access for sampling 4 weeks minimum before starting production.

.2 If materials from proposed source do not meet, or cannot reasonably be processed to meet, specified requirements, locate alternative source.

.3 Advise Departmental Representative 4 weeks minimum in advance of proposed change of material source.

.4 Acceptance of material at source does not preclude future rejection if it fails to conform to requirements specified, lacks uniformity, or if its field performance is found to be unsatisfactory.

PART 3 – EXECUTION

3.1 Placement and Installation

.1 Place granular base after underlying surface is inspected and approved in writing by Departmental Representative.

.2 Placing:

.l Construct granular base to depth and grade in areas indicated.

.2 Ensure no frozen material is placed

.3 Place material only on clean unfrozen surface, free from snow and ice.

.4 Begin spreading base material on crown line or on high side of one-way slope.

.5 Place material using methods which do not lead to segregation or degradation of aggregate.

.6 Place material to full width in uniform layers with thickness not exceeding the values indicated in the drawings.

.1 Departmental Representative may authorize thicker lifts (layers) if specified compaction can be achieved.

.7 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.

.8 Remove and replace that portion of layer in which material becomes segregated during spreading.

.9 During winter operations, prevent ice and snow from becoming mixed into stockpile or in material being removed from stockpile.

3.2 Cleaning

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.3 Leave aggregate stockpile site in tidy, well drained condition, free of standing surface water.

.4 Leave any unused aggregates in neat compact stockpiles as directed by Departmental Representative.

.5 Waste Management: separate waste materials for reuse or recycling.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

.6 For temporary or permanent abandonment of aggregate source, restore source to condition meeting requirements of authority having jurisdiction.

.7 Restrict public access to temporary or permanently abandoned stockpiles by means acceptable to Departmental Representative.

END OF SECTION

SECTION INCLUDES

PART 1 – GENERAL

1.1 Action and Informational Submittals

1.2 Quality Assurance

1.3 Waste Management and Disposal

1.4 Existing Conditions

1.5 Measurement and Payment Procedures

PART 2 – PRODUCTS:

2.1 Materials

PART 3 – EXECUTION:

3.1 Site Preparation

3.2 Preparation/Protection

3.3 Stripping of Topsoil

3.4 Stockpiling

3.5 Dewatering and Heave Prevention

3.6 Excavation

3.7 Fill Types and Compaction

3.8 Bedding and Surround of Underground Services

3.9 Backfilling

3.10 Hand Seed

3.11 Restoration

1.1 Action and Informational Submittals

.l Make submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Quality Control: in accordance with Section 01 45 00 - Quality Management:

.1 Submit condition survey of existing conditions as described in EXISTING CONDITIONS article of this Section.

.2 Submit to Departmental Representative written notice at least 7 days prior to excavation work, to ensure cross sections are taken.

.3 Submit to Departmental Representative written notice when bottom of excavation is reached.

.4 Submit to Departmental Representative inspection results as described in PART 3 of this Section.

.3 Preconstruction Submittals:

.1 Submit construction equipment list for major equipment to be used in this section prior to start of Work.

.2 records of underground utility locates, indicating: location plan of existing utilities as found in field.

.4 Samples:

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

.2 Contractor has option to use the granular material provided at PSPC's Km 445 Gravel Pit.

.3 Submit 70 kg samples of type of fill specified including representative samples of excavated material.

.4 Ship samples prepaid to Departmental Representative, in tightly closed containers to prevent contamination and exposure to elements.

1.2 Quality Assurance

.1 Qualification Statement: submit proof of insurance coverage for professional liability.

.2 Where Departmental Representative is employee of Contractor, submit proof that Work by Departmental Representative is included in Contractor's insurance coverage.

.3 Submit design and supporting data at least 2 weeks prior to beginning Work.

.4 Design and supporting data submitted to bear stamp and signature of qualified professional engineer registered or licensed in Province of British Columbia, Canada.

.5 Keep design and supporting data on site.

.6 Do not use soil material until written report of soil test results are approved by Departmental Representative.

.7 Health and Safety Requirements:

.1 Perform construction occupational health and safety in accordance with Section 01 35 33 – Health and Safety Requirements.

1.3 Waste Management and Disposal

.1 Separate waste materials for reuse or recycling.

.2 Divert excess aggregate materials from landfill to local recycling facility for reuse as directed by Departmental Representative.

1.4 Existing Conditions

.1 Buried services:

.1 Before commencing work establish location of buried services on and adjacent to site.

.2 Remove obsolete buried services within 2 m of foundations: cap cut-offs.

.3 Confirm locations of buried utilities by careful soil hydrovac methods.

.4 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered.

.5 Where utility lines or structures exist in area of excavation, obtain direction of Departmental Representative before removing. Costs for such Work to be paid by Departmental Representative.

.6 Record location of maintained, re-routed and abandoned underground lines.

.7 Confirm locations of recent excavations adjacent to area of excavation.

.2 Existing buildings and surface features:

.1 Conduct, with Departmental Representative, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, rail tracks, pavement, survey benchmarks and monuments which may be affected by Work.

.2 Protect existing buildings and surface features from damage while Work is in progress. In event of damage, immediately make repair as directed by Departmental Representative.

.3 Where required for excavation, cut roots or branches as directed by Departmental Representative.

1.5 Measurement and Payment Procedures

.1 Payment for Excavating, Trenching and Backfilling will not be made and shall be considered incidental to the applicable payment item of work.

PART 2 - PRODUCTS

2.1 Materials

.1 Granular Material: to Section 31 05 16 - Aggregate Materials.

.2 Geotextiles: to Section 31 32 19.01 - Geotextiles.

.3 Geomembrane: to Section 31 32 19.02 - Geomembranes.

.4 Compacted Backfill: selected material from excavation or other sources, to be confirmed by Design - Builder.

PART 3 - EXECUTION

3.1 Site Preparation

.1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.

3.2 Preparation/Protection

.1 Protect existing features in accordance with applicable local regulations.

.2 Keep excavations clean, free of standing water, and loose soil.

.3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Departmental Representative approval.

.4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.

.5 Protect buried services that are required to remain undisturbed.

3.3 Stripping of Topsoil

.1 Begin topsoil stripping of areas after area has been cleared of brush, weeds, and grasses and removed from site.

.2 Strip topsoil to depths as directed by Departmental Representative.

.1 Do not mix topsoil with subsoil.

.3 Stockpile in locations as directed by Departmental Representative

.1 Stockpile height not to exceed 2 m and should be protected from erosion.

.4 Dispose of unused topsoil as directed by Departmental Representative.

3.4 Stockpiling

.1 Stockpile fill materials in areas designated by Departmental Representative.

.1 Stockpile granular materials in manner to prevent segregation.

.2 Protect fill materials from contamination.

.3 Implement sufficient erosion and sediment control measures to prevent sediment release off construction boundaries and into water bodies.

3.5 Dewatering and Heave Prevention

.1 Keep excavations free of water while Work is in progress.

.2 Provide for Departmental Representative details of proposed dewatering or heave prevention methods, including dikes, well points, and sheet pile cut-offs.

.3 Avoid excavation below groundwater table if quick condition or heave is likely to occur.

.1 Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut-offs, or other means.

.4 Protect open excavations against flooding and damage due to surface run-off.

.5 Dispose of water in accordance with Section 01 35 43 - Environmental Procedures and in manner not detrimental to public and private property, or portion of Work completed or under construction.

.1 Provide and maintain temporary drainage ditches and other diversions outside of excavation limits.

.6 Provide flocculation tanks, settling basins, or other treatment facilities to remove suspended solids or other materials before discharging to storm sewers, watercourses or drainage areas.

3.6 Excavation

.1 Advise Departmental Representative at least 7 days in advance of excavation operations for initial cross sections to be taken.

.2 Excavate to lines, grades, elevations and dimensions as indicated.

.3 Do not disturb soil within branch spread of trees or shrubs that are to remain.

.l If excavating through roots, excavate by hand and cut roots with sharp axe or saw.

.4 Keep excavated and stockpiled materials safe distance away from edge of trench as directed by Departmental Representative.

.5 Restrict vehicle operations directly adjacent to open trenches.

.6 Dispose of surplus and unsuitable excavated material in approved location on site.

.7 Do not obstruct flow of surface drainage or natural watercourses.

.8 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.

.9 Notify Departmental Representative when bottom of excavation is reached.

.10 Obtain Departmental Representative approval of completed excavation.

.11 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth as directed by Departmental Representative.

.12 Hand trim make firm and remove loose material and debris from excavations.

.1 Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.

.2 Clean out rock seams and fill with concrete mortar or grout to approval of Departmental Representative.

.13 Install geotextiles in accordance with Section 31 32 19.01 - Geotextiles.

.14 Install geomembrane in accordance with Section 31 32 19.02 - Geomembranes.

3.7 Fill Types and Compaction

.1 Use types of fill as indicated in the drawings.

3.8 Bedding and Surround of Underground Services

.1 Bedding material shall consist of hard durable particles free from clay lumps, cementation, organic material, frozen material and other deleterious materials.

.2 Gradation to be within limits specified when tested to ASTM C117. Sieve Size to BC Ministry of Transportation and Infrastructure Specifications. Refer to Section 31 05 16 – Aggregate Materials.

3.9 Backfilling

.1 Do not proceed with backfilling operations until completion of following:

.1 Departmental Representative has inspected and approved installations.

.2 Departmental Representative has inspected and approved of construction below finish grade.

.3 Inspection, testing, approval, and recording location of underground utilities.

.2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.

.3 Do not use backfill material which is frozen or contains ice, snow or debris.

.4 Place backfill material in uniform layers with loose thickness lifts not exceeding the values indicated in the engineering drawings. Compact each layer before placing succeeding layer.

.5 Backfilling around installations:

.1 Place bedding and surround material as specified elsewhere.

.2 Do not backfill around or over cast-in-place concrete within 24 hours after placing of concrete.

.3 Place layers simultaneously on both sides of installed Work to equalize loading.

.6 Compaction Equipment:

.1 Ensure compaction equipment is capable of obtaining required material densities.

.7 Compacting:

.1 Compact to density not less than percentage provided on the engineering drawing. The method of compaction to be employed may be selected by the Contractor, but shall be approved by Departmental Representative.

.2 Shape and roll alternately to obtain smooth, even and uniformly compacted base.

.3 Apply water as necessary during compacting to obtain specified density.

.4 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved in writing by Departmental Representative.

.8 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.10 Hand Seed

.1 Hand seed grass mix on all disturbed areas around the perimeter of the Salt Shed as directed by the Departmental Representative. Seed mix shall be pre-approved by the Departmental Representative.

3.11 Restoration

.1 Upon completion of Work, remove waste materials and debris, trim slopes, and correct defects as directed by Departmental Representative.

.2 Clean and reinstate areas affected by Work as directed by Departmental Representative

END OF SECTION

SECTION INCLUDES

PART 1 - GENERAL

1.1 References.

1.2 Action and Informational Submittals.

1.3 Delivery, Storage and Handling.

1.4 Measurement and Payment Procedures.

PART 2 – PRODUCTS:

2.1 Materials.

PART 3 – EXECUTION:

3.1 Examination.

3.2 Installation.

3.3 Cleaning.

3.4 Protection.

1.1 References

.1 ASTM International

.1 ASTM A123/A123M-17, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.2 ASTM D4491-09, Standard Test Methods for Water Permeability of Geotextiles by Permittivity.

.3 ASTM D4533-15, Standard Test Method for Trapezoid Tearing Strength of Geotextiles.

.4 ASTM D4632-15, Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.

.5 ASTM D6241-14, Standard Test Method for Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe.

.6 ASTM D4751-04, Standard Test Method for Determining Apparent Opening Size of a Geotextile.

.2 CSA International

.1 CSA G40.20/G40.21-04 (R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

1.2 Action and Informational Submittals

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for geotextiles and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Samples:

.1 Submit following samples 4 weeks prior to beginning Work.

.1 Minimum length of 2 m of roll width of geotextile.

.2 Methods of joining.

.4 Test and Evaluation Reports:

.1 Submit copies of mill test data and certificate at least 4 weeks prior to start of Work.

1.3 Delivery, Storage and Handling

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

.2 Storage and Handling Requirements:

.1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect geotextiles from direct sunlight and UV rays.

.3 Replace defective or damaged materials with new.

.3 Packaging Waste Management: remove for reuse and return by manufacturer of packaging materials.

1.4 Measurement and Payment Procedures

.1 Payment for Geotextiles will not be made and shall be considered incidental to the applicable payment item of work.

PART 2 - PRODUCTS

2.1 Materials

.1 Geotextile: woven and non-woven synthetic fibre fabric, supplied in rolls.

.1 Composed of: minimum 85% by mass of polypropylene or polyester.

.2 Physical properties:

.1 Tensile strength and elongation (in any principal direction): to ASTM D4632.

.1 Tensile strength: minimum 801 N.

.2 Elongation: minimum 50% for nonwoven and 15% for woven geotextile.

.2 CBR Puncture Strength: to ASTM D6241, minimum 2047 N.

.3 Trapezoidal Tear: to ASTM D4533, minimum 334 N.

.3 Hydraulic properties:

.1 Apparent opening size (AOS): to ASTM D4751, minimum 0.212 Mm (US Sieve).

.2 Permittivity: to ASTM D4491, 1.5 pers for nonwoven and 0.05 pers for woven geotextile.

.4 Securing pins and washers: to CSA G40.21, Grade 300W, hot- dipped galvanized with minimum zinc coating of 600 g/m2to ASTM A123/A123M.

.5 Factory seams: sewn in accordance with manufacturer's recommendations.

.6 Thread for sewn seams: equal or better resistance to chemical and biological degradation than geotextile.

PART 3 - EXECUTION

3.1 Examination

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for geotextile material installation in accordance with the manufacturer's written instructions.

.1 Visually inspect substrate in presence of Departmental Representative.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 Installation

.1 Place geotextile material by unrolling onto graded surface in orientation, manner and locations indicated and retain in position with securing pins.

.2 Place geotextile material smooth and free of tension stress, folds, wrinkles and creases.

.3 Place geotextile material on sloping surfaces in one continuous length from toe of slope to upper extent of geotextile.

.4 Overlap each successive strip of geotextile 600 mm over previously laid strip.

.5 Pin successive strips of geotextile in accordance with manufacturer's instruction.

.6 Protect installed geotextile material thorn displacement, damage or deterioration before, during and after placement of material layers.

.7 After installation, cover with overlying layer within 4 hours of placement.

.8 Replace damaged or deteriorated geotextile to approval of Departmental Representative.

.9 Place and compact soil layers in accordance with Section 31 23 33.01 – Excavating, Trenching and Backfilling.

3.3 Cleaning

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.3 Waste Management: separate waste materials for recycling.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.4 Protection

.1 Vehicular traffic not permitted directly on geotextile.

END OF SECTION

SECTION INCLUDES

PART 1 - GENERAL

1.1 References

.1 ASTM International.

.1 ASTM D1004-13 Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting.

.2 ASTM D1505 — 10, Standard Test Method for Density of Plastics by the Density-Gradient Technique.

.3 ASTM D1603-06, Standard Test Method for Carbon Black in Olefin Plastics.

.4 ASTM D4833/D4833M-07 (2013) e1 Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products.

.5 ASTM D5199-12 Standard Test Method for Measuring the Nominal Thickness of Geosynthetics.

.6 ASTM D5885/D5885M-17 Standard Test Method for Oxidative Induction Time of Polyolefin Geosynthetics by High-Pressure Differential Scanning Calorimetry.

.7 ASTM D6693/D6693M-04 (2015) e1 Standard Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes.

1.2 Action and Informational Submittals

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for geomembranes and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of British Columbia, Canada.

.2 Submit shop drawings and indicate installation layout, dimensions and details, including fabricated and field seams, anchor trenches and protrusion details.

.4 Samples:

.1 Submit 4 weeks minimum before beginning Work samples as follows:

.1 Minimum 2 m length of standard width membrane.

.2 Minimum of 1 m seam with at least 300 mm of membrane on both sides of seam.

.4 Certificates:

.1 Submit 2 copies of manufacturer's mill test data at least 4 weeks before start of Work.

.2 Submit certificates, including test results 2 weeks before delivery to job site.

1.3 Quality Assurance

.1 Test quality of resin and membrane to ensure consistency of raw material and geomembrane quality in accordance with manufacturer's recommendations.

.2 Test seams in strength and peel at beginning of each searing period, and at least once every 4 hours if welding operation is interrupted, for each seaming apparatus and seamer used that day.

.1 Also test at least two samples from each panel, with samples taken from extra material, such that panel is not damaged and blanket geometry is not altered.

.3 If seam test specimen fails in seam, repeat on new specimen.

.1 If new specimen fails in seam, material will not be used for seaming until deficiencies are corrected and two consecutive successful test seams are achieved.

.4 Test seams by non-destructive methods over their full length, using vacuum test unit or air pressure test.

.1 Vacuum chamber to contain glass viewport and seal for sealing chamber to seam area. With chamber sealed in place and after partly filling chamber with water, apply vacuum of 17.2 kPa. Seam failure is detected by presence of air bubbles through water.

.2 Use air lance to apply air at 343 kPa through nozzle directed at edge of overlap seam. Seam failure is indicated by inflation or lifting of any part of geomembrane.

.5 Provide test results to Departmental Representative, for each shift's production, including documentation of non-destructive testing and repairs at end of each shift.

1.4 Delivery, Storage and Handling

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

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 During delivery and storage, protect geo-membranes from direct sunlight, ultraviolet rays, excessive heat, mud, dirt, dust, debris and rodents.

.4 Storage and Handling Requirements:

.1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, well-ventilated area.

.2 Replace defective or damaged materials with new.

.5 Develop Construction Waste Management Plan related to Work of this Section.

.6 Packaging Waste Management: Remove from site and dispose of all packaging materials at appropriate recycling facilities. Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard packaging material for recycling. Fold up metal banding, flatten and recycle.

1.5 Measurement and Payment Procedures

.1 Payment for Geomembranes will not be made and shall be considered incidental to the applicable payment item of work.

PART 2 - PRODUCTS

2.1 Materials

.1 Geomembrane:

.1 If required, new materials are to match existing. Existing materials are understood to be Nilex PVC 30 or similar. The contractor is responsible for verifying this understanding.

.2 The contractor shall be responsible for verifying adequacy and compatibility of seams or other joins to the existing material.

.3 Seams: welded in accordance with manufacturer's recommendations. Manufacturer’s recommendations shall be provided to the owner for approval prior to execution

.1 Seaming shall be performed by a contractor with a minimum of three years of experience in seaming of similar liner materials.

PART 3 - EXECUTION

3.1 General

.1 Extent of work shall be determined based on contractor’s work plan. If existing membrane is fully protected, no work in this section is required. If limited scope repairs are required, work plans shall be developed for review by the owner using the below as a guide.

3.2 Examination

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or

Contracts are acceptable for geomembranes installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Departmental Representative.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.3 Installation

.1 Maintain area of installation free of water and snow accumulations.

.2 Prepare excessively soft supporting material as directed by Departmental Representative.

.3 Do not proceed with panel placement and seaming when ambient temperatures are below minus 5 degrees C or above 40 degrees C, during precipitation, in presence of excessive moisture (i.e. fog, dew), nor in presence of high winds.

.4 Place and seam panels in accordance with manufacturer's recommendations on graded surface in orientation and locations indicated. Minimize wrinkles, avoid scratches and crimps to geomembranes and avoid damage to supporting material.

.5 Protect installed membrane from displacement, damage or deterioration before, during and after placement of material layers.

.6 Place a layer of protecting Nonwoven Geotextile, in accordance with Section 31 32 19.01 — Geotextiles, for cushioning top and bottom of the Geomembrane.

.7 Replace damaged, torn or permanently twisted panels to approval of Departmental Representative. Remove rejected damaged panels from site.

.8 Keep field seaming to minimum. Locate field seams up and down slopes, with no horizontal field seam less than 1.5 m beyond toe of slope.

.9 Keep seam area clean and free of moisture, dust, dirt, debris and foreign material.

.10 Make field seam samples in accordance with manufacturer’s requirements on fragment pieces of geo-membrane and test to

verify that seaming conditions are adequate.05 12 23

.11 Test field seams as seaming work progresses by non-destructive methods over their full length. Repair seams which do not pass non-destructive test. Reconstruct seam between failed location and any passed test location, until non-destructive testing is successful.

.12 Repair minor tears and pinholes by patching until non-destructive testing is successful. Patches to be round or oval in shape, made of same geomembrane material, and extend minimum of 75 mm beyond edge of defect.

3.4 Cleaning

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.3 Waste Management: Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.5 Protection

.1 Do not permit vehicular traffic directly on membrane.

END OF SECTION

R.113313.001
Appendix A

Written Communication / Document Management Protocol

Alaska Highway Fort Nelson Salt Shed Replacement Km 445 Project: Written Communication / Document Management Protocol

Communication for the Fort Nelson Salt Shed Replacement Km 445, Alaska Highway, BC Project (R. 113313.001) will occur using CentraCollab, email, telephone, and through the delivery of hardcopy documents (if requested by PSPC). CentraCollab will act as the primary communication and document management tool throughout the project. It will act as the central file storage location for all project documents, allows for retrieval of these documents at any time during the project by group members and is capable of storing and sharing large electronic files.

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

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

CentralCollab

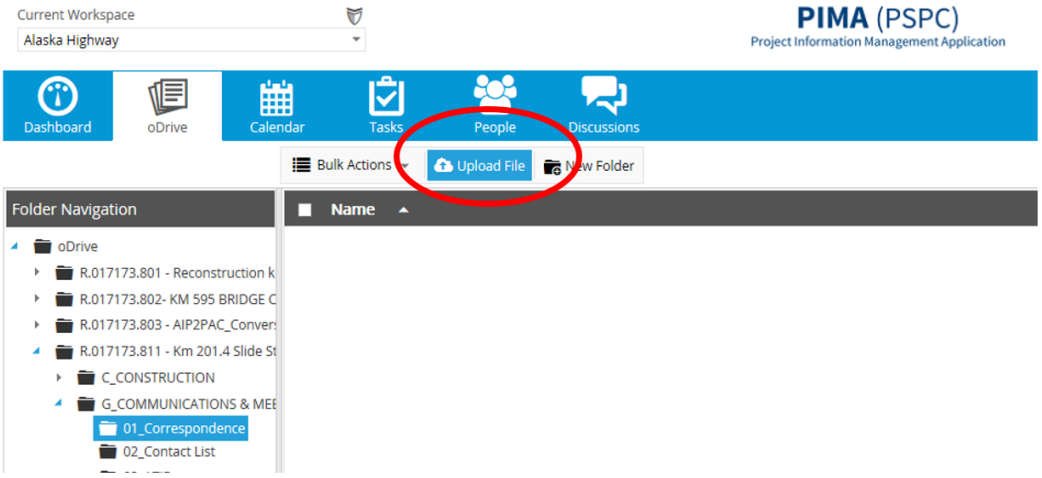
CentralCollab is a web-based collaborative platform that is used to submit and store project documentation. It is the responsibility of the submitting party to upload documents to CentralCollab in the correct folder and with the correct file naming convention.

CentralCollab can be accessed at the following address: https://app.centralcollab.com/
The contractor is encouraged to have CentralCollab accounts for project team members who are involved with accessing or posting project documentation. Accounts can be created by PSPC throughout the project by contacting the PSPC project team.

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

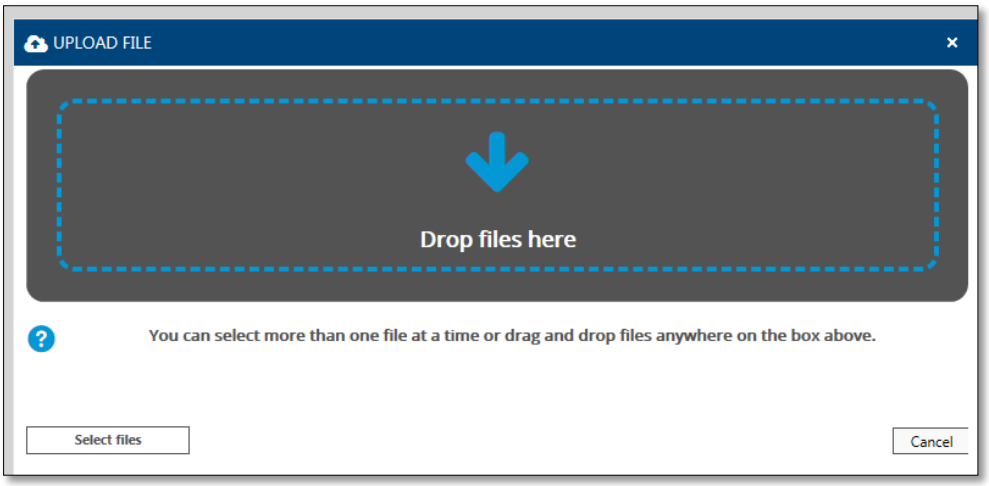
1 Uploading to CentralCollab

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

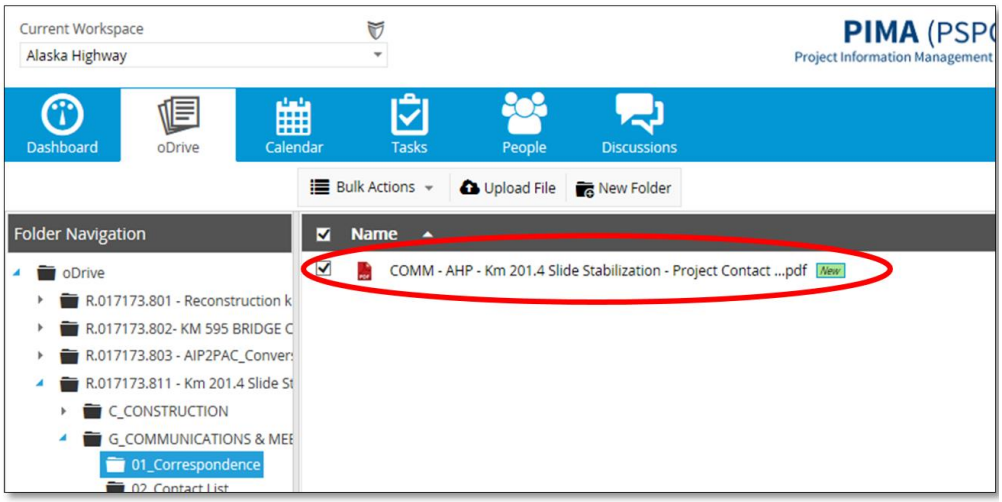


Drag and drop your document(s), then press Save.

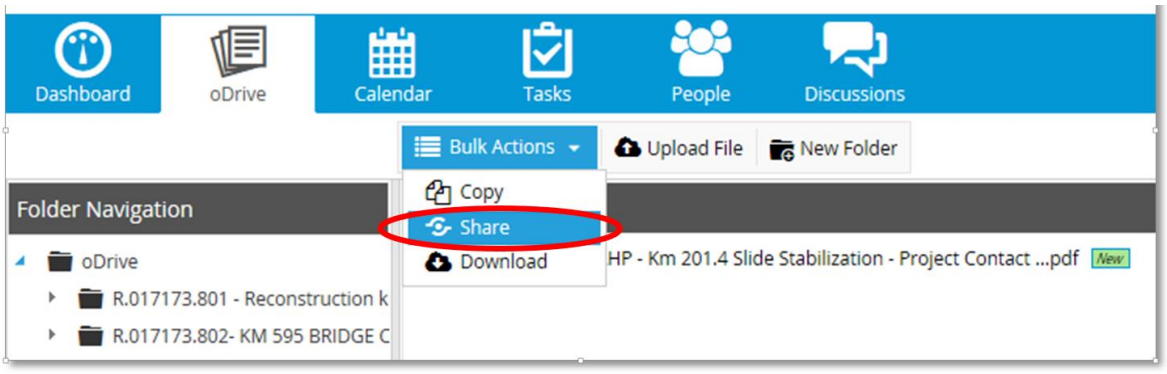
NOTE: Make sure you have named your document correctly, as explained in Section 2.2 CentralCollab File Naming Convention.



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

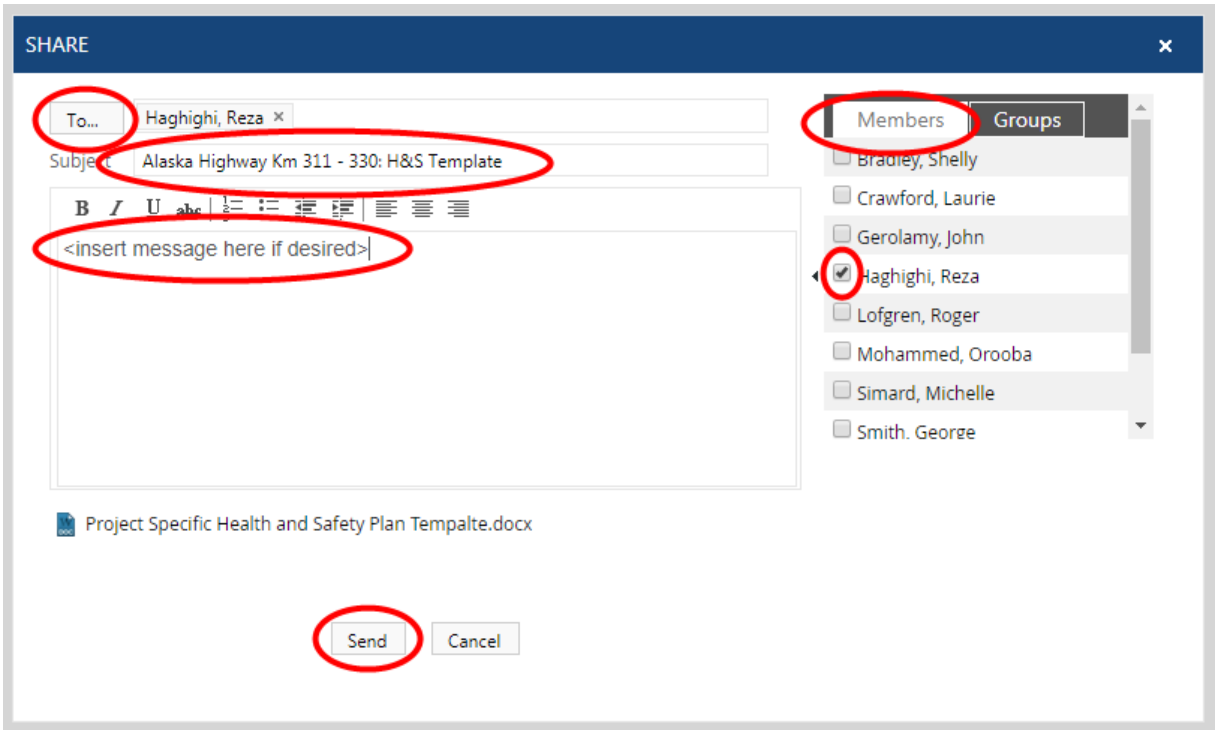


To **notify members** of the new document, check the box next to the document √ then click **Bulk Actions > Share** :

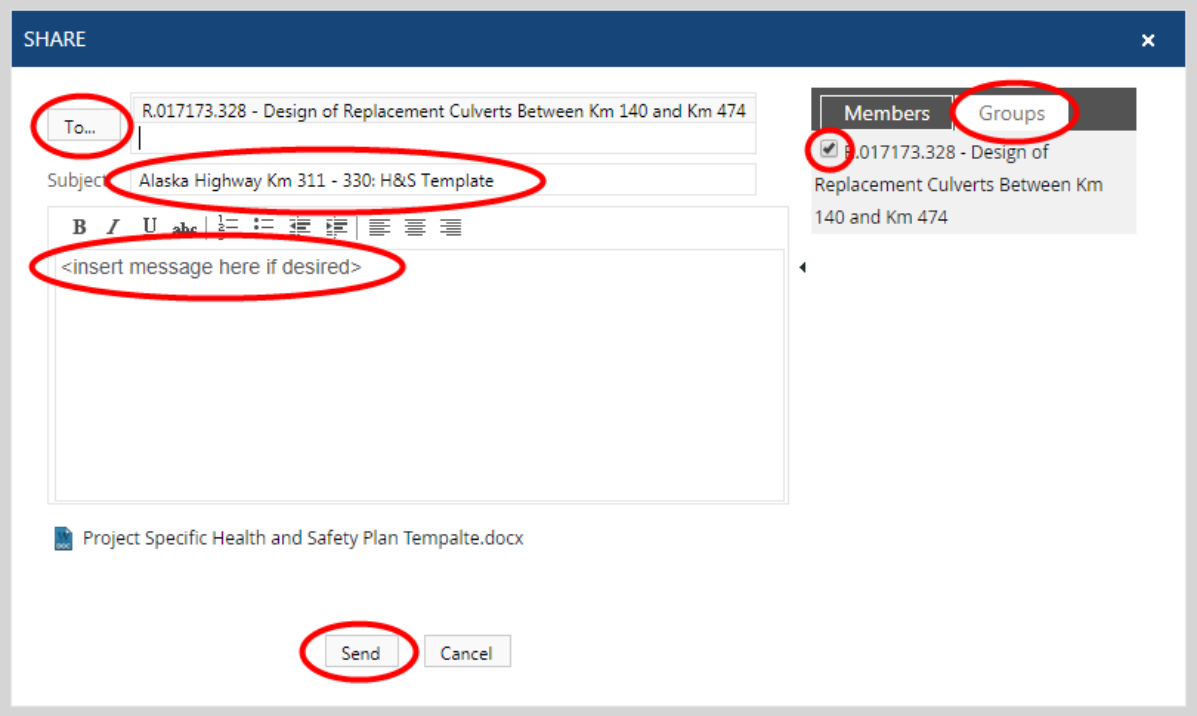


Once the new window opens, select **To,** and then select the **Members** tab and all Members from whom you wish to notify (as directed during the pre-construction meeting or otherwise by PSPC) or select the **Groups** tab and select the pre-set group:

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 be provided 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 – Fort Nelson Salt Shed Replacement Km 445 Project– File Description or Document Name – YYYY MM DD

Example file names:

- Plan – AHP – Fort Nelson Salt Shed Replacement Km 445 Project – Quality Management Plan – 2017 02 15
- Schedule – AHP – Fort Nelson Salt Shed Replacement Km 445 Project – Project Schedule – 2017 02 20
- Finance – AHP – Fort Nelson Salt Shed Replacement Km 445 Project – Progress Payment 01 – 2017 02 26

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

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

3. CentralCollab Folder Arrangement:

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

Table 2: Common Document Filing / Folder Locations	
Folder Names	**Description of Typical Documents**
CentralCollab folder: R.113313.001– Fort Nelson Salt Shed Replacement Km 445 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)

Table 2: Common Document Filing / Folder Locations	
Folder Names	**Description of Typical Documents**
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
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

Table 2: Common Document Filing / Folder Locations	
Folder Names	**Description of Typical Documents**
	• Check Sheets • Daily Reports • NCR's
CentralCollab folder: R.113313.001– Fort Nelson Salt Shed Replacement Km 445 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.113313.001– Fort Nelson Salt Shed Replacement Km 445 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.113313.001
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;*
- *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>

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

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

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

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

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

5.2 Hazards Materials

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

5.3 Job Specific Safe Work Procedures

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

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 – Contract Asset Performance Manager, Alaska Highway	250.774.6956	250.321.0174	600.700.0131
XXX – Onsite Inspection and QA Representative			

9.2 Emergency Response Agencies/Assistance

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

Agency/Assistance	**Contact**
RCMP	911
Local Police – Fort Nelson (emergency)	250.774.2777
Local Police – Fort Nelson (non-emergency)	250.774.2700
BC Ambulance (BC Emergency Health Services)	911 / 1.800.461.9911 / 250.374.5937
Ambulance – Fort Nelson	250.774.2344
S.T.A.R.S Ambulance	1.888.888.4567

Hospitals		
Local Hospital – Fort Nelson		250.774.8100
Fire and Rescue		911
Fire and Rescue – Fort Nelson (emergency)		250.774.2222
Fire and Rescue – Fort Nelson (non-emergency)		250.774.3955
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:	
Location:	
Date:	
Name of Departmental Representative:	
Name of Client:	
Name of Client Project Co-ordinator	George Smith PH: 250.774.6956

Site Specific Orientation Provided at Project Location **Yes** ☐ **No** ☐

Notice of Project Required **Yes** ☐ **No** ☐

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

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

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

TYPES OF HAZARDS TO CONSIDER	Potential Risk for:				COMMENTS
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 Worksafe B.C. Occupational Health and Safety Regulations and *Worker's Compensation Act*

Name of Project: Fort Nelson Salt Shed Replacement Km 445, Alaska Highway, BC

Owner: Public Services and Procurement Canada

Contractor: _____

Consulting Engineer: Tetra Tech Canada Inc.

	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

<provided by the Contractor>

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*>

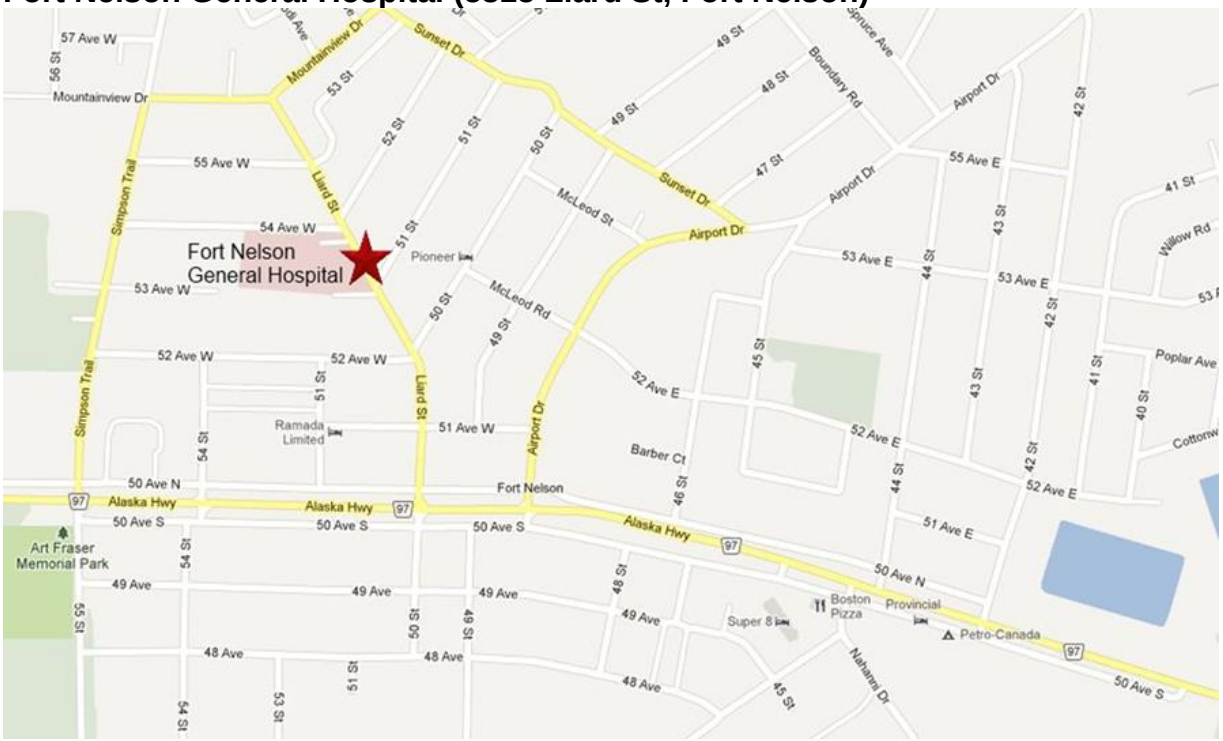
Appendix 7: Key Member Resumes and Safety Certifications

<*provided by the Contractor*>

Appendix 8: Local Hospital Maps

<remove unnecessary maps>

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



Directions

<If Project Site South of Fort Nelson>

<Head Northbound on the Alaska Highway

Turn Right onto Liard St.>

<If Project Site North of Fort Nelson>

<Head Southbound on the Alaska Highway

Turn Left onto Liard St.>

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

R.113313.001
Appendix C

On-site Construction Start-up Form

Public Services and Procurement Canada | Services publics et Approvisionnement Canada

On-site Construction Start-up Form

Project Name:	Fort Nelson Salt Shed Replacement Km 445, Alaska Highway, BC
Project Number:	R.113313.001
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	☐		
Cash Flow Plan	☐		
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: _____

R.113313.001
Appendix D

Progress Payment Submittal Form

Progress Payment Submittal Form

Project Name:	Fort Nelson Salt Shed Replacement Km 445, Alaska Highway, BC
Progress Payment Number:	113313.001
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:_____

R.113313.001
Appendix E

General Contractor & Sub-Contractor
Construction Equipment List

Public Services and Procurement Canada | Services publics et Approvisionnement Canada

General Contractor & Sub-Contractor Construction Equipment List

Project Name: Fort Nelson Salt Shed Replacement Km 445, Alaska Highway, BC

Project Number: R.113313.001

General Contractor: _____ Sub-Contractors: _____

Owner of Equipment (General Contractor / Sub-Contractor)	Equipment Model and Size	Quantity	Brand	Equipment Manufacture Year	Additional Comments

R.113313.001
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	Fort Nelson Salt Shed Replacement Km 445, Alaska Highway, BC
Project Description	
Project Type	
Comments	

Issued By	Document Type	Yes	No	N/A
PSPC Responsibility				
Federal				
DFO - Fisheries Act http://laws.justice.gc.ca/en/F-14/	Section 35(2) Authorization for Harmful Alteration Disruption or Destruction (HADD) to fish habitat (Eg. new bridges that are not clear span; erosion protection works that extend into the river channel).			
	Section 32 Authorization for Destruction of Fish (when explosives are used). Protects fish from being destroyed except by fishing or as Authorized by DFO.			
	Section 20 Approval – The Need for Safe Fish Passage – Every obstruction across or in any stream where DFO determines it necessary that a fish-pass should exist requires either a fish way or canal around the obstruction.			
	Notification process required for culverts and those works that fall under DFO Operational Statements. Stream Crossings by Roads: • Clear Span Bridges • Temporary Ford Stream Crossing • Ice Bridges and Snow Fills • Bridge Maintenance • Maintenance of Riparian Vegetation in Existing Rights-of Way			
	Section 36 – under this Section of the Fisheries Act the proponent can be FINED resulting from deposition of substances deleterious to fish in waters frequented by fish – this includes release of silt laden waters from construction activities.			

Transport Canada NWPA http://laws.justice.gc.ca/en/N-22/text.html	Section 5(1) Formal Approval for construction of new structures (new bridges, culverts, scour protection).			
	Section 5(2) Work Assessment for work resulting in insignificant impacts on navigability.			
	Section 6(4) Formal Approval for existing structures (existing bridges).			
	Minor Works and Waters Order – This is an amendment to the NWPA that streamlines the federal review process by establishing classes of waters and works (projects) that do not require an Application or Approval through the NWPP because they are "minor" in nature. These would include such “works” as repairs to riprap (no groynes) or “waters” that are not large enough for vessel traffic (ie. Contact Creek). http://www.tc.gc.ca/eng/marinesafety/oep-nwpp-minorworks-menu-1743.htm			
Indian and Northern Affairs Canada – Indian Act	Approval for activities on lands under their jurisdiction. This is addressed under the EA review process in most cases. If the project is exempt from an EA it must be addressed by the PM or ES personnel.			
Migratory Birds Convention Act (MBCA)	Environment Canada is responsible for implementing the *Migratory Birds Convention Act*, which provides for the protection of migratory birds through the *Migratory Birds Regulations*. This is addressed under the EA review process in most cases. If the project is exempt from and EA it must be addressed by the PM or ES personnel.			
ECMP	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 FrontCounter BC at MoE who then send off to the appropriate departments for approval/notification/permitting – this does not apply to the archaeological.**				
Wildlife Act – WLAP – MoE http://www.qp.gov.bc.ca/statreg/stat/W/96488.01.htm	Wildlife Act – Section 34 – Birds, Nests and Eggs – vegetation clearing should not occur during critical bird nesting periods, which typically occur in the spring and summer. Contact the local WLAP for vegetation clearing timing windows.			
Water Act - Water Stewardship Division - Ministry of Forests, Lands, Natural Resource Operations, and Rural Development	Section 11 – regulates changes in or about a stream and ensure that water quality, riparian habitat, and the rights of licensed water users are not compromised. This is an approval process and takes approximately 140 days. An application fee is also required. Works requiring approval include channel realignment, retaining wall or bank protection stabilization etc.			
Environmental Stewardship Division - MoE	Notification process for such works as replacement and maintenance of culverts and outfalls; temporary stream diversions around a worksite and takes approximately 45 days to receive notification approval. In general, those works requiring a notification are those that do not involve any diversion of water.			
Fish Protection Act – MoE http://wlapwww.gov.bc.ca/habitat/fishprotectionact/	This Act was passed in 1997 and is reviewed as part of the Water Act under Section 11 when applying for approval.			

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.			

R.113313.001
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.

R.113313.001
Appendix I

Archaeological Overview Assessment (Desktop)
ALH – Fort Nelson Salt Shed Replacement Project, April 9, 2021

TETRA TECH

TECHNICAL MEMO

ISSUED FOR USE

To:	Pei-Chin Tsai, Civil Engineer Public Services and Procurement Canada	**Date:**	April 9, 2021
c:	Alex Taheri, P.Eng., PMP Public Services and Procurement Canada	**Memo No.:**	01
From:	Charla Arnott	**File:**	704-TRN.VHWY03200-02
Subject:	Multiple Saltsheds Design and Installation: Archaeological Overview Assessment (Desktop) ALH – Fort Nelson Saltshed Replacement Project (R.113313.001)		

This document may contain sensitive information about Cultural Resources that are protected under provisions of British Columbia's Heritage Conservation Act. This information is to be used to assist in planning the proposed project only. It is not to be disseminated, and no copies of this document are to be made without written permission of Public Services and Procurement Canada.

1.0 INTRODUCTION

Tetra Tech Canada Inc. (Tetra Tech) was retained by Public Services and Procurement Canada (PSPC) to provide highway engineering services required for the development of five new saltsheds at various locations along the Alaska Highway. This review pertains to the proposed Fort Nelson Saltshed at KM 445 of the current alignment (herein referred to as the "Project").

As part of this work, Tetra Tech requested the services of Soriak Consulting and Research Ltd. (Soriak Consulting) to complete a desktop-based review of archaeological potential for the Project. This work was undertaken to determine potential impacts to cultural heritage resources within each proposed location. Heritage resources include a range of culturally and naturally modified materials deposited both above and below ground surfaces. Ground disturbance, therefore, has potential to damage these materials. Appropriate planning can facilitate cultural heritage resource protection.

1.1 Objectives

While the primary objective of this review is to determine if ground disturbance proposed within each location will adversely impact cultural heritage resources, it also serves to identify the potential extent of these impacts and outlines mitigative options prior to development.

Through a review of satellite imagery and other topographic data, an analysis of the Project's geographic location and ground cover was completed. Existing archaeological and historic site records in the region were reviewed and included study of both past and proposed project construction activities. In summary, the scope of this assessment included evaluation of:

- Existing databases and archaeological site records, including the British Columbia Archaeology Branch's Remote Access to Archaeological Data (RAAD) online database to determine if previously recorded archaeological sites are located within, or in proximity to, the Project area;
- Archaeological and ethnographic sources to gain an understanding of regional archaeological site density and distribution;
- Available archival and photographic sources, such as historic photos, satellite imagery and published materials pertaining to the development history of the general area; and

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Vancouver, BC V6C 1N5 CANADA
Tel 604.685.0275 Fax 604.684.6241

- General soil stratigraphy and geomorphology of the area to understand how geomorphic processes or other environmental conditions may have impacted site distribution within the Project area.

1.2 Assessment of Archaeological Potential

An area's archaeological potential is determined through a review of its geography, the nature and distribution of previously recorded cultural resources in the region, traditional knowledge, and levels of ground disturbance and site preservation. If these factors, in combination or individually, are suggestive of prehistoric or historic use of an area, then a moderate to high probability rating for archaeological sites is normally designated regarding the presence and/or preservation of cultural resource sites within a development area. This designation may trigger recommendations for further archaeological studies. A Preliminary Field Reconnaissance (PFR) or Archaeological Impact Assessment (AIA) may be undertaken to better understand a project's archaeological potential, particularly when existing datasets are limited, outdated, or unavailable.

A designation of low archaeological potential does not mean that heritage resources are not present; in these instances, it is advisable to implement a tailored Chance Find Procedure for the Project and to stop work in the event cultural materials are recovered during construction.

2.0 STUDY AREA DESCRIPTION

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

PSPC has selected to replace the existing saltshed located at KM 445 of the Alaska Highway because the existing saltshed is inadequate as per loading requirements set out in the British Columbia Building Code. The intention is to replace the existing saltshed with a new prefabricated engineered structural steel saltshed capable of meeting the most severe conditions of loading as set forth by the building code.

The dimensions of the new saltshed is expected to be 27.5 m wide, 52.0 m in length, and have a 7.3 m wide by 8.5 m high opening.

Project work is scheduled to occur in 2021 at this location. Proposed works for this Project may include the following:

- Localized excavations to prep the work site;
- Construction of new spread footings which may require excavation of up to 2 m;
- Installation of membrane under the new footings to prevent salt seepage; and
- Use of adjacent terrain as laydown area and temporary storage of residual salt from the existing salt shed.

The Project is in an industrial area, south of the town of Fort Nelson (Appendix A - Figure 1).

3.0 EVALUATION

3.1 Cultural Heritage Resources and Archaeological Sites

Cultural heritage sites are found upon a variety of topographic features. Typically, the closer terrain features are to natural hydrological features, the higher the archaeological potential. Other factors, such as proximity to trails, fishing, hunting, and gathering areas, sun exposure, and locations protected from the elements, can explain why certain areas were, and may continue to be favoured for use. In northeast British Columbia, micro-topographic features, such as knolls, eskers, banks, terraces, and ridges frequently contain subsurface cultural materials.

There are no previously recorded archaeological sites or historic places in conflict with the proposed Project location (Appendix A – Figure 1). The closest archaeological sites to the Project include:

- IeRp-8, referred to as the 'Chalo School Site' is a precontact archaeological site located approximately 1. 8 km to the northeast;
- IeRq-1 is a precontact archaeological site located approximately 2 km to the northwest;
- IeRp-4 is a precontact archaeological site located approximately 2.6 km to the southeast; and
- IeRp-3 is a precontact archaeological site located approximately 3 km to the southeast.

3.2 Environment

The region's first inhabitants utilised terrain stable enough to support the plant and animal resources they required for survival. Such areas included high, dry terrain away from postglacial lakes and ancient waterways and included such features as raised terraces, beaches, dunes and glaciofluvial bars. Early hunters and gatherers whose lives were greatly influenced by weather and animal migrations fastened their tools from materials such as rock, antler, bone and wood. They trapped and hunted animals; their success at hunting ultimately affected their success at survival. Furs and hides provided clothing and shelter. Fish and plants were harvested for food and medicinal purposes. The winters were long, and the summers were short and hot. Food was not abundant enough to support large populations. Early populations generally consisted of small groups of nomadic hunters/fishers and gatherers although larger groups may have congregated during important communal hunts. Food was stored in cache pits. Adaptation to long winters included use of toboggans and snowshoes fashioned from bark, wood and hides. Shelter needed to be easily moved as populations traveled north in summer and returned south to river valleys and deep forests in winter (Garbarino and Sasso 1994)[1].

The Project is located within the moist cool (mk) unit of the Boreal White and Black Spruce (BWBS) biogeoclimatic zone. The BWBS zone covers approximately 16 million hectares of British Columbia and is part of the circumpolar boreal zone. This zone is comprised of two main ecosystem types, the upland forests and mountainous regions and the poorly drained muskeg of the northeastern lowlands. The mk unit generally ranges in elevation from 300 m to 1,050 m and is dominated by extensive wetlands in the west and upland forests in the east. Vegetation is dependent on elevation and soil conditions but generally includes trembling aspen (Populus tremuloides), white spruce (Picea glauca), black spruce (Picea mariana), tamarack (Larix laricina), scrub birch (Betula nana ssp. Exilis), sedges (Carex spp.), balsam poplar (Populus balsamifera), paper birch (Betula papyrifera), and lodgepole pine (Pinus contorta var. latifolia). The dominant soil development type at this location includes Gray Luvisolic soils and the mode of deposition is lacustrine.

[1] Garbarino, M. and R. Sasso. *Native American Heritage.* 3rd Ed. Waveland Press, Inc.: Prospect Heights, Illinois, 1994.

The Project is located on elevated terrain adjacent to the existing highway right-of-way. The Fort Nelson River is situated approximately 1 km to the east, while the confluence of the Muskwa and Prophet Rivers is approximately 4.3 km to the northeast. Proposed construction work will remain within the existing saltshed footprint and adjacent terrain. This location is characterized as 'disturbed' and is expected to be largely devoid of vegetation.

3.3 Ground Disturbance

Cultural heritage resources can occur at various locations and soil depths. Ground alteration activities have the potential of causing damage to, or the displacement of, artifacts and other cultural heritage resources, particularly those occurring in shallow deposits. Ground disturbances may cause an area bearing cultural heritage resources to be more susceptible to future damage through erosional activities. It is also possible for shallow cultural deposits to be impacted while deeper deposits remain intact. When cultural resource sites are disturbed, the context of artifact distribution may be lost, which may result in incorrect interpretations of archaeological data. For this reason, ground disturbance is considered when determining if an area exhibits elevated archaeological potential.

Impacts to soil stratigraphy and possible subsurface cultural deposits within disturbed Areas of Potential (AOP), if present, can be determined through further assessment, notably an AIA. Accordingly, documentation of intact native soils can confirm whether AOPs are naturally occurring or the result of previous construction activities.

Significant ground disturbance within the Project is the result of previous site clearing activities and minor natural impacts caused by wind and water erosion. The degree of impact to soil horizons within this area is unknown; however, past disturbance included the removal of topsoil within the Fort Nelson maintenance camp footprint. Terrain in this location appears to be generally level and devoid of naturally occurring topographic features.

3.4 Archaeological Potential

A 5-year assessment of archaeological potential within select areas of northeast British Columbia was undertaken during the development of archaeological predictive models for the region. This study occurred between 2000 and 2005 and served to create a predictive archaeological model on behalf of the British Columbia Oil and Gas Commission and British Columbia Archaeology Branch (Millennia Research Ltd., 2005) [2]. The goal of this analysis was to improve upon a previously developed model that was created when little information was known regarding archaeological site distribution in the region.

For the purposes of this desktop assessment, an Area of Interest (AOI) was established for the Project (Appendix A – Figure 1). The AOI included assessment of a circular area (radius = 500 m) around the existing saltshed structure and includes a segment of the existing Alaska Highway right-of-way. Construction within the AOI is expected to be limited to terrain in immediate proximity of the existing saltshed structure. The AOI falls mostly within areas of modelled low and high archaeological potential. Most of the identified high potential areas appear representative of microtopographic landscape features that no longer exist within cleared terrain. The saltshed is located mostly within an area of modelled low archaeological potential (Figure 1).

As there are no previously recorded archaeological sites within the AOI and no naturally occurring topographic features indicative of moderate or higher archaeological potential or significant hydrological features located within immediate proximity of the existing saltshed structure, project construction appears limited to previously disturbed, unforested terrain indicative of low archaeological potential.

[2] Millennia Research Ltd., *Archaeological Overview of Northeastern British Columbia,* Prepared on behalf of the Oil and Gas Commission, Ministry of Forests, Archaeology and Registry Services Branch, University of Victoria and Ministry of Energy and Mines, 2000-2005.

4.0 RECOMMENDATIONS AND CONCLUSIONS

The Project includes terrain indicative of modelled low and high archaeological potential. An overview of the archaeological potential of the AOI is outlined in Table 4-1:

Table 4-1: Overview of AOI Archaeological Potential

Location	UTM Coordinates		Modelled Archaeological Potential	Proposed Construction Location	Assessed Potential of Construction Footprint	Recommendation
	Easting	Northing				
Fort Nelson Saltshed	518210	6510574	Low to High	Restricted to existing disturbed footprint	Low	Implementation of CFP

No further work is recommended for previously cleared areas within the AOI. However, undisturbed terrain may include AOPs indicative of moderate and higher potential. Avoidance of areas indicative of moderate and higher archaeological potential is generally recommended unless additional fieldwork confirms the presence or absence of topographic features.

A PFR is recommended if any ground altering activities, including tree removal, are proposed outside the cleared footprint. If cultural materials requiring protection are identified during subsequent assessment, mitigation strategies to avoid or mitigate impacts to cultural heritage resource materials will be developed. The processes involved in permitting and conducting an AIA are dependent upon the ownership of the land. Notably, a provincial Heritage Inspection Permit (under Section 14 of the *Heritage Conservation Act*) is required for lands held by the Province of British Columbia. For federal lands under the jurisdiction of PSPC, a Provincial Heritage Inspection permit may not be required (permit requirements to be discussed with PSPC).

It is further recommended that the Construction Contract for the Project include PSPC's standard contract clause requiring work be stopped and further assessments undertaken if cultural heritage resource materials are identified during any ground altering activities. A heritage resource Chance Find Procedure should be prepared for the Project.

5.0 LIMITATIONS OF REPORT

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

6.0 CLOSURE

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

Respectfully submitted,

Prepared by:
Charla Arnott, M.Sc., RPCA, PMP, RPA
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Reviewed by:
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Senior Scientist, Tetra Tech Canada Inc.
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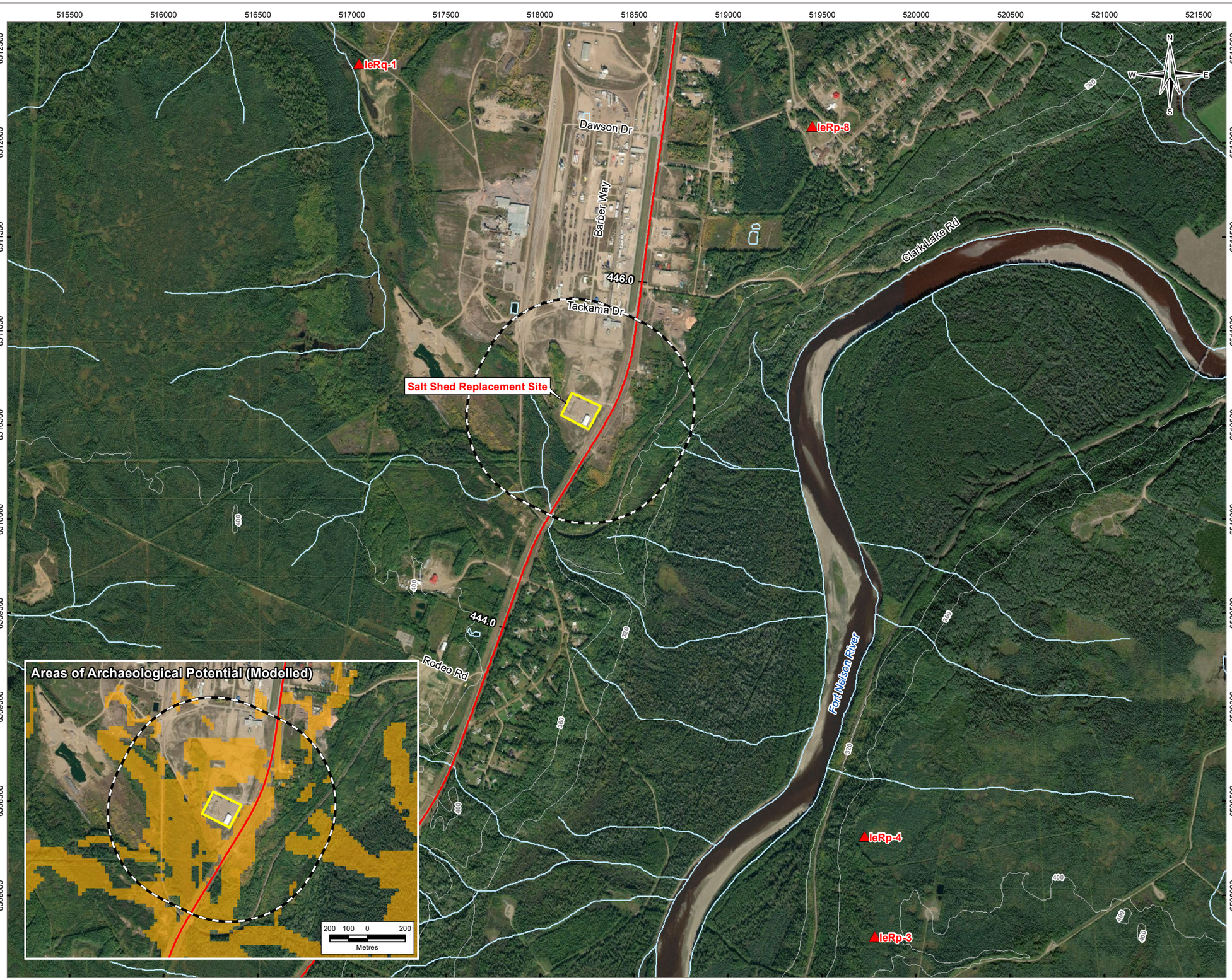
Attachments: Appendix A – Figure 1
Appendix B – Tetra Tech's Limitations on the use of this Document

APPENDIX A

Figure 1. Archaeological Assessment Fort Nelson, BC



LEGEND

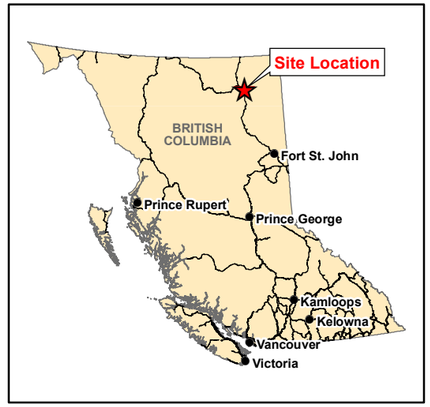
- Salt Shed Replacement Site
- Area of Interest (AOI)
- Archaeological Site

Archaeological Potential (Modelled)

- High

Base Data

- Alaska Highway Centerline
- Contour (40 m)
- Watercourse/Waterbody



NOTES

This document contains sensitive information about cultural resources that are protected under provisions of British Columbia's Heritage Conservation Act. This information is to be used to assist in planning the proposed project only and is not to be disseminated. No copies of this document are to be made without written permission of Public Services and Procurement Canada.

Archaeological data source:
British Columbia's Remote Access to Archaeological Data (RAAD) (accessed November 18, 2020)

Base data source:
CanVec 1:50,000
Imagery provided by ESRI; Maxar (2017)

STATUS
ISSUED FOR REVIEW

SALT SHEDS DESIGN AND INSTALLATION ALASKA HIGHWAY, BC

Archaeological Assessment Fort Nelson, BC

PROJECTION UTM Zone 10		**DATUM** NAD83			**CLIENT** Public Services and Procurement Canada
Scale: 1:20,000 400 200 0 400 Metres					TETRA TECH
FILE NO. VHWY03200-02_Fig01_FortNelson_ArchAOP.mxd					
OFFICE Tt-EDM	**DWN** MRV	**CKD** SL	**APVD** CA	**REV** 0	**Figure 1**
DATE December 16, 2020	**PROJECT NO.** TRN.VHWY03200-02				

Q:\Edmonton\GIS\TRANSPORTATION\VHWY\VHWY03200-02\Maps\VHWY03200-02_Fig01_FortNelson_ArchAOP.mxd modified 12/16/2020 by megan.vetburg

APPENDIX B

TETRA TECH'S LIMITATIONS ON THE USE OF THIS DOCUMENT

LIMITATIONS ON USE OF THIS DOCUMENT

1.1 USE OF DOCUMENT AND OWNERSHIP

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

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

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

1.3 STANDARD OF CARE

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

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

1.4 DISCLOSURE OF INFORMATION BY CLIENT

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

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

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

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

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

R.113313.001
Appendix J

Geotechnical Exploration Data Report, Fort Nelson Salt Shed, May 12, 2021

TETRA TECH

Geotechnical Exploration Data Report
Fort Nelson Salt Shed

PRESENTED TO

Public Services and Procurement Canada

MAY 12, 2021
ISSUED FOR USE
FILE: 704-TRN.VHWY03200-04

Tetra Tech Canada Inc.
#1 - 4376 Boban Drive
Nanaimo, BC V9T 6A7 CANADA
Tel 250.756.2256 Fax 250.756.2686

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LIMITATIONS OF REPORT

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

1.0 INTRODUCTION

Tetra Tech Canada Inc. (Tetra Tech) was retained by Public Services and Procurement Canada (PSPC) for project number R.017173.214 to provide engineering services for proposed replacement of a salt shed located in Muskwa, BC, near Fort Nelson, BC (the Site).

To support the salt shed replacement, Tetra Tech completed a geotechnical subsurface exploration program to characterize the soil conditions at the Site. This data report details the findings of the geotechnical exploration program including:

- The results of a desktop study.
- Description of the equipment and methods used during the geotechnical exploration.
- Summary of observed soil conditions encountered during exploration.
- A testhole location plan and testhole logs with descriptions of conditions encountered and incorporating the results of laboratory testing of recovered soil samples.

The limitations on the use of this document, attached in Appendix A, for an integral part of this report.

2.0 PROJECT AND SITE DESCRIPTION

2.1 Project Description

Tetra Tech understands that PSPC intends to replace the existing fabric covered steel truss salt shed building at the Site with a new salt shed structure in the same location as the existing structure. The proposed salt shed is understood to be a pre-engineered structural steel portal frame building with no internal slab, complete with lighting and a power connection.

2.2 Site Description

The Fort Nelson salt shed is located at the south end of the Muskwa industrial area, approximately 7 km south of Fort Nelson. The Site is generally comprised of flat terrain with an approximate elevation of 389 m above sea level (asl). The area is bordered to the east and west by two rivers. The Fort Nelson River is approximately 1 km east and at an elevation of 290 m asl while the Prophet River is approximately 4 km west and at an elevation of 295 m asl. Both Rivers run generally south to north and are anastomosing type channels.

2.2.1 Surficial Geology

Review of the map ‘Surficial Geology, Fort Nelson, NTS 94-J/NE’ (Levson and Fournier, 2012) indicates that surficial geology at the Site consists of glaciofluvial terraces. Glaciofluvial terraces are described as sand and gravel terraces situated relatively high above modern floodplains. The deposits are usually well sorted and stratified, associated with meltwater channels and locally associated with kames. The map also indicates that undifferentiated organic and glaciofluvial soils occur near the Site. Undifferentiated organic deposits are described as occurring along former drainage courses, and undifferentiated glaciofluvial sediments are described as consisting of sand and gravel.

2.2.2 Bedrock Geology

Review of the map 'Bedrock Geology, Fort Nelson, British Columbia' (Okulitch et. al., 2002) indicates that bedrock at the Site consists of rocks belonging to the Buckinghorse Formation. The Buckinghorse Formation is described as dark grey marine shale and siltstone with minor sandstone.

3.0 GEOTECHNICAL EXPLORATION

3.1 Utility Locates

Tetra Tech completed a BC One Call request for the Site and retained Underworld Line Locating Ltd. (Underworld) to clear proposed borehole locations of potential underground utilities. Prior to drilling, Tetra Tech reviewed all BC One Call responses, and Underworld conducted on-site utility locates using electromagnetic methods.

3.2 Borehole Exploration

A total of four boreholes were completed using air rotary (ODEX) drilling techniques. Borehole locations were selected to provide coverage of the salt shed area while not impacting the existing structure or operations. Locations of the completed holes are shown on Figure 1. Target depths for drilling were between 9 m and 12 m. Drilling was completed using a Fraste Multidrill PL owned and operated by Westech Drilling Corp. of Prince George, BC.

ODEX drilling uses compressed air to drive a down-hole impact hammer and clear cuttings through the casing as the borehole is advanced. It is noted that the drilling method has the potential to impact in-situ testing values.

Standard Penetration (SPT) tests were undertaken at select intervals during drilling. SPT tests were conducted using a Marl Brand automatic trip hammer attached to the drill rig. The SPT sample tube had a in inside diameter of 35 mm and an outside diameter of 50.8 mm. The SPT sampler was attached to NWJ drill rods for sampling and did not use sample tube liners.

Upon completion boreholes were backfilled with layers of cuttings and bentonite. The specific backfill for each borehole is shown on the borehole logs, attached in Appendix B. Borehole locations were measured in the field relative to local landmarks for inclusion on site plans and are estimated to have an accuracy of +/- 1 m. Borehole elevations were estimated by cross referencing borehole locations with site survey dated November 29, 2020 and are estimated to have an accuracy of +/- 1 m. Borehole completion data is summarized in Table 1, below.

Table 1: Borehole Completion Summary

Borehole ID	Easting[1] (m)	Northing[1] (m)	Ground Surface Elevation[2] (m asl)	Final Depth Below Ground Surface (m)
BH21-01	518254	6510503	388.6	9.1
BH21-02	518271	6510538	388.8	9.8
BH21-03	518245	6510561	388.8	9.1
BH21-04	518226	6510521	388.7	12.2

1: Borehole locations were measured in the field relative to local landmarks and are estimated to be accurate to +/- 1 m. UTM coordinates are for UTM zone 10 N.

2: Borehole elevations are approximate and have been estimated using site survey information dated November 2020 combined with field observations of borehole locations.

3.3 Laboratory Testing

Soil samples obtained during the subsurface exploration were shipped to Tetra Tech's laboratory in Nanaimo, BC, for geotechnical index classification. The following tests were conducted on selected samples in general accordance with the associated ASTM test number, as shown in Table 2, below. Laboratory index test results are presented in Appendix C and included in the testhole logs.

Table 2: Geotechnical Laboratory Testing Summary

Test Type	Number of Tests	ASTM Reference
Water Content	12	D2216
Atterberg Limits	5	D4318
Sieve Analysis	3	D6913
Fines Content Analysis	5	D1140-00

4.0 SUBSURFACE CONDITIONS

Conditions at the Site generally took the form of Sand and Gravel, overlying variable fine-grained soils. A layer of wood was encountered in boreholes BH21-03 and BH21-04. Conditions encountered were generally in agreement with the conditions expected based on the background review. Detailed descriptions of the conditions encountered are provided in the borehole logs, attached in Appendix B.

4.1 Sand and Gravel

Sand and Gravel soils were encountered in every hole from surface to between 4.9 m and 7.5 m in depth. Composition of the soils ranged from Sand, gravelly, some silt, to Sand and Gravel, trace silt. The soils were generally found to be in a compact state of consistency.

High blow counts or refusal were encountered in SPT tests in the Sand and Gravel soils near the ground surface in every borehole. The cause of the high blow counts or refusal in these cases is inferred to be due to frozen soil rather than changes in soil consistency.

The Sand and Gravel soils encountered above the wood debris discussed in Section 4.2 are assumed to be fill soils although a transition from fill to native soils was not readily apparent.

4.2 Wood Debris (Assumed Fill)

A layer of wood debris was encountered within the Sand and Gravel layer in BH21-03 and BH21-04. Cuttings from the drill rig in this layer consisted of wood fragments only, no other minor constituents were observed. Due to the nature of ODEX drilling, the type of wood debris encountered was difficult to determine. However, based on drill reaction, it is inferred that the wood is construction debris or other wood fill rather than solid logs. The wood was encountered from 1.2 m to 2.2 m in depth in BH21-03 and from 1.8 m to 2.4 m in depth in BH21-04.

4.3 Fine-Grained Soils

Fine-grained soils were encountered beneath the near surface Sand and Gravel soils. Composition of the soils primary constituents ranged from Silt and fine Sand in BH21-01 to high plastic Clay in BH21-03. Minor soil constituents included sand and gravel in varying quantities. No consistent layering was noted in the distribution of soil constituents within the fine-grained soils. Soil consistencies ranged from stiff to hard. The top of the Fine-grained unit was encountered at depths ranging between 4.9 m to 7.5 m, and extended to borehole termination depth at each location.

4.4 Groundwater

Groundwater was encountered in each of the holes during drilling. Depths to groundwater were estimated based on drilling observations and ranged between 5.5 m below ground surface in BH21-01, and 7.0 m below ground surface in BH21-04. Note that the groundwater levels were observed during the drilling process and may not be representative of stabilized pore pressure conditions within the drill holes. In addition, groundwater levels at the site may fluctuate over time due to seasonal variations in precipitation, snow melt, and changes in recharge/discharge from local and regional groundwater sources.

5.0 CLOSURE

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

Respectfully submitted,
Tetra Tech Canada Inc.

FILE: 704-TRN.VHWY03200-04
FILE: 704-TRN.VHWY03200-04
FILE: 704-TRN.VHWY03200-04

Prepared by:
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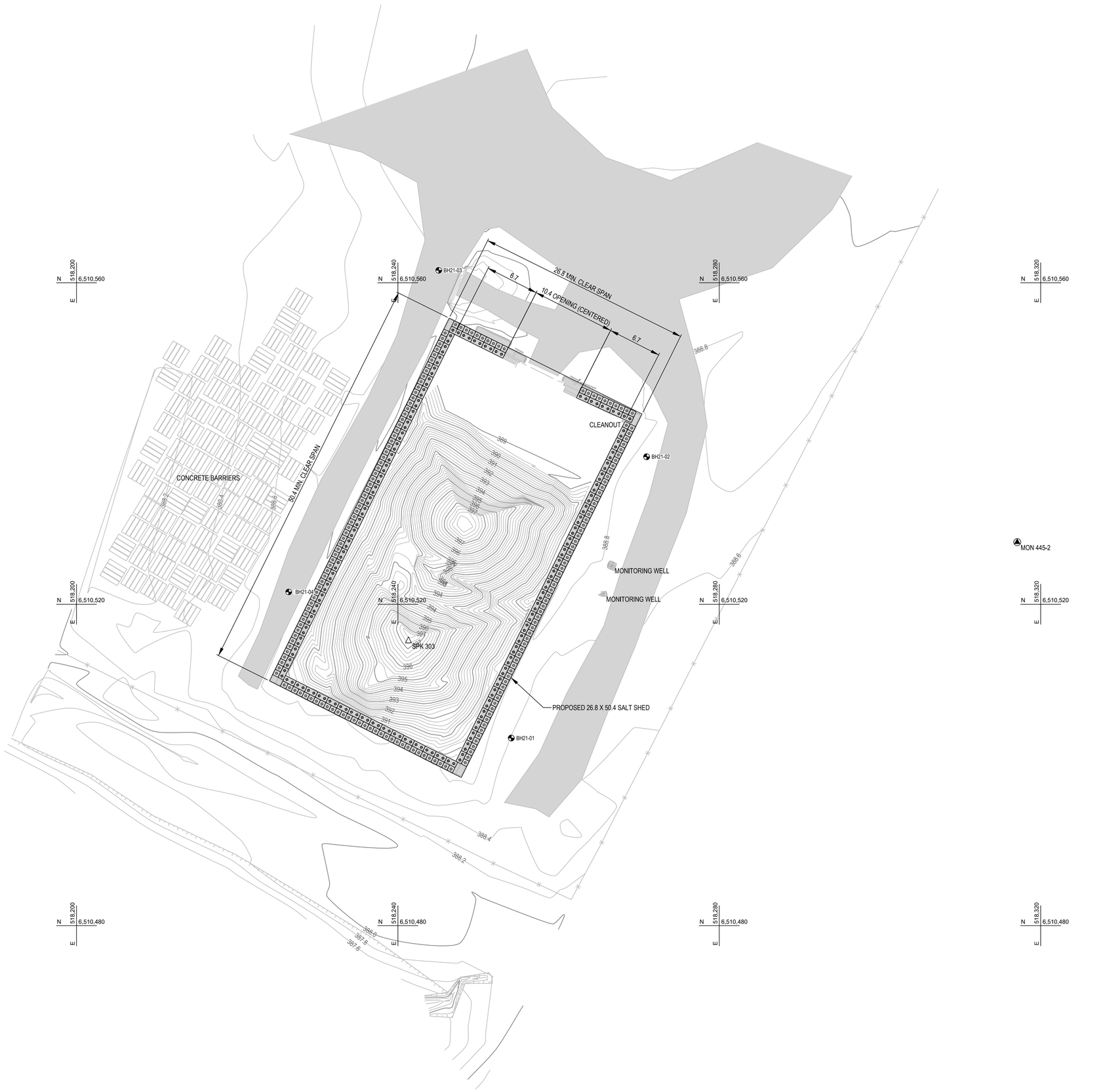
/sy

REFERENCES

Levson, V., Fournier, M. 2012. Surficial Geology, Fort Nelson (NTS 94-J/NE), British Columbia. Geological Survey of Canada. Open File 7041. British Columbia Ministry of Energy and Mines. BCGS Geoscience Map 2011-06. Scale 1:100,000. DOI 10.4095/291399.

Okulitch, A.V., MacIntyre, D.G, Taylor, G.C., Gabrielse, H., Cullen, B., Massey, N., Bellafontaine, K. 2002. Geology, Fort Nelson, British Columbia, Central Foreland, Map NO-10-G, Scale 1:500,000. Geological Survey of Canada. Open File 3604 (revised).

FIGURES



Public Services and Procurement Canada / Services publics et Approvisionnement Canada

REAL PROPERTY SERVICES
Pacific Region
SERVICES IMMOBILIERS
Région du Pacifique

ISSUED FOR REVIEW

GENERAL NOTES:
1. DIMENSIONS, COORDINATES, ELEVATIONS ARE IN METRES UNLESS NOTED OTHERWISE.

0 10
Scale: 1: 250 (metres)

Revision/ Revision	Description/Description	Date/Date
B	ISSUED FOR REVIEW	21/05/14
A	ISSUED FOR REVIEW	21/03/18

Client/client

Public Services and Procurement Canada

TETRA TECH

Project title/Titre du projet

KM 445 - FORT NELSON SALT SHED REPLACEMENT ALASKA HIGHWAY, BC

Approved by/Approuve par
N. EKMAN

Designed by/Concept par
T. MORTON

Drawn by/Dessine par
R. HALL

PSPC Project Manager/Administrateur de Projets SPAC
A. TAHERI

PSPC, Architectural and Engineering Resources Manager/ Ressources Architectural et de Directeur d'Ingénierie, SPAC

Client/client
Public Services and Procurement Canada

Drawing title/Titre du dessin

BOREHOLE LOCATION PLAN

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.017173.214	C101	B

Q:\Vancouver\Transportation\TRN_VHWY\Projects\TRN_VHWY\03200 PSPC Salt Sheds-Telsa River- Bridge Decks\CADD KM 445 Fort Nelson\C101 FORT NELSON PLAN TH.dwg [C101] May 14, 2021 - 9:10:22 am (BY- HALL, ROBERT J.)

PSPC – A1 – 841x594

0 10 20 30 40 50 60 70 80 90 100mm

APPENDIX A

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GEOTECHNICAL

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

1.7 ENVIRONMENTAL AND REGULATORY ISSUES

Unless stipulated in the report, TETRA TECH has not been retained to explore, address or consider and has not explored, addressed or considered any environmental or regulatory issues associated with development on the subject site.

1.8 NATURE AND EXACTNESS OF SOIL AND ROCK DESCRIPTIONS

Classification and identification of soils and rocks are based upon commonly accepted systems, methods and standards employed in professional geotechnical practice. This report contains descriptions of the systems and methods used. Where deviations from the system or method prevail, they are specifically mentioned.

Classification and identification of geological units are judgmental in nature as to both type and condition. TETRA TECH does not warrant conditions represented herein as exact, but infers accuracy only to the extent that is common in practice.

Where subsurface conditions encountered during development are different from those described in this report, qualified geotechnical personnel should revisit the site and review recommendations in light of the actual conditions encountered.

1.9 LOGS OF TESTHOLES

The testhole logs are a compilation of conditions and classification of soils and rocks as obtained from field observations and laboratory testing of selected samples. Soil and rock zones have been interpreted. Change from one geological zone to the other, indicated on the logs as a distinct line, can be, in fact, transitional. The extent of transition is interpretive. Any circumstance which requires precise definition of soil or rock zone transition elevations may require further investigation and review.

1.10 STRATIGRAPHIC AND GEOLOGICAL INFORMATION

The stratigraphic and geological information indicated on drawings contained in this report are inferred from logs of test holes and/or soil/rock exposures. Stratigraphy is known only at the locations of the test hole or exposure. Actual geology and stratigraphy between test holes and/or exposures may vary from that shown on these drawings. Natural variations in geological conditions are inherent and are a function of the historical environment. TETRA TECH does not represent the conditions illustrated as exact but recognizes that variations will exist. Where knowledge of more precise locations of geological units is necessary, additional exploration and review may be necessary.

1.11 PROTECTION OF EXPOSED GROUND

Excavation and construction operations expose geological materials to climatic elements (freeze/thaw, wet/dry) and/or mechanical disturbance which can cause severe deterioration. Unless otherwise specifically indicated in this report, the walls and floors of excavations must be protected from the elements, particularly moisture, desiccation, frost action and construction traffic.

1.12 SUPPORT OF ADJACENT GROUND AND STRUCTURES

Unless otherwise specifically advised, support of ground and structures adjacent to the anticipated construction and preservation of adjacent ground and structures from the adverse impact of construction activity is required.

1.13 INFLUENCE OF CONSTRUCTION ACTIVITY

Construction activity can impact structural performance of adjacent buildings and other installations. The influence of all anticipated construction activities should be considered by the contractor, owner, architect and prime engineer in consultation with a geotechnical engineer when the final design and construction techniques, and construction sequence are known.

1.14 OBSERVATIONS DURING CONSTRUCTION

Because of the nature of geological deposits, the judgmental nature of geotechnical engineering, and the potential of adverse circumstances arising from construction activity, observations during site preparation, excavation and construction should be carried out by a geotechnical engineer. These observations may then serve as the basis for confirmation and/or alteration of geotechnical recommendations or design guidelines presented herein.

1.15 DRAINAGE SYSTEMS

Unless otherwise specified, it is a condition of this report that effective temporary and permanent drainage systems are required and that they must be considered in relation to project purpose and function. Where temporary or permanent drainage systems are installed within or around a structure, these systems must protect the structure from loss of ground due to mechanisms such as internal erosion and must be designed so as to assure continued satisfactory performance of the drains. Specific design details regarding the geotechnical aspects of such systems (e.g. bedding material, surrounding soil, soil cover, geotextile type) should be reviewed by the geotechnical engineer to confirm the performance of the system is consistent with the conditions used in the geotechnical design.

1.16 DESIGN PARAMETERS

Bearing capacities for Limit States or Allowable Stress Design, strength/stiffness properties and similar geotechnical design parameters quoted in this report relate to a specific soil or rock type and condition. Construction activity and environmental circumstances can materially change the condition of soil or rock. The elevation at which a soil or rock type occurs is variable. It is a requirement of this report that structural elements be founded in and/or upon geological materials of the type and in the condition used in this report. Sufficient observations should be made by qualified geotechnical personnel during construction to assure that the soil and/or rock conditions considered in this report in fact exist at the site.

1.17 SAMPLES

TETRA TECH will retain all soil and rock samples for 30 days after this report is issued. Further storage or transfer of samples can be made at the Client's expense upon written request, otherwise samples will be discarded.

1.18 APPLICABLE CODES, STANDARDS, GUIDELINES & BEST PRACTICE

This document has been prepared based on the applicable codes, standards, guidelines or best practice as identified in the report. Some mandated codes, standards and guidelines (such as ASTM, AASHTO Bridge Design/Construction Codes, Canadian Highway Bridge Design Code, National/Provincial Building Codes) are routinely updated and corrections made. TETRA TECH cannot predict nor be held liable for any such future changes, amendments, errors or omissions in these documents that may have a bearing on the assessment, design or analyses included in this report.

APPENDIX B

BOREHOLE LOGS

BOREHOLE KEYSHEET

Water Level Measurement

 Measured in standpipe, piezometer or well

 Inferred

Sample Types

 A-Casing

 Core

 Disturbed, Bag, Grab

 HQ Core

 Jar

 Jar and Bag

 NQ Core

 No Recovery

 Split Spoon/SPT

 Tube

 CRREL Core

Backfill Materials

 Asphalt

 Bentonite

 Cement/ Grout

 Drill Cuttings

 Grout

 Gravel

 Sand

 Slough

 Topsoil Backfill

Lithology - Graphical Legend[1]

 Asphalt

 Bedrock

 Cobbles/Boulders

 Clay

 Coal

 Concrete

 Fill

 Gravel

 Limestone

 Mudstone

 Organics

 Peat

 Sand

 Sandstone

 Shale

 Silt

 Siltstone

 Till

 Topsoil

1. The graphical legend is an approximation and for visual representation only. Soil strata may comprise a combination of the basic symbols shown above. Particle sizes are not drawn to scale

TETRA TECH

TERMS USED ON BOREHOLE LOGS

TERMS DESCRIBING CONSISTENCY OR CONDITION

COARSE GRAINED SOILS (major portion retained on 0.075 mm sieve): Includes (1) clean gravels and sands, and (2) silty or clayey gravels and sands. Condition is rated according to relative density, as inferred from laboratory or in situ tests.

descriptive term	relative density	n (blows per 0.3 m)
Very Loose	0 to 20%	0 to 4
Loose	20 to 40%	4 to 10
Compact	40 to 75%	10 to 30
Dense	75 to 90%	30 to 50
Very Dense	90 to 100%	greater than 50

The number of blows, N, on a 51 mm O.D. split spoon sampler of a 63.5 kg weight falling 0.76 m, required to drive the sampler a distance of 0.3 m from 0.15 m to 0.45 m.

FINE GRAINED SOILS (major portion passing 0.075 mm sieve): Includes (1) inorganic and organic silts and clays, (2) gravelly, sandy, or silty clays, and (3) clayey silts. Consistency is rated according to shearing strength, as estimated from laboratory or in situ tests.

descriptive term	unconfined compressive strength (kPa)
Very Soft	Less than 25
Soft	25 to 50
Firm	50 to 100
Stiff	100 to 200
Very Stiff	200 to 400
Hard	Greater than 400

NOTE: Slickensided and fissured clays may have lower unconfined compressive strengths than shown above, because of planes of weakness or cracks in the soil.

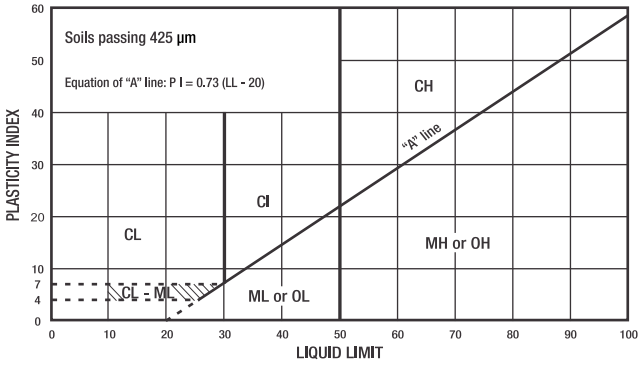
GENERAL DESCRIPTIVE TERMS

Slickensided - having inclined planes of weakness that are slick and glossy in appearance.
Fissured - containing shrinkage cracks, frequently filled with fine sand or silt; usually more or less vertical.
Laminated - composed of thin layers of varying colour and texture.
Interbedded - composed of alternate layers of different soil types.
Calcareous - containing appreciable quantities of calcium carbonate.;
Well graded - having wide range in grain sizes and substantial amounts of intermediate particle sizes.
Poorly graded - predominantly of one grain size, or having a range of sizes with some intermediate size missing.

MODIFIED UNIFIED SOIL CLASSIFICATION

MAJOR DIVISION			GROUP SYMBOL	TYPICAL DESCRIPTION	LABORATORY CLASSIFICATION CRITERIA		
COARSE-GRAINED SOILS More than 50% retained on 75 µm sieve*	GRAVELS 50% or more of coarse fraction retained on 4.75 mm sieve	CLEAN GRAVELS	GW	Well-graded gravels and gravel-sand mixtures, little or no fines	Classification on basis of percentage of fines. Less than 5% Pass 75 µm sieve; More than 12% Pass 75 µm sieve; 5% to 12% Pass 75 µm sieve. GW, GP, SW, SP GM, GC, SM, SC Borderline Classification requiring use of dual symbols	$C_U = D_{60} / D_{10}$ Greater than 4; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3	
			GP	Poorly graded gravels and gravel-sand mixtures, little or no fines		Not meeting both criteria for GW	
		GRAVELS WITH FINES	GM	Silty gravels, gravel-sand-silt mixtures		Atterberg limits plot below "A" line or plasticity index less than 4	Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols
			GC	Clayey gravels, gravel-sand-clay mixtures		Atterberg limits plot above "A" line or plasticity index greater than 7	
	SANDS More than 50% of coarse fraction passes 4.75 mm sieve	CLEAN SANDS	SW	Well-graded sands and gravelly sands, little or no fines		$C_U = D_{60}/D_{10}$ Greater than 6; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3	
			SP	Poorly graded sands and gravelly sands, little or no fines		Not meeting both criteria for SW	
		SANDS WITH FINES	SM	Silty sands, sand-silt mixtures		Atterberg limits plot below "A" line or plasticity index less than 4	Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols
			SC	Clayey sands, sand-clay mixtures		Atterberg limits plot above "A" line or plasticity index greater than 7	
FINE-GRAINED SOILS (by behavior) 50% or more passes 75 µm sieve*	SILTS Liquid limit <50		ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands of slight plasticity	For classification of fine-grained soils and fine fraction of coarse-grained soils.		
	SILTS Liquid limit >50		MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts			
	CLAYS Above "A" line on plasticity chart negligible organic content Liquid limit <30		CL	Inorganic clays of low plasticity, gravelly clays, sandy clays, silty clays, lean clays			
	CLAYS Above "A" line on plasticity chart negligible organic content Liquid limit 30-50		CI	Inorganic clays of medium plasticity, silty clays			
	CLAYS Above "A" line on plasticity chart negligible organic content Liquid limit >50		CH	Inorganic clays of high plasticity, fat clays			
	ORGANIC SILTS AND CLAYS Liquid limit <50		OL	Organic silts and organic silty clays of low plasticity			
	ORGANIC SILTS AND CLAYS Liquid limit >50		OH	Organic clays of medium to high plasticity			
HIGHLY ORGANIC SOILS			PT	Peat and other highly organic soils			

PLASTICITY CHART



*Based on the material passing the 75 mm sieve
Reference: ASTM Designation D2487, for identification procedure see D2488. USC as modified by PFRA

SOIL COMPONENTS

FRACTION	SIEVE SIZE PASSING	SIEVE SIZE RETAINED	DEFINING RANGES OF PERCENTAGE BY MASS OF MINOR COMPONENTS PERCENTAGE	DESCRIPTOR
GRAVEL			>35 %	"and"
coarse	75 mm	19 mm		
fine	19 mm	4.75 mm	21 to 35 %	"y-adjective"
SAND				
coarse	4.75 mm	2.00 mm	10 to 20 %	"some"
medium	2.00 mm	425 µm		
fine	425 µm	75 µm	>0 to 10 %	"trace"
SILT (non plastic) or CLAY (plastic)	75 µm		as above but by behavior	

OVERSIZE MATERIAL

Rounded or subrounded

COBBLES	75 mm to 300 mm
BOULDERS	> 300 mm

Not rounded

ROCK FRAGMENTS	>75 mm
ROCKS	> 0.76 cubic metre in volume

Tt_Modified Unified Soil Classification.cdr

TETRA TECH

PUBLIC SERVICES AND PROCUREMENT CANADA

Borehole No: **BH21-01**

Project: FORT NELSON SALT SHED GEOTECHNICAL	Project No: 704-TRN.VHWY03200-04
Location: ALASKA HIGHWAY	Ground Elev: 388.6 m
FORT NELSON	UTM: 518254 E; 6510503 N; Z 10

Depth (m)	Method	Core Diameter (mm)	Soil Description	Graphical Representation	Sample Type	Sample Number	Particle Size Distribution: Gravel (%)	Sand (%)	Silt and Clay (%)	Field Blowcount (blows/300 mm) □ SPT	Field Vane (kPa) Post-Peak ◇ Peak ◆	Plastic Limit	Moisture Content	Liquid Limit	BH21-01	Elevation (m)
0										20 40 60 80	10 20 30 40	20	40	60 80		
0	ODEX		SAND, gravelly, some silt, moist, frozen, brown; subangular to angular gravel up to 45 mm nominal diameter.													388
1			SPT at 0.9 m: Refusal (>50 blows per 6"). 65% Recovery.			SPT01 G1										387
2			- Compact, not frozen below 2.0 m.													386
2			SPT at 2.4 m: 5/8/9/6 (n=17). 50% Recovery.			SPT02				□	●					385
4			SPT at 4.0 m: 3/4/8/9 (n=12). 23% Recovery.			SPT03				□						384
5			SILT and SAND, trace gravel, wet, stiff to very stiff, dark grey; fine sand.													383
5			SPT at 5.5 m: 3/6/7/7 (n=13). 80% Recovery. - Groundwater inferred at 5.5 m.			SPT04			52	□	●					382
7			- Becomes SILT, some sand below 7.0 m. SPT at 7.2 m: 6/5/7/9 (n=13). 100% Recovery.			SPT05			76	□	●					381
8			SPT at 8.5 m: 4/9/13/15 (n=22). No recovery.			SPT06				□						380
9			End of borehole at 9.1 m, target depth reached. - UTM coordinates calculated from measurements on site relative to local landmarks. - Ground surface elevations estimated using site survey information dated June 2017. - Soil descriptions are based on visual classifications and field observations, in combination with in-situ and laboratory testing. Some variation throughout the interpreted soil layers is expected. - Estimates of soil consistency were determined from drill reaction, in-situ testing and visual classification of recovered samples. - Groundwater inferred at 5.5 m during drilling. - Upon completion, borehole was backfilled with cuttings and bentonite as shown on the borehole log.												379
10																378
11																377
12																376
13																

3/2/2021

3/2/2021

TETRA TECH

Contractor: WESTECH	Completion Depth: 9.1 m
Drilling Rig Type: FRASTE MULTIDRILL PL	Start Date: 2021 March 02
Logged By: ER	Completion Date: 2021 March 02
Reviewed By: TM	Page 1 of 1

PUBLIC SERVICES AND PROCUREMENT CANADA

Borehole No: **BH21-02**

Project: FORT NELSON SALT SHED GEOTECHNICAL	Project No: 704-TRN.VHWY03200-04
Location: ALASKA HIGHWAY	Ground Elev: 388.8 m
FORT NELSON	UTM: 518271 E; 6510538 N; Z 10

Depth (m)	Method	Core Diameter (mm)	Soil Description	Graphical Representation	Sample Type	Sample Number	Particle Size Distribution: Gravel (%)	Sand (%)	Silt and Clay (%)	Field Blowcount (blows/300 mm) □ SPT	Field Vane (kPa) Post-Peak ◇ Peak	Plastic Limit / Moisture Content / Liquid Limit	BH21-02	Elevation (m)
0										20 40 60 80	10 20 30 40	20 40 60 80		
1	ODEX		SAND and GRAVEL, trace silt, damp, frozen, brown; subrounded to angular gravel up to 40 mm nominal diameter. SPT at 0.9 m: Refusal (>50 blows per 6"). 90% Recovery.			SPT01								388
2														387
3			SPT at 2.4 m: 9/18/22/22 (n=40). 60% Recovery. - Compact, not frozen below 3.0 m.			SPT02	43	47.1	9.9					386
4			SPT at 4.0 m: 4/8/11/13 (n=19). 45% Recovery. - Some silt below 4.0 m.			SPT03								385
5			- Becomes GRAVEL, sandy below 5.0 m.											384
6			SPT at 5.5 m: 7/12/12/28 (n=24). 41% Recovery. - Groundwater inferred at 5.9 m.			SPT04								383
7			SILT, some sand, wet, very stiff, dark grey; fine sand. SPT at 7.0 m: 6/10/15/17 (n=25). 73% Recovery.			SPT05			66					382
8														381
9			CLAY, silty, some gravel, trace sand, wet, hard, low to medium plastic; subrounded gravel up to 40 mm nominal diameter.			ST01								380
			SPT at 9.1 m: 4/15/22/33 (n=37). 80% Recovery.			SPT06								
10			End of borehole at 9.8 m, target depth reached. - UTM coordinates calculated from measurements on site relative to local landmarks. - Ground surface elevations estimated using site survey information dated June 2017. - Soil descriptions are based on visual classifications and field observations, in combination with in-situ and laboratory testing. Some variation throughout the interpreted soil layers is expected. - Estimates of soil consistency were determined from drill reaction, in-situ testing and visual classification of recovered samples. - Groundwater inferred at 5.9 m during drilling. - Upon completion, borehole was backfilled with cuttings and bentonite as shown on the borehole log.									379
11														378
12														377
13														376

3/3/2021

3/3/2021

TETRA TECH

Contractor: WESTECH	Completion Depth: 9.8 m
Drilling Rig Type: FRASTE MULTIDRILL PL	Start Date: 2021 March 03
Logged By: ER	Completion Date: 2021 March 03
Reviewed By: TM	Page 1 of 1

PUBLIC SERVICES AND PROCUREMENT CANADA

Borehole No: **BH21-03**

Project: FORT NELSON SALT SHED GEOTECHNICAL	Project No: 704-TRN.VHWY03200-04
Location: ALASKA HIGHWAY	Ground Elev: 388.8 m
FORT NELSON	UTM: 518245 E; 6510561 N; Z 10

Depth (m)	Method	Core Diameter (mm)	Soil Description	Graphical Representation	Sample Type	Sample Number	Particle Size Distribution: Gravel (%)	Sand (%)	Silt and Clay (%)	Field Blowcount (blows/300 mm) □ SPT	Field Vane (kPa) Post-Peak ◇ Peak	Plastic Limit / Moisture Content / Liquid Limit	BH21-03	Elevation (m)
0										20 40 60 80	10 20 30 40	20 40 60 80		
1	ODEX		SAND (FILL), gravelly, some silt, damp, frozen, brown.											388
			SPT at 0.9 m: 34/45/refusal (bouncing). 65% Recovery.			SPT01								
2			WOOD DEBRIS (POSSIBLE FILL).											387
			SAND and GRAVEL, gravelly, trace to some silt, damp, compact, brown; angular to subrounded gravel up to 35 mm nominal diameter.			SPT02								
3			SPT at 2.5 m: 46/refusal (>50 blows per 6"). 85% Recovery.											386
4			SPT at 4.0 m: 5/6/7/12 (n=13). 46% Recovery.			SPT03			5.4					385
5														384
6			SPT at 5.5 m: 6/8/6/6 (n=14). No recovery.			SPT04								383
			- Becomes SAND, gravelly below 6.5 m.			G1								
7			- Groundwater inferred at 6.8 m. 3/2/2021											382
			SPT at 7.0 m: 10/20/18/8 (n=38). 50% Recovery.			SPT05								
8			CLAY, trace sand, trace silt, moist, stiff, dark grey, high plastic.											381
9			SPT at 8.5 m: 34/8/8 (n=12). 67% Recovery.			SPT06								380
			End of borehole at 9.1 m, target depth reached.											
10			- UTM coordinates calculated from measurements on site relative to local landmarks.											379
			- Ground surface elevations estimated using site survey information dated June 2017.											
11			- Soil descriptions are based on visual classifications and field observations, in combination with in-situ and laboratory testing. Some variation throughout the interpreted soil layers is expected.											378
			- Estimates of soil consistency were determined from drill reaction, in-situ testing and visual classification of recovered samples.											
12			- Groundwater inferred at 6.8 m during drilling.											377
			- Upon completion, borehole was backfilled with cuttings and bentonite as shown on the borehole log.											
13														376

TETRA TECH

Contractor: WESTECH	Completion Depth: 9.1 m
Drilling Rig Type: FRASTE MULTIDRILL PL	Start Date: 2021 March 02
Logged By: ER	Completion Date: 2021 March 02
Reviewed By: TM	Page 1 of 1

PUBLIC SERVICES AND PROCUREMENT CANADA

Borehole No: **BH21-04**

Project: FORT NELSON SALT SHED GEOTECHNICAL	Project No: 704-TRN.VHWY03200-04
Location: ALASKA HIGHWAY	Ground Elev: 388.7 m
FORT NELSON	UTM: 518226 E; 6510521 N; Z 10

Depth (m)	Method	Core Diameter (mm)	Soil Description	Graphical Representation	Sample Type	Sample Number	Particle Size Distribution: Gravel (%)	Sand (%)	Silt and Clay (%)	Field Blowcount (blows/300 mm) □ SPT	Field Vane (kPa) Post-Peak ◇ Peak	Plastic Limit / Moisture Content / Liquid Limit	BH21-04	Elevation (m)
0										20 40 60 80	10 20 30 40	20 40 60 80		
1	ODEX		SAND (FILL), gravelly, trace to some silt, damp, frozen, brown; subrounded to subangular gravel up to 20 mm nominal diameter. SPT at 0.9 m: 28/40/35/30 (n=75). 80% Recovery.			SPT01	26	62	12					388
2			WOOD DEBRIS (POSSIBLE FILL).											387
3			SAND, silty, some gravel, trace clay, damp, compact, brown; subrounded gravel up to 25 mm nominal diameter. SPT at 2.5 m: 13/6/8/16 (n=14). 80% Recovery.			SPT02	20	54	26					386
4			SPT at 4.0 m: 9/12/10/10 (n=22). 50% Recovery.			SPT03								385
5														384
6			CLAY, silty, sandy, trace gravel, wet, stiff, dark grey, low plastic; fine sand; angular fine gravel.			ST01								383
7			- Groundwater inferred at 7.0 m. SPT at 7.0 m: 3/5/8/9 (n=13). 100% Recovery.			SPT04								382
8														381
9			SPT at 8.5 m: 5/9/10/11 (n=19). 45% Recovery.			SPT05			40					380
10			- Some silt, trace sand, very stiff, medium plastic; occasional layers of SAND and GRAVEL, wet, dark grey, 20 mm thick, below 10 m.			SPT06								379
11			SPT at 10 m: 5/9/8/11 (n=17). 80% Recovery.											378
12			SPT at 11.6 m: 4/8/11/11 (n=19). 77% Recovery.			SPT07								377
13			End of borehole at 12.2 m, target depth reached. - UTM coordinates calculated from measurements on site relative to local landmarks.											376

3/2/2021

3/2/2021

TETRA TECH

Contractor: WESTECH	Completion Depth: 12.2 m
Drilling Rig Type: FRASTE MULTIDRILL PL	Start Date: 2021 March 02
Logged By: ER	Completion Date: 2021 March 02
Reviewed By: TM	Page 1 of 2

PUBLIC SERVICES AND PROCUREMENT CANADA

Borehole No: **BH21-04**

Project: FORT NELSON SALT SHED GEOTECHNICAL	Project No: 704-TRN.VHWY03200-04
Location: ALASKA HIGHWAY	Ground Elev: 388.7 m
FORT NELSON	UTM: 518226 E; 6510521 N; Z 10

Depth (m)	Method	Core Diameter (mm)	Soil Description	Graphical Representation	Sample Type	Sample Number	Particle Size Distribution: Gravel (%)	Particle Size Distribution: Sand (%)	Particle Size Distribution: Silt and Clay (%)	Field Blowcount (blows/300 mm) ☐ SPT 20 40 60 80	Field Vane (kPa) Post-Peak ◇ Peak ◆ 10 20 30 40 / Plastic Limit Moisture Content Liquid Limit 20 40 60 80	BH21-04	Elevation (m)
13			- Ground surface elevations estimated using site survey information dated June 2017. - Soil descriptions are based on visual classifications and field observations, in combination with in-situ and laboratory testing. Some variation throughout the interpreted soil layers is expected. - Estimates of soil consistency were determined from drill reaction, in-situ testing and visual classification of recovered samples. - Groundwater inferred at 7.0 m during drilling. - Upon completion, borehole was backfilled with cuttings and bentonite as shown on the borehole log.										375
14													374
15													373
16													372
17													371
18													370
19													369
20													368
21													367
22													366
23													365
24													364
25													363
26													

TETRA TECH

Contractor: WESTECH	Completion Depth: 12.2 m
Drilling Rig Type: FRASTE MULTIDRILL PL	Start Date: 2021 March 02
Logged By: ER	Completion Date: 2021 March 02
Reviewed By: TM	Page 2 of 2

APPENDIX C

LABORATORY TEST RESULTS

MOISTURE CONTENT and 75 MICRON FINES CONTENT TEST RESULTS

ASTM D2216, ASTM D1140

Project:	Salt Shed Geotechnical Investigation and Assessment	Borehole No.:	96
Project No.:	704-TRN.HWY03200-04	Date Tested:	March 17, 2021
Client:	Public Services and Procurement Canada	Tested By:	EE
Project Engineer:	Nick Ekman, Tim Morton, Eli Riedl	Page:	1 of 1

Sample Number	Depth m	Moisture Content (%)	Fines Content (%)	Visual Description of Soil
BH21-01	SPT01 @ 0.9 - 1.5	3.5		SAND, gravelly, some silt, moist, brown
BH21-01	SPT02 @ 2.4 - 3.0	2.4		SAND and GRAVEL, some silt, moist, brown
BH21-01	SPT04 @ 5.5 - 6.1	18.5	52	SILT and SAND, trace gravel, very moist, grey
BH21-01	SPT05 @ 7.2 - .78	20.8	76	SILT, some sand, trace gravel, very moist, grey
BH21-02	SPT03 @ 4.0 - 4.6	3.2		SAND and GRAVEL, some silt, moist, brown
BH21-02	SPT04 @ 5.5 - 6.1	6.4		GRAVEL, sandy, some silt, moist, brown
BH21-02	SPT05 @ 7.0 - 7.6	19.6	66	SILT, some sand, very moist, grey
BH21-03	SPT01 @ 0.9 - 1.5	5.1		SAND, gravelly, some silt, moist, brown
BH21-03	SPT02 @ 2.4 - 3.0	4.5		SAND and GRAVEL, some silt, moist, brown
BH21-03	SPT03 @ 4.0 - 4.6	3.0	5.4	SAND and GRAVEL, trace silt, moist, brown
BH21-03	G1 @ 6.4 - 6.7	4.8		SAND, gravelly, some silt, moist, brown
BH21-04	SPT05 @ 8.5 - 9.1	13.0	40	CLAY, silty, sandy, trace gravel, very moist, grey

* Non-standard sample size

Reviewed By: Brian Gunnarson ASc.T.

TETRA TECH

ATTERBERG LIMITS - LABORATORY RESULTS SUMMARY

ASTM D4318

Project:	Salt Shed Geotechnical Investigation and Assessment	Test Hole No.:	BH 21 - 02 to BH 21 - 09		
Project No.:	704-TRN.VHWY03200-04	Submitted By:	ER	Sampled By:	ER
Client:	Public Services and Procurement Canada	Date Sampled:	March 3, 2021	Tested By:	EE
Attention:		Date Tested:	March 19, 2021	Laboratory:	Nanaimo

Test Hole Number	Sample ID	Depth (m)	Moisture Content (%)	Atterberg Limits			Mod. USCS	Soil Description Type, constituants/composition, structure, moisture, consistency, plasticity, colour, odour, inclusions.
				LL	PL	PI		
BH 21 - 02	SPT06	9.1 - 9.8	14.1	29	13	16	CL - CI	CLAY, silty, some gravel, trace sand, moist, grey
BH 21 - 03	SPT06	8.5 - 9.1	28.0	54	17	37	CH	CLAY, trace sand, trace silt, moist, grey
BH 21 - 04	SPT04	7.0 - 7.6	22.4	29	14	15	CL - CI	CLAY, silty, trace sand, moist ,grey
BH 21 - 04	SPT06	10.1 - 10.7	13.9	35	15	20	CI	CLAY, some silt, trace gravel, trace sand, moist, grey
BH 21 - 04	SPT07	11.6 - 12.2	16.9	38	14	24	CI	CLAY, some silt, trace gravel, trace sand, moist, grey

Remarks: Samples prepared over 425 micron to remove sand and gravel

Reviewed By: Kevin Jamieson ASc.T.

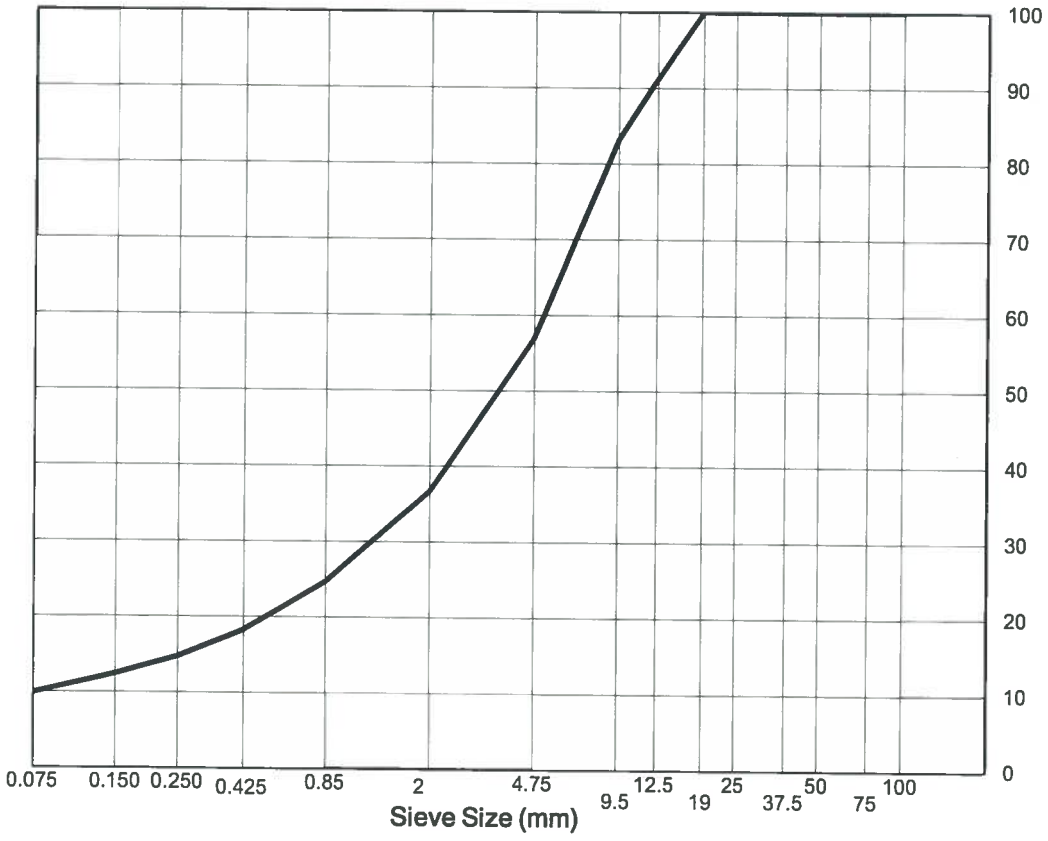
TETRA TECH

SIEVE ANALYSIS REPORT

Washed Sieve: ASTM C136 and C117

Project No.:	704-TRN.VHWY03200-04	Sample No.:	102
Project:	Salt Shed Geotechnical Investigation and Assessment	Date Sampled:	March 3, 2021
Client:	Public Services and Procurement Canada	Sampled by:	ER
Attention:		Date Tested:	March 17, 2021
Email:		Tested by:	EE Office: Nanaimo
Description:	SAND and GRAVEL, trace silt, moist, brown	Moisture Content (as received):	3.5%
		No. Crushed Faces:	Two (2) or Three (3)
Source:	BH 21 -02	By particle mass:	
Supplier:			
Sample Location:	SPT02 @ 2.4 - 3.0		
Specification:			

Sieve Size	Percent Passing
25	100
19	100
12.5	90
9.5	83
4.75	57
2.00	37
0.85	25
0.425	18
0.250	15
0.150	12
0.075	9.9



Remarks:

Reviewed By: Brian Gunnerson ASc.T.

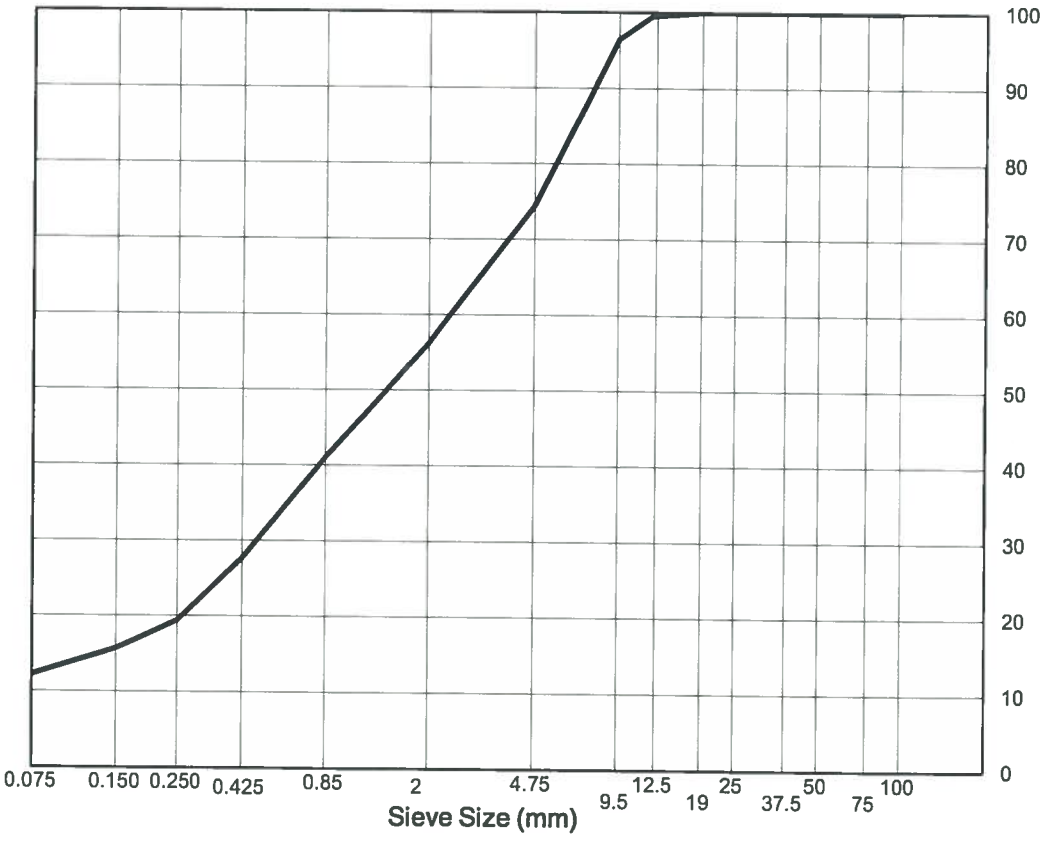
TETRA TECH

SIEVE ANALYSIS REPORT

Washed Sieve: ASTM C136 and C117

Project No.:	704-TRN.VHWY03200-04	Sample No.:	103
Project:	Salt Shed Geotechnical Investigation and Assessment	Date Sampled:	March 3, 2021
Client:	Public Services and Procurement Canada	Sampled by:	ER
Attention:		Date Tested:	March 17, 2021
Email:		Tested by:	EE Office: Nanaimo
Description:	SAND, gravelly, some silt, moist, brown	Moisture Content (as received):	6.0%
		No. Crushed Faces:	Two (2) or Three (3)
Source:	BH 21 -04	By particle mass:	
Supplier:			
Sample Location:	SPT01 @ 0.9 - 1.5		
Specification:			

Sieve Size	Percent Passing
25	100
19	100
12.5	100
9.5	96
4.75	74
2.00	56
0.85	41
0.425	27
0.250	19
0.150	16
0.075	12



Remarks:

Reviewed By: Brian Gammerson ASc.T.

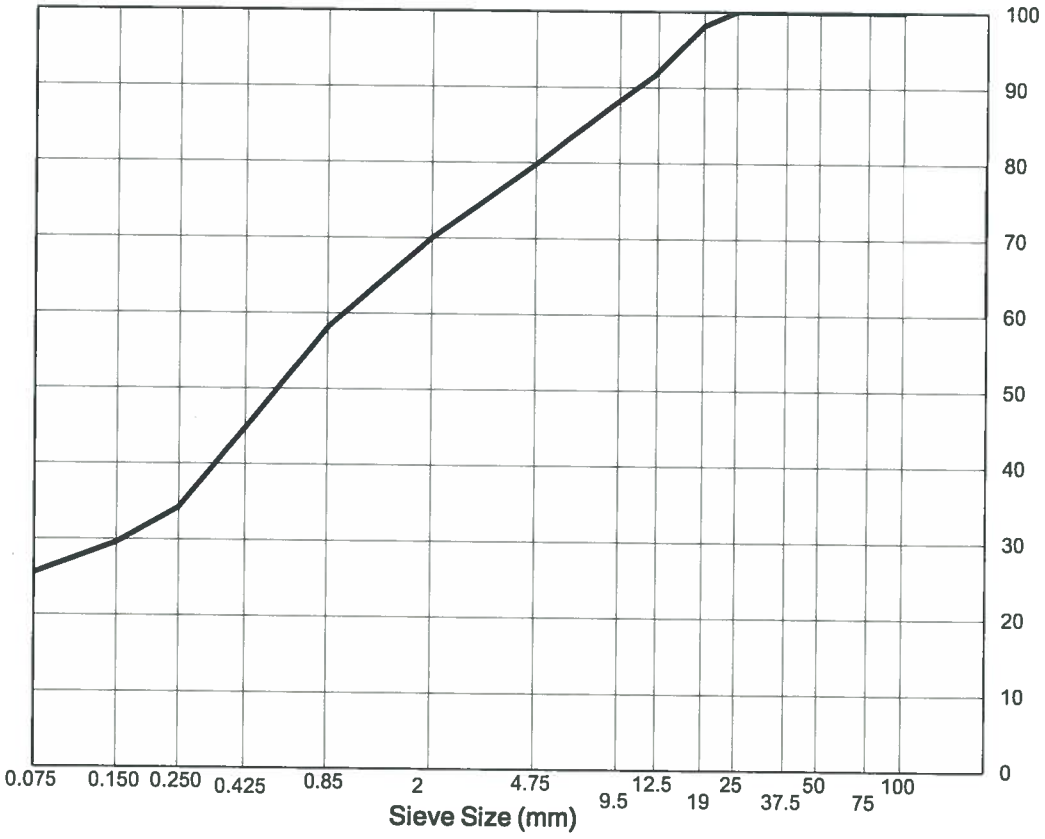
TETRA TECH

SIEVE ANALYSIS REPORT

Washed Sieve: ASTM C136 and C117

Project No.:	704-TRN.VHWY03200-04	Sample No.:	104
Project:	Salt Shed Geotechnical Investigation and Assessment	Date Sampled:	March 3, 2021
Client:	Public Services and Procurement Canada	Sampled by:	ER
Attention:		Date Tested:	March 17, 2021
Email:		Tested by:	EE Office: Nanaimo
Description:	SAND, silty, some gravel, trace clay, moist, brown	Moisture Content (as received):	8.8%
		No. Crushed Faces:	Two (2) or Three (3)
Source:	BH 21 -04	By particle mass:	
Supplier:			
Sample Location:	SPT02 @ 2.4 - 3.0		
Specification:			

Sieve Size	Percent Passing
37.5	100
25	100
19	98
12.5	91
9.5	88
4.75	80
2.00	70
0.85	58
0.425	45
0.250	34
0.150	30
0.075	26



Remarks:

Reviewed By: Brian Gunnesch ASc.T.

TETRA TECH

R.113313.001
Appendix K

Environmental Design Criteria for Alaska Highway Salt Sheds, Fort Nelson Maintenance Camp, April 15, 2021

TETRA TECH

Environmental Design Criteria

Project Name: Alaska Highway Salt Sheds
TT Project No.: 704-TRN.VHWY03200-02 / 719-220246.T1
Client Project No.:
Project Location: Fort Nelson Maintenance Camp

Date: 2021-04-15
Page: 1/1
Originator: Tyler Smith
Checker: Sophie Overney Ragan

Design Build Contractor is responsible for determination of appropriate environmental criteria.
Criteria used shall be no less than those shown on this sheet.

Code: British Columbia Building Code 2018

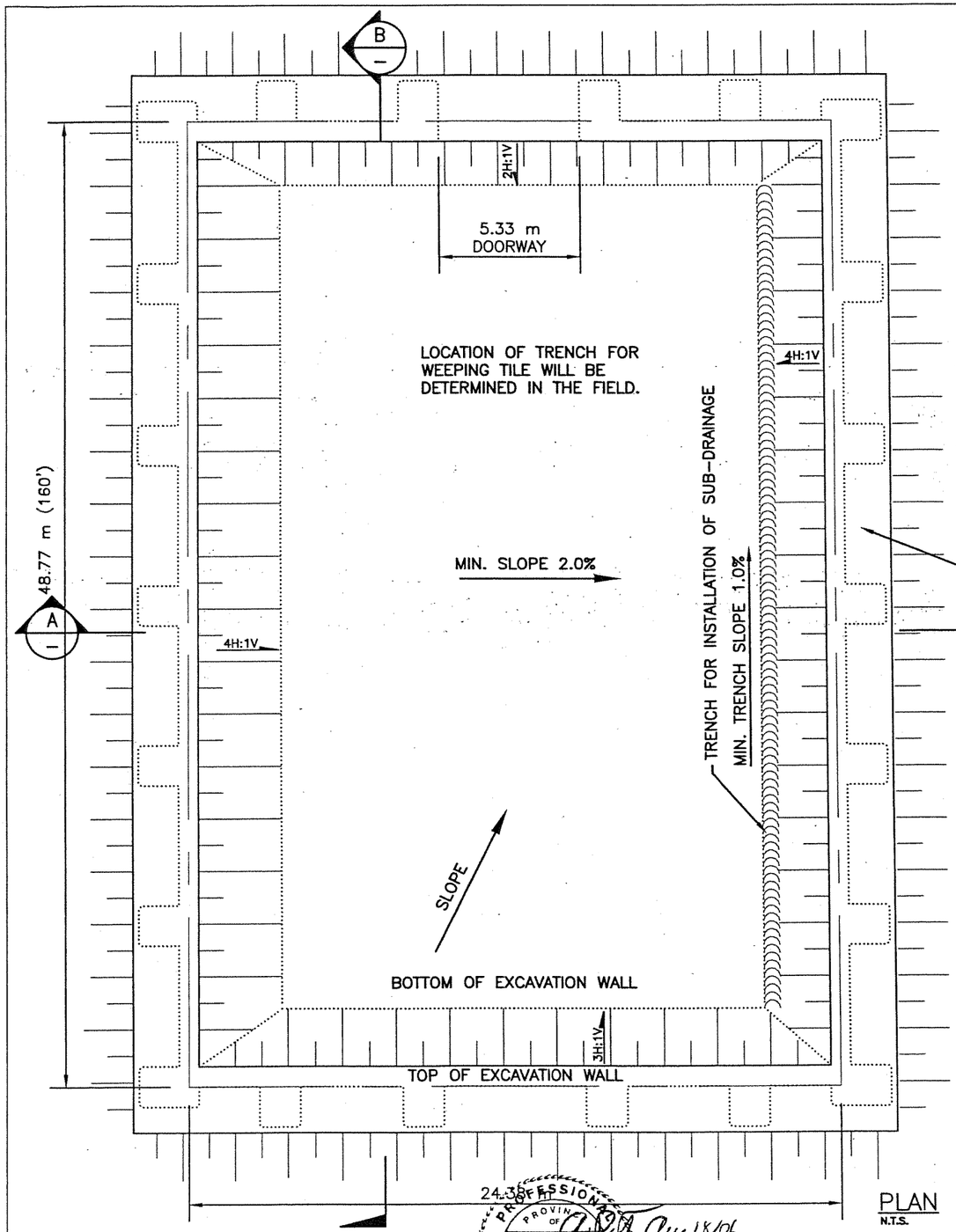
*Unless noted otherwise, source of data is climactic data appendix of the specified code and revision

No.	Description	Variable Symbol	Value	Unit	Source*	Notes
1	Latitude		58.73488	Deg	1	
2	Longitude		-122.68545	Deg	1	
3	Elevation above MSL		386	m	2	
4	2.5% January Design Temperature		-	Deg C		Not Required
5	1% January Design Temperature		-	Deg C		Not Required
6	2.5% July Design Dry-Bulb Temperature		-	Deg C		Not Required
7	2.5% July Design Wet-Bulb Temperature		-	Deg C		Not Required
8	Annual Total Degree Days Below 18C		6710	Deg C * Day	3	
9	15 Min. Rainfall		15	mm	3	
10	One Day Rainfall (1/50)		70	mm	3	
11	Annual Rain		325	mm	3	
12	Moisture Index		-			Not Required
13	Annual Total Precipitation		450	mm	3	
14	Driving Rain and Wind Pressure (1/5)		80	Pa	3	
15	Ground Snow Load (1/50)	*Ss*	2.4	kPa	3	
16	Associated Rain Load (1/50)	*Sr*	0.1	kPa	3	
17	Hourly Wind Pressures					
	Probability 1/10 year		0.23	kPa	3	
	Probability 1/50 year	*q*	0.3	kPa	3	
18	Mapped Seismic Spectral Accelerations				3	
		Sa(0.2)	0.141	G		
		Sa(0.5)	0.10	G		
		Sa(1.0)	0.068	G		
		Sa(2.0)	0.036	G		
		Sa(5.0)	0.012	G		
		Sa(10.0)	0.005	G		
		PGA	0.081	G		
		PGV	0.071	m/s		
16	Seismic Site Classification		TBD			Pending geotech report

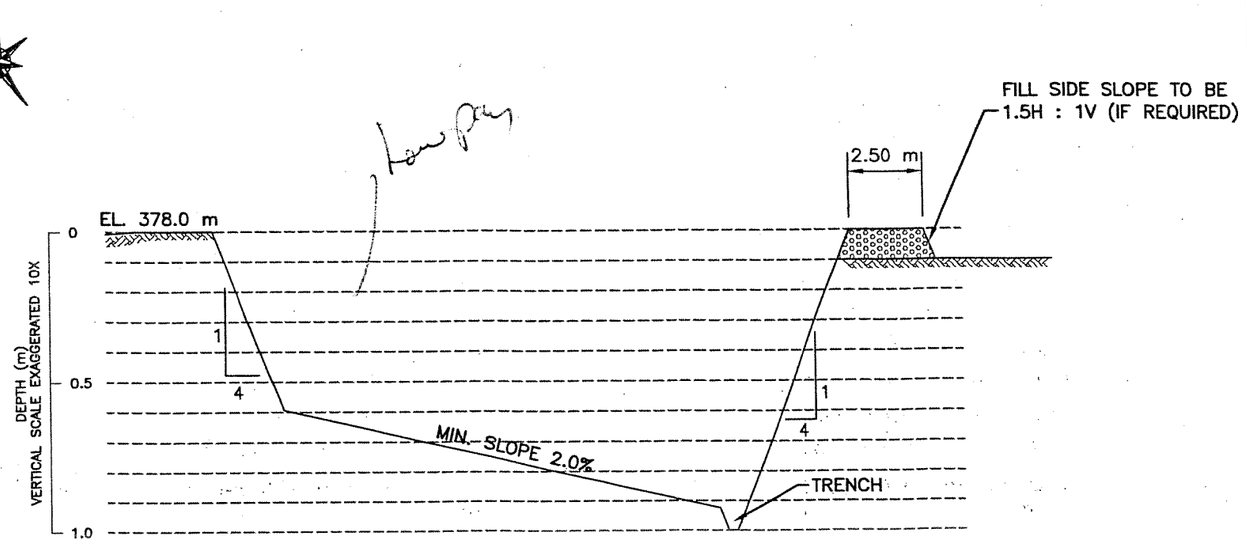
Remarks:
Source 1: Sourced from Google Earth kmz file provided to 719 group by 704 group
Source 2: Google Earth
Source 3: Fort Nelson data from 2018 BC Building Code Climatic and Seismic Data

R.113313.001
Appendix L

Existing Geomembrane Details Excerpt from Project Number 859645 Sheets 2 Through 4



PLAN
N.T.S.

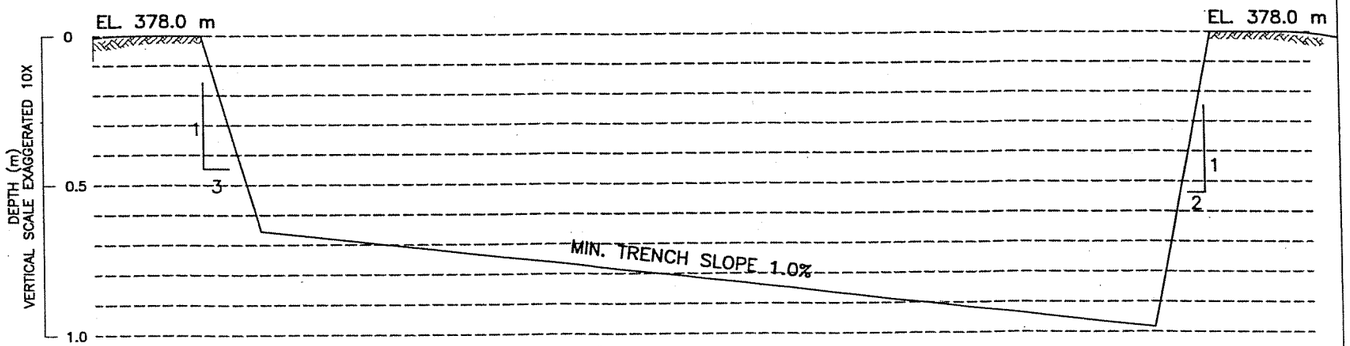


A SECTION
N.T.S.

LOCK–BLOCK FOUNDATION MINIMUM WIDTH 2.5 m.
EXCAVATE TO MINIMUM 0.5 m DEPTH AND REPLACE WITH GRANULAR FILL COMPACTED TO AT LEAST 100% STANDARD PROCTOR DENSITY OR AS DIRECTED BY ENGINEER.
FILL SIDE SLOPE TO BE 1.5H : 1V

NOTE

FOUNDING SURFACE FOR LOCK–BLOCKS TO HAVE A MINIMUM ALLOWABLE BEARING CAPACITY OF 250 kPa.



B SECTION
N.T.S.

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Pacific Region

designed by / conçu par	drawn by / dessine par
AHG/AP	AHG/CYW
approved by / approuve par	
PWGSC Project Manager / Administrateur de Projets TPSGC	

project title / titre du projet
ALASKA HIGHWAY
FORT NELSON SALT SHED
km 445 , BRITISH COLUMBIA

drawing title / titre du dessin
SALT SHED AND LINER INSTALLATION
SITE PREPARATION

scale / echelle	date
N.T.S.	JULY 2006
project no. / projet no.	
859645	
sheet / feuille	
02	

8 – 11x17

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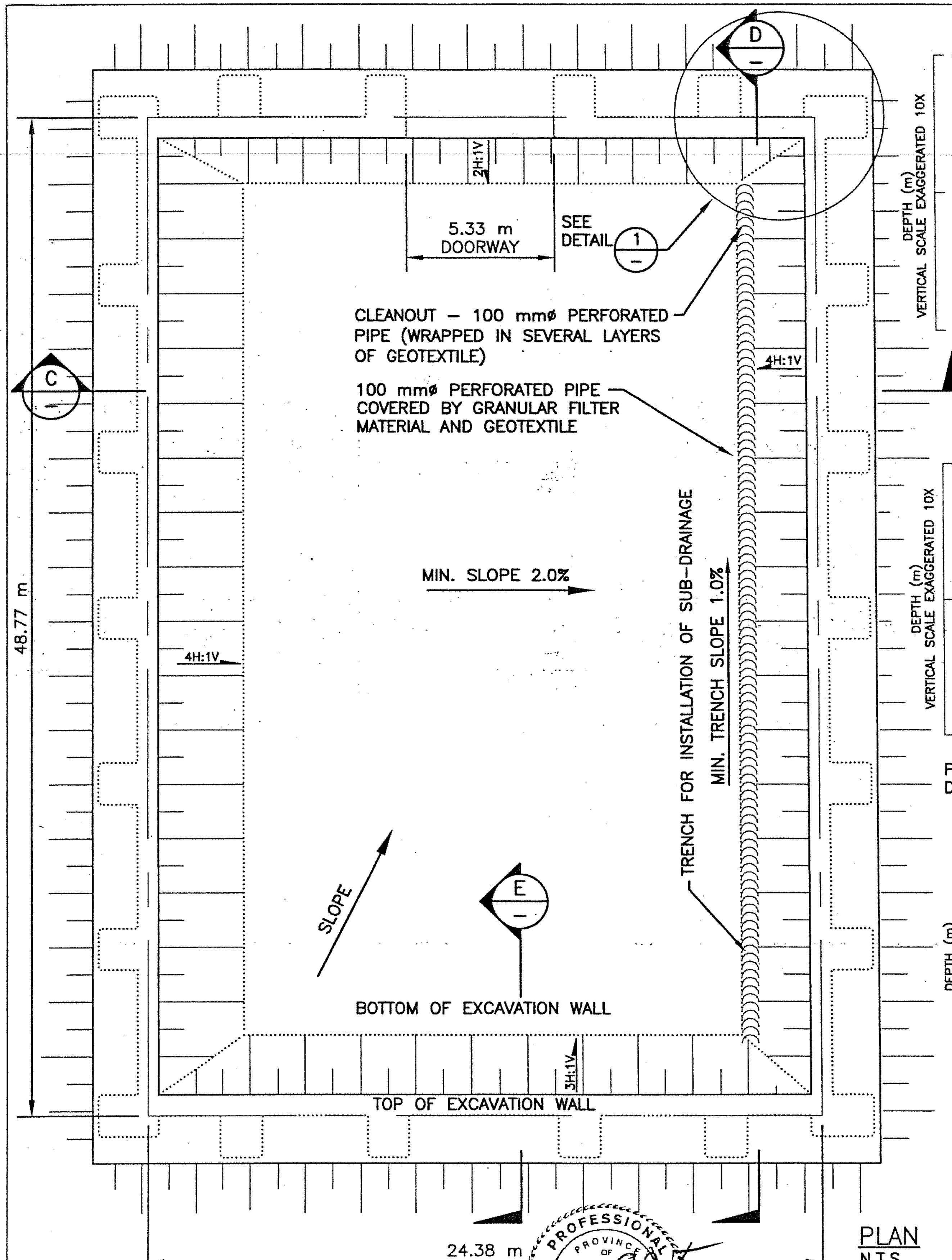

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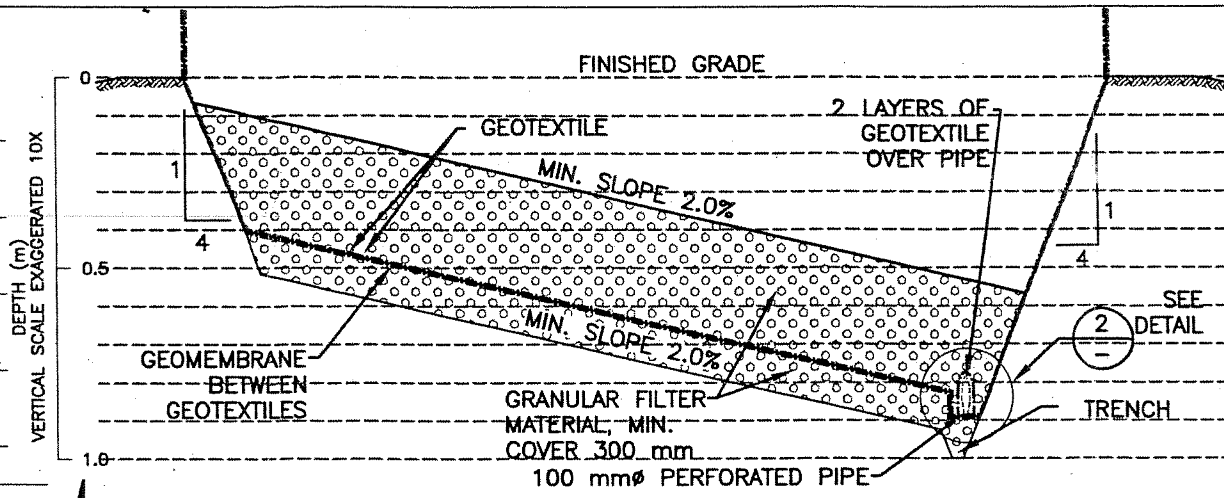

C SECTION
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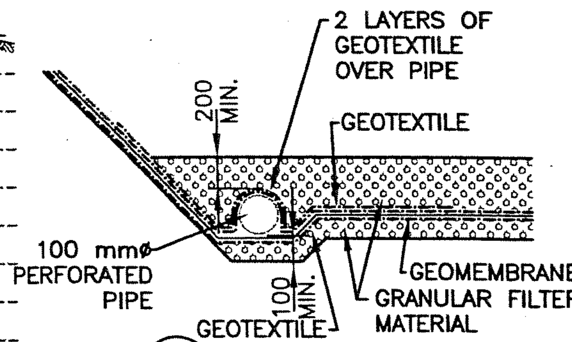
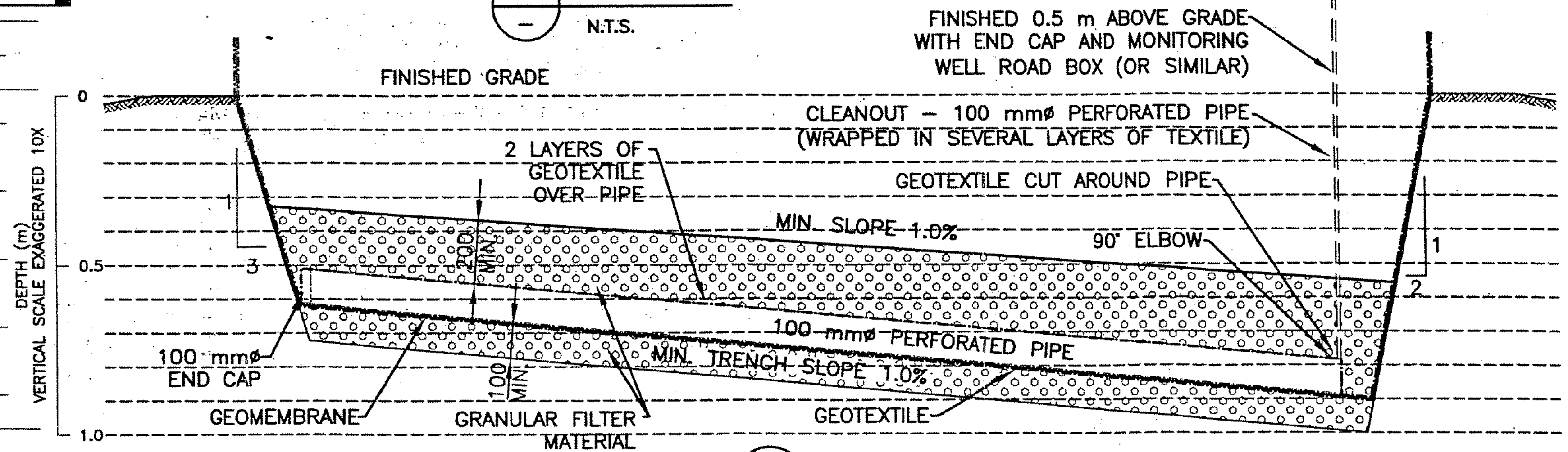


2 SUB-DRAINAGE DETAIL
N.T.S.



D SECTION
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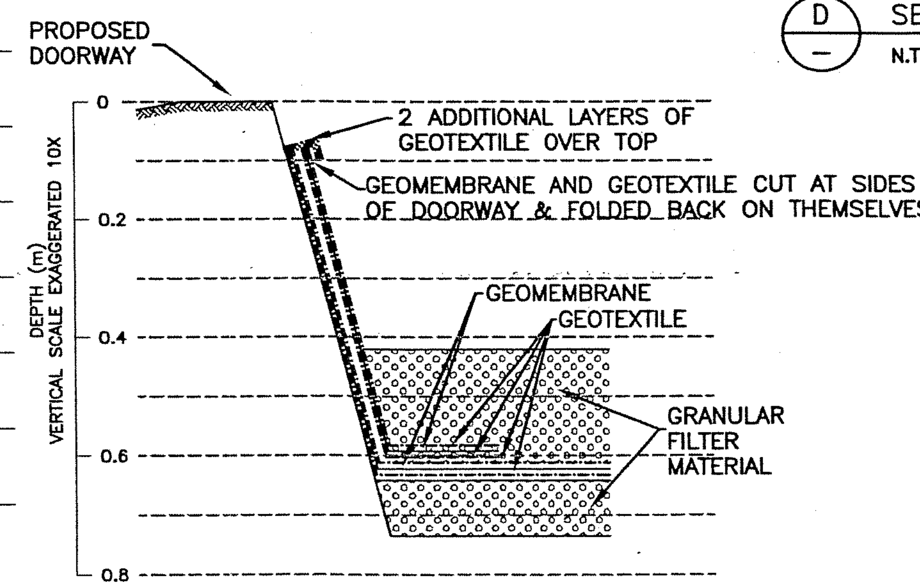
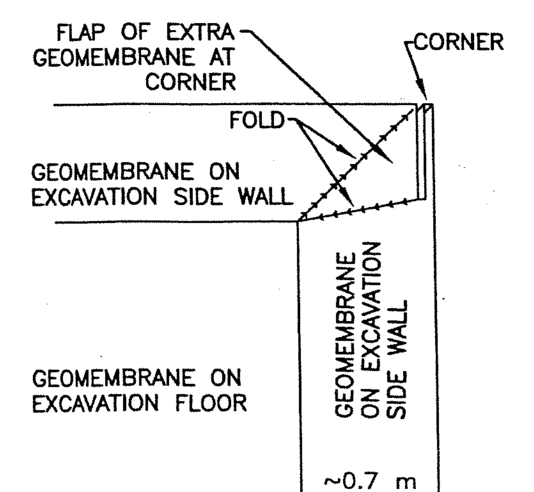


E SECTION
N.T.S.

GEOTEXTILE AND TEXTILE FOLDING AT PROPOSED DOOR



1 DETAIL
N.T.S.

FOLDED GEOMEMBRANE IN CORNERS

Public Works and Government Services Canada — Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Pacific Region

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — A.D. — AHG/ARK — Aug 18/06

designed by / conçu par	drawn by / dessiné par	project title / titre du projet	drawing title / titre du dessin	scale / échelle	date / date
AHG/ARK	AHG/CYW	ALASKA HIGHWAY FORT NELSON SALT SHED km 445, BRITISH COLUMBIA	GEOMEMBRANE AND DRAINAGE	N.T.S.	JULY 2006
approved by / approuvé par				project no. / projet no.	859645
PWGSC Project Manager / Administrateur de Projets TPSGC				sheet / feuille	03

B – 11x17

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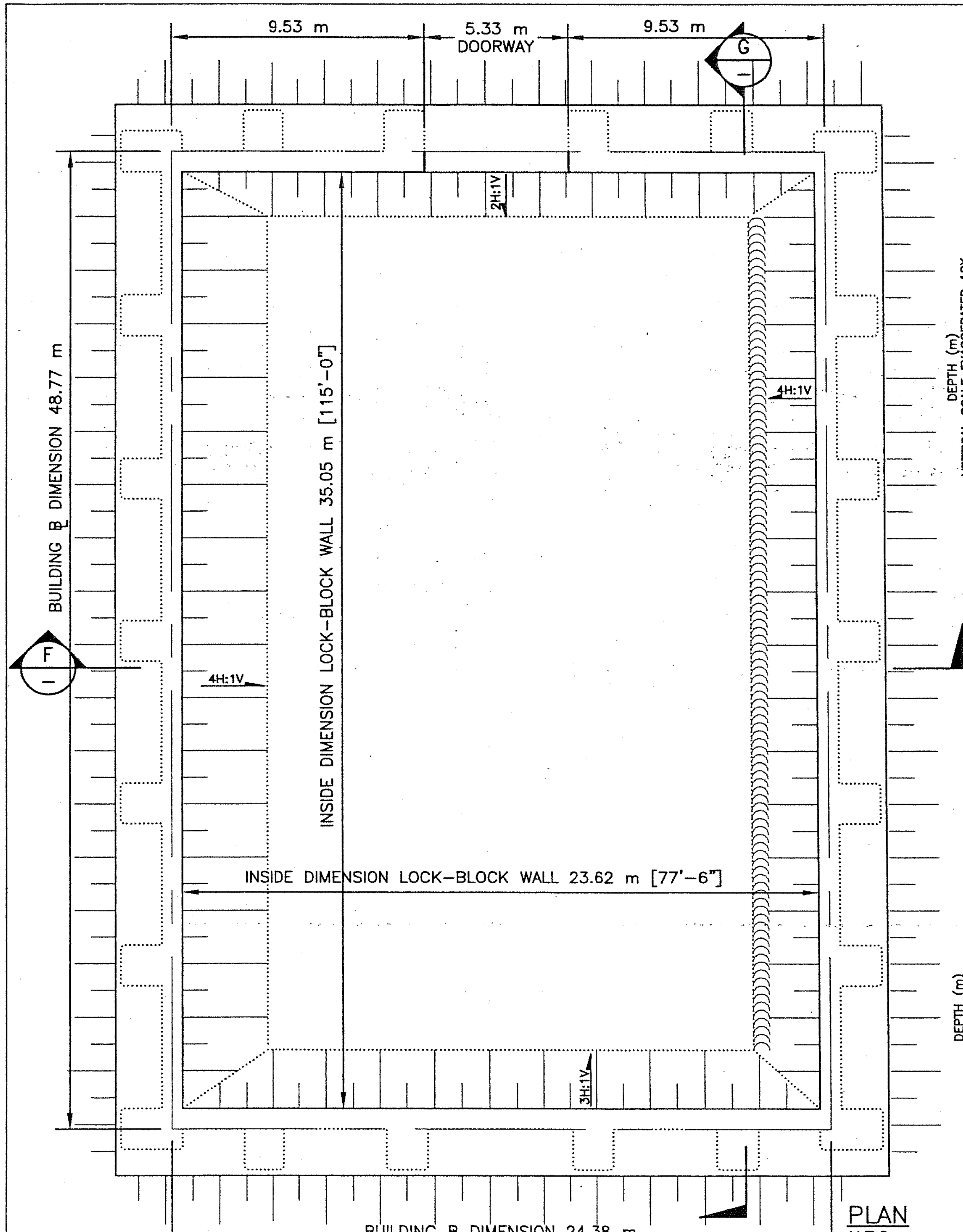

PLAN
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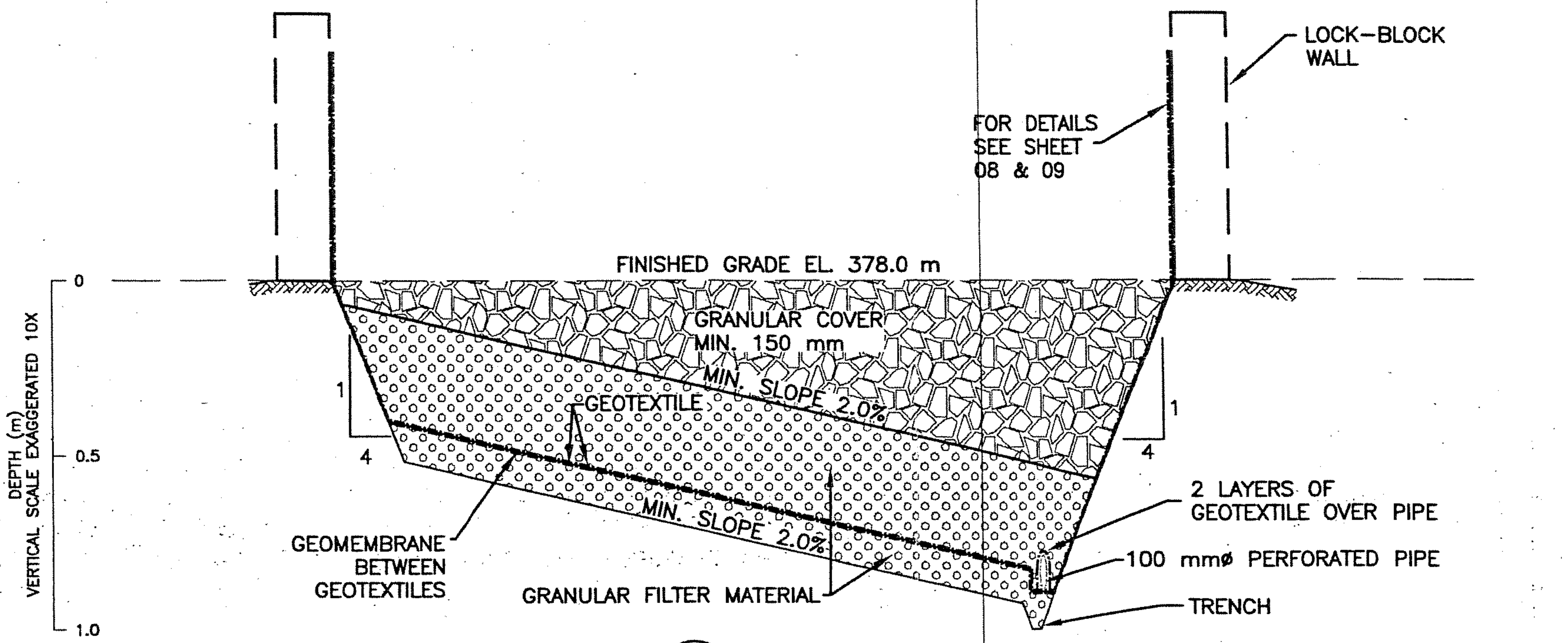

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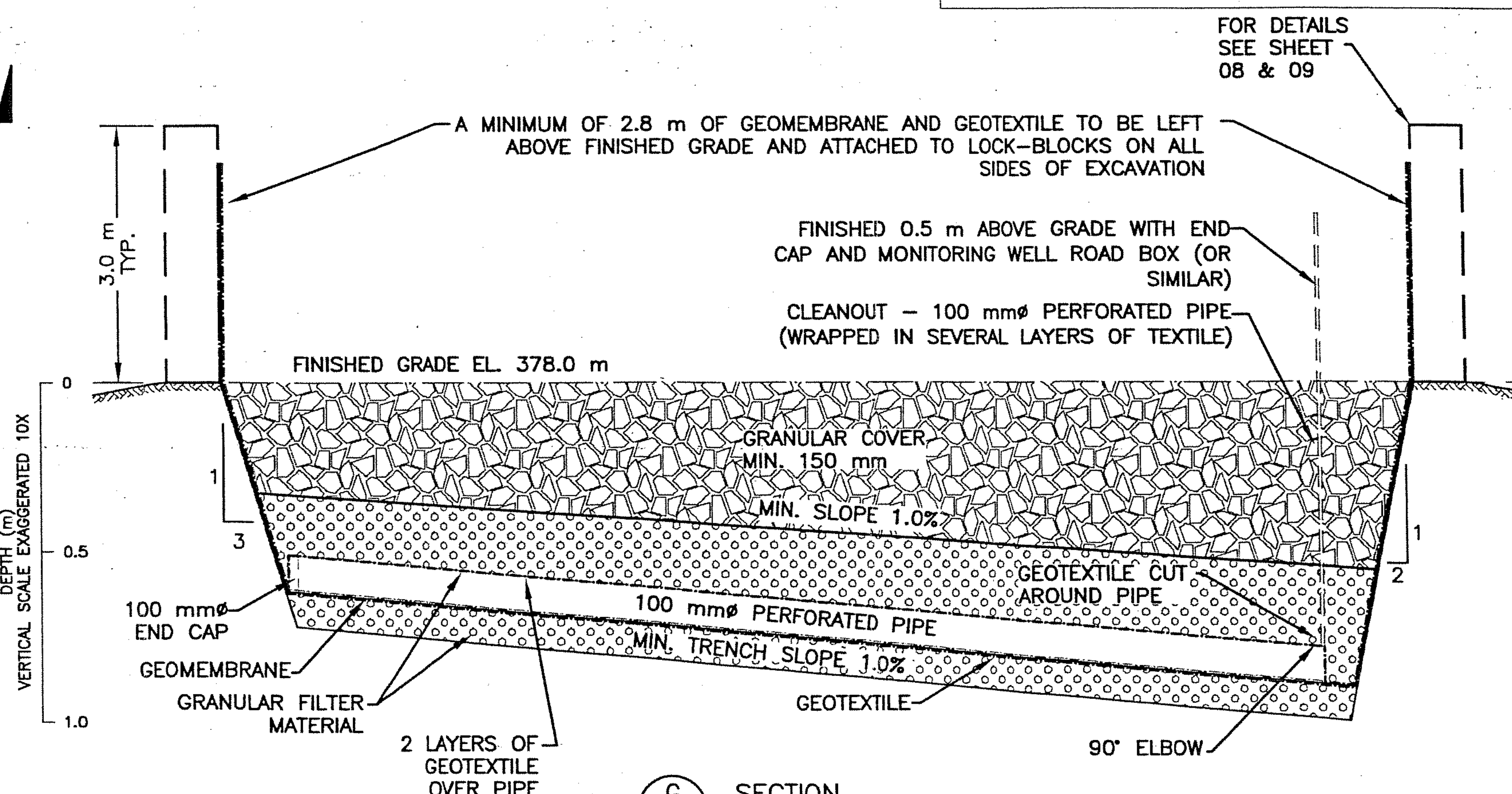

G — SECTION
N.T.S.

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada — REAL PROPERTY SERVICES, Pacific Region	designed by / conçu par: AHG/AP; drawn by / dessiné par: AHG/CYW; approved by / approuvé par; PWGSC Project Manager / Administrateur de Projets TPSGC	project title / titre du projet: ALASKA HIGHWAY, FORT NELSON SALT SHED, km 445, BRITISH COLUMBIA	drawing title / titre du dessin: FINISHED INSTALLATION	scale / échelle: N.T.S.; project no. / projet no.: 859645; sheet / feuille: 04	date / date: JULY 2006

B – 11x17

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