Public Works and
Government Services Canada

Requisition No: EZ899-200500

DRAWINGS & SPECIFICATIONS
For:

Alaska Highway Racing River Bridge Km 641.1 and Tetsa#1 River Bridge Km584.5 Rehabilitation Alaska Highway

Project No.
R.104797.001
R.104798.001

July, 2019

APPROVED BY:

Regional Manager, AES — Date: 2019-07-10

Construction Safety Coordinator — Date: 2019-07-09

TENDER:

Project Manager — Date: July 10/19

7/09/2019
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END OF SECTION

PART 1 - GENERAL

1.1	Definitions	.1	"Department" shall mean Public Works and Government Services Canada and is abbreviated as "PWGSC" or Public Services Procurement Canada, abbreviated as "PSPC."
		.2	"Departmental Representative" shall mean a representative appointed by PSPC for the purpose of execution of this Contract.
		.3	"Owner" shall mean PSPC.
		.4	"Bearing Assembly" refers to the assembled new steel stool, new bearing.
		.5	"New Pedestal" refers to the portion of the bearing assembly connecting the new bearing to the existing pier concrete, as labelled on the Contract Drawings.
		.6	"New Stool" refers to the portion of the bearing assembly connecting the existing truss end post to the new bearing, as labelled on the Contract Drawings.
1.2	Codes, Bylaws, Standards	.1	Perform work to most CURRENT Codes, Construction Standards and Bylaws, including Amendments unless otherwise noted.
		.2	Perform work in accordance with the Canadian Standards Association, the American Society for Testing of Materials, Highway Bridge design code CAN/CSA S6-14, AASHTO LRFD Bridge Construction specifications and BC MoTI Standard Specifications for Highway Construction and/or any other Code or Bylaw of local application or referenced in the Contract Documents.
		.3	Comply with applicable local bylaws, rules and regulations enforced at the location concerned.
		.4	Meet or exceed requirements of Contract documents, specified standards, codes, and referenced documents.
		.5	In any case of conflict or discrepancy, the most stringent requirements shall apply.
		.6	The latest version of any standards referenced in the Contract Documents and Drawings shall be used unless noted otherwise.
1.3	Design and Specification Requirements	.1	In the following order of precedence, all design, fabrication and installation of the work shall be in accordance with: .1 Contract Specifications .2 Canadian Highway Bridge Design Code, S6-14

.3 BC MoTI Standard Specifications for Highway Construction Volume 1 and 2

.4 AASHTO LRFD Bride Construction Specifications, 3rd edition 2010.

1.4 Contract Documents

.1 The Contract Documents, drawings and specifications, are intended to complement each other, and to provide for and include as much information as possible for the completion of the Work.

.2 If anything is found by the Contractor to be missing from the Contract Documents immediately inform the Departmental Representative.

1.5 Other Contracts

.1 Cooperate with other Contractors in carrying out their respective works and carry out instructions from Departmental Representative.

.2 Coordinate work with that of other Contractors. If any part of work under this Contract depends for its proper execution or result upon work of another Contractor, report promptly to Departmental Representative, in writing, any defects which may interfere with proper execution of this Work.

1.6 Division of Specifications

.1 The specifications are subdivided in accordance with the current 6-digit National Master Specifications System.

.2 A division may consist of the work of more than 1 subcontractor. Responsibility for determining which subcontractor provides the labour, material, equipment and services required to complete the work rests solely with the Contractor.

1.7 Contractor's Responsibility

.1 Give all required Notices and comply with all local, provincial, and federal laws, bylaws, ordinances, rules, regulations, codes, and orders relating to the Work which are or become in force during the Performance of the Work.

.2 As Prime Contractor, coordinate all the Work and provide all labour, materials, equipment, and services necessary for delivery, storage, handling, protection, installation, removal, inspection, and replacement or maintenance as required to complete the scope of work as specified in the Contract Documents.

1.8 Cost Breakdown

.1 Before submitting the first progress payment invoice, submit a breakdown of the Contract prices in detail as directed by the Departmental Representative and aggregating Contract price.

1.9 Regulatory Requirements

.1 Obtain and pay for any Permits, Certificates, Licenses, and other permits required by regulatory municipal, provincial or federal authorities to complete the work.

.2 Provide inspection authorities with plans and information required for issue of acceptance certificates.

.3 Furnish inspection certificates in evidence that the work conforms to the requirements of the authority having jurisdiction.

1.10 Existing Information

.1 The Departmental Representative will make available to the Contractor the following documents:

.1 2018 Inspection Reports for the Racing River Bridge and Tetsa River Bridge No. 1 and the 2015 substructure defect map.

.2 Available shop drawings, as-builts and rehabilitation drawings for the Racing River Bridge and Tetsa River Bridge No. 1.

.3 It is not warranted that the information shown in the provided drawings is current and the Contractor shall verify by detailed survey of all dimensions and details which are relevant to the work prior to undertaking any of the work.

.4 The dimensions and information shown on the Contract drawings are taken from the available drawings. Dimensions shown are those which are deemed relevant to the new work. Other items shown on these drawings are schematic in nature and intended to give the Contractor a sense of the general working area and site constraints.

1.11 Survey

.1 The Contractor shall verify all related dimensions and details of existing structure in the field prior to ordering affected material, producing shop or temporary works drawings or fabricating affected components.

.2 Prior to construction, provide photographs of surrounding objects that are liable to be damaged.

.3 The Contractor shall be responsible for producing a detailed survey of each bearing location for the Racing River Bridges to confirm final dimensions and elevations for substructure and superstructure to facilitate the production of shop drawings. The survey, together with a detailed list of all amendments required to the details shown on the Contract Drawings, shall be submitted to the Departmental Representative within ten (10) days after the pre-construction

meeting and in accordance with Section 01 33 00 Submittal Procedures.

.4 The work of verification of existing construction dimensions shall be considered as the Contractor's subsidiary obligation and no additional payment will be made.

1.12 Location of Equipment and Fixtures

.1 Location of equipment, structures, Racing River, and Tetsa River No. 1 indicated in Contract plans or specification are to be considered as approximate.

.2 Inform Departmental Representative of impending installation and obtain approval for actual location.

1.13 Setting Out Work

.1 Assume full responsibility for and execute complete layout of work to locations, lines and elevations indicated.

.2 Assume full responsibility for dimensions, spacings, overall fit with field components, and exact locations of new bolt holes and their spacings.

.3 Provide devices needed to lay out and construct work.

.4 Supply such devices as templates required to facilitate Departmental Representative's inspection of work.

1.14 Quality of Work

.1 Ensure that quality workmanship is performed through use of skilled tradesmen, under supervision of qualified journeyman.

.2 The workmanship, erection methods, and procedures are to meet requirements set out in the applicable codes and standards.

.3 In cases of dispute, decisions as to standard or quality of work rest solely with the Departmental Representative, whose decision is final.

1.15 Works Coordination

.1 Coordinate work of subtrades:

.1 Designate one person to be responsible for review of contract documents and shop drawings and managing coordination of Work.

.2 Convene meetings between subcontractors whose work interfaces and ensure awareness of areas and extent of interface required.

.1 Provide each subcontractor with complete plans and

specifications for Contract, to assist them in planning and carrying out their respective work.

.2 Publish minutes of each meeting.

.3 Departmental Representative is not responsible for, or accountable for extra costs incurred as a result of Contractor's failure to coordinate Work.

.4 Maintain efficient and continuous supervision.

1.16 Testing

.1 The Contractor will appoint and pay for the services of testing agencies and/or testing laboratories to meet the requirements specified in the Contract documents and where required for the following:

.1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.

.2 Inspection and testing performed exclusively for Contractor's convenience.

.3 Tests specified to be carried out by Contractor under the Departmental Representative's supervision.

.2 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.

.3 Provide Departmental Representative with 2 copies of testing laboratory reports and mill tests and certificates of compliance as soon as they are available.

1.28 As-Built Documents

.1 As work progresses, Contractor is to maintain accurate records to show all deviations from the Contract documents. Note on as-built specifications, drawings, and shop drawings as changes occur. Within six weeks of the substantial completion of the work, Contractor is to supply the Departmental Representative the redline mark-ups of the changes in the drawings and specifications for the consultant to prepare as-built drawings.

1.33 Relics and Antiques

.1 Relics and antiquities and items of historical or scientific interest shall remain property of Department. Protect such articles and request directives from Departmental Representative.

.2 Give immediate notice to Departmental Representative if evidence of archaeological finds are encountered during

		excavation/construction, and await Departmental Representative's written instructions before proceeding with work in this area.
	.3	Coordinate all excavation work with the Archaeologist retained by the Department
1.34 Additional Drawings	.1	The Departmental Representative may furnish additional drawings for clarification. These additional drawings have the same meaning and intent as if they were included with plans referred to in the Contract documents.
1.36 System of Measurement	.1	The metric system of measurement (SI) will be employed on this Contract.
1.37 Submission of Tender	.1	Submission of a tender is deemed to be confirmation of the fact that the Tenderer has analyzed the Contract documents and is fully conversant with all conditions therein.

END OF SECTION

PART 1 - GENERAL

1.1 Contractor Prequalification's

.1 The work consists of structural rehabilitation of an existing steel truss bridge and concrete repair to concrete substructure. The Contractor shall demonstrate their ability to perform the scope of work included in the Contract documents as part of their bid for the work.

.2 The Contractor shall provide project experience of three (3) projects similar in scope to this project completed within the last five years. Project experience shall include the following information at a minimum:

.1 Project name and location, and a detailed description of the work completed;

.2 Client for which the work was completed for including contact information for references;

.3 Construction costs of the project;

.4 Name of key individual(s) involved in the project experience who will be part of this project;

.5 General description of the project experience and how it relates to this project.

.3 The Contractor shall submit resumes of the key individuals who will work on this project including site superintendent and project manager/coordinator.

.4 The Contractor shall hire a concrete repair specialist who will design the concrete repairs to the substructure considering the project sites remote locations and existing condition of deteriorated concrete. The Contractor shall submit in their bid, the resume of he concrete specialist who will be responsible for the design of the concrete repairs.

.5 The Contractor shall submit in their bid the resume of the construction engineer(s) who will be responsible for preparing and signing and sealing the jacking procedure and bearing replacement plans.

PART 2 - PRODUCTS

2.1 Not Used.

.1 Not Used.

PART 3 - EXECUTION

3.1 Not Used.

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 Work Covered by Contract Documents

.1 Work under this Contract covers repairs to truss bridges along the Alaska Highway. The truss bridges are:

.1 Racing River Bridge, km 641.
.2 Tetsa River Bridge No.1, km 584.6.

For reference the town of Fort Nelson BC is at approximately km 454 of the Alaska Highway.

There are two primary scopes of work to be carried out as part of this Project:

.2 Concrete repairs: Concrete repairs involve removal of deteriorated concrete and patching with new concrete. The contractor is to design the patch repair in accordance with the performance-based specification. Photos from the 2018 inspection report and defect map from the 2015 inspection show the extent of concrete deterioration noted at the time of those inspections.

.3 Bearing End Posts: for each bearing location a portion of the existing vertical end post web is to be cut & removed along with the existing bearing assembly and replaced with a new bearing and connection to existing vertical post. This shall include:

.1 Remove portion of the existing end post web plate and install new steel stool.
.2 Remove existing steel rocker and fixed bearings and install new bearings.
.3 Fabricate, test and supply the new bearings to the bridge site.
.4 Prepare bearing seat and install new concrete pedestal to support the new bearings
.5 Design and install required strengthening to existing floorbeam. A proposed strengthening of the existing floorbeams is provided in the contract drawings. The Contractor is ultimately responsible for any strengthening work of the existing bridge to facilitate the jacking operation, including the floor beams and their connections to the truss members.
.6 Jacking the bridge to allow removal of existing bearing and installation of new bearing
.7 Coating of structural steelwork.
.8 Traffic management as required for the duration of construction work on the bridge.
.9 The Contractor is required to submit detailed jacking procedures and bearing replacement plan as per the Contract documents which shall be signed and sealed by a Professional Engineer registered in the Province of British Columba. These plans shall fully detail the

methodology, equipment and quality control to be used to complete the work. Jacking and bearing replacement shall not commence until these documents are submitted and approved by the Departmental Representative.

1.2 Contract Method
.1 Construct the work under a Unit Price Contract arrangement as shown on form of tender.

1.3 Work Schedule
.1 Work under this contract to be completed by March 31st, 2020.

1.4 Access to Site
.1 Maintain access to private and public or commercial facilities for the duration of the contract.

.2 Maintain all emergency vehicles access/control.

.3 Allow Departmental Representative and his consultant unrestricted access to site.

PART 2 – PRODUCTS

2.1 Products
.1 Products shall be as specified in these Specifications and Contract drawings. Any substitutions shall be in accordance with Section 016100 Product Requirements.

PART 3 - EXECUTION

3.1 Execution of Work
.1 Supply the required materials, equipment and labor to carry out the work in accordance with and as specified in these Specifications and the Contract Drawings.

.2 Unless specifically stated otherwise, the Work is to include the furnishing of all labour, materials, equipment, and services necessary to complete the Work.

END OF SECTION

PART 1 - GENERAL

1.1 Precedence

.1 In the event of any discrepancy or conflict, order of precedence shall be in accordance with GC 1.2.2 – Order of Precedence and as follows:

.1 The Division 1 Sections of these specifications take precedence over the other sections of the specifications.

.2 In the event that two or more plans show conflicting information, the information on the most recently dated plan shall govern.

.3 If conflict arises between an item in the main body of these Specifications (Division 1 – Division 35) and an item found in one of the Appendices (Reference Documents), the main body of the Specifications (Division 1 – Division 35) shall govern.

.4 Any technical and manufacturer's standard, Government Act, Regulations or Code of practice referred to in the Contract Documents shall be the version current at the time of tender closing.

1.2 Related Sections

.1 Section 01 32 18 – Construction Progress Schedules – Bar (GANTT) Chart.

.2 Section 01 35 43 – Environmental Protection.

1.3 **Existing Fiber Optic Cable Protection on Bridge**

.1 **There is an existing fiber optic cable supported on the bridge structures and along the Alaska HWY road. The Contractor shall identify the Utility Owner of the cable and notify the Utility Owner of the work to be completed under this contract within fifteen (15) days following Contract Award. The Contractor shall implement and meet all requirements imposed by the Utility Owner to protect the utility. The Contractor shall not damage the utility during the currency of the work and shall immediately notify the Utility Owner and Departmental Representative if the utility is damaged and repair or pay for repairs by others, at no additional cost to the Owner**.

.2 The costs for protection of the fiber optic cable shall be considered incidental to the project and is part of the total Contract amount.

1.4 Existing Services

.1 Notify Departmental Representative and utility companies of intended interruption of services and obtain required permission. The Contractor shall notify the owner of the fiber optic cable, mounted on the structure, of the work to take place and implement any required protections as dictated by the utility owner.

.2 Where Work involves disrupting or connecting to existing services, give Departmental Representative 48 hours of notice for necessary interruption of mechanical or electrical service throughout course of work. Keep duration of interruptions to a minimum. Carry out interruptions after normal working hours

of occupants, preferably on weekends.

.3 Provide for pedestrian and vehicular traffic.

1.5 Use of the 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 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.

.3 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.

.4 The Contractor shall provide sanitary facilities for work force in accordance with governing regulations and the Environmental Procedures for this project. The Contractor shall post notices and take such precautions as required by local health authorities and keep area and premises in sanitary condition.

.5 Any damage to the Work Site caused by the Contractor shall be repaired by the Contractor at its expense.

.6 The Contractor may work 24 hours per day, seven days per week with the following restrictions:

.1 No hauling of material during inclement weather.

1.6 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.

.2 The Contractor is responsible for the development and supply of construction access to the Work as approved by the Departmental Representative.

1.7 Access to Adjacent Properties

.1 Construction operations shall be conducted so as to cause minimal disruption to the Public and to owners of adjoining property. Existing access to property shall be maintained as far as possible and if new access must be provided, every effort shall be taken to provide the new access before the existing access is removed.

1.8 Utilities

.1 There are active utilities within the Highway Right of Way. There is an existing fiber optic cable which is supported on the bridge structure.

.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. The Contractor shall be responsible for identifying all

utilities within the work zone which may be affected by the work.

.3 If it is determined by the Departmental Representative that Utilities affected by the permanent Work will be relocated 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 establish and maintain direct and continuous contact with the owners or operators of any Utilities which may interfere with the Work. The Contractor shall cooperate with them at all times and in all places of Work. The Contractor shall keep the Departmental Representative informed of all communications with the Utility companies and authorities.

.5 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.

.6 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.

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

.8 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 and Department.

1.9 Survey of Existing Property Conditions

.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 work.

.2 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.

.3 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 requested, the Departmental Representative will provide a copy of the survey records to the Contractor for reference.

.4 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.

.5 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.

1.10 Protection of Persons and Property

.1 The Contractor shall comply with all applicable safety regulations of the Workers Compensation Board of British Columbia (WCB) including, but not limited to, WCBs Industrial Health and Safety Regulations, Industrial First Aid Regulations, and Workplace Hazardous Materials Information System Regulations.

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

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

1.11 Use of Public Areas

.1 The Contractor shall ensure that its vehicles and equipment do not cause nuisance in public areas. All vehicles and equipment leaving the Work Site and entering public roadways shall be cleaned of mud and dirt clinging to the body and wheels of the vehicle. All vehicles arriving at or leaving the Work Site and transporting materials shall be loaded in a manner which will prevent dropping of materials or debris on the roadways, and, where contents may otherwise be blown off during transit, such loads shall be covered by tarpaulins or other suitable covers. Spills of 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. Hauling units on Alaska Highway not to exceed legal highway load limits. 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.

1.12 Supervisory Personnel

.1 Within five Days after 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.

The following personnel shall be included in the list:

.1 Project Superintendent.
.2 Safety Representative.

.2 The above personnel shall perform the following duties:

.1 The Project Superintendent shall be employed full time and shall be present on the Work Site each and every work day that Work is being performed, from the commencement of Work to Total Performance of the Work.
.2 Project Superintendent shall nominate a Deputy Project Superintendent who shall have the authority of the Project Superintendent during the latter's absence.
.3 Safety Representative shall possess safety experience in general construction. Duties shall encompass all matters of safety activities from commencement of Work until Total Completion of the Work.

1.13 Construction Signage

.1 No Signs or advertisements, other than regulatory or warning signs, are permitted on site.

.2 Signs and notices for Safety and instruction shall be provided by the Contractor. Graphic symbols shall be diamond grade and conform to CAN3-Z321.

.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 as required.

PART 2 - PRODUCTS

2.1 Not Used

.1 Not Used.

PART 3 - EXECUTION

3.1 Not Used

.1 Not Used

END OF SECTION

PART 1 - GENERAL

1.1 Description

.1 Mobilization and Demobilization consists of those items not specifically defined and paid for at the unit rates contained in the Unit Price Table.

.2 Included within this item are the insurance, bonding, and permits, the necessary Work and operations to complete the project including, but not limited to, the movement to and from the project site of personnel, equipment, supplies, and incidentals to the Site, the establishment of offices, camps, temporary utilities, barriers, and enclosures, and other facilities necessary to undertake the Work, project management, reporting, health and safety, cleaning, waste management, closeout procedures, and all other Work Items and operations which must be initiated and finished as part of completion of the Work.

1.2 Measurement for Payment

.1 Mobilization and demobilization costs for the concrete repairs and bearing replacement shall be paid for under the line item "Mobilization and Demobilization For Bearing Replacement and Concrete Repairs".

.2 The lump sum price tendered for Mobilization and Demobilization shall not exceed 10% of the total price tendered for the Work. Costs in excess of 10% of the total tendered price shall be included in other contract items.

.3 Payment for Mobilization and Demobilization shall be made at the lump sum price tendered. Payment shall be distributed as follows: 50% in the first Progress Payment and 50% when the Work is completed.

.4 For the Contractor's first Progress Payment, it is a condition precedent to the Owner's obligation that the Contractor has provided all necessary documentation required by the Contract for the first Progress Payment.

.5 The payments from the Lump Sum Price, as set out above, will be full compensation for mobilization, demobilization and re-mobilization, regardless of the number of times the Contractor mobilizes.

PART 2 - PRODUCTS

2.0 .1 Not Used.

PART 3 - EXECUTION

3.0 .1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 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, surveyed or measured, and accepted by the Departmental Representative in the field. Provide to the Departmental Representative for each progress claim, survey data and measurements as applicable at each stage of construction to support progress claim quantities for each unit price item.

.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 1.2 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.

.6 Any work called for in the specifications or shown on the 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 Measurement for Payment will be at the Departmental Representative's discretion using one or more of the following methods.

.1 Measurements made by the Contractor in the presence of the Departmental Representative.
.2 Measurements made by the Departmental Representative in the presence of the Contractor.
.3 Tests specified to be carried out by Contractor under supervision of Departmental Representative.

.9 Measurement for Payment of concrete repair areas shall be based on the repair area designated by the Departmental Representative. No payment will be made for concrete repairs made beyond the designated limits. Should removals beyond the designated limits be warranted by poor concrete condition, the Contractor shall identify immediately to the Departmental Representative. Additional removal and repair of concrete beyond designated limits shall not procced until approved in writing by the Departmental Representative who will designate the new repair limits.

PART 1 - GENERAL

1.1 Section Includes

.1 Coordination of the Work, progress meetings, schedules, submittals, and close out procedures.

1.2 Related Sections

.1 Section 01 11 10 – Summary of Work.

.2 Section 01 32 18 – Construction Progress Schedules – Bar (GANTT) Chart.

.3 Section 01 33 00 – Submittal Procedures.

.4 Section 01 35 43 – Environmental Protection.

.5 Section 01 52 00 – Construction Facilities.

1.3 Coordination

.1 Perform coordination of progress schedules, submittals, use of site, temporary utilities, construction facilities, and construction Work, with progress of Work of Other Contractors, and Work by Owner, under instructions of the Departmental Representative.

1.4 Project Meetings

.1 Schedule and administer bi-weekly project meetings throughout progress of Work as determined by Departmental Representative.

.2 Schedule and administer pre-installation meetings when specified in Sections and when required to coordinate related or affected work.

.3 Prepare agenda for meetings.

.4 Distribute written notice of each meeting four days in advance of meeting date to Departmental Representative.

.5 Provide physical space and make arrangements for meetings, if necessary. Telephone conference is also permissible

.6 Preside at meetings.

.7 Record minutes. Include significant proceedings and decisions. Identify action by parties.

.8 Reproduce and distribute copies of minutes within three days after each meeting and transmit to meeting participants, affected parties not in attendance and Departmental Representative.

1.5 Construction

.1 Within seven (7) days after award of Contract, request a meeting of parties in

Organization and Start-up

contract to discuss and resolve administrative procedures and responsibilities.

.2 Senior representatives of the Owner, Departmental Representative, Contractor, major Subcontractors, field inspectors and supervisors are to be in attendance.

.3 Establish the time and location of meeting and notify parties concerned minimum five (5) days before meeting

.4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.

.5 Agenda to include the following

.1 Appointment of official representative of participants in Work.
.2 Schedule of Work, progress scheduling in accordance with Section 01 32 18.
.3 Requirement for temporary facilities, offices, storage sheds, utilities, and fences in accordance with Section 01 35 43.
.4 Site safety and security in accordance with Section 01 52 00.
.5 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, working hours, and administrative requirements.
.6 Owner furnished materials.
.7 Monthly progress claims, administrative procedures, photographs and holdbacks.
.8 Insurance and transcript of policies.

.6 Comply with Departmental Representative's allocation of mobilization areas of site; for field offices and sheds, for access, traffic, and parking facilities.

.7 During construction, coordinate use of site and facilities through Departmental Representative's procedures for intra-project communications; submittals, reports and records, schedules, coordination of Drawings, recommendations, and resolution of ambiguities and conflicts.

.8 Comply with instructions of the Departmental Representative for use of temporary utilities and construction facilities.

.9 Coordinate field engineering and layout work with Departmental Representative.

1.6 On-Site Documents

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

.1 Contract Drawings.
.2 Specifications.
.3 Addenda.
.4 Reviewed Shop Drawings.
.5 Manufacturer's Installation and Application instructions.
.6 Change Orders.

.7 Other modifications to Contract.
.8 Traffic Management Plan.
.9 Environmental Protection Plan
.10 Safety Plan.
.11 WHMIS.
.12 Field Test Reports.
.13 Copy of approved Work Schedule.
.14 Labour Conditions and Wage schedules.
.15 Applicable current editions of municipal regulations and by-laws.
.16 All applicable Federal Permits and Licenses.
.17 All Applicable Provincial Permits and Licenses.

1.7 Schedules

.1 Submit preliminary construction progress schedule in accordance with Section 01 32 18 to Departmental Representative coordinated with Owner's project schedule.

.2 After review, revise and resubmit schedule to comply with revised project schedule.

.3 During progress of Work revise and resubmit as directed by the Departmental Representative.

1.8 Construction Progress Meetings

.1 During course of Work prior to project completion, schedule weekly progress meetings.

.2 Contractor, major subcontractors involved in the Work and Departmental Representative are to be in attendance.

.3 Notify parties a minimum of seven (7) days prior to meetings.

.4 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within five (5) calendar days after meeting.

.5 Agenda to include the following:

.1 Review, approval of minutes of previous meeting.
.2 Review of Work progress since previous meeting.
.3 Field observations, problems, conflicts.
.4 Problems which impede construction schedule.
.5 Review of off-site fabrication delivery schedules.
.6 Corrective measures and procedures to regain project schedule.
.7 Revision to construction schedule.
.8 Progress schedule for next work period.
.9 Review Submittal schedules: expedite as required.
.10 Maintenance of Quality standards, review of test results.
.11 Review proposed changes for affect on construction schedule and on completion date.
.12 Review site Safety and Security issues.

.13 Other business.
.14 Schedule next meeting.

1.9 Submittals

.1 Submit product data in accordance with Section 01 33 00 for review for compliance with Contract Documents.

.2 Submit requests for payment for review, and for transmittal to the Departmental Representative.

.3 Submit requests for interpretation of Contract Documents, and obtain instructions through the Departmental Representative.

.4 Process any proposed substitutions through Departmental Representative.

.5 Process Change Orders through the Departmental Representative.

.6 Deliver Closeout submittals for review and preliminary inspections, for transmittal to Departmental Representative.

1.10 Closeout Procedures

.1 Notify Departmental Representative when Work is considered ready for Substantial Performance.

.2 Accompany Departmental Representative on preliminary inspection to determine items listed for completion or correction.

.3 Comply with Departmental Representative's instructions for correction of items of Work listed in executed Certificate of Substantial Performance.

.4 Notify Departmental Representative of instructions for completion of items of Work determined in Departmental Representative's Final Inspection.

PART 2 - PRODUCTS

2.1 Not Used .1 Not Used.

PART 3 - EXECUTION

3.1 Not Used .1 Not Used

END OF SECTION

PART 1 GENERAL

1.1 Precedence

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

1.2 Measurement Procedures

.1 Cost of providing Construction Progress Schedules will be considered incidental to the work and no additional payment will be made.

1.3 Definitions

.1 Activity: An element of Work performed during course of Project. An activity normally has an expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.

.2 Bar Chart (GANTT Chart). A graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Bar Chart should be derived from MS Project or compatible software.

.3 Baseline: Original approved plan for Project, plus or minus approved scope changes.

.4 Construction Work Week: Monday to Sunday, inclusive, will provide seven day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.

.5 Duration: Number of work periods (not including holidays or other nonworking periods) required to complete an activity or other Project element. Usually expressed as workdays or workweeks.

.6 Master Plan: A summary-level schedule that identifies major activities and key milestones.

.7 Milestone: A significant event in Project, usually completion of major deliverable.

.8 Project Schedule: The planned dates for performing activities and the planned dates for meeting milestones. A dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.

.9 Project Planning, Monitoring and Control System: Overall system operated by Departmental Representative to enable monitoring of project work in

relation to established milestones.

N 1.4 Requirements

.1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.

.2 Plan to complete Work in accordance with prescribed milestones and time frame.

.3 Limit activity durations to maximum of approximately 20 working days, to allow for progress reporting.

.4 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Substantial Completion Certificate and Final Certificate as defined times of completion are of essence of this contract.

.5 Include the requirements of Section 01 14 00, Work Restrictions

1.5 Submittals

.1 Submit to Departmental Representative within Seven (7) working days of Award of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.

.2 Submit Project Schedule to Departmental Representative within ten (10) working days of receipt of acceptance of Master Plan. Within seven (7) days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

1.6 Project Milestones

.1 Project milestones form interim targets for Project Schedule:

.1 Substantial Completion by March 31st, 2020.

1.7 Master Plan

.1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).

.2 Departmental Representative will review and return revised schedules within five (5) working days.

.3 Revise impractical schedule and resubmit within 5 working days.

.4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.8 Project Schedule

.1 Develop detailed Project Schedule derived from Master Plan.

.2 Ensure detailed Project Schedule includes as minimum milestone and Activity types as follows:

.1 Award.

.2 Submission of:

.1 Quality Control Plans.
.2 Detailed survey of Bridge bearing locations and existing condition.
.3 Shop Drawings.
.4 Bridge Superstructure Jacking Plan, Structure Strengthening and Bearing Replacement Plan.
.5 Concrete Repair Plan.
.6 Product data information.

.3 Mobilization and preparation of staging area(s).

.4 Concrete repairs.

.5 Steel work and bearing replacement.

.1 Duration that Bridge will be jacked and traffic is limited to one lane on the structure.

.6 Site Clean-up and demobilization.

1.9 Project Schedule Reporting

.1 Update Project Schedule on monthly basis reflecting activity changes and completions, as well as activities in progress.

.2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

1.10 Project Meetings

.1 Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.

.2 Weather related delays with their remedial measures will be discussed and negotiated.

PART 2 PRODUCTS

2.1 Not Used .1 Not Used.

PART 3 EXECUTION

3.1 Not Used .1 Not Used

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes

.1 This section includes but is not limited to the following:

.1 Shop drawings.
.2 Product data.
.3 Samples.
.4 Waste Management Work Plan.
.5 Environmental Plan.
.6 Health and Safety Plan.
.7 Certificates and Transcripts
.8 Survey and Quality Testing Reports.
.9 Warranties
.10 Quality Control Plan.
.11 Bridge Strengthening and Jacking Plan
.12 Bearing Replacement Plan

1.2 Administrative

.1 Submit to Departmental Representative submittals listed for review. Submit with reasonable promptness and in orderly sequence so as to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed. **The Contractor shall submit all submission within 5 weeks of contract award or sooner as per the relevant sections should the work take place sooner.**

.2 Shop drawings for the work shall only be submitted after verification of the existing geometry and conditions.

.3 Work affected by submittal shall not proceed until review is complete.

.4 Present shop drawings, product data, samples, and mock-ups in SI Metric units.

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

.6 Review submittals prior to submission to 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 requirements of Work and Contract Documents. Submittals not stamped, signed, dated, and identified as to specific project will be returned without being examined and shall be considered rejected.

.7 Notify Departmental Representative, in writing at time of

submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.8 Verify field measurements and affected adjacent Work are coordinated. It is recommended that Contractor become familiar with all site conditions likely to affect the cost of the Work before submission of their Tender documents.

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

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

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

1.3 Shop Drawings, Plans and Product Data

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by 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. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.3 Each shop drawing or plan submitted that involves the provision of engineering design to bear signature and stamp of qualified professional engineer registered or licensed in province of British Columbia, Canada. These include but are not limited to:

.1 Falsework and/or shoring. It is the Contractor’s responsibility to ensure that the structure is adequately braced at all times during the performance of the Contract, if and when necessary.
.2 Strengthening of the existing structure to facilitate jacking.
.3 Jacking procedure of the existing structure.
.4 Bearing replacement plan

.4 Allow 10 days for Departmental Representative's review of each submission.

.5 Adjustments made on shop drawings 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 shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of any revisions other than those requested.

.7 Accompany submissions with 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, sample, etc.
- .5 Other pertinent data.

.8 Submissions shall include:

- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of:
  - .1 Subcontractor.
  - .2 Supplier.
  - .3 Manufacturer.
- .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements, and compliance with Contract Documents.
- .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 Wiring diagrams.
  - .9 Single line and schematic diagrams.
  - .10 Relationship to adjacent work.

.9 After Departmental Representative's review, distribute copies.

.10 Submit electronic copies and originals on CD of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.

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

.12 Delete information not applicable to project.

.13 Supplement standard information to provide details applicable to project.

.14 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

.15 The review of shop drawings by Departmental Representative is for sole purpose of ascertaining conformance with general concept. This review shall not mean that Departmental Representative approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting all requirements of construction and Contract Documents. Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation, and for co-ordination of Work of all sub-trades.

1.4 Survey and Quality Testing Reports

.1 Submit certified survey and quality testing reports with progress reports.

1.5 Quality Control Plan

.1 Prepare and submit to Departmental Representative for review and approval a Quality Control Plan including but not limited to:

.1 Quality control processes and procedures.
.2 Quality control reporting and frequency.
.3 Testing agencies employed to provide materials testing.
.4 Frequency and types of testing.
.5 Verification of materials and installation procedures, including but not limited to structural steel, bolts, welds,

paint.

.6 Coating inspections.

.7 Dimension checks of pre-fabricated and site-fabricated elements.

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes

.1 Informational and Warning Devices.

.2 Protection and Control of Traffic.

.3 Operational Requirements.

1.2 Description

.1 Provide a detailed Traffic Management Plan (TMP) with a dedicated traffic control and pedestrian delineation for safety of motorists, pedestrians, and bicycle traffic for all locations where roadways are affected by construction activities.

.2 The TMP shall be prepared in accordance with the BC Ministry of Transportation and Infrastructure "Management Manual for Work on Roadways" latest edition, and the "Standard Specifications for Highway Construction" latest edition.

.3 Provide all traffic delay and traffic control signage for the project.

.4 The plan shall be submitted to the Departmental Representative for approval at least 14 days before commencing any work.

.5 The Contractor shall notify the Departmental Representative at least 14 days in advance of any lane or road closures.

1.3 Special Provisions

.1 One lane of traffic at a minimum, with appropriate traffic control as per the Traffic Management Plan, shall be maintained at all times during the construction.

.2 The bridges shall be open to a maximum of one (1) lane of traffic while it is jacked and/or supported on the jacks during the work, with appropriate traffic control.

.3 The bridges will be permitted to be completely closed to traffic for the jacking operation for a maximum of two hours between the times of 1900 hrs – 0550 hrs and must be approved in advance by the Departmental Representative. The Contractor shall notify the Departmental Representative at least fifteen (15) working days in advance of required closures of the Bridge.

.4 The Contractor shall post at the bridge signs, in both official languages, identifying the timing of the road closures over twenty (20) minutes at least 10 Working days in advance of the road closure.

.5 The contractor must provide notification to the departmental representative five (5) working days in advance of closures of the bridge to traffic for

durations over twenty (20) minutes for approval.

.6 Contractor must provide notification to the departmental representative at least two (2) working days in advance of any closures under twenty (20) minutes.

1.4 Measurement for Payment

.1 The lump sum price tendered for this item shall be full compensation for developing and implementing the TMP including flagging personnel, signs, cones, flashers, control vehicles, temporary markings and associated work. The costs shall be paid under the line item "Traffic Control Plan and Implementation.

.2 Payment shall be distributed as follows: 25% in the first Progress Payment, 50% equal distribution in intermediate Progress Payments, and 25% when this portion of the Work is completed.

1.5 References

.1 "Traffic Control Manual for Work on Roadways" (Province of British Columbia, Ministry of Transportation and Infrastructure).

.2 "Standard Specifications for Highway Construction" latest edition. (Province of British Columbia, Ministry of Transportation and Infrastructure).

1.6 Protection of Traffic

.1 Comply with current requirements of Acts, Regulations, and By-Laws for regulation of traffic or use of roadways upon or over which it is necessary to carry out Work or haul materials or equipment.

.2 When working on traveled way:

.1 Position equipment to present minimum of interference and hazard to traveling public.
.2 Keep equipment units as close together as working conditions permit and preferably on same side of traveled way.
.3 Do not leave equipment on traveled way overnight.

.3 Do not close any lanes of road or highway without consulting Departmental Representative. Before re-routing traffic erect suitable signs and devices in accordance with instructions contained in "Traffic Control Manual for Work on Roadways".

.4 Keep traveled way graded, free of pot-holes, and of sufficient width for required number of lanes of traffic.

1.7 Informational and Warning Devices

.1 Provide, erect, and maintain signs, flashing warning lights, delineators, barricades, traffic cones, and other devices required to indicate construction activities and other temporary and unusual conditions resulting from Project

Work that requires road user response as specified in "Traffic Control Manual for Work on Roadways".

.2 All traffic and warning signs shall be bilingual with English and French of equal size and elevation, English on the left and French on the right. Assistance in translation of signs may be obtained through the Departmental Representative.

.3 Place signs and other devices in locations recommended in "Traffic Control Manual for Work on Roadways".

.4 Meet with Departmental Representative prior to commencement of Work to prepare list of signs and other devices required for project.

.5 Continually maintain traffic control devices in use by:

.1 Checking signs daily for legibility, damage, suitability, and location. Clean, repair, or replace to ensure clarity and reflectance.

.2 Removing or covering signs which do not apply to conditions existing from day to day.

.6 Provide Type D traffic cones as specified in "Traffic Control Manual for Work on Roadways". Provide minimum of 100 cones for use on site.

.7 Ensure that necessary traffic cones and signs are in place prior to interference with traffic on existing roadways.

1.8 Control of Traffic

.1 Provide traffic control in accordance with "Traffic Control Manual for Work on Roadways". Ensure that current copy of manual is available on site at all times.

.2 Flagpersons:

.1 Provide trained, competent flagpersons with proof of certification from recognized training program on traffic control procedures through construction zones.

.2 Ensure flagpersons have proper equipment and clothing as specified in "Traffic Control Manual for Work on Roadways".

.3 Flagpersons are required in the following (but not limited to) situations:

.1 When public traffic is required to pass working vehicles or equipment that block all or part of traveled roadway.

.2 When it is necessary to institute one-way traffic system through construction area or other blockage where traffic volumes are heavy, approach speeds are high, and traffic signal system is not in use.

.3 When workmen or equipment are employed on traveled way over brow of hills, around sharp curves, or at other locations where oncoming traffic would not otherwise have adequate warning.

.4 When temporary protection is required while other traffic control devices are being erected or taken down.

.5 For emergency protection when other traffic control devices are not readily available.

.6 In situations where complete protection for workers, working equipment, and public traffic is not provided by other traffic control devices.

.7 When construction traffic is crossing a roadway.

.3 Changes to traffic control operation are to be reviewed by Departmental Representative.

.4 Safely control traffic through unique or varied construction situations.

1.9 Operational Requirements

.1 Maintain existing conditions for traffic throughout period of Contract except when required for construction under Contract and when measures have been taken as specified herein and reviewed by Departmental Representative to protect and control public traffic.

.2 At the discretion of the Departmental Representative the Contractor may be required to modify the TMP to accommodate irregularities of excessive congestion of traffic flow.

.3 Remove signs and barriers upon completion of the work.

END OF SECTION

PART 1 - GENERAL

1.1 References

.1 Government of Canada:

- .1 Canada Labour Code - Part II
- .2 Canada Occupational Health and Safety Regulations.

.2 National Building Code of Canada (NBC):

- .1 Part 8, Safety Measures at Construction and Demolition Sites.

.3 Canadian Standards Association (CSA):

- .1 CSA S269.1, Falsework for Construction Purposes.
- .2 CSA S269.2, Access Scaffolding for Construction Purposes.
- .3 CSA-S350, Code of Practice for Safety in Demolition of Structures.

.4 National Fire Code of Canada 2010:

- .1 Part 5 – Hazardous Processes and Operations.
- .2 Division B Acceptable Solutions.

.5 American National Standards Institute (ANSI):

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

.6 Province of British Columbia:

- .1 Workers Compensation Act, Part 3, Occupational Health and Safety.
- .2 Occupational Health and Safety Regulation.

1.2 Workers Compensation Board Coverage

.1 Comply fully with the Workers' Compensation Act, regulations, and orders made pursuant thereto, and any amendments up to the completion of the work.

.2 Maintain Workers' Compensation Board coverage during the term of the Contract, until and including the date that the Certificate of Final Completion is issued.

1.3 Compliance with Regulations

.1 PSPC may terminate the Contract without liability to PSPC where the Contractor, in the opinion of PSPC, refuses to comply with a requirement of the Workers' Compensation Act or the Occupational Health and Safety Regulations.

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

1.4 Submittals

.1 Submit to Departmental Representative for review all submittals listed.

.2 Work affected by submittals shall not proceed until review(s) by Departmental representative is/are complete.

.3 Submit the following:

.1 Health and Safety Plan prior to commencement of Work.
.2 Copies of reports or directions issued by federal and provincial Health and Safety inspectors.
.3 Copies of incident and accident reports.
.4 Complete set of Material Safety Data Sheets (MSDS) and all other documentation required by Workplace Hazardous Materials Information System (WHMIS) requirements.
.5 On site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

.4 The Departmental Representative will review the Contractor's site-specific project Health and Safety Plan and emergency procedures, and provide comments to the Contractor within 7 days after receipt of the plan. Revise the plan as appropriate and resubmit to Departmental Representative for review upon request.

.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 Submission of the Health and Safety Plan, and any revised version, to the Departmental Representative is 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.

1.5 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 site-specific Health and Safety Plan.

1.6 Health and Safety Coordinator

.1 Employ and assign to Work, competent and authorized representative as Health and Safety Coordinator. The Health and Safety Coordinator must:

- .1 Have site-related working experience.
- .2 Have working knowledge of occupational Health and Safety regulations.
- .3 Be responsible for completing all Health and Safety training, and ensuring that personnel that do not successfully complete the required training are not permitted to enter the site to perform Work.
- .4 Be responsible for implementing, daily enforcing, and monitoring the site-specific Health and Safety Plan.
- .5 Be on site during execution of work.

1.7 General Conditions

.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 Secure Work site before leaving each day as deemed necessary to protect site against entry from non-authorized persons / entry by animals overnight.

.3 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 personnel, and temporary lighting as required.

1.8 Project/Site Conditions

.1 Potential work hazards onsite include: working over water, working in remote locations, bears and other wildlife, and extreme weather.

1.9 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 provision 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.

1.10 Work Permits

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

1.11 Health and Safety Plan

.1 Conduct a site-specific hazard assessment based on review of Contract documents, required work, and project site. Identify any known and potential health risks and safety hazards.

.2 Prepare and comply with a site-specific project Health and Safety Plan based on hazard assessment, including, but not limited to, the following:

.1 Primary requirements:

- .1 Contractor's safety policy.
- .2 Identification of applicable compliance obligations.
- .3 Definition of responsibilities for project safety/organization chart for project.
- .4 General safety rules for project.
- .5 Job-specific safe work procedures.
- .6 Inspection policy and procedures.
- .7 Incident reporting and investigation policy and procedures.
- .8 Occupational Health and Safety Committee/Representative procedures.
- .9 Occupational Health and Safety meetings.
- .10 Occupational Health and Safety communications and record keeping procedures.

.2 Summary of health risks and safety hazards resulting from analysis of hazard assessment, with respect to site tasks and operations which must be performed as part of the work.

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

.4 Indicate engineering and administrative control measures to be implemented at the site for managing identified risks and hazards.

.5 Identify personal protective equipment to be used by workers.

.6 Identify personnel and alternates responsible for site Safety and Health.

.7 Identify personnel training requirements and training plan, including site orientation for new workers.

.3 Develop the plan in collaboration with all Subcontractors. Ensure that work/activities of Subcontractors are included in the hazard assessment and are reflected in the plan.

.4 Revise and update Health and Safety Plan as required, and re-submit to the Departmental Representative.

.5 Departmental Representative's review: the review of Health and Safety Plan by PSPC shall not relieve the Contractor of responsibility for errors or omissions in final Health and Safety Plan or of responsibility for meeting all requirements of construction and Contract documents.

1.12 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 own 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.

.4 Design and mark emergency exit routes to provide quick and unimpeded exit.

.5 Revise and update emergency procedures as required, and re-submit to the Departmental Representative.

1.13 Hazardous Products

.1 Comply with requirements of WHMIS regarding use, handling, storage, and disposal of hazardous materials, and regarding labelling and provision of MSDSs acceptable to the Departmental Representative and in accordance with the Canada 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. Submit applicable MSDS and WHMIS documents as per Section 013300 – Submittal Procedures.

1.14 Removal of Lead Containing Paints

.1 All paints containing TCLP lead concentrations above 5 ppm are classified as hazardous.

.2 Carry out demolition activities involving lead-containing paints in accordance with applicable provincial regulations.

1.15 Overloading

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

1.16 Falsework

.1 Design and construct falsework in accordance with CSA-S269.1.

1.17 Scaffolding

.1 Design, construct, and maintain scaffolding in a rigid, secure, and safe manner, in accordance with CAN/CSA-S269.2 and the British Columbia Occupational Health and Safety Regulations.

1.18 Confined Spaces

.1 Carry out work in confined spaces in compliance with provincial regulations.

1.19 Blasting

.1 Blasting or other use of explosives is not permitted.

1.20 Powder Actuated Devices

.1 Use powder-actuated devices in accordance with ANSI A10.3 only after receipt of written permission from the Departmental Representative.

1.21 Fire Safety and Hot Work

.1 Obtain Departmental Representative's authorization before any welding, cutting, straightening, or any other hot work operations can be carried out onsite.

.2 Hot work includes cutting/melting with use of torch, flame heating roofing kettles, or other open flame devices and grinding with equipment which produces sparks.

1.22 Fire Safety Requirements

.1 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.

.2 Handle, store, use, and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.

1.23 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.

1.24 Posted Documents

.1 Keep legible versions of the following documents on site:

- .1 Health and Safety Plan.
- .2 Sequence of work.
- .3 Emergency procedures.
- .4 Site drawing showing project layout, locations of the first-aid station, evacuation route and marshalling station, and the emergency transportation provisions.
- .5 Notice of Project.
- .6 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.
- .7 WHMIS documents.
- .8 MSDSs.
- .9 List of names of Joint Health and Safety Committee members, or Health and Safety Representative.

.2 Post all MSDSs onsite, 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.

1.25 Meetings

.1 Schedule and administer a Health and Safety meeting with Departmental Representative prior to commencement of Work.

.2 Attend the Health and Safety pre-construction meeting and all subsequent meetings called by the Departmental Representative if required.

	.3	Contractor to hold regular Health and Safety meetings onsite as required by applicable legislation.
	.4	All Health and Safety documentation / meeting minutes completed by the Contractor are to forwarded to the Departmental Representative.
1.26 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 issues identified.
	.3	The Departmental Representative may issue a "stop work order" if non-compliance with 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".

END OF SECTION

PART 1 - GENERAL

1.1 Definitions

.1 **Environmental Pollution and Damage**: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally and/or historically.

.2 **Environmental Protection**: prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

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

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

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

.6 **Invasive plants**: are any alien plant species that have the potential to pose undesirable or detrimental impacts on humans, animals or ecosystems. Invasive plants have the capacity to establish quickly and easily on both disturbed and un-disturbed sites, and can cause widespread negative economic, social and environmental impacts

.7 **Noxious weeds**: are invasive plants that have been designated under the *BC Weed Control Act*. This legislation imposes a duty on all land occupiers to control a set list of identified invasive plants.
www.agf.gov.bc.ca/cropprot/noxious.htm

1.2 Measurement for Payment.

.1 Preparation and implementation of the Environmental Protection Plan (EPP) in accordance with this Section 01 35 43 will be paid for at the lump sum tender rate under the line item "Environmental Protection Plan and Implementation". This line item shall include full compensation for all work and effort related to the EPP and its implementation. Progress payment of 25% will be once upon acceptance of the EPP. The remainder of the payment will be prorated over the length of the Contract.

1.3 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 Migratory Birds Convention Act, as amended in 1994.

.4 Pay specific attention to provincial BC MOE guidelines in Standards and Best Practices for Instream Works (2004) for best management practices.

1.4 Submittals

.1 The Contractor is required to prepare an Environmental Protection Plan (EPP) in accordance with Section 01 33 00 – Submittal Procedures. The EPP **must** be submitted fifteen (15) working days prior to construction commencement to the Departmental Representative for review and approval.

The Environmental Protection Plan shall be completed by a P.Biol or RPBio, or other qualified professional, and shall, at a minimum include the following:

.1 The specifics of a detailed monitoring program. This includes details and rational concerning sampling locations, timing, duration, and methods.

.2 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.

.3 An Erosion 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 all applicable federal regulations and guidelines, and all other applicable regulations including the requirements of these specifications.

.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 an 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 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 resources or human remains.

.2 All submittals in accordance with Section 01 33 00 - Submittal Procedures.

1.6 Site Access

.1 The Contractor shall review both short and long term access requirements with the Departmental Representative, both at the start-up and on an on-going basis. In consultation with the Departmental Representative, the contractor shall formulate an agreement for worker transportation to and from the work site.

.2 The Contractor shall ensure that the environment beyond the work limits is not negatively impacted or damaged by workers' activities or equipment and shall instruct workers so that the "footprint" of the project is kept within defined boundaries.

1.7 Protection of Work Limits

.1 The Contractor shall include in the Environmental Protection Plan (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.

1.8 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 If necessary, 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 referencing should include the provincial MOE Standards and Best Practices for Instream Works (2004) for best management practices in sediment and erosion control during construction activities.

1.9 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 re-fueling, 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 Immediately report any spills of sediments, debris, concrete dines, wash or contact water of reportable quantities to the Provincial Emergency Program Environmental Emergency Management Plan Incident Reporting Hotline 1-800-663-3456 and DFO’s Observe, Record and Report Hotline 1-800-465-4336. Implement emergency mitigation and clean-up measures.

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

.10 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.

.11 Provide containment facilities for wash-down water from concrete delivery trucks, concrete pumping equipment and other tools and equipment.

1.10 Equipment Maintenance, Fueling and Operation

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

.2 Equipment fueling sites will be identified by the Contractor to the satisfaction of the Departmental Representative. Except for chain saws, any fueling closer than 100 metres to any surface water (streams, wetlands, water bodies or watercourses) shall require approval by the Departmental Representative.

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

.4 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 sill-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.

.5 The Contractor shall ensure that all equipment is inspected daily for fluid/fuel leaks and maintained in good working condition.

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

1.11 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, the Contractor is required to describe measures to be employed to ensure fugitive materials (e.g.

rocks, soil, branches) and especially deleterious substances (e.g. chemicals) does not enter any surface water areas.

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

.3 When, in the opinion of PWGSC, 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.

1.12 Managing Invasive Plant Vegetation

.1 Keep equipment and tools clean and avoid parking, turning around or staging equipment in known invasive species infested areas, or mow prior to use.

.2 Wash equipment and tools prior to mobilization to site.

1.13 Fire Prevention and Control

.1 A fire extinguisher shall be carried and available for use on each machine and at locations within the quarry in the event of fire. Basic firefighting equipment is recommended shall be maintained at the construction site at a location known and easily accessible to all Contractors' staff. Contactor's staff shall receive basic training in early response to wildfire events during the "environmental briefing".

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

.3 Care shall be taken while smoking on the construction site to ensure that the accidental ignition of any flammable material is prevented. All cigarette butts must be disposed of off-site.

.4 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 start-up meeting.

.5 Fires or burning of waste materials is not permitted.

.6 Where fires or burning is permitted, prevent staining or smoke damage to structures, materials or vegetation which is to be preserved. Restore, clean and return to new condition stained or damaged Work.

.7 Provide supervision, attendance and fire protection measures as directed.

.8 Obtain all required permits from the province.

1.14 Wildlife

.1 Avoid or terminate activities on site that attract or disturb wildlife and vacate the area and stay away from bears, cougars, wolves, or elk 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, bear activity or encounters on or around the site or crew accommodations. Other wildlife related encounters are to be reported within 24 hours.

1.16 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.

.2 All wastes originating from construction, trade, hazardous and domestic sources, shall not be mixed, but will be kept separate.

.3 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. Biodegradable materials are allowed to be disposed of on the forest floor, as long as all metal components (such as nails and bolts) are removed. They are to be placed out of site of hikers and spread no more than one layer thick, in order to promote biodegradation.

.4 A concerted effort shall be made by the Contractor and workers to reduce, reuse and recycle materials where possible.

1.17 Wastewater Discharge Criteria

.1 The Contractor must obtain approval from the Departmental Representative prior to discharging any treated wastewater.

.2 The Contractor shall prevent any water that contacts deleterious uncured or partly cured concrete (during activities like exposed aggregate wash-off, wet curing, or equipment washing) from directly or indirectly entering any watercourse or stormwater system.

.3 Isolate and hold any water that contacts uncured or partly cured concrete until the pH is between 6.5 and 8.0 pH units and the turbidity is less than 25 nephelometric turbidity units (NTU), measured to an accuracy of +/- 2NTU.

1.18 Site Clearing and 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 and vegetation.

.5 Restrict tree removal to areas indicated or designated by Departmental Representative.

1.19 Environment Protection Supplies

.1 Contractor to include a list of supplies in the Environmental Protection Plan and Erosion and Sediment Control plan.

1.20 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.

1.21 Environmental Monitoring

.1 On-site Environmental monitoring work will be done by a Departmental Representative. Monitoring work, done by the Departmental Representative, will be based in part by the Contractor produced Environmental Protection Plan.

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

.3 The monitoring program shall satisfy all regulatory requirements and terms of these specifications. The onus is on the Contractor to ensure compliance, to identify arising problems, and to subsequently take responsibility and all necessary measures in response.

1.22 Preservation of Watercourses

.1 See Section 35 42 19.

END OF SECTION

PART 1 - GENERAL

1.1 Quality Control Plan

.1 Prepare and submit to Departmental Representative for review and approval a Quality Control Plan in accordance with Section 01 33 00 – Submittal Procedures, prior to project startup. The Contractor's quality control shall include inspection and testing plan to ensure the completed work meets the contract requirements.

1.2 Measurement for Payment

.1 Payment for quality control, inspections and testing shall be made at the lump sum price tendered for the line item "Quality Control". Payment shall be distributed as follows: 25% in the first Progress Payment, 50% equal distribution in intermediate Progress Payments, and 25% when this portion of the Work is completed.

1.3 Inspection

.1 Allow Departmental Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.

.2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.

.3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.

.4 Departmental Representative may order any part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Departmental Representative shall arrange to pay cost of examination and replacement.

1.4 Independent Inspection Agencies

.1 The Contractor shall appoint and pay for services of third-party Independent Quality Assurance testing laboratory and field staff including as follows:

.1 Inspection and testing required by laws, ordinances, rules, regulations, or orders of public authorities.
.2 Inspection and testing performed exclusively for Contractor's convenience.
.3 Mill tests and certificates of compliance.
.4 Tests specified to be carried out by Contractor under supervision of Departmental Representative.

.2 Where tests or inspections by designated testing laboratory reveal Work not in accordance with contract requirements, pay costs for additional tests or inspections as required by Departmental Representative to verify acceptability of

corrected work.

.3 Provide equipment required for executing inspection and testing by appointed agencies.

.4 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

.5 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to Departmental Representative. Pay costs for retesting and reinspection.

1.5 Access to Work

.1 Allow inspection/testing agencies access to Work and off-site manufacturing and fabrication plants.

.2 Cooperate to provide reasonable facilities for such access.

1.6 Procedures

.1 Notify appropriate agency and Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made.

.2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in Work.

.3 Provide labour and facilities to obtain and handle samples and materials onsite. Provide sufficient space to store test samples.

1.7 Rejected Work

.1 Remove defective Work, whether result of poor workmanship, use of defective products, or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

.2 Make good on Contractor's work damaged by such removals or replacements promptly.

.3 If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, the Owner may deduct from otherwise due to the Contractor the difference in value between Work performed and that called for by Contract Documents, amount of which shall be determined by Departmental Representative.

1.8 Reports

.1 Submit 4 copies of inspection and test reports to Departmental Representative with all progress reports or, generally, as reports become available.

.2 Provide copies to Subcontractor of Work being inspected or tested and to manufacturer or fabricator of material being inspected or tested.

1.9 Mill Tests .1 Submit mill test certificates as required of specification sections.

END OF SECTION

PART 1 - GENERAL

1.1 Installation and Removal

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

.2 Remove from all sites all such facilities after use.

1.2 Measurement for Payment

.1 Payment for items in this section, other than access/scaffolding to the structure shall be included in the lump sum price bid for Mobilization and Demobilization for the applicable structure and scope of work.

.1 Access/scaffolding to the bridges for concrete repairs shall be made at the lump sum bid rate under the line item "Access/Scaffolding for Concrete Repairs".

.2 Progress payment of 50% shall be made once access/scaffolding is in place and the remaining 50% shall be paid once it is completely removed from the site to the satisfaction of the Departmental Representative.

1.3 Submittals

.1 The Contractor shall submit shop drawings of the scaffolding system, for each structure in accordance with Section 01 33 00 Submittal procedures at least fifteen (15) working days prior to their installation to the Departmental Representative for information purposes only. Where required by Federal or Provincial regulation and law, the scaffolding drawings shall be sealed and signed by a Professional Engineer licensed in the Province of British Columbia.

.2 The Contractor shall identify their laydown areas, parking areas, work area fencings, storage area for materials including hazardous materials office locations, storage areas and other areas to be used for the Contractor's operations to complete the work to the Departmental Representative at least fifteen (15) working days prior to mobilizing to site for review and approval.

1.4 Scaffolding

.1 Provide and maintain scaffolding, ramps, ladders, swing staging, platforms, and temporary stairs as necessary to carry out Work.

.2 Where required by Federal or Provincial regulation and law, the scaffolding system shall be designed by a Professional Engineering licensed in the Province of British Columbia.

.3 Should scaffolding be supported from the existing structure, the Contractor shall verify that the existing structure can support the additional loads and no damage will be done to the existing structure.

.4 The scaffolding shall be completely removed upon completion of the work. Any damage caused to the existing structure from the scaffolding shall be repaired to as good or better than the original condition, to the satisfaction of the Departmental Representative.

1.5 Hoisting	.1	Provide, operate, and maintain hoists and cranes required for moving of workers, materials, and equipment. Make financial arrangements with Subcontractors for use thereof.
	.2	Hoists and cranes shall be operated by qualified operators.
	.3	Hoists and cranes shall be used only outside of wetted perimeters, outside riparian zones and beyond top of bank for bridge locations.
1.6 Site Storage/Loading	.1	Confine Work and operations of employees to only that which is required by the Contract Documents.
	.2	Do not unreasonably encumber premises with products.
	.3	Do not load or permit to load any part of Work with a weight or force that will endanger the Work.
	.4	Locations of heavy machinery with respect to loadings on the existing structures are the responsibility of the Contractor.
1.7 Construction Access and Parking	.1	Parking is permitted onsite provided it does not disrupt the Work.
	.2	Provide and maintain adequate access to project site.
	.3	Build and maintain temporary roads where indicated or directed by Departmental Representative and provide snow removal during period of Work.
	.4	If authorized to use existing roads for access to project sites, maintain such roads for duration of Contract and make good damage resulting from Contractors' use of roads.
	.5	Provide road cleaning to ensure Alaska Highway and all other roads are kept clean from mud, dust or other debris.
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 and Security	.1	Signs and notices for health, safety, traffic control, instruction, etc. shall be in both official languages. See Sections 01 35 33, Health and Safety, and 01 35 00, Special Procedures for Traffic Control, of these Specifications for more information.

.2 Maintain approved signs and notices in good condition for duration of project, and dispose of on completion of project, or as directed by Departmental Representative.

.3 Provide signage and barriers at all access points to prevent public access to the work site.

1.10 Laydown Areas

.1 The Contractor shall propose a laydown area which will be permitted to be used for offices, storage and parking, subject to the approval of the Departmental Representative.

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes	.1	Barriers.
	.2	Traffic Controls.
1.2 Measurement for Payment	.1	The Costs for Temporary Barriers and Enclosures shall be fully included in the items requiring temporary barriers and enclosures. No separate payment shall be made.
1.3 Protection for Trees	.1	Protect from damage by equipment and construction procedures. Refer to Section 01 35 43 - Environmental Procedures for further details.
	.2	Protect from damage by equipment and construction procedures tree roots necessary for the health and survival of trees designate as protected by the Departmental Representative. Refer to Section 01 35 43 - Environmental Procedures for additional information.
1.4 Guard Rails and Barricades	.1	Provide as required by governing authorities.
	.2	Confirm with Departmental Representative locations and installation schedule 3 days before installation.
1.5 Access to Site	.1	Provide and maintain access roads as may be required for access to Work.
1.6 Public Traffic Flow	.1	Provide and maintain competent signal flag operators, 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.
1.9 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 existing, finished and, partially finished structure finishes during performance of Work with screens, covers, and hoardings.
	.2	Confirm with Departmental Representative locations and installation schedule 3 days prior to installation.
	.3	Be responsible for damage incurred due to lack of or improper protection.

END OF SECTION

PART 1 - GENERAL

1.1	Description	.1	This section specifies requirements of regulatory agencies related to establishment and removal of construction camps.
1.2	Requirements of Regulatory Agencies	.1	Camp and service area locations are subject to approval of Departmental Representative and are to be established and operated in accordance with local regulations governing operations of field camps.
		.2	Prior to installation of camp and services, submit plan of layout to Departmental Representative for approval.
		.3	Apply to authority having jurisdiction for authorization for use of water and disposal of domestic sewage wastes. Obtain authorization prior to establishing camp.
		.4	Comply with Environment Regulations.
1.3	Measurement for Payment	.1	No separate payment for construction camp, the cost is deemed to be included in the mobilization and demobilization items.

PART 2 - PRODUCTS

2.1	Not Used	.1	Not used.

PART 3 - EXECUTION

3.1	Mobilization	.1	Mobilize equipment, camp, personnel and material. Establish temporary buildings, shops, offices and facilities. Obtain necessary license and approvals.
		.2	Upon vacating camp and services area sites, clean up and leave in condition satisfactory to Departmental Representative.
3.2	Maintenance	.1	Maintain camps in neat and tidy condition.
		.2	No separate payment for camp clean-up.

END OF SECTION

PART 1 - GENERAL

1.1 Products/Material and Equipment

.1 Use new products/material and equipment unless otherwise specified.

.2 Use products of one manufacturer for material and equipment of the same type or classification unless otherwise specified.

.3 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods.

.4 Notify Departmental Representative in writing of any conflict between these specifications and manufacturer's instructions. Departmental Representative will designate which document is to be followed.

.5 Metal fastenings and bolts:

.1 Prevent electrolytic action between dissimilar metals.
.2 Use corrosive resistant fasteners, anchors, and spacers for securing exterior work unless noted otherwise.
.3 Fastenings which cause spalling or cracking are not acceptable.

.6 Bolts may not project more than 1 diameter beyond nuts.

.7 Deliver, store and maintain packaged material and equipment with manufacturer's seals and labels intact. Do not remove from packaging or bundling until required in Work. Store products in accordance with suppliers' instructions.

.8 Prevent damage, adulteration, and soiling of products during delivery, handling, and storage. Immediately remove rejected products from site.

.9 Store products subject to damage from weather in weatherproof enclosures.

.10 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.

.11 Touch-up damaged finished surfaces to Departmental Representative 's satisfaction.

.12 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.

1.2 Quality of Products

.1 Products, materials, equipment, and articles (referred to as products throughout Specifications) incorporated in Work shall be new, not damaged or defective, and of best quality (compatible with specifications) for purpose intended. If requested, furnish evidence as to type, source, and quality of Products provided.

.2 Defective products will be rejected regardless of previous inspections.

.1 Inspection does not relieve responsibility, but is precaution against oversight or error.

.2 Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.

.3 Retain purchase orders, invoices, and other documents to prove that all products utilized in this Contract meet the requirements of the specifications. Produce documents when requested by the Departmental Representative.

.4 Should any dispute arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.

.5 Unless otherwise indicated in the Specifications, maintain uniformity of manufacture for any particular or like item throughout the site.

1.3 Availability of Products

.1 Immediately upon signing the Contract, review product delivery requirements and anticipate foreseeable supply delays for any items. If delays in supply of products are foreseeable, notify Departmental Representative of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.

.2 In event of failure to notify Departmental Representative at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Departmental Representative reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.4 Manufacturer's Instructions

.1 Unless otherwise indicated in Specifications, install or erect products in accordance with manufacturer's instructions.

.1 Do not rely on labels or enclosures provided with products.

.2 Obtain written instructions directly from manufacturers.

.2 Notify Departmental Representative in writing, of conflicts between Specifications and manufacturer's instructions, so that Departmental Representative may establish course of action.

.3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Departmental Representative to require removal and re-installation at no increase in Contract Price or Contract Time.

.4 Provide Manufacturer’s instructions and specifications to Departmental Representative for review prior to any installations.

1.5 Contractor's Options for Selection of Products for Tendering

.1 Products are specified by "Prescriptive" specifications: select any product meeting or exceeding specifications.

.2 Products specified under "Acceptable Products": select any one of the indicated manufacturers, or any other manufacturer meeting or exceeding the Prescriptive specifications and indicated Products.

.3 Products specified by performance and referenced standard: select any product meeting or exceeding the referenced standard.

.4 Products specified to meet particular design requirements or to match existing materials: use only material specified Approved Products. Alternative products may be considered provided full technical data is received in writing by Departmental Representative.

.5 When products are specified by a referenced standard or by Performance specifications, upon request of Departmental Representative obtain from manufacturer an independent laboratory report showing that the product meets or exceeds the specified requirements.

1.6 Substitution After Contract Award

.1 No substitutions are permitted without prior written approval of the Departmental Representative.

.2 Proposals for substitution may only be submitted after Contract award. Such request must include statements of respective costs of items originally specified and the proposed substitution.

.3 Proposals will be considered by the Departmental Representative if:

.1 Products selected by tenderer from those specified are not available;
.2 Delivery date of products selected from those specified would unduly delay completion of Contract, or
.3 Alternative product to that specified, which is brought to the attention of and considered by Departmental Representative as equivalent to the product specified.

.4 Should the proposed substitution be accepted either in part or in whole, assume full responsibility and costs when substitution affects other work on the Project. Pay for design or drawing changes required as result of substitution.

1.7 Transportation

.1 Pay costs of transportation of products required in performance of Work.

1.8 Quality of Work

.1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Departmental Representative if required Work is such as to make it impractical to produce required results.

.2 Do not employ anyone unskilled in their required duties. Departmental

Representative reserves right to require dismissal from site, workers deemed incompetent or careless.

.3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Departmental Representative, whose decision is final.

1.9 Coordination

.1 Ensure cooperation of workers during Work. Maintain efficient and continuous supervision.

.2 Be responsible for coordination and placement of openings, sleeves, and accessories.

1.10 Remedial Work

.1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Coordinate adjacent affected Work as required.

.2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

PART 2 - PRODUCTS

2.1 Acceptable Products

.1 Submit product data sheets for all manufactured products used in the Work to Departmental Representative for review in accordance with Section 01 33 00, Submittal Procedures.

.2 Use best quality products.

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes
.1 Progressive cleaning.
.2 Final cleaning.

1.2 Progressive Cleaning
.1 Maintain Work in tidy condition, free from accumulation of waste products and debris.
.2 Remove waste materials from sites at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials onsite.
.3 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
.4 Ensure no invasive plant species, vegetation, or seeds are brought into the project area or transported between locations within the project areas.
.5 Ensure that no food waste, peelings, or wrappers are discarded on site as this may attract animals and lead to wildlife / human conflicts.

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

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes

.1 Administrative procedures preceding preliminary and final reviews of Work.

1.2 Inspection and Declaration

.1 Contractor's Inspection: Contractor and all Subcontractors shall conduct an inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.

.1 Notify Departmental Representative in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.

.2 Request Departmental Representative's Inspection.

.2 Departmental Representative's Review: Departmental Representative and Contractor will perform review of Work to identify defects or deficiencies. Contractor shall correct Work accordingly.

.1 Departmental; Representative will include general Civil Inspectors

.2 A minimum of four (5) working days' notice shall be given to the Departmental Representative by the Contractor before any inspections are to be carried out.

.3 Contractor shall uncover any work that is covered before required inspection or testing is completed and approved by Departmental Representative.

.4 Where inspections by the Departmental Representative reveal work incomplete or not in accordance with the Contract requirements and cannot be corrected within the Representative's site visit, Contractor shall pay costs for additional inspections the Departmental Representative may require to verify acceptability of corrected work.

.5 Remove defective Work, whether result of poor workmanship, use of defective products, or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents. Contractor shall pay any additional costs to re-mobilize to site to correct

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

1.3 Final Completion

.1 Certificate of Substantial Performance: when Departmental Representative considers the Contract Work and the requirements of Contract have been substantially performed, make application for Certificate of Substantial Performance.

.2 Once the Contractor has completed all Work and correction of deficiencies, he shall submit written certification to the Departmental Representative that:

.1 Contract Documents have been reviewed.
.2 The Work shall be deemed to have reached Completion when all labour, Plant and Material required have been performed, used or supplied, and the Contractor has complied with the Contract and all orders and directions made pursuant thereto, all to the satisfaction of the Owner.
.3 Defects are corrected and deficiencies are completed.
.4 Work is complete and ready for Final Review.

.3 Final Review: when items noted above are completed, request final review of Work by Departmental Representative. If Work is deemed incomplete by Departmental Representative, complete outstanding items and request another review.

.4 Certificate of Completion: when Departmental Representative considers deficiencies and defects have been corrected and all the requirements of Contract have been met, the Contractor shall make application for Certificate of Completion.

1.4 Close-Out Submittals

.1 Project Record Documents as specified in Section 01 33 00.

.2 As-Built Documents as specified in Section 01 11 00.

.3 Guarantees and Warranties:

.1 In addition to guarantee requirements contained elsewhere in the Contract Documents to which all Work of this Contract is to be guaranteed for 12 months after the date of issue of the Certificate of Completion by the Departmental Representative.

.2 Upon completion of the Work, furnish to the PSPC a guarantee in writing, stating that the Contractor will make good, at their expense, and to the satisfaction of the Departmental Representative, all defects that may develop in materials and equipment used on the Work for a period of 12 months from date of Certificate of Completion, upon PSPC assuming custody, that are in the opinion of the Departmental Representative due to the use of improper workmanship and faulty materials and equipment.

.3 The Contractor is to, in the case of Work Performed by their Subcontractors and when guarantees are required, secure such guarantees from the Subcontractor and furnish them to PSPC on or before the final completion of the Work.

.4 The guarantees are to provide that all Work furnished and installed by the guarantors are to remain in like new condition and working order for the period of 12 months and that the guarantors will replace same with new and like materials at no expense to PSPC unless it can be proven that the defects are caused by abuse and negligence on the part of PSPC or its employees.

.5 It is to be understood that in effecting the replacement, the Contractor or Subcontractor responsible is to also bear all Costs involved in removing or replacing adjacent affected materials.

.6 One month prior to expiry of guarantee period, the Departmental Representative will carry out a detailed inspection of the Project.

.7 Any defect apparent will be noted and will be forwarded to the Contractor in writing for correction under the terms of the Contract with no additional cost to PSPC.

.4 Commencement of Guarantee and Warranty Periods: date of Departmental Representative's issuing the Certificate of Completion shall be date of commencement for warranty periods.

1.5 Final Payment

.1 Final Payment: When Departmental Representative considers final deficiencies and defects have been corrected and it appears requirements of Contract have been totally performed, make application for final payment. If Work is deemed incomplete by Departmental Representative, complete outstanding items and request final review.

END OF SECTION

PART 1 - GENERAL

1.1 Payment Procedure	.1	Payment for jacking of the superstructure shall include, but is not limited to, design and installation of strengthening of the existing bridge, repairs to the existing structure, materials, equipment, submission of shop drawings, submission of jacking procedure, labour and engineering to facilitate the jacking of the superstructure. Payment shall be made at the lump sum price bid for the line item "Jacking of Superstructure". Progress payments will be made at the discretion of the Departmental Representative based on the progress of work to date. The lump sum amount for the line item "Jacking of Superstructure" is deemed to include the jacking operation for the entire bridge to allow the replacement of the existing bearing and repair of cracked web plate in the existing end post.
1.2 Service during Construction	.1	The bridge shall remain in service during the course of the work as specified in Section 01 35 00 Special Procedures for Traffic Control. At least one lane shall be open to traffic at all time, except during permitted closures as specified in Section 01 35 00 Special Procedures for Traffic Control.
	.2	While the structure is supported on jacks, only one lane of traffic shall be allowed on the bridge.
1.3 Jacking	.3	The Contractor shall design a jacking and support system for the removal of existing bearings and installation of new bearings. Temporary support stools may be required to release the jacks and support the bridge during construction to keep it in service. Lateral stability of the jacking and/or support stools must be maintained during construction and bearing replacement of the bridge. The Contractor shall take into consideration the bridge longitudinal movement due to temperature change during the jacking operation and take necessary action by providing steel plates to allow the bridge movement.
	.4	The Contractor shall ensure the stability of the structure when it is in a jacked condition, accounting for horizontal loads imposed on the structure.
	.5	The Contractor shall be responsible for the design and implementation of the Jacking and temporary support systems. The Contractor shall also be responsible for the design of any required strengthening of the bridge to allow traffic continuously operating during the course of the Work.
1.4 Submittals	.1	The Contractor's Bearing replacement plan and bridge superstructure strengthening design shall be designed and sealed by

a Professional Engineer registered in the Province British Columbia and shall be submitted to the Departmental Representative for review fifteen (15) working days prior to beginning of any bearing replacement work and in accordance with Section 01 33 0 Submittal Procedures.

1.5 Alternative Procedure

.1 The Contractor may propose any alternative solution to replace the bearings, other than the suggested scheme in the contract drawings, outlined in this Section and the Contract Drawings. Any alternative solution shall be designed and sealed by a Professional Engineer registered in the Province of British Columbia and shall be submitted to the Departmental Representative for Review and written approval before implementing.

PART 2 - PRODUCTS

2.1 Equipment

.1 Contractor shall submit product information for the jacks being used to the Departmental Representative at least fifteen (15) days prior to commencing the jacking operation.

PART 3 - EXECUTION

3.1 Jacking

.1 The Contractor shall carry out the concrete repairs to the substructure prior to commencing jacking and replacement of the bearings.

.2 Only one (1) end of the bridge shall be jacked at a time. All jacks at one end of the bride must be jacked simultaneously and the bridge shall not be jacked up more than 6mm. The jacks shall be located as shown on the Contract Drawings.

.3 Before the commencement of jacking operations, the existing end floorbeam shall be strengthened to provide adequate strength. Jacking stiffeners shall be added in the end floor beam where the jacks are located. A minimum 50mm thick steel distribution plate shall be used at the top of the jacks to better distribute the load.

.4 Missing rivets in the top batten plate, or any other location, at the end of the trusses shall have high strength A325 bolts installed prior to undertaking the jacking operation.

.5 Existing rivets shall be replaced with high strength A325 bolts as indicated on the Contract Drawings.

END OF SECTION

PART 1 - GENERAL

1.1 Scope

.1 This Section applies to removals related to the bridge bearing replacement.

.2 See Section 03 30 00 Concrete Repairs for removals related to concrete repairs.

1.2 Section Includes

.1 Methods and procedures for demolition of existing structural components.

1.3 Payment Procedure

.1 Payment for all supply, equipment and labour required to remove the existing concrete at the top of the Bridge piers for the recessed pocket for the new concrete pedestals shall be at the unit rate price bid for the line item “Removal of Existing Concrete for Bearing Replacement”. Payment shall be made for each bearing location. No additional payment will be made for concrete removed beyond the dimensions specified.

.2 Payment for all supply, equipment and labour required to cut the existing post web, remove and dispose of the existing bearing assemblies, as well as to cut the existing anchor rods and structural steel as specified on the drawings shall be at the unit rate price bid for the line item “Removal of Existing Bearings and Post Web”. Payment for removal of bearings includes the removal of existing embedded plates, if required to facilitate the jacking operation, in the bearing seats which are left over from a pervious jacking operation for the Racing River structure.

.3 Payment shall be made once all removals are completed at a given bearing/post location.

1.4 Submittals

.4 For the bearing replacement and as part of the bearing replacement plan, the Contractor shall submit a removal plan and procedure to the Departmental Representative for review fifteen (15) working days prior to the beginning of any removal work.

1.5 References

.1 Canadian Standards Association (CSA International).

.1 CSA S350-M1980(R1998), Code of Practice for Safety in Demolition of Structures.

.2 Department of Justice Canada (Jus).

.1 Canadian Environmental Assessment Act (CEAA)
.2 Canadian Environmental Protection Act (CEPA)
.3 Transportation of Dangerous Goods Act (TDGA)

.3 Comply with National Building code of Canada, Part 8, "Safety Measures at Construction and Demolition Sites", and Provincial requirements.

1.6 Storage and Protection

.1 Perform all work in accordance with Section 013543 – Environmental Protection, and the EASR.

.2 The Contractor shall protect the existing bridge and use caution during existing components removal to ensure that the bridge strength and stability is not compromised at any time. Protect existing structural components that are to remain. In event of damage to such components, immediately replace or make repairs to satisfaction of Departmental Representative at the contractor's own cost.

.3 In all circumstances, ensure that demolition work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.

.4 Do not dispose of waste of volatile materials such as, mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses. Ensure disposal procedures are in accordance with the Waste Management Workplan and to the satisfaction of the Departmental Representative.

.5 Do not pump water containing suspended materials into watercourses or ocean.

.8 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authorities, and the EASR.

.9 Protect trees, plants and foliage on site and adjacent properties where indicated.

1.7 Regulatory Requirements

.1 Ensure all work is performed in compliance with CEPA, CEAA, TDGA, MVSA, and all applicable provincial regulations.

PART 2 - PRODUCTS

2.1 Equipment

.1 Equipment used shall meet or exceed all applicable emission requirements.

.2 Equipment shall be left running only while in use, except where extreme temperatures prohibit shutting machinery down.

PART 3 - EXECUTION

3.1 Preparation	.1	Review site with Departmental Representative and verify extent and location of items designated for removal, disposal, and items to remain.
3.2 Cutting of Existing End Post Web Plate of the Bridges	.1	The web of the existing end post is to be cut by mechanical means only and the Contractor is to minimize the introduction of heat into the existing steel as much as possible. Torch cutting of existing structural components is not permitted. Care shall be taken to prevent damaging any structural steel that is to remain.
	.2	The vertical cut of the web along the flange shall be parallel, smooth and flush with the flange. The horizontal cut of the web shall be perpendicular to the flange and within +/- 3mm of the specified removal line.
3.2 Preparation of Existing Post Flange Faying Surfaces	1.	The existing surfaces of the flanges which will be faying surfaces with the new steel stool shall have the existing paint and any surface corrosion removed. Should the surface of the existing steel not be smooth or flush following removal of the surface corrosion, the Contractor shall repair the existing flange plate to ensure a smooth surface for the intended purpose. A procedure shall be submitted to the Departmental Representative for review and approval prior to starting the work. The surface of the existing steel flanges which will act as faying surfaces shall be prepared to meet the surface conditions required for a Class B primer coating.
3.3 Replacement of Rivets	1.	The Contractor is responsible for ensuring that existing rivets are only removed when it will not compromise the stability or capacity of the structure. Rivets shall be removed by grinding the rivet head off and then drilling the rivet out with a drill bit slightly smaller than the rivet diameter. The Contractor shall use caution to not damage the existing steel which is to remain. Damage to existing coating during rivet removal shall be repaired as specified in Section 05 99 00 Coating of Structural Steel. At any given time, only one single existing rivet shall be removed and replaced with the same size A325 high strength bolt
3.4 Concrete Removals	.1	The Contractor shall remove existing concrete to the extents shown on the Contract Drawings by mechanical means. Edges of removal areas shall be saw-cut to a depth of 25 mm to provide a neat edge to cast concrete/grout against. Jackhammers for concrete removals to the bearing seats shall be limited to maximum weight of 18 kg, unless otherwise approved by the Departmental Representative. The contractor shall take measures to prevent damage to sound concrete to remain and shall not damage existing steel reinforcement in the concrete.

3.5 Removal of Existing Bearings

.1 Care shall be taken during removal of existing bearing assemblies, to ensure no damage to the bridge structural components. Torch cutting of existing structural components to remain is not permitted. Removal shall be as per the Contractors reviewed and approved removal plan and procedures. It is the Contractor's responsibility to provide temporary supports to maintain bridge stability if required. Removal of the bearings is deemed to include the removal of limiter frames on Racing River Bridge, the bearing assembly components, embedded plate in the bearing seat and existing anchor rods to the depth of concrete removal.

.2 Demolished bearing assemblies shall be removed, hauled and disposed of off-site to the satisfaction of the Departmental Representative. No debris shall fall into the Waterway.

3.6 Sequences of Operation

.1 Removal:

.1 Remove items as indicated.
.2 Do not disturb items designated to remain in place.

3.7 Restoration

.1 Restore areas and existing works outside areas of demolition to match condition of adjacent, undisturbed areas.

.2 Use only soil treatments and procedures that are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent watercourses or ground water.

3.8 Cleanup

.1 Upon completion of work, the Contractor shall clean the Site. This shall include removing any rubbish, construction debris, equipment and temporary structures. All disturbed areas shall be restored as directed by Departmental Representative. Site restoration will be a subsidiary obligation of the Contractor under this Contract. No separate payment will be made for site restoration, and shall be considered incidental to the work.

END OF SECTION

PART 1 - GENERAL

1.1 Measurement for Payment

.1 Include all materials, labour, equipment, and services necessary for any toxic waste removal. Payments for such Work is deemed to be included in the mobilization and demobilization line items for the applicable structure and scope.

1.2 Presence of Lead and Contractor's Responsibility

.1 The existing paint coating on the structural steel of the bridge is suspected to be lead based. The Contractor is responsible to ascertain the presence and extent of lead containing paint if any; and conform to all regulations for work undertaken. This includes but is not necessarily limited to WorkSafeBc and MoE regulation requirements for working with, storing, transporting, disposing of and documenting any work process involving lead paint.

1.3 References

.1 Canadian Environmental Protection Act, CEPA.

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS).

.1 Material Safety Data Sheets (MSDS)

.3 National Fire Code of Canada latest edition.

.4 Transportation of Dangerous Goods Act (TDG Act).

.5 Transportation of Dangerous Goods Regulations (T-19.01-SOR/2003-400).

1.3 Definitions

.1 Toxic: For the purposes of this specification, a substance is considered toxic if it is listed on the Toxic Substances List found in Schedule 1 of CEPA.

.2 List of Toxic Substances: found in Schedule 1 of CEPA, lists all substances that have been assessed as toxic. The federal government can make regulations with respect to a substance specified on the List of Toxic Substances. Column II of this List identifies the type of regulation applicable to each substance.

1.4 Submittals

.1 Product Data:

.1 Submit photocopies of shipping documents and waste manifests to Departmental Representative when shipping toxic wastes off-site.

.2 Maintain 1 copy of product data in a readily accessible file onsite.

.2 Submission Requirements:

.1 Submit product data to Departmental Representative in accordance with Section 013300, Submittal Procedures.

.2 Express all weights and volumes in SI Metric units.

.3 Accompany submissions with a transmittal letter containing:

.1 Date.
.2 Project title and number.
.3 Contractor's name and address.
.4 Identification and quantity of attached product data.
.5 Other pertinent data.

1.5 Storage and Handling

.1 Store and handle toxic wastes in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.

.2 Store and handle flammable and combustible wastes in accordance with current National Fire Code of Canada requirements.

.3 Coordinate storage of toxic wastes with Departmental Representative and abide by internal requirements for labeling and storage of wastes.

.4 Observe smoking regulations at all times. Smoking is prohibited in any area where toxic wastes are stored, used, or handled.

.5 Report spills or accidents involving toxic wastes immediately to Departmental Representative and to appropriate regulatory authorities within 24 hours of incident. Take all reasonable measures to contain the release while ensuring health and safety is protected.

.6 Transport toxic wastes in accordance with federal Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations.

.7 Use only an authorized/licensed carrier to transport toxic waste.

.8 Coordinate transportation and disposal of toxic wastes with Departmental Representative.

1.6 Waste Management and Disposal

.1 Dispose of toxic wastes generated onsite in accordance with applicable federal and provincial acts, regulations, and guidelines.

.2 Ensure toxic waste is shipped to an authorized/licensed treatment or

disposal facility and that all liability insurance requirements are met.

END OF SECTION

PART 1 - GENERAL

1.1 References

.1 Canadian Environmental Protection Act, CEPA.

.1 Export and Import of Hazardous Waste Regulations (ETHW Regulations), SOR/2002-200.

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS).

.1 Material Safety Data Sheets (MSDS)

.3 National Fire Code of Canada.

.4 Transportation of Dangerous Goods Act (TDG Act) 1999, (c.34).

.5 Transportation of Dangerous Goods Regulations (T-19.01-SOR/2003-400).

1.2 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.

1.3 Submittals

.1 Submit product data in accordance with Section 013300, Submittal Procedures.

.2 Submit to Departmental Representative current MSDSs for each hazardous material required prior to bringing it/them onsite.

.3 Submit a hazardous materials management plan to Departmental Representative that identifies all hazardous materials, their use, their location, personal protective equipment requirements, and disposal arrangements.

1.4 Storage and Handling

.1 Coordinate storage of hazardous materials with Departmental Representative and abide by internal requirements for labeling and storage of materials and wastes.

.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 Keep no more than 45 litres of flammable and combustible liquids such as gasoline, kerosene, and naphtha for ready use. Store all flammable and combustible liquids in approved safety cans bearing the Underwriter's Laboratory of Canada or Factory Mutual seal of approval. Storage of quantities of flammable and combustible liquids exceeding 45 litres for work purposes requires the written approval of the Departmental Representative.

.5 Transfer of flammable and combustible liquids will not be carried out in the vicinity of open flames or any type of heat-producing devices.

.6 Flammable liquids having a flash point below 38 degrees Celsius, such as naphtha or gasoline will not be used as solvents or cleaning agents.

.7 Store flammable and combustible waste liquids for disposal in approved containers located in a safe, ventilated area. Keep quantities to an absolute minimum.

.8 Observe smoking regulations at all times. Smoking is prohibited in any area where hazardous materials are stored, used, or handled.

.9 Abide by the following storage requirements for quantities of hazardous materials and wastes in excess of 5 kg for solids and 5 litres for liquids:

- .1 Store hazardous materials and wastes in closed and sealed containers which 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 toxic wastes immediately to Departmental Representative and to appropriate regulatory authorities within 24 hours of incident. Take all reasonable measures to contain the release while ensuring health and safety is protected.

1.5 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.

.3 If hazardous waste is generated onsite:

.1 Coordinate transportation and disposal with Departmental Representative.

.2 Ensure compliance with applicable federal, provincial, and municipal laws and regulations for generators of hazardous waste.

.3 Use licensed carrier authorized by provincial authorities to accept subject material.

.4 Prior to shipping material obtain written notice from intended hazardous waste treatment or disposal facility that it will accept material and that it is licensed to accept this material.

.5 Label containers with legible, visible safety marks as prescribed by federal and provincial regulations.

.6 Ensure that trained personnel handle, offer for transport, or transport dangerous goods.

.7 Provide photocopy of shipping documents and waste manifests to Departmental Representative.

.8 Track receipt of completed manifest from consignee after shipping dangerous goods. Provide a photocopy of

completed manifest to Departmental Representative.

.9 Report discharge, emission, or escape of hazardous materials immediately to Departmental Representative and appropriate provincial authority. Take reasonable measures to control release.

PART 2 - PRODUCTS

2.1 Materials

.1 Only bring onsite the quantity of hazardous materials required to perform Work.

.2 Maintain MSDSs 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.

.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, the environment in general, 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

PART 1 - GENERAL

1.1 Measurement Procedures

.1 Payment for materials, equipment and labour to supply and place formwork for the deep and shallow concrete repairs is deemed to be included in the unit price bid for the "Shallow Concrete Patches" and "Deep Concrete Patches" line items.

.2 Payment for materials, equipment and labour to supply and place formwork for the new concrete pedestal is deemed to be included in the unit price bid for the "Supply and Installation of new Concrete Pedestal" Line item.

1.2 References

.1 Canadian Standards Association (CSA)

.1 CAN/ CSA-A23.1, Concrete Materials and Methods of Concrete Construction.

.2 CAN/ CSA-O86.1, Engineering Design in Wood (Limit States Design

.3 CSA-0121, Douglas Fir Plywood.

.4 CSA-0151, Canadian Softwood Plywood.

.5 CSA 0153, Poplar Plywood

.6 CAN3-0188.0, Standards Test Methods for Mat Formed Wood Particleboards and Waferboard.

.7 CSA-0437 Series - 93, Standards for OSB and Waferboard.

.8 CSA-S269.1, Falsework for Construction Purposes.

.9 CAN/CSA-S269.3, Concrete Formwork

.2 Council of Forest Industries of British Columbia (COFI)

.1 COFI Exterior Plywood for Concrete Formwork

1.3 Waste Management and Disposal

.1 Separate and recycle waste materials

.2 Place material defined as hazardous or toxic waste in designated containers.

.3 Ensure emptied containers are sealed and stored safely for disposal away from wildlife.

.4 Use sealers, form release and stripping agents that are non toxic, biodegradable and have zero or low VOC's.

PART 2 - PRODUCTS

2.1 Materials

.1 Formwork materials: to CAN/CSA-A23.1

.2 Form ties:

.1 Use snap ties complete with plastic cones and light grey concrete plugs or cement mortar fill in surface to be left smooth, even and uniform in colour.

.3 Form liner:

.1 Plywood: high density overlay Douglas Fir to CSA O121 exterior grade, square edge, 19 mm thick.

. 4 Form release agent low VOC

. 5 Form stripping agent colorless mineral oil, low VOC, free of kerosene with viscosity between 70 and 110s Saybolt Universal 15 to 24 mm2/s at 40ºC, flashpoint minimum 150ºC, open cup.

. 6 Falsework materials: to CSA-S269.1.

PART 3 - EXECUTION

3.1 Fabrication and Erection

.1 Where required, formwork and associated temporary falsework design and drawings shall be prepared and sealed by a professional engineer registered in the Province of British Columbia and experienced in the design and construction of falsework and formwork structures similar to those required for this project.

.2 All forms shall be designed and built mortar-tight and of sufficient rigidity to prevent distortion due to the pressure of vibrated concrete and other loads incidental to the construction operation.

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

.4 Obtain Departmental Representative's approval for use of earth forms framing openings not indicated on drawings.

.5 Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.

.6 Fabricate and erect falsework in accordance with CSA S269.1 and COFI Exterior Plywood for Concrete Formwork.

.7 Refer to architectural drawings for concrete members requiring architectural exposed finishes.

.8 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CAN/CSA-A23.1.

.9 Align form joints and make watertight. Keep form joints to minimum.

.10 Use 20 mm chamfer strips on external corners and/or 20 mm fillets at interior corners, joints, unless specified otherwise.

.11 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.

.12 Construct forms for architectural concrete, and place ties as indicated and/or as directed. Joint pattern not necessarily based on using standard size panels or maximum permissible spacing of ties.

.13 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections. Assure that all anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.

.14 Clean formwork in accordance with CAN/CSA-A23.1, before placing concrete.

.15 Dowels which are placed into the existing concrete to secure formwork in place shall be removed to a depth of 50mm below the existing concrete surface and a zinc rich paint shall be applied to the end of the dowel. Once the zinc rich paint has dried, the remainder of the hole shall be filled with an approved grout or propriety patching product.

END OF SECTION

PART 1 - GENERAL

1.1 Measurement and Payment

.1 The cost of steel reinforcement for concrete repairs are deemed to be included in the concrete repair line items "Shallow Concrete Patch" and Deep Concrete Patch.

.2 The cost of steel reinforcement for the new concrete pedestals are deemed to be included in the pedestal line item "Supply and Installation of New Concrete Pedestal".

1.2 References

.1 American Concrete Institute (ACI):

.1 ACI 315R, Manual of Engineering and Placing Drawings for Reinforced Concrete Structure.

.2 American National Standards Institute/American Concrete Institute (ANSI/ACI):

.1 ANSI/ACI 315, Details and Detailing of Concrete Reinforcement.
.2 SP-66-04, ACI Detailing Manual 2004.

.3 American Society for Testing and Materials (ASTM):

.1 ASTM A143/A143M, Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.
.2 ASTM A1064/A1064M, Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plan and Deformed for Concrete.
.3 ASTM A641/A641M Specifications for Zinc-Coated (Galvanized) Carbon Steel Wire

.4 Canadian Standards Association (CSA):

.1 CAN/CSA-A23.1, Concrete Materials and Methods of Concrete Construction.
.2 CAN3-A23.3, Design of Concrete Structures for Buildings.
.3 CAN/CSA-G30.18, Billet-Steel Bars for Concrete Reinforcement.
.4 CAN/CSA-G40.21, Structural Quality Steels.
.5 CAN/CSA-G164, Hot Dip Galvanizing of Irregularly Shaped Articles.
.6 CSA W186, Welding of Reinforcing Bars in Reinforced Concrete Construction.
.7 CAN/SGSB-1.181, Ready-Mixed Organic Zinc-Rich Coating.
.8 CAN/CSA-S6-14, Canadian Highway Bridge Design Code (CHBDC).
.9 CAN/CSA-S806 Design and Construction of Building Structures with Fiber-Reinforced Polymers.
.10 CAN/CSA-S807 Specification for fiber-reinforced polymers.

.5 Reinforcing Steel Institute of Canada:

.1 RISC, Reinforcing Steel Manual of Standard Practice.

1.3 Shop Drawings

.1 Submit shop drawings including placing of reinforcement in accordance with Section 01 33 00 - Submittal Procedures.

.2 Indicate on shop drawings, bar bending details, lists, quantities of reinforcement, sizes, spacings, locations of reinforcement and mechanical splices if approved by Departmental Representative, with identifying code marks to permit correct placement without reference to structural drawings. Indicate sizes, spacings, lengths, and locations of chairs, spacers and hangers. Prepare reinforcement drawings in accordance with Reinforcing Steel Manual of Standard Practice - by Reinforcing Steel Institute of Canada (RSIC).

.3 Detail lap lengths, bar development lengths, bend radius, standard hooks to CAN/CSA-S6-14, and the Drawings unless otherwise indicated.

1.4 Waste Management and Disposal

.1 Refer to Section 01 35 43 Environmental Procedures

1.5 Material Storage

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Product Requirements and 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 in clean, dry, well-ventilated area.

.2 Replace defective or damaged materials with new.

.4 Do not store material so as to interfere with site operation and drainage.

.5 Identification of reinforcing bars shall be maintained throughout the fabrication process.

PART 2- PRODUCTS

2.1 Materials

.1 Reinforcing steel: grade 400R, deformed bars to CAN/CSA-G30.18, unless

indicated otherwise.

.2 Welded wire fabric: minimum yield strength of 450 MPa and galvanized in accordance with ASTM A641/A641M

.3 FRP dowels: shall be in accordance with CSA S806. All FRP products shall comply with *Specifications for Product Certification of Fiber Reinforced Polymers (FRPs) as Infernal Reinforcement in Concrete Structures* developed by Intelligent Sensing for Innovative Structures. The FRP supplier shall provide test data from an independent third-party testing lab that demonstrates the material conforms to the specifications.

.2 Substitute different size bars only if permitted in writing by Departmental Representative.

.3 Tie Wire: conforming to ASTM A82/A 82M and shall be minimum 1.6 mm diameter, cold drawn, annealed steel wire.

.4 Chairs, bolsters, bar supports, spacers: to CAN/CSA-A23.1.

.5 Mechanical splices: subject to approval of Departmental Representative.

2.2 Fabrication

.1 Fabricate reinforcing steel in accordance with CAN/CSA-A23.1, ANSI/ACI 315, and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada unless indicated otherwise. Bars shall be cold bend done to a sufficient accuracy that placement tolerances can be met.

.2 Obtain Departmental Representative's approval for locations of reinforcement splices other than those shown on placing drawings.

.3 Upon approval of Departmental Representative, weld reinforcement in accordance with CSA W186.

.4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

2.3 Source Quality Control

.1 Provide Departmental Representative with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, minimum 2 weeks prior to commencing reinforcing work.

.2 Inform Departmental Representative of proposed source of material to be supplied.

PART 3 - EXECUTION

3.1 Field Bending

.1 Do not field bend or field weld reinforcement except where indicated or authorized by Departmental Representative.

.2 When field bending is authorized, bend without heat, applying a slow and steady pressure.

.3 Replace bars that develop cracks or splits.

3.2 Placing Reinforcement

.1 Place reinforcing steel as indicated on reviewed shop drawings and in accordance with CAN/CSA-A23.1.

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

.3 Ensure cover to reinforcement is maintained during concrete pour.

.4 Secure all reinforcement steel with ties, spacers, and supports as required.

.5 Chairs: where concrete is exposed to view, exposed to elements or where rust is possible, use plastic or non-corrosive material, or precast concrete made from concrete of equal strength and durability of concrete to be placed. Chairs used are not to result in voids or unacceptable appearance in exposed concrete surfaces.

.6 Cover tolerance for placement of steel reinforcement is +/- 8 mm.

.7 Location tolerance for steel reinforcement is +/- 20mm.

3.4 Cleaning

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

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

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

.6 Waste Management: Refer to Section 01 74 21.

END OF SECTION

PART 1 - GENERAL

1.1 Measurement and Payment

.1 The cost for supply and installation for concrete, formwork, steel reinforcement, doweling and epoxying steel reinforcement, curing, quality control and all other items required to construction of the new concrete pedestals shall be paid under the line item "Supply and Installation of New Concrete Pedestal" for each bearing location. Payment shall be made as each work location is completed or on a prorated basis based on the work completed at the discretion of the Departmental Representative.

1.2 References

.1 Canadian Standards Association (CSA):

- .1 CAN/CSA-A23.1, Concrete Materials and Methods of Concrete Construction.
- .2 CAN/CSA-A23.2, Test Methods and Standard Practices for Concrete
- .3 CAN/CSA-G30.18, Billet-Steel Bars for Concrete Reinforcement.
- .4 CAN/CSA-S6-14, Canadian Highway Bridge Design Code (CHBDC).

1.3 Shop Drawings

.1 Submit shop drawings including placing of reinforcement in accordance with Section 01 33 00 - Submittal Procedures.

.2 Indicate on shop drawings, bar bending details, lists, quantities of reinforcement, sizes, spacings, locations of reinforcement and mechanical splices if approved by Departmental Representative, with identifying code marks to permit correct placement without reference to structural drawings. Indicate sizes, spacings, lengths, and locations of chairs, spacers and hangers. Prepare reinforcement drawings in accordance with Reinforcing Steel Manual of Standard Practice - by Reinforcing Steel Institute of Canada (RSIC).

.3 Detail lap lengths, bar development lengths, bend radius, standard hooks to CAN/CSA-S6-14, and the Drawings unless otherwise indicated.

.4 If cold or hot weather concreting procedures are required, the Contractor shall submit a detailed procedure for review and approval by the Departmental Representative prior to placing any concrete.

1.4 Product Submissions

.1 The Contractor shall submit the product data sheets and product installation instructions to the Departmental Representative prior to placing any concrete for the concrete product used and adhesive used for the rebar dowels.

1.5 Concrete Placement Plan

.1 The Contractor shall submit a concrete placement plan to the departmental representative at least 14 days prior to casting the new concrete pedestals to the Departmental Representative for review and approval. The plan shall include the following information:

- Storage and handling procedures
- Mix Design

- Mixing procedures
- Placement procedures
- Curing procedures
- Quality control procedures
- Hot weather or cold weather concreting procedures as required.

1.6 Concrete Test Results

.1 Concrete test results shall be forward to the Departmental Representative immediately once they are available.

PART 2- PRODUCTS

2.1 Materials

.1 Reinforcing steel shall be as per Section 03 20 00.

.2 Formwork shall be as per Section 03 10 00.

.3 The concrete for the new concrete pedestals shall be Sikacrete-08 SCC or approved equivalent by Departmental Representative. No admixtures or accelerators are permitted to be used without the written authorization of the Departmental Representative.

.4 Rebar dowels shall be epoxied into drilled holes using Hilti HIT-HY 200 or approved equivalent by Departmental Representative. Installation shall be as per manufactures written instruction.

PART 3 - EXECUTION

3.1 Concrete

.1 Following removal of the existing concrete for the recess of the new concrete pedestal into the existing bearing seat, the existing concrete surface shall be prepared so that it is clean and free of laitance and intentionally roughened to a full amplitude of 5mm and a spacing of 15 mm.

.2 The Contractor shall handle, store, mix, place and cure the concrete product in accordance with the manufactures written instructions and these specifications. The time of placement from the time of mixing shall not exceed 1 hour unless otherwise approved by the Departmental Representative.

.3 The existing bridge structure shall not be lowered onto the new concrete pedestals until the minimum specified strength as shown on the Contract Drawings has been achieved as demonstrated by strength tests and approval has been given by the Engineer.

.4 Curing procedures shall be as per the written instruction of the manufactures but shall at a minimum meet a recognized curing procedure consistent with CSA A23.1, including hot or cold weather concreting procedures as required.

Freshly deposited concrete shall be protected from freezing, abnormally high temperatures or temperature differentials, premature drying, excessive moisture, moisture loss, heavy shocks, excessive vibration and high stresses, for the period of time necessary to develop the desired properties of the concrete. The curing process will begin following the placement of the concrete in the section cast. It shall be the responsibility of the Contractor to ensure that the system of curing and protection is properly planned, constructed and maintained throughout the curing period.

a. When the ambient air temperature is 25 degrees Celsius or higher or there is a probability of it rising to 25 degrees Celsius during the placing period, hot weathering concreting procedures shall be used.

b. When the ambient temperature is, or forecasted to be, below 5 degrees Celsius during placement, and/or forecast to fall below 5 degrees Celsius during the first seven days after placing, cold weather concreting procedures shall be used.

3.2 Concrete Quality Control

.1 The Contractor shall be fully responsible for hiring, scheduling, overseeing, performing and documenting all quality control testing and inspection.

.2 Laboratory testing shall be carried out by a testing laboratory certified in accordance with the requirements of CSA Standard A282. Field tests shall be undertaken by experienced personnel and shall be certified under CSA Standard A283 or certified as an ACI concrete Field-Testing Technician – Grade 1 (minimum). Testing personnel shall be on-site and available to test concrete for the complete duration of any concrete placement operation.

.3 Samples for the determination of concrete properties for acceptance shall be taken at the discharge end of the placement system.

.4 Concrete strength tests shall be taken for the following:

- Determine that the minimum specified strength of the new concrete pedestal has been achieved prior to lowering the structure onto the new concrete pedestals. This shall be determined based on a minimum of a single sample test result. The Contractor shall cast additional samples as they deem necessary to verify strength should the first sample fail.

- Determine the 28-day strength of the new concrete pedestal concrete. This shall be determined based on the average of three test sample results.

.5 The Contractor shall take a set of samples and test for each bearing location.

.6 Concrete samples and strength tests shall be in accordance with CAN/CSA A23.2-1C *Sampling Plastic Concrete* by the Contractor. The person preparing

the concrete test cylinders on site shall certified under CSA Standard A283 or certified as an ACI concrete Field-Testing Technician – Grade 1 (minimum).

.7 Should the strength tests show that the concrete has not achieved the 28-day design strength, the contractor shall remove the deficient concrete and replace with new concrete at no additional cost to the Owner.

3.3 Epoxy Doweling of Steel Reinforcing.

.1 L-bars as shown on the Contract drawings shall be doweled into the existing concrete using an approved adhesive product.

.2 **Drilling Dowel Holes and Bar Installation:** Holes for dowels shall be drilled in existing abutment concrete using carbide-tipped drill bits to the depths shown on the Contract Drawings and shall be drilled to produce a straight alignment over the full required depth of the hole. Holes shall be drilled using the smallest bit possible that will accommodate the actual reinforcing steel bar. Any spoils from the drilling operation shall be contained and disposed of in accordance with these Special Provisions. Where vertical obstructions prevent drilling a vertical hole, the Contractor may drill the hole at the small angle possible to the vertical and then bend the bar to be vertical. Holes drilled at an angle shall be drilled away from free edges and towards the center of the abutment.

Existing concrete reinforcing steel shall not be damaged when drilling holes. It is the Contractor's responsibility to determine the location of existing reinforcing steel prior to drilling holes for rebars. In cases where specified hole locations interfere with existing embedded reinforcing steel, the hole for new rebar can be shifted by a maximum of 50mm or the Contractor shall inform the Departmental Representative, who will then determine the adjustments to the hole locations.

All abandoned holes shall be filled with non-shrink cement grout at the Contractor's expense. Grout shall be placed according to the manufacturer's specifications.

Holes shall be thoroughly cleaned and dried prior to injecting the epoxy grout. Dowels shall be installed in a manner, which ensures their full embedment and complete bonding within the holes. All manufacturer recommendations for application and installation shall be strictly adhered to.

After bonding, dowels shall be supported as necessary to prevent movement during curing, and shall remain undisturbed until the epoxy has cured for the time specified by the manufacturer.

.3 **Acceptance Testing of Dowels:** The Contractor shall be responsible for carrying out all tests on the selected dowels. Testing shall be performed by an independent testing agency acceptable to the Departmental Representative. All required repairs and retesting shall be at the Contractor's expense.

The Contractor shall carry out a minimum of two (2) tensile (pull-out) tests for each size of the drilled-in-dowels at each bearing pedestal to verify the adequacy of the installation procedure. The tests shall be conducted at the commencement of the installation to verify the installation procedure. If any one (1) test fails, the Contractor shall re-evaluate the installation procedure with the Department Representative and carry out a minimum of two (2) additional tests. The testing procedure shall be repeated, if necessary, until all two dowels pass the pull-out test.

The tensile test shall conform to ASTM E488 "Test Methods for Strength of Anchors in Concrete and Masonry Elements". The dowels shall be tensioned to 50% of the minimum specified yield strength of the reinforcing steel dowels and must hold the load for five (5) minutes.

Any Dowel that fails shall be re-installed and re-tested.

The tests my take place on the L-bars to be installed as per the Contract Drawings or may be performed at an alternative location on the concrete piers/abutments. The location shall be approved by the Departmental Representative. Following the trial installation, the Contract shall remove the dowel to a depth of 50mm below the existing surface of concrete and patch with an approved non-shrink grout.

END OF SECTION

PART 1 - GENERAL

1.0 Scope

.1 This Section outlines the requirements for concrete materials and procedures to be used in rehabilitation of abutments, piers, and all other related concrete repairs.

.2 Concrete patchwork specified in this document shall meet performance and uniformity requirements.

.3 The performance characteristics will be measured by conformance to the concrete removal requirements, plastic concrete properties, hardened concrete properties, durability properties and bond strength between new and old concrete.

.4 Concrete shall be used for structure components exposed to temperature fluctuations, cycles of freezing and thawing, presence of de-icing chemicals, and traffic loading.

1.1 Measurement and Payment

.1 The costs for concrete patch repairs shall be paid for under the "Shallow Concrete Patch" or "Deep Concrete Patch" line item for the applicable structure. This item shall include all labor, materials and equipment needed to remove the existing deteriorated concrete and to carry out the patch repair, including curing. The cost of field quality testing and testing required to show that the performance criteria has been met shall be deemed to be included in the unit rate.

.2 Failure to meet any of the performance criteria for patch repair material, the Contractor shall repair/replace the patch at its expense.

1.2 General Requirements

.1 The Contractor shall be responsible for designing the concrete patch repair based on the requirements and performance criteria set out in this specification. Two different concrete patch repairs shall be designed and implemented:

- .1 Shallow concrete patches, where the depth of concrete repair does not expose existing steel reinforcement. These repairs shall consist at a minimum of:
  - .1 Saw cutting edges of area of deteriorated concrete.
  - .2 Removal of deteriorated concrete.
  - .3 Cleaning of remaining concrete substrate.
  - .4 Drill holes and epoxy in Fibre Reinforced Polymer (FRP) dowels (if warranted by patch depth)
  - .5 Placement of wire fabric mesh, while not interfering with patching material placement.
  - .6 Application of patch material.

.7 Curing of patch material.

.2 Deep concrete patches, where the depth of concrete repair exposes existing steel reinforcement. These repairs shall consist at a minimum of:

.1 Saw cutting edges of area of deteriorated concrete.
.2 Removal of deteriorated concrete.
.3 Assess the deterioration of rebar and splice additional steel bars if required.
.4 Cleaning of remaining concrete substrate and exposed rebar.
.5 Drill holes and epoxy in Fibre Reinforced Polymer (FRP) dowels
.6 Placement of wire fabric mesh which is secured to the FRP dowels.
.7 Application of patch material.
.8 Curing of patch material.

.2 Splicing of existing steel reinforcement with new black steel reinforcement is required when there is more than 10% section loss and increase the repair cover to 75 mm

.3 The contractor shall submit a concrete repair design to the Departmental Representative for review and approval at least 4 weeks prior to implementing the concrete repairs. The objectives of the repair design are to reinstate the original structural capacity at the repair locations and to minimize corrosion of reinforcement in the repair locations and in the original concrete at the perimeter of the repair patches.

.4 This repair design shall include the patch repair material to be used, the design of the repair (i.e. wire mesh, dowels, dowel adhesive or grout, etc) methodology of carrying out the concrete removal, surface preparation, repair material mixing preparation procedure, curing procedure and quality control method. The quality control plan shall be consistent with industry standard for the patch material chosen.

.5 The BC Ministry of Transportation and Infrastructure (BC MoTI) 2016 Standard Specifications for Highway Construction Volume 1 and 2 shall apply to the execution of the concrete repairs, in addition to the requirements of this specification.

.6 Submittals in accordance with Section 01 33 00 - Submittal Procedures.

1.3 Qualifications and Experience

.1 The concrete repairs, including the patching materials used shall be designed by a Professional Engineer licensed in the Province of British Columbia who is qualified by their experience and education in concrete repairs. The Contractor shall submit the Professional Engineer's qualifications prior to commencing the work to the Departmental Representative for acceptance. This person shall also have at least 5 years of relevant experience.

.2 All field testing and laboratory testing of field samples carried out to demonstrate that the patch material meets the performance requirements of this specification and/or field quality control shall be conducted by a Canadian Council of Independent Laboratories certified independent testing laboratory. Any field testing or sampling shall be carried out by a person certified to perform such test by an industry recognized program such as CSA A283 or ACI Concrete Field Testing Technician Grade.

1.4 Related Selections

.1 Section 01 29 01 - Method of Measurement and Payment.

.2 Section 01 45 00 - Quality Control.

.3 Section 01 74 11 - Cleaning.

.4 Section 01 74 19 - Waste Management and Disposal.

.5 Section 03 10 00 - Forming and Accessories.

.6 Section 03 20 00 - Concrete Reinforcing.

PART 2 - PRODUCTS

2.1 Materials

1. The Contractor shall select the patch material based on their experience and expertise and considering the site specifics of the repairs.

2. Steel reinforcement used to splice deteriorated existing reinforcement shall be in accordance with Section 03 20 00 Concrete Reinforcement. 75mm cover to black steel to be used.

3. FRP dowels used to secure the wire mesh shall be in accordance with Section 03 20 00 Concrete Reinforcement.

4. Welded wire fabric shall have a minimum yield strength of 450 MPa and be in accordance with CAN/CSA G30.5.

5. Any formwork used for the repair shall be in accordance with Section 03 10 00 Forming and Accessories.

2.2 Performance Requirements of Patch Material

.1 The Contractor shall provide test data to demonstrate the patch material meets the following performance criteria by the test method stated or approved equivalent test method.

.2 The repair design shall include the acceptance ages for repair material properties to be consistent with the loading and exposure conditions on site, and any additional quality control tests as-required to confirm compliance of work with the repair design.

.1 The patch repair material shall have the properties of CSA A23.1 Exposure Class C-1 Concrete or its approved equivalent, including the properties below.

.2 Compressive Strength: Minimum of 35 MPa as determined by CSA A23.2-9C. Samples shall be taken at the time of placement for these tests. At least one compressive strength test shall be carried out for each day of placement at a time and location selected by the Departmental Representative.

.3 Chloride Ion Penetrability: Maximum of 1,500 coulombs by ASTM C1202. The Contractor shall provide test data on the patch material to be used which demonstrates it meets this performance requirement.

.4 Tensile Bond Strength: Minimum of 1.0 MPa by CSA A23.2-6B. This test shall be conducted on the placed patch material of a shallow and/or deep patch repair. At least three tests shall be conducted. The location of testing shall be selected by the Departmental Representative.

.5 Thermal Coefficient of Expansion: to match substrate, 7 to 12 10^{-6}/°C, by AASHTO T 336. The Contractor shall provide test data on the patch material to be used which demonstrates it meets this performance requirement.

.6 Modulus of Elasticity: to match substrate, 25 to 35 GPa, by ASTM C469. The Contractor shall provide previous test data on the patch material to be used which demonstrates it meets this performance requirement.

.7 Resistance to Freeze Thaw: minimum 95% durability factor, by ASTM C666. The Contractor shall provide previous test data on the patch material to be used which demonstrates it meets this performance requirement.

.8 Drying Shrinkage: maximum of 0.04%, by CSA A23.2-21C. The Contractor shall provide test data on the patch material to be used which demonstrates it meets this performance requirement.

.9 Deicing Salt Scaling: maximum of Category 1, by CSA A23.2-22C. The Contractor shall provide previous test data on the patch material to be used which demonstrates it meets this performance requirement.

.2 The test data shall be based on material which was prepared, mixed and cured in a manner consist with that which will be used for the patch repairs carried out as part of this project.

.3 A test is considered to pass the performance criteria when all tests carried out during this project shows that the performance criteria are met.

.4 The Departmental Representative shall choose the location of where the test sample shall be taken.

PART 3 - EXECUTION

3.1 Identification of Repair Areas

.1 Defect maps from the 2015 inspection reports of these structures are provided to the Contractor for information purposes and to give a sense of the condition and extent of repairs to be carried out. These defects maps are not warranted to represent the current condition of the substructure. The most recent bridge inspection reports of the structure are also provided for reference.

.2 The Departmental Representative, in the presence of the Contractor, will identify the areas of concrete repairs to be carried out for each structure. The Contractor shall provide access (via scaffolding or other appropriate means) to the entire substructure concrete for this purpose.

.3 The entire area of an individual repair area shall be classified as deep if more than 50% of the area meets the definition of a deep repair as specified in this Section. Otherwise the repair shall be classified as shallow.

3.3 Construction

.1 The repair shall be carried out as per the approved repair design as prepared by the Contractor. The repair design shall include details of all requirements in this Section.

3.2 Preparation

.1 Obtain Departmental Representatives approval of repair substrate before placing patch material. Provide 24 hours' notice prior to placing of patch material.

.2 Pumping of concrete is permitted only after approval of equipment and mix.

.3 Ensure reinforcement and inserts have adequate clearance for the patch materials and are not disturbed during placement. Ensure that all corrosion products have been removed from the existing reinforcement and concrete.

.4 Prior to placing of patch material, obtain Departmental Representative's approval of proposed method for curing and protection of concrete.

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

.6 Concrete surface preparation shall be according to International Concrete Repair Institute (ICRI) methods and concrete surface profile (CSP) scale for good adhesion of the repair material

3.4 Curing Protection

.1 Curing shall be carried out as per the approved repair design as prepared by the

Contractor.

3.5 Field Quality Control

.1 Site tests: conduct tests as follows in accordance with Section 01 45 00 - Quality Control and submit report Departmental Representative.

.1 Concrete pours.
.2 Slump.
.3 Air content.
.4 Compressive strength at 7 and 28 days, or alternate acceptance ages.
.5 Air and concrete temperature.

.2 Appoint and pay for services of a CCIL certified testing agency(s), to provide full testing services of sampling and testing of concrete in accordance with CAN/CSA-A23.1 and the Contractor Quality Control Plan.

.3 Frequency of testing: as specified in section 2.2.1

.5 Inspection and testing by Departmental Representative will not augment or replace Contractor quality control nor relieve him of his contractual responsibility.

3.6 Cleaning

.1 Concrete truck washout: For washing out concrete trucks the following procedures shall be followed, unless all cement waste including wash water is captured and treated prior to release into an area approved by the Departmental Representative.

.2 Concrete truck washout: For washing out concrete trucks the following procedures shall be followed:

.1 Onsite Temporary Concrete Washout Facility

.1 Temporary concrete washout facilities shall be located a minimum of 30m from watercourses.

.2 Temporary concrete washout facilities shall be temporary pit or bermed areas constructed and maintained in sufficient quantity and size to contain all liquid and concrete waste generated by washout operations.

.3 Straw bales, wood stakes, and sandbag materials can be used to construct temporary containment walls or “barriers”.

.4 Plastic lining material shall be a minimum of 10-mil polyethylene sheeting and shall be free of holes, tears or other defects that compromise the impermeability of the material.

.5 The soil base shall be prepared free of rocks or other debris that may cause tears or holes in the plastic lining material.

.6 Perform washout of concrete mixer and/or trucks in designated areas only.

.7 Wash concrete from mixer and/or truck chutes into approved concrete washout facility or collect in an impermeable bag for disposal.

.8 Pump excess concrete in concrete pump bin back into concrete mixer truck.

.9 Concrete washout from concrete pumper bins can be washed into concrete pumper trucks and discharged into designated washout area or properly disposed offsite.

.10 Once concrete wastes are washed into the designated area and allowed to harden, the concrete shall be broken up, removed, and disposed of per applicable regulations.

.2 Maintenance and Inspection of Temporary Concrete Washout Facilities

.1 Temporary concrete washout facilities shall be maintained to provide adequate holding capacity with a minimum freeboard of 100 mm for above grade facilities and 300 mm for below grade facilities.

.2 Maintaining temporary concrete washout facilities shall include removing and disposing of hardened concrete and returning the facilities to a functional condition.

.3 Existing facilities must be cleaned, or new facilities must be constructed and ready for use once the washout is 75% full.

.4 Temporary concrete washout facilities shall be inspected for damage (i.e. tears in PVC liner, missing sand bags, etc.)

.5 Onsite concrete waste storage and disposal procedures should be monitored at least weekly or as directed by the Departmental Representative.

.3 Removal of Temporary Concrete Washout Facilities

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

.3 Waste Management: Separate waste materials for reuse and recycling as follows:

.1 Remove unused concrete materials from site.

.2 Provide appropriate area on job site where concrete trucks can be safely washed.

.3 Divert unused admixtures and additive materials (pigments, fibres) from landfill to official hazardous material collections site as approved by the Departmental Representative.

.4 Do not dispose of unused admixtures and additive materials into streams, onto ground or in other location where it will pose health or environmental hazard.

.5 Prevent admixtures and additive materials from entering water supplies or streams.

.6 Ensure emptied containers are sealed and stored safely for disposal away from wildlife.

.7 Using appropriate safety precautions, collect liquid or solidify liquid with inert, non-combustible material and remove for disposal. Dispose of waste in accordance with applicable local, Provincial/Territorial and National regulations.

3.7 Equipment .1 Power-driven hand tools for removal of concrete down to sound substrate will be permitted with the following restrictions:

.1 Jack hammers and chipping hammers heavier than nominal 7 kg respectively shall not be used.

.2 Jack hammers or mechanical chipping tools shall not be operated at an angle in excess of 45 degrees measured from the surface, in order to prevent internal damage to the structure.

.3 Mechanical roughening devices, grinders or shotblasting, capable of removing the concrete and producing an angular finished surface are permitted.

.4 Concrete cutting saws capable of sawing to the depths indicated on the

Drawings are permitted.

.2 As an alternate, other equipment may be used for concrete removal upon approval from the Departmental Representative, if it can be demonstrated that the method will not damage overlying and/or underlying or adjacent concrete elements.

.3 Hand tools such as hammers and chisels are also permitted.

END OF SECTION

PART 1 - GENERAL

1.1 Scope	.1	This Section applies to the bearing replacement and structural steel work.
1.2 Applicable Specifications	.2	All structural steel shall be in accordance with this Section and BC MoTI Highway Construction Specifications Section 421 Structural Steelwork.
1.3 Payment Procedure	.1	Payment for the supply, fabrication, testing and shipping of structural steel components shall be made at the unit rate bid for the line item "Supply, Fabrication, and Shipping of Structural Steel for New Stool" for each bearing location.
	.2	Payment for all equipment, labour and materials required for the installation of all new structural steel fabricated components shall be paid at the unit rate bid for the line item "Installation of New Bearing and New Steel Stool" for each bearing location.
1.4 Submittals	.1	For all steel fabricated components, the Contractor shall submit shop drawings for review and approval at least fifteen (15) working days prior to undertaking any fabrication, and in accordance with Section 01 33 00 Submittal Procedures. Shop drawings shall not be submitted until the existing geometry and condition have been verified and all required amendments to the work have been submitted to the Departmental Representative.
	.2	Weld procedures shall be submitted to the Departmental Representative for review and approval at least fifteen (15) business days prior to undertaking any welding. The procedures shall be CWB certified and signed and sealed by a Professional Engineer licenced in the Province of British Columbia.
	.3	Weld repair procedures shall be submitted to the Departmental Representative for approval prior to undertaking any weld repairs. The repair procedures shall be signed and sealed by a Professional Engineer Licenced in the Province of British Columbia.
	.4	Steel mill certificates shall be submitted to the Departmental Representative for all structural steel used in the works.
	.5	The Contractor shall submit material test reports for the bolt assemblies in accordance with ASTM F3125M to the Departmental Representative.
	.6	Welders, Welding Inspectors and NDT Technicians shall provide a copy of their certification upon request by the Departmental

Representative.

PART 2 - PRODUCTS

2.1 New Structural Steel .1 All new structural steel shall be in accordance with CSA G40.20M/G40.21M, grade 350W. Structural Steel shall be supplied from a Canadian or American steel mill.

2.2 Existing Structural Steel .1 Existing structural steel is assumed to be fabricated to ASTM A7-39 with a yield strength of 230 MPa and an ultimate strength of 420 MPa based on the information shown on the existing structural steel shop drawings.

2.3 High-Strength Bolts .1 Bolts shall be high strength bolts which conform to ASTM A325-Type 3. Nuts for high strength bolts shall conform to ASTM A563M and washers for high strength bolts shall conform to ASTM F436M. Bolt sizes shall be as specified in the Contract Drawings.

.2 Bolts shall be detailed with threads excluded from the shear plane.

PART 3 - EXECUTION

3.1 Cutting of New Structural Steel .1 Cutting of new structural steel by shearing is not permitted. New structural steel shall be gas cut or by other approved means. Cut steel surfaces shall be ground smooth. Cutting of existing structural steel shall be as specified in Section 02 22 50 Sitework Demolition and Removals.

3.2 Steel Corners .1 All corner edges of new structural steel shall be chamfered to 2 mm by grinding.

3.3 Bolt and Bolt Holes .1 The nominal diameter of new bolts holes shall not be greater than 2 mm larger than the nominal bolt diameter.

.2 Where new bolt holes are to line up with existing bolt holes, the Contractor shall either match drill the holes in the field, take the necessary measurements or prepare a template in the field so that the holes may be drilled in the shop such that they match the existing holes.

.3 Holes shall be drilled or sub-punched 5 mm smaller and reamed to full size. All holes shall be free of burrs and cutting chips.

.4 Bolts shall be installed by the turn of the nut method in accordance with the Canadian Highway Bridge Design Code S6-14.

	.5	Shim plates used between the new stool flange and existing vertical post flange shall not consist of more than one plate. The Contractor shall provide shim plates of varying thickness for the existing post to new stool flange connection to accommodate the actual gap between the new stool and existing post flanges.
	.6	Bolt connections shall be slip critical.
	.7	Bolts shall only be tensioned once. Should a bolt be tensioned and then un-tensioned, it shall be discarded and replaced with a new bolt.
	.8	Bolts shall be detailed with threads excluded from the shear plane.
3.4 Faying Surfaces	.1	Faying surfaces of bolted connections of new structural steel shall have a class B primer only applied to them as per Section 05 99 00. The surface shall be prepared to meet the requirements of the class B primer so that a mean slip coefficient of 0.52 is achieved.
	.2	Faying surfaces of bolted connections of existing structural steel shall have the existing coating removed and a class B primer applied as per Section 05 99 00. The cleaned existing structural steel surface shall be prepared to meet the requirements of the class B primer so that a mean slip coefficient of 0.52 is achieved.
3.5 Fit-to-Bear Connections	.1	For members designated as “Fit-to-Bear” their completed joint shall have at least 75% of the entire contact area in full bearing defined as not more than 0.5 mm separation and the separation of the remaining shall not exceed 1.0 mm.
3.6 Bearing Surfaces	.1	Bearing contact surfaces of all steel bearing plates which are to come into contact with other steel bearing plates shall have a surface roughness of 25 Microns. All steel bearing plates in contact with concrete shall have a surface roughness of 50 Microns.
	.2	Bearing contact surfaces for all steel bearing plates which are to come into contact with other steel bearing plates shall be fit-to-bear.
3.7 Welding	.1	Welding and inspection of welds shall be completed in accordance with CSA W59 unless noted otherwise. Welding electrodes shall comply with S6-14 Clause 10.18.3.1. All welding shall be done in the shop, no field welding is permitted, unless noted otherwise.
	.2	Run-of tabs shall be used at the ends of all welds that terminate at the edge of a member. After welding, the tabs are to be removed by flame cutting, not breaking off. The surface shall be then grindedmooth.

.3 Welding fabrication shall be completed by a company certified to Division 1 or 2 of CSA W47.1. Only welders, welding operators and tackers approved by the CWB in the particular category shall be permitted to perform weldments.

.4 Welds shall be inspected as follows:

.1 100% visual inspection of all welds

.2 100% magnetic particle testing for fillet welds

.3 100% ultrasonic testing for partial and complete penetration welds.

Visual welding inspectors shall comply with the requirements of CAN/CSA W178.2 Level 3. Non-destructive testing personnel shall comply with CAN/CGSB-48.9712 Level 2 at a minimum.

3.8 Tolerances

.1 Tolerances for structural steel shall be within CSA Standard W59 limits, except as noted in this Section.

.2 The outside to outside plan dimension of the new stool built up W section is +0/- 3 mm.

.3 The combined warpage and tilt of the flanges of the new stool shall not be greater than +/- 1 mm. This shall be measured by determining the offset at the toe of the flange from a line normal to the plane of the web through the intersection of the centerline of the web with the outside surface of the flange plate.

.4 Lateral deviation between centerline of web and centerline of flange of the new stool shall not be greater than +/- 1 mm.

.5 The maximum deviation from specified length shall be +/- L/100.

END OF SECTION

PART 1 - GENERAL

1.1 Scope	.1	This Section covers the requirements for coating of existing and new structural steel.
1.2 Applicable Specifications	.1	Product storage, surface preparation, application, curing, quality control, inspection, removal and disposal of existing paint which may contain lead and all other aspects of the coating shall be in accordance with this Section, BC MoTI Highway Construction Specifications Section 216, and the product manufacture's written instructions and procedures. The most stringent requirement shall apply.
1.3 Payment Procedure	.1	Payment for all the work required to complete the coating of new and existing structural steel shall be made at the tendered lump sum rate for the line item "Coating of New and Existing Structural Steel. Payment under this item shall include, but is not limited to, all labour, material and equipment required to remove existing paint and dispose of existing paint which may contain lead. It shall also include the supply, mixing, application, curing and quality control of new paint to new and existing structural steel.
	.2	Coating of the bearings is deemed to be included in the cost of the bearings under the line item "Supply, Testing and Shipping of New Bearings".
1.4 Presence of Lead in Existing Steel	.1	The existing paint coating on the bridge is suspected to be lead based. The Contractor is responsible to ascertain the presence and extent of lead containing paint if any; and conform to all regulations for work undertaken. This includes but is not limited to WorkSafeBc and MoE regulation requirements for working with, storing, transporting, disposing of and documenting any work process involving lead paint.
1.5 Submittals	.1	The Contractor shall submit to the Departmental Representative the manufacturer's product data sheets and storage, mixing, surface preparation, application and curing written instructions for the coating products at least fifteen (15) days prior to the application of any coating.
	.2	The Contractor shall provide a copy of the Class B test certificate for the coating product which is applied to the faying surfaces to the Departmental Representative. The class of coating is as defined in the Canadian Highway Bridge Design Code.
	.3	The Contractor shall submit their Coating Quality Control Plan to the Departmental Representative at least fifteen (15) days prior to

undertaking any coating work. Quality control inspection shall be in accordance with BC MoTI Highway Construction Specification Section 216.09.02.

PART 2 - PRODUCTS

2.1 Coating Product for New and Existing Structural Steel

.1 The coating system is to be supplied by the Contractor.

.2 The coating system for this Project shall be a high ratio calcium sulfonate alkyd system.

.3 The coating system shall consist of the following products or approved equivalents:

.1 Primer: Sherwin Williams Zinc Clad III HS
.2 Midcoat: Sherwin Williams Macropoxy 646 fast cure epoxy
.3 Topcoat: Sherwin Williams Acrolon 218 HS Polyurethane

.4 The top coat color shall match the existing bridge as closely as possible.

.5 The coating shall not contain lead.

.6 Any proposed alternative coating systems shall be listed on the BC MoTI Recognized Products List, latest edition.

.7 Each coating shall have a different cured color for identification purposes.

PART 3 - EXECUTION

3.1 Coating Methodology For New and Existing Structural Steel

.1 Application of the coating shall be in accordance with BC MoTI Highway Construction Specification Section 216 and the suppliers written instructions, the most stringer requirement shall apply.

.2 Existing and new structural steel surfaces to receive coating shall have their surface prepared in accordance with the manufactures written instruction. Faying surfaces of bolted connections on new and existing steel shall have their surface prepared to meet the requirements of a Class B primer and the coating and curing conditions shall strictly follow all application parameters listed on the Class B certificate.

.3 New structural steel shall receive a 3-coat paint system. The primer

coat and the midcoat shall be applied in the shop after all fabrication has been completed. Paint application in the shop shall be by airless or conventional spray.

.4 Existing structural steel which has the original coating damaged or removed during the course of the work shall have a 2-coat paint system consisting of the primer coat and top coat applied to it. The primer coat shall be applied as soon as reasonably possible following removal of the existing paint. Any corrosion which forms prior to the application of the primer coat shall be removed in advance. New coating on existing structural steel shall be feathered in with the existing coating which remains.

.5 The top coat of paint shall be applied to the existing and new structural steel only after installation of the new components in their final position is complete. Paint application in the field may be by brush. Top coating shall cover all bolts and nuts. Grease or other lubricants applied to bolts shall be removed prior to painting over.

.6 A stripe coat shall be applied for the primer coat to new and existing structural steel. Faying surfaces on new and existing structural steel is as per Section 05 12 33 Structural Steel. Steel surfaces in contact with grout/concrete shall only have the primer coat applied

.7 No additive to accelerate the curing process shall be used.

.8 Temperature and humidity requirements stated in SS216.08.04 and SS 216.08.05 of the BC MoTI Highway Construction Specifications may be modified in accordance with manufacturer's recommendations for selected materials.

END OF SECTION

PART 1 - GENERAL

1.1 Scope .1 This Section applies to the new bearing supply and installation..

1.2 Applicable Design Code and Specifications .1 In order of precedence the supply, design, fabrication, installation and testing of bearings shall be in accordance with the requirements of the following

.1 This Section
.2 The Canadian Highway Bridge Design Code (CHBDC), S6-14
.3 AASHTO LRFD Bridge Construction Specification, 3rd edition, Section 18, for items that CHBDC is not applicable.

1.3 Payment Procedure .1 Payment for the supply, fabrication and testing of the bearings shall be made at the unit rate bid for the line item "Supply, Testing and Shipping of New Bearings" for each bearing and shall include but is not limited to:

.1 Shop drawings production
.2 Submission of verification of compliance with material criteria
.3 Fabrication and coating of bearings
.4 Testing of bearings
.5 Quality control
.6 Shipping of bearings.

Payment will be made for supply, testing and shipping once the bearings have been delivered to site, all required submittals have been provided and the bearings meet the requirements of this Section to the satisfaction of the Departmental Representative.

.2 Payment for all equipment, labour and materials for the installation of the new bearings is deemed to be included in the line item "Installation of New Bearing and New Steel Stool".

1.4 Submittals .1 Shop drawings showing the dimensions of the bearings shall be submitted at least fifteen (15) days prior to bearing fabrication to the Departmental Representative for review and approval. These drawings shall include, but not be limited to, the following information:

.1 Plan and elevation of each bearing size.
.2 Complete details and sections showing all materials incorporated into the bearing.
.3 Vertical and horizontal load capacities.

.4 Displacement capacity and rotation capacity.
.5 All bearing connection details.

.2 The Contractor shall submit the bearing testing plan prior to undertaking any bearing testing.

.3 Certificates of compliance with material criteria shall be submitted to the Departmental Representative for review prior to bearing fabrication. This shall include the coating system applied to the bearings.

.4 The Contractor shall submit to the Departmental Representative a report documenting the bearing testing and results, in accordance with AASHTO LRFD Bridge Construction Specification, 3rd edition 2010, prior to shipping the bearings to site.

.5 The Contractor shall submit a sealed and signed letter by a Professional Engineer licensed in the Province of British Columbia certifying the bearings have been designed, fabricated and tested in accordance with this Section, the Canada Highway Bridge Design Code and AASHTO LRFD Bridge Construction Specification, 3rd edition, 2010.

.6 The Contractor shall submit a bearing replacement plan to the Departmental Representative for review and approval at least fifteen (15) days prior to commencing the work. The bearing replacement plan shall be signed and sealed by a Professional Engineer registered in the Province of British Columbia. This plan shall provide a detailed step-by-step procedure for the removal of the existing bearings and replacement with the new bearings in coordination with the jacking of the superstructure.

PART 2 - PRODUCTS

2.1 Bearings

.1 Bearings shall be designed in accordance with CAN/CSA S6-14 Canadian Highway Bridge Design code (CHBDC). For items not covered by the CHBDC, design shall be as per AASHTO LRFD Bridge Construction Specifications, 3rd edition, 2010.

.2 The bearings shall be pot bearings supplied as fixed bearings, guided expansion bearings and non-guided expansion bearings as indicated on the Contract Drawings.

.3 The bearings shall consist of a hollow metal cylinder, a confined one-piece moulded unreinforced elastomer, sealing rings, and a piston. They shall permit transmission of vertical and horizontal

force components without significant restraint of rotation between the top and bottom loaded areas of the bearing. Guides shall be provided along the bearing as required to restrict movement in the specified direction and shall have a low-friction material at their sliding contact surface.

2.2 Materials

.1 Materials which are not specified in this Section shall be as per the Canadian Highway Bridge Design Code, S6-14 Cl 11.6.5.

.2 Shim plates shall be made from rolled carbon steel conforming to CAN/CSA G40.20M/G40.21M Grade 350W. Shim plates shall be hot dip galvanized. A barrier coating shall be applied to the shim stack such that the galvanized surface is not in direct contact with black steel or grout/concrete.

.3 Structural steel for the bearings shall conform to the requirements of CAN/CSA G40.21M/G40.21M Grade 300W at a minimum.

.4 Bolts attaching the bearing to the new stool base plate shall be A325 high strength bolts type 3.

.5 The exposed surfaces of the bearings shall be zinc metallized in accordance with SSPC-CS 23.00/AWS C2.23M/NACE No. 12. Metallizing includes the thermal spraying of zinc, aluminum or their alloys onto a properly prepared metal substrate. Minimum thickness of zinc coating shall be 0.25 mm. All edges of steel to be metallized shall be slightly rounded in order for metalizing to adhere.

The method of heating the spray metal is either by flame or by plasma arc. Spray metal may be in wire or powder form to fit the apparatus used to spray the metal. The application method shall ensure that a uniform, clean, well adhered, film of metal is applied to the steel surface. Surface preparation shall be SSPC SP5/NACE No. 1 white metal blast. Profile shall be sharp, 50 to 75 μm. Cut metal edges may be harder and consequently have less profile. If that is the case they may have to be ground back to softer metal and reblasted to achieve sufficient profile.

Metallizing shall be applied by qualified personnel with documented field experience metallizing steel structures such as bridges. Metallizing shall be applied in a uniform layer at a thickness of 150 to 200 μm thickness. For special applications, the thickness may be specified outside this range. When the metallizing is to be overcoated to form a duplex system, the newly metallized surface shall be protected from contamination until coated. If the metallized surface becomes contaminated, the steel substrate shall be recleaned to SSPC SP5/NACE No. 1 as above and remetallized.

Metallizing is porous, and application of a coating over the surface may require a mist coat or other special procedures to avoid bubbling and subsequent problems caused by the interaction of the porous coat with the coating being applied. This cost if any, shall be borne by the Contractor. Metallizing may be applied over a much wider range of ambient conditions than normal paint.

PART 3 - EXECUTION

3.1 Fabrication Tolerances

.1 Fabrication tolerances shall be in accordance with Clause 11.6 of CAN/CSA-S6-14 and AASHTO LRFD Bridge Construction Specification 3rd edition, 2010, section 18.1.4. The requirements of Clause 11.6 of CAN/CSA S6-14 shall govern in the event of a conflict with those of the AASHTO requirements.

.2 The tolerance of parallelism of the upper surface of the bearing with respect to the lower surface of the bearing as datum is to be 0.2% of the diameter of surfaces circular in plan and 0.2% of the longer side of surface rectangular in plan.

3.2 Shipping and Handling

.1 Each bearing shall be permanently marked on two of the four sides. The markings shall include the bearing type in accordance with the Contract Drawings, serial number and date of fabrication. The bearing number shall also be indicated as per the Contract Drawings. After assembly, including bearing sole plate and masonry plate, bearing components shall be held together with steel strapping or other means to prevent disassembly until the time of installation. The bearings shall be delivered in protective packaging for freight and handling purposes. They shall be stored under cover and above ground in their original packing until installation. Bearing assemblies shall be handled by their bottom surfaces only, unless specifically designed lifting brackets are used or as otherwise recommended by the bearing supplier.

3.3 Testing

.2 Bearings shall be tested in accordance with AASHTO LRFD Bridge Construction Specification, Section 18.1.5 and 18.3.4.

3.4 Installation

.1 New bearings shall be installed as shown on the Drawings and in accordance with the manufactures' written instructions. the sequence of bearing installation shall be as follows:

.1 Bearings are to be installed only after the bridge superstructure has been secured against any movement as proposed, discussed and agreed in the Contractor's bearing replacement plan.

.2 The Contractor shall survey the relationship between the centerline of the bearing seat and the centerline of the bearing attachments to the superstructure at bearing locations. The corresponding ambient temperatures of the steel truss shall be recorded at the same time.

.3 The Contractor shall survey the pier bearing elevation for both the existing and the modified structure where existing bearings are to be replaced to determine any deviation from their theoretical vertical position.

.4 The Contractor shall survey the elevation of the underside of the superstructure at all bearing locations

.5 The data collected from the items above shall be forwarded to the Departmental Representative, who will issue instructions as to the location of bearings on the piers, pre-shearing (pre-setting) of bearings and vertical shimming if required.

.2 New bearings shall be installed level and normal to the gravity loads, within a tolerance of 0.5/100 of the bearing assembly's height.

.3 Upon final installation of the bearings, the Departmental Representative shall inspect the bearing components to assure that they are level and parallel to within +/- 0.005 radians. Any deviation in excess of the allowed tolerance shall be corrected.

.4 Bearings shall be installed within +/- 3mm of their plan location.

END OF SECTION

PART 1 - GENERAL

1.0 Measurement for Payment

.1 All costs related to preserve the water course and to meet the requirements of this Section are deemed to be included in the Environmental Protection Plan and Implementation Tender item.

1.1 Requirements for Working Within or Near Watercourses

.1 Activities which involve Work within or near waterways should be first coordinated with the Departmental Representative and must always follow applicable legislation/regulations and the Contractor's Environmental Protection Plan (EPP) which is outlined in Section 013543 – Environmental Procedures.

.2 Keep all Approved activities within wetted perimeters to an absolute minimum.

.3 Do not operate construction equipment in waterways unless required by Contract and methodologies have been approved by Department.

.4 Do not dump excavated fill, waste material, or debris in waterways.

.5 Abide by all conditions of permits obtained from Provincial and Federal Government environmental agencies.

.6 Do not skid logs or construction materials across waterways.

.7 Provide a buffer area of at least 100 metres between the storage and handling of fuels, lubricants, or other deleterious substances and the waterway.

.8 Do not store construction materials, debris, waste, etc. within 50 metres of any waterbody.

.9 Nothing should drop into the river.

.10 Prevent release of deleterious substances by ensuring that all works involving the use of concrete, cement, mortars, and/or other Portland cement or lime-containing construction materials will not deposit directly or indirectly sediments, debris, concrete, leachate concrete fines, wash or contact water into or about any watercourse.

.11 Cast in place concrete must remain isolated from water inside sealed formed structures until cured (approximately 48-72 hours) as concrete leachate is highly toxic to fish and other aquatic life.

.12 Ensure a carbon dioxide (CO_2) tank with regulator, hose and gas

diffuser is readily available during concrete work to neutralize pH levels should a spill occur. Staff must be trained in its proper use.

1.2 Basis for Payment .1 No separate payment will be made for preservation of watercourses. Include watercourse protection in Lump Sum price for the line item Environmental Protection Plan and Implementation.

PART 2 – PRODUCTS

2.1 Preparation .1 Obtain work permits from governing federal and provincial conservation authorities as applicable.

PART 3 - EXECUTION

3.1 Existing Conditions .1 Maintain existing flow patterns in natural watercourse systems during completion of this Work.

.2 Only interrupt the natural watercourse system as direct by the Departmental Representative or the Contract Documents.

.3 Monitor pH frequently in the watercourse immediately downstream of the isolated worksite until the works are completed. Emergency measures should be implemented if downstream pH has changed more than 1.0 pH units from the background level, or is below 6.0 or above 9.0 pH units.

3.2 Site Clearing and Plant Protection .1 Conduct Work to provide minimal disturbance to vegetated areas. Protect all trees and plants onsite.

.2 Maintain temporary erosion and pollution control features installed under this Contract.

3.3 Drainage .1 Pumping water containing suspended materials into watercourse is prohibited.

.2 Establish rock chute spillways to accommodate safe surface water entry into watercourses as instructed by Departmental Representative as applicable.

3.4 Site Restoration .1 Replant vegetation natural to area, suitable for application without requirement for fertilizers, pesticides, and/or other chemicals in order to restore site to its former condition (before the Work under this Contract began) as instructed by Departmental Representative.

.2 Establish vegetated buffer zones with suitable native vegetation to a minimum of 3m from water level at time of planting, along edge of watercourse banks as determined by Departmental Representative.

END OF SECTION