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Part 1 GENERAL

1.1 Project Location

1.1.1 The project is located on the Pipestone River in the Village of Lake Louise, located in Banff National Park. The work site is the pedestrian bridge crossing the Pipestone River behind the Park Visitor Reception Centre in the Village of Lake Louise .

1.2 Work Covered by the Contract Documents

1.2.1 The work consists of reshaping a portion of the east bank of the Pipestone River upstream and downstream of the pedestrian bridge, supply and installation of geotextile and placement of rip rap on the prepared bank. Rip rap is necessary to protect the river bank and adjacent infrastructure from continued erosion caused by high flows in the river particularly during severe storm events or spring runoff. The work includes but is not limited to:

1.2.1.1 Construct a temporary access to the designated work area as directed by the Parks Canada Representative. Access to the construction area and river bank will require the removal and disposal of several trees.

1.2.1.2 Reshape the existing river bank on the east side of the creek at a 2:1 backslope, extending upstream of the pedestrian bridge and downstream of the bridge as indicated on the drawing.

1.2.1.3 Supply and install a non-woven geotextile filter cloth on the prepared bank extending from the waterline to the top of slope

1.2.1.4 Supply and install a minimum Class 2 rip rap on the reshaped bank on top of the filter cloth, extending from the toe of slope at the waterline to the top of slope.

1.2.1.5 Restore and hydroseed all disturbed areas impacted by the Works.

1.2.1.6 Provide and maintain all traffic control required for the duration of the Works.

1.2.1.7 Disposal of excess materials (soils, stumps, roots etc.) at Niblock Pit, located 4km west of the work site. Niblock Pit is located at the junction between Trans Canada Highway and Icefields Parkway (93N). Contractor is to coordinate access to Niblock Pit with the Highway Service Centre in Lake Louise.

1.3 Codes and Standards

1.3.1 Perform all construction work in accordance with CAN/CSA S6-06, CAN A23.1-09, and any other code of provincial or local application. In the event of conflict, the more stringent shall apply.

1.3.2 Perform all traffic control in accordance the current Province of Alberta standards. These include the provincial TMG – Traffic Management Guidelines For Work on Roadways, and the TCM – Traffic Control Manual for Work on Roadways.

1.3.3 Perform all in stream work and riparian work in accordance with the Department of Fisheries and Oceans (DFO) requirements for working around waterways

1.3.4 Perform the works in accordance to the environment requirements for the Parks Canada Agency and specified in the Basic Environmental Impact Analysis for this project, which is appended to this document.

1.3.5 Meet or exceed the requirements specified in the Contract Documents

1.4 Contractors Use of the Site

1.4.1 Restrict the work to within the area where the bank protection is to be placed, the established 8 m wide construction footprint adjacent the top of the river bank.

1.4.2 Use of any areas outside the designated work area will be the Contractor's responsibility to organize and use. Any additional costs for the use and recovery of any additional work areas over and above the designated area will be the responsibility of the Contractor and will not be considered for payment under this contract.

1.4.3 The Contractor will assume full responsibility for safekeeping and protection of products under this contract.

Part 2 EXECUTION

2.1 Work Schedule

2.1.1 Preparation of required submittals to commence immediately on Contract Award.

2.1.2 Project completion is required by November 30, 2013. Restoration and hydroseeding of affected areas will be completed in Spring of 2014 once weather conditions allow.

2.2 Special Precautions

2.2.1 The Contractor is responsible for locating all utilities that cross the work area and protect the located utilities from damage during the course of the Works

2.2.2 The Contractor is to reinstate any temporary access routes that were created to do the work. Reinstatement entails removal of any materials required to obtain access and then reclaim and reseed the disturbed ground. Any temporary access must be reviewed and approved by the Parks Canada Representative prior to construction.

2.2.3 Any disturbed ground at the top of the bank must be reclaimed and hydro seeded with an approved seed mix. Submit the seed mix design for approval.

2.2.4 Contractor is responsible for all survey and layout required to establish the top of bank as indicated in the drawings. Any surveying that is done as part of the work is considered incidental to the Work and will not be considered for additional payment.

2.2.5 The Contractor is responsible for all existing structures, roads, trails, and any other existing infrastructure that may be present in the work area and shall protect these structures from damage or injury, either directly or indirectly. Any damage or injury to these structures will be repaired and made good and the contractors expense to the satisfaction of the Parks Canada Representative.

END OF SECTION

See Bid and Acceptance Form – Appendix 1

Part 1 GENERAL

1.1 Related Sections
.1 Section 01 11 00 – Scope of Work

1.2 Description
.1 Basis of Payment for items appearing in the Unit Price Table

1.3 Basis of Payment
.1 Where not specified, basis of payment for all work included in Division 1 – General Requirements of these Specifications is considered incidental to the work and forms part of the Total Contract Amount.

.2 For Lump Sum items in the Unit Price Table, progress payments shall be made on the basis of percent of work completed and accepted by the Parks Canada Representative at the time of the progress payment (excluding Mobilization and Demobilization which is paid per 1.4 of Section 01 29 00).

.3 Support claims for products purchased, manufactured, or delivered to the place of work but not yet incorporated into the work by such evidence as that the Parks Canada Representative may reasonably require to establish value and percent of work completed.

.4 Any work called for in the specifications or shown on the drawings but not specifically mention as an item for which payment is made, will be considered incidental to the items of work listed. No additional payment will be made for this incidental work.

.5 All equipment, materials, and labour necessary to complete any item of work is included in the cost of that work.

1.4 Mobilization and Demobilization
.1 Payment for Mobilization and Demobilization will be made on the basis of the Lump Sum price bid and includes all costs associated with movement of personnel, equipment, supplies, and incidentals to/from Work Site, the establishment of offices and other facilities necessary to undertake the Work, for costs incurred for the other work (including Contingency Items) and operations which must be performed prior to the commencement of the Work and for all costs incurred for clean up and project completions.

.2 Payment for this item will be made at the lump sum price and will be scheduled as follows:
i. 50% at the beginning of construction after the Contractor required submittals (including construction schedule, Traffic Management Plan, Quality Management 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 Parks Canada Representative.
ii. 50% at the end of the construction, once the site has been cleaned to the satisfaction of the Parks Canada Representative and the Final Completion Certificate has been issued for the completion of the Works.

1.5 Traffic Control

.1 Payment for the cost of traffic control will be made by Lump Sum for Traffic Control in the Unit Price Table. The primary traffic control requirement will be within the parking lot of the Sampson Mall where access to the site is required. The Lump Sum bid shall be inclusive of completion of the Traffic Management Plan, signage, traffic flaggers, guides for backing up and maneuvering of heavy equipment and all other items necessary for the successful completion of the task.

.2 Measurement for Payment for completion of the Traffic Control will be made on the basis of Lump Sum for the work completed and accepted by the Parks Canada Representative. Payment will be made as a percentage of work completed as shown on the Construction Progress Schedule and accepted by the Parks Canada Representative.

1.6 Clear and Grub

.1 Payment for the Clear and Grub of the designated work site of trees and other riparian vegetation adjacent the top of the bank along the bank protection works and that required for the temporary access will be made on the basis Lump Sum for Clear and Grub in the Unit Price Table. The Lump Sum Bid shall include all costs associated with the removal of vegetation and hauling the debris offsite to a location designated by the Parks Canada representative, stockpiling of topsoil in the disturbed area of the designated worksite, and all other items necessary for the successful completion of the work.

.2 The objective is to remove as few trees as possible to complete the work. The amount of trees and brush to be removed must be approved by the Parks Canada Representative prior to removal. Clearing and grubbing for at the site will be limited to a maximum of 8m adjacent to the river along the extents of the rip rap plus area necessary for site access.

.3 Measurement for Payment for Clear and Grub will be made by Lump Sum based on the percentage of work completed and accepted by the Parks Canada Representative.

1.7 Bank Excavation

.1 Payment for the excavation of granular materials to recontour the river bank within designated work site and disposal at a site designated by the Parks Canada Representative will be made on the basis of the price per square meter of recontoured bank as indicated in the Unit Price Table. The Unit Price per square meter shall include all costs to excavate the river bank to a 2:1 backslope, the disposal of the granular material to a location designated by the Parks Canada Representative including hauling, and all other items necessary for the successful completion of the work associated with this item.

.2 No overhaul will be considered for this item. All cost for the hauling of this material for either disposal or stockpile is considered incidental to the works and shall not be considered for additional payment.

.3 Measurement for Payment for Bank Excavation will be made by measurement of the total surface area of excavated river bank, measured from the top of the finished excavated river bank slope to the toe of the slope, extending the length of the works completed and accepted by the Parks Canada Representative.

1.8 Class 2 Rip Rap

.1 Payment for the Class 2 Rip Rap will be made of the basis of price per cubic meter of Class 2 Rip Rap materials as indicated in the Unit Price Table. The Unit Price shall include all costs included with the supply, haulage, and placement of the Class Rip Rap, supply and placement of the non-woven geotextile filter fabric, and all other items necessary for the successful completion of the work.

.2 Measurement for Payment for the supply and placement of Class 2 Rip Rap will be made based of the total cubic meters of material placed and accepted by the Parks Canada Representative.

.3 The determination of the quantity placed can be determined through the use of weigh tickets for each truck hauling the material to site. Prior to the commencement of the work, the Contractor must supply a calibration factor for each truck being used that converts the weight hauled to the worksite to the volume of material placed and that has been agreed to by the Parks Canada Representative. Any new trucks that will haul material cannot be used until they have been calibrated and accepted by the Parks Canada Representative. Any material hauled by a non-calibrated truck will be excluded from the total volume of materials submitted for payment. A copy of all weigh tickets for each truck is to be submitted with Progress Payment request.

.4 Should the calibrated load count not be accepted by the Contractor or Parks Canada Representative then the quantity submitted for progress payment will be based on the volume measured and calculated through survey of the work area prior to placement and a survey of the area upon completion of the work included for a given progress payment for this material.

1.9 Topsoil and Seeding

.1 Payment for the Topsoil and Seeding will be made on the basis of Lump Sum for Top Soil and Seeding in the Unit Price Table. The Lump Sum bid shall include all cost included with the spreading of topsoil, supply and placement of seeding, and all other items necessary for the successful completion of the work.

.2 Measurement for payment for Topsoil and Seeding will be made by Lump Sum based on the percentage of the work completed and accepted by the Parks Canada Representative.

END OF SECTION

PART 1 - GENERAL

1.1 DEFINITIONS

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

.2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.

.3 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.

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

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

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

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

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

.9 Project Planning, Monitoring and Control System: overall system operated by Parks Canada Representative to enable monitoring of project work in relation to established milestones.

1.2 REQUIREMENTS

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

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

.3 Limit activity durations to maximum of approximately 10 working days, to allow for progress reporting.

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

1.3 SUBMITTALS

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

.2 Submit to Parks Canada Representative with in 5 working days of Award of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.

.3 Submit Project Schedule to Parks Canada Representative within 5 working days of receipt of acceptance of Master Plan.

1.4 MASTER PLAN

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

.2 Parks Canada Representative will review and return revised schedules within 5 working days.

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

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

1.5 PROJECT SCHEDULE

.1 Develop detailed Project Schedule derived from Master Plan.

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

.1 Award.
.2 Shop Drawings, Samples.
.3 Permits.
.4 Mobilization.

.5 Clear and Grub
.6 Bank Excavation and Recontour
.7 Construction of Dike
.8 Placement of Class 2 Rip Rap
.9 Topsoil and Seeding
.10 Project Completion

1.6 PROJECT SCHEDULE REPORTING

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

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

1.7 PROJECT MEETINGS

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

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

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

PART 1 - GENERAL

1.1 ADMINISTRATIVE

.1 Submit to Parks Canada Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 Do not proceed with Work affected by submittal until review is complete.

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

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

.5 Review submittals prior to submission to Parks Canada Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.

.6 Notify Parks Canada Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.7 Verify field measurements and affected adjacent Work are co-ordinated.

.8 Contractor's responsibility for errors and omissions in submission is not relieved by Parks Canada Representative's review of submittals.

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

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

1.2 SHOP DRAWINGS AND PRODUCT DATA

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

.2 Submit drawings stamped and signed by professional engineer registered or licensed in the Province of Alberta.

.3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles

or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.4 Allow 5 days for Parks Canada Representative's review of each submission.

.5 Adjustments made on shop drawings by Parks Canada Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Parks Canada Representative prior to proceeding with Work.

.6 Make changes in shop drawings as Parks Canada Representative may require, consistent with Contract Documents. When resubmitting, notify Parks Canada Representative in writing of revisions other than those requested.

.7 Accompany submissions with transmittal letter, in duplicate, containing:

.1 Date.
.2 Project title and number.
.3 Contractor's name and address.
.4 Identification and quantity of each shop drawing, product data and sample.
.5 Other pertinent data.

.9 After Parks Canada Representative's review, distribute copies.

.10 Submit 6 prints and an electronic copy of product data sheets or brochures for requirements requested in specification Sections and as requested by Parks Canada Representative where shop drawings will not be prepared due to standardized manufacture of product.

.11 Submit 6 copies and one electronic copy of test reports forrequirements requested in specification Sections and as requested by Parks Canada Representative.

.1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
.2 Testing must have been within 3 years of date of contract award for project.

.12 Submit 6 prints and one electronic copy of certificates for requirements requested in specification Sections and as requested by Parks Canada Representative.

.1 Statements printed on manufacturer's letterhead and signed

by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.

.2 Certificates must be dated after award of project contract complete with project name.

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

.14 If upon review by Parks Canada Representative, no errors or omissions are discovered or if only minor corrections are made, transparency 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.

1.3 SAMPLES

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

.2 Deliver samples prepaid to Parks Canada Representative's site office.

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

.4 Adjustments made on samples by Parks Canada Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Parks Canada Representative prior to proceeding with Work.

.5 Make changes in samples which Parks Canada Representative may require, consistent with Contract Documents.

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

1.4 CERTIFICATES AND TRANSCRIPTS

.1 Immediately after award of Contract, submit Workers' Compensation Board status.

.2 Submit transcription of insurance immediately after award of Contract.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

END OF SECTION

Part 1 General

1.1 Section Includes

.1 Informational and Warning Devices.
.2 Protection and Control of Public Traffic.
.3 Operational Requirements.

1.2 Related Sections

.1 Section 01 33 00 - Submittals

1.3 Traffic Management Plan

.1 Provide for review and acceptance a Traffic Management Plan to the Parks Canada Representative. The Traffic Management Plan shall conform with the requirements of Section 01 33 00 unless otherwise pre-approved in writing by the Parks Canada Representative.

1.4 References

.1 Traffic Control Manual for Work on Roadways (latest edition, distributed by the Province of Alberta, Ministry of Transportation and Highways).

1.5 Protection of Public Traffic

.1 Site access will require construction equipment to travel through a Mall Parking Lot and adjacent to commercial establishments in Lake Louise. Traffic control and protection of the general public from dump trucks, excavators and heavy equipment will be very important. Ground guides will be required to guide construction equipment, such as dump trucks etc. through areas where public access must be maintained.

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

.3 When working on travelled way:

i. Position equipment to present a minimum of interference and hazard to the travelling public.
ii. Keep equipment units as close together as working conditions permit and preferably on the same side of the travelled way.
iii. Do not leave equipment on the travelled way overnight.

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

.5 Provide and maintain reasonable access to property in the vicinity of work and in other areas as indicated.

.6 Protect passing vehicles from damage caused by extraneous materials from construction activities at each site.

1.6 Informational and Warning Devices

.1 Provide, erect, and maintain signs, flashing warning lights, and other devices required to indicate construction activities and other temporary and unusual conditions resulting from project work that requires road user response as specified in the Traffic Control Manual for Work on Roadways.

.2 Supply signs, delineators, barricades, traffic cones, and miscellaneous warning devices in accordance with the Traffic Control Manual for Work on Roadways in effect at the place of work.

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

.4 Meet with the Parks Canada Representative prior to commencement of work to prepare a list of signs and other devices required for the project. If the situation on site changes, revise the list and review it with the Parks Canada Representative.

.5 Continually maintain traffic control devices in use by:

i. Checking signs daily for legibility, damage, suitability, and location. Clean, repair, or replace to ensure clarity and reflectance.
ii. Removing or covering signs that do not apply to conditions existing from day to day.

.6 Provide Type D traffic cones as specified in the Traffic Control Manual for Work on Roadways.

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

1.7 Control of Public Traffic

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

.2 Flag persons:

i. Provide trained, competent flag persons with proof of certification from a recognized training program on traffic control procedures through construction zones.
ii. Provide flag persons with proper equipment and clothing as specified in the Traffic Control Manual for Work on Roadways.
iii. Flag persons are required in the following situations:
    1. When public traffic is required to pass working vehicles or equipment that blocks all or part of travelled roadway.
    2. When it is necessary to institute a one-way traffic system through the construction area or other blockage where traffic volumes are heavy,

approach speeds are high, and traffic signal system is not in use.

3. When temporary protection is required while other traffic control devices are being erected or taken down.
4. For emergency protection when other traffic control devices are not readily available.
5. In situations where complete protection for workers, working equipment, and public traffic is not provided by other traffic control devices.
6. When construction traffic is grossing roadway

.3 The maximum allowable delay to any individual motorist travelling through each of the project limits as a result of the Contractor's activities will be 15 minutes.

.4 Provide continuous temporary lane control system or flag persons where roadway carrying two-way traffic is to be restricted to one lane for construction purposes. Adjust, as necessary, and regularly maintain system during the period of restriction. Signal system is to meet the requirements of the Traffic Control Manual for Work on Roadways. Remove lane travel lane restrictions outside of non-working hours.

.5 Changes to traffic control operation are to be reviewed by Parks Canada Representative.

.6 Safely control traffic through unique or varied construction situations

1.8 Operational Requirements

.1 Maintain existing conditions for traffic throughout the period of contract except that, when required for construction under contract and when measures have been taken as specified herein and reviewed by Parks Canada Representative to protect and control public traffic, existing conditions for traffic to be restricted as follows:

i. For each sign location: .
    1. Single 3.6 m lane alternating traffic at all times.
    2. Speed limit reduced to 30 km/h at all times.
ii. Maintain existing conditions for traffic crossing the right of way.

END OF SECTION

PART 1 – GENERAL

1.1 REFERENCES

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

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
- .1 Material Safety Data Sheets (MSDS).

.3 Province of Alberta
- .1 Occupational health and Safety Act, 2009

1.2 SUBMITTALS

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

.2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
- .1 Results of site specific safety hazard assessment.
- .2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.

.3 Submit one copy of Contractor's authorized representative's work site health and safety inspection reports to Parks Canada Representative andor authority having jurisdiction, daily bi-weekly.

.4 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.

.5 Submit copies of incident and accident reports.

.6 Submit WHMIS MSDS - Material Safety Data Sheets.

.7 Parks Canada Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 5 days after receipt of plan. Revise plan as appropriate and resubmit plan to Parks Canada Representative within 5 after receipt of comments from Parks Canada Representative.

.8 Parks Canada Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.

1.3 FILING OF NOTICE	.1	File Notice of Project with Provincial authorities prior to beginning of Work on behalf of the Parks Canada Agency.
1.4 SAFETY ASSESSMENT	.1	Perform site specific safety hazard assessment related to project.
1.5 MEETINGS	.1	Schedule and administer Health and Safety meeting with Parks Canada Representative prior to commencement of Work.
1.6 GENERAL REQUIREMENTS	.1	Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
	.2	Parks Canada Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.
1.7 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.
1.8 COMPLIANCE REQUIREMENTS	.1	Comply with Occupational Health and Safety Regulations.
	.2	Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.9 UNFORSEEN HAZARDS

.1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province Territory having jurisdiction and advise Parks Canada Representative verbally and in writing.

1.10 HEALTH AND SAFETY CO-ORDINATOR

.1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:

.1 Have site-related working experience.

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

.3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.

.4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.

.5 Be on site during execution of Work and report directly to and be under direction of Registered Occupational Hygienist Certified Industrial Hygienist and or site supervisor.

1.11 POSTING OF DOCUMENTS

.1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province Territory having jurisdiction, and in consultation with Parks Canada Representative.

1.12 CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Parks Canada Representative.

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

.3 Parks Canada Representative may stop Work if non-compliance of health and safety regulations is not corrected.

1.13 WORK STOPPAGE .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not used.

END OF SECTION

Part 1 General

1.1 **CANADIAN ENVIRONMENTAL ASSESSMENT ACT (CEAA)**

Execution of the work is subject to the provisions within the Canadian Environmental Assessment Act (CEAA) 2012 and subsequent amendments. This project and its components, has been subject to an environmental assessment pursuant to the expectations of CEAA. Environmental Protection Plans (EPPs) are the next step to achieve the desired end results of minimal adverse environmental effect, as the project is constructed.

A project specific Environmental Impact Analysis, Lake Louise Pipestone River Footbridge Bank Armouring is appended to the End of this Specification. The contractor is directed to this document for site specific environmental mitigation requirements.

Failure to comply with or observe environmental protection measures as identified in these specifications and the CEAA determination may result in the work being suspended pending rectification of the problems.

1.2 **START-UP AND ENVIRONMENTAL BRIEFING**

.1 All staff employed at the construction site will be subject to a briefing regarding their individual and collective responsibilities lasting approximately 2 hours, to ensure avoidable adverse environmental impact does not arise from their activities and personal choices. Employees must attend this briefing before beginning their work at the site. Each employee, having received the environmental briefing, will be issued a certification sticker to be displayed on their helmet. Employees of other service and materials providers who attend at the site – e.g. concrete truck operators, crane operators, and truck drivers must be apprised of their duty not to cause adverse environmental impact.

Parks Canada will have an Environmental Science Officer (ESO) attending the site to monitor the construction activity for conformance with the EPP. 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 Engineer, 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 Engineer

1.3 **CONSTRUCTION SITE ACCESS AND PARKING**

.1 The Contractor shall review both short and long term construction access requirements with the Engineer, both at start-up and on an ongoing basis. In consultation with the Engineer, the Contractor shall formulate an agreement for worker transportation o and from the work sites 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.

1.4 **PROTECTION OF WORK LIMITS**

.1 The Contractor is to prepare an EPP which details how the work limits shall be marked, and what procedures will be employed to ensure trespass outside these limits does not, occur, to the satisfaction of the engineer and the ESO.

1.5 **EROSION CONTROL**

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

.2 On-site sediment control measures shall be constructed and functional prior to initiating grubbing, stripping, excavating, loading, hauling, placing fill and bridge construction. The Contractor shall prepare an Erosion Control Plan, to the satisfaction of the Engineer and 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 lot functioning effectively they are to be repaired. The ESO and Engineer will also monitor erosion control performance.

.4 The site will be secured against erosion during any periods of construction inactivity or shutdown.

1.6 **POLLUTION CONTROL**

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

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

.3 The containment, storage, security, handling, use, unique spill response requirements and disposal of empty containers, surplus product or waste generated in the use of any

hazardous or toxic products shall be in accordance with all applicable federal and provincial legislation. Hazardous products shall be stored no closer than 100 metres from any water body.

.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 Engineer 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 rods and on-site work by methods that are approved by the Engineer or ESO.

.6 The Contractor shall provide spill kits at re-fuelling, 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 Engineer prior to the 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 Engineer and the ESO shall be notified immediately of any spill. If not available, Waterton Dispatch will be contacted at (403) 859-2636. Spill response cards will be distributed during the initial Environmental Briefing with basic instructions and phone numbers.

.8 In the event of a major spill, all other work shall be stopped and all personnel devoted to spill containment and clean-up

.9 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 Engineer and ESO.

1.7 **EQUIPMENT MAINTENANCE, FUELLING AND OPERATION**

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

.2 Equipment fuelling sites will be identified by the Contractor and approved by the Engineer and the ESO. Except for chain saws, any fuelling closer than 100 metres to any other streams, wetlands, water bodies or waterways requires the authorization and oversight of the Engineer.

.3 Diesel and gasoline delivery vehicles, including bulk tankers shall be parked more than 100 metres from any streams, wetlands, water bodies or watercourses. Gravity fed fuel systems are not allowed. Manual or electric pump delivery systems shall be used. Fuelling personnel shall maintain presence at and immediate attention to the fuelling 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 # 4 of Pollution Control above.

.5 Equipment used on the project shall be fuelled 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 Engineer. 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 Waterton Lakes National Park.

.7 The Contractor shall ensure that all equipment is inspected daily for fuel leaks and maintained in good working order.

.8 Fuel containers and lubricant products shall be stored only in secure locations specified by the Engineer. Fuel tanks or other potentially deleterious substance containers shall be secured to ensure they are tamperproof and cannot be drained by vandals when left overnight in Waterton Lakes National Park. Alternatively, the Contractor may hire a security person employed to prevent vandalism.

1.8 **OPERATION OF EQUIPMENT**

.1 Equipment movements shall be restricted to the 'footprint' of the construction area. The work limits shall be identified by stake and ribbon or other methods approved by the Engineer. Unless authorized by the Engineer, activities beyond the work limits are not permitted. No machinery will enter, work in or cross over streams, rivers or wetlands, water bodies or watercourses, nor damage aquatic and riparian habitat or trees and plant communities. Some of the construction shall require working 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 Engineer and ESO.

.2 The Contractor shall instruct workers how 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 his or her expense, for complete restoration including the replacement of trees, shrubs, topsoil, grass, etc. to the satisfaction of the Engineer and ESO.

.4 Restrict vehicle movements to work limits.

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

1.9 **FIRE PREVENTION AND CONTROL**

.1 A fire extinguisher will be carried and available for use on each machine in the event of fire (e.g. ignited by a spark) to prevent the fire from burning the unit or spreading to other fuels in the work area.

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

.3 Care shall be taken while smoking on the construction site to ensure that accidental ignition of any flammable material is prevented. Fires or burning of waste materials are not permitted.

.4 The Contractor will maintain an awareness of the fire danger rating (Index) in the work area by contacting the Waterton Fire Duty Officer at (403) 859-2636. Fire prevention care is to be commensurate with the fire Index.

.5 In case of fire, the Contractor or worker will take immediate action to extinguish the fire provided it is safe to do so. The ESO and the Engineer will be notified of any fire immediately. If not available, Waterton Dispatch will be contacted at (403) 859-2636

.6 Fires or burning of waste materials is not permitted

1.10 **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 If necessary, the construction activity may be scheduled around important wildlife windows. Fisheries windows for avoidance of stream disturbance work will apply - see Fish and Fish Habitat Considerations section below.

.3 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.

.4 Notify the ESO and Engineer 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. If the ESO or Engineer are not available, Waterton Lakes National Park Dispatch at (403)859-2636.

1.11 **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 Engineer immediately. The Contractor and workers shall wait for instructions before proceeding with their work. All historical or archaeological objects found in Waterton Lake National Park 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 Engineer.

1.12 **WASTE MATERIALS STORAGE AND REMOVAL**

.1 The Contractor and workers shall dispose of hazardous wastes in accordance 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 Waterton Lake National Park. 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 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 Waterton Lakes National Park. Such wildlife attractants shall not be stored at the work site overnight.

.6 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.

.7 The Contractor and workers shall immediately report any circumstances related to food garbage and wildlife to the ESO or the Engineer. If neither can be reached, the Contractor worker shall immediately contact the Banff National Park Dispatch at 1-888-927-3367 to report the details.

.8 Sanitary facilities, such as a portable container toilet, shall be provided by the Contractor and maintained in a clean condition.

1.13 **MISCELLANEOUS SITE MANAGEMENT CONTINGENCIES**

.1 The Contractor shall prepare an EPP which details how the work limits will be marked and what procedures will be employed to ensure trespass outside these limits does not occur, to the satisfaction of the Engineer and the E.S.O.

.2 The Contractor shall provide toilets and maintain them in a clean and sanitary condition at the camp. These facilities shall not be used for the disposal of anything but human body wastes.

.3 The National Park Act regulations prohibit anyone working within Waterton Lakes National Park from using public campground facilities.

.4 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.

.5 Security services at the construction site may be desirable or necessary during the contract, especially during quiet times. Fuel tanks or other potentially deleterious substance containers must be secured by the Contractor to ensure they are tamperproof and cannot be drained by vandals.

.6 Pets shall not be brought to or maintained at the construction site or worker's camp.

.7 Specific intake measures are required when water is approved to be withdrawn from open watercourses.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 STRIPPING

.1 A contingency plan for control of dust generated from the construction 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. The Contractor's EPP will describe measures to be implemented in such a circumstance.

.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. Generally, work within a 30 metre buffer of waterways or wetland requires the close oversight of the ESO and the Engineer.

.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 Engineer, 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 Engineers direction, the Contractor shall prepare a plan for management of each stripping pile.

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. Generally, work within a 30 metre buffer of waterway or wetlands require the close oversight of the ESO and the Engineer.

.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 ;in 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 limit is to be removed promptly in a manner that does not damage trees or vegetation at that location.

3.3 **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 limit; is to be removed promptly in a manner that does not damage trees or vegetation in that location.

.2 All sediment control measures shall be implemented by the Contractor prior to the commencement of the work in the vicinity of water bodies, watercourses, and wetlands.

.3 Special precautions may have to be taken during excavation in the vicinity of intermittent or active drainage channels. See "Specific Concerns".

.4 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. See "Specific Concerns".

.5 Placement of riprap and backfill shall be undertaken without contacting the watercourse or wetted margins of the river, unless approved by the Engineer.

.6 If a pump-out sump to dewater excavation sites will be required, the Contractor is to prepare an EPP which details how the dewatering shall be undertaken, to the satisfaction of the Engineer and the E.S.O. 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 Engineer and the E.S.O.

3.4 **FINE GRADING, TOPSOIL PLACEMENT, AND SEEDING**

.1 This contract involves the final shaping of cut slopes, fills and landscapes disturbed in the construction of the Works. Where required by the Parks Canada Representative, some disturbed areas may be required to be covered by stripped soil and chip compost materials and seeded. Environmental concerns related to these activities largely focus on erosion prevention and sediment control. The Contractor is to present a plan for placement, spreading, and stabilization of reclamation materials that controls soil erosion and prevents sedimentation, to the satisfaction of the Engineer and E.S.O.

3.5 **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 Engineer and ESO. 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 spil1with capacity for 1:100 year storm events. 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.

3.6 **ENVIRONMENTAL PROTECTION POINTS SPECIFIC TO EXCAVATING AND PLACING RIPRAP**

.1 All sediment control measures shall be implemented by the Contactor prior to the commencement of the work in the vicinity of a water course. Special precautions may have to be taken during excavation in the vicinity of intermittent or active drainage channels. See "Specific Concerns". If sediments do enter a water course during any nearby excavation or at its banks, the Contractor shall ensure that sediment levels in the waters of the creek do not exceed specified limits and meet the "desired end result" limits outlined. See "Specific Concerns". Placement of riprap and backfill at the bridge will be undertaken so as to avoid unauthorized contact with the waterway or wetted margins of the stream. Fisheries protection windows will be in place to guide when stream disturbance can or cannot be allowed. See "Specific Concerns".

END OF SECTION

Part 1 General

1.1 **RELATED SECTIONS**

.1 Section 01 35 43 - Environmental Procedures.

.2 Section 31 11 00 - Clearing and Grubbing.

.3 Section 32 91 21 – Topsoil Placement and Grading.

1.2 **DESCRIPTION**

.1 This item consists of the excavation and disposal of all materials in conformity with the lines, grades and dimension indicated on the drawings and as directed by the Parks Canada Representative, and includes:

.1 Excavation of the river bank to contour the river bank to a 2:1 backslope for placement of rip rap

.2 Removal and disposal of unsuitable materials from excavation and embankment as directed by Parks Canada representative and described in Scope of Work.

.3 Transportation of excavated materials.

.4 Finishing of top surfaces and slopes.

.5 Maintenance of the work set forth under this section in a finished condition until any portion thereof has been accepted as completed by the Parks Canada Representative.

1.3 **MEASUREMENT PROCEDURES**

1. Measurement and Payment for items covered under this specification will be as described in Secion 01 29 00 – Basis of Payment.

.1 No measurement payment will be made for:

.1 Excavating unnecessarily beyond lines established by Parks Canada Representative, with exception of unavoidable slide material. Do not measure slide material, when such slides are attributable to negligence.

.2 Scarifying or benching existing slopes or existing road surfaces.

.3 Removing and disposing of roots, stumps and other materials excavated during waste operation.

.4 Removing unsuitable material from embankment attributable to negligence.

.5 Watering, drying or compacting.

.6 Proof rolling.

.7 Compaction of material (150 mm) below sub-grade horizon in areas of cut.

.8 Finishing.

1.4 **REFERENCES**

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

.1 ASTM D698-00a, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,000 ft-lbf/ft^3) (600 kN-m/m^3).

1.5 **DEFINITIONS**

.1 Rock Excavation: excavation of:

.1 Material from solid masses of igneous, sedimentary or metamorphic rock which, prior to removal, was integral with parent mass. Material that cannot be ripped with reasonable effort from Caterpilar D9L or equivalent to be considered integral with parent mass.

.2 Excavation Common: excavation of materials that are not Rock Excavation or Stripping.

.3 Borrow: Suitable material obtained from locations outside the limits of the roadway cut placed as embankment material.

.4 Free Haul: distance that excavated material is hauled without compensation to an area within Banff National Park as directed by department representative.

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

.6 Embankment: material derived from usable excavation and placed above original ground or stripped surface.

.7 Waste Material: material unsuitable for embankment, embankment foundation or material surplus to requirements.

.8 Topsoil: material passing a 100 mm sieve and capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.

1.6 **QUALITY CONTROL**

.1 Regulatory Requirements:

.1 Adhere to regulations of authority having jurisdiction when blasting is required.

.2 Adhere to Provincial and National Environmental requirements when potentially toxic materials are involved.

.2 All Quality Control testing by the Contractor.

1.7 **WASTE MANAGEMENT AND DISPOSAL**

.1 Separate and recycle waste materials in accordance with Section 01 35 43 - Environmental Procedures.

Part 2 Products

2.1 **MATERIALS**

.1 Embankment materials require acceptance by Parks Canada Representative.

.2 The Parks Canada Representative shall designate a source of granular material to be utilized for the construction of the Dike.

.3 The granular material utilized for the dike construction will be well graded and free of any large rock or organic materials.

.4 Material used for embankment not to contain more than 3% organic matter by mass, frozen lumps, weeds, sod, roots, logs, stumps or other unsuitable material.

.5 Borrow material:

.1 Obtained from sources as indicated or as designated by Parks Canada Representative.

.2 Obtained from borrow pit approved by Parks Canada Representative.

Part 3 Execution

3.1 **COMPACTION EQUIPMENT**

.1 Compaction equipment must equivalent of one 12 tonne vibratory packer capable of obtaining required densities in materials on project. Equipment that does not achieve specified densities must be replaced or supplemented.

3.2 **WATER DISTRIBUTORS**

.1 Apply water with equipment capable of uniform distribution.

3.3 **STRIPPING OF TOPSOIL**

.1 Strip topsoil only as required to complete the work. Stockpile any topsoil within the work area to be reused to retopsoil any disturbed ground as a result of the Works.

3.4 **EXCAVATING**

.2 General:

.1 Identify the areas of riverbank that needs to be recontoured to a 2:1 slope. Excavate the bank to the designated slope leaving the slope clear of any roots or protruding rocks.

.2 The dimensions of the excavations and embankments shall be, in accordance with the typical sections accompanying these specifications, but the dimensions of any or all excavations and embankments may be increased or decreased at any time by the Parks Canada Representative as conditions and circumstances may determine.

.3 Reuse granular material excavated from the river bank to rehabilitate the top of bank or utilize in the construction of the dike protection between the pedestrian bridge and the railway bridge. Any unusable material shall be excavated and hauled away to a waste area designated by the Parks Canada representative.

.2 Drainage:

.1 Maintain profiles, crowns and cross slopes to provide good surface drainage at all times.

.2 Provide ditches as work progresses to provide drainage.

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3.5 **SUBGRADE COMPACTION**

.1 Break material down to sizes suitable for compaction and mix for uniform moisture to full depth of layer.

.2 Embankment material shall be placed in successive uniform layers over the entire area as follows:

.1 Material containing less that 25 percent by volume of stones larger than 100 mm shall be placed in 200mm compacted layers.

.2 Material containing 25 percent or more by volume of stones larger than 100 mm shall be placed in layers not exceeding the maximum size of the stones. Stones larger than 100 mm shall not be placed within 150 mm of the subgrade elevation.

.3 In embankments composed principally of material obtained from rock cuts, the larger stones shall be carefully distributed and the interstices filled with smaller stones and other material to form a compact mass. Such embankments shall be constructed in layers not exceeding 1 metre. The placing of individual rocks and boulder exceeding 1.0 metres in least dimension will be permitted provided they are carefully distributed and the interstices filled with finer material to form a dense and compact mass. Each layer, before starting the next, shall be levelled and smoothed with suitable equipment. Hauling and spreading equipment shall be operated over the full width of each layer.

.3 Each layer shall be brought to its required degree of compaction throughout its entire width before successive layers are placed.

.4 Compact each layer to minimum 95% maximum dry density, ASTM D698 (AASHTO T99). Top 300 mm of sub-grade to be compacted to 98% maximum dry density, ASTM D698 (AASHTO T99).

.5 Add water or dry as required to bring moisture content of materials to level required to achieve specified compaction.

.6 For rock placed as fill, compact with large steel wheeled or tracked equipment of sufficient size to break larger particles. Compact until rock fill is stable under compaction equipment and all voids are filled.

.7

3.6 **PROTECTION**

.1 Maintain finished surfaces in condition conforming to this section until acceptance by the Parks Canada Representative.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 Canadian Standards Association (CSA International)
.1 CAN/CSA-Z321, Signs and Symbols for the Occupational Environment.

.2 U.S. Environmental Protection Agency (EPA) / Office of Water
.1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.2 SUBMITTALS

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

1.3 INSTALLATION AND REMOVAL

.1 Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.

.2 Identify areas which have to be graveled or otherwise protected to prevent tracking of mud or damage to travelling surfaces such as concrete sidewalks, asphalt roadways, parking lots etc.

.3 Indicate use of supplemental or other staging area.

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

.5 Remove from site all such work after use.

.6 Temporary access to the site is required. Construct access as directed by the Parks Canada Representative. Once the work has been completed rehabilitate the temporary access as directed by the Parks Canada Representative.

1.4 SITE STORAGE/LOADING	.1	Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.
	.2	Do not load or permit to load any part of Work with weight or force that will endanger Work.
	.3	Coordinate area and location with Parks Canada Representative.
1.5 CONSTRUCTION PARKING	.1	Parking will be permitted on site in the designated parking area as assigned by the Parks Canada Representative.
	.2	Provide and maintain adequate access to project site.
1.6 SECURITY	.1	It is the responsibility of the contractor to secure their equipment and construction materials.
1.7 OFFICES	.1	Contractor will arrange for their own office space for project administration and daily operation.
1.8 CONTRACTOR ACCOMMADATIONS	.1	No construction camp facilities are permitted on the construction site or in the National Park.
1.9 EQUIPMENT, TOOL AND MATERIALS STORAGE	.1	Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.

.2 Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

1.10 SANITARY FACILITIES

.1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.

.2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.11 CONSTRUCTION SIGNAGE

.1 Provide and erect project sign, within three weeks of signing Contract, in a location designated by Parks Canada Representative Engineer Consultant.

.2 Construction sign 2.44 x 2.44 m, of wood frame and plywood construction painted with exhibit lettering produced by a professional sign painter.

.3 Indicate on sign, name of Owner, and Contractor and Subcontractor, of design style established by Parks Canada Representative Engineer Consultant as detailed.

.4 No other signs or advertisements, other than warning signs, are permitted on site.

.5 Signage wording must be in both official languages.

.6 Signs and notices for safety and instruction in both official languages Graphic symbols to CAN/CSA-Z321.

.7 Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project or earlier if directed by Parks Canada Representative Engineer Consultant.

1.12 PROTECTION AND MAINTENANCE OF TRAFFIC

.1 Provide access and temporary relocated roads as necessary to maintain traffic.

.2 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Parks Canada Representative Engineer Consultant.

.3 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs

.4 Protect travelling public from damage to person and property.

.5 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public, pedestrian, and park operations traffic.

.6 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.

.7 Construct access and haul roads necessary.

.8 Haul roads: constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided.

.9 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.

.10 Dust control: adequate to ensure safe operation at all times.

.11 Location, grade, width, and alignment of construction and hauling roads: subject to approval by Parks Canada Representative Engineer Consultant.

.12 Lighting: to assure full and clear visibility for full width of haul road and work areas during night work operations.

.13 Provide snow removal during period of Work.

.14 Remove, upon completion of work, haul roads designated by Parks Canada Representative Engineer Consultant.

1.13 CLEAN-UP

.1 Remove construction debris, waste materials, packaging material from work site daily.

.2 Clean dirt or mud tracked onto paved or surfaced roadways.

.3 Store materials resulting from demolition activities that are salvageable.

.4 Stack stored new or salvaged material not in construction facilities.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction, sediment and erosion control plan, specific to site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

END OF SECTION

Part 1 General

1.1 **RELATED SECTIONS**

.1 Section 01 35 43 – Environmental Procedures.

.2 Section 35 43 00 – Excavation and Embankment

.3 Section 31 37 00 - Heavy Rock Rip Rap

.4 Section 32 91 21 – Topsoil and Seeding

1.2 **MEASUREMENT PROCEDURES**

.1 The bank of the river plus a 6 m buffer back from the original top of bank has been identified as the work area for this project, extending roughly 25m on either side of the Pipestone River Pedestrian Bridge. In addition, clearing and grubbing will be required to provide an access road to the work area. Measurement for payment for clearing and grubbing will be "Lump Sum and will include:

.1 Removal of all visible, wastes as directed by the Parks Canada representative.

.2 Removal of trees and brush that is inside the defined work area that will impede the progress and completion of the Work.

.3 Removal of trees and brush required for temporary access to the designated work area.

.2 Payment for Clearing and Grubbing will be as described in Section 01 29 00 Basis for Payment.

.3 Additional clearing and grubbing, as required within the work zone for execution of the work will not be measured separately for payment and will be considered incidental to the work.

.1 The contractor is to minimize the affected area and limit clearing and grubbing to that space that is required to complete the work.

.4 Mobilization and demobilization required for this Work shall be incidental to "Lump Sum Price, and no additional payment will be made.

.5 Environmental mitigations required in accordance with Section 01 35 43 – Environmental Procedures, for the Work in this Section shall be incidental to the contract and no separate payment will be made to the Contractor

1.3 **DEFINITIONS**

.1 Clearing consists of cutting off trees and brush vegetative growth to not more than specified height above ground and disposing of felled trees, previously uprooted trees and stumps, and surface debris.

.2 Close-cut clearing consists of cutting off standing trees, brush, scrub, roots, stumps and embedded logs, removing at, or close to, existing grade and disposing of fallen timber and surface debris as directed by Parks Canada Representative during site restoration.

.3 Clearing isolated trees consists of cutting off to not more than specified height above ground of designated trees, and disposing of felled trees and debris as directed by Parks Canada Representative during site restoration.

.4 Underbrush clearing consists of removal from treed areas of undergrowth, deadwood, and trees smaller than 50 mm trunk diameter and disposing of fallen timber and surface debris as directed by Parks Canada Representative during site restoration.

.5 Grubbing consists of excavation and disposal of stumps, roots, boulders and rock fragments as required to execute work.

1.4 **STORAGE AND PROTECTION**

.1 Prevent damage to trees and root systems of trees which are to remain.

.1 Repair damaged items to approval of Parks Canada Representative.

.2 Replace trees designated to remain, if damaged, as directed by Parks Canada Representative.

1.5 **WASTE MANAGEMENT AND DISPOSAL**

.1 Man-made wastes are to be placed within the work site as directed by Parks Canada Representative.

.2 All vegetative wastes are to be salvaged and placed as directed by Parks Canada Representative during site restoration.

Part 2 Products

2.1 **MATERIALS**

.1 Not used.

Part 3 Execution

3.1 **TEMPORARY EROSION AND SEDIMENTATION CONTROL**

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.2 **PREPARATION**

.1 Inspect site and verify with Parks Canada Representative items designated to remain.

.2 Locate and protect utility lines if present: preserve in operating condition active utilities traversing site.

.1 Notify Parks Canada Representative immediately of damage to or when unknown existing utility line[s] are encountered.

.2 When utility lines which are to be removed are encountered within area of operations, notify Parks Canada Representative in ample time to minimize interruption of service.

.3 Notify utility authorities before starting clearing.

3.3 **CLEARING**

.1 Clear as directed by Parks Canada Representative, by cutting trees and vegetative growth.

.2 Cut off branches and cut down trees overhanging area cleared as directed by Parks Canada Representative.

.3 Cut off unsound branches on trees designated to remain as directed by Parks Canada Representative.

.4 All clearing shall be felled in such a manner that surrounding vegetation is preserved along the construction limits. Stumps remaining within 3.0 metres of cleared perimeter are to be cut flush with ground and vegetative mat left undisturbed.

.5 All removed trees and brush must be disposed of at a location designated by the Parks Canada Representative.

3.4 **FINISHED SURFACE**

.1 Leave ground surface in condition suitable for the stripping and stockpiling of topsoil as required to complete the Works.

3.5 **CLEANING**

.1 Proceed in accordance with Section 01 35 43 Environmental Procedures.

.2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

Part 1 GENERAL

1.1 RELATED SECTIONS

.1 Section 01 35 43 - Environmental Procedures.

1.2 DESCRIPTION

.1 This specification is for the supply, delivery, and installation of heavy rock riprap. This work shall include all necessary trimming, excavation, and fill required to satisfactorily place the rock riprap, such as:

.1 Supply and placing of geotextile filter fabric

.2 Supply and placing of Rip Rap

.3 Top of bank rehabilitation.

1.3 PERMITS

.1 The Contractor shall obtain whatever permits, agreements, and authorizations are necessary, prior to loading the riprap. He shall advise the Parks Canada Representative of any special provisions required under such permits, and must provide evidence that the requirements of the permits have been fully complied with before final payment will be made.

1.4 MEASUREMENT AND PAYMENT

.1 The quantity of heavy rock riprap to be paid for will be measured in place. The volume of rock paid for will be calculated from the thickness of the riprap as shown on the drawings, and the actual area covered.

.2 Overages in thickness or area beyond the limits shown on the drawings will not be paid for unless these changes were requested by the Engineer. Payment will be made at the unit price bid per cubic metre of Heavy Rock Riprap acceptably in place, which price shall include full compensation for all necessary materials, royalties, permits, haul of materials, equipment, tools, labour and incidentals necessary to complete the work, including the preparation of the subgrade for the riprap, geotextile filter fabric, bedding material, trimming, excavation, backfill as required, and labour for measurement.

Part 2 PRODUCTS

2.1 MATERIAL

.1 The rock supplied shall be hard, durable and angular in shape, resistant to weathering and water action, free from overburden, spoil, shale or shale seams and organic material, and shall meet the gradation requirements for the class specified. No sandstone will be permitted for all classes. The minimum dimension of any single rock shall be not less than one third of its maximum dimension. The minimum acceptable unit weight of the rock is 2.5 t/m^3.

.1 The Contractor shall provide the Engineer with evidence of the acceptability of the riprap material. Reliable performance records of proposed material, other than fieldstone, will be considered evidence of acceptability. Fieldstone shall be considered

to have a reliable performance record, and will be accepted if it meets the gradation requirements.

.2 Sampling and testing are required for Class 2 rock riprap for which no performance records are available. Sampling and testing are not required for Class 1 rock riprap and field stone. Tests are based on the Durability Index and Durability Absorption Ratio as developed by the State of California, Department of Transportation. The Contractor shall submit samples of the proposed material to an independent certified testing laboratory of his choice and provide written reports of the test results to the Consultant. The reports shall be stamped by a Professional Engineer. The Contractor shall be responsible for all associated costs for rock riprap sample testing including, but not limited to, transporting samples to an independent certified testing laboratory, testing, disposing of samples after testing, and providing written reports to the Engineer.

.3 A representative sample of 70 kg minimum is required for each type and source of rock to be tested, and shall contain a number of pieces ranging up to 25 kg mass.

.4 The approval of rock samples from a particular source or quarry site shall not necessarily be construed as constituting approval of all material from that location.

.5 The material provided for each class specified shall have a gradation that conforms to the following:

		Class			
		1M	1	2	3
Nominal Mass (Kg)		7	40	200	700
Nominal Diameter (mm)		175	300	500	800
None greater than:	kg	40	130	700	1800
	or mm	300	450	800	1100
20% to 50%	kg	10	70	300	1100
	or mm	200	350	600	900
50% to 80%	kg	7	40	200	700
	or mm	175	300	500	800
100% greater than:	kg	3	10	40	200
	or mm	125	200	300	50

.6 Percentages quoted are by mass. Sizes quoted are equivalent spherical diameters, and are for guidance only.

.7 Rip Rap shall meet the following minimum requirements for specific gravity, absorption and durability:

2.2 METHOD OF TEST REQUIREMENTS

-

Method of Test	Criteria
California Department of Transportation Method of Test for Specific Gravity and Absorption of Coarse Aggregate (California Test 206)	Minimum Specific Gravity = 2.60 Maximum Absorption= 2.0 percent
California Department of Transportation Method of Test for Durability (California Test 229)	Minimum Durability Index = 52 Index Durability Index may be less than 52 if DAR* > 23

* Durability Absorption Ratio (DAR) = Durability Index / (Absorption % + 1%)

2.3 GEOTEXTILE FILTER FABRIC

.1 Where geotextile filter fabric is specified, the slope shall be graded to provide a smooth, uniform surface and a layer of 19 mm road crush placed upon which the geotextile will be placed..

.2 All stumps, large rock, brush or other debris that could damage the fabric shall be removed. All holes and depressions shall be filled so that the fabric does not bridge them. Loose or unstable soils shall be replaced.

.3 Non-woven geotextile filter fabric shall be used under all riprap in accordance with the following table of minimum average roll value properties (MARV's) for each specific Class of riprap:

2.4 NON-WOVEN GEOTEXTILE FILTER FABRIC

Non-Woven Geotextile Filter Fabric		
Specifications and Physical Properties		
	Class 1M, 1 and 2	Class 3
Grab Strength	650 N	875 N
Elongation	50%	50%

Puncture Strength	275 N	550 N
Burst Strength	2.1 MPa	2.7 MPa
Trapezoidal Tear	250 N	350 N
Minimum Fabric Lap to be 300 mm		

.1 The non-woven geotextile filter fabric shall meet the specifications and physical properties as listed above.

.2 The fabric shall be laid parallel to the slope direction. It shall be placed in a loose fashion, however folds and wrinkles shall be avoided. Adjacent strips of fabric shall be overlapped a minimum of 300 mm, except where placed underwater, the minimum lap width shall be 1 m. Overlaps shall be pinned using 6 mm diameter steel pins fitted with washers and spaced at 1 m intervals along the overlaps.

.3 The top edge of the filter fabric shall be anchored by digging a 300 mm deep trench, inserting the top edge of the fabric and backfilling with compacted soil.

.4 Care shall be taken to prevent puncturing or tearing the geotextile. Any damage shall be repaired by use of patches that extend at least 1 m beyond the perimeter of the tear or puncture.

.5 The fabric shall be covered by rock riprap within sufficient time so that ultraviolet damage does not occur; in no case shall this time exceed 7 days for ultraviolet material and 14 days for ultraviolet protected and low ultraviolet susceptible polymer geotextiles.

.6 Riprap placement shall commence at the base of the blanket area and proceed up the slope. The height of drop of riprap shall be limited to 1.0 m or less, and the riprap shall not be allowed to roll down the slope. Heavy equipment will not be permitted to operate directly on the geotextile.

Part 3 EXECUTION

3.1 PLACING OF ROCK

.1 Placing of the rock will occur during low flow conditions.

.2 Install the non-woven geotextile filter fabric on the subgrade prior to placement of the Class 2 Rip Rap.

.3 Do not place Class 2 Rip Rap until the applicable surveys or inspections of the subgrade surfaces have been carried out and accepted by the Parks Canada Representative.

.4 Rip Rap shall be placed to the lines and thickness shown on the drawings and shall be maintained free of contamination by other materials throughout the construction process.

.5 Do not place Class 2 Rip Rap by dumping into chutes or by end dumping from haul units or similar methods likely to cause segregation of various sizes and damage to the subgrade materials

.6 Do not drop from a height greater than 1.0 m vertically from its final position.

.7 Begin placement at the toe of the slope and proceeding up the slope. The Rip Rap shall be densely placed and individual stones shall be worked with placement equipment to form a well-keyed surface.

.8 The Contractor shall ensure the construction methods adopted produces a finished surface for the Class 2 Rip Rap that is comprised of the full spectrum of particle sizes continuously throughout its length and breadth.

.9 Construction equipment is not permitted on the Class 2 Rip Rap surface at any stage of the construction.

3.2 INSPECTION OF ROCK

.1 Control of gradation will be by visual inspection. The Contractor shall provide a minimum of two samples of rock, of the minimum sample size specified below. These samples shall be proven to acceptably conform to the required gradation by direct weighing of all the individual pieces with suitable scales; the mass of each piece in the sample shall be painted on the piece. These samples, located as required by the Engineer at the construction site and at the source or quarry site, may be incorporated in the finished riprap when they are no longer required for reference purposes. The samples shall be used for frequent reference in judging the gradation of the riprap being loaded at the source and placed at the site. The minimum sample size in area shall be as follows:

Class	Minimum Sample Size
1M	1 m x 1 m
1	2 m x 2 m
2	3 m x 3 m
3	4 m x 4 m

.2 The Contractor shall provide, at no additional cost to the Engineer, whatever facilities are required to assist the Engineer in checking gradation and measuring riprap in place. If, during the delivery of the material to the site, a particular load is found to be made up of pieces predominantly one size, or to be lacking in pieces of one size, it shall be dumped in a suitable location outside the area to be protected.

.3 Additional material as required to make up the deficient sizes shall be added to this load such that the combination can then be placed to ensure uniformity.

END OF SECTION

Part 1 GENERAL

1.1 RELATED SECTIONS

.1 Section 01 35 43 - Environmental Procedures

1.2 MATERIALS SUPPLIED BY OTHERS

.1 The Parks Canada representative shall approve the seed mix for the project. Contact the Parks Canada representative prior to purchase of seed, to acquire an approve seed mix.

1.3 MEASUREMENT PROCEDURES

.1 Measurement and payment for Topsoil and Seeding will be as described in Section 01 29 00 – Basis of Payment

1.4 SUBMITTALS

.1 Product Data:

.1 Submit product data as discussed with the Parks Canada representative, seed mix product sheets will need be reviewed and approved prior to any work starting.

.2 Provide product data for:

Fertilizer.

1.5 QUALITY ASSURANCE

.1 Pre-Installation Meetings: Conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements.

1.6 SCHEDULING

.1 Schedule completion of work immediately prior to hydraulic mulching. Completion of topsoil and seeding will be carried out in Spring of 2014 as dictated by field conditions on site.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 35 43 Environmental Procedures.

.2 Divert unused fertilizer from landfill to official hazardous material collections site.

.3 Do not dispose of unused fertilizer into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

Part 2 PRODUCTS

2.1 WATER

.1 Free of impurities that would inhibit germination and growth.

2.2 FERTILIZER

.1 To Canada "Fertilizers Act" and "Fertilizers Regulations".

.2 Complete synthetic fertilizer with guaranteed minimum analysis as specified.

2.3 SEEDING

.1 Parks Canada to approve seed mix prior to installation. Seed mix bag tags will be required as part of this review and approval.

Part 3 EXECUTION

3.1 QUALITY OF WORK

.1 Do not perform work under adverse field conditions.

.2 Remove and dispose of weeds; debris; stones 100 mm in diameter and larger; soil contaminated by oil, gasoline and other deleterious materials; to a licensed contaminated soils disposal site or as directed by Parks Canada representative.

3.2 TOPSOIL PLACEMENT

.1 Spread any stockpiled topsoil over the disturbed ground in the designated work area. No topsoil or seeding is to place on the areas that have been riprapped.

.2 No topsoil is to imported from outside the park.

3.3 SEED BED PREPARATION

.1 Verify that grades are correct. If discrepancies occur, notify the Parks Canada representative and do not commence work until instructed by the Parks Canada representative.

.2 Fine grade surface free of humps and hollows to smooth, even grade, to contours indicated to tolerance of plus or minus 15 mm, surface draining naturally.

.3 Cultivate fine grade approved by Parks Canada representative to 25 mm depth immediately prior to seeding.

3.4 SEED PLACEMENT

.1 For mechanical seeding:

.1 Use equipment and method acceptable to the Parks Canada representative. It is expected that this project will require hydro seeding for all seeding applications. Areas to be hydro seeded will be completed in consultation with department representative. Item #2 manual seeding is included in the event that the hydro seeder is unable to access all areas.

.2 For manual seeding:

.1 Use "Cyclone" type manually operated seeder.

.2 Use manually operated, water ballast, landscaping type, smooth steel drum roller. Ballast as directed by the Parks Canada representative.

.3 Use equipment and method acceptable to the Parks Canada representative.

.3 On cultivated surfaces, sow seed uniformly as directed by the Parks Canada representative.

.4 Blend applications 150 mm into adjacent grass areas and previous applications to form uniform surfaces.

.5 Sow half of required amount of seed in one direction and remainder at right angles as applicable.

.6 Incorporate seed by light raking in cross directions.

3.5 MAINTENANCE DURING ESTABLISHMENT PERIOD

.1 Perform following operations from time of seed application until acceptance by the Parks Canada representative.

.2 Water seeded area to maintain optimum soil moisture level for germination and continued growth of grass. Control watering to prevent washouts.

.1 Repair and reseed dead or bare spots to allow establishment of seed prior to acceptance.

.2 Cut grass to 100 mm whenever it reaches height of 120 mm. Remove clippings which will smother grass as directed by the Engineer.

.3 Fertilize seeded areas after first cutting in accordance with fertilizing program. Spread half of required amount of fertilizer in one direction and remainder at right angles and water well.

.4 Control weeds by mechanical means utilizing acceptable integrated pest management practices.

3.6 FINAL ACCEPTANCE

.1 Seeded areas will be accepted by the Parks Canada representative provided that:

.1 Areas are uniformly established and turf is free of rutted, eroded, bare or dead spots and free of weeds.

.2 Areas have been fertilized.

.2 Areas seeded in fall will be accepted in following spring, one month after start of growing season provided acceptance conditions are fulfilled.

3.7 CLEANING

.1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

Appendix

Basic Environmental Impact Analysis

Lake Louise Pipestone River Footbridge Bank Amouring

Basic Environmental Impact Analysis

Lake Louise Pipestone River Footbridge Bank Armoring

Lake Louise, Banff National Park

October 2, 2013

1. PROJECT TITLE	Lake Louise Pipestone River Footbridge Bank Armoring	
2. PROJECT LOCATION (Park, Site, Canal, NMCA)	Banff National Park	
3. PROJECT SITE(S)	Lake Louise, Pipestone River	
4. PROPONENT	Parks Canada	
5. PROPONENT CONTACT INFORMATION	Dwayne Doucette. (403.522.1278)	
6. PROJECT DATES	Commencement: 2013-10	Completion: 2013-11
7. INTERNAL PROJECT FILE #	LLYK 2013-0020L	

8. PROJECT DESCRIPTION

In June 2013 Banff National Park experienced flooding and high water at a number of streams and rivers, resulting in a variety of river channel changes and facility loss or damage. On the Pipestone River near Lake Louise damage included;

- An infiltration gallery for the Lake Louise Ski Area's water withdrawal system was damaged beyond reasonable repair
- Woody debris was deposited under bridges and on mid-channel islands
- Significant deposits of cobble material were created within the river channel
- The river left bank in the vicinity of a picnic area was breached, resulting in flooding of this facility including bank erosion occurred for 100+ m along the river left bank.
- Erosion of the river bank along the access road to the Lake Louise water reservoir

In addition, the footbridge connecting the hamlet of Lake Louise with the Post Hotel was compromised. There was significant scouring and erosion around the abutments for the footbridge, particularly on the hamlet side. There appears to be some minor undercutting of the footings for the abutments however there has been no measured settling or movement in the bridge. In addition, there was bank erosion up and down stream of the abutment that could lead to further bank loss, damage to the abutment or potentially cutting the abutment completely off (see photos below).

This project will seek to protect the abutment for the bridge as well as the shoreline up and downstream. The work consists of the recontouring the east bank of the Pipestone River upstream of the pedestrian bridge and the supply and installation of rip rap on the recontoured bank to protect the river bank and adjacent facilities from continual erosion by the high flows in the river that is associated with a severe storm event or spring runoff. The bank will be recontoured at 2:1 backslope using Class 2 rip rap. It will be installed 24m upstream and 20m downstream of the bridge. A non-woven geotextile filter cloth will be installed behind the rip rap to improve stability. Approximately 8 trees will be removed along the river as they are in immediate danger of falling into the stream. Another 20 trees will be removed when creating an access road and to accommodate the wider bank.

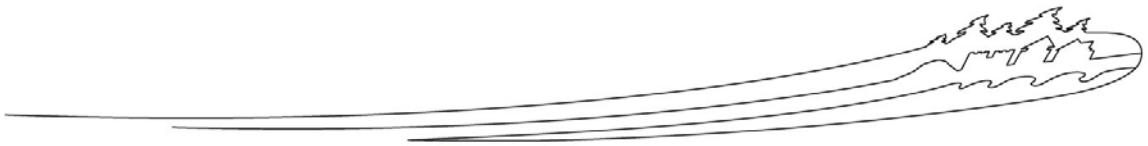
Due to the extraordinary nature of the flooding, the Banff Field Unit created a broad-level EIA to cover the many projects that needed completing. They use the following criteria to determine if each project was suitable for assessment under this EIA. These criteria include:
a. They have predictable, mitigable environmental effects;
b. Take place in previously disturbed areas and/or involve existing infrastructure;
c. Based on past experience with similar projects, significant adverse effects are unlikely to occur;
d. Project-specific follow-up programs will not be required as there are no expected variations in predictions or effects to be monitored (standard site inspections during/after a project are still applicable).
e. Based on past experience, projects are not expected to raise concerns for stakeholders and park visitors (i.e., public consultation will not be required).

Because this project falls within those criteria, the BMP's from Banff's general EIA were used to guide the development of this EIA. Additional mitigations were used where needed. The Department of Fisheries and Oceans was also consulted to ensure that this project would not require a specific authorization. DFO agreed that the environmental effects were unlikely and could be mitigated.

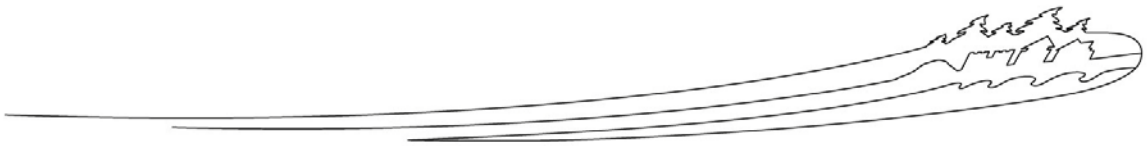
Figure 1. Bank erosion upstream of footbridge

Figure 2. Scouring of bridge abutment

9. ENVIRONMENTAL COMPONENTS LIKELY TO BE AFFECTED (For help completing this section see instructions at end of document)
In general, the environmental component of greatest concern for most of the flood rehabilitation projects will be aquatic resources due to the proximity of many of the sites to water courses. Other components of concern include terrain and soils, vegetation, wildlife and cultural/archaeological resources.



10. IMPORTANT EFFECTS IDENTIFIED



Soils and Landforms
There is potential for soil damage and rutting as a result of equipment access to project sites, as well as soil loss as a result of wind or water erosion of disturbed soils. For example, irresponsible equipment operation, including excessive speeds, improper turning and other "stunting" can rip organic mats (the duff layer) and expose soils making them vulnerable to erosion. Loss of organic matter in soil also reduces nutrient content and water holding capacity and increases vulnerability to wind and water erosion. Repeated equipment travel along a route can also result in soil compaction (an alteration of soil structure affecting the substrate's water holding capacity, levels of aeration, microbial diversity and overall productivity). Compacted soils are vulnerable to water erosion. Vegetation associated with compacted soils is not only vulnerable to direct trampling from equipment, but also from the limited capability of compacted soils to provide the moisture and nutrient regime necessary for survival, which in turn impedes site rehabilitation. Soils on steep slopes and in wet areas are particularly prone to the above effects.

Improper excavation and backfilling can result in loss of topsoil and/or loss of soil structure due to topsoil and subsoil mixing, as well as slope instability, ground subsidence and/or ground surface mounding/frost heave.

Other potential impacts to soils include soil contamination due to leaks, accidental spills or improper handling of hazardous materials (including fuels and lubricants for equipment).

Aquatic Resources
There are four species of fish in the Pipestone River, 3 of which are fall spawners. The Table below shows these specie and their spawning windows.

Species	Spawning time	Conservation Status
Westslope Cuthroat Trout	Spring (June)	SARA - threatened
Bull Trout	Fall (September)	COSEWIC – threatened
Brook Trout	Fall (September-October)	
Rocky Mountain Whitefish	Fall (October-November)	

Works in and around water, (e.g. excavation, storage of construction materials, dewatering activities etc.), have the potential to release sediment into fish or amphibian habitat. The introduction of debris into a watercourse or water body can affect food production and cover. Fine sediments can bury food such as aquatic invertebrates and fish eggs or alevins that have not left gravel. Settled sediments can infill pools and riffles, reducing the availability and quality of rearing habitat, as well as potentially destroying spawning habitat. Suspended sediments may reduce water clarity, making it more difficult for fish to feed and cutting off sunlight to aquatic plants. Suspended sediments can also clog and abrade fish gills and mucous membranes, causing injury or suffocation.

There is also potential for surface water contamination as a result of leaks or spills of fuels, hydraulic fluid, among others. Spills of deleterious substances (gas, hydraulic fluid, oils) from equipment use adjacent to and overtop of waterbodies can negatively impact water quality and aquatic life.

Installation of shoreline rock armouring, bridge footings or abutments and culverts often encroach into streams and may damage fish habitat by removing riparian vegetation, changing the angle and general nature of the stream bank, increasing the size of materials exposed along the water line, and covering part of the bed and bank with coarse angular rock. If the resulting channel is more constricted, flow velocities may increase and cause a barrier to upstream fish movement. Bank protection projects may also cause secondary effects, such as bed scour near the works and coarsening of the bed material, or opposite bank erosion that may also be detrimental to fish habitat.

Vegetation Resources
There is potential for damage to and loss of native vegetation at the project sites and in areas that are used for construction staging and access. Trees are an important component of riparian habitat and help provide shade and bank stability. 30 or more trees will be removed for this project. Weed species are likely already present in the area which may be spread with equipment use and soil disturbance. Vegetation clearing has the potential to increase the habitat available to weeds. Additionally, machinery and equipment contaminated with seeds of non-native species and the application of weed infested topsoil or unapproved seed mixes could introduce weeds to project area.

Wildlife
Wildlife effects are unlikely during this time period. The area has much human disturbance and the construction will occur outside of any times that are particularly sensitive for wildlife in the area.

Cultural/Archaeological Resources
The project location has been previously disturbed however the potential remains for earth moving activities (e.g., excavation) to disturb as yet unidentified cultural/archaeological resources.

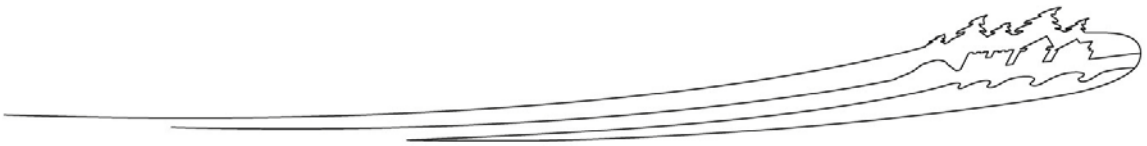
11. MITIGATION MEASURES

Because the project is at the stream edge and within the High Water Mark, an Environmental Protection Plan must be developed by the successful contractor and approved by the Environmental Assessment Office. This will allow the contractor the flexibility to deal with sedimentation and erosion control in the best way they are able. The EPP will be required to detail the following:

1. An access plan including access routes, type of equipment used for various construction phases, and lay down areas in order to prevent/minimize disturbance to vegetation and soils;
2. Details on how the work limits will be marked and what procedures will be employed to ensure trespass outside these limits does not occur and to ensure that the environment is not impacted or damaged by workers or construction equipment beyond the work limits;
3. An erosion and sediment control plan to prevent/minimize erosion and sedimentation into neighbouring watercourses and outlining appropriate dewatering and erosion and sediment control measures for the project;
4. An emergency response plan that outlines procedures to follow in the case of a spill or other type of emergency (wildlife encounter, capsize, equipment malfunction/failure).

General Project Mitigations:

- Identify and avoid areas with wet soils, steep slopes, rare plants or valued vegetation features.
- Keep vegetation removal and site clearing to a minimum to maintain vegetative cover.
- All equipment is to arrive on site in a clean condition, free of soil, weed seeds and any debris (e.g., power washed before entering the park) and is to be maintained free of fluid leaks. All equipment must be inspected daily for fluid/fuel leaks and maintained in good working order.
- Do not place or allow dispersal of any rock, silt, petroleum product, vegetation, domestic waste, or any deleterious substance into any stream, river, pond, wetland, lake or other water course, stormwater system or sanitary sewer.
- All work limits shall be clearly delineated by the project manager and no activities will be permitted outside of these limits.
- Limit activities to daylight hours, avoiding activities during critical wildlife foraging times (dusk and dawn).
- Maintain all worksites in a clean and tidy condition, free from the accumulation of waste materials, debris and other litter. Dispose of garbage in bear proof containers or remove daily from the site.
- Ensure crews have received bear safety training.
- Store hazardous chemicals (e.g. antifreeze) that might be attractants in animal proof containers.
- Erosion and Sediment Control:
    - If necessary, erosion and sediment control measures shall be constructed and functional prior to initiating activities that have sediment release potential.
    - Phase work to minimize exposure of disturbed areas (e.g., complete smaller/shorter sections of work at a time rather than having a larger area of exposed soil for an extended period).
    - If a prolonged period of exposure is expected, protect exposed soils and stockpiles with temporary cover (e.g. mulch, gravel, erosion blanket, vegetative cover, tarps).
    - Cover and contain fine particulate materials during transportation to and from the site and during storage to protect against wind erosion.
    - To minimize site run-off, control overland flow up gradient and down gradient of exposed areas and filter or settle out sediment before surface flows enter any drainage pathway. (e.g., using diversion ditches, swales, vegetative filter strips and/or sediment traps).
    - Regularly inspect and maintain erosion and sediment control structures for effectiveness. If not effective, repair or replace with alternative erosion and sediment control measures as necessary.
    - Halt activity on exposed soil during high rainfall and runoff events.
    - Sites will be secured against erosion during any periods of construction inactivity or shutdown.
- Spill Prevention and Cleanup:
    - Ensure machinery is in good working order and free of leaks.
    - Where possible, the least harmful fuels, lubricants and other fluids will be used in machinery and equipment (e.g., vegetation oil for chainsaw chain lubricant).
    - Identify and handle all toxic/hazardous materials as required under the Canadian Environmental Protection Act, Transportation of Dangerous Goods Act and Workplace Hazardous Materials Information Service (WHMIS).
    - Prepare an appropriate Spill Response Plan.
    - Ensure spill containment equipment is on hand and personnel are trained in its use.
    - Report all spills to Banff Dispatch at (403) 762-1470.
    - Refuel equipment carefully to avoid spillage. Refuelling equipment should be equipped with no drop nozzles. Refuelling will not take place in locations where run-off could carry contaminants into water courses.
    - Store and handle fuel and hazardous materials in a berm or secondary containment designed to contain 125% of the product's volume.



  - Ensure other materials are stored appropriately to prevent spills.
  - Do not store fuels, oils, solvents, and other chemicals overnight within 30 m of a waterbody.
  - Timely and effective action shall be taken to stop, contain and clean-up all spills as long as the site is safe to enter. Spills greater than 5 L will be reported immediately to Banff Dispatch at (403) 762-1470. All spills will be reported to the EA within 24 hours.
  - Remove waste oil-based paints from the park in accordance with the federal and provincial Transportation of Dangerous Goods Act and Regulations.
- Use temporary closures, fencing and signage as necessary to ensure public safety at or below work sites. Post guards to ensure compliance where failure to comply may result in serious injury or death.
- Reclaim and revegetate the site (including temporary access routes and staging areas) as soon as possible following the project. Revegetate with Parks Canada recommended seed mixes and species appropriate for the site. Contact the Environmental Assessment Office for advice.

Over-land Equipment Access and Equipment Use

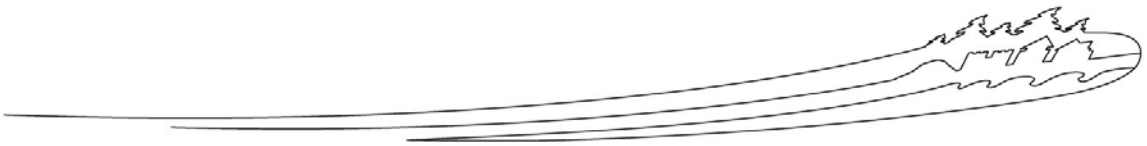
- Access route to the pedestrian bridge must be approved by the Environmental Assessment Office.
- Use existing roadways, trails or disturbed areas to access and travel within sites. Keep off-road/off-trail equipment travel to an absolute minimum, particularly on exposed soils.
- Where equipment access is required through previously undisturbed sites:
  - Routes should be as direct as possible while avoiding sensitive areas, including steep slopes, riparian areas, wetlands, drainage features, fine textured, organic and/or wet soils, and areas with rare plants or valued vegetation features.
  - If such areas cannot be avoided, use equipment of low bearing weight, low PSI (Pounds per Square Inch) tires or tracked vehicles.
  - Vegetation removal should be kept to a minimum. Where trees/shrubs must be removed, limb where possible rather than felling.
  - For temporary access routes, ensure surface vegetation remains as intact as possible (i.e., use protective materials over the vegetation where necessary).
- No machinery will enter, work in or cross over streams, rivers, wetlands, water bodies, watercourses or riparian areas unless otherwise approved by the EA Office.
- In proximity to water bodies/watercourses, all machinery will be operated above the high water mark and in a manner that minimizes disturbance to riparian areas. Measures must also be in place to ensure that deleterious materials or substances (e.g., rocks, soil, branches, chemicals) do not enter any watercourses or water bodies.
- Where necessary, restrict the location and scheduling of machinery (including quads, trail hoes, etc.) to minimize impacts (e.g., avoiding equipment use on areas that are known to rut after rainfall until they have dried out, avoiding equipment use on steep slopes). Avoid using heavy equipment in sensitive sites. Use hand tools instead or equipment with low bearing weight, low PSI tires or tracked vehicles.
- Operate machines carefully to avoid damaging surrounding vegetation.

Staging Areas for Equipment and Materials Storage

- When selecting staging areas, use previously disturbed sites wherever possible.
- If previously undisturbed areas must be used for staging, identify and avoid sensitive areas, including steep slopes, riparian areas, wetlands, drainage features, fine textured, organic and/or wet soils, and areas with rare plants or valued vegetation features.
- Designate and clearly delineate staging areas, keeping them as compact as possible to reduce the area of disturbance and limit soil compaction.

Vegetation Removal

- Keep vegetation removal and site clearing to a minimum to maintain vegetative cover. Minimize the potential for over-cutting by clearly delineating the limits of vegetation removal with flagging tape or other highly visible marking methods.
- No trees or other vegetative debris will be permitted to fall into streams, rivers, wetlands or water bodies. Trees inadvertently felled into watercourses shall be removed by means (e.g., winch) so as not to damage the substrate or any standing trees outside the clearing limits. Machinery shall not go outside of the clearing limits or into streams, rivers, watercourses or water bodies to remove felled trees.
- For temporary disturbance areas (e.g., access routes, staging areas), ensure surface vegetation remains as intact as possible (i.e., use protective materials over the vegetation where necessary).
- All debris will be removed from the site.
- Salvage as much timber as practical for other uses (e.g. firewood). Logs and other salvage materials are to be conveyed to and placed at designated storage sites without spread of debris or damage to other standing trees or landscape features outside the marked clearing and storage limits.
- Vegetation removed within 15 m from the high water mark of a water body or watercourse shall be replaced with new plantings in accordance with the Fisheries and Oceans Operational Statement for Maintenance of Riparian Vegetation in Existing Rights-of-way and the Fisheries and Oceans guidance on Riparian Areas and Revegetation. If there is insufficient time remaining in the growing season, the site should be stabilized and vegetated the following spring.



- BC Tree replacement guidelines will be followed when replacing vegetation. Trees will be replaced as:
  - 0 mm - 151 mm (6") dbh 2 replacement trees (min height 1.5 m), or, 4 shrubs (for up to 50% of trees being replaced in this range);
  - 152 mm - 304 mm (12") dbh 3 replacement trees (min height 1.5 m);
  - 305 mm - 456 mm (18") dbh 4 replacement trees (min height 2.0 m);
  - 457 mm - 609 mm (24") dbh 6 replacement trees (min height > 2.0 m);
  - 610 mm - 914 mm (36") dbh 8 replacement trees (min height > 2.0 m).

Excavation/Earth Moving

- Salvage and store any topsoil and duff separately from subsoil and other construction materials for re-use during site reclamation.
- Store soil stockpiles in already disturbed areas where possible and a minimum of 2 m from embankments, slumps and water bodies to prevent material loss.
- Ensure excavated material does not damage or bury plant material that is to be retained on the site or in adjacent areas.

Rip-rap Installation

There are many factors to consider when designing or repairing rip-rap installations. The characteristics of rock riprap affecting resistance to erosion include stone size, shape and weight, stone durability, gradation and thickness. The interlocking of angular rocks provides resistance to movement for the individual blocks in the revetment. Local stream characteristics also strongly affect the stability of riprap revetments. Local scour, as affected by stream characteristics and bed materials, requires that protection be provided against undermining of the toe of the revetment. Channel slope and alignment affect the degree of impingement of flows on the bank and the hydraulic conditions that the rock must resist. Rip-rap installations should be designed and installed by appropriately qualified professionals.

Rip-rap placement is to be conducted in accordance with the Fisheries and Oceans Operational Statement for Bridge Maintenance including the following BMPs:

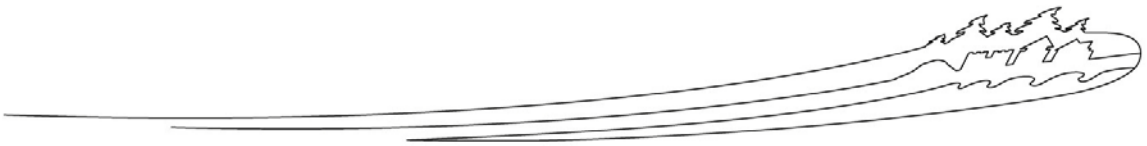
- Works must be designed, constructed and maintained in such a manner that the change does not increase bank erosion or flooding on other properties or otherwise pose a significant danger to life or property.
- Install effective sediment and erosion control measures before starting work to prevent the entry of sediment into the watercourse. Inspect them regularly during the course of the construction and make all necessary repairs if any damage occurs.
- Riprap shall be clean, durable and angular in shape and suitably graded and sized to resist movement by freshet flows.
- The upstream end of the riprap shall be keyed (trenched) back into the bank so that the bank protection is not outflanked by erosion farther upstream.
- Riprap material will be clean rock free of fines and other deleterious substances and be from rock which is not acid generating.
- Any removal of vegetation should be kept to a minimum.
- Operate machinery on land (from outside of the water) in a manner that minimizes disturbance to the banks or bed of the watercourse.
- Rip rap will be placed using a thumbed excavator. Boulders will be placed carefully and not dumped directly into the river course.
- Machinery may not operate within the wetted portion of a watercourse (i.e., an excavator may sit on top of the bank and reach into the river to place rocks but may not sit in the river itself).
- Surface disturbance on the banks and slopes leading to the river will be kept to the minimum necessary to provide safe working conditions.
- Appropriate temporary erosion control measures (e.g., silt fence, brush mats, cross ditches) will be installed to prevent exposed soil from eroding into the stream before vegetative cover is re-established on disturbed areas.
- Stabilize any waste materials removed from the work site to prevent them from entering the watercourse.
- Restore banks to original condition if any disturbance occurs.
- Vegetate any disturbed areas by planting and seeding preferably with native trees, shrubs or grasses and cover such areas with mulch to prevent erosion and to help seeds germinate. If there is insufficient time remaining in the growing season, the site should be stabilized (e.g., cover exposed areas with erosion control blankets to keep the soil in place and prevent erosion) and vegetate the following spring.
- Maintain effective erosion and sediment control measures until re-vegetation of disturbed areas is achieved.

12. IMPACT SIGNIFICANCE (For help completing this section see instructions at end of document)

Provided the above mitigation measures are implemented, residual impacts to soils and landforms, aquatic resources, vegetation, wildlife and cultural/archaeological resources are expected to be negligible to low in magnitude and significant adverse effects are not anticipated.

13. SITE INSPECTION (For help completing this section see instructions at end of document)

☐	Site inspection not required
X	Site inspection required



The project manager and a representative from the environmental assessment office will conduct periodic inspections to ensure that all mitigations are being adhered to and that effective sediment control measures are in place.	
14. EXPERTS CONSULTED (Including PCA Experts)	
Department/Agency/Institution	Katapodis EcoHydraulics
Contact Information	Chris Katapodis, (204)261-1482
Date of Request	2013/09/24
Expertise Requested	River engineering
Response	See Pipestone River Visit notes in file
Department/Agency/Institution	Department of Fisheries and Oceans
Contact Information	Michael Hunka, (780) 495-8469
Date of Request	2013/10/02
Expertise Requested	Fisheries
Response	Project as proposed is unlikely to cause significant effects or loss of fish habitat. DFO operational statements must be followed. Parks aquatics specialists must be consulted and approve the project. No authorization is required.
15. PUBLIC PARTICIPATION **X** No ☐ Yes	

16. DECISION	
Taking into account implementation of mitigation measures outlined in the analysis, the project is:	
X	Not likely to cause significant adverse environmental effects.
☐	Likely to cause significant adverse environmental effects.

SIGNATURES AND APPROVAL		
EA Reviewed by		
Name: Michael den Otter	Title: Environmental Assessment Specialist	
Signature		Date 2013/10/02
DECISION APPROVAL		
Name: Alex Kolesch	Title: Manger, Land Use, Policy & Planning	
Signature		Date 2013/10/02
17. REFERENCE LIST		
18. ATTACHMENTS LIST		

19. ADDITIONAL CONSIDERATIONS / COMMENTS