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SPECIFICATION

PROJECT NO. 669
PHASE 9 – French Mountain

CAPE BRETON HIGHLANDS NATIONAL PARK, NS

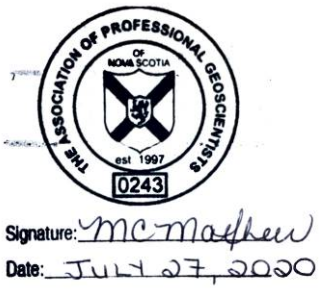
ISSUED FOR TENDER

2020-07-27

Specifications
Issued for Tender

Parks Canada Agency

Project No. 669
Phase 9 – French Mountain
Cape Breton Highlands National Park, NS



Justin Matthew, B.Sc., P.Eng.
Geotechnical Engineer
Stantec Consulting Limited

Maureen Matthew, M.Sc., P.Geo.
Associate, Engineering Geologist
Stantec Consulting Limited

END OF SECTION

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Part 1 General

1.1 RELATED SECTIONS

.1 All.

1.2 DESCRIPTION OF WORK

.1 Work on this Contract covers the furnishing of all labour, materials and equipment required to provide construction services for the mitigation of rockfall and slope stability hazards at four rock slopes along the Cabot Trail Highway at French Mountain, within the Cape Breton Highlands National Park, NS as illustrated on the attached Project Drawings.

.2 The four slopes are identified as RR1303, RR1358, RR1372, and RR1402, and are located at approximate Station 13+030 to 13+080, 13+570 to 13+630, 13+730 to 13+850 and14+010 to 14+290, respectively.

.3 All stations along the Cabot Trail Highway referenced in the Project Documents are measured from the Park Boundary at Chéticamp River (Station 0+000). Station chainage starts and stops at Park Boundaries.

.4 The Project shall include, but is not limited to, the following:

.1 Manual clearing and grubbing of vegetation along rock slope faces and crests.

.2 Scaling operations for removal of loose and unstable rock and soil from slopes.

.3 Cleanout and reinstatement of roadway catchment ditches.

.4 Removal off site and disposal of scaled, cleared/grubbed, and existing fallen material, at a disposal site outside the Park boundary.

.5 Final field layout of slope stabilization measures as per direction of Departmental Representative.

.6 Installation and testing of rock anchors.

.7 Installation of reinforced concrete buttress at RR1303.

.8 Mobilization and Demobilization of all staff, equipment, materials, and other resources necessary to execute the Work.

.9 Supply and operation of traffic control to provide at least one open lane for vehicular, bicycle, and pedestrian traffic through the work areas at all times for the duration of the project schedule in accordance with Section 01 35 00.06 – Special Procedures for Traffic Control.

.10 Provision of temporary protective measures (barriers, rockfall fences, protective mats, etc.) required to prevent injury to site personnel, PCA staff, park users and the travelling public and damages to adjacent infrastructure. **Protective measures must be submitted to Departmental Representative for review and approval. Infrastructure to protect includes, but is not limited to, buried utilities, asphalt and shoulder surface, barriers, signs, and culverts.**

.11 Provision of all environmental protection measures required to complete the project in accordance with Section 01 35 43 - Environmental Procedures.

.12 All work to be carried out in accordance with applicable federal and provincial regulations for those agencies having jurisdiction for the work. The work is subject to the National Park Act and Regulations, Canadian Environmental Protection Act, Impact Assessment Act, and the Code of Practice of the Department of Labour, as it applies to the Nova Scotia Temporary Workplace Traffic Control Manual.

1.3 SITE CONDITIONS

.1 Before submitting a bid, it is recommended that bidders visit the site to review and verify the form, nature and extent of the work, materials needed, the means of access and the temporary facilities required to perform the Work. Obtain prior permission from the Parks Canada Asset Manager before carrying out such a site inspection.

.2 Rock slopes RR1303, RR1358, RR1372, and RR1402 are located along the Cabot Trail highway on the western coast of the Cape Breton Highlands National Park, upslope from the highway.

.3 The Cabot Trail is a two-lane, undivided roadway. In the area of the work, the speed limit is 50 km/h. The highway is considered a critical transportation route providing the sole access through the Park and the link to communities in northwestern Cape Breton. A local school bus route follows the Cabot Trail through the work areas.

.4 Work sites are illustrated, and their geological conditions described on the Contract Drawings.

1.4 CONTRACT METHOD

.1 All items in this contract will be paid for as indicated in Section 01 29 00 – Payment Procedures.

1.5 WORK SEQUENCE

.1 Construct Work in stages to accommodate Owner's continued use of premises during construction.

.2 Maintain fire and emergency service access/control along the highway and to the project sites at all times.

.3 Contract start and completion dates are as indicated on the Bid and Acceptance Form (BA) of the Invitation to Tender (ITT).

.4 Work at Slope RR1303 shall be completed first within a single traffic control setup. Work at Slopes RR1358, RR1372, and RR1402 shall be completed in a second shared traffic control setup after RR1303 is completed.

.5 Provide within 5 days after Contract Award, construction schedule showing material delivery dates, key milestones, anticipated progress stages and final completion of work within the time period required by Contract Documents. The schedule shall include detailed construction plan/sequence and include time for ordering, preparation and delivery of all materials.

.6 Submit to the Departmental Representative for review all submittals listed in each related specification section. Submission shall be in accordance with the submission dates specified.

.7 After receiving the Contractor's submittals, and prior to start of construction, a pre-construction meeting involving Contractor, Departmental Representative and Parks Canada will be held.

.8 No work shall begin until the pre-construction meeting is held and required submittals are accepted.

.9 The general sequence for remedial measures is as follows:

.1 RR1303:

.1 Installation of concrete buttress.

.2 RR1358, RR1372, and RR1402:

.1 Rock scaling.

.2 Installation of rock anchors.

.3 Ditch clean-out and restoration.

.10 Interim reviews of work progress based on work schedule will be conducted as decided by the Departmental Representative and schedule updated by the Contractor in conjunction with and approval of the Departmental Representative.

1.6 WORK WITHIN NATIONAL PARK BOUNDARIES

.1 The Work is within a national park and it is essential that lands remain as undisturbed as possible. Protection of the environment and aesthetic requirements are a priority for the Work, beyond those for regular construction work. The Contractor is expected to apply and adhere to all standards and methods required to protect the environment and ensure the aesthetics of the work. Contract limits shall be strictly adhered to and every precaution shall be taken to minimize environmental damage and disruption to vegetation, wildlife habitat, and structures or existing services, within the construction and access sites:

.1 If any damage occurs during construction, the Contractor is responsible to immediately restore such damaged areas to the satisfaction of the Departmental Representative. All restoration shall be at the Contractor's expense.

.2 If the Contractor fails to repair damage to the satisfaction of the Departmental Representative, the Departmental Representative may complete repairs at the Contractor's expense.

.3 The Contractor shall ensure that contracted work meets the standards outlined in the contract specifications and drawings.

.4 The Contractor is responsible to follow the Provincial requirements regarding the following:

.1 Pit and Quarry Guidelines.

.2 Environmental Construction Practice Specifications.

.5 The Contractor will arrange with authorities or owners of private properties for transporting materials and machinery over their properties and be responsible for obtaining permits and paying fees, as required.

1.7 CONTRACTOR USE OF SITE

.1 Co-ordinate use of premises under direction of the Departmental Representative.

.2 Obtain and pay for use of additional storage or work areas need for operations under this Contract.

.3 The Contractor shall limit the use of the premises for work, storage, and access to allow:

.1 Public usage.

.2 Work by other contractors.

.3 Emergency access to the Cabot Trail Highway at all times.

.4 At completion of the Work, return project sites and other disturbed areas to equal condition or better condition than existed before Work started.

1.8 PERMITS/AUTHORITIES

.1 The Contractor shall obtain, and pay for, permits from authorities as required for all operations and construction. The Contractor shall also comply with all pertinent regulations of all authorities having jurisdiction over the work. The Contractor shall provide copies of all permits and approvals to the Owner prior to starting the work. The Contractor shall be responsible for obtaining all applicable permits, inspections and approvals required and shall pay all charges in connection therewith.

1.9 OWNER OCCUPANCY

.1 PCA will occupy premises during construction period to execute normal operations in the Cape Breton Highlands National Park.

.2 Cooperate with PCA in scheduling operations to minimize conflict and to facilitate owner usage.

1.10 WORK BY OTHERS

.1 The Contractor must be aware that other construction work may be performed at different locations within the Park during the time frame of this contract and that coordination with other Contracts may be required. Co-operate with other Contractors in carrying out their respective works and carry out instructions from the Departmental Representative.

.2 If any part of work under this Contract depends for its proper execution or result upon work of another Contractor, report promptly to Departmental Representative, in writing, prior to proceeding with that part of the work.

1.11 PROJECT MEETINGS

.1 A mandatory pre-construction meeting and mandatory project meetings during construction are required in accordance with Section 01 31 19 - Project Meetings.

1.12 SETTING OUT OF WORK

.1 The Contractor shall provide devices needed to lay out and construct Work.

.2 Coordinate with the Departmental Representative to review and layout the proposed work at each site.

.3 Departmental Representative will provide measurements for payment.

.4 Contractor shall allow sufficient time and facilitate site access for the Departmental Representative to inspect the work and take measurements for payment.

.5 The Contractor shall make the Departmental Representative immediately aware of any discrepancies between the Contract Documents (including drawings and specifications) and field measurements and inform the Departmental Representative immediately when errors are discovered.

.6 All layout and survey requirements are considered incidental to the Contract.

1.13 ALTERATIONS, ADDITIONS, OR REPAIRS TO EXISTING FACILITIES

.1 Execute Work with least possible interference or disturbance to existing park operations and regular use of premises. Arrange with Departmental Representative to facilitate execution of Work.

.2 Remove or alter existing work to prevent injury or damage to portions of existing work which remain.

.3 Repair or replace portions of existing work which have been altered or damaged during construction operations to match existing or adjoining work, as directed by the Departmental Representative.

1.14 CONSTRUCTION SAFETY MEASURES

.1 The Contractor must submit a project specific Safety Plan prior to the pre-construction meeting..

1.15 EXISTING SERVICES

.1 There are existing Bell Aliant communication cables located within the work area along the upslope shoulder of the Cabot Trail. .

.2 Establish location and extent of service lines in area of work before starting Work. Notify the Departmental Representative of findings.

.3 The Contractor shall obtain clearance reports from all utilities and ensure temporary lines are not disturbed during the duration of this project. The Contractor is be required to coordinate their work with utility companies and schedule the works accordingly.

.1 A copy of all clearance reports shall be submitted to the Departmental Representative prior to starting the work.

.4 Where unknown services are encountered, immediately advise the Departmental Representative and confirm findings in writing

.5 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.

1.16 DOCUMENTS REQUIRED

.1 Required submittals are listed in each Specification section. Prepare and submit all required submittals, and maintain on site in accordance with Section 01 33 00 – Submittal Procedures:

.1 Contract Drawings.

.2 Specifications.

.3 Addenda.

.4 Site Instructions.

.5 Reviewed Shop Drawings.

.6 List of outstanding Shop Drawings.

.7 Manufacturer's installation and application instructions.

.8 Change Orders.

.9 Other modifications to Contract.

.10 Field Test Reports.

.11 Approved Work Schedule.

.12 Health and Safety Plan and other safety related documents.

.13 Environmental Protection Plan.

.14 Plan locating all aboveground and underground utilities.

.15 Other documents as specified elsewhere in the Contract Documents.

1.17 EQUIPMENT RENTAL RATES

.1 Upon written request, the Contractor will supply the Departmental Representative with a list of the rental equipment to be used on work beyond the scope of bid items. Equipment rental rates will be in accordance with current rates published by the Nova Scotia Road Builders Association.

1.18 EXECUTION

.1 Disposal of Materials from Rock Slope Remediation

.1 All materials from rock scaling, clearing/grubbing, and excavation of existing fallen material in ditches in work areas shall be hauled to a disposal site outside of Park boundaries as noted within these specifications.

.2 All ditches in work sites where remediation work is carried out, shall be cleaned, and restored to allow functionality as catchment and drainage area, which includes sloped side and bottoms to allow rockfall retainment and prevent the ponding of water, or as directed by Departmental Representative.

.3 Roadways in work sites shall be cleaned of scaled rock and debris before motorists and pedestrians are permitted to pass through the work site.

.4 No extra payment will be made for clean-up of roadway and work site following rock scaling and all other project work as it will be considered incidental to the project. Ditch clean up and disposal of rock materials are paid under the Common Excavation bid item.

.2 Execution of Work

.1 The Contractor shall execute work in an efficient, safe, and expeditious manner. The Departmental Representative reserves the right to order the removal of any of the Contractor's employees from the work site who fails to work in accordance with all applicable safety standards and regulations. This shall be strictly enforced.

.2 The Departmental Representative reserves the right to order removal of any piece of equipment from the work site that is not in good operating condition. The Contractor shall not resume work with equipment that is not in good operating condition and shall immediately rectify the problem or replace faulty equipment with an equivalent unit within two days.

.3 Crew Qualifications

.1 The Contractor must provide a crew and supervisors experienced and qualified in manual rock scaling (Section Scaling 31 23 20), drilling, rock anchor and dowel installation, excavation and disposal of excavated material, and all other work identified in the Contract Documents.

.2 The Contractor shall provide an experienced scaling crew that consists of a supervising scaling foreman with at least five years of experience in rock scaling and a minimum of two rock scalers with at least two years of experience. Scaling experience shall be related to slopes that are similar to the project site conditions. The scaling crew size shall be maintained at all times until the completion of all work.

.3 In view of the rock slope heights at the project site, it has been assumed that scaling crews will be working from ropes at heights. Each scaling person working from ropes at heights must have a minimum of Level 1 Industrial Rope Access Trade Association (IRATA) training or approved equivalent. In addition, a Level 3 IRATA or approved equivalent supervisor must be onsite at all times.

.4 If scaling is performed from a boom lift, the boom lift scaler shall have at least two years of scaling experience on slopes similar to the project site.

.5 The Contractor shall provide qualified traffic control personnel.

Part 2 Products – Not Used

Part 3 Execution – Not Used

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 35 30 - Health and Safety Requirements.

.2 Section 01 35 31 - Special Procedures for Traffic Control.

.3 Section 01 35 43 - Environmental Procedures.

1.2 ACCESS AND EGRESS

.1 Design, construct and maintain temporary “access to” and “egress from” work areas, in accordance with relevant municipal, provincial and other regulations.

1.3 EXISTING SERVICES

.1 There are existing Bell Aliant communication cables located within the work area along the upslope shoulder of the Cabot Trail. Other infrastructure within the work area, includes, but is not limited to, asphalt and shoulder surfaces, barriers, signs, and culverts.

.2 The Contractor is responsible for locating all utilities and Park infrastructure in the work areas prior to commencing the work.

.3 All utilities and Park infrastructure must be protected or temporarily relocated throughout the project in coordination with the utility company and the Park.

.4 The Contractor shall notify the Departmental Representative and the utility companies of intended interruption of services and obtain required permission. Protective measures must be submitted to Departmental Representative for review and approval.

.5 The Contractor shall be responsible for any damage incurred to utilities and Park infrastructure in the work area while occupying the site.

.6 Utilities in the ditch/shoulder shall be protected for the duration of active slope work by laying temporary rubber tire blasting mats or an alternative approved by the Departmental Representative.

.7 When inactive services are encountered, cap off in a manner approved by authorities having jurisdiction.

.8 Where unknown services are encountered, immediately advise the Departmental Representative and confirm findings in writing.

.9 Record locations of maintained, re-routed and abandoned service lines.

1.4 USE OF SITE AND FACILITIES

.1 The Contractor is restricted to the upslope lane, shoulder and ditch of the Cabot Trail highway in the areas associated with the rock slope remediation work at the four rock slopes as specified in the Contract Documents and as directed by the Departmental Representative. One lane of traffic must be open to public traffic at all times in accordance with NSTWTCM and the Contract.

.2 The Contractor shall provide all required traffic control and other safety measures to ensure the safe use of the open highway lane and to provide safe work conditions for site personnel.

.3 Execute work with least possible interference or disturbance to regular use of the highway. Make arrangements with Departmental Representative to facilitate work as stated.

.4 Provide for safe personnel and vehicle access to the work sites.

.5 The Contractor shall coordinate and submit a plan to the Departmental Representative for review and approval of proposed locations for laydown, equipment storage, preparatory work, staff parking, etc needed for operations. Locations shall generally be limited to the construction limits for each area under construction, unless special permission is granted by the Departmental Representative.

.6 Obtain permission and pay for use of additional storage or work areas needed for operations under this Contract.

.7 The Contractor shall keep the Work Site clean and free from accumulation of waste materials and rubbish / trash regardless of source. Snow shall be removed by the Contractor as necessary for the performance and inspection of the Work.

.8 Steel tracked equipment with cleats will not be allowed on pavement surfaces. All tracked equipment operating on pavement surfaces shall be equipped with rubber 'Street Pads' or employ other methods (mats, etc.) to otherwise prevent damage to the road surface. Excavation materials hauled on highway shall be by standard highway trucks not exceeding legal highway load limits.

.9 The Contractor shall ensure its vehicles and equipment do not cause nuisance in public areas of the Park outside the Work Site. Vehicles and equipment leaving the Work Site and entering public roadways shall be cleaned of soil and other detritus clinging to the vehicle body and wheels. All vehicles transporting materials to or from the Work Site shall be loaded in a manner that prevents dropping of materials or debris on the roadways.

.10 The Contractor shall not park equipment on the shoulder of the roadway at the end of each work day.

.11 Where security is reduced by work provide temporary means to maintain security.

.12 Provide for safe pedestrian, bicycle, vehicular, and wildlife traffic outside the work areas for the duration of the construction.

.13 The natural environment within the work area must be preserved, as practical. Excessive cutting of trees or other vegetation surrounding the slopes is not allowed. The Contractor will submit, with the Work Plans/Procedures, any requirement for tree cutting or disturbance of the natural ground surface beyond the crest of the slopes or in areas adjacent to the rock slopes.

.14 All components of the Work shall be conducted in accordance with Section 01 35 43 - Environmental Procedures and the Environmental Protection Plan for the project. An environmental non-compliance clause for this Contract has been identified.

1.5 PROTECTION OF PERSONS AND PROPERTY

.1 A preconstruction inspection shall be conducted by the Contractor, Departmental Representative and the Parks Canada Environmental Protection Officer upon mobilization to the project site. A record of the inspection shall be submitted within five days of the inspection and approved by the Departmental Representative. As a minimum, the preconstruction inspection, shall include a site walk-over and photographic record of all infrastructure (culverts, guiderail, asphalt, gutters, ditches, signage, utilities, etc.) within the project site. The preconstruction inspection is considered incidental to the Contract.

.2 The Contractor shall comply with all applicable safety regulations including, but not limited to, the Worker's Compensation Act and the Occupational Health and Safety Regulations, Industrial First Aid Regulations, and Workplace Hazardous Materials Information System Regulations.

.3 The Contractor shall promptly repair, replace, or compensate for any loss or damage caused by the Contractor to any property or, if Departmental Representative so directs, shall promptly reimburse the costs resulting from such loss or damage.

1.6 SPECIAL REQUIREMENTS

.1 There are no general restrictions on working on nights, weekends, or statutory holidays.

.2 Work may be restricted to accommodate special events within the park:

.1 Parks Canada will provide at least two weeks notice of any upcoming special events that might impact the Work.

.2 All coordination requirements for special events are incidental to the project.

.3 Any maintenance performed on equipment must be completed outside park boundaries or at a predetermined location approved by the Departmental Representative.

.4 Traffic interruptions/road closures to facilitate the Work shall be in accordance with Section 01 35 00 06 – Special Procedures for Traffic Control.

.5 During the school year, minimize delays for school buses.

.6 The use of drones is strictly prohibited without a Parks Superintendent issued permit.

.7 Water extraction from within the Park boundaries is strictly forbidden, unless otherwise approved by the Departmental Representative. Water extraction may be permitted following detailed proposal submitted by the Contractor and subject to approval by Department Representative in writing.

.8 Keep within limits of work and avenues of ingress and egress.

Part 2 Products – Not Used

Part 3 Execution – Not Used

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 General Conditions.

1.2 MEASUREMENT FOR PAYMENT

.1 See Section 01 29 00 – Payment Procedures.

1.3 PRIME COST SUM

.1 Include in Contract Price a total Prime Cost Sum of $ 25,000.

.2 The Contractor's overhead and profit in connection with such prime cost sum shall be included in the Contract Price, and not in the Prime Cost Sum.

.3 The Prime Cost Sum provided in the unit price table is not a sum due to the Contractor. Rather, payment will be made against it for miscellaneous work not included in the unit price table ordered under GC 6.1 of the General Conditions.

.4 Such miscellaneous work may include, but not be limited to:

.1 Additional remedial work within project sites as directed by the Departmental Representative (rock scaling, excavation of rock slope debris, drilling and installation of rock anchors, placement of reinforced concrete and installation rock dowels for the construction of the concrete buttress).

.5 Once a utilization of the Prime Cost Sum has been agreed upon with Parks, it shall be included as an item on the Project Schedule. This shall occur on the next update of the Project Schedule.

Part 2 Products – Not Used

Part 3 Execution – Not Used

END OF SECTION

Part 1 General

1.1 DESCRIPTION

.1 Mobilization and Demobilization consists of the preparatory work and operations including, but not limited to, those necessary for the loading, transportation, unloading, and complete set-up of all plant, equipment, labour, materials, facilities and incidentals necessary to complete the work associated with the Contract, as well as, the decommissioning, loading, transportation, unloading and storage of all plant, equipment, excess materials, facilities and incidentals after the work associated with the Contract is complete.

.2 Any protective measures or movement of Contractor trailers necessitated by animal interactions and required by Parks Canada will be paid by the Departmental Representative and are not to be anticipated in the Lump Sum Contract Price for Mobilization and Demobilization.

1.2 RELATED REQUIREMENTS

.1 Section 01 11 00 – Summary of Work.

1.3 MEASUREMENT FOR PAYMENT

.1 See Section 01 29 00 - Payment Procedures.

1.4 DESCRIPTION

.1 There shall be no change in the Lump Sum Price of this Item due to a change in Contract scope or an extension to the Contract Completion Date.

.2 The payments from the Lump Sum Price shall be full compensation for the Work under this Item regardless of the number of times the Contractor mobilizes.

.3 At no time shall the total of the amounts paid to the Contractor under this Item be greater than the Contractor's Lump Sum Price.

.4 For those purposes of mobilization and demobilization, "project site" means the location.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 CONSTRUCTION

.1 The Contractor shall carry out the Work as indicated in the Contract Documents and/or as specifically directed by the Departmental Representative.

END OF SECTION

Part 1 General

1.1 GENERAL REQUIREMENTS OF THE BID AND ACCEPTANCE FORM

.1 This section covers the measurement of Work done for payment purposes.

.2 The quantities listed in the Bid and Acceptance Form are approximate only and are for the purpose of tendering. Payment to the Contractor will be based on actual quantities of work completed in accordance with the Drawings and Specifications.

.3 There shall be no measurement or payment for Work carried out beyond the limits defined on the Drawings, unless approved by the Departmental Representative.

.4 The total of all Unit Prices and Lump Sum payments shall constitute full compensation for the entire Work of the Contract, as shown, specified, and intended.

.5 The Contractor will only be entitled to payment when prior authorization has been received from the Departmental Representative for utilization and then only to the extent of the work authorized by the Departmental Representative.

.6 The unit and lump sum prices for all items in the Unit Price Table and Lump Sum Table shall represent the full compensation for the Work and shall include the cost of furnishing all materials, labour, tools, and equipment necessary to complete the Work in accordance with the Contract, the Drawings and Specifications, and shall cover all costs of surety. Each item shall include all necessary supervision, plant and services, and all operations and allowances customary and necessary to complete each item and the Contract as a whole, notwithstanding the fact that not every such necessary operation is mentioned or included specifically for measurement.

.7 Unless specified otherwise, all materials necessary to complete the items listed in the Unit Price Table, Lump Sum Table and the finished Work shall be new materials supplied by the Contractor and the cost of such materials is to be included in the Contractor's prices.

.8 All measurements for progress payment purposes shall be taken jointly by the Contractor and the Departmental Representative.

.9 There will be no payment for work carried out on excavated material in the absence of truck tickets.

.10 Overhaul will not be paid on this Contract.

1.2 MEASUREMENT AND PAYMENT

.1 All items in this contract will be paid for as indicated in the bid items below:

.2 Lump Sum Item 1 – Section 01 21 00 – Prime Cost Sum.

.1 Unit of Measurement: Lump Sum (LS)

.2 All incidentals to cover miscellaneous work (allowance) which may occur during work on the project. Payment will be made against it for miscellaneous work not included under items specified in the Lump Sum or Unit Price Tables ordered under GC 6.1 of the General Conditions. Prime Cost Sum is not a sum due the Contractor.

.3 Payment for work under the Prime Cost Sum will be made using negotiated rates or by material, labour, and equipment rates as per the following:

.1 Rental rates will be in accordance with current Nova Scotia Roadbuilders rate schedule, or for work undertaken in Nova Scotia, and will be all inclusive and fully operated. Hourly rental of equipment will be measured in actual working time and necessary travel time within project limits.

.2 Transportation time to and from site to be reimbursed only if equipment is used exclusively for additional work.

.3 Lump Sum Item 2 – Section 01 25 20 – Mobilization / Demobilization.

.1 Unit of Measurement: Lump Sum (LS).

.2 50% of Lump Sum Contract Price for Mobilization and Demobilization to be paid when mobilization to site is complete.

.3 The remainder of the Lump Sum Price for Mobilization and Demobilization to be paid when work is complete and all plant, equipment, excess materials, facilities and incidentals have been removed from site and site cleaned and left in condition to the satisfaction of the Departmental Representative and all other Agencies having Jurisdiction.

.4 Payment of only **5%** of the total price tendered will be scheduled as outlined above. If the amount bid for mobilization and demobilization is greater than **5%** of the total price tendered, payment of the remainder of the amount will be authorized when the Contract has been completed.

.4 Lump Sum Item 3 – Section 01 35 00.06 - Special Procedures for Traffic Control.

.1 Unit of Measurement: Lump Sum (LS).

.2 This Item includes:

.1 Regulate traffic to provide for vehicular, bicycle, and pedestrian traffic through the work areas at all times for the duration of the work in accordance with the requirements of the Contract Documents, the Public Highways Act (Nova Scotia), and NSTIR's Temporary Workplace Traffic Control Manual (TWTCM).

.2 Maintaining one lane of traffic open at all times, except for approved traffic interruptions.

.3 Traffic control persons, traffic accommodation person(s), and any equipment, supplies, and additional manpower required.

.4 Provision, installation, maintenance, and removal of temporary traffic control devices, including traffic signals, temporary rockfall protection barriers and other barriers, delineator drums, flashing light units, and temporary pad sites.

.5 Provision, erection, and maintenance of construction signage, project identification site signs, safety and instruction signs, additional traffic signs (TC-73/TC-73S and RB-55), trail closure signs and notices, "look-off" closure devices, TC-132NS flashing light units.

.6 Maintaining an Accredited Temporary Workplace Signer on site during active work and 24/7 traffic accommodations person(s).

.5 Lump Sum Item 4 – Section 01 35 43 – Environmental Procedures.

.1 Unit of Measurement: Lump Sum (LS).

.2 This item includes:

.1 Provision, installation, maintenance, and removal of all environmental protection, sedimentation and erosion control measures required to complete the project, such as (but not limited to) diversion ditching, silt fences, and temporary ground covers in accordance with Parks Canada National Best Management Practices – Roadway, Highway, Parkway and Related Infrastructure (May 2015).

.2 Submission of the Environmental Protection Plan as per the EPP Template Document, provided in Appendix B. The EPP shall be developed using this template document and is to be submitted to the Departmental Representative for review and approval.

.6 Lump Sum Item 5 – Section 01 52 00 – Construction Facilities.

.1 Unit of Measurement: Lump Sum (LS).

.2 This item includes:

.1 Provision and maintenance of adequate access to the project site.

.2 Cleaning of roads and parking areas where used by the Contractor or employees.

.3 Provision, erection, and maintenance of project identification site signs, Safety and Instruction signs, trail closure signs, and notices.

.4 Provision of construction site office.

.5 Provision of sanitary facilities.

.6 Removal of temporary facilities from site as directed by the Departmental Representative.

.7 Unit Price Item 1 – Section 31 33 13 – Supply and Install 26 mm x 6 m Rock Anchors.

.1 Unit of Measurement: Each (Ea).

.2 Method of measurement: Unit price for supply and installation of 26 mm diameter, 6 m long rock anchor.

.3 This item includes: All labour, materials, equipment, any special drilling and grouting methods, and site access necessary to complete the work in accordance with the Drawings and Specifications. Submittal of Rock Anchor Installation Plan and all related documentation.

.4 The number of rock anchors specified on the drawings is based on estimated rock conditions and may change after scaling operations.

.5 Rock anchors will be installed at locations designated by the Departmental Representative.

.6 Rock anchors must be locked off at the design loads and proof tested as per PTI guidelines. Proof testing of rock anchors is incidental to this unit price.

.7 Providing the Departmental Representative with any samples of grouting materials that may be requested for quality assurance testing.

.8 Performance testing of select Rock Anchors to be paid separately under the Unit Price Item Performance Test Rock Anchors.

.8 Unit Price Item 2 – Section 31 33 13 – Supply and Install 26 mm x 9 m Rock Anchors.

.1 Unit of Measurement: Each (Ea).

.2 Method of measurement: Unit price for supply and installation per 26 mm diameter, 9 m long rock anchor.

.3 This item includes: All labour, materials, equipment, any special drilling and grouting methods, and site access necessary to complete the work in accordance with the Drawings and Specifications. Submittal of Rock Anchor Installation Plan and all related documentation.

.4 The number of rock anchors specified on the drawings is based on estimated rock conditions and may change after scaling operations.

.5 Rock anchors will be installed at locations designated by the Departmental Representative.

.6 Rock anchors must be locked off at the design loads and proof tested as per PTI guidelines. Proof testing of rock anchors is incidental to this unit price.

.7 Providing the Departmental Representative with any samples of grouting materials that may be requested for quality assurance testing.

.8 Performance testing of select Rock Anchors to be paid separately under the Unit Price Item Performance Test Rock Anchors.

.9 Unit Price Item 3 – Section 31 33 13 – Performance Test Rock Anchors.

.1 Unit of Measurement: Each (Ea).

.2 This item includes: Unit price for completing performance load tests on rock anchors in accordance with PTI Recommendations for Prestressed Rock and Soil Anchors (PTI DC35.1-14).

.3 The final number of rock anchors to be performance tested will be determined by the Departmental Representative during construction.

.4 Payment for rock anchor performance testing shall be full compensation for supplying all material, labour, equipment, and incidentals to execute the work as specified.

.10 Unit Price Item 4 – Section 31 23 20 – Manual Rock Scaling.

.1 Unit of Measurement: Hour (hr).

.2 Method of measurement: Unit price per hour of 3-person scaling crew actively manually scaling by repelling on rope.

.3 Manual scaling by repelling on rope will be measured as the hours of time spent by the entire crew actively scaling the slope, beginning at the top of rope decent

to the scaling area, and ending at the time the scaler reaches the bottom of that particular rope decent. Time spent accessing scaling areas, maintaining equipment, or carrying out work using tools or methods which are not the most appropriate or best suited to a particular situation will not be measured for payment.

.4 Payment for scaling will be made at the Contract Unit Prices per crew hour for manual scaling, which shall be full compensation for supplying all material, labour and equipment to execute the work as specified.

.5 Disposal and cleanup of materials from rock scaling and excavation of existing fallen materials in ditches in the work areas will be paid separately under the Common Excavation bid item.

.11 Unit Price Item 5 – Section 31 23 20 – Boom Lift Rock Scaling.

.1 Unit of Measurement: Hour (hr).

.2 This item includes: Unit price per hour for manual scaling from boom lift.

.3 Boom lift scaling will be measured as the hours of time spent actively scaling the slope in designated areas while one approved scaler is working from a boom lift, commencing when the scaler ascends from ground level, and ending at the time the scaler returns to ground level. Time spent maintaining equipment or carrying out work using tools or methods which are not the most appropriate or best suited to a particular situation will not be measured for payment.

.4 The boom lift must have appropriate capacity and horizontal and vertical reach to suit the slope heights and the distance from the lift location to the scaling areas on the slope faces.

.5 Payment for scaling will be made at the Contract Unit Prices per hour for one approved scaler actively scaling from a boom lift, which shall be full compensation for supplying all material, labour, and equipment to execute the work as specified.

.6 Disposal and cleanup of materials from rock scaling and excavation of existing fallen materials in ditches in the work areas will be paid separately under the Excavation of Rock Slope Debris bid item.

.12 Unit Price Item 6 – Section 31 23 16 – Excavation of Rock Slope Debris.

.1 Unit of Measurement: Cubic meter (m^3).

.2 Excavation of Rock Slope Debris will be based on the measured volume of excavated material in the box of haul trucks, multiplied by the number of truck loads. The tendered unit price shall be full compensation for supplying all material, labour, and equipment to execute the work as specified.

.3 The Departmental Representative will measure the volume of each different haul truck based on physical dimensions of the truck box measured up to the base of batter boards, or if there are no batter boards, the physical dimensions that would provide a freeboard of at least 300 mm with a level load.

.4 Haul truck operators shall submit a haul ticket for each load to the Departmental Representative prior to taking each load off site. Failure to do so will result in the load not being measured for payment.

.5 Only full loads of excavated material will be measured for payment. Non-full loads must be approved by the Departmental Representative prior taking off site.

.6 To verify reinstatement, existing catchment ditches shall be surveyed prior to the start of work and after the completion of excavation activities. All costs associated with surveying, protection of the existing ditch profile, and protection of infrastructure including buried utilities with blasting mats, shall be incidental to the work. The catchment ditch shall be reinstated post scaling operations to the elevation of the existing ditch and shoulder width, or as directed by the Departmental Representative. Costs to re-instate the ditch to its original condition (including provision of new materials, compaction, etc.) are incidental to the work.

.7 Over excavation beyond the limits shown on the plans or directed by the Departmental Representative will not be measured for payment.

.8 Excavation, removal, stockpiling, clearance of snow or other frozen materials are not considered to be measurable items.

.13 Unit Price Item 7 – Section 31 32 13 – Concrete Buttress

.1 Unit of Measurement: Cubic meter (m^3).

.2 Method of measurement: Volume of concrete placed for concrete buttress installation, including levelling pad.

.3 This item includes: All materials, labour, tools, equipment, form work, concrete, concrete pigmentation, reinforcing steel, curing, inclined dowels, drain holes, water stops, and any incidentals necessary to complete the work as specified. Submittal of Buttress Construction Plan and all related documentation.

.4 Providing the Departmental Representative with any samples that may be requested from each concrete batch for quality assurance testing, and the supply of trial batches/samples for review and approval of the finished concrete colour are considered incidental to the work.

.5 Installation of Rock Dowels for the Concrete Buttress to be paid separately under the Unit Price item for Rock Dowels for Concrete Buttress.

.14 Unit Price Item 8 – Section 31 32 13 – Rock Dowels for Concrete Buttress

.1 Unit of Measurement: Linear meter (m).

.2 Method of measurement: Length of rock dowel supplied, installed, and accepted. Measurement length shall be the length of bar embedded in the ground (rock/concrete) plus specified tail length. Excessive bar protruding from the rock / concrete face shall not be measured.

.3 This item includes: All material, labour, equipment, and incidentals to execute the work as specified, including required drilling and any special drilling and grouting methods.

.4 Providing the Departmental Representative with any samples of grouting materials that may be requested for quality assurance testing.

.5 Pull-Out Testing of select Rock Dowels as per the specifications is considered incidental to this work.

Part 2 Products – Not Used

Part 3 Execution – Not Used

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 11 00 – Summary of Work.

1.2 ADMINISTRATIVE

.1 The Departmental Representative shall schedule and administer a mandatory pre-construction meeting and mandatory project meetings throughout the execution of the Work.

.2 The Departmental Representative shall prepare meeting agendas and provide these to all parties and required participants prior to the meetings.

.3 The Departmental Representative shall distribute written notice of each meeting four days in advance of meeting date to all parties and required participants.

.4 The Contractor shall provide physical space and make arrangements for meetings on site.

.5 The Departmental Representative, or PCA, will preside at meetings.

.6 The Departmental Representative will record the meeting minutes to include significant proceedings and decisions and actions required by all parties, including responsibilities and due dates.

.7 The Departmental Representative will reproduce and distribute copies of minutes within three days after meetings and transmit to all meeting participants and affected parties not in attendance, except Subcontractors. The Contactor shall be responsible for distribution of meeting minutes to their Subcontractors.

.8 Representatives of Contractor, Subcontractor, and suppliers attending meetings must be qualified and authorized to act on behalf of the party they represent.

1.3 PRE-CONSTRUCTION MEETING

.1 Within 15 days after award of Contract, after receiving the Contractor's submittals but prior to the start of construction, the Departmental Representative shall arrange a pre-construction meeting of all parties involved in the Work to discuss and resolve administrative procedures and responsibilities.

.2 Representatives of the Owner, Contractor, Subcontractors, field inspectors and supervisors shall be in attendance.

.3 The Departmental Representative will establish time and location of the meeting and notify parties concerned a minimum of five days before the meeting.

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

.5 Agenda to include:

.1 Appointment of official representative of participants in the Work.

.2 Schedule of Work.

.3 Schedule of submission of shop drawings and other submittals as specified in the Contract Documents.

.4 Requirements for temporary facilities, site signage, offices, storage sheds, utilities, fences.

.5 Delivery schedule of specified equipment.

.6 Site security.

.7 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.

.8 Monthly progress claims, administrative procedures, photographs, hold backs.

.9 Appointment of inspection and testing agencies or firms.

.10 Insurances, transcript of policies.

1.4 PROGRESS MEETINGS

.1 During the course of the Work, the Departmental Representative shall schedule bi-weekly progress meetings.

.2 Contractor, Subcontractors, Departmental Representative are to be in mandatory attendance.

.3 Agenda to include the following:

.1 Review, approval of minutes of previous meeting.

.2 Review of Work progress since previous meeting.

.3 Review of actions and due dates identified in previous meeting.

.4 Field observations, technical problems, conflicts and solutions.

.5 Problems which impede design and constructability of remedial measures, construction schedule and budget.

.6 Review of off-site fabrication delivery schedules.

.7 Corrective measures, technical solutions and procedures to regain projected design, schedule and budget.

.8 Revision of construction schedule.

.9 Progress schedule, during succeeding work period.

.10 Review submittal schedules: expedite as required.

.11 Maintenance of quality standards.

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

.13 Other business.

.14 Required actions including responsible party and due dates.

Part 2 Products – Not Used

Part 3 Execution – Not Used

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 – Submittal Procedures.

1.2 MEASUREMENT FOR PAYMENT

.1 The work for this section will not be measured for payment, but will be incidental to the work.

1.3 DEFINITIONS

.1 Activity: element of Work performed during the course of the Project. Activity normally has expected duration, 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 Sunday, inclusive, will provide seven-day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.

.5 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project elements. 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 Departmental Representative to enable monitoring of project work in relation to established milestones.

1.4 REQUIREMENTS

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

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

.3 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.

1.5 SUBMITTALS

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

.2 Submit to Departmental Representative within five 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 Departmental Representative within five working days of receipt of acceptance of Master Plan.

1.6 MASTER PLAN

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

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

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

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

1.7 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 Traffic Control.
.6 Buttress installation.
.7 Scaling Operations and Excavation of Rock Slope Debris.
.8 Install Rock Anchors.
.9 Cleanup and Demobilization.

1.8 PROJECT SCHEDULE REPORTING

.1 Update Project Schedule every two weeks 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.

1.9 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.

Part 2 Products – Not Used

Part 3 Execution – Not Used

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 11 00 – Summary of Work.

.2 Section 01 32 16.07 – Construction Progress Schedules.

.3 Section 01 35 29 – Health and Safety.

.4 Section 01 45 00 – Quality Control.

.5 Section 01 78 00 – Closeout Submittals.

1.2 ADMINISTRATIVE

.1 Submit to the Departmental Representative submittals listed for review in each specification section within the specified timeframes. Submit promptly and in orderly sequence to not cause delay in the execution of the Work. Failure to submit within specified timeframes 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 order material or proceed with Work affected by submittal until review by the Departmental Representative is complete and approval is provided.

.3 Provide all submittals, such as work procedures, shop drawings, product data, etc. in SI Metric units. Exceptions are submittals such as data sheets that are only available in imperial units.

.4 Review submittals prior to submission to the Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and 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.

.5 Notify the Departmental Representative, in writing prior to submission, of deviations from requirements of Contract Documents stating reasons for deviations. All deviations from Contract Documents must be approved by the Departmental Representative.

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

.7 The Contractor's responsibility for deviations in submittals from requirements of Contract Documents is not relieved by the Departmental Representative’s review.

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

.9 Revise submissions as requested by the Departmental Representative in accordance with Contract Documents and resubmit as directed by Departmental Representative.

.10 Notify Departmental Representative, in writing, when resubmitting of any revisions other than those requested by Departmental Representative.

1.3 WORK PLANS

.1 The Contractor shall submit work plans outlining construction and installation methods, material, equipment, work procedures and sequences and all other relevant information for work items described in the specification sections within the specified timeframes.

.2 Allow a minimum of five working days, for the Departmental Representative's review and approval of each submission.

1.4 SHOP DRAWINGS AND PRODUCT DATA

.1 The Contractor shall submit shop drawings to illustrate details of the Work, as specified in the specification sections. All shop drawings shall be stamped and signed.

.2 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes, and other information necessary for completion of the 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.

.3 Allow a minimum of five working days, for the Departmental Representative's review and approval of each submission.

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

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

.6 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.

.7 Submissions include:

- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of:
  - .1 Subcontractor.
  - .2 Supplier.
  - .3 Manufacturer.
- .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
- .5 Details of appropriate portions of Work as applicable:

.1 Fabrication.
.2 Layout, showing dimensions, including identified field dimensions, and clearances.
.3 Setting or erection details.
.4 Capacities.
.5 Performance characteristics.
.6 Standards.
.7 Operating weight.
.8 Relationship to adjacent work.

.8 After the Departmental Representative's review, distribute copies.

.9 Submit prints of shop drawings for each requirement requested in specification Sections and as the Departmental Representative may reasonably request.

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

.11 Delete information not applicable to project.

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

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

.14 The review of shop drawings by Departmental Representative is for sole purpose of ascertaining conformance with general concept.

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

1.5 SAMPLES

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

.2 Deliver samples prepaid to the Departmental Representative's business address.

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

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

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

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

1.6 PHOTOGRAPHIC DOCUMENTATION

.1 Submit electronic colour digital photographs in ".jpg" format.

.2 Identification: name and number of project and date of exposure indicated.

.3 Number of viewpoints: location of viewpoints determined by Department Representative.

.4 Frequency: monthly and at completion of project.

1.7 CERTIFICATES AND TRANSCRIPTS

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

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

1.8 MEASUREMENT PROCEDURES

.1 The work for this section will not be measured for payment but will be incidental to the work.

Part 2 Products - Not Used

Part 3 Execution - Not Used

END OF SECTION

Part 1 General

1.1 DESCRIPTION

.1 This section specifies requirements and procedures for traffic regulation to ensure protection of work and safety of public to satisfaction of Departmental Representative.

1.2 RELATED REQUIREMENTS

.1 Section 01 14 00 – Work Restrictions.

1.3 REFERENCES

.1 Manual of Uniform Traffic Control Devices Canada (MUTCD) – Latest Edition.

.2 Nova Scotia Temporary Workplace Traffic Control Manual (NSTWTCM) – Latest Edition.

1.4 MEASUREMENT OF PAYMENT

.1 See Section 01 29 00 – Payment Procedures.

1.5 GENERAL

.1 Provide traffic control through use of either an approved traffic signal system, or traffic control persons in accordance with Nova Scotia Department of Transportation and Infrastructure Renewal Temporary Workplace Traffic Control Manual (Latest Edition).

.2 Additional requirements above and beyond the designated minimums in the reference standard are noted herein and in each specification section.

.3 The Department Representative reserves the right to stop or reduce work in the event of excessive traffic delays or if excessive dust or other hazardous conditions (rockfall) are impacting driver safety when traffic is flowing. No payment will be due to the Contractor for these stoppages.

.4 Provide and maintain traffic control services twenty-four (24) hours a day and seven (7) days a week during the project schedule.

.5 Conduct operations as to create a minimum of inconvenience to traffic as practical.

.6 The Contractor shall provide an accredited Temporary Workplace Signer, who has successfully completed an approved Temporary Workplace Signer course, to be on site at all times when active construction is taking place. The Temporary Workplace Signer will be responsible to supervise the placement and dismantling of all temporary conditions signs and devices that indicate to the road user that highway construction activity exists and also to ensure that proper traffic control producers are carried out in accordance with NSTWTCM. The Temporary Workplace Signer is considered part of the Contractor's supervision and administration staff and compensation from the provision of this individual is considered incidental to the work.

.7 The Contractor shall provide supervision as required during non-working hours to ensure that traffic control is in proper working order. Provision of this supervision and any Traffic Accommodation Person(s) is considered incidental to the work.

.8 Contractor shall maintain and regulate access to the 'Look Off' locations at all times, except when special permission has been granted by the Departmental Representative for a temporary closure. Any work being completed at the 'Look Off' areas requires 48-hour notice to the Departmental Representative's review and approval. Temporary closures of the 'Look Off' areas shall be completed with adequate signage and barricading.

1.6 TRAFFIC CONTROL PERSONS TO BE INSTRUCTED

.1 Contractor shall ensure that only employees who are in possession of a valid "Traffic Control Persons Certificate" as per the Nova Scotia Department of Transportation and Infrastructure Renewal Temporary Workplace Traffic Control Manual (Latest Edition) are assigned to this project.

1.7 TRAFFIC CONTROL PLAN

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

.2 The contractor shall develop and implement a Traffic Control Plan in accordance with the requirements of NSTWTCM. The Traffic Control Plan must be submitted to the Departmental Representative for review within 5 working days after Contract award, and a minimum of 48 hrs prior to the pre-construction meeting.

.3 Work shall not commence until Departmental Representative has approved the Traffic Control Plan.

.4 The Traffic Control Plan shall include:

.1 Plans specific to each rock slope location (effect of steep grades and curved alignment present in the work area, 'Look-offs', windy conditions, etc.) and any special requirements for each work task (scaling, etc.) based on the project specific hazards.

.2 Layout drawings indicate the quantity, spacing and detail of signs, and traffic control devices to be used during construction for each work area site (including adjustments for various stages of work).

.3 Initial timing of traffic lights by a third-party consultant for approval by the Departmental Representative prior to mobilizing to site.

.4 Contact information for The Temporary Workplace Signer(s) and Traffic Accommodation Person(s).

.5 Response plan for emergency vehicles.

.5 The Traffic Control Plan may be required to be updated and re-submitted to the Departmental Representative for review and acceptance should traffic, site, or work conditions change.

.6 The Departmental Representative will monitor traffic management measures and may require modifications of these measures from time to time to achieve satisfactory traffic flow, safety of travelling public, and coordination with adjacent contracts.

.7 Do not change traffic control operation without approval of Departmental Representative.

1.8 PROTECTION OF PUBLIC TRAFFIC

.1 At slopes RR1358, RR1372, and RR1402 temporary concrete barricades and fencing will be required due to the potential for active rockfall and equipment to impact the public.

The barricades and fencing must be erected at all times in areas where active work is being carried out on the slope.

.2 Work at RR1303, is to be carried out in accordance with the NSTWTCM..

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

.4 When working on travelled way:

.1 Place equipment in position to present minimum of interference and hazard to travelling public.

.2 Keep equipment units as close together as working conditions permit and preferably on same side of travelled way.

.3 Do not leave equipment on travelled way overnight.

.5 Do not close any lanes of road without approval of Departmental Representative. Before re-routing traffic, erect suitable signs and devices in accordance with instructions contained in Part D of MUTCD and NSTWTCM.

.6 Keep travelled way sufficient width for required number of lanes of traffic.

.7 Keep travelled way free of damage and debris (scaled material, etc.).

.8 Do not exceed a long duration lane closure length of 800 metres.

.9 Provide and maintain road access and egress to property fronting along Work under Contract and in other areas as indicated, unless other means of road access exist that meet approval of Departmental Representative.

.10 Accommodate cyclists and provide appropriate signage and space for traveling through project limits.

1.9 INFORMATIONAL AND WARNING DEVICES, BARRICADES

.1 Provide and maintain NSTIR approved temporary, fully actuated traffic signals; signs, flashing warning lights and other devices required to indicate construction activities or other temporary and unusual conditions resulting from Project Work which requires road user response.

.2 Provide, erect, and maintain necessary barricades, suitable and sufficient flashing warning lights, danger signals and other signs.

.3 Placement and erection of signs, barricades, delineators and warning lights and other devices to be in strict accordance with the Nova Scotia Department of Transportation and Infrastructure Renewal Temporary Workplace Traffic Control Manual.

.4 TC-132NS flashing light units with lights ahead signs will be required at both approaches, as well as proper work zone signage and spacing.

.5 Provide additional traffic signage including No Stopping (RB-55) and ‘Share The Road’ signs (TC-73 and TC-73S).

.6 Continually maintain traffic control devices in use by:

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

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

.3 Repair, replace or reposition as required or as directed by Departmental Representative.

.4 Monitor power supply and battery levels at traffic signals to ensure there are no interruptions to service.

1.10 CONTROL OF PUBLIC TRAFFIC

.1 Provide traffic control personnel who have a valid provincial license and are trained in accordance with, and properly equipped as specified in NSTWTCM manuals in following situations:

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

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

.3 When workmen or equipment are employed at locations where oncoming traffic would not otherwise have adequate warning.

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

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

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

.7 At each end of restricted sections where pilot vehicles are required.

.2 All Traffic Control Personnel shall be equipped with portable radios of sufficient range to ensure continuous communication within the traffic control zone.

.3 All construction vehicles shall operate in accordance with and are subject to traffic control restrictions and operations in place on the project.

.4 Flagpersons are to be equipped with portable radios only, not cellular devices. Any flagperson using cellular devices, except for emergency use only, shall be removed from the site immediately. PCA shall not be held responsible for any lost time incurred due to the removal of such an individual.

1.11 OPERATIONAL REQUIREMENTS

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

.1 In accordance with NSTWTCM.

.2 Maintain, at minimum, one-lane two-way traffic, by way of temporary, fully actuated traffic signals, for long-duration work.

.3 Maintain, at minimum one-lane two-way traffic, by way of traffic control persons, for short-duration work.

.4 As directed by Departmental Representative, temporarily relocate traffic control informational devices, warning devices and barriers as required to accommodate 'wide load' traffic. Minimum 24 hours notice will be provided by Departmental Representative for passage of such traffic.

1.12 TRAFFIC INTERRUPTIONS

.1 Any traffic interruptions greater than ten (10) minutes must have prior approval of the Departmental Representative.

.2 Requests should be provided to the Departmental Representative at least one (1) week in advance of the planned interruption, providing details on the period, timing, and nature. Requests with less than 72 hours notice may be rejected without consideration.

.3 Road Rental for unapproved traffic interruptions:

.1 Parks Canada Agency (PCA) and the Contractor agree that the maximum cumulative time delay to traffic through the Contract limits shall be ten (10) minutes. In the event that this time limit is not met by the Contractor, PCA will suffer damages which are very difficult to identify with precision because of the nature of the project. PCA and the Contractor agree that a fair pre-estimate of the amount of set damages is One Thousand Dollars ($1,000.00) per 15 minute interval or part thereof for which the traffic delay extends beyond maximums identified. Therefore, the parties agree that the Contractor shall pay to PCA for each and every 15 minute increment the traffic delay extends after maximum time limit identified, the sum of One Thousand Dollars ($1,000.00) determined by the parties hereto to be liquidated damages, not a penalty.

.2 During the school year, delays for school buses shall be avoided. Any bus delays reported will be subject to road rental clause.

Part 2 Products

2.1 TRAFFIC CONTROL DEVICES

.1 Barricades, signs, delineators, warning lights, traffic control person's paddles and other devices shall be in strict accordance with the Nova Scotia Department of Transportation and Infrastructure Renewal Temporary Workplace Traffic Control Manual.

.2 Signs, barricades, delineators and traffic control persons paddles shall be as new and reflectorized to show same shape and colour by night as by day.

.3 Signs to be bilingual or symbolic.

2.2 TRAFFIC SIGNAL LIGHT UNITS

.1 Traffic signal units shall be powered by reliable power source capable of operating at all times. Solar powered signal lights shall require adequate backup generators, or backup battery systems.

.2 Communication between traffic signal units is to be provided via hardline cable, not wireless/radio interface.

.3 Units are to be safely erected on a stable surface ensuring the unit is clearly visible and does not overly encroach upon the active travel lane. The construction of temporary pad

sites for the unit may be required. Construction and removal of temporary pads is to be completed under the approval of the Departmental Representative.

.4 Provide initial timing of traffic lights by a third-party consultant for approval by the Departmental Representative prior to mobilizing to site.

2.3 TEMPORARY ROCKFALL BARRIERS

.1 Where active slope work is being carried out, temporary barriers to protect the active lane of traffic shall be installed. Active slope work is defined as scaling, rock bolt installation, and excavation of scaled material.

.2 At a minimum, temporary rockfall barriers shall consist of PreCast Concrete 570 mm F-shaped Jersey Barriers or equivalent in accordance with NSTWTCM, with top mounted fencing:

.1 Fencing shall be installed prior to start of construction.

.2 Fencing shall consist of interlocking modular metal temporary fence panels utilizing structural steel square tubing and interior panels with heavy gauge welded wire mesh (Modu-loc or approved equivalent).

.3 The height of the fence shall be no less than 1800 mm high, as measured from the top of the Jersey barrier.

.4 The Fencing Supplier shall rigidly mount the fencing to the temporary concrete barriers with all necessary hardware/accessories to ensure support and stability during the expected project work conditions in accordance with the Fencing Manufacturer's installation procedures. As a minimum, the fencing system shall include:

.1 Heavy duty concrete saddle mounts or equivalent concrete mounts.

.2 Heavy duty wind braces.

.3 Heavy duty steel fence top interlocking caps.

.3 The temporary fencing system must be provided to the Departmental Representative for approval at least one (1) week prior to the commencement of work.

Part 3 Execution

3.1 GENERAL

.1 Traffic management for the purposes of all aspects of the work including, but not limited to scaling, anchoring, and excavation of rock slope debris as per this specification.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures.

1.2 MEASUREMENT FOR PAYMENT

.1 The work for this section will not be measured for payment, but will be incidental to the work.

1.3 REFERENCES

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

.2 Province of Nova Scotia.

.1 Occupational Health and Safety Act, S.N.S. - Updated 2013.

1.4 DEFINITIONS

.1 Competent Person means a person to who is:

.1 Qualified by virtue of personal knowledge, training and experience to perform assigned work in a manner that will ensure the health and safety of persons in the workplace.

.2 Knowledgeable about the provisions of occupational health and safety statutes and regulations that apply to the Work.

.3 Knowledgeable about potential or actual danger to health or safety associated with the Work.

.2 Medical Aid Injury: any minor injury for which medical treatment was provided and the cost of which is covered by Workers' Compensation Board of the province in which the injury was incurred.

.3 PPE: personal protective equipment.

.4 Work Site: where used in this section shall mean areas, located at the premises where Work is undertaken, used by Contractor to perform all of the activities associated with the performance of the Work.

1.5 GENERAL REQUIREMENTS

.1 Contractors are required under Nova Scotia Occupational Health and Safety Act, and the Regulations made pursuant to the Act to have in place a Health and Safety Program. Compliance requirements for the content, detail and implementation of the program resides with the provincial authority. For the purpose of this contract the Health and Safety Program shall include a site-specific Health and Safety Plan (the “Plan”) that acknowledges, assesses and addresses hazardous substances and/or hazardous conditions known and identified and on-going hazard assessments performed during the progress of work identifying and documenting new or potential health risks and safety hazards not previously known and identified.

.2 The Health and Safety Program shall include no texting or cell phone use permitted when driving or operating heavy equipment.

.3 Contractor shall ensure that all site personnel are familiar with the contents of the Plan and maintain records for proof.

.4 Contractor shall employ measures to ensure all personnel entering the site are advised to abide by the Plan.

.5 The Departmental Representative reserves the right to demand the removal of any persons not complying with the Plan. Any persons removed from the site shall not be permitted re-entry unless authorized by Departmental Representative.

1.6 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submit site-specific Health and Safety Plan to Departmental Representative within 7 calendar days of Contract Award date and prior to the pre-construction meeting.

.3 Submit building permit, compliance certificates and other permits obtained.

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

.5 Submit copies of incident reports.

.6 Submit WHMIS MSDS - Material Safety Data Sheets.

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

.8 Departmental Representative's review of Contractor's Health and Safety Plan should not to be construed to imply approval by the Departmental Representative that the program is complete, accurate and legislatively compliant with the Nova Scotia Occupational Health and Safety Act, and the Regulations made pursuant to the Act, and shall not relieve the Contractor of their legal obligations under such legislation.

.9 Submit other data, information and documentation upon request as stipulated elsewhere in this section.

1.7 COMPLIANCE REQUIREMENTS

.1 Comply with the Occupational Health and Safety Act for the Province of Nova Scotia, and the Regulations made pursuant to the Act.

.2 Comply with Canada Labour Code Part II, and the Canada Occupational Safety and Health Regulations made under Part II of the Canada Labour Code.

.3 Observe and enforce applicable construction safety measures required by:

.1 National Building Code of Canada (latest edition).

.2 Nova Scotia Health and Safety Act.

.3 Provincial Worker's Compensation Board.

.4 Municipal statutes and ordinances.

.5 In event of conflict between any provisions of above authorities the most stringent provision shall apply.

.4 Maintain Workers Compensation Coverage in good standing for duration of Contract. Provide proof of clearance through submission of Letter in Good Standing.

.5 Medical Surveillance: Where prescribed by legislation or regulation, obtain and maintain worker medical surveillance documentation.

1.8 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.

1.9 FILING OF NOTICE

.1 File Notice of Project and other Notices with Provincial authorities prior to commencement of Work.

.2 Upon request, Departmental Representative will provide name and mailing address of provincial department to whom the Notice of Project must be sent.

.3 Contractor shall agree to install proper site separation and identification in order to maintain time and space at all times throughout life of project.

1.10 PERMITS

.1 Obtain permits, licenses and compliance certificates, at appropriates times and frequency as stipulated by authorities having jurisdiction.

.2 Where particular permit or compliance certificate cannot be obtained at the required stage of work, notify Departmental Representative in writing and obtain Departmental Representative's approval to proceed prior to carrying out that portion of the work.

.3 Post all permits on site. Submit copies to Departmental Representative.

1.11 SITE CONTROL AND ACCESS

.1 Control all work site access points and work site activities. Delineate and isolate the work site from adjacent and surrounding areas by use of appropriate means of maintain control of all work site access points.

.2 Secure the work site at all times to protect against un-authorized access. Immediately stop and remove non-authorized persons

.3 Make provisions for granting permission to access onto work site to all persons who require access. Procedures for granting permission to access are to be in accordance with the Nova Scotia Occupational Health and Safety Act, and the Regulations made pursuant to the Act and the Contractor's Health and Safety Program.

.4 Provide safety orientation session to persons granted access to Work Site. Advise of hazards and safety rules to be observed while on site.

.5 Ensure persons granted access to the work site are in possession of and wear the minimum personal protective equipment (PPE) designated by the Contractor's Health and Safety Program. Ensure persons granted access to the work site are provided with, trained in the use of, and wear, appropriate PPE that are required above and beyond the designated minimums previously noted and as specifically related to the work site activity that they are involved in. Be responsible for the efficacy of the PPE that is provided above and beyond the designated minimums.

.6 Supply PPE to inspection authorities who require access to conduct tests or perform inspections.

.7 Secure Work Site against entry when inactive or unoccupied and to protect persons against harm.

1.12 SAFETY ASSESSMENTS

.1 Implement and carry out a health and safety hazard assessment program as part of the work. Program to include:

.1 Initial hazard assessment carried out immediately upon notification of contract award and prior to commencement of work.

.2 On-going hazard assessments performed during the progress of work identifying new or potential health risks and safety hazards not previously known. As a minimum, hazard assessments shall be carried out when:

.1 New subtrade work, new subcontractor(s) or new workers arrive at the site to commence another portion of the work.

.2 The scope of work has been changed by Change Order.

.3 Potential hazard or weakness in current health and safety practices are identified by Departmental Representative or by an authorized safety representative.

.3 Hazard assessments to be project and site specific, based on review of contract documents, site and weather conditions.

.4 Each hazard assessment to be made in writing. Keep copies of all assessments on site for duration of work. Upon request, make available to Departmental Representative for inspection.

1.13 HEALTH AND SAFETY PLAN

.1 Develop written site-specific Project Health and Safety Plan, based on hazard assessments, prior to commencement of work.

.2 Health and Safety Plan shall contain the following three (3) parts:

.1 Part 1: List of individual health risks and safety hazards identified by hazard assessments.

.2 Part 2: List of specific measures to control or mitigate each hazard and risk identified in part one of Plan. Describe the engineering controls, personnel protective equipment and safe work practises to be implemented and followed when performing work related to each identified hazard or risk.

.3 Part 3: Emergency Measures and Communications Procedures as follows:

.1 Emergency Measures: on-site operating procedures, evacuation measures and emergency response to be implemented in the occurrence of an incident. Procedures to be specific and relevant to identified hazards. Measures to complement and be integrated with the facility and tenants Emergency Response Plans in place at site:

.1 Obtain information on existing emergency and evacuation plans from Departmental Representative and incorporate appropriate data.

.2 Communication Procedures:

.1 List of names and telephone numbers of designated officials, to be contacted should an incident or emergency situation occur, including the following:

.1 General Contractor and all Subcontractors.

.2 Federal and Provincial Departments and local emergency resources organizations, as resources organizations, as applicable laws and regulations.

.3 Officials from Parks Canada. Departmental Representative will provide list of names to be included.

.2 Procedures implemented at site to communicate and share information between workers, subcontractors, and General Contractor on work activities.

.3 Prepare Health and Safety Plan in a three-column format, addressing the three parts specified above, as follows:

Part 1	Part 2	Part 3
Identified Hazards	Safety Measures	Emergency Response & Communications

.4 Develop Health and Safety Plan in collaboration with all subcontractors. Address all work and activities of subcontractors as they arrive on site. Immediately update Plan and submit to Departmental Representative.

.5 Implement, maintain and enforce compliance with requirements of the Health and Safety Plan until final completion of work and demobilization from site.

.6 As work progresses, review and update Plan addressing additional health risks and safety hazards identified by on-going hazard assessments.

.7 Submit revised versions of Plan to Departmental Representative.

.8 Post a typed written copy, including all updates, of the Health and Safety Plan in a common visible location at work site.

.9 Submission of the Health and Safety Plan, and updates, to the Departmental Representative is for review and information purposes only. Its submission shall not be construed to imply approval by Departmental Representative, be interpreted as a warranty

of being complete, accurate and legislative compliant and shall not relieve Contractor of his legal obligations for the provision Health and Safety on the construction project.

1.14 HEALTH AND SAFETY CO-ORDINATOR

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

.2 Health and Safety Co-Ordinator must:

.1 Have site-related working experience specific to activities associated with slope and roadway rehabilitation projects completed with live traffic.

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

.3 Be on Work Site at all times during execution of the Work.

.3 The Health and Safety Co-Ordinator shall be required to conduct regularly scheduled safety inspections of the work site as follows:

.1 Informal inspections on a minimum daily basis noting deficiencies and remedial actions taken in a log book or diary. Make the log book and/or diary available for the Departmental Representative's viewing as requested.

.2 Formal inspections on a minimum weekly basis and shall provide a written report to the Departmental Representative for each formal inspection, document deficiencies, remedial action needed and assign responsibility for rectification to the appropriate party.

.3 Follow-up and ensure corrective measures are taken.

.4 Keep inspection reports and supervision related documentation on site.

.4 The Health and Safety Co-Ordinator shall be assigned the responsibility and authority to:

.1 Implement, monitor and enforce daily compliance with health and safety requirements of the Work.

.2 Monitor and enforce Contractor's site-specific Health and Safety Plan.

.3 Conduct site safety orientation session to persons granted access to Work Site.

.4 Ensure that persons allowed site access are knowledgeable and trained in health and safety pertinent to their activities at the site or are escorted by a competent person while on the Work Site.

.5 Stop the Work as deemed necessary for reasons of health and safety.

1.15 PROJECT SITE CONDITIONS

.1 The following are known or potential project related safety hazards at site:

.1 Steep cliffs are present throughout the majority of site and working from heights will be required to complete the scope of the project.

.2 Rock cuts adjacent to the site have been actively releasing quantities of rock ranging from small individual pieces falling into the ditch to larger masses that have filled the ditch and landed on the road.

.3 The site will be open to one-way traffic throughout the entire project which could pose risk to construction staff and equipment.

.4 The working area of the site is relatively narrow being limited to one lane and may become congested during construction activities.

.5 The site is frequently exposed to adverse weather conditions (high winds, rain/snow/ice, fog, etc.) and planning may be required to ensure safe construction practices under these conditions.

.6 The site is known to be home of various wildlife, including black bears, moose and coyotes.

.2 Above lists shall not be construed as being complete and inclusive of all safety and health hazards encountered as a result of Contractor's operations during the course of work. Include above items into the hazard assessment program specified herein.

1.16 TRAINING

.1 Use only skilled workers on Work Site who are effectively trained in occupational health and safety procedures and practices pertinent to their assigned task.

.2 Maintain employee records and evidence of training received. Make data available to Departmental Representative upon request.

1.17 HEALTH AND SAFETY MEETINGS

.1 Schedule and administer Health and Safety meetings as required by the Nova Scotia Occupational Health and Safety Act, and the Regulations made pursuant to the Act.

.2 Prior to commencement of work attend health and safety meeting conducted by Departmental Representative. Have Contractor's Site Superintendent in attendance. Departmental Representative will advise of time and location.

.3 Conduct site specific occupational health and safety meetings during the entire work as follows:

.1 Formal meetings on a minimum monthly basis.

.2 Informal tool box meetings on a regular basis from a predetermined schedule.

.4 Keep workers informed of anticipated hazards, on safety practices and procedures to be followed and of other pertinent safety information related to:

.1 Progress of Work.

.2 New sub-trades arriving on site.

.3 Changes in site and project conditions.

.5 Record and post minutes of meetings. Make copies available to Departmental Representative upon request.

1.18 TOOLS AND EQUIPMENT SAFETY

.1 Implement and follow a scheduled tool and equipment inspection/maintenance program at work site. Regularly check tools, equipment and machinery for safe operation and perform maintenance at pre-established time and frequency intervals as recommended by manufacturer. Include subcontractors equipment as part of the inspection process.

.2 Use standardized checklists to ensure established safety checks are stringently followed.

.3 Immediately tag and remove items found faulty or defective off site.

.4 Maintain written documentation on each inspection. Make available to Departmental Representative upon request.

1.19 HAZARDOUS PRODUCTS

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

.2 Keep MSDS data sheets on site. Provide copies of all data sheets to Departmental Representative upon receipt of materials on site.

.3 Put all MSDS data sheets on site, in a common area, visible to workers.

1.20 BIRDS AND WILDLIFE

.1 Any food or waste that could attract birds or wildlife can only be discarded in properly sealed waste containers.

1.21 INCIDENT REPORTING

.1 Investigate and report all incidents and accidents as outlined in Provincial Occupational Safety and Health Act and Regulations.

.2 Investigate and immediately report to Departmental Representative incidents and accidents which result, or have the potential of resulting in:

.1 Injuries requiring medical aid.

.2 Property damage in excess of $10,000.00.

.3 Required notification to Workers Compensation Board or other regulatory agencies as stipulated by applicable regulations.

.4 Interruptions to Facility operations resulting in an operational lost to a Federal department in excess of $5000.00.

.3 Medical aid in above clause shall have the same meaning as the term "medical aid injury" as defined in the Canadian Dictionary of Safety Terms - 1987 issue, from the Canadian Society of Safety Engineers (C.S.S.E.) as follows:

.1 Medical Aid Injury: any minor injury for which medical treatment was provided and the cost of which is covered by Workers' Compensation Board of the province in which the injury was incurred.

.4 Submit report in writing.

1.22 CORRECTION OF NON-COMPLIANCE

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

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

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

1.23 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.

.2 Should an unforeseen or peculiar safety related hazard or condition become evident during performance of work, immediately take measures to rectify the situation and prevent damage or harm. Advise the Departmental Representative verbally and in writing of the hazard or condition.

1.24 RECORDS ON SITE

.1 Maintain on site copy of safety documentation as specified in this section and other safety related reports and documents issued to or received from authorities having jurisdiction.

.2 Make available to Departmental Representative, or authorized safety representative, for inspection upon request.

1.25 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 having jurisdiction.

.2 Post documents indicated herein and as required by Authority having jurisdiction.

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 RELATED REQUIREMENTS

.1 Section 01 33 00 – Submittal Procedures.

.2 Section 01 74 11 – Cleaning

1.2 MEASUREMENT FOR PAYMENT

.1 See Section 01 29 00 - Payment Procedures.

1.3 REFERENCES

.1 Canadian Environmental Protection Act.

.2 Canadian Impact Assessment Act.

.3 Nova Scotia Provincial Standards.

.4 Guidelines for Protection of Freshwater Fish Habitat, DFO Canada.

.5 DFO's, Measures to avoid causing harm to fish and fish habitat including aquatic species at risk. http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/measures-mesures-eng.html

.6 Parks Canada National Best Management Practices – Roadway, Highway, Parkway and Related Infrastructure (May 2015), Environmental Construction Practice Specifications, National Parks Act and Regulations, Canadian Environmental Protection Act, provided in **Appendix A.**

.7 Environmental Protection Plan Template Document provided in **Appendix B.**

1.4 DEFINITIONS

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

.2 **Environmental Protection:** prevention/control of pollution and habitat or environment disruption during construction.

1.5 ENVIRONMENTAL PERFORMANCE

.1 The Contractor shall comply with all mitigative measures, terms and conditions outlined in the attached Parks Canada National Best Management Practices Roadway, Highway, Parkway and Related Infrastructure (May 2015).

1.6 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 An Environmental Briefing will be held prior to work commencing at the site, which will outline environmental factors to be considered during the work. It is mandatory that all current staff of the Contractor attend this meeting with the Departmental Representative and Environmental Protection Officer (EPO).

.3 5 days after contract award and prior to the pre-construction meeting, submit Environmental Protection Plan for review and approval by Departmental Representative. Environmental Protection Plan is to present comprehensive overview of known or potential environmental issues which must be addressed during construction.

.4 Address topics at level of detail commensurate with environmental issue and required construction tasks.

.5 Environmental Protection Plan to follow template as provided in **Appendix B** and to include, but not limited to the following:

.1 Name of person responsible for ensuring adherence to Environmental Protection Plan.

.2 Name and qualifications of person responsible for manifesting hazardous waste to be removed from site.

.3 Name and qualifications of person responsible for training site personnel.

.4 Descriptions of environmental protection personnel training program.

.5 Erosion and sediment control plan identifying type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.

.6 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use.

.1 Plan to include measures for marking limits of use areas including methods for protection of features to be preserved within authorized work areas.

.7 Spill Contingency Plan to include procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.

.8 Non-Hazardous Solid Waste Disposal Plan identifying methods and locations for solid waste disposal including clearing debris and recycling of decommissioned bridge materials.

.9 Air pollution Control Plan detailing provisions to assure that dust, debris, materials, and trash, do not become air borne and travel off project site.

.10 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.

.11 Waste Water Management Plan identifying methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.

1.7 FIRES

.1 Fires and burning of rubbish on site not permitted.

.2 The Contractor is required to comply with the Fire Protection Regulations of the National Parks Act.

.3 In accordance with these Regulations, the Park Superintendent may restrict activities, or access to work areas, in the interest of fire prevention.

.4 The Contractor's equipment must be in proper working condition and be used in such a manner as to minimize the potential for ignition of vegetation.

.5 Vehicles and stationary equipment must be equipped with fire suppression equipment such as an operable fire extinguisher.

.6 If storage and/or operation of in-Park equipment during a high fire hazard season is of concern to the Park, the Contractor may be required to prepare and implement a Fire Suppression Contingency Plan.

.7 The Departmental Representative and the Duty Warden of the Park must be contacted immediately in the event of a fire. The Contractor is held responsible to make all reasonable efforts to extinguish any fires on the site.

1.8 DRAINAGE

.1 A part of the Environmental Protection Plan, the Contractor shall provide Erosion and Sediment Control Plan that identifies type and location of erosion and sediment controls to be provided. Plan: include monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.

.2 Provide temporary drainage and pumping required to keep excavations and site free from water, if required.

.3 Do not pump water containing suspended materials into waterways, or drainage systems.

.4 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with Provincial authority requirements.

1.9 SITE CLEARING AND PLANT PROTECTION

.1 Restrict vegetation removal to areas indicated or designated by Departmental Representative.

.2 Sensitive areas should be cleared in a manner which will minimize disturbance to surface vegetation and soils. Areas identified for clearing within 30 metres of a watercourse shall be completed by hand.

.3 Should cultural resources artifacts be unearthed or discovered during project excavation, work in that area should be stopped and the Departmental Representative contacted immediately.

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

.5 Minimize stripping of topsoil and vegetation.

1.10 SITE SET-UP AND USE

.1 All site activities related to construction are to be confined within the defined project boundaries.

.2 Office trailer(s) will be permitted to be located within the boundaries of the Cape Breton Highlands National Park. Location is subject to the approval of the Departmental Representative.

.3 Work sites will be equipped with appropriate and properly maintained sanitary facilities.

.4 Garbage must be collected and removed daily from the worksite to keep the site sanitary and to prevent unwanted interactions with Park fauna (e.g. bears). All material must be removed, transported and disposed of in accordance with existing provincial-municipal and Park solid waste disposal guidelines, project waste management plan and/or regulations.

.5 Temporary storage parking areas and turn-a-round facilities for contractor-related equipment and vehicles will be limited to those areas agreed to and designated by the Departmental Representative.

.6 To reduce potential negative impacts on Park fauna, noise control measures, such as properly functioning mufflers on equipment, must be in place.

.7 Littering is prohibited.

.8 Water extraction from within the Park boundaries is strictly forbidden, unless otherwise approved by the Departmental Representative. Water extraction may be permitted following detailed proposal submitted by the Contractor and subject to approval by Departmental Representative.

1.11 DISPOSAL OF WASTES

.1 Do not bury rubbish and waste material on site. Remove all garbage from site daily.

.2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.

1.12 WORK ADJACENT TO WATERWAYS

.1 Any required instream work must be completed between June 1 and September 30.

.2 Do not operate construction equipment in waterways.

.3 All work is to be done in the dry. Environmental controls required to separate the work from the waterway is the responsibility of the Contractor.

.4 All work is to be carried out with siltation control which separates the work area from the watercourse. The method of siltation control shall be provided as part of the Erosion and Sediment Control Plan.

.5 No fresh concrete, lime, cement, or other construction materials or debris is to enter the watercourse.

.6 All heavy equipment to be used on the project site is to be cleaned of mud, soil or debris prior to being brought to the site, in good working order, without leaks of fuel, oil, grease or lubricants.

.7 The movements of fish through the project site will be unimpeded at all times.

.8 Contractor is to have a copy of the environmental assessment and all applicable permits at the project site at all times.

.9 Do not use waterway beds for borrow of material.

.10 Do not clean or drain equipment in waterways.

.11 Blasting is prohibited within the Park boundaries unless approved by the Departmental Representative. Blasting outside Park boundaries shall be in accordance with the project EPP and requires approval from the Department of Fisheries and Oceans, and shall be in accordance with the "Guidelines for Use of Explosives in Canadian Fisheries Waters" (DFO, April 1993).

.12 Temporary diversion ditches approved by the Departmental Representative are to be plastic lined.

.13 Temporary storage sites for debris and soil generated from clearing operations should be deposited away from watercourses, should be surrounded by a natural vegetative buffer, should be screened from the road and should be selected by the Departmental Representative.

.14 All temporary structures, piles, falseworks and debris are to be completely removed from the waterway.

.15 Dredged material is not to re-enter the waterway.

.16 Design and construct temporary crossings to minimize erosion to waterways.

.17 Do not skid logs or construction materials across waterways.

1.13 POLLUTION CONTROL

.1 Maintain temporary erosion and pollution control features installed under this Contract.

.2 Control emissions from equipment and plant in accordance with local authorities' emission requirements.

.3 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area:

.1 Provide temporary enclosures where directed by the Departmental Representative.

.4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

1.14 EARTH MOVEMENT

.1 Clearing and grubbing of project site is to be kept to a minimum.

.2 Where engineering requirements can be met, excavated materials from this project must be used for backfilling.

.3 There are no borrow areas available in the Park.

.4 All surplus excavated material must be removed from the Park as soon as possible and disposed of at an approved location and in an approved manner.

.5 Any proposed sources of borrow material shall be approved by the Departmental Representative prior to start-up.

.6 When vegetation must be removed, then the extent and duration of exposure should be kept to a minimum. Plan the phases of development so that only areas which are actively being developed are exposed.

.7 Topsoil from excavated sections shall be stockpiled for subsequent application to the work area requiring revegetation. Steep slopes on stockpiles should be avoided in order to prevent erosion.

.8 Sediment traps, basins, or ponds, whether temporary or permanent, shall be installed before construction begins on the rest of the site.

.9 Dust control measures may be necessary. The use of chemical dust control agents must be pre-approved by the Departmental Representative.

.10 Where there is potential for severe erosion and/or downstream siltation the Contractor shall cover excavations during major precipitation events as directed by Departmental Representative.

1.15 EROSION AND SEDIMENT CONTROL

.1 Appropriate preventative controls shall be in place at all times during construction to prevent undue erosion and sedimentation. As part of the Environmental Protection Plan, the Contractor is required to provide to the Departmental Representative within 5 working days after Contract award an Erosion and Sedimentation Control Plan. Such a plan shall incorporate necessary silt fences, silt / sediment traps, plastic lined trenches and ditches, temporary culverts or diversions as approved by the Departmental Representative

.2 Exposed soils should be immediately stabilized against erosion using suitable materials. All environmental controls must be monitored on a daily basis and following precipitation events. Any required maintenance or must be done immediately.

1.16 HAZARDOUS MATERIALS

.1 As part of the Environmental Protection Plan, the Contractor must submit a Fuel and Hazardous Materials Management and Spill Contingency Plan.

.2 The management of fuels, lubricants and chemicals must meet with the requirements of the Nova Scotia Dangerous Goods and Hazardous Waste Management Criteria and all other appropriate provincial and federal regulations to include but not be limited to the following:

.1 Temporary fuel storage sites are to be located a minimum 100 m from any watercourse.

.2 Fuel storage containers must be accompanied by impermeable structures that would provide containment of 110% of the container capacity in the event of a leak or spill.

.3 Fueling and lubricating of equipment cannot be done closer than 100 m to any

.4 watercourse.

.5 All refuelling and lubricating operations should employ protection measures such as drip pans, to reduce the potential for escape of petroleum products to the environment.

.3 No material toxic to fish or any aquatic life shall be permitted to enter any stream, river, or lake. This shall include, but not be limited to lubricants, fuels, testing fluids, insecticides, detergents, herbicides, cement, lime or concrete.

.4 The Departmental Representative and the Park Warden must be immediately contacted after a spill of more than 10 L of fuel or lubricant, and after any amount of other chemical products has escaped. All stained soil resulting from the Contractor's use of chemicals and fuel is to be cleaned up and disposed of at an approved disposal site.

.5 Storage of large amounts of fuel (more than 900 L) in the Park is not permitted. Refuelling of on-line equipment from storage facilities located outside Park boundaries is strongly preferred. Storage of any fuel has to occur only in previously approved locations, and with Park consent. The Contractor is expected to be prepared to effect the containment and cleanup of all spills related to the Work.

.6 Storage of hazardous material, including explosives, shall not be permitted within the Park, except for quantities which shall normally be expected to be utilized in a day of Work, and which are not permitted to stockpile.

.7 Emulsion storage tanker and transfer of emulsion from tanker to spray vehicle are not permitted within the National Park.

.8 Equipment maintenance is not permitted within the Park boundaries.

1.17 TREATED WOOD

.1 Creosote is not approved for use in Parks.

.2 Workers should be made aware of the possible health risks associated with exposure to CCA or creosote treated timber as well as the recommended safe practices for handling such materials.

.3 Disposal of treated wood wastes including saw-dust must be outside of the Park, and in accordance with all applicable Provincial and Municipal regulations. Similar attention must be given to the disposal of any replaced guiderail posts which have been treated with creosote.

1.18 SITE DECOMMISSIONING

.1 Unless prior permission from the Departmental Representative is obtained, all contractor equipment, facilities and materials must be removed from the Park at the finish of each work phase, or if work is suspended due to weather or other circumstance, upon the suspension of work activities.

.2 All work sites must be returned to a neat and tidy condition upon site abandonment.

1.19 HISTORICAL/ARCHAEOLOGICAL CONTROL

.1 Provide historical, archaeological, and cultural resources plan that defines procedures for identifying and protecting historical, archaeological, and cultural resources: and identifies procedures to be followed if historical archaeological, and cultural resources not previously known to be onsite or in area are discovered during construction.

.2 Plan: include methods to assure protection of known or discovered resources and identify lines of communication between Contractor personnel and Departmental Representative.

.3 Relics and antiquities and items of historical or scientific interest such as cornerstones and contents, commemorative plaques, inscribed tablets, and similar objects found on site or in structures demolished, shall remain property of Canada. Protect such articles and request direction from Departmental Representative.

.4 Give immediate notice to Departmental Representative if evidence of archaeological finds are encountered during construction and await written instructions before proceeding with work in the area.

1.20 NOTIFICATION

.1 The Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.

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

.1 Take action only after receipt of written approval by the Departmental Representative.

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

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

1.21 ENVIRONMENTAL PROTECTION PLAN

.1 Submit a plan showing all pollution control measures that will be used to fulfill the requirements of the Environmental Protection Section. This plan will be reviewed by the Departmental Representative and the Environmental Protection Officer prior to commencement of any work. Any deviation from this plan will require further approval by the Departmental Representative. Submit the protection plan within 5 working days after Contract award.

.2 The Environmental Plan will outline how the Contractor will address the environmental protection requirements, and ensure pollution created by the construction is controlled. It must show sufficient detail on products to be used and physical placement on site to determine effectiveness of these items.

1.22 ENVIRONMENTAL PERFORMANCE

.1 Follow the Canadian Environmental Protection Act / Canadian Impact Assessment Act.

.2 Confirm all necessary permits related to Environmental Protection have been obtained and that necessary documentation is available on-site.

1.23 ENVIRONMENTAL INCIDENT OR EMERGENCY

.1 In the event of an environmental incident or emergency such as:

.1 Chemical spill or petroleum spill.
.2 Poisonous or caustic gas emission.
.3 Hazardous material spill.
.4 Sewage spill.
.5 Contaminated water into waterways.

.2 The Contractor or his employees must:

.1 Notify the Contractor’s job superintendent.
.2 Call the local emergency services and give type of emergency.
.3 Submit to Departmental Representative a copy of its Environmental/Spill Response Plan for approval.

1.24 NON-COMPLIANCE OF REQUIREMENTS

.1 The failure to adhere to the environmental protection measures of the specifications, and following the issuance of an environmental non-compliance notice, the Contractor is subject to a permanent retention of sums applicable as a fine for each infraction factually noted by the Departmental Representative or one of their agents. The fine sum per infraction is based on the total construction contract value as stated below:

.1 Total contract value < $1 M = $1,000
.2 Total contract value > $1M < $3M = $2,000
.3 Total contract value > $3M < $5M = $3,000
.4 Total contract value > $5M = $5,000

.2 Any infraction that is not corrected by the following day shall be subject to an additional permanent retention in the sum of the same amount. Each following day shall be subject

to the same until the infraction is corrected. Additionally, any expense related to the damage caused to the environment shall be at the cost of the Contractor, notably any analysis, report, works required to manage restoration of fauna and wildlife and indemnities.

.3 In the case of non-execution by the Contractor of repairs or damage, the Owner/Applicable Public Authority shall proceed with corrective works and will charge the Contractor the cost of such works and delays as permanent retention of sums.

.4 Protection of the environment: Prevention/control of pollution and disturbances to the environment and surrounding habitat during construction.

.5 In the case of work done for the Federal Government; sections of Division 1 have priority over the technical sections of other divisions of project specifications. The Contractor shall at all times respect the National Parks Act and Regulations Reference Standards.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 CLEANING

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

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

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 – Submittal Procedures.

1.2 INSPECTION

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

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

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

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

1.3 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies will be engaged by the Departmental Representative for purpose of inspecting and/or testing portions of Work with the cost of such services borne by Departmental Representative.

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

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

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

1.4 ACCESS TO WORK

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

.2 Co-operate to provide reasonable facilities for such access.

1.5 PROCEDURES

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

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

.3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.6 REJECTED WORK

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

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

1.7 REPORTS

.1 Provide copies to Subcontractor of work being inspected or tested, and manufacturer or fabricator of material being inspected or tested.

1.8 TESTS AND MIX DESIGNS

.1 Furnish test results and mix designs as requested.

.2 Cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work will be appraised by the Departmental Representative and may be authorized as recoverable.

1.9 MOCK-UPS

.1 Prepare mock-ups for Work specifically requested in specifications. Construct in locations acceptable to the Departmental Representative as specified in specific section.

.2 Prepare mock-ups for the Departmental Representative's review with reasonable promptness and in orderly sequence, to not cause delays in Work.

.3 Failure to prepare mock-ups 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.

.4 Specification section identifies whether mock-up may remain as part of Work or if it is to be removed and when.

1.10 Mill Tests

.1 Submit mill test certificates as requested by Departmental Representative.

1.11 MEASUREMENT PROCEDURES

.1 The work for this section will not be measured for payment, but will be incidental to the 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 MEASUREMENT FOR PAYMENT

.1 The work for this section will not be measured for payment, but will be incidental to the work.

1.2 INSTALLATION AND REMOVAL

.1 Provide temporary utilities controls in order to execute work expeditiously.

.2 Remove from site all such work after use or as directed by Departmental Representative.

1.3 DEWATERING

.1 Provide temporary drainage to keep excavations and site free from standing water.

.2 Ensure discharge is not contaminated with sediment, oil, etc.

1.4 TEMPORARY POWER AND LIGHT

.1 Departmental Representative will not provide and pay for temporary power during construction for temporary lighting and operating power tools.

.2 Arrange for connection with approval utility company. Pay all costs for installation, maintenance, and removal.

.3 Temporary power for electric cranes and other equipment requiring in excess of above is the responsibility of the Contractor.

.4 Provide and maintain temporary lighting throughout the project.

.5 Coordinate with all Parks Canada Staff.

.6 Install temporary facilities for power to approval of local power supply authorities.

1.5 FIRE PROTECTION

.1 Provide and maintain temporary fire protection equipment during performance of Work required by insurance companies having jurisdiction and governing codes, regulations and bylaws.

.2 Burning rubbish and construction waste materials is not permitted on site.

1.6 SANITARY FACILITIES

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

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

.3 All surface modifications are restricted to the identified corridors. Accurate delineation of these corridors by field survey is required prior to commencement of construction.

1.7 STORAGE SHEDS

.1 Provide adequate weather-tight sheds with raised floors, for storage of materials, tools and equipment which are subject to damage by weather.

1.8 ACCESS

.1 Provide and maintain adequate access to project site.

.2 Build and maintain temporary roads where indicated and provide snow removal during period of work.

.3 If authorized to use existing roads for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractors' use of roads.

.4 All surface modifications are restricted to the identified construction corridors. Accurate delineation of these corridors by field survey prior to commencement of construction is required.

.5 All vehicle traffic is restricted to existing roadways or as indicated in project plans. A field visit will be scheduled with the Contractor for locational confirmation and all areas of proposed construction will be marked in the field with orange flagging tape prior to commencement of 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 RELATED SECTIONS

.1 Section 01 25 20 – Mobilization and Demobilization.

1.2 MEASUREMENT FOR PAYMENT

.1 See Section 01 29 00 – Payment Procedures.

1.3 ACCESS

.1 Provide and maintain adequate access to project site.

.2 Parks Canada must approve any proposed temporary roads within the Park.

.3 Maintain temporary roads during the work. Upon completion of contract work, rehabilitate any temporary roads to the satisfaction of the Departmental Representative.

.3 If authorized to use existing roads for access to project site, maintain such roads for the duration of the Contract and repair damage resulting from Contractors' use of roads.

.4 Clean roads and parking areas where used by Contractor's equipment or employees' vehicles.

1.4 SANITARY FACILITIES

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

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

1.5 SITE SIGNS & NOTICES

.1 Safety and Instruction Signs and Notices:

.1 Signs and notices for safety and instruction shall be in both official languages. Graphic symbols shall conform to CAN3-Z321.

.2 Maintenance and Disposal of Site Signs:

.1 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 the Departmental Representative.

1.6 SITE OFFICE

.1 Contractor to provide Departmental Representative’s office trailer/space.

.2 The office space shall be fully functional and operational prior to the start of Work.

1.7 PARKING

.1 Parking space for work force will be limited to the construction limits for each area under construction.

1.8 CONTRACTOR'S CAMP

.1 The Contractor will not be permitted to set up a camp within Cape Breton Highlands National Park.

Part 2 Materials – Not Used

Part 3 Execution – Not Used

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 35 31 – Special Procedures for Traffic Control.

1.2 MEASUREMENT PROCEDURES

.1 The provision and maintenance of temporary barriers and enclosures is considered incidental to the contract and will not be measured for payment.

1.3 INSTALLATION AND REMOVAL

.1 Provide temporary controls in order to execute Work safely and according to schedule.

.2 Remove from site all such work after use.

.3 Additional requirements for specialized temporary barriers for traffic control, protection against rockfall hazards, etc. are as noted in their respective specification sections.

1.4 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

.1 Protect surrounding private and public property from damage during performance of Work.

.2 Be responsible for damage incurred.

Part 2 Products – Not Used

Part 3 Execution – Not Used

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

.1 Within text of each specifications section, reference may be made to reference standards.

.2 Conform to these reference standards, in whole or in part as specifically requested in specifications.

.3 If there is question as to whether any product or system is in conformance with applicable standards, Departmental Representative reserves right to have such products or systems tested to prove or disprove conformance.

.4 Cost for such testing will be borne by Contractor in event of non-conformance.

1.2 MEASUREMENT FOR PAYMENT

.1 The work for this section will not be measured for payment, but will be incidental to the work.

1.3 QUALITY

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

.2 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.

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

.4 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout the project.

1.4 AVAILABILITY

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

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

1.5 STORAGE, HANDLING, AND PROTECTION

.1 Handle and store products in manner to prevent damage, adulteration, deterioration, and soiling and in accordance with manufacturer's instructions when applicable.

.2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.

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

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

.5 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.6 TRANSPORTATION

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

1.7 MANUFACTURER'S INSTRUCTIONS

.1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.

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

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

1.8 QUALITY OF WORK

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

.2 Do not employ anyone unskilled in their required duties. Departmental Representative reserves right to require dismissal from site, workers deemed incompetent or careless.

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

1.9 CO-ORDINATION

.1 Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.

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

1.10 REMEDIAL WORK

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

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

1.11 EXISTING UTILITIES

.1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, and/or pedestrian and vehicular traffic.

.2 Protect, relocate, or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

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 RELATED SECTION

.1 Section 01 35 43 – Environmental Procedures.

.2 Section 01 77 00 – Closeout Procedures.

1.2 MEASUREMENT FOR PAYMENT

.1 The work for this section will not be measured for payment, but will be incidental to the work.

1.3 PROJECT CLEANLINESS

.1 Maintain Work area in tidy condition, free from accumulation of waste materials and debris, including waste caused by PCA, the public, or Sub-Contractors.

.2 Remove waste materials and debris from site and dispose off site at approved facilities in accordance with applicable regulations or as directed by Department Representative.

.3 Do not burn waste materials on site.

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

.5 Provide on-site containers for collection of waste materials and debris.

.6 Provide and use clearly marked separate bins for recycling materials.

.7 Remove waste material and debris from site and deposit in waste container at end of each working day.

.8 Store volatile waste in covered metal containers and remove from site at end of each working day.

.9 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

.10 The Departmental Representative or the PCA Environmental Protection Officer may, at their total discretion, require the Contractor to suspend work activities until such a time as the Work Site is cleaned and debris, waste, and animal attractants are satisfactorily managed. The Contractor shall do as requested at their cost and no claim for time or additional costs will be accepted.

1.4 FINAL CLEANING

.1 When the Work is Substantially Performed and prior to final review, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

.2 Remove waste materials and debris including that caused by PCA, the public, and Sub-Contractors and leave Work area clean and suitable for occupancy.

.3 Sweep and wash clean paved areas.

.4 Clean drainage systems.

Part 2 Products – Not Used

Part 3 Execution – Not Used

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 29 01 – Site Occupancy.

1.2 MEASUREMENT FOR PAYMENT

.1 The work for this section will not be measured for payment, but will be incidental to the work.

1.3 INSPECTION AND DECLARATION

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

.2 Departmental Representative Inspection: Departmental Representative and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor shall correct Work accordingly.

.3 Each slope will be inspected separately upon completion of all the work specified on the project drawings.

.4 Completion: submit written certificate that following have been performed:

- .1 Work has been completed and inspected for compliance with Contract Documents.
- .2 Defects have been corrected and deficiencies have been completed.
- .3 Equipment and systems have been tested, adjusted and are fully operational.
- .4 Operations of systems have been demonstrated to Departmental personnel.
- .5 Work is complete and ready for Final Inspection.

.5 Final Inspection: when items noted above are completed, request final inspection of work by Departmental Representative, and Contractor. If Work is deemed incomplete by Departmental Representative, complete outstanding items and request re-inspection.

.6 Declaration of Substantial Performance: when Departmental Representative considers deficiencies and defects have been corrected and it appears requirements of Contract have been substantially performed, make application for certificate of Substantial Performance.

.7 Commencement of Lien and Warranty Periods: date of Departmental acceptance of submitted declaration of Substantial Performance shall be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.

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

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures.

.2 Section 01 77 00 – Closeout Procedures.

1.2 MEASUREMENT FOR PAYMENT

.1 The work for this section will not be measured for payment, but will be incidental to the work.

1.3 FORMAT

.1 Organize data as instructional manual.

.2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.

.3 When multiple binders are used correlate data into related consistent groupings.

.1 Identify contents of each binder on spine.

.4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.

.5 Arrange content by systems under Section numbers and sequence of Table of Contents.

.6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.

.7 Text: manufacturer's printed data, or typewritten data.

.8 Drawings: provide with reinforced punched binder tab.

.1 Bind in with text; fold larger drawings to size of text pages.

.9 Provide 1:1 scaled CAD files in dwg format on CD.

1.4 AS-BUILT DOCUMENTS AND SAMPLES

.1 Maintain, in addition to requirements in General Conditions, at site for the Departmental Representative one record copy of:

.1 Contract Drawings.

.2 Specifications.

.3 Addenda.

.4 Change Orders and other modifications to Contract.

.5 Reviewed shop drawings, product data, and samples.

.6 Field test records.

.7 Inspection certificates.

.8 Manufacturer's certificates.

.2 Store record documents and samples in field office apart from documents used for construction.

.1 Provide files, racks, and secure storage.

.3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual.

.1 Label each document "PROJECT RECORD" in neat, large, printed letters.

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

.1 Do not use record documents for construction purposes.

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

1.5 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

.1 Record information on set of black line opaque drawings, and in copy of Project Manual, provided by the Departmental Representative.

.2 Record information concurrently with construction progress.

.1 Do not conceal Work until required information is recorded.

.3 Contract Drawings and shop drawings: mark each item to record actual construction, including:

.1 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

.2 Field changes of dimension and detail.

.3 Changes made by change orders.

.4 Details not on original Contract Drawings.

.5 References to related shop drawings and modifications.

.4 Specifications: mark each item to record actual construction, including:

.1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.

.2 Changes made by Addenda and change orders.

.5 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

.6 Provide digital photos, if requested, for site records.

1.6 FINAL SURVEY

.1 Where final surveys are required as noted in the Specification sections (ditch after excavation is complete, damaged or relocated existing services), submit in a format acceptable to the Departmental Representative.

1.7 WARRANTIES AND BONDS

.1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.

.2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

.3 Obtain warranties and bonds, executed in manufacturers, within ten days after completion of the applicable item of work.

.4 Except for items put into use with Departmental permission, leave date of beginning of time of warranty until the Date of Substantial Performance is determined.

.5 Verify that documents are in proper form, contain full information, and are notarized.

.6 Co-execute submittals when required.

.7 Retain warranties and bonds until time specified for submittal.

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 RELATED SECTIONS

.1 Section 01 35 31 – Special Procedures for Traffic Control.

.2 Section 31 23 20 – Scaling.

1.2 DEFINITIONS

.1 Excavation of rock slope debris consists of excavation, hauling, and disposal of scaling debris materials (including rock, soil, vegetation) and pre-existing debris from the highway ditches or as directed by the Departmental Representative.

1.3 MEASUREMENT PROCEDURES

.1 See Section 01 29 00 – Payment Procedures.

1.4 SUBMITTALS

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

.2 Prior to initiation of the work, the Contractor must advise the Departmental Representative in writing, or otherwise agreed, of how the Contractor intends to complete common excavation operations, including:

- .1 Excavation procedures and proposed equipment.
- .2 Protection measures for any existing infrastructure, the ditch and road surfaces.
- .3 Disposal of material, including completed PCA Material Disposal Site Release Form (if applicable).

.3 Provide haul tickets for each load prior to taking each load off site and daily total material quantities excavated at each site to the Departmental Representative for verification.

Part 2 Products

2.1 MATERIALS

.1 Not used.

Part 3 Execution

3.1 EXCAVATION

.1 Excavation activities shall be carried out only under the full-time inspection of the Departmental Representative.

.2 Where excavation activities may impact upon any existing infrastructure, the contractor shall provide protective measures. The Contractor shall be completely responsible for all damage that is a result of its operations.

.3 To verify reinstatement of catchment ditches, a survey shall be completed prior to the start of work and after the completion of excavation activities. As a minimum, the survey shall include the collection of sections at 5 m stations (edge of asphalt, top of foreslope, toe of foreslope, toe of backslope) and relevant features (check dams, culverts, etc.). This surveying is considered incidental to the work.

.4 Excavation areas shall be cleaned and restored to a condition equal or better than before excavation.

.5 After excavation is complete, the highway ditch shall be reinstated to the pre-construction conditions, or other lines, limits, and grades as directed by the Departmental Representative to allow functionality as catchment and drainage area, which includes sloped side and bottoms to allow rockfall retainment and prevent the ponding of water.

.6 Where disturbed, the highway shoulders shall be reinstated to match existing dimensions and compaction.

.7 Existing catch basins and culvert inlets shall be cleaned of scaling and other debris from the work and restored to match or exceed pre-construction conditions. Damage to culverts or catch basins caused by the Contractor shall be repaired. If catch basin or culvert is damaged beyond repair, a full replacement is required.

.8 Existing ditch check dams are to be protected, or re-instated post-construction.

.9 Clean in accordance with Section 01 74 11 – Cleaning

.10 Dispose of material off site unless otherwise indicated by the Drawings, or unless permitted otherwise by the Departmental Representative in writing.

.11 The Contractor shall find a suitable place for the disposal of all excavated material off site. The Contractor and the recipient of the material shall provide PCA with a signed copy of the Material Disposal Site Release Form (Appendix C).

END OF SECTION

Part 1 General

1.1 Description

.1 This section outlines the requirements for rock scaling operations.

.2 Rock scaling shall be carried out in all areas as indicated on the Drawings as directed by the Departmental Representative within the project limits. Certain areas of the slope may be designated by the Departmental Representative as special areas where scaling is restricted.

.3 Scaling shall be manual scaling by rope or boomlift. No mechanical scaling is allowed without prior review and approval by the Departmental Representative.

.4 Blasting is not permitted.

1.2 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures.

.2 Section 01 35 29.06 – Health and Safety Requirements

.3 Section 01 35 31 – Special Procedures for Traffic Control.

.4 Section 31 33 13 – Rock Anchors.

.5 Section 31 23 22 – Excavation of Rock Slope Debris.

1.3 DEFINITIONS

.1 Scaling: Consists of the removal of loose and unstable soil, rock, overburden, and vegetation by methods approved by the Departmental Representative from the slope face, and up to 5 m behind the crest of the slope. Scaling also includes felling and removal of trees and brush. Scaling may also include visual examinations of the face at height and manual probing / "check scaling" to identify loose or unstable areas when directed by the Departmental Representative.

.2 Scaling Crew: Experienced scaling crew consists of a scaling supervisor and a minimum of two rock scalers.

.3 Manual Scaling: Removal of loose soil, rock, trees and bushes using hand-held scaling tools and/or powered equipment. Manual scaling shall be carried out using rope access techniques or a work positioning system (i.e. boom lift or telescopic crane) beneath overhanging areas that are not easily accessible using rope access techniques. Scaling from a boom lift or telescopic crane shall be done by a single scaler.

.4 Mechanical Scaling: Removal of loose soil, rock, trees and bushes using mechanical equipment, such as hydraulic hammers, backhoes or long-reach excavators with toothed bucket or with attached scaling chains.

1.4 MEASUREMENT PROCEDURES

.1 See Section 01 29 00 – Payment Procedures.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Prior to initiation of the work, the Contractor must advise the Departmental Representative in writing, or otherwise agreed, of how the Contractor intends to complete the scaling operations, including:

.1 Rock scaling procedures and proposed equipment.

.2 Statement of Qualifications of work crews - Experience and duties of all personnel assigned to scaling activities and a summary of previous project experience including the project name, location, duration, and the owner/client name and contact information.

1.6 REQUIREMENTS

.1 The Contractor shall provide an experienced scaling crew that consists of a scaling supervisor with at least three years' experience and a minimum of two rock scalers each with at least two years' experience in scaling on slopes similar to the project site conditions, within the last five years. The scaling crew size shall be maintained at all times until the completion of all work.

.2 It has been assumed that scaling crews will be working from ropes at heights and all crew members must be trained rope access technicians. Each scaler working from ropes at heights must have a minimum of Level 1 Industrial Rope Access Trade Association (IRATA) training or approved equivalent. The scaling supervisor must have Level 3 IRATA training or approved equivalent and must be on site and available for supervision and guidance of the scaling crew at all times.

.3 All work carried out by rope access shall be in accordance with the IRATA requirements and guidelines.

.4 Where scaling activities may impact existing infrastructure (buried utilities, asphalt and shoulder surface, barriers, signs, culverts, etc.), the Contractor shall provide protective measures as detailed in the Contractor's Work Plan/Procedure, prior to commencing scaling. Protective measures shall include but not be limited to; padding material placed on the roadway, blasting mats, temporary rock berms or barriers, and temporary removal of signs, guardrails, and similar infrastructure. The Contractor shall be responsible for all damage that is a result of the scaling operations.

.5 Blasting mats must be placed over the roadway and catchment ditches in areas of active scaling to provide protection of the road surfaces and telecommunications or other services buried within the area.

.6 The Contractor shall have handheld tools and equipment available on site such that scaling can be carried out using the most appropriate and effective tools and methods for any given situation (such as scaling bars, mattocks, shovels, hydraulic jacks or wedge jacks, air bags, chainsaws, compressed air "blow pipes").

.7 The scaling crew shall be equipped with 2-way radios to ensure that communication between the supervisor and the scaling personnel working on the slope be maintained at all times to permit direct and immediate control and for communication with supervisory/traffic control personnel at the highway grade.

.8 Mechanical scaling shall not be permitted on these rock slopes to avoid over excavation.

.9 Any mobile equipment used for scaling shall have adequate reach and load capacities required at each site.

.10 All mobile equipment operators shall be equipped with two-way radios.

.11 The scaler working off the mobile equipment shall have at least two years' experience in scaling from mobile equipment under conditions similar to the project site conditions, within the last five years.

.12 The Contractor may suggest alternative methods of scaling to those described in this specification. Any alternate method of scaling must be approved by the Departmental Representative.

Part 2 Products – Not Used

Part 3 Execution

3.1 SCALING

.1 Rock slope scaling and debris removal shall include the areas of the site identified on the project drawings or on site by the Departmental Representative.

.2 Thoroughly scale the rock slope to remove all loose soil, rock, and overburden from the slope face and up to 5 m behind the crest of the slope, where conditions require scaling.

.3 All scaling operations must be completed from the top and proceeding downwards to ensure that at no time the scaling crew works beneath loosened, unstable or undercut sections of the slope.

.4 The Contractor must assess the appropriateness of the methods to safely and effectively carry out the scaling and removal operations.

.5 On slopes that require both scaling and anchoring, complete the scaling operation in the area of the rock anchor prior to rock anchor installation unless otherwise directed by the Departmental Representative..

.6 All scaling and removal operations are to be conducted under full time monitoring and inspection of the Departmental Representative and completed to the satisfaction of the Departmental Representative. The extent of scaling and removal in all areas and the suitability of equipment being used will require the approval of the Departmental Representative.

.7 Provide an allowance for the Departmental Representative to inspect the slope and scaling work by boom lift. Facilitation of slope inspection by the Departmental Representative is incidental to rock scaling.

.8 Scaled material is considered waste material. Disposal and cleanup of materials from rock scaling and excavation of existing fallen materials in ditches in the work areas is covered separately under the Excavation of Rock Slope Debris bid item.

.9 Notify Departmental Representative two days prior to completion of scaling operations for inspection of scaled work surface. The Departmental Representative may request the Contractor to do additional scaling, if deemed necessary by the Departmental Representative.

3.2 PROTECTION

.1 The Contractor shall be responsible for public safety and protection of existing infrastructure during scaling operations.

.2 Prevent damage to surroundings and injury to persons in accordance with Section 01 35 29.06 – Health and Safety Requirements, Section 01 35 00.06 – Special Procedures for Traffic Control and Section 01 56 00 - Temporary Barriers. Comply with all safety requirements during the scaling operation.

.3 Protection of infrastructure shall be considered incidental to scaling and all other unit price work items.

.4 Any infrastructure damaged by scaling operations must be repaired or replaced to the satisfaction of the Departmental Representative, at the Contractor's cost.

.5 One lane of traffic must remain open all times. Temporary protection measures shall be in place to protect traffic on the open roadway from falling rock and debris. The Contractor shall submit his proposed protection measures to the Departmental Representative for review and approval. If required, complete road closures shall be in place temporarily for the removal of rock to ensure the safety of the public. Road closures are subject to approval by the Departmental Representative.

END OF SECTION

Part 1 General

1.1 DESCRIPTION

.1 This section outlines the requirements for the provision and installation of rock anchors.

.2 Rock anchors shall consist of the installation of deformed steel bars (tendons) in holes drilled into rock which are fully grouted, and either tensioned (separate bond zone and free length) or un-tensioned as directed by the Departmental Representative.

.3 The requirement for tensioned or un-tensioned anchors will be determined by the Departmental Representative in the field.

.4 Tensioned anchors shall be two-stage grouted with the free length of the anchor fully grouted after tensioning and lock-off (no bond breaker). Bond lengths are as shown on the Contract Drawings. Tensioning loads for each rock anchor will be determined in the field by the Engineer but will not exceed the maximum loads shown on the Contract Drawings.

.5 Un-tensioned anchors can be installed with either an exposed plate and nut, or installed 'camouflaged' as directed by the Departmental Representative in the field. Un-tensioned 'camouflaged' anchors are installed with the bar cut flush to the face and covered with a drill dust-based mortar. Design pull-out loads are shown on the Contract Drawings.

.6 Rock anchors shall be installed in areas as shown on the Contract Drawings and/or as identified in the field by the Departmental Representative within the project limits. The required number, location and orientation of the rock anchors will be determined by the Departmental Representative following scaling, and will depend on the conditions encountered during scaling.

.7 Allowances for each area in the project limits are estimates only. The total project allowance for rock anchors shall be transferable between all areas of the project limits.

1.2 RELATED SECTIONS

.1 Section 01 11 00 – Summary of Work.

.2 Section 01 33 00 – Submittal Procedures.

.3 Section 31 23 20 – Rock Scaling.

1.3 REFERENCES

.1 Recommendations for Prestressed Rock and Soil Anchors, Post-Tensioning Institute (PTI), 2014.

.1 ASTM A 123 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.2 ASTM A153 Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

.3 ASTM A722 Standard Specification for High-Strength Steel Bars for Prestressed Concrete.

1.4 MEASUREMENT PROCEDURES

.1 See Section 01 29 00 – Payment Procedures.

1.5 SUBMITTALS

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

.2 Rock Anchor Installation Plan:

.1 Prior to ordering rock anchor materials, the Contractor shall submit a Rock Anchor Installation Procedure for review by the Departmental Representative.

.2 The Installation Plan shall include:

.1 Product Data from the anchor hardware, grout, and other applicable manufacturers (printed product literature and data sheets including recommended installation procedures, product characteristics, performance criteria, physical size, finish and limitations, mill and galvanizing certificates).

.2 Installation procedures, including drilling equipment and hole diameter, control and monitoring of angle and alignment, grouting, preparation of rock surface to accept the bearing plate, tensioning/testing and supporting calibration certificate(s).

.3 No product shall be used in the works without prior submittal of sufficient technical information and approval by the Departmental Representative.

.3 Grout batching QA methodology (including one trial batch, if requested) for Departmental Representative approval seven (7) days prior to grouting procedures.

.4 Field Quality Control Submittals:

.1 Maintain field drilling records for each rock anchor, including drill type, date/time, drilling location and hole identification number, drilled diameter, drilled length, inclination, and general drilling conditions such as loss of flush, jamming, inferred weak zones, inferred faults, water ingress, or other relevant information that may affect the quality of the installation.

.2 Maintain anchor installation records, including anchor location and anchor identification number, bar grade/diameter, bar length, coupling, spacers, depth of insertion, stick-up from the face, over-drill depth, rock face preparation, tendon insertion date/time, grouting (type, dates/times of staged grouting, volumes of grout used, length grouted), testing/lock-off date/time.

.3 Provide Departmental Representative with a copy of all field records at the end of each working day.

.5 Provision of the Rock Anchor Installation Plan and all documentation and certificates (calibration for the Contractor's tensioning/testing equipment, mill and galvanizing certificates, etc.) is considered incidental to the work.

Part 2 Products

2.1 Rock Anchors

.1 Anchors tendons shall be ASTM A722 Grade 150 (827/1034 MPa) fully threaded steel bars, with all accessories (caps, centralizers, couplers, bearing plates, wedge washers, nuts, etc.) required to complete the work as detailed on the Contract Drawings and to the manufacturer's specifications.

.2 All anchors shall be provided with Class I, encapsulated tendon, double corrosion protection according to the PTI Recommendations for Prestressed Rock and Soil Anchors.

.3 Anchor end caps shall consist of black fiber reinforced nylon caps or approved equivalent.

.4 Anchor tendon diameters and lengths shall be as specified on the Contract Drawings:

.5 Anchors shall have a 300 mm by 300 mm by 38 mm bearing plate, beveled hardened steel washers (minimum two (2) per anchor) and a hexagonal nut.

.6 Each item of the rock anchor system shall be Hot-Dip Galvanized conforming to ASTM A123 or ASTM A153 wherever applicable.

.7 Field cut steel bars shall be touched up with zinc-rich paint or alternate approved by the Engineer.

.8 Each item of the rock anchor system shall be able to develop 100% of the bars published ultimate strength.

.9 To keep the bar centered in the hole, use commercially manufactured centralizers at intervals not greater than 3 meters, with a minimum of one centralizer per rock anchor. Ensure centralizers do not interfere with tremie tube and are sized appropriately for bar diameters.

2.2 Grout

.1 Rock anchor installations will utilize non-expansive, non-shrink cementitious grout. Grout shall have a minimum compressive strength of 35 MPa at three (3) days and 50 MPa at twenty-eight (28) days when tested in accordance with CSA A23.2-1B.

.2 Water for use in grout mixes shall be clean and free of deleterious substances.

2.3 Grout Socks

.1 Contractor shall submit grout sock information and reasonable justification for their use for approval by the Engineer prior to use. The Contractor may be required to include the completion field test(s) to confirm the grout to ground bond strength at no additional cost to PCA.

.2 Grout socks shall be made from a woven synthetic fabric resistant to tears and handling damage. The geotextile apparent opening size shall be such that they will allow water to filter out of the grout but prevent significant amounts of cement particles to pass.

.3 Grout socks shall be appropriately sized for the bar and drill hole, with the diameter of the sock sufficient to expand at least 50 mm beyond the drill hole in the uninstalled condition.

2.4 Mortar Pads

.1 Mortar levelling pads, where necessary to create a level bearing surface, shall consist of an approved structural repair mortar.

2.5 Discrepancies

.1 Discrepancies between the manufacturer's specifications and those presented within this specification shall be reported immediately upon discovery to the Departmental Representative for review and approval prior to proceeding with the work.

Part 3 Execution

3.1 GENERAL

.1 Due to the nature of this project, the Contractor is responsible for site condition assessment regarding ground and rock conditions that are anticipated to be encountered. It is the Contractor's responsibility to assess the site with their experience and/or obtain third party professional advice on the geological conditions.

.2 For a general geological description of the site, see Section 01 11 00. This section does not preclude the responsibility of the Contractor to verify conditions.

.3 Based on the height and geometry of the slopes, it is expected that some of the upper anchors will have to be installed by high angle/at height methods. For the site conditions and constraints, a buggy-style drill using rope access is the preferred method for these anchors. Alternative high angle/at height methods of anchor installation must be reviewed and approved by PCA and the Departmental Representative prior to mobilization with consideration to the impact to Park operations and safety.

.4 Upon completion of the scaling allow forty-eight (48) hours for the Departmental Representative to review the slope condition and finalize anchor locations.

.5 Provide an allowance for the Departmental Representative to assess the slopes by boom lift prior to determining anchor locations. Facilitation of anchor layout by the Departmental Representative is incidental to rock anchor installation.

3.2 INSPECTION OF GROUND CONDITIONS

.1 Visually inspect substrate in presence of Departmental Representative.

.2 Inform Departmental Representative of unacceptable conditions that prevent or adversely affect the anchor installation immediately upon discovery.

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

3.3 INSTALLATION

.1 Anchor hole drilling, anchor installation, grouting, stressing and related activities shall be carried out only under the full-time inspection of the Departmental Representative.

.2 Anchors are to be installed after all scaling operations are complete in the area, unless otherwise approved by the Departmental Representative.

.3 Anchor hole diameters shall meet the minimum specified by the anchor manufacturer and the PTI recommendations.

.4 Contractor is to assume the potential for poor rockmass conditions containing weak rock, voids, sand seams and closely spaced fractures, and take special measures incidental to rock anchor installation to maintain open drill holes, seal holes and prevent anchor grout loss, including: temporary casing to stabilize drill hole sidewalls, the use of grout socks, modification of the grout mixture (admixtures, etc.), and pre-grouting and re-drilling. Special measures require the review and approval of the Departmental Representative.

.5 The completed drill holes shall be cleaned as practical of drill cuttings, debris, grease, oil, or other deleterious materials using clean water and/or air as required. Anchor hole depth and cleanliness shall be approved by Departmental Representative before anchor insertion.

.6 Anchors shall be inserted and fully grouted (untensioned anchors) or primary grouted (tensioned anchors) within forty-eight (48) hours of the hole being drilled. Departmental representative may require re-cleaning of the hole if insertion and grouting is not completed within this period, or if holes otherwise become unclean Any hole re-cleaning required is incidental to anchor installation.

.7 Rock anchors shall be installed with sufficient thread exposed to allow installation of hardware and testing equipment to facilitate testing and subsequent tensioning of the anchors.

.8 Tendons shall not be driven or forced into the hole to cause damage to the tendon/encapsulation. If the tendon cannot be completely inserted, it shall be removed, and the hole be re-cleaned and/or re-drilled to permit insertion.

.9 Clear rock anchor locations from all loose rock and overburden material prior to anchor installation.

.10 Where required, prepare the rock surface at each anchor location to accept the bearing plate for uniform loading during tensioning (cutting, chipping, and/or mortar levelling pad). Each prepared rock surface to be approved by the Departmental Representative prior to tensioning each anchor.

.11 Grout shall be tremied into anchor hole with the bond zone grouted without interruption.

.12 Wash all excess, or spilled cement grout from rock face surfaces.

.13 Grout sampling and testing will be carried out by the Departmental Representative, or a certified testing consultant appointed by PCA. Provide the Departmental Representative with any samples of grouting materials that may be requested for quality assurance testing.

.14 Testing & Tensioning

.1 Tensioned Rock Anchors shall be tested and tensioned after primary grout in the bond zone has cured to at least 30 MPa, but before secondary grouting. Anchors shall be tension tested and locked off in accordance with the PTI recommendations for Proof Testing of rock anchors. Performance load tests as per PTI will be performed on select anchors under the Rock Anchor Performance Testing Unit Price Item, as per Departmental Representative direction. Proof testing is incidental to rock anchor installation. Maximum design loads and lock off loads are as shown on the Drawings.

.2 Un-tensioned Rock Anchors shall be Pull-Out Tested as per the Departmental Representative's direction after grout has cured to at least 30 MPa. Pull-Out Testing shall consist of an abbreviated proof test where the anchor is loaded to 133% of its design pullout load and then maintained for 5 minutes watching for pull-out failure. Test equipment for Pull-Out Testing shall be the same as for Proof Testing and in accordance with PTI recommendations. Pull-Out Testing is incidental to rock anchor installation. Maximum design pull-out loads are as shown on the Drawings.

.3 Un-tensioned rock anchors with nut and plate shall be Pull-Out Tested, then nominally tensioned to 25 kN and locked off.

.4 Un-tensioned rock anchors with a 'camouflaged' head, shall be Pull-Out Tested with a temporary bearing plate and nut, then these shall be removed, the protruding length of the bar cut off and the head covered with a drill dust-based mortar.

3.4 DEFECTIVE ROCK ANCHORS

.1 If rock anchors are deemed to be defective by the Departmental Representative, then the Contractor must remediate or reinstall anchors at own cost with methods approved in writing from Departmental Representative.

3.5 CLEANING

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

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

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

END OF SECTION

Part 1 General

1.1 DESCRIPTION

.1 This section outlines the requirements for the provision and installation of a reinforced concrete buttress to fill in and support an undermined area of a rock slope.

.2 The concrete buttress shall be installed in the area as shown on the Drawings and/or as identified in the field by the Departmental Representative. Shape and dimensions of the buttress as shown in the Contract Drawings are approximate only. All buttress dimensions must be verified in the field and adjusted to actual site conditions.

.3 The project is within a National Park and it is essential that the buttress be constructed to conform, where possible, to the natural slope of the surrounding rock cut. The concrete surface shall be smooth and free of defects, and the mix design shall have pigmentation to reduce colour contrast with the adjacent rock.

1.2 RELATED SECTIONS

.1 Section 01 11 00 – Summary of Work.

.2 Section 01 33 00 – Submittal Procedures

.3 Section 31 23 20 – Rock Scaling.

1.3 REFERENCES

.1 CSA A23.1 Concrete materials and methods of concrete construction

.2 CSA A23.2 Test methods and standard practices for concrete

.3 CSA A23.3 Design of Concrete Structures

.4 CAN/CSA G30.18-M92 - Billet Steel Bars for Concrete Reinforcement

.5 ASTM A615 Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.

.6 ASTM A 123 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.7 ASTM A153 Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

.8 ASTM A36 Standard Specification for Carbon Structural Steel.

.9 Recommendations for Prestressed Rock and Soil Anchors, Post-Tensioning Institute (PTI), 2014.

1.4 MEASUREMENT PROCEDURES

.1 See Section 01 29 00 – Payment Procedures.

1.5 SUBMITTALS

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

.2 Prior to commencing the work, the Contractor shall submit signed and stamped shop drawings for the construction of the concrete buttress for review and approval by the Departmental Representative.

.3 Prior to buttress construction, the Contractor shall submit a Buttress Construction Plan for review by the Departmental Representative. The plan shall include but not be limited to:

.1 Product data from the applicable suppliers / manufacturers of buttress materials (printed product literature and material data sheets, including product characteristics, performance criteria, curing requirements, and limitations, mill certificates, etc.).

.2 Proposed construction methodology and sequence for concrete placement.

.3 Details of all equipment to be used during the concrete placement.

.4 Proposed concrete mix.

.5 Concrete and aggregate test results to verify compliance with performance requirements.

.6 Rebar specifications and bar lists.

.7 Concrete curing and protection procedures.

.8 Proposed rock dowel installation procedures, including drilling equipment and hole diameter, control and monitoring of angle and alignment, grouting, testing and supporting calibration certificate(s).

.4 Field Records:

.1 Maintain field drilling records for each rock dowel, including drill type, date/time, drilling location and hole identification number, drilled diameter, drilled length, inclination, and general drilling conditions such as loss of flush, jamming, voids, zones of weak rock, water ingress, or other relevant information that may affect the quality of the installation.

.2 Maintain rock dowel installation records, including dowel location and identification number, bar grade/diameter, bar length, coupling, spacers, depth of insertion, stick-up from the face, over-drill depth, tendon insertion date/time, grouting (type, dates/times, volumes of grout used).

.3 Provide Departmental Representative with a copy of all field records at the end of each working day.

Part 2 Products

2.1 MATERIALS

.1 REINFORCED CONCRETE:

.1 All concrete and mix designs shall conform to CSA-A23.1 Latest Edition.

.2 Concrete requirements:

.1 Minimum 28-Day Compressive Strength of 35 MPa

.2 Maximum slump of 80 mm +/- 30 mm

.3 5-7% Entrained Air

.4 F2 Exposure Classification

.3 The concrete mix shall be pigmented to reduce visual contrast with the adjacent rock cut. Trial batches will be required for evaluation and approval by PCA prior to construction. The supply of these trial batches shall be incidental to the cost of buttress construction. Allow for a minimum of 3 trial batches.

.4 All concrete additives shall be approved by the Departmental Representative.

.5 All admixtures shall be compatible and shall be subject to review by Departmental Representative. Salts, such as calcium chloride or other chemicals shall not be used under any circumstances.

.2 FORMWORK

.1 All formwork shall be designed by the contractor and shall conform to CSA A23.1 and CAN/CSA S269.3.

.2 The buttress dimensions and shape as shown in the Contract Drawings are approximate only and must be verified in the field. All formwork shall be sufficiently flexible to be adjusted to site conditions and field dimensions of the buttress.

.3 REINFORCEMENT

.1 All reinforcing steel work and placement shall conform to CSA A23.1.

.2 Reinforcement shall conform to CSA G30.18, shall have a minimum yield strength of 400 MPa, and shall be new deformed bars free from loose rust, scale, oil, dirt, defects and shall be unpainted and uncoated.

.3 Provide minimum Class “B” tension lap splices in accordance with Reinforcing Steel Institute of Canada. No more than 50% of reinforcing shall be spliced at any location.

.4 ROCK DOWELS

.1 Rock dowel tendons shall be ASTM A615 Grade 75 (517/690 MPa) fully threaded steel bars with all accessories (centralizers, couplers, bearing plates, washers, nuts, etc.) required to complete the work as detailed on the Contract Drawings and to the manufacturer’s specifications. Steel bar diameters and lengths shall be as specified on the Contract Drawings.

.2 Steel bearing plates (if required) shall conform to CAN/CSA-G40.21, Grade 300W and have minimum dimensions as specified on the Contract Drawings.

.3 Nuts shall be hexagonal head, heavy duty type and shall conform to ASTM A325. Threads and nuts shall be capable of developing the full strength of the tendon.

.4 Rock dowels and all associated hardware (plate, nuts, etc.) shall be Hot-Dip Galvanized conforming to ASTM A123 or ASTM A153, wherever applicable. Field cut steel bars shall be touched up with zinc-rich paint or alternate approved by the Departmental Representative.

.5 Dowels shall be cement grouted. Cementitious grout shall be pre-mixed, non-metallic, non-shrink cementitious grout placed according to the manufacturer’s specifications. All grouting materials must have a minimum 7-day compressive strength of 35 MPa and a 28-day compressive strength of 50 MPa. Calcium chloride shall not be used as an accelerator. It is the responsibility of the

contractor to determine the suitability of the cement grout for the specified application.

.6 Couplers (if used) shall be installed in a manner which will ensure that they be capable of developing the full strength of the tendon.

.7 Commercially manufactured centralizers sized appropriately for the steel bar diameter shall be used to center the dowel in the drill hole.

.8 Water used in grout mixes shall be clean and free of deleterious substances. The water shall be filtered if necessary, to reduce the suspended solids to less than 500 mg/L.

.5 WEEP HOLES:

.1 Weep hole lining shall consist of minimum Schedule 40 PVC pipe in the diameter and colour specified on the Contract Drawings.

.2 PVC pipe shall be slotted in the portion embedded within the rock. Slots shall be 0.5 mm wide, spaced 6 mm apart and have a minimum length of 30% of the outside circumference of the pipe, or an approved alternative.

.6 Discrepancies between the manufacturer's specifications and those presented within this specification shall be reported immediately upon discovery to the Departmental Representative for review and approval prior to proceeding with the work.

Part 3 Execution

3.1 GENERAL

.1 Dimensions given in the Contract Drawings are estimates only. Field conditions will determine final dimensions. The Contractor shall verify all dimensions and conditions with the Departmental Representative on site before proceeding with any portion of this work.

.2 Due to the nature of this project, the Contractor is responsible for site condition assessment regarding ground and rock conditions that are anticipated to be encountered. It is the Contractors responsibility to assess the site with their experience and/or obtain third party professional advice on the geological conditions.

.3 For a general geological description of the site, see Section 01 11 00. This section does not preclude the responsibility of the Contractor to verify conditions.

.4 The Contractor shall be responsible for construction means, methods, techniques, sequences and safety procedures. Neither PCA, nor the Departmental Representative shall be responsible for the acts or omissions of the Contractor, subcontractor, or their agents, or employees, or other persons performing any of the work.

.5 The Contractor shall design and install any temporary structures, rockfall protection, etc. as required. All temporary structures and installations must be removed following construction progress or after completion of the work and shall not become part of the Work.

.6 Notify the Departmental Representative 24 hours in advance for observations and/or inspections of excavated and prepared rock bearing surfaces, reinforcing steel, and inspection of placement conditions before each concrete placement.

3.2 INSPECTION OF GROUND CONDITIONS

.1 Visually inspect ground conditions in the buttress area in the presence of the Departmental Representative.

.2 Inform the Departmental Representative of unacceptable conditions that prevent or adversely affect the buttress installation immediately upon discovery.

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

3.3 DOWELS

.1 All dowels into the rock (vertical and inclined dowels) shall be installed into the adjacent rock with the pattern, and to depths, as specified in the Contract Drawings.

.2 Vertical dowels (shear pins) at the slope toe shall be installed prior to concrete placement. Shear pins to be drilled into rock at toe with a minimum embedment length into rock as specified in the Contract Drawings and fully grouted with a minimum stickup length into the buttress as specified in the Contract Drawings.

.3 Inclined dowels in the back rock face shall be installed prior to concrete placement. Dowels to be drilled into the rock face and fully grouted with bar stickup extending beyond buttress face. Any deviation from this installation sequence must be submitted to the Departmental Representative for approval prior to proceeding with the work.

.4 Dowel hole drilling, tendon installation, grouting, pull-testing and all related installation activities shall be carried out only under the full-time inspection of the Departmental Representative.

.5 Drill hole diameters shall be a minimum of 2 times the bar diameter or as specified by the steel bar manufacturer.

.6 The Contractor shall assume the potential for weak rock conditions (such as voids, sand seams, and closely spaced fractures) and be prepared to take special measures incidental to rock dowel installation to maintain open drill holes and prevent grout loss, including: temporary casing to stabilize drill hole sidewalls, the use of grout socks, the modification of the grout mixture (admixtures, etc.), and pre-grouting and re-drilling methods. Special measures require the review and approval of the Departmental Representative.

.7 The use of steel bar alternatives such as hollow core ‘self-drilling’ anchor systems require the review and approval of the Departmental Representative.

.8 Drill holes shall be cleaned of drill cuttings, debris, grease, oil, or other deleterious materials using clean water and/or air as required. Drill hole depth and cleanliness shall be approved by Departmental Representative before dowel installation.

.9 Tendons shall not be driven or forced into the hole to prevent any damage. If the tendon cannot be completely inserted, it shall be removed and the hole be re-cleaned and/or re-drilled to permit insertion.

.10 To keep the bar centered in the hole, use commercially manufactured centralizers at intervals not greater than 3 meters, with a minimum of one centralizer per rock dowel. Ensure centralizers do not interfere with tremie tube and are sized appropriately for bar diameters.

.11 Grout shall be tremied into the drill hole without interruption.

.12 Grout sampling and testing will be carried out by the Departmental Representative, or a certified testing consultant appointed by PCA. Provide the Departmental Representative with any samples of grouting materials that may be requested for quality assurance testing. .

.13 Wash all excess, or spilled cement grout from rock face surfaces.

.14 At the discretion of the Departmental Representative, proof testing incorporating up to 25% of the total number of dowels shall be completed in accordance with the PTI (2014) recommendations. Testing will be conducted by the Contractor under the observation of the Departmental Representative. The dowels shall be tested to a test load as specified on the Contract Drawings. The Contractor shall provide all testing equipment required to perform the tests. Additional testing may be requested based on the tests results. If more than 25% of the tested dowels fail, all dowels shall be tested.

3.4 WEEP HOLES

.1 Weep holes shall be installed on the pattern, angles, and to depths, as specified in the Contract Drawings.

.2 Drilled section of weep hole within bedrock shall be cleaned of drill cuttings, debris, grease, oil, or other deleterious materials using clean water and/or air as required.

.3 Weep hole pipe shall be secured tightly in the hole and flush to the face of the buttress.

3.5 CONCRETE

.1 Due to the size of the buttress, a single monolithic placement will not be allowed. Placement to be completed in a series of horizontal lifts or vertical panels with a minimum of 48 hours between placements. Details of proposed sequence and construction joints shall be provided to the Departmental Representative for review and approval. Construction joints shall comply with the requirements of CSA A23.1:19, Clause 7.3.1 so that the strength and appearance of the buttress are impaired as little as practical.

.2 A water stop shall be installed at the back of the buttress to inhibit rock mass dewatering along cold joints.

.3 No concrete shall be placed without prior to approval by the Departmental Representative.

.4 All exposed concrete edges shall be chamfered 25 mm.

.5 Concrete cover over reinforcement shall be 75 mm.

.6 All concrete shall be durable and impermeable, free from honeycombing and other defects. Any concrete which fails to meet the specifications or referenced standards, or is otherwise deemed to be unacceptable or substandard, shall be repaired at the Contractor’s cost.

.7 Concrete shall be moist cured for a minimum of 7 days and shall be maintained at 10 degrees Celsius for the curing period.

.8 Make provisions to provide cold weather protection when temperatures are forecast to fall below 5 degrees Celsius. Conform to the minimum requirements of CSA A23.1.

.9 Curing measures / compounds shall be in accordance with the pigmentation supplier's recommendations / best practices.

.10 All concrete shall be placed with the aid of internal vibrators.

.11 All concrete shall be cast in the dry.

.12 Concrete sampling and testing will be carried out by the Departmental Representative, or a certified testing consultant appointed by PCA in conformance with CSA-A23.2, latest edition. Contractor to facilitate all inspections and tests, providing any samples of concrete materials that may be requested for quality assurance testing.

3.6 FORMWORK

.1 Forms shall be constructed so that the finished concrete will conform to the shape and dimensions specified in the Contract Drawings and verified in the field and to produce smooth and even concrete surfaces free of honeycombing and bug holes.

.2 Form ties shall leave a conical shape 25 mm diameter hole which shall be neatly filled with a high strength preblended and prebagged cementitious no-shrink grout. Form ties, when removed, shall have no steel within 50 mm of the concrete surface. Wire ties or ties without the minimum setback shall not be used. Flat snap-ties shall not be used.

.3 Leave forms in-place for a minimum of 48 hours after completing the placement unless approved by Departmental Representative. Continue with the initial curing process for the full 7 days as specified.

.4 Correct surface defects after forms are removed.

.5 Provided hydrophilic water stops along cold joints between placements.

3.7 CONCRETE REINFORCEMENT

.1 Do not place concrete until the Departmental Representative has an opportunity to review the rebar placement and until the Contractor submits their concrete curing and protection plans.

.2 Maintain rebar placement and specified cover while concrete is being placed.

3.8 ENVIRONMENTAL PROTECTION

.1 The Contractor shall develop a site specific environmental protection plan for review and approval by the Departmental Representative. The Contractor is responsible for the protection of natural watercourses from any damages due to runoff from the construction site and dewatering procedures.

.2 The Contractor shall not dump, drain, or permit water containing suspended materials to enter waterways.

END OF SECTION

Appendix A

Parks Canada National Best Management Practices – Roadway, Highway, Parkway and Related Infrastructure (May 2015)

Parks Canada Parcs Canada

Parks Canada National Best Management Practices

Roadway, Highway, Parkway and Related Infrastructure

Canada

By: Archie Doucette *Environmental Assessment & Ecosystem Restoration*

Parks Canada National Best Management Practices for Roadway, Highway, Parkway and Related Infrastructure

Approved by

Original signed by Mike Wong

Mike Wong, Executive Director Natural Resource Conservation Branch

Original signed by Kalvin Mercer

Kalvin Mercer, Associate Vice-President Asset Management and Project Delivery

July 23, 2015

Date

Contents

Introduction

The Parks Canada National Best Management Practices for Roadway, Highway, Parkway and Related Infrastructure will allow an identified suite of project activities to be undertaken in such a manner that there will not be resulting significant adverse environmental effects.

The Best Management Practice (BMP) pathway is applied when there is a suite of routine, repetitive projects (e.g. paving) or activities (e.g.de-watering), with well understood and predictable effects. This fulfils Park's Canada's obligations under the *Canadian Environmental Assessment Act 2012* as a manager of federal land, see the Guide to the Parks Canada EIA Process. The BMP maximizes efficiency through creation of a pre-approved impact assessment for the defined suite of projects, to which standard mitigation and environmental management measures can be applied.

The impact assessment officer (IAO) will review a proposed project and advise the functional manager of the project if and how this BMP should be applied. The IAO's advice will be based on whether the project falls within the scope of the BMP, and whether application of the mitigation measures in the BMP will adequately address potential adverse effects of the project.

Project Managers are responsible to ensure all mitigation measures applicable to the project are added to the terms and conditions of any permits or contracts issued for the project.

The Impact Assessment Officers must ensure the project, EIA pathway applied and determination are recorded in the Parks Canada National Impact Environmental Assessment Tracking System.

Scope of Application

This BMP outlines the impact assessment of repetitive and routine projects on roadways, highways and parkways. If a project involves some or all of below activities, and the initial assessment of site and project indicate "the project is unlikely to result in significant adverse environmental effects" the BMP can be applied. Projects that this BMP would likely be applied to include:

- The proposed maintenance or repair of an **existing** sidewalk, or parking lot.
- The proposed maintenance or repair of an **existing** road, including pull-off areas, that would be carried out on the existing right of way[1].

Activities included in the scope of this BMP are:

1. Project Design
2. General Activities
    - Worksite Conditions/Staging/Laydown
    - Equipment operations
    - Fuel storage and refueling

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[1] Highway Footprint or Right of Way (ROW): The permanent physical intrusion of a highway or freeway, including the road surface, shoulders, side slopes, drainage ditches and/or storm drainage ponds (Transport Canada, 2008).

- Site Clean Up/Waste Disposal

3. Asphalt Production and Handling
   - Asphalt Plant Operation
   - Gravel Crushing and Washing
   - Oiling of Truck Boxes
   - Clean Up and Disposal of Waste Products
4. Concrete Handling
   - Operation, maintenance and inspection of Onsite Temporary Concrete Washout Facility
   - Removal of Temporary Concrete Washout Facilities
   - Onsite concrete management
5. Paving, Resurfacing and Grading
   - Grading
   - Paving and Resurfacing
   - Pavement Marking and Barrier and Guardrail Reinstatement
6. Barriers and Guardrails
   - Repair, replacement and upgrades of barriers and guardrails
7. Vegetation Removal
   - Vegetation Removal
   - Grubbing
   - Brushing
   - Disposal of Vegetation Debris
   - Integrated Pest Management
8. Excavation, Soil Stripping and Overburden Removal
   - Excavation
   - Soil Stripping
   - Topsoil Salvage
   - Excavated Material Storage
   - Excess Material and Waste (overburden removal)
9. Slope Stabilization, Drilling and Blasting
   - Slope stabilization-scaling, hydraulic hammers
   - Drilling and blasting for Slope Stabilization and Geotechnical Investigations
10. Soil and Vegetation Restoration
    - Topsoil Replacement
    - Soil Amendments
    - Seedbed Preparation
    - Species Selection
    - Seed Lot Selection
    - Seed Mixture Composition
    - Seeding
    - Alternatives to Seeding
    - Reclamation Standards
    - Reclamation Plot Evaluation
    - Time Limits

10. Drainage Structures
    - Drainage structures
    - Culverts
11. Bridge Maintenance
    - Bridge Cleaning
    - Bridge Repairs Using Treated Wood Products
    - Bridge and Structure Painting
12. Water Withdrawal and Dewatering
    - Water Withdrawal
    - Pump Screens
    - Dewatering

Exceptions

This BMP is not suitable for the following project activities as they would require supplemental assessment and/or mitigations:

- Work that may impact aquatic or terrestrial wildlife habitat connectivity, such as fences or culverts;
- Elongation of culverts; realigning water courses; dredging; or work below the high water mark of a fish bearing water body;
- Bridge projects needing work to occur below the High-Water Mark[1], with permanent; alteration to the water course, such as replacement of piers/abutments or permanent installation of structures on the bed of a water body;
- Greater than 10% increase in land use footprint (e.g. gravel pit expansion); and,
- Work which might adversely impact any potential or established Aboriginal and Treaty rights or traditional use[2].

If the project has the potential to have an adverse effect on the critical habitat of a species at risk (with endangered, threatened, or extirpated status) this BMP does NOT apply. The project will require a separate environmental impact analysis.

If the project has the potential for **residual** adverse effects on a listed species at risk (including effects to individuals and residence of the individuals) this BMP does NOT apply, the project will require a separate environmental impact analysis.

Note: If there is any uncertainty regarding potential adverse effects to species at risk, consult a member of the National Office Species Conservation team.

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[1] High-water Mark is the usual or average level to which a body of water rises at its highest point and remains for a sufficient time so as to leave a mark on the land. (Fisheries and Oceans, 2015). Upper Controlled Water Elevation (UCWE) is used as definition of High-water Mark in managed waterways.

[2] Parks Canada must engage in additional and separate consultations with Aboriginal groups if there is a possibility of a project adversely affecting established or potential Aboriginal or Treaty rights. This is required to fulfill federal government responsibilities in upholding the honour of the crown. If there is uncertainty regarding the need for Aboriginal consultation with respect to a project, refer the matter to Parks Canada Legal Services for advice. Guidance on consultation may be sought from the Aboriginal Affairs Secretariat and from the guidance document "A Handbook for Parks Canada Employees on Consultation with Aboriginal Peoples".

Approved geographic area of application

This BMP is intended for use in all Parks Canada administered protected heritage places with roadways, highways and parkways.

Components of the environment that may be affected

Potential effects from projects of this type are well understood and predictable. They include:

Water Resources:

- Adverse modifications to surface drainage patterns
- Reduced water quality due to increased erosion, sedimentation, transportation of debris and contamination (i.e. from leaks and accidental spills, etc.)

Soil/Land Resources:

- Change in slopes, landforms, and landscape
- Soil compaction and rutting
- Slope instability, due to increased soil exposure and improper excavation and storage
- Soil contamination

Air quality:

- Decreased ambient air quality (i.e. from dust, equipment emissions, etc.)
- Increased ambient noise levels
- Temporary increased levels of CO_2 and other pollutants
- Temporary increased localized temperatures from paving and equipment operation.

Flora and Fauna:

- Damage to and/or removal of vegetation in immediate or adjacent areas
- Introduction of non-native species populations, or expansion of existing populations
- Wildlife sensory disturbance causing displacement/preferred habitat avoidance
- Wildlife habituation/attraction to artificial food sources
- Impeded/altered wildlife movement
- Damage to nests/disruption of nesting animals
- Mortality from project activities

Cultural Resources:

- Adverse effects on the heritage value or character-defining elements of a cultural resource
- Impacts to archaeological resources (known or potential)

Mitigation Measures

To use the document efficiently, keep the activity mitigation lists that apply to the project expanded and collapse the other activities by clicking on the section titles, print this as a pdf or paper document and include with the EIA determination record. This will reduce the overall size and scope of the mitigations to present to contractors and project managers.

Choose all that apply to project. Each title is hyperlinked to the related section.

Module	
1.	Project Design
2.	General Activities
3.	Asphalt Production and Handling
4.	Concrete Handling
5.	Paving, Resurfacing, Grading
6.	Barriers and Guardrails
7.	Vegetation Removal
8.	Excavations, Soil Stripping and Overburden Removal
9.	Slope Stabilization, Drilling and Blasting
10.	Soil and Vegetation Restoration
11.	Drainage Structures
12.	Bridge Maintenance
13.	Water Withdrawal and Dewatering

1. Project Design

When upgrades to infrastructure are planned opportunities to decrease the environmental impacts of long term operation should be considered in the engineering design. Some examples are: directing runoff into vegetated areas rather than directly into surface waters to decrease pollution in surface waters, increasing the span length of bridges during replacements to allow for terrestrial wildlife passage underneath and converting smaller culverts to larger culverts or clear span bridges to allow for better fish passage and less restricted flows.

2. General Activities Mitigations Module

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

Work Site Conditions/Staging/Laydown

2.1. All employees must attend a briefing with an Impact Assessment Officer (IAO) or Surveillance Officer (SO) before beginning work at the site review and explain the mitigations that are conditions of the project approvals.

2.2. Minimize vegetation-clearing activities and ground disturbance by staging on existing hardened areas wherever possible.

2.3. Avoid or terminate activities on site that attract or disturb wildlife. Vacate the area and stay away from the immediate location if wildlife display aggressive behaviour or persistent intrusion.

2.4. Control materials that might attract wildlife (e.g. petroleum products, human food and garbage).

2.5. Notify the SO immediately about dens, litters, nests, carcasses (road kills), wildlife activity or encounters on or around the site or crew accommodation. Other wildlife-related encounters are to be reported to SO within 24 hours.

2.6. Delineate the work zone; clearly mark the limits to active construction and the access and egress locations.

2.7. When work involves the disturbance of soils or the use of erodible materials (e.g. sands, topsoil), prevent the transport of sediment by the installing of appropriate erosion and sediment control.

2.8. An Erosion and Sedimentation Management Plan shall be prepared for the components of the work undertaken in proximity to watercourses, wetlands or riparian environments. If sediment ponds are required, they shall be designed to settle all sediment particles 0.02 mm or larger. The ponds shall also be designed to handle 1:5 year storm events, with overflow spill capacity for 1:10 year storm events and emergency spillway capacity for 1:100 year storm events. All components require regular maintenance to ensure effectiveness.

Equipment Operations

2.9. Equipment movements and workers' private vehicles shall be restricted to the 'footprint' of the construction area.

2.10. Ensure machinery arrives on site in a clean condition and is maintained free of fluid leaks, invasive species, noxious weeds and soils from off-site.
2.11. Operate machinery on land above the high water mark, on ice, or in another manner that minimizes disturbance to the banks and bed of any water body.
2.12. Limit machinery crossing (fording) a stream or watercourse to a one•time event (i.e., over and back), and only if no alternative crossing method is available. If repeated crossings of the watercourse are required, construct a temporary crossing structure in compliance with the *Fisheries Act*.
2.13. For fording equipment without a temporary crossing structure, use stream bank and bed protection methods (e.g., swamp mats, pads) if minor rutting is likely to occur during fording.
2.14. Use temporary crossing structures or other practices to cross streams or water bodies with steep and highly erodible (e.g., dominated by organic materials and silts) banks and beds.

Fuel Storage and Refueling/Emergency Plans

2.15. A Spill Response Plan will be prepared and detail the containment and storage, security, handling, use and disposal of empty containers, surplus product or waste generated in the application of these products in accordance with all applicable federal and provincial legislation. The Plan shall include a list of products and materials to be used or brought to the construction site that are considered or defined as hazardous or toxic to the environment. Such products include, but are not limited to, waterproofing agents, grout, cement, concrete finishing agents, hot poured rubber membrane materials, asphalt cement and sand blasting agents.
2.16. Spill kits shall be provided at re-fuelling, lubrication, and repair locations that are capable of dealing with 110% of the largest potential spill and shall be maintained in good working order. Site staff shall be informed of the location of the spill response kit(s) and be trained in its use.
2.17. If potentially hazardous materials (e.g. cement-based products, sealants or paints) are used on site ensure raw material, mixed compounds and wash water are not released to any watercourse or soils. 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.
2.18. Hazardous or toxic products shall be stored no closer than 100 metres from streams, wetlands, water bodies or waterways.
2.19. Timely and effective action shall be taken to stop, contain and clean-up all spills as long as the site is safe to enter. The SO shall be notified immediately of any spill. In the event of a major spill, all other work shall be stopped and all personnel devoted to spill containment and clean-up.
2.20. 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 proponent. The site will be inspected to ensure completion to the expected standard and to the satisfaction of Parks Canada.

Site Clean Up/Waste Disposal

2.21. Clean tools and equipment off-site to prevent the release of wash water that may contain deleterious substances.

2.22. Where possible, sweep up loose material or debris. Any material thought to pose a risk of contamination to soils, surface water or groundwater should be disposed of appropriately off-site.

2.23. Construction, trade, hazardous waste and domestic waste materials shall not be burned, buried or discarded at the construction site or elsewhere in Parks Canada protected heritage places. These wastes shall be contained and removed in a timely and approved manner and disposed at an appropriate waste landfill site located outside the Parks Canada protected heritage place. Construction waste storage containers, shall be emptied when 90% full. Waste containers will have lids, be wildlife proof if there attractants and waste loads shall be covered while being transported.

2.24. Sanitary facilities, such as a portable container toilet, shall be provided and maintained in a clean condition.

3. Asphalt Production and Handling Mitigations Module

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

Timing of Works

3.1. Asphalt works are preferably undertaken during periods of dry weather as this allows easier control of contaminated runoff and sediment.

3.2. If the work schedule requires working in the rain, the area of work must be isolated and appropriate sediment controls must be installed to prevent the release of sediment-laden water or any other deleterious substances into surface waters, particularly for surface repair works requiring the application of patching and sealing compounds, tar, asphalt, and chemical surface sealants.

Operation of Asphalt Plants

3.3. Asphalt plant operation must comply with all environmental pollution control regulations, including provincial regulations, and the plant operational plan.

3.4. Spoil piles and stock piles will be at least 30 meters from the edge of any water body.

3.5. There must be enough room between the stockpiles and the asphalt plant for a loader in the event of a spill at the asphalt plant.

3.6. A containment berm with an associated liner made of occlusive material (e.g. plastic of a thickness approved by the SO) and covered with absorbent sand or clay shall be installed under the asphalt storage tank to ensure containment of 110% of the tank's capacity.

3.7. The proponent shall be responsible for the purchase and safe delivery/storage/handling of asphalt cement and emulsions to the asphalt plant site.

3.8. Excess hot mix or reject new asphalt shall be temporarily in stored in the containment area sufficient to prevent runoff of petroleum into soils or surface waters as directed by the SO, and removed from the Parks Canada protected heritage place, prior to project completion.

3.9. Every effort will be made to recycle waste asphalt, either as a base course, or by recycling waste asphalt through the asphalt plant according to engineering specifications.Old cured ground asphalt material shall be removed, recycled, or stored for future recycling at an approved operational gravel pit or asphalt plant site. Stockpiles must be further than 30 metres from any surface waters.

3.10. Remaining stockpiles will be removed or incorporated into reclamation plans for the gravel pits or asphalt plant sites.

3.11. Asphalt to be removed must be sampled and analyzed to determine possible lead contamination. Contaminated asphalt will be transported to an approved waste disposal facility. A receipt of delivery is to be provided to the SO.

3.12. Proponent should protect containment/catchment areas and drip trays at the asphalt plant from rainfall since, if contaminated, all of the collected water will require disposal of at an approved disposal facility at the expense of the Proponent.

3.13. Dyking and ponding will be required to control the rate and quality of runoff from the plant site.

3.14. Ensure that the water in the settling ponds remains clean of petroleum products. Any contaminated water will require disposal at an approved disposal facility at the expense of the Proponent.

Gravel Crushing and Washing

3.15. Where possible within engineering constraints, asphalt materials should be recycled to reduce the need for new gravel.

3.16. Gravel will be obtained from an approved operational borrow pit only. For gravel obtained from a borrow pit within a protected heritage place or borrow pit, gravel extraction within the footprint of the disturbed area of the approved operational borrow pit is permitted.

3.17. Gravel will not be crushed within 30 meters of any water body.

3.18. If water for cleaning is extracted from a watercourse, refer to water withdrawal section of this BMP.

3.19. If gravel requires washing, the water used will not be returned directly to any watercourse.

3.20. Water free from chemical contaminants will be discharged into ground where further erosion and runoff into surface water is prevented. Discharging into well vegetated ground surface, at a rate which prevents erosion can often provide increased absorption and reduction of sediment load.

3.21. Contaminated water must be treated to meet CCME guidelines or transported outside of the Parks Canada protected heritage place for disposal at an approved facility.

3.22. For waste removed from the park a detailed receipt of delivery to an approved facility will be provided to the SO.

Oiling of Truck Boxes

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

3.23. Truck boxes may be oiled only when absolutely necessary.

3.24. Oiling will take place in a bermed area, consisting of a plastic underlay with 15 centimetres overlay of clean gravel. Oil contaminated gravel will be hand collected (so as to prevent tearing of the plastic) from the bermed area daily, and put through the asphalt plant.
3.25. Vehicle covers shall be securely fastened.

Air Quality Mitigations

3.26. Asphalt plants should be 500 meters from buildings with human habitation.
3.27. Emissions from the asphalt plant and paving project equipment will comply with End Product Specifications (EPS) emission control standards and other provincial emissions regulations. Stack test results provided to the ESO by the operator or surveillance contractor may be required when the asphalt plant is at full capacity to ensure the plant is operating within the required standards. If the plant is not operating within the appropriate levels, production will cease until the requirements are met.
3.28. Sludge removed from the clarifier that is free of chemical contamination will be contained to prevent fine dust particles from becoming airborne during windy periods.
3.29. Unannounced stack tests will be conducted throughout the project. If the plant does not meet requirements, operation will cease until the requirements can be met.

Disposal and Clean Up of Other Waste Products

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

4. Concrete Handling Mitigations Module

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

Onsite Temporary Concrete Washout Facility

4.1. Temporary concrete washout facilities shall be located a minimum of 30m from storm drain inlets, open drainage facilities, and watercourses.
4.2. Temporary concrete washout facilities shall be temporary pit or bermed areas constructed and maintained in sufficient quantity and size to contain all liquid and concrete waste generated by washout operations.
4.3. Straw bales, wood stakes, and sandbag materials can be used to construct temporary containment walls or "barriers".

4.4. Plastic lining material shall be a minimum of 10-mil polyethylene sheeting and shall be free of holes, tears or other defects that compromise the impermeability of the material.
4.5. The soil base shall be prepared free of rocks or other debris that may cause tears or holes in the plastic lining material.
4.6. Perform washout of concrete mixer trucks in designated areas only.
4.7. Wash concrete from mixer truck chutes into approved concrete washout facility or collect in an impermeable bag for disposal.
4.8. Pump excess concrete in concrete pump bin back into concrete mixer truck.
4.9. Concrete washout from concrete pumper bins can be washed into concrete pumper trucks and discharged into designated washout area or properly disposed offsite.
4.10. Once concrete wastes are washed into the designated area and allowed to harden, the concrete shall be broken up, removed, and disposed of per federal and provincial regulations.

Maintenance and Inspection of Temporary Concrete Washout Facilities

4.11. Temporary concrete washout facilities shall be maintained to provide adequate holding capacity with a minimum freeboard of 100 mm (4 inches) for above grade facilities and 300 mm (12 inches) for below grade facilities.
4.12. Maintaining temporary concrete washout facilities shall include removing and disposing of hardened concrete and returning the facilities to a functional condition.
4.13. Existing facilities must be cleaned, or new facilities must be constructed and ready for use once the washout is 75% full.
4.14. Temporary concrete washout facilities shall be inspected for damage (i.e. tears in PVC liner, missing sand bags, etc.).
4.15. Onsite concrete waste storage and disposal procedures should be monitored at least weekly or as directed by the ESO.

Removal of Temporary Concrete Washout Facilities

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

Onsite Concrete Management

4.17. Rolling concrete mixers with surplus concrete in amounts less than one cubic metre of wet concrete may waste this concrete in the grade right-of-way as directed by the Parks Canada Representative in areas that drain well away from watercourses. Surplus amounts in excess of one cubic metre are to be returned to the batching yard.
4.18. Water contaminated in the placing of cement and curing of concrete shall be contained and removed from the site to an approved disposal facility.
4.19. The concrete batching plant must be operated pursuant to applicable dust, air emission, and water quality control regulations.

4.20. Waste, solidified concrete from rolling concrete mixers in amounts less than 1 cubic meter and waste solidified concrete from construction pour shall be buried in the grade within 48 hours of the pour, subject to approval and direction from the Departmental Representative

5. Paving, Resurfacing, Grading Mitigations Module

Highway surface management activities are undertaken to ensure public safety on Parks Canada Agency highways by maintaining clean, level, and unbroken road surface conditions through activities such as pavement cleaning, patching, application of surface treatments, and pavement crack sealing. Grading is used to address drainage issues, vegetation encroachment, potholes and rough surfaces.

Timing of Works

5.1. Works are preferably undertaken during periods of dry weather (e.g., summer) as this allows easier control of contaminated runoff and sediment.

5.2. If the work schedule requires working in the rain, the area of work must be isolated and appropriate sediment controls must be installed to prevent the release of sediment-laden water or any other deleterious substances into surface waters, particularly for surface repair works requiring the application of patching and sealing compounds, tar, asphalt, and chemical surface sealants.

Grading

5.3. During grade construction conducted close to any watercourse, water body or wetland ensure materials are not pushed, fall or are eroded into the water or wetlands.

5.4. No grade building shall occur outside of the delineated work area or within 1 metre of the drip line of existing forest. Any material inadvertently falling outside the work limits will be removed promptly in a manner that does not damage trees or vegetation.

5.5. Materials shall be placed at storage sites or on the grade without spillage outside the work limits. Any material inadvertently falling outside the work limits will be removed promptly in a manner that does not damage trees or vegetation.

5.6. Retain a 30 metre vegetated buffer around water bodies or install runoff management structures.

5.7. If possible grade roads early in the spring before vegetation develops seed heads or late in season after vegetation has set seed and is dormant to minimize non-native vegetation propagation.

5.8. Ensure gravel or road bed material is free of weeds and comes from an approved operational gravel source free of other contaminates.

Paving and Resurfacing

5.9. Minimize changes to the surface that could affect infiltration and runoff characteristics and maintain effective surface drainage to limit direct runoff into surface waters.

5.10. Minimize application of seal coats in wet conditions. Attempt to apply only to dry surfaces and not prior to (within 24 hrs.) or during rainfall. If unforeseen rain arrives ensure runoff from recently seal coated surfaces are prevented from entering surface waters.

5.11. For asphalt handling and management see the Asphalt Mitigation Module of the BMP.

Pavement Marking and Barrier and Guardrail Reinstatement

5.12. Minimize changes to the surface that could affect infiltration and runoff characteristics and maintain effective surface drainage to limit direct runoff into surface water Pavement marking shall be undertaken pursuant to standard methods applied in National Parks for control of paint products, both in transport and handling. The Contractor shall present a description of methods to be employed for transporting and controlling paint and hazardous products, application of paint, cleaning of equipment, containment and disposal of waste paint and cleaning products, etc. the satisfaction of the Parks Canada Representative.

5.13. Where concrete barriers or guard rails are temporarily removed, for highway improvements, temporary glow posts shall be installed, at 20.0 m intervals on straight sections and at 10.0 m intervals on curves and shall remain in place until permanent barrier system has been installed.

6. Barriers and Guardrails Mitigations Module

Repair, installation and upgrade of barriers and guardrails involves laydown/staging areas, equipment operations, minor excavation (e.g., for barrier post holes) and use of concrete. Potential adverse effects include destruction of vegetation and erosion and sedimentation.

Timing of Works

6.1. Where excavation is required, schedule work to avoid wet, windy and rainy periods that may increase erosion and sedimentation.

6.2. If the work schedule requires working in the rain, appropriate sediment controls must be installed to prevent the release of sediment-laden water or any other deleterious substances into surface waters.

Repairs, Replacement and Upgrades

6.3. An Erosion and Sedimentation Management Plan shall be prepared for the components of the work undertaken within 100m of watercourses, wetlands or riparian environments. If sediment ponds are required, they shall be designed to settle all sediment particles 0.02 mm or larger.

6.4. Where use of concrete is required for guardrail post holes, Concrete Handling Mitigations apply.

6.5. If vegetation removal is required for barrier or guardrail works, Vegetation Removal Mitigations apply.

6.6. Where concrete barriers or guardrails are temporarily removed, temporary glow posts shall be installed, at 20.0 m intervals on straight sections and at 10.0 m intervals on curves and shall remain in place until permanent barrier system has been installed.

7. Vegetation Removal Mitigations Module

Roadside vegetation management activities include mowing, brushing, and landscape maintenance activities undertaken to maintain clear sight lines for highway users, control noxious weeds, facilitate effective drainage, and reduce possible fire hazards. Mature timber

may need to be removed for improving road alignments, improving sight linesor replacing or repairing associated infrastructure. Grubbing (stump and root removal) may be required to prepare the ground surface for other activities.

Timing Windows

7.1. Vegetation clearing can negatively impact nesting birds and/or bats in spring and summer. Avoid all vegetation removal during this time. If vegetation removal is scheduled to occur within these times a qualified professional biologist/ecologist should further clarify the species presence and timing particular to the work site and any occupied bird nests, eggs, or nests of species protected under the Migratory Bird Convention Act (MBCA). See appendix on regulatory guidance for further detail on the MBCA and SARA.

7.2. If a nest is found during the pre-work surveys, the vegetated area will be left intact with a suitable sized buffer of shrubs/trees around it until the young have fledged and left the nest. Size of buffer species dependent, to be determined in consultation with professional biologist or park ecologist.

7.3. Grass mowing and trimming should not occur during peak spring or fall reptile/amphibian migrations and hatching. Consult a local biologist/ecologist for site and species specific timing windows.

Vegetation Removal Mitigations

7.4. Vegetation removal should be limited to the minimum Clear Zone Distance[1] - dependent on type and size of road and maximum height needed to meet the road safety objectives.

7.5. Minimize full removal and retain vegetation when possible to reduce erosion.

7.6. Prior to the commencement of any vegetation removal, the worksite must be surveyed for species at risk. If species at risk are found, work must be stopped until site-specific mitigations to address potential adverse effects are developed.

7.7. Survey vegetation for non-native species, clear vegetation areas with non-native vegetation in spring and early summer to avoid further spread and development of the non-native seed bank.

7.8. Clearing activities shall be avoided during nesting seasons for birds, reptiles and amphibian species in the project area.

7.9. If wildlife is observed during work, if possible, give animals the opportunity to escape the work area to the surrounding forest or elsewhere to seek new shelter.

7.10. Avoid ground vegetation removal during dry, windy periods to prevent erosion of topsoil and reduction of air quality with dirt/dust.

7.11. Retain 30 metre vegetated buffer around water bodies, where disturbance is necessary and unavoidable restoration is required.

7.12. Debris will not be deposited in water bodies.

7.13. Ensure tree limbs/stumps are flush cut as close to the ground or stem as possible.

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[1] A clear zone is an unobstructed, traversable roadside area designed to enable a driver to stop safely or regain control of a vehicle that has accidentally left the roadway. The selection and design of appropriate clear zone dimensions is project-specific and should be the responsibility of professionals trained in roadside design.

7.14. Logs and other salvage materials are to be conveyed to and placed at a storage site without spread of debris or damage to other standing trees or landscape resources outside the marked clearing or storage limits. They shall not be skidded through wetlands, waterways or water bodies.

7.15. During the grubbing component, stumps, roots, imbedded logs and other non-soil debris shall be pulled and shaken free of loose soil and rocks before transport to a designated pit.

7.16. Where possible preserve identified wildlife trees by limbing or topping if they are not assessed as hazard trees.

Disposal of Vegetation Debris

7.17. All vegetation debris must be removed as soon as possible from the right-of-way, either by transporting off-site for disposal or piling and burning on-site.

7.18. All vegetation containing non-native species will be piled and burnt or bagged and removed off site to disposal facility.

7.19. Piles will be made where trees are felled, piles will be 1.2-1.8 (4 to 6 feet) in diameter and no more than 1.2 m (4 feet) high (approximately 1 to 3 trees per pile) or as instructed by local fire and vegetation specialists.

7.20. Piles are to be located so that they do not scorch surrounding live trees and measures must be in place to ensure that fires do not spread (i.e., conduct burning on snow or on mineral soil).

7.21. Piles will be left until fall for burning to allow for curing of green fuels.

7.22. Provincial regulations for air quality must be met.

7.23. Where fire fuel loading is not a concern vegetation debris of limited amounts will be dragged in the forest to mimic natural tree fall.

7.24. If removal or burning are not feasible a chipper may be used for less than 50 boles per hectare. Chip depth is to be a maximum of 5 cm (2 inches), spread over area no greater of 5m x 5m per hectare so as to not cover underlying vegetation, prevent new native seedlings from sprouting, and cause soil/seed bank sterilization. Spreading of chips may extend beyond these parameters with permission from Parks Canada.

7.25. To facilitate chipping of woody debris, all trees/shrubs/vines can be left temporarily along the road shoulders and laid facing the same direction.

7.26. In some cases, logs from newly cut trees may be set aside for use elsewhere as directed by local park site managers and the ESO.

7.27. Store removed vegetation on already disturbed areas to minimize disturbance area.

7.28. In appropriate areas re-establish native vegetation where it has been completely removed/damaged.

Integrated Pest Management

7.29. A Field Unit Integrated Pest Management Plan (IPMP) must be completed and approved prior to the use of herbicides to ensure the most effective and least harmful substances are properly used.

8. Excavations, Soil Stripping and Overburden Removal Mitigations Module

Construction projects often involve excavations. To successfully complete reclamation of disturbed areas, and protect areas from erosion proper soil handling and backfilling procedures must be followed. Post excavation and stripping soil and vegetation restoration mitigations should be applied. See section of this BMP for Soil and Vegetation Restoration.

Timing of Works

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

8.2. If the work schedule requires working in the rain, appropriate sediment controls must be installed to prevent the release of sediment-laden water or any other deleterious substances into surface waters.

Excavation

8.3. Materials shall be placed at storage sites or on the grade without spillage outside the working limits. Any material inadvertently falling outside the work limits is to be removed promptly in a manner that does not damage trees or vegetation.

8.4. All sediment control measures must be in place before starting work in the vicinity of rivers, water bodies, watercourses, and wetlands.

8.5. Special precautions may have to be taken during excavation in the vicinity of intermittent or active drainage channels.

8.6. Excavation plans must be compared to local archaeological resource inventories, if available. If no archaeological information is available for the work area, an Archaeological Overview Assessment (AOA) may be required to determine the archaeological potential of the work area. Based on the results from the AOA, an Archaeological Impact Assessment might be required. It would be time and cost efficient to refer the plan to Parks Canada's Terrestrial Archaeology section before conducting any excavation to determine the appropriate course of action.

8.7. If cultural resources (eg. archaeological resources) are discovered, immediately cease work, and alert SO.

8.8. Minimize changes to the ground surface that affects its infiltration and runoff characteristics and maintain/re-establish effective surface drainage on completion of the project

8.9. Backfill and compact excavations as soon as possible. Optimize degree of compaction to minimize erosion and allow for re-vegetation.

8.10. All trenches or ditches left unattended overnight must be fenced or covered to prevent wildlife entrapment.

Soil Stripping

8.11. Strip topsoil under dry conditions, whenever possible.

8.12. No stripping shall occur outside of the delineated work area or within 1 metre of the drip line of existing forest.

8.13. In the event of a work program shutdown during inclement weather (e.g. winter conditions unfavourable for construction, heavy rain events, construction delays, etc.) erosion control of bared soils or excavated material stockpiles is required.
8.14. Stripping close to any watercourse, water body or wetland shall employ methods to ensure materials are not pushed, do not fall or erode into the water or wetlands.
8.15. Work within a 100 metre buffer from the high water mark of waterways or wetlands will require a site specific sediment and erosion control plan.
8.16. An erosion control plan is also needed to control dust generated from the construction site.

Topsoil Salvage

8.17. Salvage topsoil at all excavation sites for reclamation purposes.
8.18. Usually the upper 15 cm of soil, below the sod layer if present, is considered topsoil, where depths exceed 15cm salvage the entire depth of topsoil.
8.19. Remove stumps and woody debris from topsoil, wherever possible.

Excavated Material Storage

8.20. Allow space for separate storage of topsoil and spoil; where space is available separate stored topsoil from spoil by at least 1 m. Use appropriate material (e.g., geo-textile) to separate soil components where space is limited.
8.21. Topsoil may be stored on hardened surfaces, geo-textile material or directly on undisturbed vegetation. If storage occurs on vegetation, material recovery by hand may be required.
8.22. Cover all stockpiled material with heavy-duty plastic or filter cloth to prevent erosion during precipitation events.
8.23. Topsoil should be stockpiled on the uphill side of the disturbance on sloped terrain.
8.24. Construct barricades to prevent losses on steep terrain (>18°, 3:1) and within 100m of watercourses.

Excess Materials and Waste (Overburden Removal)

8.25. Remove excess excavated material from site where it cannot be used for the final grading of the area. Site specific arrangements must be made for disposal locations and procedures of overburden.
8.26. Surplus excavated material may be used to fill depressions around the project site providing topsoil is stripped before filling, with approval from SO.

9. Slope Stabilization, Drilling and Blasting Mitigations Module

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

Timing of Works

9.1. Time any vegetation removal work should adhere to the Migratory Bird windows for the area.
9.2. Time work to reduce impact to mammals, amphibians and reptiles using rock faces during sensitive life stages such as birthing and rearing of young. This often occurs during the spring. Confirm timing windows with local wildlife ecologists.
9.3. Avoid ditch clearing during wet periods and wait until ditches are dry to reduce impacts to amphibians and reptiles and limit sedimentation.

Slope Stabilization-Scaling, Hydraulic Hammers

The use of hydraulic hammers attached to excavators is considered the ideal solution for rock disintegration. It avoids rock blasting where the parent rock is no longer rippable by the excavator's bucket but still has enough planes of weakness for economical operation and effective use of the hydraulic hammer. Scaling is the manual removal of loose material on rock slopes using pry bars, hydraulic press, brooms, shovels and power equipment operated by personnel using roped access to a rock face.

9.4. For vegetation clearing refer to the vegetation removal mitigation module of this BMP.
9.5. For slope-stabilization in soils, please refer to the Excavation section.
9.6. Survey the work site for cultural resources such as rock art (ex. pictographs, petroglyphs, etc. prior to the work commencing, establish site specific mitigations for their protection.
9.7. Measures shall be taken to control dust as much as possible during the removal and falling of rock materials down slope.
9.8. Placement of rip rap and backfill on shorelines shall be undertaken without contacting the watercourse, wetted margins and must not be below the High Water Mark.
9.9. If replacement rock reinforcement/armouring is required to stabilize eroding or exposed areas, then ensure that appropriately• sized, clean rock is used, and rock is installed at a similar slope to maintain a uniform bank.
9.10. Direct concentrated surface water (runoff) away from cut and fill slopes.
9.11. Immediately stabilize banks disturbed by any activity associated with the project to prevent erosion and/or sedimentation, preferably through vegetation restoration with native species suitable for the site-refer to soil and vegetation restoration section of BMP.

Drilling and Blasting for Slope Stabilization and Geotechnical Investigations

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

Drilling

9.12. Debris from drilling will be contained (screened or settle out) so it will not cover the surrounding area or enter any water course. All debris will be removed, see section on overburden removal for further mitigations.

9.13. The cuttings from all drilling will be contained so they can be removed entirely from the site. If contaminated, the cuttings are to be disposed at an approved waste disposal facility.

9.14. Control of spoil and sediment loaded water is required on the drill site. Dyking will be required to retain the deposit on non-vegetated surfaces. If contaminated, the spoil pile must be disposed at an approved waste disposal facility.

9.15. During aquifer tests, the water must be piped so it does not erode any soil or any part of the ground. If the water from the tests is piped to a creek, stream, or river, the pipe is to be situated so that there is no erosion of the stream bank or bed. If any sand or similar material is discharged during the aquifer test, care must be taken that the sand does not cover any vegetation.

9.16. All test wells will be filled in after the testing is completed. The proponent will be responsible for rectifying any future problems associated with any of the wells or test wells.

Blasting

9.17. The Parks Canada Representative will identify a magazine location for explosives should a factory site or "ready-to-use" explosives storage site be required

9.18. The blasting supervisor will ensure no damage to infrastructure, people, surrounding vegetation or wildlife by mitigating risk of fly rock.

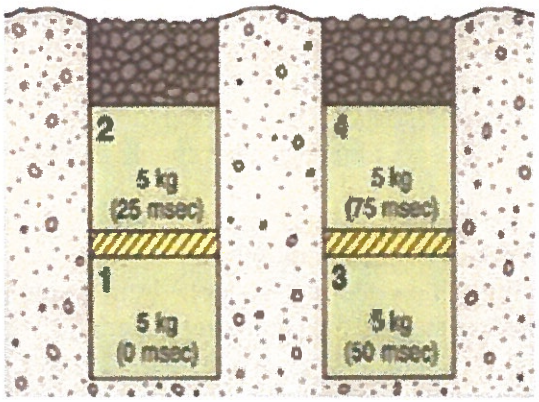
9.19. Avoid using explosives in or near water. Use of explosives in or near water produces shock waves that can damage a fish swim bladder and rupture internal organs. Blasting vibrations may also kill or damage fish eggs or larvae.

9.20. If explosives are required as part of a project (e.g., removal of structures such as piers, pilings, footings; removal of obstructions such as beaver dams; or preparation of a river or lake bottom for installation of a structure such as a bridge or culvert), the potential for impacts to fish and fish habitat will be minimized by implementing the following measures:

- Time in water work requiring the use of explosives to prevent disruption of vulnerable fish life stages, including eggs and larvae, by adhering to appropriate fisheries **timing windows**.
- Isolate the work site to exclude fish from within the blast area by using bubble/air curtains (i.e., a column of bubbled water extending from the substrate to the water surface as generated by forcing large volumes of air through a perforated pipe/hose), cofferdams or aquadams.
- Remove any fish trapped within the isolated area and release unharmed beyond the blast area prior to initiating blasting.
- Minimize blast charge weights used and subdivide each charge into a series of smaller charges in blast holes (i.e. Decking) with a minimum 25 millisecond (1/1000 seconds) delay between charge detonations (see Figure 1).

- Back•fill blast holes (stemmed) with sand or gravel to grade or to streambed/water interface to confine the blast.
- Place blasting mats over top of holes to minimize scattering of blast debris around the area.
- Do not use ammonium nitrate based explosives in or near water due to the production of toxic by-products. Remove all blasting debris and other associated equipment/products from the blast area.

Figure 1: Sample Blasting Arrangement



Per Fig. 1: 20 kg total weight of charge; 25 msecs delay between charges and blast holes and decking of charges within holes. (Fisheries and Oceans Canada, 2015)

10. Soil and Vegetation Restoration Mitigations Module

Almost all projects activities included in this BMP will require some ecological restoration- *the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed.* The restoration plan can be a simple application of the following mitigations and can be at the site or both at the site and in concert with another site designated to offset the permanent impact of a project. For disturbance areas greater than a hectare a restoration plan is required. The restoration works can be often be considered projects in and of themselves. Soil and vegetation restoration must apply the principles of effective, efficient and engaging solutions.

Timing Windows

10.1. Develop restoration plan as part of the project scoping and specifications prior to project approvals.

10.2. Vegetation restoration is most effective if seeded in the fall, this allows for full scarification of the seed over the winter and adequate moisture available. Spring and early summer will also work, consider using seed that requires shorter scarification times for these applications. Transplants will do best in the spring and summer and will require adequate watering.

Topsoil Replacement

10.3. Implement restoration plan for the disturbed area immediately following completion of construction.
10.4. Replace topsoil to all areas immediately following fine grading.
10.5. Do not compact topsoil.
10.6. Where insufficient topsoil is available imported soil may be used as a last resort. Imported topsoil must be certified completely free of non-native seeds and compost developed from sewage treatment plants. Methods of improving vegetation succession using locally sourced, weed and contaminant free materials are preferred.
10.7. Slopes to be seeded should be no steeper than 2 horizontal to 1 vertical (2:1) and covered with a minimum of 5 cm (2 inch) of topsoil. Finish grading should always follow top soil placement.
10.8. Where remaining soils are unstable due to steepness or soil characteristics, immediate installation of sod or erosion control blanket is required.
10.9. Methods of bioengineering such as terracing, willow staking, live pole drain systems should be assessed as solutions where soils are steeper or remain unstable.

Soil Amendments

Fertilizer Application

10.10. Avoid use of fertilizer to limit non-native vegetation growth and allow for local species to use available nutrients.
10.11. If needed use locally sourced mycorrhizae compost teas to improve vegetative success.

Topsoil substitute

10.12. Apply an organic cellulose only amendment as a soil substitute if reclamation standards are not being met within the defined time frame.
10.13. Determine the type of organic amendment based on the site-specific requirements (e.g., peat moss, compost).

Seedbed Preparation

10.14. The seedbed will be scarified by hand or, with the approval of the SO, by machine on large areas (i.e., roadbeds) where it is accessible and appropriate.
10.15. The seedbed will be scarified if seeding takes place more than 7 days after final grading or if there has been a rainfall between final grading and the seeding date.

10.16. The cleats of a tracked vehicle or a harrow device will be used, where possible, to prepare an adequate seedbed with seedling safe-sites (microsites) substantially free of soil crusts.

10.17. Align cleat marks at right angles on slopes to trap seed and sediment and reduce erosion.

Species Selection

10.18. When selecting species and varieties:

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

Seed Lot Selection

10.19. Select seed lots based on indigenous species variety and quality (guaranteed weed seed free content and highest purity and germination), consult with vegetation restoration specialist or fire/vegetation ecologist.

10.20. Reject any seed lots containing any seed of undesirable crop or weed species.

Seed Mixture Composition

10.21. The proportion of each species should be calculated to provide an adequate quantity of pure live seed (PLS) per unit area of each key component.

10.22. Aim for density of about 140 seedlings/m^2 at the end of the first growing season to provide adequate ground cover and allow native species to re-colonize the site over time.

10.23. Consider that parameters such as seed lot purity, seed germination, seedling establishment, seed size and seeding method affect the final stand composition.

Seeding

10.24. Use approved native seed mixes developed for site-specific conditions for various elevations.

10.25. Seed and stabilize (e.g. mulch/tackifier) bare areas as soon as possible after disturbance, preferably as soon as a significant area is graded and finished and before the next rain event. If there is a risk of seedling mortality as a result of fall frost stabilize until appropriate growing conditions exist.

10.26. Use sod in high traffic areas or places that need extra erosion control. Source sod grown from native species (often called fescue sod) and ensure adequate anchoring and watering is in place.

10.27. Use temporary seeding when outside the seeding dates for permanent vegetation

10.28. Apply a seed mixture which is appropriate for the climate, soil, and drainage conditions of the site.

10.29. Apply seed at a rate appropriate to the seed mixture, seeding method and existing vegetation conditions.

10.30. Conduct broadcast seeding under calm wind conditions. Hydro-seeding is acceptable where access is available.
10.31. Do not exceed 30 kg/ha for the broadcast method, ensure seed is integrated with the soil by light rake or harrow. Broadcast method seeding rate is 25 kg/ha (2.5g/m^2) (e.g., 1x25 kg bag will cover 10,000m^2 or 1 hectare).
10.32. For hydro-seeding do not exceed 75 kg/ha with light mulch rates (500 kg/ha- of mulch with hydro-seeding) and 150 kg/ha with heavy mulch rates (1500 kg/ha of mulch with hydro-seeding).
10.33. Do not increase the seeding rate to compensate for poor seedbed conditions.
10.34. Monitor temporary erosion control measures to prevent seed loss.
10.35. Some seeding procedures may have to be completed or repeated in subsequent years.

Alternatives to Seeding

10.36. Use topsoil seed bank in small areas when there is no risk of erosion or competition from invasive species (i.e., natural regeneration).
10.37. Use native transplants in areas where conventional seeding applications are not applicable or where slope stability is an issue.
10.38. Use conventional forestry planting methods for container grown transplants, see website for guidance.

Reclamation Standards

10.39. Minimum standard for plant density is 25 plants/m^2, with 90% frequency.
10.40. Minimum standard for plant cover is 80% ground cover, with 90% frequency.
10.41. Minimum standard for plant community composition standard is 50% cover and 90% frequency of native species.
10.42. Exclude species designated as weeds in the work sites from the plant density standard consult local vegetation ecologist for current site specific non-native vegetation management program.
10.43. Rock, plant litter and non-vascular species are included in the cover standard.
10.44. Remaining plant cover of seeded native species is acceptable.

Reclamation Plot Evaluation

10.45. Select any site within reclamation area measuring 10 x 10 m, providing 100 plots of 1 square meter.
10.46. Measure the plant density, cover and composition in each of the 100 square meter plots.
10.47. The reclamation standard will have been met if 90 of the 100 plots match or exceed the criteria.
10.48. No fertilizer will be applied one year before the reclamation standard is evaluated.

Time Limits

10.49. Inspect site annually during the growing season.
10.50. Minimum reclamation standard, as above, to be met within one season post planting.
10.51. Apply amendments annually, depending on reclamation progress.

10.52. Re-seed site if the plant density standard is not expected to be achievable within 5 years.

- A new restoration plan will be prepared and implemented when reclamation standards have not been met after 5 years.

11. Drainage Structures Mitigations Module

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

Timing of Works

11.1. Time work in water to respect **timing windows** to protect fish, including their eggs, juveniles, spawning adults and/or the organisms upon which they feed. Contact your local aquatics specialists and DFO offices for further information on **timing windows** in your region.

11.2. Conduct in-stream work during periods of low flow, or at low tide, to further reduce the risk to fish and their habitat or to allow work in water to be isolated from flows.

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

11.4. If the work schedule requires working in the rain, the area of work must be isolated and appropriate sediment controls installed to prevent the release of sediment-laden water or any other deleterious substances into surface waters.

Drainage Structures

11.5. Isolate your work area from any flowing water that may be present. Ensure any flows are temporarily diverted around the portion of the ditch or watercourse where you are working.

11.6. Select appropriate equipment and work access routes to reduce damage to riparian vegetation and watercourse banks when using earth-moving equipment.

11.7. For smaller scale debris and sediment removal activities, remove materials by hand.

11.8. To assist with bank stability and invasive plant prevention, leave topsoil and root systems intact on channel banks surrounding your work area.

11.9. Ensure any works to repair damaged structures retain the pre-repair channel conditions (e.g., streambed profile, substrate, channel cross section) and do not constrict the stream width.

11.10. Maintain effective sediment and erosion control measures until complete re-vegetation of disturbed areas is achieved.

Culverts

If a proposed culvert crosses a stream where fish are present, the crossing should be designed or upgraded to provide fish passage and avoid interference with fish habitat. To mitigate the

impact of culverts on fish movement technical assessment of the water flows and fish species is required to establish a culvert design that will allow for passage of fish. Often there are regional or provincial best practices available online and qualified professionals can assist with designs. Some best management practices for installation or replacement of culverts follows.

Culvert Design and Alternatives

Utilize alternative crossing structures (e.g. clear span bridges, lock blocks and concrete decks) as a replacement for culverts, where possible.

11.11. Ideally, crossings should have natural streambed material through them to allow continuous substrate that matches the streambed below and above the crossing. Open bottom crossings are ideal for maintaining natural substrate.

11.12. Utilize a single large culvert design over a multiple culverts design (i.e. several smaller culverts) to reduce debris blockage and increased fish and wildlife passage, where hydrologically feasible

11.13. Design culvert bottoms to be placed at least 30cm below the stream bed elevation to ensure culverts remain passable by fish and wildlife by preventing culverts from becoming perched.

11.14. A minimum water depth of 200 mm should be provided throughout the culvert length. To maintain this water depth at low flow periods an entrance/downstream pool can be constructed. In some cases, an upstream pool may also be necessary.

11.15. The culvert slope should follow the existing streambed slope where possible.

11.16. The culvert, inlet(s) and outlet(s) should be adequately protected with rip-rap to prevent erosion and scour around the culvert during high runoff events. The following measures should be incorporated when using replacement rock to stabilize the culvert:

- Place appropriately-sized, clean rocks into the eroding bank area by hand or machinery operating outside the water course.
- Do not obtain rocks from below the ordinary high water mark of any water body.
- Where possible, install rock at a slope similar to the stream bank to maintain a uniform stream profile and natural stream alignment. Otherwise, install the rock at the closest slope required to ensure it is stable.
- Ensure rock does not interfere with fish passage or constrict the channel width.

11.17. Trash racks should not be used near the culvert inlet. Accumulated debris may lead to severely restricted fish passage and potential injuries to fish. Where trash racks cannot be avoided in culvert installations, they must only be installed above the water surface indicated by bank full flow. A minimum of 9 inches clear spacing should be provided between trash rack vertical members. If trash racks are used, a long term maintenance plan must be provided along with the design, to allow for timely clearing of debris.

11.18. Natural or artificial supplemental lighting should be considered in new or replacement culverts that are over 150 feet in length.

11.19. Ensure designs locate culvert structures in areas that minimize impacts to riparian vegetation and associated wildlife.

Culvert Installation

11.20. It may be necessary to exclude fish from the immediate construction site while a culvert is being installed. If this practice is necessary, fish shall be salvaged by a qualified aquatics professional from within the exclusion area.

11.21. If dewatering is required refer to the dewatering mitigation module of this BMP for appropriate mitigations.

11.22. Maintain effective sediment and erosion control measures until complete re-vegetation of disturbed areas is achieved.

11.23. Remove any old structures to a suitable upland disposal facility away from the riparian area and floodplain to avoid waste material from re-entering the watercourse

Wildlife Considerations for Culverts

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

12. Bridge Maintenance Mitigations Module

Bridge structure management activities include the cleaning and painting of bridge structures as well as the repair, rehabilitation, and replacement of bridge elements including decks, railings, abutments, and bearings. Works may include asphalt, concrete works, chipping, painting, grouting, timber truss, abutment and piling maintenance. These activities help ensure bridge structures remain structurally sound and safe for public use.

Timing of Works

12.1. Time work in water to respect **timing windows** to protect fish, including their eggs, juveniles, spawning adults and/or the organisms upon which they feed. Contact your local aquatics ecologists, provincial jurisdictions and DFO offices for further information on **timing windows** in your region.

12.2. Conduct in-stream work during periods of low flow, or at low tide, to further reduce the risk to fish and their habitat or to allow work in water to be isolated from flows.

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

12.4. Cover or otherwise contain stockpiled materials during heavy rain events or extended absences.

12.5. If the work schedule requires working in the rain, the area of work must be isolated with appropriate sediment controls installed to prevent the release of sediment-laden water or any other deleterious substances into surface waters.

Bridge Cleaning

12.6. Schedule bridge-cleaning activities to coincide with the watercourse's spring freshet when possible. At freshet or during periods of high flow a large watercourse will often have its highest background levels of sediment. At this time, the introduction of a small amount of sediment to a watercourse (from bridge cleaning) will have a lower risk of potential impact when considered against those high natural background levels.

12.7. If works are planned outside the freshet or if your region does not experience a freshet, discuss the protocol and timing of these works with your local aquatics ecologist and/or DFO Officer.

12.8. Dry sweep and collect loose material off bridge surfaces before washing the bridge. Adequately seal drains and any open joints on the bridge deck before sweeping or washing to prevent material or sediment-laden wash water from entering any watercourse

12.9. If dry sweeping and preventing direct runoff to waterway is not a feasible way to clean the surface, discussion and planning with local aquatic ecologists will be required.

12.10. Use water alone. If your cleaning activities require degreasers or any other chemical, approval for use must be obtained from local aquatics specialists and/or DFO.

12.11. Contain any wash water or runoff to the bridge deck. Direct wash water towards the bridge approaches and away from the watercourse, then to a vegetated area or contained settling area (e.g., dry ditch channel unconnected to a watercourse) where it can infiltrate.

12.12. If superstructure cleaning is undertaken above or on the bridge deck level, prevent potentially harmful materials from entering into road drains. Block deck drains with suitable barriers (e.g., polyethylene or drain blocks) to prevent direct discharge to a watercourse, or re-route runoff through temporary piping onto adjacent settling pond or structure, using a hydro vacuum would be another option.

12.13. If water for cleaning is extracted from a watercourse, refer to water withdrawal section of this BMP.

Repairs Using Treated Wood Products

12.14. Untreated wood products are recommended, if treated wood is to be used, ensure it has been treated with a wood preservative appropriate for the project. Refer to the *Parks Canada Guide for the Use, Handling and Disposal of Pressure Treated Wood 2009* and any further updates from Parks Canada Real Property – Environmental Management.

12.15. If treated timber must be cut to size, ensure cutting takes place away from the bridge and watercourse. Sawdust from treated wood is harmful to aquatic organisms and must be prevented from entering any watercourse.

12.16. Wood preservatives should be applied in a contained area and not be applied over or within 200m of water.

Bridge and Structure Painting

12.17. Ensure paint flakes, abrasive grits and abrasive/paint flake mixtures do not enter the watercourse as they may leach toxic heavy metals into receiving waters and/or be ingested by fish.

12.18. Install ground covers and/or vertical drapes such as sheets of plastic or air-permeable cloth (e.g., burlap or canvas) prior to removal activities to capture falling debris. Floating barges may be deployed in watercourses to capture falling debris, such as paint flakes and dust.

12.19. Waste materials collected during removal and application of protective coating operations (e.g., blasting abrasives, paint particles, rust and grease) should be

collected and retained for disposal at appropriate locations. Waste materials must not be deposited into watercourses or riparian areas.

12.20. Use hydro blasting or manual techniques, where possible, when removing road dirt, soluble salts and loose paint to minimize impacts to the watercourse.

12.21. Use water without cleaning agent additives if grease film removal is necessary.

12.22. Avoid use of toxic liquid paints, primers, solvents, degreasers and rust inhibitors.

12.23. Minimize spill potential by storing, mixing and transferring paints and solvents on land.

13. Water Withdrawal and Dewatering Mitigations Module

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

Timing Windows

13.1. As a general guide to prevent taking more water than aquatic system can support, limit total take of water to less than 5 successive days and less than 10 days in any period of 30 days.

13.2. Avoid water withdrawal during breeding seasons of amphibians and reptiles to avoid destruction of egg masses, consult local aquatics ecologist for site specific guidance.

Water Withdrawal

13.3. Water should not be withdrawn from a wetland or stream less than 5 metres wide at the surface or a lake less than one hectare in area.

13.4. Water withdrawal should follow the 10/90 rule which allows for up to 10% of the stream flow to be withdrawn, as long as the stream flow does not fall below the 90% exceedence flow (eg.1 in 10 chance in a given year).

13.5. No permanent or semi-permanent works for water withdrawal should be placed in the stream channel.

13.6. Screen any water intakes or outlet pipes to prevent entrainment or impingement of fish, amphibians and/or reptiles. Entrainment occurs when a fish or amphibian is drawn into a water intake and cannot escape. Impingement occurs when an entrapped fish, reptile or amphibian is held in contact with the intake screen and is unable to free itself.

Pump Screens

13.7. In freshwater, fish-bearing waters design and installation of intake end-of-pipe fish screens:

- Locate screen in areas and depths of water with low concentrations of fish throughout the year away from natural or artificial structures that may attract fish that are migrating, spawning, or in rearing habitat.
- Orient the screen face in the same direction as the flow of water.
- Ensure openings in the guides and seals are less than the opening criteria to make "fish tight".

- Screens should be located a minimum of 300 mm (12 in.) above the bottom of the watercourse to prevent entrainment of sediment and aquatic organisms associated with the bottom area.
- Provide structural support to the screen panels to prevent sagging and collapse of the screen. Large cylindrical and box type screens should have a manifold installed to ensure even water velocity distribution across the screen surface. The end of the structure should be made of solid materials and the end of the manifold capped.
- Heavier cages or trash racks can be fabricated out of bar or grating to protect the finer fish screen, especially where debris loading (woody material, leaves, algae mats, etc.) is a concern. A 150 mm (6 in.) spacing between bars is typical.
- Provision should be made for the removal, inspection, and cleaning of screens.
- Ensure regular maintenance and repair of cleaning apparatus, seals, and screens to prevent debris fouling and impingement of fish.
- Pumps must be shut down when fish screens are removed for inspection and cleaning.

Dewatering

13.8. A site specific dewatering plan is required be provided before commencing a pump-out sump to dewater excavation sites with specific details on how and where the water will be discharge.

13.9. Site specific mitigations may be required depending on the conditions of the discharge area, freezing conditions operation, overflow avoidance, decanting and settlement pond reclamation.

13.10. Water containing suspended materials shall not be pumped into watercourses, drainage systems or on to land, except with the permission of the SO.

13.11. Soil and vegetation erosion protection is required for water pumped on to land.

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http://www.fao.org/docrep/w8297e/w8297e00.htm

Appendix 1 Regulatory Guidance

Jurisdictions

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

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

Canada National Parks Act and Regulations-Parks Canada

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

Fisheries Act - Fisheries and Oceans Canada

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

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

Migratory Bird Convention Act – Environment Canada

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

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

nesting is likely to occur, Environment Canada is publishing estimated regional nesting periods within large geographical areas across Canada referred as "nesting zones". These periods are estimated for each zone and consider the time of first egg-laying until the young have naturally left the vicinity of the nest. Field Units may wish to refine this section and add their known local nesting periods.

Species at Risk Act

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

Appendix B

Environmental Protection Plan Template Document

Company Logo

Project Name

Parks Canada Contract No. XX-XXXX

Environmental Protection Plan (EPP)

YYYY-MM-DD

Prepared by:

Contents

Tables

Appendices

A	Environmental Briefing Record
B	Daily Reporting Template
C	Incident Reporting Template
D	Instream Work Plans or other
E	Restricted Activity and other Permits
F	QEP Resume

Acronyms Used in This Report

Populate this list with any acronyms used in the Environmental Protection Plan (EPP). This would include Parks Canada Agency (PCA) terminology like Environmental Surveillance Office (ESO) or Field Units (FU). In the body of the report use the non- abbreviated form followed by the acronym in brackets when introducing a term. Consecutive uses are to use the acronym.

ACM	Asbestos Containing Material
BMP	Best Management Practice
BIA	Basic Impact Analysis
DIA	Detailed Impact Analysis
DR	Departmental Representative
EIA	Environmental Impact Analysis
EPP	Environmental Protection Plan
ESO	Environmental Surveillance Officer
ESC	Erosion & Sediment Control
GWM	General Wildlife Measures
LOS	Line of Sight
MBCA	Migratory Bird Convention Act
MBNS	Migratory Bird Nest Survey
NTU	Nephelometric Turbidity Units
PCA	Parks Canada Agency
PCB	Polychlorinated Biphenyl
PVC	Polyvinyl Chloride
SARA	Species at Risk Act
SDS	Safety Data Sheets
TSS	Total Suspended Solids
UWR	Ungulate Winter Range
QEP	Qualified Environmental Professional

Document Number	**XXX-XXX**	**Rev X**

Revision Record

Rev	**Description**	**Originator**	**Checker**	**Approved**	**Date**
X	*Title of Document*	*Author*	*Reviewer*	*Y/N*	*yyyy-mm-dd*

1. Project Description

1.1. Background

State the name of the project, consultant, contractor and QEP. Provide a brief description of key elements & related activities. Reference the approval document for the PCA environmental assessment: either a Detailed Impact Assessment (DIA), Basic Impact Assessment (BIA), or Best Management Practices (BMPs). Ensure that procedures described in this EPP are consistent with that approval.

1.2. Location

Include a figure or refer to a map in the appendices which outlines the entire project footprint including any off-site requirements. Emphasis should be placed on any areas that are considered environmentally sensitive and are thus subjective to greater scrutiny under the provisions of the EPP.

1.3. Scope

Summarize the Project activities and describe any activities that are required to successfully complete the project that were not covered in the environmental approval.

1.4. Project Components

Methodically list and detail the phases or major construction activities to be undertaken by the Contractor, with emphasis on tasks considered to carry higher environmental risk. Consider all elements that were identified during completion of the DIA, BIA or BMP-based projects.

1.4.1. List construction or related activities to be undertaken

1.4.2. List construction materials to be used and their source location

1.5. Schedule and Timing Windows

Describe how project scheduling has been planned to avoid or reduce potential impacts to sensitive environmental resources. Key project elements bearing environmental risks that require detailed planning and scheduling considerations should be featured such as works to be conducted in or around water.

1.5.1. General Schedule

1.5.2. Least Risk Work Periods and Timing Windows

1.6. Existing Environmental Resources

Provide a brief synopsis of environmental resources occurring within the project footprint and primary environmental considerations.

Summarize all (if any) sensitive fauna / flora / ecosystems which occur within or near the project footprint based on previous findings from the DIA, BIA and Project Description. If any at risk ecosystems are present, a specific plan mitigating any foreseeable impacts through the implementation of BMPs or mitigations as listed in the DIA, or BIA must be included in the EPP.

1.6.1. Fauna

1.6.2. Flora

1.6.3. Ecosystems

1.6.4. Aquatic Resources

Summarize all previously identified sensitive aquatic habitat occurring in and around the project footprint based on previous findings from the DIA, BIA or Project Description. Recap major features such as watercourses or wetlands including known fish presence. Instream Work Plans, as applicable, can be included as an Appendix and discussed further under the Water Management section.

2. Environmental Protection Plan

2.1. Objective

*State the purpose for which the EPP was created. The EPP describes site specific environmental protection measures and obligations that **must** be upheld and implemented for successful completion of the project.*

2.2. Environmental Briefing and Training

Refer to the person(s) responsible for training construction personnel. Discuss how the briefing will be documented and achieved to confirm that all personnel onsite have attended the briefing.

2.3. Awareness and Communication

In this section, describe how any updates to the EPP and its content will be communicated to site personnel. Describe ongoing measures to train workers.

2.4. Roles & Responsibilities

2.4.1. Parks Canada Agency Environmental Surveillance Officer (ESO)

The PCA ESO is responsible for communicating the environmental expectations of the project and ensuring that the standards identified in the DIA/BIA are upheld. The PCA ESO will work closely with the Departmental Representative to maintain the integrity of the EPP and assess the effectiveness of the applied BMPs. Discuss and/or list the specific responsibilities of the PCA ESO.

2.4.2. Contractor

The Contractor is tasked with the delivery of a quality product that meets or exceeds the environmental considerations identified prior to construction. Stress the importance of start-up and daily job planning meetings to successfully accomplish this objective. Discuss and/or list the general environmental obligations to be upheld by the Contractor including any additional details specified in tender documents.

2.4.3. Qualified Environmental Professional

Level of effort required by the QEP is to be in accordance with Contract Documents and may vary per project. QEP may be required to perform daily on-site environmental monitoring services during the Project activities. QEP will required to monitor conditions in the vicinity of the Project to ensure compliance with the EPP and environmental approval documents. QEP is to work with the contractor, PCA ESO and Departmental Representative in ensuring all environmental obligations are met and standards are upheld.

2.4.4. Departmental Representative

On behalf of PCA, the DR is generally responsible for overseeing project construction to confirm compliance with technical, operational and environmental provisions as defined in applicable legislation, regulations, guidelines, contract documents and specifications, the site specific EPP and standard BMPs. Discuss and/or list the specific roles in which the DR will assume during the construction of the project.

2.5. Environmental Monitoring, Reporting and Compliance

Outline the required QEP monitoring frequency for the project and provide a reporting template as an Appendix*. Discuss how potential non-compliance items will be documented.*

Note that ESO and Departmental Representative monitoring for environmental compliance may not be as frequent and thorough as required by the contractor / QEPs.

2.5.1. Daily Reporting

2.5.2. Incident Reporting

2.5.3. Non-Compliance Reporting

2.6. Environmental Suspension Order

Discuss the authority and responsibility of the ESO, DR or QEP to suspend works with the potential to harm the environment, that is in contravention of the DIA, BIA, BMP approvals or any federal act. Outline the protocol and describe the reporting process for suspension.

2.7. Contact List

All communication from the Contractor / QEP is to go through the Departmental Representative, unless it is an emergency then PCA Dispatch can be contacted and the Departmental Representative immediately notified.

Table 1. Contact List

Project Personnel	Name	Company	Phone Number
Project Manager		PCA	Office: Mobile:
Environmental Surveillance Officer		PCA	Office: Mobile:
Departmental Representative		PCA	Office: Mobile:
Project Manager		Contractor	Office: Mobile:
Superintendent		Contractor	Office: Mobile:
Qualified Environmental Professional		Contractor	Office: Mobile:
Health and Safety Supervisor		Contractor	Office: Mobile:
PCA Dispatch Office		PCA	Office: Radio:

3. Permits, Approvals and Authorizations

Highlight permitting requirements and other items required for compliance. Include a list of environmental notices, permits, and approvals received prior to construction, as well as any permit requires that are the responsibility of the Contractor.

3.1.1. Restricted Activity Permits

3.1.2. DFO or other permits

4. Mitigations and Best Management Practices

Address the requirements of the environmental approvals and provide mitigations in the form of management plans to meet all conditions and restrictions. Mitigations must be accompanied with specific references to applicable PCA BMPs and environmental approvals.

4.1. Vegetation Management Plan

Detail the practices that will be implemented to minimize impacts both inside and outside the project footprint in terms of vegetation clearing.

4.1.1. Tree and Vegetation Removal

4.1.2. Noxious Weed and Invasive Plant Handling

4.1.3. Vegetation Replanting and Site Restoration

4.2. Erosion & Sediment Control Plan

Develop a phased ESC plan expansive to all stages of construction. This plan must be specifically adapted to the scope of the project and should acknowledge any previously identified environmental sensitivities. Discuss monitoring protocols and the frequency of inspections.

4.3. Soil Management

Develop a stringent protocol for the event of contaminated soil and outline BMPs which will be implemented to adequately contain contaminated soils to the site. Include methods for management of stockpiles and temporary storage or excavated materials and other items.

4.3.1. Stockpiles and temporary storage

4.3.2. Chance-find Contaminated Soils

4.4. Water Management Plan

This section should complement the ESC plan and must describe how the Contractor intends to manage all sources and quality of water within the project footprint. If instream works are relevant to this project, this section must outline strategies to dewater and divert flows to isolate work areas to maintain relatively dry conditions within the work area.

Instream Work Plans (IWPs) need to be site specific to the culvert / watercourse. Include equipment to be used, methodology, staging plans and QEP involvement. IWPs can be included as an Appendix.

4.4.1. Working in or Around Water

4.4.2. Fish and Fish Habitat

4.4.3. Surface & Ground Water

4.4.4. Handling Suspect Contaminated Water

4.4.5. Water Quality

4.4.6. Water Quality Monitoring

i. Turbidity Monitoring

ii. pH Monitoring

4.5. Wildlife & Human Conflict Management Plan

Detail strategies which will be implemented to prevent unnecessary interactions with wildlife. Prescribe detailed mitigative procedures for items such as handling food wastes and training workers.

4.5.1. Nest Survey

4.5.2. Fish Survey and Salvage

4.5.3. Amphibian and Wildlife Survey and Salvage

4.6. Waste Management Plan

Outline the procedures for handling and disposing of waste materials generated as a result of construction or uncovered by chance.

4.6.1. General Construction Waste

4.6.2. Special or Hazardous Waste

4.6.3. Concrete Materials Handling

i. CO_2 Diffuser Kits

4.6.4. Waste Water

4.6.5. Contamination Prevention

4.7. Air Quality & Dust Control Plan

Provide technical guidance to reduce the emission of fine particulate matter and greenhouse gases into the surrounding environment.

4.8. Noise and Vibration Management Plan

In this section, indicate mitigative practices to minimize noise and vibration generated by construction activities.

4.8.1. Noise

4.8.2. Vibration

4.9. Spill Procedure & Mitigation Plan

Specify spill prevention measures that will be employed to avoid or minimize potential contamination of the soil, groundwater, and surface water (overland flow). Provide a systematic procedure which will be implemented should a spill of fuel, oils, PCB, lubricants, chemicals or other harmful substances occurs at a work site. Specify the location and contents of suitable spill abatement kits

4.9.1. Fuel and Hazardous Material Storage

4.9.2. Spill Prevention

i. Refuelling Plan

4.9.3. Hydrocarbon Products

4.9.4. Spill Response Plan

Include the appropriate PCA Dispatch number for reporting spills and list the minimum spill volume that would trigger an immediate call to Dispatch for reporting (as per Project Specifications and Environmental approval documents).

4.9.5. Spill Abatement Kits

4.10. Fire Response Plan

Provide BMPs to reduce the risk of fire, especially if the project occurs in a particularly vulnerable area, during seasonally dry conditions, and involves activities that may spark or emit heat.

4.11. Site Restoration Plan

Provide details for restoring the site to its natural pre-disturbance conditions, as applicable to the works.

4.12. Cultural Management Plan

4.12.1. Existing Archaeological Sites

4.12.2. Archaeological Accidental Finds

4.13. Visitor Experience

Provide mitigative measures to maintain visitor experience during active construction and upon completion of the Project. Consider strategies that limit disturbance and are least likely to cause inconvenience as well as utilizing construction methods, products and materials that will not negatively impact visitor experience.

5. References

(Examples)

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Appendix A – Environmental Briefing Record

Appendix B – Daily Reporting Template

Appendix C –Incident Reporting Template

Appendix D – Instream Work Plans or other

Appendix E - Restricted Activity and other Permits

Appendix F - QEP Resume

Appendix C

Material Disposal Site Release Form

RELEASE

IN CONSIDERATION of the delivery and unloading of fill material, **THE UNDERSIGNED** hereby for themselves, their administrators, successors and assigns release and forever discharge **Parks Canada Agency** from any and all action, causes of action, claims and demands for upon or by reason of any damage to property which heretofore has been or hereafter may be sustained in consequences of the material delivered in the County of _____, Nova Scotia on or about the _____ day of _____ 20 _____.

THE UNDERSIGNED hereby affirm the disposal site is not a wetland. Further, **THE UNDERSIGNED** hereby agrees the surplus excavated material shall not be placed in a wetland unless specifically permitted by the Nova Scotia Department of Environment and Labour. The **Contractor and/or recipient** of the surplus excavated material will be held responsible for all environmental permitting and liability.

AND FOR THE SAID CONSIDERATION, the undersigned agree not to make claim or take proceedings against any other person or corporation who might claim contribution or indemnity under the provisions of any statute or otherwise.

WITNESS this _____ day of _____, 20 _____.

X_____ **X** _____
Witness *(please print)* **Signature of Witness**

IN THE PRESENCE OF:

X_____ **X** _____
Resident *(please print)* **Contractor** *(please print)*

X_____ **X**_____
Signature of Resident **Signature of Contractor**

Address of Resident:

_____
Civic number, Road name, City/town/village, Postal Code

Location of Material Disposal: *(if different from resident's address)*

_____
Civic number, Road name, City/town/village, Postal Code