

Specification / Drawings Index		Page
DIVISION 1 - GENERAL REQUIREMENTS		
01 11 10	Summary of Work	1
01 14 00	Work Restrictions, Construction Staging, and Restoration	7
01 25 20	Mobilization and Demobilization	11
01 29 00	Payment Procedures	13
01 31 00	Project Management and Coordination	16
01 32 16	Construction Progress Schedules – Bar (Gantt) Chart	20
01 33 00	Submittal Procedures	23
01 35 33	Health and Safety	28
01 35 43	Environmental Protection	40
01 45 00	Quality Management	60
01 52 00	Construction Facilities	66
01 74 11	Cleaning	68
01 77 00	Closeout Procedures	69
01 78 00	Closeout Submittals	70
DIVISION 2 – EXISTING CONDITIONS		
02 41 13	Selective Site Demolition	72
02 61 33	Hazardous Materials	73
DIVISION 3 – CONCRETE		
03 30 00	Cast-in-place Concrete	77
DIVISION 31 – EARTHWORKS		
31 23 33	Excavation, Trenching, Backfilling and Compaction	82
DIVISION 32 – EXTERIOR IMPROVEMENTS		
32 12 16	Asphalt Concrete Pavement	90
32 93 21	Hydraulic Seeding	92
DIVISION 33 – SPECIALTY		
33 42 13	Concrete Box Culvert	98

LIST OF CONTRACT DRAWINGS

Sheet No.	Title	Drawing Number	Revision Number
1	Cover Sheet	G01	0
2	Index of Drawings, General Notes and Site Location	G02	0
3	Site Plan	C01	0
4	Culvert Replacement Plan and Profile	C02	0
5	Road and Channel Profiles	C03	0
6	Sections and Details	C04	0

APPENDICES

Appendix	Description
A	Parks Canada Waterton Lakes National Park Mitigation Package for Project WLNP-15-FII, Belly River Group Campground Culvert Replacement – March 2016

PART 1 – GENERAL

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| 1.1 Section Includes | .1 | Specification Precedence. |
| | .2 | Work Covered by Contract Documents. |
| | .3 | National Park Regulations. |
| | .4 | Codes. |
| | .5 | Contractor's Use of Site. |
| | .6 | Use of Owner Maintenance Yard. |
| | .7 | Site Inspection. |
| | .8 | Work Completion. |
| | .9 | Special Precautions. |
| | .10 | Sequence of Work. |
| | .11 | Survey. |
| | .12 | Contract Drawings. |
| | .13 | Electronic Contract Drawings. |
| | .14 | Contract Submittals. |
| | .15 | Special Requirements. |
| | .16 | Work by Others. |
| 1.2 Specification Precedence | .1 | The Division 1 Sections of these Specifications take precedence over the other sections of the Specifications. |
| 1.3 Work Covered by Contract Documents | .1 | The project site is located in the Belly River Campground off Highway 6 in the southeast corner of Waterton Lakes National Park, AB. |
| | .2 | The work under this contract generally comprises of the following but is not limited to: |
| | .1 | Excavation within the stream channel and off-site disposal of unused material. |
| | .2 | Removal, transport, and off-site disposal of existing in-place culvert. |

- .3 Supply (including design/sealed shop drawings), transport and install 3 sided pre-cast Concrete Box Culvert with removable lids.
 - .4 Supply, transport and install riprap.
 - .5 Excavation and disposal (if necessary) of existing Roadway materials.
 - .6 Supply, transport, placement, grading and compaction of Fill material, Granular Base material, and Asphalt Concrete Pavement.
 - .7 Cast-in-place concrete between the asphalt concrete pavement and the precast concrete box.
 - .8 Restoration to pre-construction conditions and Hydraulic Seeding of all disturbed areas.
 - .9 Environmental protection including Environmental Protection Plan.
 - .10 Work complete by Change Order (if required).
 - .11 Quality Management
- 1.4 National Park Regulations
- .1 The Contractor shall ensure that all work is performed in accordance with the ordinances, laws, rules and regulations set out in the Canada National Parks Act and Regulations.
 - .2 For the work in Waterton Lakes National Park, the Contractor and any sub-Contractors shall obtain a business license from the Parks Canada Administration Office in Waterton Lakes National Park prior to commencement of the contract.
 - .3 All Contractor's vehicles are required to display a vehicle work pass from Parks Canada. These permits may be obtained free of charge from the Departmental Representative, or PCA Environmental Officer (ESO).
- 1.5 Codes
- .1 Meet or exceed requirements of:
 - .1 Contract Documents;
 - .2 Specified standards, applicable legislation, codes, and referenced documents;
 - .3 Other codes of Local, Provincial, or Federal application (in the case of conflict or discrepancy, the

more stringent requirements shall apply).

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| 1.6 Contractor's Use of Site | .1 | Restrict work to within the limits/areas of work shown on the Contract Drawings. |
| | .2 | Any additional areas required by the Contractor outside the limits shall be the Contractor's responsibility to organize. Any costs associated with the use of these additional lands shall be the Contractor's responsibility. |
| | .3 | Assume full responsibility for protection and safekeeping of products under this contract. |
| 1.7 Use of Owner Maintenance Yard | .1 | The Contractor may choose to use PCA's maintenance yard as a disposal site for excavated materials. The maintenance yard is located approximately 28 km northwest from the Work Site; off Highway 5 near the PCA Park Warden Office and Operations Building. |
| | .2 | When using PCA's maintenance yard, the Contractor shall be aware of the following: |
| | .1 | PCA and other Contractors may be working in the maintenance yard completing similar or different types of work. Coordination with PCA and these other Contractors may be required. |
| | .2 | Laydown areas for material disposal may be restricted due to other works ongoing or the existing size of the gravel pits and maintenance yards. |
| | .3 | The security of equipment parked (if necessary) in the maintenance yard along with the safety of the contractors personnel remains the Contractors responsibility. |

PART 2 – EXECUTION

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| 2.1 Site Inspection | .1 | Submission of tender is deemed to be confirmation that the Contractor has inspected the site and is conversant with all conditions affecting execution and completion of the work. |
| 2.2 Work Completion | .1 | Preparation of required submittals to commence immediately upon receipt of notice to proceed. |
| | .2 | Commence onsite work on or after September 12, 2016. |
| | .3 | Achieve Substantial Performance by September 30, 2016. |

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- .4 Achieve Completion by October 07, 2016.
 - .5 Works may need to be temporally shut down during high flow, heavy rain events, or adverse weather conditions. The works may be stopped by the following processes:
 - .1 The Contractor with approval from the Departmental Representative shall suspend works should the stream water level or adverse weather conditions adversely affect the Contractors ability to achieve the contract specifications for quality of work.
 - .2 The Contractor's Environmental Monitor with approval from the Departmental Representative may suspend work should they feel it is not be possible to achieve the environmental requirements due to the high flows or adverse weather conditions.
 - .3 The Departmental Representative may suspend instream works should it be felt that it is not possible to achieve the environmental requirements or the contract specifications for quality of work due to the high flows or adverse weather conditions.
 - .6 Regardless of who suspends the work, the Contractor will be responsible for maintaining the site and protecting the works throughout the suspension period.
 - .7 The Contractor shall account for the possibility of not being able to complete work due to high flows or adverse weather conditions in the construction schedule and in the unit prices. No payment for temporary work stoppages due to high flows or adverse weather conditions will be made.
- 2.3 Special Precautions
- .1 The Contractor is responsible for notifying appropriate utility companies and complete locates as needed prior to starting the work. All costs for utility locates shall be incidental to the work. The Contractor shall notify the Departmental Representative should utilities be located in areas other than those shown on the drawings, and await instructions from the Departmental Representative before proceeding with work in the vicinity of such encountered services and utilities.
 - .2 Existing structures, utilities, and all others structures, services, piping or equipment within the limits of work shall be properly protected from any injury or damage, direct or indirect. Any damage that is caused as a result of the operations of the Contractor shall be repaired and made good at the Contractor's expense to the satisfaction of the Departmental Representative.

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| 2.4 Sequence of Work | .1 | The Contractor shall schedule the work progress to allow Owner/Departmental Representative unrestricted access to inspect all phases of the Work. |
| | .2 | The Contractor shall prepare a bar chart or network diagram showing the proposed schedules of major work, which shall be submitted to the Departmental Representative one (1) week prior to commencement of any work. |
| 2.5 Survey | .1 | Complete survey layout for all aspects of construction and payment (see Section 01 29 00 – Payment Procedures) using project survey control as shown on Contract Drawings. Survey methods and equipment shall be per industry standards approved by the Departmental Representative. |
| | .2 | Report any discrepancies between project survey control and Contract Drawings to the Departmental Representative as soon as they are discovered. Should a discrepancy be found, await written approval from the Departmental Representative prior to proceeding. |
| | .3 | The Contractor shall establish survey control points for use on the project from the control points provided on the Contract Drawings. Contractor Survey Control Points shall be established prior to removal of existing culvert. |
| 2.6 Contract Drawings | .1 | Upon award of the project, PCA will provide the successful Contractor with a digital file version of the “Issued for Construction” or “Issued for Tender” contract drawings. Preparation of the PDF drawing file may take up to 14 days to prepare. |
| 2.7 Electronic Contract Drawings | .1 | If requested by the Contractor, the Departmental Representative will provide the Contractor with available contract drawings in electronic format for the Contractor to reference throughout the work. |
| | .2 | The format and software of the electronic contract drawings shall be at the Departmental Representatives discretion. |
| | .3 | The Departmental Representative accepts no responsibility for the accuracy or completeness of the electronic contract drawings. Should the Contractor choose to reference the electronic contract drawings, the Contractor shall satisfy itself as to the accuracy and completeness of the electronic contract drawings before commencing construction. |

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- 2.8 Contract Submittals .1 Complete and submit for Departmental Representative review, all required contract submittals as detailed in the relevant sections of the contract specifications. Work affected by the submittals shall not proceed until the submittal is accepted by the Departmental Representative. Allow for submittal review periods as required for each submittal and as detailed in Section 01 33 00 – Submittal Procedures. Required submittals include but are not limited to the following:
- .1 Project Schedule (see Section 01 32 16).
 - .2 Health and Safety Plan (see Section 01 35 33).
 - .3 Environmental Protection Plan (see Section 01 35 43).
 - .4 Culvert Installation Plan (see Section 01 35 43).
 - .5 Pre-Construction Survey (see Section 01 29 00).
 - .6 As-built Survey, As-built Drawing mark-ups, and Shop Drawing mark-ups (see Section 01 78 00).
 - .7 Shop Drawings (including professional seal for design work required), Product Data / Samples, and Mix designs (see Section 01 33 00 Submittal Procedures).
- 2.9 Special Requirements .1 The following special requirements for this project are emphasized for the Contractors attention:
- .1 Ground water and/or stream flows may be present during the work. The Contractor shall account for the need to dewater and/or divert the water as necessary to complete the work.
 - .2 The project site is located within a National Park and the Contractor shall be aware that the environmental standards when working in a National Park are high (see Section 01 35 43 – Environmental Protection for further details).
 - .3 The Contractor will be responsible to comply with and complete the construction related requirements as detailed in the Belly River Group Campground Culvert Replacement Mitigation Package (Appendix A).
- 2.10 Work by Others .1 The Contractor is advised that concurrent with this project there may be other Contractors working in nearby adjacent projects. Should other Contractors be working in nearby adjacent projects, the Contractors shall coordinate his operations with the other Contractors.

END OF SECTION

PART 1 – GENERAL

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| 1.1 Section Includes | <ul style="list-style-type: none">.1 Use of Work Site..2 Work Conducted in and Adjacent to Waterways..3 Protection of Persons and Property..4 Use of Public Property..5 Construction Signage..6 Access Development..7 Construction Staging..8 Restoration. |
| 1.2 Use of Work Site | <ul style="list-style-type: none">.1 The Work Site will be specified by the Departmental Representative and shall only be used for the purposes of the Work. The Work Site will be made available to the Contractor for its exclusive use for the duration of the Work, unless otherwise provided in the Contract Documents..2 The Contractor's office trailer and accommodation may be set up in the locations identified in Section 01 52 00 – Construction Facilities..3 While the Work Site is under the Contractor's control, the Contractor shall be entirely responsible for the security of the Work Site and of the Work..4 The Contractor shall keep the Work Site clean and free from accumulation of waste materials and rubbish regardless of the source. Snow/ice shall be removed by the Contractor as necessary for the performance and inspection of the Work..5 The Contractor shall provide sanitary facilities for work force in accordance with governing regulations and the Environmental Procedures for this project. The Contractor shall post notices and take such precautions as required by local health authorities and keep area and premises in sanitary condition..6 Any damage to the Work Site caused by the Contractor shall be repaired by the Contractor at its expense..7 The Contractor may work 12 hours per day, seven days per week with the following restrictions: |

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| | .1 | No hauling of material during inclement weather. |
| 1.3 Work Conducted in and Adjacent to Waterways | .1 | All components of the work shall be conducted in accordance with Section 01 35 43 – Environmental Protection. |
| 1.4 Protection of Persons and Property | .1 | The Contractor shall comply with all applicable safety regulations of the Workers Compensation Board of Alberta (WCB) including, but not limited to, WCB's Industrial Health and Safety Regulations, Industrial First Aid Regulations, and Workplace Hazardous Materials Information System Regulations (see Section 01 35 33 – Health and Safety for additional requirements). |
| | .2 | The Contractor shall take all necessary precautions and measures to prevent injury or damage to persons and property on or near the Work Site. |
| | .3 | The Contractor shall promptly take such measures as are required to repair, replace or compensate for any loss or damage caused by the Contractor to any property. |
| 1.5 Use of Public Property | .1 | Construction equipment will not be allowed outside the project area shown on the Contract Drawings unless pre-approved by Departmental Representative. |
| | .2 | The Contractor shall ensure that its vehicles and equipment do not cause nuisance in public areas. All vehicles and equipment leaving the Work Site and entering public roadways shall be cleaned of mud 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 may not exceed legal load limits. The Contractor is responsible for ensuring all equipment accessing the Work Site meets all requirements for vehicles traveling on Public Highways in the Province. |
| 1.6 Construction Signage | .1 | No signs or advertisements, other than regulatory or warning signs are permitted on site. |
| | .2 | 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.
- .3 Signage shall be coordinated with other Contractors working in the area as needed.
- 1.7 Access Development .1 The Contractor is required to develop access to the required work areas. The Contractor is fully responsible for the selection and implementation of all methods to accomplish this requirement. Any access roads or trails extending outside the limits of the work must be pre-approved by Departmental Representative and be in conformance with the requirements of Section 01 35 43 – Environmental Protection and the Contractor's Environmental Protection Plan.
- 1.8 Construction Staging .1 The Contractor shall stage the work ensuring that:
- .1 All design requirements as specified in the contract drawings, contractor prepared shop drawings, and contract specifications are achieved.
- .2 All requirements of the Section 01 35 43 – Environmental Protection and the Contractor's Environmental Protection Plan are achieved.
- The Contractor is fully responsible for the selection and implementation of all methods to accomplish this requirement.
- 1.9 Restoration .1 Remove access points, roads, detours, pads, and all other works installed during access development (including those shown in the Contract Drawings). Re-instate the worksite to a condition equal to or better than the site condition prior to construction by:
- .1 Restoring organic soils (if removed during access development).
- .2 Eliminating uneven areas and low spots.
- .3 Restoring existing and proposed drainage patterns as shown on the Contract Drawings.
- .4 Removal of all gravels, other materials, or structures placed to create access points, roads, detours, or pads. Dispose of gravels, other materials, or structures at an off-site disposal facility acceptable to the Departmental Representative.

- .5 Replacement of all temporary excavated materials. Return ground back to original contour elevations or as pre-approved by the Departmental Representative.
- .6 Hydraulic Seed all disturbed areas and areas designated for Hydraulic Seeding, per Section 32 93 21 – Hydraulic Seeding.
- .2 Complete restoration requirements as detailed in the Belly River Group Campground Culvert Replacement Mitigation Package (Appendix A).

END OF SECTION

PART 1 – GENERAL

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| 1.1 Section Includes | .1 | Definitions. |
| | .2 | Measurement and Payment Procedures. |
| 1.2 Definitions | .1 | Mobilization and Demobilization: Consists of preparatory work and operations, including but not limited to: |
| | .1 | Preparation and acceptance of submittals (Project Schedule, Health and Safety Plan, Environmental Protection Plan, and any other submittals required prior to starting work). |
| | .2 | Work and costs incurred necessary for the movement of personnel, equipment, supplies and incidentals to/from the work site. |
| | .3 | Work and cost incurred in the establishment and operation of offices and other facilities necessary to undertake the work. |
| | .4 | Work and costs incurred in the completion of clean-up and project completion. |
| | .5 | All other work and costs incurred in the successful completion of mobilization and demobilization. |
| 1.3 Measurement and Payment Procedures | .1 | Payment for Mobilization and Demobilization will be made on the basis of the Lump Sum Price per Unit Bid for “Mobilization and Demobilization” in the Bid and Acceptance Form. The Lump sum Price per Unit Bid shall include all costs included with the successful completion of the work, including the items of work listed in 1.2 Definitions above. |
| | .2 | The Lump Sum arrangement for Mobilization and Demobilization shall be a maximum of 10% of the Total Tender Price. If the Lump Sum arrangement is greater than 10% of the Total Tender Price, payment for the Mobilization amount greater than 10% will only be authorized when the contract has achieved completion. |
| | .3 | Payment for this item will be made at the Lump Sum price and will be scheduled as follows: |
| | .1 | 50% at the beginning of construction after the Contractor required submittals (including Project Schedule, Health and Safety Plan, Environmental Protection Plan, and any other submittals required prior |

to starting work) have been submitted for approval, accepted, and work onsite has commenced to the satisfaction of the Departmental Representative.

- .2 50% once the project has achieved “Completion” and the site has been cleaned to the satisfaction of the Departmental Representative.

END OF SECTION

PART 1 – GENERAL

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| 1.1 Section Includes | .1 | Basis of Payment. |
| | .2 | Survey. |
| 1.2 Basis of Payment | .1 | Where not specified, basis of payment for all work included in these specifications or contract drawings specifications 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 and accepted by the Departmental Representative. Provide to the Departmental Representative for each progress claim, measurement data 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 1.3 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 | Materials shall be excavated or placed within the specified tolerances of the design lines and grades shown on the contract drawings but not uniformly high or low. Materials excavated or placed outside the specified tolerances will not be measured for payment unless pre-approved by the Departmental |

Representative.

- .9 Measurement for Payment will be at the Departmental Representative's discretion using one or more of the following methods:

- .1 Based upon the survey data collected by the Contractor – when the materials have been excavated or placed within the specified tolerances of the design lines and grades shown on the contract drawings but not uniformly high or low.
- .2 Based upon the survey data collected by the Contractor – when the Contractor's or Departmental Representatives survey data indicates that less materials were excavated or placed than called for by the design lines and grades on the contract drawings.
- .3 By the design grade / design drawing neat lines – when the Contractor's or Departmental Representatives survey data indicates that materials were excavated or placed outside / beyond the specified tolerances of the design lines and grades on the contract drawings.

1.3 Survey

- .1 Surveys shall be undertaken by the Contractor to verify quantities for payment purposes. Survey shall be considered incidental to the work and not measured for payment.
- .2 Survey data collected shall be of sufficient density to fully characterize the work. Survey methods and location of surveyed cross sections is subject to prior approval of the Departmental Representative. At a minimum the Contractor shall survey all features at 10 m station intervals and the location of all treatment boundaries including changes in material type / placement, changes in surface treatment, and changes in the terrain.
- .3 A survey of the existing ground and road surfaces, river banks, river bed, stream channels, and other topographic features shall be undertaken by the Contractor prior to initiation of construction. The survey shall be provided to the Departmental Representative for review and acceptance prior to starting the Work. Additionally, during construction no material shall be placed unless the applicable surveys on the completed surfaces have been carried out and the data accepted by the Departmental Representative, and the completed surface has been inspected and accepted by the Departmental Representative.
- .4 Survey data shall be collected at an accuracy of ± 0.020 m

horizontal and ± 0.020 m vertical or better and shall be referenced to the local survey control as shown on the Contract Drawings.

- .5 Survey data shall be provided to the Departmental Representative in digital xyz format with an appropriate descriptor code as to the type of material surface or feature being surveyed.
- .6 The Contractor shall provide detailed volume calculations using average end area determination or electronic surface to surface comparisons. Details of volume calculations shall be provided to the Departmental Representative for review.
- .7 Surveys may be subject to verification by the Departmental Representative. In case of discrepancy, the Departmental Representative's survey will govern.

END OF SECTION

PART 1 – GENERAL

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| 1.1 Section Includes | <ul style="list-style-type: none">.1 Pre-construction Meeting..2 On-Site Documents..3 Schedules..4 Submittals..5 Close-Out Procedures. |
| 1.2 Pre-construction Meeting | <ul style="list-style-type: none">.1 Following award of the contract and prior to the Contractor mobilizing to the site, attend in person or via teleconference a pre-construction meeting organized by the Departmental Representative..2 Departmental Representatives and senior representatives of the Contractor and major subcontractors shall attend in person or via teleconference..3 The Departmental Representative shall establish a time, location, and teleconference number for the meeting and notify the Contractor a minimum of three days prior to the meeting. The Contractor shall notify all concerned parties of the meeting..4 The agenda is to include but is not limited to the following:<ul style="list-style-type: none">.1 Appointment of the official representative of participants in the work and lines of communication..2 Project schedule..3 Contractor submissions (requirements and submissions schedule)..4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, and fences..5 Permitting and Environmental requirements..6 Site security in accordance with Section 01 52 00 – Construction Facilities..7 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, and administrative requirements. |

- .8 Record drawings in accordance with Section 01 78 00 – Closeout Submittals.
 - .9 Take-over procedures, acceptance, and warranties in accordance with Section 01 77 00 – Closeout Procedures.
 - .10 Progress claims, administrative procedures, photographs, and holdbacks.
 - .11 Contractor's Quality Management and Quality Assurance undertaken by the Departmental Representative.
 - .12 Insurances and transcript of policies.
 - .13 Contractor's site specific Health and Safety Plan.
 - .14 Other business as required by the Departmental Representative or Contractor.
 - .5 Within 14 working days of the pre-construction meeting, the Departmental Representative shall distribute meeting minutes to the Contractor. The Contractor shall review the meeting minutes and provide any comments within 5 working days.
- 1.3 On-Site Documents
- .1 Maintain at job site, one copy each of the following:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Reviewed and accepted submittals.
 - .5 Change orders.
 - .6 Other modifications to Contract.
 - .7 Field test reports.
 - .8 Copy of approved work schedule.
 - .9 Manufacturer's installation and application instructions (if applicable).
 - .10 All permits.

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- .11 Meeting minutes.
 - .12 Contractor's site specific Health and Safety Plan.
 - .13 Contractor's Environmental Protection Plan (EPP).
 - .14 Current construction standards of workmanship listed in the contract specifications.
 - .15 One set of Issued for Construction contract drawings, contract specifications, and shop drawings for as-built purposes.
- 1.4 Schedules
- .1 Submit preliminary construction progress schedule in accordance with Section 01 32 16 – Construction Progress Schedules – Bar (Gantt) Chart to the Departmental Representative.
 - .2 After review by Departmental Representative, revise project schedule to comply with comments given.
 - .3 During progress of work, revise and resubmit as directed by Departmental Representative.
- 1.5 Submittals
- .1 Provide submittals, shop drawings, product data and samples in accordance with Section 01 33 00 – Submittal Procedures for review for compliance with Contract Documents, field dimensions and clearances, compatibility and available space, and for relation to work of other contracts. If requested, after receipt of Departmental Representative comments, revise and resubmit.
 - .2 Submit requests for payment through the Departmental Representative via email. Support claims for payment with survey data and other evidence as required by the Departmental Representative.
 - .3 Submit requests for interpretation of Contract Documents, and obtain instructions through Departmental Representative. If required by the Departmental Representative, provide supporting documents for proposed substitutions via email.
 - .4 Process substitutions through Departmental Representative. If required by the Departmental Representative, provide supporting documents for proposed substitutions via email.
 - .5 Process change orders through Departmental Representative via email.

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| | .6 | Deliver closeout submittals for review and preliminary inspections, for transmittal to Departmental Representative via email. |
| 1.6 Close-Out Procedures | .1 | Notify Departmental Representative when work is considered ready for Substantial Performance. |
| | .2 | Accompany Departmental Representative on preliminary inspection to determine items listed for completion or correction. |
| | .3 | Comply with Departmental Representative's instructions for correction of items of work listed in executed certificate of Substantial Performance. |
| | .4 | Notify Departmental Representative of instructions for completion of items of work determined in Departmental Representative's final inspection. |

END OF SECTION

PART 1 – GENERAL

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| 1.1 Section Includes | .1 | Progress schedule. |
| | .2 | Schedule format. |
| | .3 | Submission of schedules. |
| | .4 | Critical path scheduling. |
| 1.2 Project Schedule | .1 | Develop detailed Project Schedule conforming to the project completion dates found in Section 01 11 10 – Summary of Work. |
| | .2 | Ensure detailed Project Schedule includes as a minimum all relevant milestone activity types as follows: |
| | .1 | Project Award. |
| | .2 | Receipt of Necessary Permits. |
| | .3 | Submittal Schedule: |
| | .1 | Environmental Protection Plan. |
| | .2 | Site Specific Health and Safety Plan, including MSDS sheets. |
| | .3 | Material Purchase Plan. |
| | .4 | Survey Plan. |
| | .5 | If applicable, Shop Drawings, product data, samples, and mix designs. |
| | .6 | As-Built Survey, As-Built Drawing mark-ups, and Shop drawing mark-ups. |
| | .4 | Mobilization. |
| | .5 | Work activities by segment / locations. |
| | .6 | Interim inspections. |
| | .7 | Site Clean-up / De-mobilization. |
| | .8 | Project Substantial Completion and Project Completion dates. |

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| | .3 | Indicate dates for submitting, review time, resubmission time, and last date for meeting fabrication schedule. |
| | .4 | Include dates when reviewed submittals will be required from the Departmental Representative. |
| 1.3 Schedule Format | .1 | Prepare schedule in form of a horizontal Gant bar chart. |
| | .2 | Provide a separate bar for each major item of work or operation. |
| | .3 | Split horizontally for projected and actual performance. |
| | .4 | Provide horizontal time scale identifying first work day of each week. |
| | .5 | Format for listings: the chronological order of start of each item of work. |
| | .6 | Identification of listings by systems description. |
| 1.4 Submission of Schedules | .1 | Submit initial format of schedules within 12 days after award of Contract. |
| | .2 | Submit schedules in electronic format via email to the Departmental Representative at time of submission following contract award). Provide schedules in PDF format and native file format if requested by the Departmental Representative. |
| | .3 | If requested submit two hard copies to be retained by the Departmental Representative. |
| | .4 | The Departmental Representative will review the schedule and return any comments within ten days after receipt. |
| | .5 | Resubmit finalized schedule within seven days after return of review copy. |
| | .6 | Submit revised progress schedule with each application for payment. |
| | .7 | Distribute copies of revised schedule to: |
| | .1 | Job site office. |
| | .2 | Subcontractors. |
| | .3 | Other concerned parties. |
| | .8 | Instruct recipients to report to Contractor within ten days any |

problems anticipated by timetable shown in the schedule.

1.5 Critical Path Scheduling

- .1 Update project schedule every two weeks reflecting activity changes and completions, as well as activities in progress. Provide updated project schedule to Departmental Representative.
- .2 Indicate progress of each activity to date of submission schedule.
- .3 Show changes occurring since previous submission of schedule:
 - .1 Major changes in scope.
 - .2 Activities modified since previous submission.
 - .3 Revised projections of progress and completion.
 - .4 Other identifiable changes.
- .4 Provide a narrative report to define:
 - .1 Problem areas, anticipated delays, and impact on schedule.
 - .2 Corrective action recommended and its effect.
 - .3 Effect of changes on schedules of other Prime Contractor's.

END OF SECTION

PART 1 – GENERAL

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| 1.1 Section Includes | .1 | General requirements. |
| | .2 | Shop drawings and product data. |
| | .3 | Samples. |
| 1.2 General Requirements | .1 | Submit to the Departmental Representative submittals listed for review. Submit with reasonable promptness (per the timelines indicated (if applicable)) and in an orderly sequence so as to not cause delay in work. Failure to submit in ample time is not considered sufficient reason for an extension of contract Substantial Completion Date, and no claim for extension by reason of such default will be allowed. |
| | .2 | Unless specified otherwise or requested by the Departmental Representative, submittals shall be submitted to the Departmental Representative in electronic format via email at time of submission following contract award). |
| | .3 | The Departmental Representative will endeavor to complete reviews within the review time specified for each particular submittal, however a longer review period may be required. If a longer review period is required, the Contractor will be notified prior to the passing of the specified review period. Upon completion of the submittal reviews by the Departmental Representative, comments and or acceptance of the submittals will be given. Upon review by the Departmental Representative, should comments be provided, the Contractor shall revise the submittal as required and re-submit the submittal back to the Departmental Representative for review within one week (or within a time pre-approved by the Departmental Representative). The submittals will not be accepted until all comments from all reviews have been addressed to the satisfaction of the Departmental Representative. Despite acceptance of a particular submittal, the Departmental Representative reserves the right to provide additional comments to ensure the correction of any deficiencies with particular submittals at any time during the project. |
| | .4 | Work affected by a submittal shall not proceed until the submittal is completed, reviewed, and accepted by the Departmental Representative. |
| | .5 | Present all necessary drawings, shop drawings, product data, samples, and mock-ups in SI Metric units. |

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| .6 | Where items or information is not produced in SI Metric units, converted values are acceptable. |
| .7 | Review submittals prior to submission to the Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with the requirements of work and Contract Documents. Submittals not stamped, signed, dated, and identified as to a specific project will be returned without being examined and shall be considered rejected. |
| .8 | Notify the Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents and stating reasons for deviations. |
| .9 | Prior to any submission, verify field measurements and affected adjacent work included on the submission are coordinated. |
| .10 | Contractor's responsibility for errors and omissions in submission is not relieved by the Departmental Representative's review of submittals. |
| .11 | Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review. |
| .12 | Keep one reviewed copy of each submission on-site. |
| 1.3 Shop Drawings and Product Data | |
| .1 | The term "Shop Drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures, and other data that are to be provided by the Contractor to illustrate details of a portion of work. |
| .2 | Indicate materials, methods of construction, and attachment or anchorage, erection diagrams, connections, explanatory notes, and other information necessary for completion of work or as indicated elsewhere in the specifications. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of the section under which adjacent items will be supplied and installed. Indicate cross-references to design drawings and specifications. |
| .3 | Adjustments made on Shop Drawings by the Departmental Representative are not intended to change the Contract Price. If adjustments affect the value of work, state such in writing to the Departmental Representative prior to proceeding with |

work.

- .4 Make changes in Shop Drawings as the Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify the Departmental Representative in writing of any revisions other than those requested.
- .5 Accompany submissions with a transmittal letter, in duplicate, containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each Shop Drawing, product data, and sample.
 - .5 Other pertinent data.
- .6 Submissions shall include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by the Contractor's authorized representative certifying approval of submissions, verification of field measurements, and compliance with Contract Documents and requirements.
 - .5 Details of appropriate portions of work as applicable:
 - .1 Fabrication.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.

- .3 Setting or erection details.
- .4 Capacities.
- .5 Performance characteristics.
- .6 Standards.
- .7 Operating weight.
- .8 Single line and schematic diagrams.
- .9 Relationship to adjacent work.
- .6 Professional seal and signature of the engineer certifying approval of the work (if required).
- .7 After the Departmental Representative's review and acceptance, distribute copies.
- .8 Submit an electronic copy of the Shop Drawing for each requested within the specification sections. Submit hard copies as requested by the Departmental Representative.
- .9 Submit electronic copies of product data sheets or brochures for requirements requested in Specification Sections and as requested by the Departmental Representative where Shop Drawings will not be prepared due to standardized manufacture of product.
- .10 Delete information not applicable to project.
- .11 Supplement standard information to provide details applicable to the project.
- .12 If upon review by the Departmental Representative no errors or omissions are discovered or if only minor corrections are made, copies will be returned, and fabrication and installation of work may proceed. If Shop Drawings are rejected, noted copy will be returned and resubmission of corrected Shop Drawings, through same procedure indicated above, must be performed before fabrication and installation of work may proceed.
- .13 The review of Shop Drawings by the Departmental Representative is for the sole purpose of ascertaining conformance with general concept. This review shall not mean that the Departmental Representative approves the detail design inherent in Shop Drawings, responsibility for which shall remain with the Contractor submitting same, and such

review shall not relieve the Contractor of responsibility for errors or omissions in Shop Drawings or of responsibility for meeting all requirements of construction and Contract Documents. Without restricting generality of the foregoing, the Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation, and for coordination of work of all sub-trades.

- .14 Work affected by shop drawing shall not proceed until the shop drawing is reviewed, and accepted by the Departmental Representative.

1.4 Samples

- .1 Submit for review samples in duplicate as requested in respective specification Sections. Label samples with origin and intended use.
- .2 Deliver samples prepaid to Departmental Representative's site office or to a location as directed by the Departmental Representative.
- .3 Notify Departmental Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .4 Where colour, pattern or texture is criterion, submit full range of samples.
- .5 Adjustments made on samples by Departmental Representative are not intended to change Contract Price. If adjustments affect value of work, state such in writing to Departmental Representative prior to proceeding with work.
- .6 Make changes in samples which Departmental Representative may require, consistent with Contract Documents.
- .7 Reviewed and accepted samples will become standard of workmanship and material against which installed work will be verified.
- .8 Work affected by the sample shall not proceed until the sample is reviewed, and accepted by the Departmental Representative.

END OF SECTION

PART 1 – GENERAL

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| 1.1 Section Includes | .1 | References. |
| | .2 | Workers' compensation coverage. |
| | .3 | Compliance with regulations. |
| | .4 | Submittals. |
| | .5 | Health and safety plan. |
| | .6 | Contractor's Responsibility. |
| | .7 | Health and Safety Coordinator. |
| | .8 | General |
| | .9 | Project / Site Conditions. |
| | .10 | Regulatory Requirements. |
| | .11 | Work Permits. |
| | .12 | Filing of Notice. |
| | .13 | Emergency Procedures. |
| | .14 | Hazardous Products. |
| | .15 | Overloading. |
| | .16 | Fire Safety Requirements. |
| | .17 | Unforeseen Hazards. |
| | .18 | Posted Documents. |
| | .19 | Correction of Non-compliance. |
| | .20 | Medical |
| | .21 | Accidents and Accident Reports |

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| 1.2 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) as amended: |
| | .1 | CSA S269.1-1975 (R2003) Falsework for Construction Purposes |
| | .2 | CSA S350-M1980 (R2003) Code of Practice for Safety in Demolition of Structures |
| | .4 | Fire Protection Engineering Services, HRSDC: |
| | .1 | FCC No. 301, Standard for Construction Operations. |
| | .5 | Province of Alberta: |
| | .1 | Workers Compensation Act Part 3-Occupational Health and Safety. |
| | .2 | Occupational Health and Safety Regulation. |
| | .3 | WCB's Industrial Health and Safety Regulations, Industrial First Aid Regulations, and Workplace Hazardous Materials Information System Regulations |
| 1.3 Workers' Compensation Coverage | .1 | Comply fully with the Workers' Compensation Act, regulations and orders made pursuant thereto, and any amendments up to the completion of the work. |
| | .2 | Maintain Workers' Compensation Board coverage during the term of the Contract, until and including the date that the Certificate of Final Completion is issued. |
| 1.4 Compliance with Regulations | .1 | PCA may terminate the Contract without liability to PCA where the Contractor, in the opinion of PCA, 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.
- 1.5 Submittals
- .1 The Contractor's Health and Safety Plan shall be submitted to the Departmental Representative for review and acceptance in accordance with the procedures outlined in Section 01 33 00 – Submittal Procedures. The Departmental Representative will review the plan (first submission and if required all subsequent re-submissions) within 14 days of submission. Upon review of the plan the Departmental Representative will either:
 - .1 Accept the plan.
 - .2 Accept portions of the plan and provide comments outlining required changes or additional information in other sections. Following completion of edits by the Contractor, re-submit the plan for review, re-submit the plan for review.
 - .3 Reject the plan and provide comments outlining required changes or additional information needed. Following completion of edits by the Contractor, re-submit the plan for review.
 - .2 Submit the following to the Departmental Representative in accordance with the procedures outlined in Section 01 33 00 – Submittal Procedures:
 - .1 Copies of reports or directions issued by Federal and Provincial health and safety inspectors.
 - .2 Copies of incident and accident reports.
 - .3 Complete set of Material Safety Data Sheets (MSDS), and all other documentation required by Workplace Hazardous Materials Information System (WHMIS) requirements.
 - .4 Emergency Procedures.
 - .5 Medical surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of work, and submit additional certifications for any new site

personnel to Departmental Representative.

- .3 The Contractor shall allow time in the schedule for the reviews, and subsequent edits / re-submission.
- .4 Work affected by the submittal (as determined by the Departmental Representative) shall not proceed until acceptance of the submittal by the Departmental Representative.
- .5 Submission of the Health and Safety Plan, and any revised version, to the Departmental Representative are for information and reference purposes only. It shall not:
 - .1 Be construed to imply approval by the Departmental Representative.
 - .2 Be interpreted as a warranty of being complete, accurate and legislatively compliant.
 - .3 Relieve the Contractor of his legal obligations for the provision of health and safety on the project.
- .6 Should deficiencies in the Contractor's Health and Safety Plan be noted following acceptance of the submittal by the Departmental Representative but during the project work, the Departmental Representative reserves the right to provide additional comments to the Contractor and require re-submission of the Health and Safety Plan to ensure the correction of any deficiencies.

1.6 Health and Safety Plan

- .1 The Contractor shall prepare and comply with the site specific Health and Safety Plan. The preparation and details of the site specific Health and Safety Plan shall include conducting a site-specific hazard assessment based on review of Contract Documents, required work, and project site. The site specific Health and Safety Plan shall address all concerns / requirements identified in the Contract Documents and identify any known and potential health risks and safety hazards 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 (PPE) 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 and personnel designated by the Departmental Representative as needing to visit the site.
- .8 Identify wildlife management plans for bears and other large mammal safety.
- .9 Identify employee training plans for wildlife

encounters and prevention.

.10 Identify fire safety and fire reporting procedures.

.2 Include with the Health and Safety plan, a resume(s) of Health and Safety Coordinator(s) detailing the Health and Safety Coordinator's past experience.

.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 PCA 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.

1.7 Contractor's Responsibility

.1 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.

.2 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.

.3 The protection of persons off-site and the environment such that they may be affected by the conduct of the work.

1.8 Health and Safety Coordinator

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

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

.2 Be responsible for implementing, daily enforcing, and monitoring the site-specific Health and Safety Plan.

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- .3 Be on-site during execution of critical elements of the work or as required by the Contractor.
 - .4 Have a minimum of two years site related working experience specific to activities associated with Construction.
 - .5 Have working knowledge of occupational safety and health regulations.
 - .6 Attend pre-construction and construction progress meetings as required or as requested by the Departmental Representative.
- 1.9 General
- .1 Provide safety barricades and lights around work site as required to provide a safe working environment for workers and protection for pedestrian and vehicular traffic.
 - .2 Ensure that non-authorized persons are not allowed to circulate in designated construction areas of the work site.
 - .1 Provide appropriate means by use of barricades, fences, warning signs, traffic control personnel, and temporary lighting as required.
 - .2 Secure site during non-work at night time or provide security guard as deemed necessary to protect site against entry.
 - .3 Conduct daily safety meetings and task specific meetings (toolbox) as required by special work. At a minimum meetings shall include refresher training for existing equipment and protocols, review ongoing safety issues and protocols, and examine new site conditions as encountered. Keep records of meetings.
- 1.10 Project / Site Conditions
- .1 Work at the site will, at a minimum, involve contact with:
 - .1 Local wildlife.
 - .2 Unpredictable and adverse weather conditions.
- 1.11 Regulatory Requirements
- .1 Comply with specified codes, acts, bylaws, standards and regulations to ensure safe operations at site.
 - .2 In event of conflict between any provisions of the above authorities, the most stringent provision will apply. Should a dispute arise in determining the most stringent

requirement, the Departmental Representative will advise on the course of action to be followed.

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| 1.12 Work Permits | .1 | Obtain specialty permit(s) related to project before start of work. |
| 1.13 Filing of Notice | .1 | The Contractor is to complete and submit an Advance Notice of Project as required by the Worker's Compensation Board and any other authority in effect at the place or work. |
| | .2 | Provide copies of all notices to the Departmental Representative. |
| 1.14 Emergency Procedures | .1 | List standard operating procedures and measures to be taken in emergency situations. Include an evacuation plan and emergency contacts (i.e. names/telephone numbers) of: <ul style="list-style-type: none">.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: <ul style="list-style-type: none">.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. |

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| | .3 | Provide written rescue/evacuation procedures as required for, but not limited to: |
| | .1 | Work in confined spaces or where there is a risk of entrapment. |
| | .2 | Work with hazardous substances. |
| | .3 | Work on, over, under and adjacent to water. |
| | .4 | Revise and update emergency procedures as required, and re-submit to the Departmental Representative. |
| 1.15 Hazardous Products | .1 | Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of hazardous materials, and regarding labeling and provision of Material Safety Data Sheets (MSDS) acceptable to the Departmental Representative and in accordance with the Canadian Labour Code. |
| | .2 | Where use of hazardous and toxic products cannot be avoided: |
| | .1 | Advise Departmental Representative beforehand of the product(s) intended for use. Submit applicable MSDS and WHMIS documents as per Section 01 33 00 – Submittal Procedures. |
| 1.16 Overloading | .1 | Ensure no part of the work is subject to a load which will endanger its safety or will cause permanent deformation. |
| 1.17 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. |
| 1.18 Unforeseen Hazards | .1 | Should any unforeseen or peculiar safety-related factor, hazard or condition become evident during performance of the work, immediately stop work and advise the Departmental Representative verbally and in writing. |
| | .2 | Should contaminated site conditions be encountered when completing the work, contact the Departmental Representative immediately. |

1.19 Posted Documents

.1

Post 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 marshaling station, and the emergency transportation provisions.

.5 Notice of Project.

.6 Floor plans or site plans.

.7 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.

.8 Workplace Hazardous Materials Information System (WHMIS) documents.

.9 Material Safety Data Sheets (MSDS).

.10 List of names of Joint Health and Safety Committee members, or Health and Safety Representative, as applicable.

.2

Post all Material Safety Data Sheets (MSDS) on-site, in a common area, visible to all workers and in locations accessible to tenants when work of this Contract includes construction activities adjacent to occupied areas.

.3

Postings should be protected from the weather, and visible from the street or the exterior of the principal construction-site shelter provided for workers and equipment, or as approved by the Departmental Representative.

1.20 Correction of Non-compliance

.1

Immediately address health and safety non-compliance issues identified by the Departmental Representative.

.2

Provide Departmental Representative with written report of action taken to correct non-compliance with health and safety issues identified.

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- .3 The Departmental Representative may issue a "stop work order" if non-compliance of health and safety regulations is not corrected immediately or within posted time. The General Contractor/subcontractors will be responsible for any costs arising from such a "stop work order".
- 1.21 Medical
- .1 Provide and maintain first aid facilities for all workers as required by the Workers' Compensation Act or the Occupational Health and Safety Regulations.
- .2 Provide the appropriate first aid kit, based on the number of workers, in accordance with the Workers' Compensation Act or the Occupational Health and Safety Regulations.
- .3 Establish an emergency response plan acceptable to Departmental Representative, for the removal of any injured person to medical facilities or a doctor's care in accordance with applicable legislative and regulatory requirements.
- .4 Provide proof of First Aid credentials to Departmental Representative prior to the start of construction. Provide the appropriate number of first aid attendants on site in accordance with Workers' Compensation Act or the Occupational Health and Safety Regulations.
- .5 Emergency and First Aid Equipment:
- .1 Locate and maintain emergency and first aid equipment in appropriate location on site including first aid kit to accommodate number of site personnel; portable emergency eye wash; fire protection equipment as required by legislation.
- .2 Locate sufficient; blankets and towels; stretcher; and 1 hand held emergency siren in all confined access locations.
- .3 Provide a minimum of 1 qualified first aid attendant as per Workers' Compensation Act or the Occupational Health and Safety Regulations on site at all times when Work activities are in progress; duties of first aid attendant may be shared with other light duty Work related activities.
- 1.22 Accidents and Accident Reports
- .1 Immediately report, verbally, followed by a written report within 24 hours, to Departmental Representative, all accidents of any sort arising out of or in connection with the performance of the Work, giving full details and

statements of witnesses. If death or serious injuries or damages are caused, report the accident promptly to Departmental Representative by telephone in addition to any report required under federal and territorial laws and regulations.

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

END OF SECTION

PART 1 – GENERAL

- 1.1 Section Includes
- .1 Definitions.
 - .2 National Park Regulations.
 - .3 References.
 - .4 Regulatory Overview.
 - .5 Submittals.
 - .6 Environmental Protection Plan (EPP).
 - .7 Start-up and Environmental Briefing.
 - .8 Site Access and Parking.
 - .9 Protection of Work Limits.
 - .10 Erosion Control.
 - .11 Pollution Control.
 - .12 Equipment Maintenance, Fueling, and Operation.
 - .13 Operation of Equipment.
 - .14 Fire Prevention and Control.
 - .15 Wildlife.
 - .16 Relics and Antiquities.
 - .17 Waste Materials Storage and Removal.
 - .18 Miscellaneous Site Management Contingencies.
 - .19 Managing of Invasive Plant Vegetation.
 - .20 Drainage.
 - .21 Environmental Protection Supplies.
 - .22 Products.
 - .23 Asphalt Plant Operation and Paving.
 - .24 Material Loading, Hauling, Placement and Grade Building.

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| | .25 | Specific Concerns Relative to Erosion Control and Sedimentation. |
| | .26 | Clearing and Grubbing. |
| | .27 | Stripping. |
| | .28 | Excavating and Placement. |
| | .29 | Culvert Installation. |
| 1.2 Definitions | .1 | Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally and/or historically. |
| | .2 | Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants. |
| | .3 | Wetted Perimeter: area of stream where water is currently running or pooled. |
| | .4 | In-stream Work: any work performed below the high water mark, either within or above the Wetted Perimeter of any Fisheries Sensitive Zone. |
| | .5 | Fisheries Sensitive Zone: in-stream aquatic habitats and out of stream habitat features such as side channels, wetlands, and riparian areas. |
| | .6 | Invasive plants: are any alien plant species that have the potential to pose undesirable or detrimental impacts on humans, animals or ecosystems. Invasive plants have the capacity to establish quickly and easily on both disturbed and un-disturbed sites, and can cause widespread negative economic, social and environmental impacts. |
| | .7 | Noxious weeds: are invasive plants that have been designated under the AB Weed Control Act as available here:
http://www.qp.alberta.ca/1266.cfm?page=W05P1.cfm&leg_type=Acts&isbncln=9780779760602 |

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| 1.3 References | .1 | Parks Canada Waterton Lakes National Park Mitigation Package for Project WLNP-15-FII, Belly River Group Campground Culvert Replacement – March 2016 (Appendix A). |
| 1.4 National Park Regulations | .1 | The Contractor shall ensure that all work is performed in accordance with the ordinances, laws, rules and regulations set out in the Canada National Parks Act and Regulations. |
| | .2 | Comply with construction related requirements as detailed in the Belly River Group Campground Culvert Replacement Mitigation Package (Appendix A). |
| 1.5 Regulatory Overview | .1 | The Departmental Representative will complete the environmental notification / permitting required by Parks Canada Agency. |
| | .2 | Comply with all applicable environmental laws, regulations and requirements of Federal, Provincial, and other regional authorities, and acquire and comply with such permits, approvals and authorizations as may be required. |
| | .3 | Comply with and be subject to those permits and approvals obtained from the Departmental Representative to conduct the Work. |
| 1.6 Submittals | .1 | The Contractor's EPP shall be submitted to the Departmental Representative for review and acceptance in accordance with the procedures outlined in Section 01 33 00 – Submittal Procedures. The Departmental Representative will review the plan (first submission and if required all subsequent re-submissions) within 14 days of submission. Upon review of the plan the Departmental Representative will either: |
| | .1 | Accept the plan. |
| | .2 | Accept portions of the plan and provide comments outlining required changes or additional information in other sections. Following completion of edits by the Contractor, re-submit the plan for review. |
| | .3 | Reject the plan and provide comments outlining required changes or additional information needed. Following completion of edits by the Contractor, re-submit the plan for review. |
| | .2 | The Contractor shall allow time in the schedule for the reviews, and subsequent edits / re-submission. |

- .3 Work affected by the submittal (as determined by the Departmental Representative) shall not proceed until acceptance of the EPP by the Departmental Representative.
 - .4 The review of the EPP by the Departmental Representative shall not relieve the Contractor of responsibility for errors or omissions in the accepted EPP or of responsibility for meeting all requirements of the Contract Documents.
 - .5 Should deficiencies in the Contractor's EPP be noted following acceptance of the submittal by the Departmental Representative but during the project work, the Departmental Representative reserves the right to provide additional comments to the Contractor and require re-submission of the EPP to ensure the correction of any deficiencies.
- 1.7 Environmental Protection Plan (EPP) .1 The Contractor is required to prepare an EPP. The EPP should include and address all relevant environmental impacts/issues at the site as shown on the Contract Drawings and as identified in this Section of the specifications. The EPP will require the Contractor to carefully think through the entire project, including identifying what activities and works will be occurring, both generally and at specific sites, and by what methods. The Environmental Protection Plan shall be completed by a P.Biol or RPBio, or other qualified professional, and shall, at a minimum include the following:
- .1 The process and protocol for ensuring that supervisors and individual staff employed by the Contractor are very clear on which environmental standards need to be achieved, how they will be achieved, and establishing how the Contractor will ensure that this is successfully occurring.
 - .2 Erosion, drainage, and sediment control plan which identifies type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with the requirements of PCA's permitting and best management practices, and these specifications.
 - .3 Drawings should show locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of any excess or spoil materials including methods to control runoff and to contain materials on-site.

- .4 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Plan to include measures for marking limits of use areas including methods for protection of features to be preserved within authorized work areas.
- .5 Spill Control Plan: including procedures, instructions, and reports to be used in the event of unforeseen spill of regulated substance.
- .6 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
- .7 Contaminant prevention plan that: identifies potentially hazardous substances to be used on job site; identifies intended actions to prevent introduction of such materials into air, water, or ground; and details provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.
- .8 Outline the avoidance and mitigate measures which the Contractor will undertake and implement to ensure compliance with the environmental regulations applicable to the project and these contract specifications.
- .9 The procedures for stopping the work and implementing changes to the construction methods should the Contractor not be achieving the environmental requirements as outlined in these specifications.
- .10 The procedures for stopping work should the Contractor encounter archaeological anomalies or human remains.

1.8 Start-up and Environmental Briefing

- .1 All staff employed at the construction site will be subject to an approximately half hour briefing regarding their individual and collective responsibilities to ensure avoidable adverse environmental impact does not arise from their activities and personal choices. **All Employees must attend this briefing before beginning their work at the site.** It is recognized new employees may join the Contractors' work force after the initial round of "environmental briefing". In that case and as required, subsequent "environmental briefings" can be

presented as numbers warrant, by arrangement with the ESO through the Departmental Representative. Also, some sub-trades may be present at the site for a short time, to perform once-only duties. In these cases, the “environmental briefing” will be replaced by the Contractor explaining the environmental sensitivity of the work location to the sub-trade worker(s), and reviewing highlights of personal conduct expected, with reference to a one-page briefing summary to be provided to the Contractor by the ESO. A copy of this summary will be provided to each sub-trade worker joining the work force at the site.

- .2 Parks Canada will have an ESO attending the site to monitor the construction activity for conformance with these specifications. The ESO or alternate designated Parks Canada staff member will present the “environmental briefing”. The ESO’s main duties are to monitor the progress of the construction on an on-going basis to ensure compliance with environmental protection measures, and to provide guidance through the Departmental Representative, in the event of unanticipated environmental problems. Although the ESO has authority to enforce National Parks Act violations, direction to the Contractor will be the duty of the Departmental Representative.

1.9 Site Access and Parking

- .1 The Contractor shall review both short and long access requirements with the Departmental Representative, both at the start-up and on an on-going basis. In consultation with the Departmental Representative, the contractor shall formulate an agreement for worker transportation to and from the work site and where workers shall park their private vehicles. Generally, personal vehicles shall be parked at least 10 metres distance from any watercourse.
- .2 The Contractor shall ensure that the environment beyond the work limits is not negatively impacted or damaged by workers’ vehicles or construction machinery and shall instruct workers so that the “footprint” of the project is kept within defined boundaries.

1.10 Protection of Work Limits

- .1 The Contractor shall ensure that workers and equipment do not trespass outside the project limits to the satisfaction of the Departmental Representative and the ESO.

1.11 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.

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- .2 If necessary, on-site sediment control measures shall be constructed and functional prior to initiating activities associated with the asphalt plant and the paving. The Contractor shall prepare an Erosion Control Plan to the satisfaction of the Departmental Representative and the ESO.
- .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 and ESO also will monitor erosion control performance.
- .4 The site will be secured against erosion during any periods of construction inactivity or shutdown.
- 1.12 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. Generally, hazardous or toxic products shall be stored no closer than 100 metres from water.
- .2 A Spill Response Plan will be prepared by the Contractor 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 the ESO and in accordance with all applicable federal and provincial legislation. The Plan 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 or toxic products shall be stored no closer than 100 metres from streams, wetlands, water bodies or waterways.
- .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 and the ESO before start-up. 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 by methods that are approved by the Departmental Representative or ESO.
- .6 The Contractor shall provide spill kits 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 ESO and Departmental Representative prior to project start-up must approve these spill kits. The Contractor and site staff shall be informed of the location of the spill response kit(s) and be trained in its use.
- .7 Timely and effective action shall be taken to stop, contain and clean-up all spills as long as the site is safe to enter. The Departmental Representative and the ESO shall be notified immediately of any spill. In the event of a major spill, all other work shall be stopped and all personnel devoted to spill containment and clean-up.
- .8 The costs involved in a spill incident (the 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 expected standard and to the satisfaction of the Departmental Representative and ESO.
- 1.13 Equipment Maintenance, Fueling and Operation
- .1 The Contractor shall ensure that all equipment arrive clean and all soil, weeds, invasive species, seeds and any debris attached to construction equipment to be used on the project site shall be removed (power washing / cleaning / sanitizing) outside the National Parks before delivery to the work site. Any water hauling equipment shall arrive empty and have its tanks inspected by the ESO prior to being permitted to work at the start of the project.
- .2 Equipment fueling sites will be identified by the Contractor and approved by the Departmental Representative and the ESO. Except for chain saws, any fueling closer than 100 metres from streams, wetlands, water bodies or waterways shall require the authorization and oversight of the Departmental Representative.
- .3 Diesel and gasoline delivery vehicles, including bulk tankers

shall be parked more than 100 metres from streams, wetlands, water bodies or waterways. Gravity fed fuel systems are not allowed. Manual or electric pump delivery systems shall be used. Fueling personnel shall maintain presence at and immediate attention to the fueling operation.

- .4 Mobile fuel containers (e.g. slip tanks, small fuel carboys) shall remain in the service vehicle at all times. Protection and containment of approved fuel storage sites is addressed in Pollution Control above.
- .5 Equipment used on the project shall be fueled with E10, and low Sulphur diesel fuels and shall conform to local emission requirements. The Contractor is to ensure that unnecessary idling of vehicles is avoided.
- .6 Oil changes, lubricant changes, greasing and machinery repairs shall be performed at locations approved by the ESO or the Departmental Representative. Waste lubrication products (e.g. oil filters, used containers, used oil, etc.) shall be secured in spill-proof containers and properly recycled or disposed of at an approved facility. No waste petroleum, lubricant products or related materials are to be discarded, buried or disposed of in borrow pits, turnouts, picnic areas, viewpoints, etc. anywhere within National Parks.
- .7 The Contractor shall ensure that all equipment is inspected daily for fluid/fuel leaks and maintained in good working order.
- .8 Fuel containers and lubricant products shall be stored only in secure locations specified by the Departmental Representative. Fuel tanks, including those on equipment, or other potentially deleterious substance containers shall be secured to ensure they are tamperproof and cannot be drained by vandals when left overnight in National Parks. Alternatively, the Contractor may hire a security person employed to prevent vandalism. The Contractor is to ensure that workers are briefed on proper 'daisy-chain' use of locks to ensure no other contractor or Parks Canada Highways Dept. staff are locked out.

1.14 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 approved by the Departmental Representative. Unless authorized by the Departmental Representative, activities beyond the work limits are not permitted. No machinery will enter, work in or cross over streams, rivers, wetlands, water bodies or

watercourses, nor damage aquatic and riparian habitat or trees and plant communities. Some of the construction shall require working close to creeks and other watercourses or water bodies. In these instances, the Contractor is to describe measures to be employed to ensure fugitive materials (e.g. rocks, soil, branches) and especially deleterious substances (e.g. chemicals) do not enter any watercourses, to the satisfaction of the Departmental Representative and ESO.

- .2 The Contractor shall instruct workers to prevent pushing, placement, raveling, storage or stockpiling of any materials (e.g. slash, rock, fill or topsoil) in the trees bordering the right-of-way or into watercourses or water bodies.
- .3 When, in the opinion of Parks Canada, 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 their expense, for complete restoration including the replacement of trees, shrubs, topsoil, grass, etc. to the satisfaction of the Departmental Representative and ESO.
- .4 The Contractor shall restrict vehicle movements to work limits.
- .5 Workers private vehicles are to remain within the construction footprint.

1.15 Fire Prevention and Control

- .1 A fire extinguisher shall be carried and available for use on each machine and at locations within the construction site in the event of fire. Basic firefighting equipment recommended (e.g. a water truck; minimum 500 Imperial gallons with 500 feet of fire hose and a pump capable of producing 45 psi water pressure at the nozzle, three shovels, two pulaskis, and two five gallon backpack pumps) shall be maintained at the construction site at a location known and easily accessible to all the Contractors' staff. Contractor's staff shall receive basic training in early response to wildfire events during the "environmental briefing".
- .2 The Contractor shall obtain a restricted activity permit prior to extracting water from any source within the National Parks.
- .3 Construction equipment shall be operated in a manner and with all original manufacturer's safety devices to prevent ignition of flammable materials in the area.
- .4 Smoking will only be allowed in designated areas as identified

in advance by PCA. Any smoking area shall be equipped with a fire extinguisher at the Contractor's expense. Care shall be taken while smoking to ensure that the accidental ignition of any flammable material is prevented. The Contractor shall ensure that all cigarette butts are properly disposed of and not littered on the site. Fires or burning of waste materials is not permitted.

- .5 In case of fire, the Contractor or worker shall take immediate action to extinguish the fire provided it is safe to do so. The ESO and the Departmental Representative shall be notified of any fire immediately. Fires or burning of waste materials is not permitted.

1.16 Wildlife

- .1 During the Environmental Briefing all personnel shall be instructed by the ESO on procedures to follow in the event of wildlife appearance near or within the work site and any other wildlife concerns.
- .2 The Contractor shall avoid or terminate activities on site that attract or disturb wildlife and vacate the area and stay away from the immediate location if bears, cougars, wolves, elk or moose display aggressive behaviour or persistent intrusion. Extra care to control materials that might attract wildlife (e.g. lunches and food scraps) must be exercised at all times.
- .3 The Contractor shall notify the ESO and Departmental Representative immediately about dens, litters, nests, carcasses (road kills), bear activity or encounters on or around the site or crew accommodation. Other wildlife-related encounters are to be reported within 24 hours.

1.17 Relics and Antiquities

- .1 Artifacts, relics, antiquities and items of historical interest such as cornerstones, commemorative plaques, inscribed tablets and similar objects found on the work site shall be reported to the ESO or the Departmental Representative immediately. The Contractor and workers shall wait for instructions before proceeding with their work.
- .2 All historical or archaeological objects found in National Parks are protected under the National Parks Act and Regulations and are the property of Parks Canada. The Contractor and workers shall protect any articles found and request direction from the ESO or the Departmental Representative.

1.18 Waste Materials Storage and Removal

- .1 The Contractor and workers shall dispose of hazardous wastes in conformance with the Environmental Contaminants Act and applicable provincial regulations while observing the

Code of Good Practice for Management of Hazardous and Toxic Wastes at Federal Establishments.

- .2 All wastes originating from construction, trade, hazardous and domestic sources, shall not be mixed, but will be kept separate.
 - .3 Construction, trade, hazardous waste and domestic waste materials shall not be burned, buried or discarded at the construction site or elsewhere in National Parks. 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 park. Construction waste storage containers, provided by the Contractor, shall be emptied by the Contractor when 90% full. Waste containers will have lids, and waste loads shall be covered while being transported.
 - .4 A concerted effort shall be made by the Contractor and workers to reduce, reuse and recycle materials.
 - .5 All efforts to prevent wildlife from obtaining food, garbage or other domestic wastes shall be made by the Contractor and contract staff while undertaking their work in National Parks. Such wildlife attractants shall not be stored at the work site overnight. Lunches, coolers and food products, including waste food products, shall be securely stored away from access by animals. Daily removal of food scraps, food wrappers, pop cans or other attractive products to bear proof containers is mandatory. It is incumbent on the Contractor to notify Parks Canada and make specific arrangements to have garbage collected by Parks Canada when using existing Parks Canada receptacles.
 - .6 The Contractor and workers shall immediately report any circumstances related to food/garbage (e.g. overflowing container or strong smell) and wildlife to the ESO or the Departmental Representative.
 - .7 Sanitary facilities, such as a portable container toilet, shall be provided by the Contractor and maintained in a clean condition.
- 1.19 Miscellaneous Site Management Contingencies
- .1 The Contractor shall ensure trespass outside the project limits does not occur, to the satisfaction of the Departmental Representative and the ESO.
 - .2 Staging and laydown areas within the National Park are limited. The contractor shall notify the Departmental

- Representative of any required equipment storage, laydown area, office, parking or other facilities required prior to mobilization. Equipment storage and laydown areas may be required outside of the Park if insufficient space is available.
- .3 The Contractor is responsible for obtaining any equipment storage, laydown area, office, parking or other facilities in area(s) outside the National Park.
- .4 No Work Camp will be allowed within the National Parks.
- .5 The Contractor shall provide toilets and maintain them in a clean and sanitary condition at the work sites. These facilities shall not be used for the disposal of anything but human wastes.
- .6 The National Park Act regulations prohibit anyone working within National Parks from using public campground facilities.
- .7 Removal and storage of snow shall be arranged with the ESO and the Departmental Representative if required.
- .8 The Contractor shall control blowing dust and debris generated from the construction site by means such as covering or wetting down dry materials and rubbish. Dust control measures for temporary access roads may also have to be initiated.
- .9 Security services at the construction site may be desirable or necessary during the contract, especially during quiet times. Fuel tanks, including those on equipment, or other potentially deleterious substance containers must be secured by the Contractor to ensure they are tamperproof and cannot be drained by vandals at his own cost.
- .10 Pets shall not be brought to or maintained at the construction site.
- 1.20 Managing Invasive Plant Vegetation
- .1 Keep equipment clean and avoid parking, turning around or staging equipment in known invasive species infested areas, or mow prior to use.
- .2 Wash equipment prior to mobilization to site.
- .3 Minimize unnecessary disturbance of roadside aggregates or soil, and retain desirable roadside vegetation whenever possible.

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- .4 Where possible, begin mowing or brushing in “invasive plant free” areas and end in infested areas.
 - .5 Where possible, use only clean fill material from an “invasive plant free” source.
 - .6 Whenever possible, re-seed with grass mixtures that are free of weeds, locally adapted, non-invasive, and quick to establish. Spread seed in the early spring or late fall to ensure successful establishment.
- 1.21 Drainage
- .1 Provide temporary drainage and pumping as necessary to keep excavations and site free from water. Drainage plans shall be part of the EPP.
 - .2 Do not pump water containing suspended materials into waterways, sewer or drainage systems.
 - .3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with PCA requirements.
 - .4 Provide an erosion and sediment control plan that identifies type and location of erosion and sediment controls to be provided. Plan to include monitoring and reporting requirements to assure that control measures are in compliance with PCA regulations.
 - .5 As part of the EPP, submit details of proposed erosion, sediment and drainage control to Departmental Representative for review and approval prior to commencing Work in fisheries sensitive areas or in areas that may affect fisheries sensitive areas and specifically address the protection of water bodies, water courses, and the following:
 - .1 Details of grading Work to prevent surface drainage into or out of Work areas.
 - .2 Details of erosion control works and materials to be used, including the deployment of silt fencing, floating silt curtains and containment booms during construction and excavation activities.
 - .3 Work schedule including the sequence and duration of all related Work activities.
 - .4 The treatment of site runoff to prevent siltation of watercourses.

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| | .5 | Dewatering procedures for excavated materials including silt removal procedures prior to discharge. |
| | .6 | Stabilizing procedures during excavation. |
| | .7 | Maintenance of filters and sedimentation traps. |
| | .6 | Any dewatering activities will be released onto the ground at a location that is a minimum of 30 metres from natural drainage courses and 100 metres from fish bearing waters. |
| 1.22 Environment Protection Supplies | .1 | Comply with federal and provincial fisheries and environmental protection legislation, including preventing the loss or destruction of fish habitat, and minimizing the impact of sedimentation, siltation or otherwise causing a degradation in water quality. |
| | .2 | Provide a minimum of 30 m or more and as required of polypropylene silt fence (typical height of 0.9 m) and the necessary stakes for installation. This will be used as necessary to prevent sediment transport into water bodies. |
| | .3 | Provide a minimum of 50 lineal metres or more and as required of 200 mm diameter hydrophobic, sorbent booms. This will be used as necessary to prevent the migration of hydrocarbons. |
| | .4 | Supply, transport, install and maintain erosion, sediment and drainage controls necessary to complete the Work in accordance with the requirements of Departmental Representative. |
| | .5 | At the completion of construction, dispose of used silt fence off-site as non-Hazardous Waste. Dispose of used absorbent boom in accordance with Section 02 61 33 - Hazardous Materials. |
| | .6 | Unused Erosion, Sediment and Drainage Control supplies will remain the property of Departmental Representative until the completion of the Contract. |
| | .7 | Provide inventory of environmental protection supplies prior to mobilization. |

PART 2 – PRODUCTS

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| 2.1 Products | .1 | Not Used. |
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PART 3 – EXECUTION

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- 3.1 Asphalt Plant Operation and Paving .1 Trucks for hauling asphalt mixture shall have tight, clean, smooth metal beds that have been sprayed with a minimum amount of thin fuel oil to prevent the mixture from adhering and causing waste asphalt. The vehicle covers shall be securely fastened. Excess truck box lubricants such as light oil, detergent or lime solutions shall not be allowed to contaminate the mix, and shall be disposed of in an environmentally acceptable manner. Truck box lubricant application shall be carried out in a containment berm.
- .2 Asphalt plant operation must comply with all environmental pollution control regulations applicable in the plant area.
- .3 The Contractor shall be responsible for the purchase and the safe delivery/storage/handling of asphalt cement and emulsions to the asphalt plant site. Excess hot mix or reject asphalt shall be temporarily stored as directed by the Departmental Representative, and removed from the Park, prior to completion of the contract a later date. All costs for removal and disposal shall be the responsibility of the Contractor and no separate payment shall be made.
- .4 The Contractor shall ensure that there is enough room between the stockpiles and the asphalt plant for a loader in the event of a spill at the asphalt plant. A containment berm with an associated liner made of occlusive material (e.g. plastic of a thickness approved by the Departmental Representative) and covered with absorbent sand or clay shall be installed under the asphalt storage tank to ensure containment of 110% of the tank's capacity.
- .5 The Contractor may wish to protect containment/catchment areas and drip trays at the asphalt plant from rainfall since, if contaminated, all of the collected water will have to be disposed of at the expense of the Contractor at an approved disposal facility.
- .6 Sites from which materials have been removed shall be restored to a neat and presentable condition upon the completion of the work.
- 3.2 Material Loading, Hauling, Placement and Grade Building .1 During grade construction conducted close to any watercourse, water body or wetland methods shall be employed to ensure materials are not pushed, fall or are eroded into the water or wetlands. Work within a 30 metre buffer of waterways or wetlands requires the oversight of the ESO and the Departmental Representative.

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- .2 No grade building shall occur outside of the designated area or within 1 metre of the drip line of existing forest. Any material inadvertently falling outside the work limits is to be removed promptly in a manner that does not damage trees or vegetation at that location. Materials shall be placed at storage sites or on the grade without spillage outside the working limits. Any material inadvertently falling outside the work limits is to be removed promptly in a manner that does not damage trees or vegetation at that location.
- 3.3 Specific Concerns Relative to Erosion Control and Sedimentation .1 The Contractor shall prepare an Erosion and Sedimentation Management Plan for the components of this contract that are undertaken in proximity to watercourses, wetlands or riparian environments. This plan shall be to the satisfaction of the Departmental Representative and ESO with the plan details in accordance with the requirements of the Belly River Group Campground Culvert Replacement Project Mitigation Procedure (Appendix A). If sediment ponds are required, they shall be designed to settle all sediment particles 0.02 mm or larger. The ponds shall also be designed to handle 1:5 year storm events, with overflow spill capacity for 1:10 year storm events and emergency spillway capacity for 1:100 year storm events.
- .2 An important desired end result is to allow no release into watercourses of sediments in levels that are deleterious to fish or that would harmfully alter, disrupt, or destroy fish habitat. Similarly there is to be no sediment release into areas of vegetation growth or sensitive areas of sediments in levels that would adversely alter growing or hydraulic conditions. The target is 0 mg/L of TSS over background levels. The threshold is a maximum instantaneous increase of 25 mg/L over background levels when background levels are <250 mg/L, or a maximum instantaneous increase of 10% over background levels when background levels are >250 mg/L. This threshold shall not be exceeded.
- 3.4 Clearing and Grubbing .1 The Contractor shall ensure that the substrate or riparian area of streams, rivers or watercourses, whether open water or frozen over shall not be disturbed by tracked, wheeled or self-propelled equipment, (e.g. a skidder or truck). The ESO or Departmental Representative will provide direction in the case of work occurring near any wetland area or watercourses.
- .2 The Contractor shall take all measures to ensure that trees do not fall into streams, rivers, wetlands or water bodies or outside the clearing limits as marked by colored flagging. Work within 30 meters of watercourses, water bodies or

wetlands requires the close oversight of the ESO or the Departmental Representative prior to and during the work.

- .3 Trees inadvertently felled into streams, rivers, watercourses or outside the clearing limits shall be removed by means (e.g. winch) so as not to damage the substrate or any standing trees left outside the clearing limits. Machinery shall not go outside the clearing limits, or into streams, rivers, watercourses or water bodies to remove felled trees.
- .4 Logs and other salvage materials are to be conveyed to and placed at the storage site without spread of debris or damage to other standing trees or landscape resources outside the marked clearing or storage limits. They shall not be skidded through wetlands, waterways or water bodies.
- .5 During the grubbing component, stumps, roots, imbedded logs and other non-soil debris shall be pulled and shaken free of loose soil and rocks before transport to designated pit.
- .6 No slash clearing, pickup or grubbing shall occur outside of the designated area or within 1 metre of the drip line of existing forest.
- .7 Existing areas of vegetation disturbed as a result of this contract shall be rehabilitated using approved topsoil from the park and a native grass seed mix as specified in Section 32 93 21 – Hydraulic Seeding.

3.5 Stripping

- .1 A contingency plan for control of dust generated from the construction site shall be prepared, with materials availability arranged in the event of their need. In the event of a work program shutdown during inclement weather (e.g. winter conditions unfavourable for construction) erosion control of bared soils or excavated materials stockpiles will be required.
- .2 Stripping close to the any watercourse, water body or wetland shall employ methods to ensure materials are not pushed, fall or are eroded into the water or wetlands. Work within 30 meters of watercourses, water bodies or wetlands requires the close oversight of the ESO or the Departmental Representative prior to and during the work.
- .3 No stripping shall occur outside of the designated area or within 1 metre of the drip line of existing forest.
- .4 Stripped soil (including fine forest litter) materials shall be placed and stored at locations and in amounts and form as instructed by the Departmental Representative, for later

reclamation use on graded slopes. Stripping piles may require erosion control, sedimentation protection or stabilization, depending on the location and anticipated duration of storage. At the Departmental Representatives direction, the Contractor shall prepare a plan for management of each stripping pile.

3.6 Excavating and Placement

- .1 Materials shall be placed at storage sites or on the grade without spillage outside the working limits. Any material inadvertently falling outside the work limits is to be removed promptly in a manner that does not damage trees or vegetation at that location.
- .2 All sediment control measures shall be implemented by the Contractor prior to the commencement of the work in the vicinity of rivers, water bodies, watercourses, and wetlands.
- .3 Special precautions may have to be taken during excavation in the vicinity of intermittent or active drainage channels.
- .4 If sediments enter a river / stream during any excavation nearby or at its banks, the Contractor shall ensure that sediment levels in the waters of the river or creeks do not exceed specified limits and meet the “desired end result” limits outlined.
- .5 Placement of rip rap and backfill at creeks shall be undertaken without contacting the watercourse or wetted margins of the stream, unless approved by the Departmental Representative.
- .6 Fisheries protection windows shall be observed for the fish creeks, and any other watercourse in this contract and will guide the timing of the work so that stream disturbance is prevented.
- .7 If a pump-out sump to dewater excavation sites will be required, the Contractor shall detail how the dewatering shall be undertaken, to the satisfaction of the Departmental Representative and the ESO. Special attention is to be given to the environmental sensitivity of the discharge area, freezing conditions operation, overflow avoidance, decanting and settlement pond reclamation. Water containing suspended materials shall not be pumped into watercourses, drainage systems or on to land, except with the permission of the Departmental Representative and the ESO.

3.7 Culvert Installation

- .1 Culvert shall be installed using best management practices for working in or near water that will result in a minimum amount of sedimentation and damage to the riparian area of the watercourse. The Contractor shall prepare and submit a

culvert installation plan for the installation of the culvert, a minimum two (2) weeks prior to undertaking the work for approval by the Departmental Representative and ESO. The plan shall include the methodology, personnel, staging approach, equipment, and schedule for the culvert install work.

- .2 The culvert shall be installed using best management practices for placement, including consideration of aquatic ecology.
- .3 The culvert shall be installed during periods of no creek flow.
- .4 The culvert installation shall be in conformance with the Belly River Group Campground Culvert Replacement Mitigation Package (Appendix A).

END OF SECTION

PART 1 – GENERAL

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| 1.1 Section Includes | .1 | Measurement and Payment. |
| | .2 | Definitions. |
| | .3 | Responsibilities. |
| | .4 | General. |
| | .5 | Quality Control Personnel. |
| | .6 | Quality Control Testing. |
| | .7 | Non-conformance Reports. |
| | .8 | Departmental Representative Inspection and Audits. |
| 1.2 Measurement and Payment | .1 | Payment for Quality Management will be made on the basis of the Price per Unit Bid for Quality Management in the Bid and Acceptance Form. The Price per Unit Bid shall include all costs for the completion and adherence to the Quality Management Plan including Quality Control and all other items necessary for successful completion of the work. |
| | .2 | Measurement for Payment for Quality Management will be made by Lump Sum of the work completed and accepted by the Departmental Representative. |
| 1.3 Definitions | .1 | Quality Control (QC): The process of checking specific product or services to determine if they comply with relevant quality standards and identifying ways to eliminate causes of unsatisfactory product or service performance. |
| | .2 | Quality Assurance (QA): The process of ensuring that the Contractor's Quality Management Plan (QMP) (QC, non-conformances, etc.) are being followed. The results of the QA are provided as feedback to the Contractor. Where required the Contractor shall implement changes to the project based on the feedback received from the QA process. |
| 1.4 Responsibilities | .1 | The quality management responsibilities for this project are as follows: |
| | .1 | Quality Control – The Contractors responsibility. |
| | .2 | Quality Assurance – The Departmental Representatives responsibility. |

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| 1.5 General | .1 | The Contractor shall be responsible for ensuring the product meets the contractual quality requirements and that Quality Control measuring and documenting the quality of the work is completed by qualified personnel independent from the Contractor's organization. Quality Control work includes monitoring, inspecting, testing, and documenting the means, methods, materials, workmanship, processes and products of all aspects of the work as necessary to ensure conformance with the Contract. |
| | .2 | The Contractor shall provide unrestricted access to all Quality Control operations and documentation produced by or on behalf of the Contractor and shall allow the Departmental Representative full access at any time during working hours. |
| | .3 | The Departmental Representative will review the Contractor's performance of the work and determine the acceptability of the work based on the Departmental Representatives Quality Assurance results and, where deemed appropriate by the Departmental Representative, supplemented by the Contractor's Quality Control results. |
| | .4 | Work failing to meet the conditions of the Contract shall be considered a non-conformance. A non-conformance report will then be issued by the Contractor. Non-conforming work shall be removed / replaced from the work. |
| | .5 | The Contractor shall not be entitled to payment for work that lacks the appropriate Quality Control documentation, verified by the Departmental Representative, as required by the Contract. |
| | .6 | The Contractor shall implement a well-coordinated approach to all operations related to the work and will organize its team and operations in keeping with the goal of doing things right the first time. |
| 1.6 Quality Control Personnel | .1 | The Contractor shall appoint qualified, and experienced Quality Control Personnel (Quality Control Manager) who will report regularly to the Contractor's management at a level which shall ensure that Quality Management requirements are not subordinated to manufacturing, construction or delivery. |
| | .2 | The Contractor shall designate one person as the Quality Control Manager who shall be responsible for ensuring Quality on the project. The Quality Control Manager shall be a qualified Professional Engineer, Certified Engineering Technician, or Applied Science Technologist, or other person with knowledge, skills and abilities acceptable to the |

Departmental Representative.

.3 The Quality Control Personnel shall remain on site at all times the Contractor is performing work which must be tested or inspected in-process, and must be readily accessible and able to return when off-site.

.4 At a minimum the Quality Control Manager shall:

.1 Be responsible to measure conformance of the work with the contract requirements and ensure that quality is not being compromised by production measures.

.2 Be empowered by the Contractor to resolve Quality Control matters.

.3 Direct and monitor Quality Control work completed by Quality Control testing agencies and Quality Control Staff.

.4 Review, sign, and be responsible for all reports (material and testing results).

.5 Stop work when material, product, processes or submittals are deficient.

.6 Complete internal Non-conformance Reports (NCR's).

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

.8 Attend pre-construction and construction progress meetings.

1.7 Quality Control Testing

.1 The Contractor shall engage an independent consulting firm registered to practice in the Province of Alberta to complete Quality Control Testing (lab and field testing).

.2 Testing required to provide Quality Control to assure that the work strictly complies with the Contract requirements shall be completed by the Contractor and at a minimum include:

.1 All testing required to confirm aggregate gradation and compaction where specified.

.2 All testing specified in the Contract Documents.

.3 Any other testing required as a condition for deviation

from the specified Contract procedures.

- .3 At a minimum the Contractor shall achieve the most stringent Quality Control testing frequencies as follows:
 - .1 The specific frequencies defined elsewhere in these specifications.
 - .2 The minimum QC testing frequencies as defined in the table below.

Table: Minimum QC Testing Frequencies		
Activity	Test / Inspection	Frequency
Supply of Granular Base / Culvert Bedding Material	Gradation	2 tests evenly distributed over the duration of the project
Site Tolerance – Common Fill	Survey	Final lift – 3 points along each cross section at 10 m stations
Site Tolerance – Granular Base	Survey	Final lift – 3 points along each cross section at 10 m stations
Site Tolerance – Culvert Bedding Material	Survey	Final lift, 1 point every m ²
Site Tolerance / Thickness – Riprap	Survey	1 Point every 2 m ² of Riprap placed or less as approved by the Departmental Representative
Compaction of Common Fill	In-Place Density	2 per lift
Compaction of Granular Base / Culvert Bedding Material	In-Place Density	3 per lift

- .3 One test per each individual area / location the material is utilized.
- .4 Quality Control Testing agencies, their inspectors, and their representatives are not authorized to revoke, alter, relax, enlarge or release any requirement of the Contract Documents, nor to approve or accept any part of the work.
- .5 The Contractor shall complete testing in the following manner:
 - .1 Identify test reports with the name and address of the organization performing all tests, and the date of the tests.
- .6 Provide to the Departmental Representative a copy of all test results via email within 24 hours of completion.

1.8 Non-Conformance Reports

- .1 The Contractor shall and the Departmental Representative may review the work to determine conformance with the contract

requirements.

- .2 Should the Contractor's Quality Control reporting indicate that the work is not in conformance, the Quality Control Manager shall.

.1 Inform the Contractor of the deficiency. The Contractor shall then take appropriate action to correct the deficiency.

.2 Ensure that the action taken by the Contractor corrected the deficiency and any substandard product was eliminated from the work. If the deficiency was not correct and substandard remains or becomes part of the work, an internal Non-Conformance Report (NCR) shall be issued to the Contractor, with a copy to the Departmental Representative. Included as part of the NCR will be a required response time.

The Contractor shall then respond to the Quality Control Manager, with a copy to the Departmental Representative, with respect to the NCR, within the specified response time, with proposed resolutions and corrective actions. The Contractor and/or the Quality Control Manager may consult with the Departmental Representative on the resolutions but is not required to do so.

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

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

The Contractor shall then respond to the Quality Control Manager, with a copy to the Departmental Representative, with respect to the NCR, within the specified response time, with proposed resolutions and corrective actions. The Contractor and/or the Quality Control Manager may consult with the Departmental Representative on the resolutions but is not required to do so.

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

- .4 Should the Departmental Representative Quality Assurance

reporting indicate that the work is not in conformance, the Departmental Representative will issue to the Contractor a NCR with a required response time.

The Contractor shall then respond to that NCR, within the specified response time, with proposed resolutions and corrective actions. The Departmental Representative will accept or reject the proposed resolution and corrective action proposal.

Quality Assurance testing and inspection may be performed by the Departmental Representative to determine if the corrective action has provided an acceptable product. Acceptance and rejection will continue until the Departmental Representative determines that a quality product has been achieved.

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

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

1.9 Departmental Representative
Inspection and Audits

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

END OF SECTION

PART 1 – GENERAL

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| 1.1 Section Includes | .1 | Installation and removal. |
| | .2 | Site storage/loading. |
| | .3 | Security. |
| | .4 | Equipment, tool, and materials storage. |
| | .5 | Sanitary facilities. |
| | .6 | Construction signage. |
| | .7 | Construction laydown area, construction parking, and site office. |
| | .8 | Power. |
| | .9 | Communications. |
| | .10 | Temporary heating, ventilation, and lighting. |
| | .11 | Fire protection. |
| 1.2 Installation and Removal | .1 | Provide construction facilities in order to execute work expeditiously. |
| | .2 | Remove from site all such work after use. |
| 1.3 Site Storage/Loading | .1 | Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products. |
| | .2 | Do not load or permit to load any part of work with a weight or force that will endanger the work or existing infrastructure. |
| 1.4 Security | .1 | Provide and pay for responsible security personnel as required. |
| 1.5 Equipment, Tool, and Materials Storage | .1 | If required by the Contractor provide and maintain, in a clean and orderly condition, lockable weather proof sheds for storage of tools, equipment and materials. |
| | .2 | Locate materials not required to be stored in weatherproof sheds on-site in a manner to cause least interference with public. |
| 1.6 Sanitary Facilities | .1 | Provide sanitary facilities for work force in accordance with governing regulations and ordinances. |

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| | .2 | Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition. |
| 1.7 Construction Signage | .1 | No other signs or advertisements, other than those pre-approved by the Departmental Representative are permitted on-site. |
| 1.8 Construction Laydown Area, Construction Parking, Site Office, and Accommodation | .1 | If desired, the Contractor may set up camp in the Belly River Campground for the duration of the work; however, sanitary facilities will not be provided by PCA. |
| | .2 | Confine construction laydown areas, site office locations, and construction parking to the locations identified below in compliance with Section 01 35 43 – Environmental Protection and as pre-approved by the Departmental Representative as follows: |
| | .1 | Areas previously disturbed within the Belly River Campground. |
| | .2 | Other areas as pre-approved by the Departmental Representative. |
| 1.9 Power | .1 | Provide and pay for power as required for the completion of the works and operations of construction offices. |
| 1.10 Communications | .1 | Provide and pay for on-site satellite phone communications or other reliable telephone systems allowing the Departmental Representative reliable communication to the Contractors onsite representative when onsite. |
| 1.11 Temporary Heating, Ventilation, and Lighting | .1 | Provide temporary heating, ventilation, and lighting as required during construction period to facilitate construction of the works. |
| 1.12 Fire Protection | .1 | Provide and maintain temporary fire protection equipment during performance of work. |

END OF SECTION

PART 1 – GENERAL

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| 1.1 Section Includes | .1 | Project cleanliness. |
| | .2 | Final cleaning. |
| 1.2 Project Cleanliness | .1 | Maintain work in a tidy condition, free from accumulation of waste products and debris. |
| | .2 | Remove waste materials from site at regularly scheduled times or dispose of as directed by the Departmental Representative. |
| | .3 | Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris. |
| | .4 | Provide wildlife resistant containers for collection of waste materials and debris. |
| | .5 | Dispose of waste materials and debris off-site. |
| | .6 | Clear snow and ice from areas of work. |
| 1.3 Final Cleaning | .1 | When work is substantially performed, remove surplus products, tools, construction machinery, and equipment not required for performance of remaining work. |
| | .2 | Remove waste products, debris, and materials used in construction. Reinstall the work site to the conditions pre-existing and to the satisfaction of the Departmental Representative as discussed in Section 01 25 20 Mobilization and Demobilization. |
| | .3 | Prior to final review, remove surplus products, tools, construction machinery, and equipment. |
| | .4 | Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris. |
| | .5 | Inspect finishes and fitments and ensure specified workmanship and operation. |
| | .6 | Remove dirt and other disfiguration from exterior surfaces. |
| | .7 | Remove debris and surplus materials from crawl areas and other accessible concealed spaces. |
| | .8 | Sweep and wash clean paved areas. |
| | .9 | Clean drainage systems. |

END OF SECTION

PART 1 – GENERAL

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| 1.1 Section Includes | .1 | Inspection and declaration. |
| 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 the Departmental Representative in writing of satisfactory completion of the Contractor's Inspection and that corrections have been made. |
| | .2 | Request the Departmental Representative's Inspection. |
| | .2 | Departmental Representative's Inspection: The Departmental Representative and Contractor will perform inspection of work to identify obvious defects or deficiencies. Contractor shall correct work accordingly. |
| | .3 | Completion: Submit written certification that the following have been performed: |
| | .1 | Work has been completed and inspected for compliance with Contract Documents. |
| | .2 | Defects have been corrected and deficiencies have been completed. |
| | .3 | Work is complete and ready for final inspection. |
| | .4 | Final Inspection: When the items noted above are completed, request final inspection of work by the Departmental Representative and Contractor. If work is deemed incomplete by the Departmental Representative, complete the outstanding items and request re-inspection. |

END OF SECTION

PART 1 – GENERAL

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| 1.1 Section Includes | .1 | Submissions. |
| | .2 | Recording actual site conditions and as-built drawings. |
| | .3 | As-built survey. |
| 1.2 Submissions | .1 | Submit submissions for Departmental Representative review. Following each review the submission may be returned with the Departmental Representative's comments. Revise and re-submit submission per the comments provided. |
| | .2 | Provide the following submissions to the Departmental Representative within two weeks of substantial performance: |
| | .1 | As-built survey. |
| | .2 | As-built drawing and shop drawing mark-ups. |
| 1.3 Recording Actual Site Conditions and As-Built Drawings | .1 | The Departmental Representative will provide one digital file version of Issued for Construction (or Issued for Tender) drawings for use by the Contractor to record as-built conditions and submit at the completion of the project as the "As-built Drawings". |
| | .2 | Record information concurrently with construction progress on the Issued for Construction drawings. Do not conceal work until the required information is recorded. |
| | .3 | Legibly mark each item on the Issued for Construction (or Issued for Tender) drawings and Shop Drawings in red ink to record actual construction conditions and any changes made by addenda and change orders. |
| | .4 | Maintain record documents in clean, dry, and legible condition. |
| | .5 | Keep record documents available for inspection by the Departmental Representative. |
| | .6 | Submit to the Departmental Representative one copy of Issued For Construction (or Issued for Tender) drawings which have been marked by the Contractor up to include all "as-built" conditions. |
| 1.3 As-Built Survey | .1 | At the completion of the work complete an as-built survey of the works. At a minimum the survey shall include. |
| | .1 | Topo of all areas disturbed and modified during |

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- construction (limit of clearing to limit of clearing incl. cut and fill slopes, embankment and gravels placed).
- .2 Culvert (inverts at inlet and outlet).
 - .3 Edge of asphalt.
 - .4 Riprap.
 - .5 Any other feature or elements of work incorporated into the project.
- .2 The survey to include sufficient point density to adequately characterize the work. Survey methods and point density is subject to prior approval of the Departmental Representative. At a minimum the Contractor shall survey all features at 10 station intervals and the location of all treatment boundaries including changes in material type / placement, changes in surface treatment, and changes in terrain.
 - .3 Survey data shall be collected at an accuracy of +/- 0.020 m horizontal and +/- 0.020 m vertical or better and shall be referenced to the local survey control as shown on the contract drawings.
 - .4 Survey data shall be provided to the Departmental Representative in digital xyz format with an appropriate descriptor code as to the type of material surface or feature being surveyed.

END OF SECTION

PART 1 – GENERAL

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| 1.1 Section Includes | .1 | Measurement and payment procedures. |
| | .2 | Materials. |
| | .3 | Existing Culvert. |
| 1.2 Measurement and Payment Procedures | .1 | Measurement and Payment for the completion of Selective Site Demolition will not be made and the work shall be considered incidental to the Concrete Box Culvert and other work as applicable. |

PART 2 – MATERIALS

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| 2.1 Materials | .1 | Not Used. |
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PART 3 – EXECUTION

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| 3.1 Existing Culvert | .1 | Take all necessary precautions as outline in Section 01 35 43 – Environmental Protection and the Contractor's EPP to mitigate against sediment transport and other environmental pollution or damage during construction. |
| | .2 | Excavate and remove existing culvert and associated components within the limits of the work. Dispose of the culvert in an offsite disposal facility permitted to accept the culvert materials and acceptable to the Departmental Representative. |
| | .3 | Unless noted otherwise in Section 31 23 33 – Excavation, Trenching, Backfilling and Compaction, dispose of the material offsite in a location and condition acceptable to the Departmental Representative. |
| | .4 | If desired, culvert can be disposed of at PCA's maintenance yard. See Section 01 11 10 – Summary of Work, Section 1.7: Use of Owner Maintenance Yard. |

END OF SECTION

PART 1 – GENERAL

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|--------------------------|---|
| 1.1 Section Includes | .1 Definitions. |
| | .2 Submittals. |
| | .3 Storage and handling. |
| | .4 Transportation. |
| | .5 Materials. |
| | .6 Disposal. |
| 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. |
| | .4 Workplace Hazardous Materials Information System (WHMIS): A Canada-wide system designed to give employers and workers information about hazardous materials used in the workplace. Under WHMIS, information on hazardous materials is to be provided on container labels, material safety data sheets (MSDS), and worker education programs. WHMIS is put into effect by a combination of federal and provincial laws. |
| 1.3 Submittals | .1 Submit product data in accordance with Section 01 33 00 – Submittal Procedures. |
| | .2 Submit to the Departmental Representative a current Material Safety Data Sheet (MSDS) for each hazardous material required prior to bringing hazardous material on-site. |
| 1.4 Storage and Handling | .1 Abide by internal requirements for labeling and storage of materials and wastes. If required coordinate storage of hazardous materials with the Departmental Representative. |
| | .2 Store and handle hazardous materials and wastes in accordance |

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- with applicable federal and provincial laws, regulations, codes, and guidelines.
- .3 Store and handle flammable and combustible materials in accordance with current National Fire Code of Canada requirements.
 - .4 Store all flammable and combustible liquids in approved safety cans bearing the Underwriter's Laboratory of Canada or Factory Mutual seal of approval.
 - .5 Transfer of flammable and combustible liquids is prohibited within buildings.
 - .6 Transfer of flammable and combustible liquids will not be carried out in the vicinity of open flames or any type of heat-producing devices.
 - .7 Flammable liquids having a flash point below 38°C, such as naphtha or gasoline, will not be used as solvents or cleaning agents.
 - .8 Store flammable and combustible waste liquids for disposal in approved containers located in a safe, ventilated area. Keep quantities to a minimum.
 - .9 Observe smoking regulations at all times. Smoking is prohibited in any area where hazardous materials are stored, used, or handled.
 - .10 Abide by the following storage requirements for quantities of hazardous materials and wastes in excess of 5 kg for solids, and 5 L for liquids:
 - .1 Store hazardous materials and wastes in closed and sealed containers that are in good condition.
 - .2 Label containers of hazardous materials and wastes in accordance with WHMIS.
 - .3 Store hazardous materials and wastes in containers compatible with that material or waste.
 - .4 Segregate incompatible materials and wastes.
 - .5 Ensure that different hazardous materials or hazardous wastes are not mixed.
 - .6 Store hazardous materials and wastes in a secure

storage area with controlled access.

- .7 Maintain a clear egress from storage area.
 - .8 Store hazardous materials and wastes in a manner and location which will prevent them from spilling into the environment.
 - .9 Have appropriate emergency spill response equipment available near the storage area, including personal protective equipment.
 - .10 Maintain an inventory of hazardous materials and wastes, including product name, quantity, and date when storage began.
 - .11 Ensure personnel have been trained in accordance with WHMIS requirements.
 - .12 Report spills or accidents involving hazardous materials immediately the Departmental Representative. Submit a written spill report to the Departmental Representative within 24 hours of incident.
 - .13 Store and handle all hazardous materials away from any water course as outlined in Section 01 35 43 – Environmental Protection.
- 1.5 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.

PART 2 – PRODUCTS

2.1 Materials

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

PART 3 – EXECUTION

3.1 Disposal

- .1 Dispose of hazardous waste materials in accordance with

applicable federal and provincial acts, regulations, and guidelines. Costs for disposal to be considered incidental to the work.

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

END OF SECTION

PART 1 – GENERAL

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| 1.1 Section Includes | .1 Measurement and Payment Procedures. |
| | .2 References. |
| | .3 Submittals. |
| | .4 Quality Management. |
| | .5 Concrete. |
| | .6 Concrete Mixes. |
| | .7 General. |
| | .8 Formwork. |
| | .9 Delivery, Storage, and Handling. |
| | .10 Preparation. |
| | .11 Placement and Finishing. |
| | .12 Curing. |
| | .13 Surface Tolerance. |
| 1.2 Measurement and Payment Procedures | .1 Measurement and Payment for the completion of Cast-in-place Concrete will not be made and the work shall be considered incidental to the Concrete Box Culvert and other work as applicable. |
| 1.3 References | .1 Canadian Standards Association (CSA): |
| | .1 CAN/CSA-A23.1-M, Concrete Materials and Methods of Concrete Construction. |
| | .2 CAN/CSA-A23.2-M, Methods of Test for Concrete. |
| | .3 CAN/CSA-A5-M, Portland Cement |
| | .4 CSA A363-M, Cementitious Hydraulic Slag |
| | .5 CAN/CSA-G30.18-M, Billet-Steel Bars for Concrete Reinforcement. |
| 1.4 Submittals | .1 Submittals in accordance with Section 01 33 00 – Submittal Procedures. |

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| | .2 | One week prior to installation, the Contractor shall provide to the Departmental Representative for review and approval the proposed mix design for the cast-in-place concrete, see Section 3.1 below for more details. |
| 1.5 Quality Management | .1 | The Departmental Representative may undertake, through an independent CSA-certified testing firm, random sampling, inspection, and testing for the purpose of Quality Assurance. |
| | .2 | Provide access to all portions of the work and cooperate with the Departmental Representatives. |
| | .3 | Make space available for storage and curing of test samples. |
| | .4 | Allow ample time for notification and inspection before scheduling concrete placement. |
| | .5 | In the case of the ambiguity whether the product or work conforms to the applicable standard, the Departmental Representative reserves the right to have such product of system tested or re-inspected to ascertain the conformance. |
| | .6 | Upon request, the Contractor will furnish the Departmental Representative with the concrete production records used in the work. |

PART 2 – PRODUCTS

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| 2.1 Concrete | .1 | Sulphate resistant Exposure class: C-1 |
| | .2 | Portland cement: to CAN3-A23.1-M |
| | .3 | Water: to CAN3-A23.1-M |
| | .4 | Aggregates: to CAN3-A23.1-M |
| | .5 | Air entraining Admixtures: to CAN3-A266.1-M |
| 2.2 Concrete Mixes | .1 | Proportion concrete in accordance with CAN3-A23.1-M to yield the following properties. |
| | .1 | Type 10 cement, 300 kg/m ³ . |
| | .2 | Minimum compressive strength at 28 days: 30 Mpa. |
| | .3 | Nominal size of course aggregate: 20 mm. |

- .4 Slump at time and point of discharge: 130 mm +/- 30 mm.
- .5 Air content: 4 – 7 %.
- .6 Calcium Chloride or admixtures containing chloride ions shall NOT be permitted.
- .7 Water cement ratio: 0.40.
- .8 Maximum 25% by mass of cementing materials.
- .2 Do not change concrete mix without prior approval of the Departmental Representative. Should change in material source be proposed, new mix design to be submitted to the Departmental Representative for compliance acceptance.

PART 3 – EXECUTION

3.1 General

- .1 Undertake the concrete mix design and pay for all costs associated with the development, testing, and submissions of the mix design.
- .2 Submit mix design for each concrete plant proposed for use to the Departmental Representative for compliance acceptance at least 14 days prior to concrete placement. Mix design documentation shall include all components of the mix and quantities of the materials used. Additional requirements of the mix design:
 - .1 Expected method of batching, transporting, and placing concrete.
 - .2 Distance and expected travel time from batch plant location to project site.
- .3 No concrete shall be placed prior to receiving Departmental Representative's acceptance of the mix design.

3.2 Formwork

- .1 Install formwork to ensure areas of cast-in-place concrete visible upon completion of the work have a straight and uniform finish (+/- 20 mm).
- .2 Install formwork to ensure 10 mm – 15 mm gap remains once Concrete Box Culvert removable lids are installed.
- .3 Ensure minimize dimensions for cast-in-place concrete are achieved. Utilize common fill and granular base for remaining formwork as needed.

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| 3.3 Delivery, Storage, and Handling | .1 | Concrete shall be fully discharged and placed within 3 hours after water and cement have been combined. Any proposed deviation from this requirement must be pre-approved by the Departmental Representative. To obtain pre-approval the contractor shall submit in writing the proposed methodology to ensure all concrete strength and other requirements are achieved. Regardless of the proposed methodology submitted, the Departmental Representative is under no obligation to deviate from this requirement. |
| | .2 | Concrete delivery: ensure that continuous concrete delivery from plant meets CSA A23.1/A23.2. |
| | .3 | Waste Management and Disposal: |
| | .1 | Divert unused concrete materials from the site to a local landfill facility approved by the Departmental Representative. |
| | .2 | Washing of concrete trucks not permitted within Waterton Lakes National Park. Any washing shall occur at designated areas outside park limits. |
| | .3 | Unused admixtures and additive materials must not be disposed of into sewer systems, into lakes, streams, onto ground, or in other locations where it will pose health or environmental hazard. |
| | .4 | Prevent admixtures and additive materials from entering drinking water supplies or streams. Using appropriate safety precautions, collect liquid or solidify liquid with inert, non-combustible material and remove for disposal. Dispose of waste in accordance with applicable local, provincial/territorial, and national regulations. |
| 3.4 Preparation | .1 | Obtain the Departmental Representative's approval before placing concrete. |
| | .1 | Provide 24 hours' notice prior to placing of concrete. |
| 3.5 Placement and Finishing | .1 | Prior to placing concrete obtain approval from the Departmental Representative of proposed method of protection of concrete during placing and curing in adverse weather or when air temperatures are less than 5 degrees Celsius or greater than 30 degrees Celsius. |

- .2 Comply with hot/cold weather concrete fabrication, placement, and curing requirements as per CSA-23.1-09.
 - .3 Convey the concrete at the site utilizing equipment of the design, size, and condition to deposit a continuous and adequate supply of concrete of the specified mix and consistency without segregation at the required locations.
 - .4 During concreting operations:
 - .1 Development of cold joints is not allowed.
 - .2 Ensure concrete delivery and handling facilitates placing with minimum of re-handling and without damage to existing structure or work.
 - .3 Addition of water to the batch is not permitted.
 - .4 One adjustment of air on site may be allowed provided that the adjustment is done under the supervision of the qualified personnel.
 - .5 Ensure reinforcement and inserts are not disturbed during concrete placement.
 - .6 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature, and test samples taken.
 - .7 Vibrate all concrete to achieve proper consolidation during placement.
 - .8 Concrete finishes above finish grade shall receive a steel trowelled finish with edges neatly tooled.
 - .9 Honeycombed concrete shall be cut out and replaced.
 - .10 Ensure minimum cover to reinforcement is maintained during concrete pour.
- 3.6 Curing
- .1 Maintain moist curing by approved means in accordance with CAN3-23.1-M.
 - .2 Curing compounds may only be applied at the acceptance of the Departmental Representative. Only curing compounds which meet the requirements of ASTM C309 will be accepted for use.
- 3.7 Surface Tolerance
- .1 Concrete tolerance in accordance with CSA-A23.1/A23.2-09.

END OF SECTION

PART 1 – GENERAL

1.1 Section Includes

- .1 Measurement and Payment Procedures.
- .2 References.
- .3 Quality Control.
- .4 Riprap.
- .5 Common Fill.
- .6 Granular Base and Culvert Bedding Material.
- .7 Non-woven Geotextile.
- .8 Excavation.
- .9 Disposal of Excavated Material.
- .10 Placement of Riprap.
- .11 Placement of Non-woven Geotextile.
- .12 Placement and Compaction of Common Fill.
- .13 Placement and Compaction of Culvert Bedding Material.
- .14 Placement and Compaction of Granular Base Material.

1.2 Measurement and Payment Procedures

- .1 Payment for excavation of the existing stream bed channel will be made on the basis of the Price per Unit Bid for “Channel Excavation” in the Bid and Acceptance Form. The Price per Unit Bid shall include all costs included with the excavating, transport, off-site disposal of waste material, and all other items necessary for successful completion of the work.
- .2 Measurement for Payment for completion of Channel Excavation will be made on the volume of material surveyed in cubic metres, as measured by before and after surveys, excavated and removed off-site, and accepted by the Departmental Representative.
- .3 Payment for the supply, transport, and placement of riprap and non-woven geotextile will be made on the basis of the Price per Unit Bid for “Riprap and Non-woven Geotextile” in the Bid and Acceptance Form. The Price per Unit Bid shall include all costs for the preparation and trimming of slopes,

excavation and offsite disposal (as necessary), placement of transition material downstream of the riprap, supply and placement of riprap and non-woven geotextile and all other items necessary for the successful completion of the work.

.4 Measurement for Payment for completion of Riprap and Non-woven Geotextile will be made by Lump Sum based on the percentage of the work completed and accepted by the Departmental Representative.

.5 Payment for the supply, transport, placement, and compaction of Common Fill and Granular Base materials will be made on the basis of the Price per Unit Bid for "Common Fill" and "Granular Base" in the Bid and Acceptance Form. The Price per Unit Bid shall include all costs included with the successful completion of the work.

.6 Measurement for Payment for completion of Common Fill will be made by Lump Sum based on the percentage of the work completed and accepted by the Departmental Representative. Measurement for Payment for completion of and Granular Base will be made on the volume of material surveyed in cubic metres, as measured by before and after surveys, in a compacted state, and accepted by the Departmental Representative.

1.3 References

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

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

.2 ASTM D6938-10 Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods.

1.4 Quality Control

.1 All Quality Control testing shall be performed by the Contractor. See Section 01 45 00 – Quality Management for testing requirements.

PART 2 – PRODUCTS

2.1 Riprap

.1 Riprap shall be 50 Kg Class Riprap shall conform with the following requirements:

.1 Stone consisting of hard durable particles free from clay lumps, frozen material and other deleterious materials, and free from splits, seams or defects

likely to impair its soundness during handling or under action of water.

- .2 Is a graded material conforming with the following gradation limits:

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

- .3 Neither the breadth or the thickness of any individual piece of material is to be less than one-third of its length. A maximum of 2.0 percent by weight of such pieces will be permitted.

2.2 Common Fill

- .1 Common Fill shall be materials excavated during the Channel Excavation process or materials excavated to facilitate the removal of the existing CSP and install of the Concrete Box Culvert. The excavated material proposed for reuse by the Contractor shall be sorted to meet the following requirements:

- .1 The material shall consist of hard durable particles free from clay lumps, frozen material, organic matter, and other deleterious materials.
- .2 The maximum particle diameter does not exceed the maximum material placement lift thickness as designated elsewhere in these specifications.

2.3 Granular Base and Culvert Bedding Material

- .1 Granular Base and Culvert Bedding Material shall conform with the following requirements:

- .1 The material shall consist of hard durable particles free from clay lumps, frozen material, organic matter, and other deleterious materials.
- .2 When tested in accordance to ASTM C136, or latest issue, the material shall have a gradation conforming to the following gradation limits:

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

- .3 Liquid limit when tested in accordance to ASTM D4318-00, maximum 25.
- .4 Plasticity index when tested in accordance to ASTM D4318-00, maximum 6.
- .5 Los Angles degradation when tested in accordance to ASTM C131-01, maximum percent loss by weight 35.
- .6 Fracture, at least 60% of particles by mass retained on 4.75 mm sieve to have at least one freshly fractured face.

2.4 Non-woven Geotextile

- .1 The non-woven geotextile shall be Nilex 4510E or pre-approved equivalent.

2.5 Transition Material

- .1 Transition material shall be material excavated from the channel bed during the install of the riprap.

PART 3 – EXECUTION

3.1 Excavation

- .1 Complete Channel Excavation by excavating the existing stream bed to the approximate lines as indicated on the Contract Drawings and as accepted by the Departmental Representative.
- .2 Following excavation of the culvert designated for removal (see Section 02 41 13 – Selective Site Demolition and Section 33 42 13 – Concrete Box Culvert), complete excavation to facilitate the install of the Concrete Box Culvert and bedding material.
- .3 Excavate the roadway to the lines and grades as indicated on the Contract Drawings to allow for a minimum of 150 mm thickness of granular road base below the asphalt as shown on Contract Drawings.

3.2 Disposal of Excavated Material

- .1 Excavated material not suitable for re-use as Common Fill and/or excess excavation shall be disposed of offsite. If desired, material can be disposed of at PCA's maintenance yard. The location is described in Section 01 11 10 – Summary of Work, Section 1.7: Use of Owner Maintenance Yard.

3.3 Placement of Riprap

- .1 The bank protection material (Riprap) shall be loaded, transported, and placed with care to ensure that material does not break or reduce in size smaller than the actual material size requirements when placed.
- .2 Place materials on a clean surface, properly shaped per the lines and grades shown in the Contract Drawings and free from debris, snow and ice or other deleterious material.
- .3 Place Non-woven Geotextile per Section 3.4 – Placement of Non-woven Geotextile
- .4 Materials shall be placed to the lines and thickness shown on the Contract Drawings. Field fit riprap on each side of culvert to the existing topography as shown on contract drawings. Thickness of riprap shall be measured perpendicular to the bank.
- .5 Place material using methods that do not lead to segregation or degradation of aggregate. Do not place by end dumping from haul units.
- .6 Do not drop materials from a height greater than 0.5 m vertically from its final position.
- .7 Place materials commencing at the toe of the slope and proceeding up the slope. Material shall be densely placed and individual stones shall be worked with placement equipment to form a well-keyed surface.
- .8 Materials not conforming to the requirements of this section shall be removed from the project site with the expense of the removal borne by the Contractor.
- .9 The Contractor shall ensure that the construction methods adopted produces a finished surface that is comprised of the full spectrum of particle sizes continuously throughout its length and breadth.
- .10 Dress all Riprap voids so that the final surface is well keyed, densely placed, and uniform. The Departmental Representative will require that all surface voids be filled into

which a rock having a mass equal or greater than 25% of the maximum stone mass can be placed.

.11 Maintain finished material surfaces in a condition conforming to this section until acceptance.

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

.13 Place transition material adjacent to the riprap on the downstream side of the proposed riprap to the limits shown on the drawings and as accepted by the Departmental Representative. Dispose offsite excess excavated material.

3.4 Placement of Non-woven Geotextile

.1 Place Non-woven Geotextile material by unrolling onto excavated / graded surface in the locations indicated on contract drawings and retain in position with pins. All nonwoven geotextile placed on a slope shall at a minimum be secured with pins min 300 mm long every 2 m² of geotextile.

.2 Place Non-woven Geotextile material smooth and free of tension stress, folds, wrinkles and creases.

.3 Place Non-woven Geotextile material on sloping surfaces in one continuous length from toe of slope to upper extent of nonwoven geotextile.

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

.1 Non-woven Geotextile placed higher on slope is placed above geotextile placed lower on slope.

.5 Pin successive strips of Non-woven Geotextile with securing pins at 1000 mm interval at midpoint of lap.

.6 Protect installed Non-woven Geotextile material from displacement, damage or deterioration before, during and after placement of material layers.

.7 Replace damaged or deteriorated Non-woven Geotextile to approval of Departmental Representative.

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

3.5 Placement and Compaction
of Common Fill

- .1 Following completion of excavation, place Common Fill to the design lines and grades, cross sections and dimensions as shown on the Contract Drawings.
- .2 Place and compact in layers not exceeding 300 mm compacted thickness. Add water or dry as required to bring moisture content of materials to level required to achieve specified compaction.
- .3 Place Common Fill using methods which do not lead to segregation or degradation.
- .4 Compact each layer to minimum 98% standard maximum dry density (ASTM D698-12). If more than 30% of the Common Fill material is oversized (retained on a 19 mm sieve), test compaction of the Common Fill using proof rolling.

Proof rolling shall require one complete coverage of the entire Common Fill area for each lift by the tires of a truck having a 9 tonne single axle dual tire or 17 tonne tandem axle group with dual tires with a tire pressure of 600 kPa.

When testing the compaction of the Common Fill material using proof rolling, the material shall be considered compacted when upon completing a pass over the Common Fill area, the embankment exhibits no observed unsuitable deflections or rutting.
- .5 Finished Common Fill surface to be within +/- 0.025 m of design lines and grades but not uniformly high or low.

3.6 Placement and Compaction
of Culvert Bedding Material

- .1 Culvert Bedding Material to conform with the following requirements:
 - .1 Following completion of excavation and dewatering as necessary, place Granular Base in minimum 150 mm thickness to the design lines and grades shown on the Contract Drawings.
 - .2 Place and compact in layers not exceeding 300 mm compacted thickness. Add water or dry as required to bring moisture content of materials to level required to achieve specified compaction.
 - .3 Place Culvert Bedding Material using methods which do not lead to segregation or degradation.

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|--|----|---|
| | .4 | Compact to minimum 100% standard maximum dry density to ASTM D698-12. Compaction testing frequencies shall comply with Section 01 45 00 Quality Management, Part 1.8 Quality Control Testing. |
| | .5 | Finished Culvert Bedding surface to be within +/- 0.020 m of design lines and grades but not uniformly high or low. |
| 3.7 Placement Compaction of Granular Base Material | .1 | Install Granular Base to conform with the following requirements: |
| | .1 | Following completion of excavation, place Granular Base in minimum 150 mm thickness up to the design bottom of concrete asphalt grade as shown on the Contract Drawings. |
| | .2 | Place and compact in layers not exceeding 300 mm compacted thickness. Add water or dry as required to bring moisture content of materials to level required to achieve specified compaction. |
| | .3 | Place Granular Base using methods which do not lead to segregation or degradation. |
| | .4 | Compact to minimum 100% standard maximum dry density to ASTM D698-12. Compaction testing frequencies shall comply with Section 01 45 00 Quality Management, Part 1.8 Quality Control Testing. |
| | .5 | Finished Granular Base surface to be within +/- 0.020 m of design lines and grades but not uniformly high or low. |

END OF SECTION

PART 1 – GENERAL

- | | | |
|--|----|---|
| 1.1 Section Includes | .1 | Measurement and Payment Procedures. |
| | .2 | References. |
| | .3 | Submittals. |
| | .4 | Quality Management. |
| | .5 | Materials. |
| | .6 | General. |
| 1.2 Measurement and Payment Procedures | .1 | Payment for the Asphalt Concrete Pavement will be made on the basis of the Price per Unit Bid for “Asphalt Concrete Pavement” in the Bid and Acceptance Form. The Price per Unit Bid shall include all costs included with the successful completion of the work, including but not limited to all materials, processing, plant mixing, loading, hauling, placement, compacting, and all other items necessary for successful completion of the work. |
| | .2 | Measurement for Payment for completion of Asphalt Concrete Pavement will be made by the area of material measured in square metres incorporated into the work and accepted by the Departmental Representative. |
| | .3 | Contrary to the City of Lethbridge Infrastructure Services Section 05140 Part 5 and 6, Payment Adjustments will not be utilized for payment on this project. |
| 1.3 References | .1 | City of Lethbridge Infrastructure Services specifications for Asphalt Concrete Pavement can be found at the following website address: |
| | .1 | http://www.lethbridge.ca/Doing-Business/Planning-Development/Urban-Construction-Right-of-Way-Coordination/Documents/Section%2005140.pdf |
| | .2 | http://www.lethbridge.ca/Doing-Business/Planning-Development/Urban-Construction-Right-of-Way-Coordination/Documents/Section%2005130.pdf |
| 1.4 Submittals | .1 | The Contractor shall submit in writing to the Departmental Representative for review and approval the Mix Design a minimum of five (5) days prior to commencing Asphalt Concrete Pavement. Upon approval by the Departmental |

Representative, the Mix Design will become the Job Mix Formula for the Project.

- .2 Upon request, the Contractor shall furnish the Departmental Representative with Asphalt Concrete production records from the asphalt plant showing compliance with the Job Mix Formula.

1.5 Quality Management

- .1 The Departmental Representative may undertake, through an independent CSA-certified testing firm, random sampling, inspection, and testing for the purpose of Quality Assurance.

PART 2 – PRODUCTS

2.1 Materials

- .1 Aggregate materials used shall be in accordance with City of Lethbridge Infrastructure Services Section 05140 – Section 2.1 Materials for Mix Type III.
- .2 Asphalt Cement shall be in accordance with City of Lethbridge Infrastructure Services Section 05130 – Section 2.1 Materials.

PART 3 – EXECUTION

3.1 General

- .1 Asphalt Concrete Pavement shall be installed to the design lines and grades shown on the Contract Drawings to a 75 mm thickness upon compaction.
- .2 Supply, transport, place and compact the Asphalt Concrete Pavement in accordance with the City of Lethbridge Infrastructure Services Section 05140 – Part 4 Execution and in accordance with the following production tolerances:
 - .1 Production Tolerances in accordance with City of Lethbridge Infrastructure Services Section 05140 – Part 2.4 Production Tolerances.
 - .2 The mean Pavement Compaction shall be equal to or greater than 97 % of the Lot Mean Maximum Relative Density.

END OF SECTION

PART 1 – GENERAL

- | | |
|--|---|
| 1.1 Section Includes | <ul style="list-style-type: none">.1 Measurement and Payment Procedures.2 Product data..3 Quality Assurance..4 Product handling and storage..5 Materials..6 Location..7 General: Seeding..8 Hydraulic Seeding..9 Cleaning. |
| 1.2 Measurement and Payment Procedures | <ul style="list-style-type: none">.1 Payment for Hydraulic Seeding will be made on the basis of the Price per Unit Bid for Hydraulic Seeding in the Bid and Acceptance Form. The Price per Unit Bid shall include all costs for supply, placement, warranty, and maintenance of the Hydraulic Seeding in all areas of disturbance outside the roadway driving surface, except areas of Riprap or as directed by the Departmental Representative..2 Measurement for Payment for completion of Hydraulic Seeding will be made by Lump Sum based on the percentage of the work completed and accepted by the Departmental Representative. |
| 1.3 Product Data | <ul style="list-style-type: none">.1 Provide product data, prior to seeding for:<ul style="list-style-type: none">.1 Seed:<ul style="list-style-type: none">.1 Shipping Bill: issued by supplier of material, identifying manufacturer and supplier, material, and net mass or volume in each container..2 Mulch.<ul style="list-style-type: none">.1 Shipping Bill: issued by supplier of material, identifying manufacturer and supplier, material, and net dry-air mass in each container. |

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- .3 Tackifier.
 - .1 Shipping Bill: issued by supplier of material, identifying manufacturer and supplier, material, and net dry-air mass in each container.
 - .4 Fertilizer
 - .1 Shipping Bill: issued by supplier of material, identifying manufacturer and supplier, material, and net dry-air mass in each container.
 - .2 Guarantees.
 - .3 Chemical Analysis.
 - .2 Submit in writing to the Departmental Representative 14 days prior to commencing work:
 - .1 Seed Certificate (certificate must be approved by the Departmental Representative prior to ordering).
 - .2 Volume capacity of hydraulic seeder in litres.
 - .3 Amount of material to be used per tank based on volume.
 - .4 Number of tank loads required per hectare to apply specified slurry mixture per hectare.
 - 1.4 Quality Assurance
 - .1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
 - 1.5 Product Handling and Storage
 - .1 The Contractor shall use all means necessary to protect all materials before, during and after installation. Provide adequate protection to materials which may deteriorate if exposed to weather.
 - .2 Fertilizer shall be packaged in waterproof bags labelled clearly, indicating net mass, analysis and manufacturer. Store on pallets and protect from weather.
 - .3 Seed to be stored in dry weatherproof place and shall be protected from damage by heat, rodents and other causes. Deliver and store grass seed in original packages with label indicating:

- .1 analysis of seed mixture;
- .2 percentage of pure seed by weight;
- .3 year of production;
- .4 net mass, and
- .5 date tagged and location.

PART 2 – PRODUCTS

2.1 Materials

- .1 Seed:
 - .1 Approved seed mix, by weight: Shall be Certified Canada No. 1 Grade quality seed varieties, in accordance with the Canadian Seeds Act and Regulations, and having a minimum purity of 97% and germination of 75%. Seed shall be free of impurities and disease.
 - .2 Seed mix shall conform to the requirements of Appendix 5 of the Belly River Group Campground Culvert Replacement Mitigation Package (Appendix A).
 - .3 Seeding rate to be 40 kg/ha for hydraulic seeding.
 - .4 Seed mix shall be certified free of Noxious weeds and other undesirable species. Other non-native species may be acceptable, at the discretion of the PCA Vegetation Ecologist.
- .2 Fertilizer:

Fertilizer shall be a 45-25-20 mixture. This fertilizer shall be applied at the time of seeding at a rate of 125kg/ha.

 - .1 Contractor to verify fertilizer blend and application rate following testing of topsoil.
- .3 Water:

Water shall be free of impurities that would inhibit germination and growth as available.
- .4 Soil Stabilizer/Tackifier:

Soil Stabilizer/Tackifier: shall be a non-toxic, colourless copolymer emulsion with no less than 52.6% solids.

- .1 Acceptable product is: Soil Master WR or approved alternate. Supplier: Target Products, Phone: 1-800-575-7700.
- .5 Mulch:
Wood fibre mulch shall be manufactured from virgin wood fibres and contain not less than 3% of an organic tackifier by volume. Cellulose type products are not acceptable.
- .1 Acceptable product is: Eco Fibre Plus or approved alternate. Supplier: Professional Gardener, Phone: (403) 263-4200.

PART 3 – EXECUTION

- 3.1 Location
 - .1 Apply Hydraulic Seeding in all disturbed areas approved by the Departmental Representative at the completion of the work (excluding riprap, roadway and stream channel).
- 3.2 General: Seeding
 - .1 Contractor shall mechanically remove any weeds prior to seeding. Weed removal will be incidental to the work.
 - .2 The Contractor shall ensure that equipment is steam cleaned, free of soil and seed from previous project to prevent site contamination.
 - .3 Contractor shall not perform work under adverse field conditions such as frozen soil, excessively wet or dry soil, or soil covered with snow, ice or standing water.
 - .4 Contractor shall hydraulic seed only during dry weather conditions with no rain forecasted for the next 24 hours and ensuring a seasonably dry seedbed to provide for proper curing of soil stabilizers/tackifier. Contractor shall check weather conditions to ensure soil stabilizer has sufficient time to cure prior to heavy rainfall.
 - .5 In areas where seed fails to germinate for whatever reason, the Contractor shall re-cultivate and reseed until acceptable germination takes place.
- 3.3 Hydraulic Seeding
 - .1 The following application rates are the minimum required for hydraulic seeding:
 - .1 Seed: 100 kg/hectare
 - .2 Fertilizer: 45-25-20 125 kg/hectare
 - .3 Mulch: 500 kg/hectare

- .4 Soil Stabilizer/tackifier: Soil Master WR 1300 L/hectare
- .5 Water: 30,000 L minimum
- .2 The Contractor shall measure quantities of materials by weight, or weight calibrated volume measurement.
- .3 The Contractor shall fill the tank half full with required water and add mulch while continuing to fill with water. Seed mix and fertilizer is to be added. All material is to be added into the hydraulic seeder under agitation. The Contractor shall pulverize mulch with tackifier and charge slowly into seeder.
- .4 The Contractor shall charge soil stabilizer/tackifier into seeder after all other material is well mixed in seeder. Contractor shall mix slowly to avoid foaming but thoroughly to complete slurry.
- .5 The Contractor shall use hydraulic seeding equipment with a minimum slurry tank capacity of 4500 litres.
- .6 The Contractor's equipment shall have an agitation system for slurry capable of operating during charging of tank and during seeding, consisting of recirculation of slurry and mechanical method:
 - .1 Pumps shall be capable of maintaining a continuous non-fluctuating flow of solution.
 - .2 Equipment shall be capable of seeding up to 150 m distance from hydraulic seeder using hand operated hoses and appropriate nozzles.
- .7 The Contractor shall apply slurry when wind velocities will not affect the application and cause the mixture to be blown.
- .8 The Contractor shall apply slurry uniformly, at optimum angle of application for adherence to surfaces and germination of seed. Ensure good contact of slurry with soil with minimal air pockets.
- .9 The Contractor shall use the correct nozzle(s) for application and use hoses to access difficult to reach surfaces and to control application.
- .10 The Contractor shall ensure that the application is uniform and the surface is evenly covered. Contractor shall blend into

retained landscape for approximately 1 metre.

- .11 The Contractor shall ensure that the application does not spray onto structures, signs, guiderails, plant material, and other than surfaces intended.

3.4 Cleaning

- .1 The Contractor shall clean all structures, appurtenances and natural features not designated to be seeded of any overspray.
- .2 Clean-up immediately, any material sprayed where not intended.

END OF SECTION

PART 1 – GENERAL

- | | | |
|--|----|--|
| 1.1 Section Includes | .1 | Measurement and payment procedures. |
| | .2 | Delivery, storage, and handling. |
| | .3 | Culvert. |
| | .4 | Culvert Bedding and Backfill. |
| | .5 | General. |
| | .6 | Culvert Fabrication. |
| | .7 | Existing Culvert Removal. |
| | .8 | Culvert Placement. |
| | .9 | Culvert Backfilling. |
| 1.2 Measurement and Payment Procedures | .1 | Payment for the supply and install of the Concrete Box Culvert to the lines and grades as indicated on the Contract Drawings will be made on the basis of the Price per Unit Bid for “Concrete Box Culvert” in the Bid and Acceptance Form. The Price per Unit Bid shall include all costs for the work including: |
| | .1 | The excavation, removal and off-site disposal of the existing in-place 900 mm diameter pipe culvert. |
| | .2 | The design and production of P.Eng. sealed shop drawings for new Concrete Box Culvert. |
| | .3 | The supply, transport, excavation, bedding material, install, backfill, compaction and hardware of the Concrete Box Culvert. |
| | .4 | Cast-in-place concrete following the installation of the Concrete Box Culvert. |
| | .5 | All other items necessary for successful completion of the work |
| | .2 | Measurement for Payment for the Concrete Box Culvert will be made by Lump Sum based on the percentage of the work completed and accepted by the Departmental Representative. |
| 1.3 Delivery, Storage, and Handling | .1 | Handle and store products in a manner to avoid damage, alteration, deterioration and soiling. |

- .2 Where the material supplied is damaged, the Contractor shall contact the Departmental Representative immediately. Culvert material designated by the Departmental Representative as unacceptable, due to damage or failure to meet specified requirements, shall be immediately repaired or replaced by the Contractor to the acceptance of the Departmental Representative.
- 1.4 Submittals
- .1 The Contractor shall provide to the Departmental Representative for review and acceptance, P.Eng. sealed (Alberta registered) shop drawings of the Concrete Box Culvert prior to ordering or commencing fabrication work.
- .2 The Contractor shall provide to the Departmental Representative for review and acceptance the concrete mix design for the Concrete Box Culvert by the prior to ordering or commencing fabrication work.
- .3 The Contractor shall provide to the Departmental Representative the precast Concrete Box Culvert manufacturer certification in the appropriate category under CSA-A23.4.

PART 2 – PRODUCTS

- 2.1 Culvert
- .1 Culvert shall be:
- .1 Reinforced precast Concrete Box Culvert designed for CL-625 loading and removable lid panels to facilitate maintenance activities. Dimensions shall comply with the Contract Drawings.
- .2 Fabricated in accordance with the specifications, shop drawings, & fabricators quality management plan.
- .3 Sealed by a professional engineer guaranteeing the performance of the designed and fabricated culvert under the proposed conditions (including designed to form a watertight seal (butyl mastic jointing material and or other) upon installation between each precast concrete unit).
- .4 Manufactured by a manufacturing plant certified in the appropriate category to CSA-A23.4.
- .2 The Contractor shall be responsible for the culvert design including but not limited to:
- .1 Design of reinforcement for loading;

- .2 Design of permanent lifting hooks on each panel. Lifting hooks should be set below or flush to the top of concrete lid to provide a smooth driving surface and should be capable of withstanding impact from vehicle loading;
 - .3 Design of concrete mix design to achieve min 35 Mpa @ 28 days or higher concrete strength as required for design loading or transport.
 - .4 Design of precast box elements to CSA-A23.3 and CSA-A23.4 to carry handling stresses.
- 2.2 Culvert Bedding Material .1 Bedding material shall be Culvert Bedding Material in accordance with Section 31 23 33 – Excavation, Trenching, Backfilling and Compaction.

PART 3 – EXECUTION

- 3.1 General .1 Complete culvert installation and related works in conformance with the requirements of Section 01 35 43 – Environmental Protection and the Contractor EPP.
- .2 The Contractor shall be responsible for ensuring the equipment has sufficient capacity to perform the Work and shall also provide satisfactory support of the excavated face.
- 3.2 Culvert Fabrication .1 Manufacture culvert units in accordance with accepted shop drawings and CSA-A23.4.
- .2 Finish culvert units to standard grade to CSA-A23.4.
- 3.3 Existing Culvert Removal .1 Excavate, remove, and dispose of existing CSP culvert as per the requirements of Section 02 41 13 – Selective Site Demolition.
- 3.4 Culvert Placement .1 Place culvert such that when complete the alignment, grade, location, and inverts are in compliance with the alignment, grade, location, and inverts shown on the Contract Drawings.
- .2 Ensure bottom of culvert is in contact with compacted fill throughout its length.
- .3 Place, connect and secure culvert segments per manufacturer recommendations.
- 3.5 Culvert Backfilling .1 Culvert backfilling and compaction shall be performed in accordance with Section 31 23 33 – Excavation, Trenching,

Backfilling and Compaction: Section 3.5 Placement and
Compaction of Common Fill and Section 3.6 Placement and
Compaction of Culvert Bedding Material.

END OF SECTION

Appendix A



Parks
Canada

Parcs
Canada

Parks Canada
Waterton Lakes National Park
Mitigation Package for Project WLNP-15-025-FII762
Belly River Group Campground Culvert Replacement

Canada





Table of Contents

1.	ENVIRONMENTAL SURVEILLANCE.....	5
2.	PROJECT PLANNING / DESIGN.....	5
3.	SUBMISSIONS	6
4.	EROSION AND SEDIMENT CONTROL PLAN	6
5.	EMERGENCY RESPONSE PLAN MODULE.....	8
6.	GENERAL ACTIVITIES MITIGATIONS MODULE	10
7.	SOIL AND VEGETATION RESTORATION MITIGATIONS MODULE	14
8.	SLOPE STABILIZATION, DRILLING AND BLASTING MITIGATIONS MODULE	17
9.	ASPHALT PRODUCTION AND HANDLING MITIGATIONS MODULE	18
10.	CONCRETE HANDLING MITIGATIONS MODULE	19
11.	DRAINAGE STRUCTURES MITIGATIONS MODULE.....	20
12.	WORKS OVER OR IMMEDIATELY ADJACENT TO WATER	22
13.	WATER WITHDRAWAL AND DEWATERING MITIGATIONS MODULE.....	22

Appendices

APPENDIX 1	CONTACT INFORMATION	25
APPENDIX 2	REGULATORY GUIDANCE	26



Abbreviations

BMP	Best Management Practices
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
DFO	Department of Fisheries and Oceans
EAS	Environmental Alignment Sheets
EI	Ecological Integrity
EIA	Environmental Impact Analysis
ERP	Emergency Response Plan
ESCP	Erosion and Sediment Control Plan
IAO	Impact Assessment Officer
LEED	Leadership in Energy and Environmental Design
PCA	Parks Canada Agency
PM	Project Manager / Functional Manager of Project
SAR	Species at Risk
SARA	<i>Species at Risk Act</i>
SO	Surveillance Officer
VC	Valued Component
WLNP	Waterton Lakes National Park



1. Environmental Surveillance

- 1.1. All projects are subject to environmental surveillance by the SO to ensure that mitigation measures as outlined through the EIA process are implemented during all phases of construction, including clearing, grading, construction, cleanup, and restoration.
- 1.2. The SO will report deficiencies to the PM and summarize site visit observations in a surveillance report. The surveillance report will be filed into a database to supplement information for restoration activities in the future.
- 1.3. The Prime Contractor is responsible for keeping the SO informed of project activities and will notify the SO prior to the following activities:
 - Vegetation clearing and soil stripping < 30 m from sensitive features;
 - Activities in and < 30 m from water;
 - Species at risk mitigation measures;
 - Rare plant mitigation measures; and
 - As otherwise outlined in the project EIA.

2. Project Planning / Design

Project planning and engineering design for new projects or upgrades to existing infrastructure will incorporate consideration of environmental impacts of long term operation and the potential for Conservation Gains through improved design.

Aquatic Habitat / Water Quality

- 2.1. Minimize runoff into water bodies; direct runoff and storm water into vegetated areas rather than directly into surface waters.
- 2.2. Avoid designs and construction practices that result in long, smooth, uniform slopes and may contribute to erosion or sediment transfer.
- 2.3. Apply appropriate standards for all septic field, pit privy, and other waste water management at facilities.
- 2.4. Projects < 100 m from sensitive aquatic features including wetlands, drainages, streams, lakes and other surface water requires additional EIA to determine appropriate setbacks, mitigations and other design considerations related to aquatic habitats.

Pre-Construction Surveys

- 2.5. Prior to the commencement of project activities, the IAO may determine that field surveys are required to determine the applicability of this BMP, requirements for additional impact analysis, identify sensitive features, and determine mitigations.
- 2.6. All ground disturbance activities must be compared to local archaeological resource inventories and the IAO will consult with the Terrestrial Archaeology section. An Archaeological Overview Assessment (AOA) may be required to determine the archaeological potential of the work area. Based on the results from the AOA, an Archaeological Impact Assessment (AIA) might be required.



Survey	Required	Details
Phase I Environmental Site Assessment	<input type="checkbox"/>	
Hazardous Materials Survey	<input type="checkbox"/>	
Reconnaissance Site Visit	<input type="checkbox"/>	
Rare Plant Survey	<input type="checkbox"/>	
Wetland Survey	<input type="checkbox"/>	
Wildlife Survey (list types)	<input type="checkbox"/>	
Fish Assessment	<input type="checkbox"/>	
Soils / Geotechnical	<input type="checkbox"/>	
Cultural Resources (list type)	<input type="checkbox"/>	
AOA / AIA	<input type="checkbox"/>	
Water/Air Quality	<input checked="" type="checkbox"/>	IAO to collect water quality parameters at site prior to work commencing, during construction and following construction to ensure no leaching from project site / concrete works.
Visitor Experience	<input type="checkbox"/>	
Weed Survey	<input type="checkbox"/>	
Other	<input type="checkbox"/>	

3. Submissions

- 3.1. Check box of attachments / plans required prior to the start of construction.

Attachments / Plans	Required	Responsible Party	Reviewer and Submission Deadline
Environmental Alignment Sheets	<input type="checkbox"/>		
Erosion and Sediment Control Plan	<input checked="" type="checkbox"/>	Prime contractor	IAO – before work starts
ERP (Emergency Response Plan)	<input type="checkbox"/>		
Spill Response Plan	<input checked="" type="checkbox"/>	Prime contractor	IAO – before work starts
Fire Contingency Plan	<input type="checkbox"/>		
Avalanche Safety Plan	<input type="checkbox"/>		
Site-specific Mitigation Details	<input checked="" type="checkbox"/>	Prime contractor	IAO – before work starts
Restoration Plan	<input type="checkbox"/>		
HDD or Geotechnical Drill Plan	<input type="checkbox"/>		

4. Erosion and Sediment Control Plan

- 4.1. An Erosion and Sediment Control Plan (ESCP) will be prepared that covers all construction and restoration periods.
- 4.2. The requirements for an erosion and sediment control plan can be scaled to the scope and associated risks of the project, as determined by the IAO or SO.
- 4.3. The Erosion and Sediment Management Plan will be developed by a qualified professional and is subject to approval of the IAO.

Timing of Works

- 4.4. Schedule work to avoid extreme wet, windy and rainy periods that may increase erosion and sedimentation.



- 4.5. Avoid soil disturbing activities during periods with saturated soils, periods of runoff, high rainfall intensity, high winds, or wet snow. Temporarily stop work when wet ground conditions contribute to erosion and sediment transport.

General Mitigations

- 4.6. Erosion control measures that prevent sediment transport into any waterway, water body or wetland shall be implemented by the contractor.
- 4.7. Identify high risk areas or components of the project including areas with fine-grained soils, sandy deposits, slopes, shallow soils, or adjacent to sensitive features (e.g., riparian areas).
- 4.8. Identify sources of potential runoff (e.g., ditches, slopes) from within the construction site or from upslope areas. Construct and maintain structures to deflect sources of runoff from entering areas of exposed soils (e.g., diversion ditches, vegetative filter strips).
- 4.9. Acquire necessary erosion and sediment control equipment (i.e., landscaping fabric, sediment fences, coir rolls etc.) and install prior to risk of sediment transport.
- 4.10. Minimize slope lengths and angles, promote surface roughness on slopes, and avoid designs and construction practices that result in smooth, uniform slopes. Incorporate texture and organics into the cover of slopes to reduce soil erodibility.
- 4.11. Plan project activities to minimize soil handling.
- 4.12. Limit equipment movement over exposed soils.
- 4.13. Avoid activities that contribute to soil compaction and use practices that roughen and decompact soils to promote infiltration.
- 4.14. Ensure all activities are conducted at least 30 m from waterbodies wherever possible.
- 4.15. Minimize extent of vegetation cover removal and grubbing. Clearly mark construction boundaries to prevent accidental damage to vegetation.
- 4.16. Where vegetation cannot be retained, apply soil covers to erodible areas (granular materials, mulches, tackifier, tarps). Note that tarp covers may not be suitable at most locations in WLNP where high winds are common.
- 4.17. Minimize the length of time soils are exposed and complete work in one area before commencing work in another area.
- 4.18. If vegetation clearing is scheduled early due to timing windows, grubbing should be delayed until just prior to construction activities, in order to maintain soil stability.
- 4.19. Initiate replanting of disturbed areas immediately after construction is completed.
- 4.20. Ensure all erosion and sediment control devices are weed free. Straw and hay based erosion control is not permitted.
- 4.21. Avoid use of coconut matting due to ungulate hoof entrapment.
- 4.22. Maintain and repair all erosion and sediment control structures in a timely manner. If the design of the control measures is not functioning effectively they are to be repaired.
- 4.23. The site will be secured against erosion during any periods of construction inactivity or shutdown.
- 4.24. Install all erosion and sediment control devices according to Typical Drawings included in ESCP. Typical Drawings must be on site and available at the request of the SO.



Minimum Requirements

- 4.25. The minimum requirements of an erosion and sediment control plan include consideration of:
- Project design and spatial concept of environmental sensitivities (e.g. watercourses, wetlands, steep slopes etc.);
 - Erosion prevention procedures (e.g., project schedule, minimization of work area, site management, ground cover measures);
 - Sediment control measures (e.g. sediment fences, check dams, sediment traps, etc.) including specifications and Typical Drawings of sediment control structures;
 - Detailed plans for instream works including site isolation measures and project timelines;
 - Water management plans including site control, equipment necessary and proposed dewatering locations;
 - Locations of erosion and sediment control measure application;
 - Monitoring of prevention and control measures and corrective actions (e.g., repairs).
 - Removal of non-biodegradable materials once site is stabilized.

5. Emergency Response Plan Module

- 5.1. The general emergency contact for WLNP is 9-1-1.

Spill Response Plan

- 5.2. The Prime Contractor is responsible for ensuring that a Spill Response Plan is developed prior to start of work and the plan is subject to approval of the IAO.
- 5.3. The Prime Contractor is responsible for ensuring that spill kits sufficient to contain and clean up 110% of the site's largest possible fuel / chemical spill must be retained on site at each location of potential spills (sites where equipment is working).
- 5.4. The Prime Contractor is responsible for ensuring that all crew members and sub-consultants on site receive a briefing about the Spill Response Plan and are aware of the location and use of spill kits and containment devices.

General Mitigations

- 5.5. Avoid work in high risk areas, particularly in areas of high water table, steep slopes or in close proximity to streams.
- 5.6. Have spill containment equipment on-hand and ensure that all personnel are aware of their location and trained in their use.
- 5.7. Absorbent booms must be immediately available on site during works in and near water.
- 5.8. Ensure all construction equipment is free of leaks from oil, fuel or hydraulic fuels. See [General Activities](#) module for the requirements for equipment inspection by the SO prior to entry to WLNP.
- 5.9. The crossing of any waterbody (including wetlands) by construction equipment, or the use of such equipment within waterbodies is strictly prohibited unless prior approval has been confirmed from the SO.
- 5.10. Designate refuelling areas at least 100 m away from any water body. Refuelling activities should not be conducted where run-off could carry contaminants into drainage pathways (including storm sewers).



- 5.11. Hazardous or toxic products shall be stored no closer than 100 metres from streams, wetlands, water bodies or waterways.
- 5.12. Equipment will be fuelled on hardened surfaces wherever possible.
- 5.13. Spill kits shall be provided at re-fuelling, lubrication, and repair locations.
- 5.14. Dispose of contaminated materials at provincially certified disposal sites outside of WLNP. No treatment of contaminated soils (e.g., bioremediation) is allowed in WLNP. All applicable documentation demonstrating proper disposal will be provided to Parks Canada.
- 5.15. If potentially hazardous materials (e.g. cement-based products, sealants or paints) are used on site ensure raw material, mixed compounds and wash water are not released to any watercourse or soils. Secondary containment 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 are required.
- 5.16. All gas generators and water pumps require secondary containment. Electric pumps are preferred.
- 5.17. Follow all applicable regulations and codes for the management and handling of hazardous waste.
- 5.18. The costs involved in a spill incident (the control, clean up, disposal of contaminants and site remediation to pre-spill conditions), shall be the responsibility of the Prime Contractor. The site will be inspected by the SO to ensure completion to the expected standard and to the satisfaction of Parks Canada.
- 5.19. Timely and effective action shall be taken to stop, contain and clean-up all spills as long as the site is safe to enter. In the event of a major spill, all other work shall be stopped and all personnel devoted to spill containment and clean-up.
- 5.20. The SO shall be notified immediately of any spill. In the event of a major spill, Banff Dispatch (403-762-4506) shall be notified immediately.

A major spill is defined below:

Material	Immediate Notification Requirements	Written Spill Report Requirements
Any deleterious substance that enters a water body of any type (e.g., stream, lake, wetland, drainage, sewer) or poses a threat to human safety (e.g., slippery road, explosive hazard, poisonous gas).	Any Quantity, notify the SO and Banff Dispatch.	Required; Major Spill
Any substance that is hazardous or toxic to the environment including but not limited to, waterproofing agents, grout, cement, concrete finishing agents, hot poured rubber membrane materials, asphalt cement, sand blasting agents, paint, solvents and hydrocarbons (e.g., fuel, grease, hydraulic fluid).	<100 L, immediately notify the SO. > 100 L, immediately notify the SO and Banff Dispatch.	At the discretion of the SO. Major Spill if not contained. Required; Major Spill

Minimum Requirements

- 5.21. The Spill Response Plan must at minimum, include the following information:
 - List of products and materials 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, sand blasting agents, paint, solvents and hydrocarbons.
 - required equipment on site and location of spill kits;



- spill prevention procedures (i.e., containment and storage of materials, security, handling, use and disposal of empty containers, surplus product or waste generated in the application of these products in accordance with all applicable federal and provincial legislation);
- fuelling procedures, fuel storage;
- spill response (i.e., containment, clean-up, disposal of contaminated materials, etc.);
- spill reporting procedure; and
- up-to-date emergency response contact list including contact information for reporting spills.

Spill Reporting Requirements

5.22. Immediate spill reports are verbal notifications and must include all available information. Follow-up written spill reports must include the following:

- Prime Contractor Name
- Name and Contact Number
- Location and time the spill occurred
- Type and quantity of the substance spilled
- Cause of the spill
- Size of area the spill spread to
- Was the spill in water or on land
- Does the spill have potential to enter a water body
- Detail of immediate action taken to control the spill
- Additional actions required or ongoing to control the spill
- Any restoration required at the spill site
- Names of PCA representatives that were present at the spill site

6. General Activities Mitigations Module

Construction activities involve the use of laydown/staging areas, equipment operations, storage and handling of hazardous materials. Potential adverse effects include: alteration of vegetation, erosion and sedimentation, constriction for wildlife movements and introduction/spread of non-native vegetation.

- 6.1. All employees must attend an environmental briefing with a SO before beginning work at the site to review and explain the mitigations that are conditions of the project approvals. Employees must attend this briefing before beginning their work at this site.
- 6.2. All equipment and vehicles will be made available for inspection by the SO on arrival to WLNP. The Prime Contractor will give 48 hours' notice and schedule equipment inspection with the SO. Water trucks require a written restricted activity permit from the SO to enter the Park. The permit is received at initial inspection.

Timing Windows

- 6.3. Timing windows to reduce erosion, maintain compliance with the *Migratory Birds Convention Act*, *Fisheries Act*, *Species at Risk Act* and may be part of best practices to reduce erosion and environmental effects. See detailed mitigations for timing windows under [**Erosion and Sediment Control**](#), [**Vegetation Removal**](#) and



Buildings modules where these activities are part of project works. A summary of these restrictions is made below.

Consideration	Applicable	Restricted Window	Notes
Migratory Bird General Breeding Period	<input type="checkbox"/>	April 1 to August 31	
Bat Maternity Roost Activity Period	<input type="checkbox"/>	April 1 to August 31	
Bat General Activity Period	<input type="checkbox"/>	April 1 to October 31	
Amphibian Calling Window	<input type="checkbox"/>		
Bull Trout Restricted Work Periods	<input checked="" type="checkbox"/>	August 31 to October 31	Work is occurring in proximity to a tributary of Belly River, known bull trout spawning habitat. All works must be completed during low flow periods to mitigate potential impact.
Other Fish Species Restricted Work Periods	<input type="checkbox"/>	Consult IAO	
Grassland Dormancy	<input type="checkbox"/>	October 1 to February 28	
Additional Timing Considerations (e.g., weed seed set, soil protection)	<input type="checkbox"/>	Dry late summer and fall conditions	

Work Site Conditions/Staging/Laydown

- 6.4. Minimize vegetation-clearing activities and ground disturbance by staging on existing hardened areas wherever possible.
- 6.5. Delineate the work zone; clearly mark the limits to active construction, sensitive features and the access and egress locations.
- 6.6. The Prime Contractor is responsible for security and safety of the work site.
- 6.7. Strong winds are a regular occurrence in WLNP. Prevent materials from blowing off of work site.
- 6.8. If contamination is found, cease work immediately and if necessary, implement Emergency Response Plan.

Wildlife Observations and Encounters

- 6.9. Notify the SO immediately of any dens, litters, nests, carcasses (road kills or other), wildlife encounters, or carnivore (bears, wolves or cougars) observations on or around the worksite.
- 6.10. If wildlife is observed at or near the work site, allow the animal(s) the opportunity to leave the work area to the surrounding habitat and away from areas of potential conflict.
- 6.11. If potentially dangerous wildlife (e.g., bear, cougar, wolf, deer, sheep) persistently enter the work area or display aggressive behaviour, the contractor will immediately notify Banff Dispatch (403-762-4506), will stop work and safely evacuate the area.
- 6.12. Contractor will make bear spray, bear spray training, and wildlife awareness training mandatory to all workers on site.
- 6.13. Secure all materials that might attract wildlife (e.g. petroleum products, human food, recyclable food and drink containers and garbage).
- 6.14. No feeding, baiting or luring of any wildlife (including bears, small mammals, birds); do not approach or harass wildlife in any way. Notify the SO immediately if wildlife obtain garbage or human food. If wildlife get into attractants that have been



intentionally or accidentally left out, individuals or the contractor could be charged under the *Canada National Parks Act* Regulations.

Equipment Operations & Fuelling

- 6.15. Equipment movements and workers' private vehicles shall be restricted to the designated footprint of the construction area.
- 6.16. Protective measures, including using appropriately sized equipment, or protective access matting must be employed if entry into wet areas is required.
- 6.17. Due to the importance of fescue grassland within WLNP, vehicles must not be driven onto any open grassland areas unless it has been designated by the SO as a parking area prior to construction activities.
- 6.18. Machinery must arrive on site in a clean and dry condition and be maintained free of fluid leaks, vegetative material (*i.e.*, invasive species, noxious weeds) and soils from off-site. All construction equipment from outside WLNP will be washed prior to arrival to minimize the risk of introducing weeds or aquatic invasive species. Additional weed-cleaning stations may be designated by the SO depending on project activities and locations (see table below).

	Required	Location(s)	Notes
Are additional weed cleaning stations required?	<input type="checkbox"/>		

- 6.19. Inspect equipment daily for fluid/fuel leaks and maintain equipment in good working order.
- 6.20. Equipment fuelling and maintenance sites will be identified by the Contractor and approved by the SO. Fuelling should occur on hardened areas > 100 m from streams, wetlands, waterbodies or watercourses. Fuelling personnel shall maintain presence at and provide immediate attention to the fuelling operation.
- 6.21. Mobile fuel containers (e.g., slip tanks) shall remain in the service vehicle at all times.
- 6.22. Operate machinery on land above the high water mark, on ice, or in another manner that minimizes disturbance to the banks and bed of any water body.
- 6.23. Limit machinery crossing (fording) a stream or watercourse to a one-time event (*i.e.*, over and back), and only if no alternative crossing method is available. If repeated crossings of the watercourse are required, construct a temporary crossing structure in compliance with the *Fisheries Act*.
- 6.24. For fording equipment without a temporary crossing structure, use stream bank and bed protection methods (e.g., swamp mats, pads) if minor rutting is likely to occur during fording.
- 6.25. Use temporary crossing structures or other practices to cross streams or water bodies with steep and highly erodible (e.g., dominated by organic materials and silts) banks and beds.
- 6.26. Equipment that will work adjacent to or within a stream or watercourse should be free of external grease, oil or other fluids, excessive mud, dirt and vegetation before entering the work area.



Small Equipment

- 6.27. All small equipment should be kept in good working condition and free of oil and fuel leaks.
- 6.28. Where possible, chain oil should be vegetable-based.

Site Clean Up/Waste Disposal

- 6.29. Clean tools and equipment at an appropriate off-site facility to prevent the release of wash water that may contain deleterious substances.
- 6.30. Sweep up loose material or debris. Any material that may pose a risk of contamination to soils, surface water or groundwater should be disposed of appropriately off-site.
- 6.31. No construction waste (sawdust, soil, vegetation, debris, pumped water, hydrocarbon, chemicals, cement, asphalt, etc.) shall be allowed to enter an aquatic habitat or be deposited on undisturbed lands unless the said lands are part of the project works and approved for temporary waste storage.
- 6.32. Construction, trade, hazardous waste and domestic waste materials shall not be burned, buried or discarded at the construction site or elsewhere in WLNP. These wastes shall be contained and removed in a timely and approved manner and disposed at an appropriate waste landfill site located outside WLNP.
- 6.33. Construction waste storage containers, shall be emptied when 90% full. Waste containers will have lids, be wildlife proof if containing attractants, and waste loads shall be covered while being transported.
- 6.34. Sanitary facilities, such as a portable container toilet, shall be provided and maintained in a clean condition. Sanitary facilities must be in good condition, and located away from sensitive resources including water bodies.

Air Quality Mitigations

- 6.35. Diesel equipment used on the project shall be fuelled with low sulfur diesel fuels and shall conform to local emission requirements.
- 6.36. Minimize idling of engines at all times.
- 6.37. Schedule dust generating activities during periods with lower wind speeds.
- 6.38. Ensure fine materials being transported are covered and protected.

Cultural Resources

- 6.39. All work in WLNP is subject to the accidental finds clause whereby on finding any unexpected Cultural Resources, workers shall stop work in the immediate area and notify the SO. Parks Canada's Terrestrial Archaeology section will provide advice and assessment of significance and determine requirements to mitigate the chance find. Examples of archaeological artefacts encountered in WLNP include buried bison bones, stone tools, and above ground cairns.
- 6.40. If applicable, follow additional mitigations outlined in the Cultural Resources Impact Assessment.

	Required	Location(s)	Notes
Are additional mitigations for cultural resources required?	<input type="checkbox"/>		Cultural Resource Impact Assessment is in progress.



7. Soil and Vegetation Restoration Mitigations Module

Almost all projects activities included in this BMP will require some ecological restoration- *the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed*. The restoration plan can be a simple application of the following mitigations and can be at the site or both at the site and in concert with another site designated to offset the permanent impact of a project. A restoration plan is required for all projects but the scale and scope can be adapted to that required by the project (i.e., BMPs, site restoration plan, etc.). Restoration works can often be considered projects in and of themselves. Soil and vegetation restoration must apply the principles of effective, efficient and engaging solutions.

Restoration Plan

- 7.1. Develop restoration plan as part of the project scoping and specifications prior to project approvals.
- 7.2. Ensure that the appropriate restoration materials are available as needed immediately following construction activities.
- 7.3. The restoration plan will be subject to the approval of the IAO, who will be responsible for consulting with the Park Vegetation Ecologist.
- 7.4. The restoration plan should the following minimum information
 - Site description;
 - Site-specific restoration goals and objectives;
 - Schedule of clean-up activities;
 - Timing of restoration activities;
 - Restoration Standards; and
 - Follow-up Protocols (i.e., supplemental seeding, native transplants, weed control, etc.)

Timing Windows

- 7.5. Complete initial seeding as soon as possible.
- 7.6. Supplemental planting should be timed for the species and location. Seeding in the fall allows for full scarification of the seed over the winter. Consider using seed that requires shorter scarification times for spring and summer applications. Transplants may do best in the spring and summer and can require watering or other maintenance.
- 7.7. Time weed control measures to prevent seed propagation.

Topsoil Replacement

- 7.8. Implement restoration plan for the disturbed area immediately following completion of construction.
- 7.9. Minimize soil movement and handling to protect existing native seed bank.
- 7.10. Replace topsoil to all areas immediately following fine grading.
- 7.11. Do not compact topsoil.
- 7.12. Backfilling should allow settling to prevent depressions however, long term roach piles on linear disturbances should be minimal.
- 7.13. Where insufficient topsoil is available, the SO may approve moving soil from different projects or areas of WLNP. Imported soil may be used as a last resort and must be from a supplier that has been inspected and approved by the Park Vegetation



Ecologist. Methods of improving vegetation succession using locally sourced, weed and contaminant free materials are preferred.

- 7.14. Slopes to be seeded should be no steeper than 2 horizontal to 1 vertical (2:1) and covered with a minimum of 5 cm (2 inch) of topsoil. Finish grading should always follow top soil placement. Maintain structure (i.e., rocks, roots, woody debris) in topsoil.
- 7.15. Where remaining soils are unstable due to steepness or soil characteristics, immediate installation of sod or other erosion control is required.
- 7.16. Methods of bioengineering such as terracing, willow staking, live pole drain systems should be assessed as solutions where soils are steeper or remain unstable.

Fescue Grassland

- 7.17. Sod must be used in restoration as soon as practicable following fine grading.
- 7.18. Depending on original topsoil depth, secondary salvage topsoil may be returned prior to sod placement
- 7.19. Sod will be placed in locations that will receive no further disturbance.
- 7.20. Once returned, do not compact or move equipment over sod. Do not harrow or pulverise sod.
- 7.21. Do not attempt to level or flatten sod. Sod should be uneven and retain vegetation and landscape structure.
- 7.22. Use topsoil from local site to fill cracks between pieces of sod.
- 7.23. To return structure, additional nursery stock of shrubby species may be required.

Soil Amendments

Fertilizer Application

- 7.24. Avoid use of fertilizer to limit non-native vegetation growth and allow for local species to use available nutrients.
- 7.25. If needed use locally sourced mycorrhizae compost teas to improve vegetative success, as approved by WLNP vegetation ecologist.

Topsoil substitute

- 7.26. Apply an organic cellulose only amendment as a soil substitute if restoration standards are not being met within the defined time frame.
- 7.27. Determine the type of organic amendment based on the site-specific requirements (e.g., peat moss, compost) at the discretion of WLNP vegetation ecologist.

Seedbed Preparation

- 7.28. The seedbed will be scarified by hand or, with the approval of the SO, by machine on large areas (i.e., roadbeds) where it is accessible and appropriate.
- 7.29. The seedbed will be scarified if seeding takes place more than 7 days after final grading or if there has been a rainfall between final grading and the seeding date.
- 7.30. The cleats of a tracked vehicle or a harrow device will be used, where possible, to prepare an adequate seedbed with seedling safe-sites (microsites) substantially free of soil crusts.
- 7.31. Align cleat marks at right angles on slopes to trap seed and sediment and reduce erosion.



Species Selection

- 7.32. When selecting species and varieties:
- Use species of local native plant communities.
 - Avoid use of cultivars.
 - Species viability in proposed environment and climatic conditions.
 - Capability to effectively control erosion, where required.
 - Adaptation to the variable site conditions of undulating topography.
 - Consider palatability of some species to herbivores and avoid growing attractants in areas of increased risk to wildlife and visitors.
 - Variable life expectancy to produce variable, delayed die-out of seeded species and replacement with indigenous native plants.

Seed Mix Selection

- 7.33. Prescriptive seed mixes are provided in [Appendix 5](#). If an appropriate seed mix is not available, the SO will contact the Park Vegetation Ecologist to determine an appropriate mix for the Project.
- 7.34. Percentage of individual species within mixes are approximate and may vary depending on seed availability. A number of native species that are available only in limited quantities commercially have been included in the seed mixes. These seed mixes are to be used conditional on availability of individual species; modifications/replacements are allowed, subject to approval by the WLNP Vegetation Ecologist.
- 7.35. Prior to seed purchase, certificates of seed analysis will be provided to the Vegetation Ecologist for approval.
- Do **NOT** purchase seed until written approval is obtained.
 - Certificates of Analysis must include both the common and include the scientific name following the CANADENSYS nomenclature system; indicate if the seed is a cultivar, ecovar, or wild native; geographic origin (seed source); date of collection; method of seed storage; germination, viability and vigour; and indicate all other species occurring including agronomic, weed, and native species; and date of the analysis. The contact information for the Seed Supplier will be included.
- 7.36. All seed is subject to testing by PCA prior to use.

Seeding

- 7.37. Use only seed purchased after written approval is obtained.
- 7.38. Seed and stabilize (e.g. mulch/tackifier) bare areas as soon as possible after disturbance, preferably as soon as a significant area is graded and finished and before the next rain event. If there is a risk of seedling mortality as a result of fall frost stabilize until appropriate growing conditions exist.
- 7.39. In previously disturbed lawn areas of the Waterton Community, consider using sod in high traffic areas or places that need extra erosion control.
- 7.40. Use temporary seeding when outside the seeding dates for permanent vegetation.
- 7.41. Apply a seed mixture which is appropriate for the climate, soil, and drainage conditions of the site.
- 7.42. Apply seed at a rate appropriate to the seed mixture, seeding method and existing vegetation conditions.



- 7.43. Conduct broadcast seeding under calm wind conditions. Hydro-seeding is acceptable where access is available.
- 7.44. Do not increase the seeding rate to compensate for poor seedbed conditions.
- 7.45. Monitor temporary erosion control measures to prevent seed loss.
- 7.46. Supplemental seeding may be required in subsequent years.

Alternatives to Seeding

- 7.47. Use topsoil seed bank in small areas when there is no risk of erosion or competition from invasive species (i.e., natural regeneration).
- 7.48. Use native transplants in areas where conventional seeding applications are not applicable or where slope stability is an issue.
- 7.49. Use native transplants to provide additional diversity and structure to supplement seeding.
- 7.50. Use conventional forestry planting methods for container grown transplants, see [website](#) for guidance.

8. Slope Stabilization, Drilling and Blasting Mitigations Module

Where standard excavation is not sufficient, scaling, hydraulic hammers, drilling units or trim blasting are used to break up rock or soil for removal. Accumulations of debris in ditches reduce their effectiveness at trapping rock fall and reduce public safety. Ditches will be cleaned using a loader and back hoe. Guardrails and rock fences may be temporarily removed to permit this activity.

Timing of Works

- 8.1. Follow timing windows as specified under the Vegetation Removal Mitigation Module.

Drilling and Blasting for Slope Stabilization and Geotechnical Investigations

Trim blasting is used for controlled blasts in which explosive charges are placed in predetermined pattern of holes drilled into the rock face and then detonated. Potentially unstable masses of rock can sometimes be stabilized using rock bolts and long steel rods drilled into the rock to bind it together. Drilling is a common method of investigation to obtain geotechnical reports required for engineering design.

Drilling (General)

- 8.2. The contractor for geotechnical investigations must obtain a Restricted Activity Permit from the IAO prior to the commencement of work (see [Geotechnical](#) section).
- 8.3. Debris from drilling will be contained (screened or settle out) so it will not cover the surrounding area or enter any water course. All debris will be removed, see section on [overburden removal](#) for further mitigations.
- 8.4. The cuttings from all drilling will be contained so they can be removed entirely from the site. If contaminated, the cuttings are to be disposed at an approved waste disposal facility.
- 8.5. Control of spoil and sediment loaded water is required on the drill site. Dyking will be required to retain the deposit on non-vegetated surfaces. If contaminated, the spoil pile must be disposed at an approved waste disposal facility.



- 8.6. During aquifer tests, the water must be piped so it does not erode any soil or any part of the ground. If the water from the tests is piped to a creek, stream, or river, the pipe is to be situated so that there is no erosion of the stream bank or bed. If any sand or similar material is discharged during the aquifer test, care must be taken that the sand does not cover any vegetation.
- 8.7. All test wells will be filled in after the testing is completed. The proponent will be responsible for rectifying any future problems associated with any of the wells or test wells.

9. Asphalt Production and Handling Mitigations Module

Asphalt is a common building material for transportation infrastructure. Its production requires the use of gravel, water, and petroleum products, and associated project activities include transportation, storage and handling of these materials. Installation of asphalt plants is common within the larger parks where gravel extraction is undertaken.

Timing of Works

- 9.1. Asphalt works are preferably undertaken during periods of dry weather as this allows easier control of contaminated runoff and sediment.
- 9.2. If the work schedule requires working in the rain, the area of work must be isolated and appropriate sediment controls must be installed to prevent the release of sediment-laden water or any other deleterious substances into surface waters, particularly for surface repair works requiring the application of patching and sealing compounds, tar, asphalt, and chemical surface sealants.

Trucks for hauling asphalt mixture shall have tight, clean, smooth metal beds that have been sprayed with a minimum amount of thin fuel oil to prevent the mixture from adhering and causing waste asphalt.

- 9.3. Truck boxes may be oiled only when absolutely necessary.
- 9.4. Oiling will take place in a bermed area, consisting of a plastic underlay with 15 centimetres overlay of clean gravel. Oil contaminated gravel will be hand collected (so as to prevent tearing of the plastic) from the bermed area daily, and put through the asphalt plant.
- 9.5. Vehicle covers shall be securely fastened.

Disposal and Clean Up of Other Waste Products

- 9.6. To ensure regular clean-up of waste asphalt and petroleum spills, a defined clean up schedule will be established during the preconstruction meeting.
- 9.7. Leaks will be collected in drip-trays, the collected material will either be removed from WLNP, or recycled back through the Asphalt Plant. For any material removed outside WLNP to an approved facility, a detailed receipt will be provided to the ESO.
- 9.8. Used oil, filters, grease cartridges, oil cans and other waste products of plant servicing will be collected and disposed of at the nearest industrial waste facility.



10. Concrete Handling Mitigations Module

Concrete is a common construction material. Its use ensures longevity of the infrastructure and safety for public use. One litre of concrete wash water or leachate in 1000L of water will kill fish. Cement-based products including grouts and concrete are lethal to fish and many other aquatic organisms. Raw product or leachate entering a watercourse will alter water chemistry, making it more basic or alkaline.

Onsite Temporary Concrete Washout Facility

- 10.1. Temporary concrete washout facilities shall be located a minimum of 100 m from storm drain inlets, open drainage facilities, and watercourses.
- 10.2. 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.
- 10.3. Wood stakes, and sandbag materials can be used to construct temporary containment walls or “barriers”.
- 10.4. 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.
- 10.5. The soil base shall be prepared free of rocks or other debris that may cause tears or holes in the plastic lining material.
- 10.6. Washout of concrete mixer trucks is not permitted in WLNP.
- 10.7. Wash concrete from mixer truck chutes/pumps into approved concrete washout facility or collect in an impermeable bag for disposal.
- 10.8. Pump excess concrete in concrete pump bin back into concrete mixer truck.
- 10.9. Concrete washout from concrete pumper bins can be washed into concrete pumper trucks and discharged into designated washout area or properly disposed offsite.
- 10.10. Once concrete wastes are washed into the designated area and allowed to harden, the concrete shall be broken up, removed, and disposed of per federal and provincial regulations.

Onsite Concrete Management

- 10.11. Rolling concrete mixers with surplus concrete in amounts less than one cubic metre of wet concrete may waste this concrete in a right-of-way as directed by the SO in areas that drain well away from watercourses. Surplus amounts in excess of one cubic metre are to be returned to the batching yard.
- 10.12. Water contaminated in the placing of cement and curing of concrete shall be contained and removed from the site to an approved disposal facility.
- 10.13. The concrete batching plant must be operated pursuant to applicable dust, air emission, and water quality control regulations.
- 10.14. Waste, solidified concrete from rolling concrete mixers in amounts less than 1 cubic meter and waste solidified concrete from construction pour shall be buried in the grade within 48 hours of the pour, or removed from the site subject to approval and direction from the SO.



11. Drainage Structures Mitigations Module

Drainage structures on roadway, highway and parkways are structures such as culverts, ditches and drains. Drainage structure management activities are undertaken to ensure that surfaces are safe and efficiently drained, water is efficiently channeled to ditches and watercourses, and erosion of highways and adjacent properties is prevented. These mitigations include the cleaning and maintenance of drainage structures and related hardware, as well as the repair or replacement of existing and installation of new drainage structures.

- 11.1. All workers shall be familiar with the [Spill Response Section](#) of this document.

Timing of Works

- 11.2. Time work in water to respect [timing windows](#) to protect fish, including their eggs, juveniles, spawning adults and/or the organisms upon which they feed. Contact your local aquatics specialists and DFO offices for further information on [timing windows](#) in your region.
- 11.3. Conduct in-stream work during periods of low flow, to further reduce the risk to fish and their habitat or to allow work in water to be isolated from flows.
- 11.4. If the work schedule requires working in the rain, the area of work must be isolated and appropriate sediment controls installed to prevent the release of sediment-laden water or any other deleterious substances into surface waters.

Drainage Structures

- 11.5. Isolate your work area from any flowing water that may be present. Ensure any flows are temporarily diverted around the portion of the ditch or watercourse where you are working.
- 11.6. Select appropriate equipment and work access routes to reduce damage to riparian vegetation and watercourse banks when using earth-moving equipment.
- 11.7. For smaller scale debris and sediment removal activities, remove materials by hand.
- 11.8. To assist with bank stability and invasive plant prevention, leave topsoil and root systems intact on channel banks surrounding your work area.
- 11.9. Ensure any works to repair damaged structures retain the pre-repair channel conditions (e.g., streambed profile, substrate, channel cross section) and do not constrict the stream width.
- 11.10. Maintain effective sediment and erosion control measures until complete re-vegetation of disturbed areas is achieved.

Culverts

A BMP for culverts is currently in development. Consult with the IA Office for more information.

- 11.11. If a proposed culvert crosses a stream where fish are present, the crossing should be designed or upgraded to provide fish passage and avoid interference with fish habitat. Consult with the IAO and/or Parks Biologist to determine the desirable outcome of the culvert design.
- 11.12. Engage qualified professionals as necessary and follow regional and provincial best practices.
- 11.13. Conduct a technical assessment of water flows and fish species to establish a culvert design that will allow for the passage of fish if desirable.



Culvert Design and Alternatives

- 11.14. Utilize alternative crossing structures (e.g. clear span bridges, lock blocks and concrete decks) as a replacement for culverts, where possible.
- 11.15. Ideally, crossings should have natural streambed material through them to allow continuous substrate that matches the streambed below and above the crossing. Open bottom crossings are ideal for maintaining natural substrate.
- 11.16. Utilize a single large culvert design over a multiple culverts design (i.e. several smaller culverts) to reduce debris blockage and increase fish and wildlife passage, where hydrologically feasible.
- 11.17. Design culvert bottoms to be placed at least 30cm below the stream bed elevation to ensure culverts remain passable by fish and wildlife by preventing culverts from becoming perched.
- 11.18. A minimum water depth of 200 mm should be provided throughout the culvert length. To maintain this water depth at low flow periods an entrance/downstream pool can be constructed. In some cases, an upstream pool may also be necessary.
- 11.19. The culvert slope should follow the existing streambed slope where possible.
- 11.20. The culvert, inlet(s) and outlet(s) should be adequately protected with rip-rap to prevent erosion and scour around the culvert during high runoff events. The following measures should be incorporated when using replacement rock to stabilize the culvert:
 - Place appropriately-sized, clean rocks into the eroding bank area by hand or machinery operating outside the water course.
 - Do not obtain rocks from below the ordinary high water mark of any water body.
 - Where possible, install rock at a slope similar to the stream bank to maintain a uniform stream profile and natural stream alignment. Otherwise, install the rock at the closest slope required to ensure it is stable.
 - Ensure rock does not interfere with fish passage or constrict the channel width.
- 11.21. Trash racks should not be used near the culvert inlet. Accumulated debris may lead to severely restricted fish passage and potential injuries to fish. Where trash racks cannot be avoided in culvert installations, they must only be installed above the water surface indicated by bank full flow. A minimum of 23 cm clear spacing should be provided between trash rack vertical members. If trash racks are used, a long term maintenance plan must be provided along with the design, to allow for timely clearing of debris.
- 11.22. Ensure designs locate culvert structures in areas that minimize impacts to riparian vegetation and associated wildlife.

Culvert Installation

- 11.23. It may be necessary to exclude fish from the immediate construction site while a culvert is being installed. If this practice is necessary, fish shall be salvaged by a qualified aquatics professional from within the exclusion area.
- 11.24. If dewatering is required refer to the [Water Withdrawal and Dewatering Mitigations Module](#) of this BMP for appropriate mitigations.
- 11.25. Maintain effective sediment and erosion control measures until complete re-vegetation of disturbed areas is achieved.
- 11.26. Remove any old structures to a suitable upland disposal facility away from the riparian area and floodplain to avoid waste material from re-entering the watercourse



Wildlife Considerations for Culverts

- 11.27. At times, culverts are placed along portions of highways that bisect wetlands or specific habitats that support an abundance of wildlife. Consider building natural rock ledges through culverts to allow for small and medium-sized animals to walk on during periods of high flow.

12. Works Over or Immediately Adjacent to Water

Works over or immediately adjacent to water include activities associated with the maintenance and repair of bridge structures and/or viewing platforms located adjacent to water. Activities could include the cleaning and painting of structures as well as the repair, rehabilitation, and replacement of elements including decks, railings, abutments, and bearings. Works may include asphalt, concrete works, chipping, painting, grouting, timber truss, abutment and piling maintenance. These activities help ensure bridge structures remain structurally sound and safe for public use.

Timing of Works

- 12.1. Bridges provide nesting and roosting habitat for wildlife including Cliff Swallows and Little Brown Bats. See timing windows under the [General Activities Mitigations Module](#). If work must occur in the restricted timing window, the SO may complete preconstruction surveys to determine if activities may proceed.
 - There is risk of **DELAY** to project activities if work is scheduled within the migratory bird window.
- 12.2. Time work in water to respect [timing windows](#) to protect fish, including their eggs, juveniles, spawning adults and/or the organisms upon which they feed.
- 12.3. Conduct in-stream work during periods of low flow to further reduce the risk to fish and their habitat or to allow work in water to be isolated from flows.
- 12.4. If the work schedule requires working in the rain, the area of work must be isolated with appropriate sediment controls installed to prevent the release of sediment-laden water or any other deleterious substances into surface waters.

13. Water Withdrawal and Dewatering Mitigations Module

Construction often requires the use of water; many common methods of excavation and site isolation require dewatering. Temporary, short term water withdrawal provides an efficient uncontaminated water source for local project sites. Dewatering can allow sites to be effectively dry during construction, reducing the impact of sediment laden water entering fish bearing waters.

Additional Permits

- 13.1. All water withdrawal requires a Restricted Activity Permit issued by the IAO.



Equipment Cleaning

- 13.2. All hoses, pumps, intake hoses, or equipment from outside of WLNP must be clean and dry on arrival and require approval and inspection by the SO prior to use in WLNP (see [General Activities Section](#)).
- 13.3. Do not bring equipment into WLNP from areas that have known infestations of aquatic invasives (e.g., USA, east of Saskatchewan).
- 13.4. Thoroughly clean water trucks, hoses, pumps and intake hoses using clean HOT WATER with as much pressure as possible.
- 13.5. If last use of equipment was out of province, allow hoses, pumps and intake hoses to dry completely and then remain dry (ideally for >20 days).

Timing Windows

- 13.6. As a general guide to prevent taking more water than aquatic system can support, limit total take of water to less than 5 successive days and less than 10 days in any period of 30 days.
- 13.7. Do not withdraw water from waterbodies that support breeding amphibians.

Water Withdrawal

- 13.8. Water should not be withdrawn from a wetland or stream less than 2 metres wide at the surface or a lake less than one hectare in area.
- 13.9. Water withdrawal should follow the 10/90 rule which allows for up to 10% of the stream flow to be withdrawn, as long as the stream flow does not fall below the 90% exceedence flow (eg. 1 in 10 chance in a given year).
- 13.10. No permanent or semi-permanent works for water withdrawal should be placed in the stream channel.
- 13.11. Screen any water intakes or outlet pipes to prevent entrainment or impingement of fish, amphibians and/or reptiles. Entrainment occurs when a fish or amphibian is drawn into a water intake and cannot escape. Impingement occurs when an entrapped fish, reptile or amphibian is held in contact with the intake screen and is unable to free itself.

Pump Screens

- 13.12. Fish-bearing waters design and installation of intake end-of-pipe fish screens:
 - Locate screen in areas and depths of water with low concentrations of fish throughout the year away from natural or artificial structures that may attract fish that are migrating, spawning, or in rearing habitat.
 - Orient the screen face in the same direction as the flow of water.
 - Ensure openings in the guides and seals are less than the opening criteria to make “fish tight”.
 - Screens should be located a minimum of 300 mm (12 in.) above the bottom of the watercourse to prevent entrainment of sediment and aquatic organisms associated with the bottom area.
 - Provide structural support to the screen panels to prevent sagging and collapse of the screen. Large cylindrical and box type screens should have a manifold installed to ensure even water velocity distribution across the screen surface. The end of the structure should be made of solid materials and the end of the manifold capped.



- Heavier cages or trash racks can be fabricated out of bar or grating to protect the finer fish screen, especially where debris loading (woody material, leaves, algae mats, etc.) is a concern. A 150 mm (6 in.) spacing between bars is typical.
- Provision should be made for the removal, inspection, and cleaning of screens.
- Ensure regular maintenance and repair of cleaning apparatus, seals, and screens to prevent debris fouling and impingement of fish.
- Pumps must be shut down when fish screens are removed for inspection and cleaning.

Dewatering

- 13.13. A site specific dewatering plan is required be provided before commencing a pump-out sump to dewater excavation sites with specific details on how and where the water will be discharge.
- 13.14. Site specific mitigations may be required depending on the conditions of the discharge area, freezing conditions operation, overflow avoidance, decanting and settlement pond restoration.
- 13.15. Water containing suspended materials shall not be pumped into watercourses, drainage systems or on to land, except with the permission of the SO.
- 13.16. Soil and vegetation erosion protection is required for water pumped on to land.



Appendix 1 Contact Information

<Update for individual projects>

24-hour Emergency Dispatch*:

Police: 9-1-1

Fire: 9-1-1

Ambulance: 9-1-1

* In an Emergency, 9-1-1 operators can also notify Banff Dispatch.

Parks Canada Emergency Dispatch:

Banff Dispatch: 403-762-4506

Project Manager:

Chris Mariotti: 403-431-0225

Impact Assessment Office: 403-859-5185

Jennifer Carpenter: 403-632-5167

Eri Hiraga: 403-859-2278

Erin Rowlands: 403-859-5185



Appendix 2 Regulatory Guidance

Jurisdictions

While all projects on lands managed by Parks Canada must adhere to Federal law and regulation, it is considered best practice to refer to local community, regional, provincial regulation and best practices where federal guidance is silent and/or attempt to meet those targets if it can reduce the overall impact of the project.

Some of the project activities reviewed have potential environmental impacts that are addressed by various provincial, federal and territorial acts and regulations. All activities must meet current environmental law and regulations in their design and construction. The following is a brief description of some of the key federal acts and regulations. Further review, understanding and application of other federal, provincial and territorial environmental laws are part of a rigorous approach to project planning and execution.

Canada National Parks Act and Regulations-Parks Canada

All work inside National Parks and Protected Areas must be performed in accordance with the laws and regulations set out in the *Canada National Parks Act* and Regulations. This includes the requirement for most activities described to only be done under a permit such as: business licence for contractor, disturbance of natural objects, travel in restricted areas, special events or use of disposal sites.

Fisheries Act - Fisheries and Oceans Canada

If a project is to be conducted near water, it is the proponent's responsibility to ensure they avoid causing serious harm to fish in compliance with the *Fisheries Act*. The advice in on the Fisheries and Oceans website will help a proponent avoid causing harm and comply with the Act.

If the water body in the project area has fish or is connected to waters at any time that have fish the project must meet the self-assessment criteria on the Fisheries and Oceans website, if not a project review can be made by Fisheries and Oceans Canada to assess whether the project requires authorization or authorization can be requested directly. Given the level of detail required for a review and/or authorization request the EIA officer may need to consider a more involved EIA pathway in those circumstances.

Migratory Bird Convention Act – Environment Canada

The purpose of this Act is to implement the Convention by protecting and conserving migratory birds - as populations and individual birds - and their nests. Section 6 - prohibits the disturbance, destruction, or taking of a nest, egg, or nest shelter of a migratory bird.

In Canada, the general nesting period may start as early as mid-March and may extend until end of August. This is a general nesting period that covers most federally protected migratory bird species. This period varies regionally across Canada mainly due to differences in species assemblages, climate, elevation and habitat type. Generally, the nesting period is delayed in more northerly latitudes, corresponding to vegetation development and food availability. (Environment Canada, 2014). To help with determining regionally relevant periods where nesting is likely to occur, Environment Canada is publishing estimated regional nesting periods within large geographical areas across Canada referred to as "nesting zones". These periods are



estimated for each zone and consider the time of first egg-laying until the young have naturally left the vicinity of the nest. Field Units may wish to refine this section and add their known local nesting periods.

Species at Risk Act

If a species listed under the *Species at Risk Act* (SARA) is found within the project area, any potential adverse effects from the proposed project to the individuals of the species, their residences and/or their critical habitat must be understood. Species at risk considerations require specific expertise, due to additional legal requirements under the SARA and CEAA 2012. If the projects or activities to be addressed by the BMP could affect a listed species or its critical habitat, the EIA officer may need to consider a more involved EIA pathway in those circumstances.

Appendix 5 Recommended Seed Mixes for WLNP

All commercial seed lots will have Certificates of Analysis for weed and undesirable species content and germination tests for each lot of each species in the mix.

Prior to seed purchase, certificates of seed analysis will be provided to the Vegetation Ecologist for approval.

Do NOT purchase seed until written approval for individual lots is obtained.

Certificates of Analysis must include both the common and scientific name following the CANADENSYS nomenclature system; indicate if the seed is a cultivar, ecovar, or wild native; geographic origin (seed source); date of collection; method of seed storage; germination, viability and vigour; and indicate all other species occurring including agronomic, weed, and native species; and date of the analysis. The contact information for the Seed Supplier will be included.

Percentage of individual species within mixes are approximate and may vary depending on seed availability. A number of native species that are available only in limited quantities commercially have been included in the seed mixes. These seed mixes are to be used as possible conditional on availability of individual species; modifications/replacements are allowed, subject to approval by the WLNP Vegetation Ecologist.

Native seed mixes will be seeded within the appropriate areas of WLNP (*i.e.*, open fescue prairie, open deciduous forests with or without a mesic area modifier, etc.).

Inclusion of a clean cover crop (e.g., awned wheatgrass), to combat invasive plant problems may be considered.

Below is a recommended seed mix for the site. Consult with Vegetation Ecologist for ALL projects, regardless of size, for a site specific and project appropriate mix.

Seed Mix	Species	Species % by Seed Weight
Belly River Group Camp Culvert Replacement Rate = 40 kg/ha	Smooth wild rye (<i>Elymus glaucus</i>)	15
	Marsh Reed Grass (<i>Calamagrostis canadensis</i>)	15
	Tufted hair grass (<i>Deschampsia caespitosa</i>)	15
	Fowl bluegrass (<i>Poa palustris</i>)	15
	Mountain Brome (<i>Bromus carinatus</i>)	15
	Awed wheatgrass (<i>Elymus trachycaulus</i>)	10
	Fringed Brome (<i>Bromus ciliatus</i>)	10
	June grass (<i>Koeleria macrantha</i>)	5