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SPECIFICATION

PROJECT NO. 669
PHASE 8 – North Mountain

CAPE BRETON HIGHLANDS NATIONAL PARK, NS

ISSUED FOR TENDER

2022-01-26

Specifications
Issued for Tender

Parks Canada Agency

Project No. 669
Phase 8 – North Mountain
Cape Breton Highlands National Park, NS

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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 two rock slopes along the Cabot Trail Highway at North Mountain, within the Cape Breton Highlands National Park, NS as illustrated on the attached Project Drawings.

.2 The two slopes are identified as OL4079 and RL4086, and are located at approximate Stations 40+840 to 40+920 and 40+920 to 41+050, 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 OL4079:

.1 Cleanout and reinstatement of roadway catchment ditch.

.2 Cleanout and re-ditching around culvert inlet to ensure positive drainage. Restoration of culvert inlet surface treatment (geotextile and rip-rap apron) as required.

.3 Removal off site and disposal of ditch debris at a disposal site outside the Park boundary.

.4 Supply and installation of new precast F-Shape Jersey Barriers with custom ashlar finish. Where required, widen road shoulder to the minimum width for barrier placement beyond the useable shoulder. Perform shoulder surface maintenance to reinstate grade and compaction where impacted by washouts/erosion/etc.

.2 RL4086:

.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 ditch.

.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 rock anchors as per direction of Departmental Representative.

.6 Installation and testing of rock anchors.

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

.4 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.

.5 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.**

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

.7 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 Slopes OL4079 and RL4086 are located upslope along the Cabot Trail highway on North Mountain in the Cape Breton Highlands National Park,.

.3 The Cabot Trail is a two-lane, undivided roadway. In the area of the work, the speed limit is 50 km/h with an advisory limit of 30 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..

.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 completion date is as indicated on the Bid and Acceptance Form (BA) of the Invitation to Tender (ITT).

.4 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.

.5 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.

.6 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.

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

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

.1 OL4079:

.1 Ditch clean-out and restoration.

.2 Removal off site and disposal of debris.

.3 Installation of precast F-Shape Jersey Barriers.

.2 RL4086:

.1 Scaling.

.2 Installation of rock anchors.

.3 Ditch clean-out and restoration.

.9 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 needed 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, in writing, 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 Establish location and extent of any service lines in area of work before starting Work. Notify the Departmental Representative of findings.

.2 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. Protection measures by the Contractor are to be documented on the clearance report and agreed to by signature between the utility company and Contractor prior to submission to Parks Canada Agency.

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

.4 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 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 Infrastructure within the work area, includes, but is not limited to, asphalt and shoulder surfaces, gutters, offtakes, 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 slope remediation work 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, offtakes, 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 All work on this Contract shall be carried out during daytime hours. There are no general restrictions on working weekends or holidays. Day time hours will be those posted by Environment Canada for the location nearest the work area.

.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 $ 30,000.

.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, and installation of additional precast concrete barriers).

.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, 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 Lump Sum Item 6 – Section 31 23 33.01 – Excavating, Trenching and Backfilling - Culvert Inlet Repairs

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

.2 This item includes:

.1 Removal of all materials and debris inside existing culvert as indicated on the Drawings.

.2 Re-ditching around inlet to ensure positive drainage as indicated on the Drawings.

.3 Supply and placement of culvert inlet treatments (geotextile and rip-rap) as shown the Drawings is considered incidental to this item.

.4 Haulage and disposal of debris and materials from culvert cleanout and re-ditching work will be paid separately under Unit Price Item 4.

.5 Dewatering of site and temporary water control works, if required.

.8 Unit Price Item 1 – Section 31 23 16 – Excavation of Rock Slope Debris

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

.2 The excavation, hauling, and disposal of material off site (Rock Slope Debris, debris from culvert repairs, and unsuitable/excess common excavation materials from shoulder widening) 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 of catchment ditches, the Departmental Representative may require that a survey be completed 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 and disposal of unsuitable materials from embankment/shoulder widening due to Contractor activities will not be measured separately for payment.

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

.9 Unit Price Item 2 – 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 Excavation of Rock Slope Debris bid item.

.10 Unit Price Item 3 – 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 designated 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.

.11 Unit Price Item 4 - Section 31 23 33.01 – Excavating, Trenching and Backfilling – Gravel Borrow

.1 Unit of Measurement: Metric Tonne (t).

.2 Method of Measurement: From scale and ticket generated and signed by the Departmental Representative.

.3 This item includes: Supply, handling, loading, hauling, placing, grading and compaction of approved fill material for roadway embankment widening, as indicated on the Drawings, or as directed by the Department Representative.

.4 There shall be no payment for extra thickness or width of gravel borrow placed beyond the limits indicated on the Drawings or approval of the Departmental Representative.

.5 Gravel Borrow material to complete the Work is to be sourced and provided by the Contractor to the approval of the Departmental Representative.

.6 Unsuitable materials fill materials placed due to Contractor activities shall be removed from the project limits and shall not be measured for payment.

.12 Unit Price Item 5 – 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 Pull-Out Testing of rock anchors as per the specifications 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.

.13 Unit Price Item 6 - Section 32 11 23 – Aggregate Base Courses – Type 1S Gravel

.1 Unit of Measurement: Metric Tonne (t).

.2 Method of Measurement: From scale and ticket generated and signed by the Departmental Representative.

.3 This item includes: Supply, handling, loading, hauling, placing, fine grading and compaction of granular base materials, as well as any incidentals, to the limits and at the locations indicated on the Drawings, or as directed by the Departmental Representative.

.4 There shall be no payment for extra thickness or width of base materials placed outside of the theoretical lines and grades as indicated on the Drawings or approval of the Departmental Representative. Whenever in the opinion of the Departmental Representative there is extra thickness or width, the appropriate weight will be deducted.

.14 Unit Price Item 7 – Section 34 71 43 – Concrete Jersey Barrier – F-Shape

.1 Unit of Measurement: Each (Ea) barrier.

.2 This item includes: Supply and installation of new F-shape barrier sections, including tapered end sections, hardware for anchorage, and delineators, as indicated on the Contract Drawings. The Contract Unit Price shall be considered full compensation for all requirements in this specification, including provision of labour, equipment and materials.

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 & Utility Clearances.
.4 Mobilization.
.5 Material Delivery Dates
.6 Traffic Control.
.7 Scaling Operations
.8 Excavation of Rock Slope Debris.
.9 Installation Rock Anchors.
.10 Installation precast concrete barriers.
.11 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.

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 slope RL4086 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 OL4079, 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 400 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 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 Agency (PCA) Preapproved Routine Impact Assessment (PRIA) – Roads and Related Infrastructure, 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 Preapproved Routine Impact Assessment - Roads and Related Infrastructure (May 6, 2021).

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 all paved surfaces within the Work area.

.4 Clean and clear all debris along ditches and culverts within Work area.

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 DEFINITIONS

.1 As-Built Drawings: means a complete set of stamped and signed Engineering drawings prepared following the completion of construction that shows, insofar as possible, the true co-ordinate location and pertinent information regarding all infrastructure constructed, placed or installed.

1.4 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 an external memory stick.

1.5 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 Site Instructions.

.5 Change Orders and other modifications to Contract.

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

.7 Field test records.

.8 Inspection certificates.

.9 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.

1.6 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.

1.7 FINAL SURVEY

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

1.8 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.

.3 Section 31 23 33.01 – Excavating, Trenching and Backfilling

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 resting in 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, the Departmental Representative may request a survey to 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 (offtakes, 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. Any existing ditch check dams are to be protected, or re-instated post-construction.

.6 Where disturbed, the highway shoulders shall be reinstated to match existing dimensions and compaction. Asphalt gutters, RAP shoulders and offtakes are to be protected, or re-instated post-construction at no cost to Parks Canada Agency.

.7 Existing 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 caused by the Contractor shall be repaired at no cost to Parks Canada Agency. If culvert is damaged beyond repair, a full replacement is required. Re-ditch inlet area to restore positive drainage, as required. Restore RAP inlet apron as required.

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

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

.10 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 16 – 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, 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 or 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 access and inspect the slope and scaling work. 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 RELATED REQUIREMENTS

.1 Section 01 35 43 – Environmental Procedures.

.2 Section 31 24 13 – Roadway Embankments.

.3 Section 31 32 19.01 – Geotextiles.

.4 Section 01 33 00 - Submittal Procedures

.5 Section 31 23 16 - Excavation of Rock Slope Debris

.6 Section 01 35 29.06 - Health and Safety Requirements.

.7 Section 32 11 23 - Aggregate Base Courses

1.2 MEASUREMENT FOR PAYMENT

.1 See Section 01 29 00 - Payment Procedures.

1.3 REFERENCES

.1 American Society for Testing and Materials International (ASTM): latest edition:

- .1 ASTM C117, Standard Test Method for Material Finer Than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.
- .2 ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- .3 ASTM D422, Standard Test Method for Particle-Size Analysis of Soils.
- .4 ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m ^{3}).
- .5 ASTM D4318, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

.2 Canadian Standards Association (CSA International); latest edition:

- .1 CAN/CSA-A3000, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
  - .1 CSA-A3001, Cementitious Materials for Use in Concrete.
- .2 CAN/CSA-A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete.

.3 Nova Scotia Department of Transportation and Infrastructure Renewal – Standard Specification – (Latest Edition) – Division 2 - Earthworks, Section 3 – Roadway and Drainage Excavation.

.4 Nova Scotia Department of Transportation and Infrastructure Renewal – Standard Specification – (Latest Edition) – Division 5 - Structures, Section 12 – Underground Drainage Systems.

.5 Canadian Environmental Protection Act (Available on-line Government of Canada Website).

.6 Nova Scotia Environmental Act and Regulations.

.7 Nova Scotia Department of Environment:

.1 Erosion and Sedimentation Control Handbook for Construction Sites – Section 2.2 Guidelines for Preparing Erosion and Sedimentation Control Plans.

.8 Occupational Health & Safety Act – Province of Nova Scotia.

1.4 DEFINITIONS

.1 Excavation classes: two classes of excavation will be recognized; common excavation and rock excavation:

.1 Rock: solid material in excess of 1.00 m^3 and which cannot be removed by means of heavy duty mechanical excavating equipment with 0.95 to 1.15 m^3 bucket. Frozen material not classified as rock.

.2 Common excavation: excavation of materials of whatever nature up to required depth, which are not included under definitions of rock excavation.

.2 Unclassified excavation: excavation of deposits of whatever character encountered in Work.

.3 Topsoil:

.1 Material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.

.4 Waste material: excavated material unsuitable for use in Work or surplus to requirements.

.5 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.

.6 Recycled fill material: material, considered inert, obtained from alternate sources and engineered to meet requirements of fill areas.

.7 Unsuitable materials:

.1 Weak, chemically unstable, and compressible materials.

.2 Frost susceptible materials:

.1 Fine grained soils with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to ASTM D422 and ASTM C136.

.1 Table: Frost Susceptible Grading Limits

Sieve Designation	% Passing
2.00 mm	100
0.10 mm	45 - 100
0.02 mm	10 - 80
0.005 mm	0 - 45

.2 Coarse grained soils containing more than 20 % by mass passing 0.075 mm sieve.

.8 Backslope: the slope in a cut between the invert of the roadside ditch and the point where the slope intersects original ground.

.9 Rock Face: the vertical or near vertical face between the top of the existing rock surface and the designated rock or ditch grade line.

.10 Rock slope debris: debris materials produced from slope scaling (including rock, soil, vegetation, etc.) and pre-existing debris resting in the highway ditches.

1.5 QUALITY ASSURANCE

.1 Engage services of a qualified Professional Engineer who is registered or licensed in the Province of Nova Scotia in which Work is to be carried out to design and inspect cofferdams, shoring, bracing and underpinning required for Work.

.2 Design and supporting data submitted to bear stamp and signature of qualified Professional Engineer registered or licensed in the Province of Nova Scotia.

.3 The Professional Engineer is to submit proof of insurance coverage for professional liability. Where the Consultant is employee of the Contractor, submit proof that Work by the Consultant is included in Contractor's insurance coverage.

.4 Submit design and supporting data at least two (2) weeks prior to beginning Work.

.5 Keep design and supporting data on site.

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

.7 Health and Safety Requirements:

.1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.6 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Preconstruction Submittals:

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

.2 Submit records of underground utility locates, indicating: location plan of existing utilities as found in field and clearance record from utility authority, as required.

.3 Samples:

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

.2 Inform Departmental Representative at least 2 weeks prior to beginning Work, of proposed source of fill materials and provide access for sampling.

1.7 EXISTING SITE CONDITIONS

.1 Contractor to visit site prior to submission of Tender.

Part 2 Products

2.1 MATERIALS

.1 Granular Backfill: properties to NSTIR Standard Specifications Division 3 – Granular Materials.

.2 Geotextile: properties to 31 32 19.01 – Geotextiles.

Part 3 Execution

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to sediment and erosion control plan, specific to site, that complies with the Nova Scotia Environment Act and Regulations, in accordance with the Nova Scotia Erosion and Sedimentation Control Handbook for Construction Sites or requirements of authorities having jurisdiction, whichever is more stringent.

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

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

3.2 SITE PREPARATION

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

3.3 PREPARATION/PROTECTION

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

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

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

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

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

3.4 STOCKPILING

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

.2 Stockpile granular materials in manner to prevent segregation.

.3 Protect fill materials from contamination.

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

3.5 DEWATERING AND HEAVE PREVENTION

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

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

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

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

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

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

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

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

3.6 EXCAVATION

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

.2 Excavate to lines, grades, elevations and dimensions as directed by the Departmental Representative.

.3 Complete mass site excavation as specified in Section 31 24 13, Items 3.4.1, 3.4.2 and 3.4.3 and 3.4.4.

.4 All surplus excavated material shall be disposed of outside of Park boundaries. The Contractor and the recipient of the material shall provide PCA with a signed copy of the Material Disposal Site Release Form (Appendix C).

.5 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.

.6 Maintain, at a minimum, one-lane two-way traffic at all times during construction. Maintain, at minimum, one-lane two-way traffic, by way of temporary, fully actuated traffic signals, for long-duration work. Maintain, at minimum one-lane two-way traffic, by way of traffic control persons, for short-duration work.

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

.8 Restrict vehicle operations directly adjacent to open trenches.

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

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

.11 Notify the Departmental Representative when bottom of excavation is reached.

.12 Obtain the Departmental Representative's approval of completed excavation.

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

.14 Correct unauthorized over-excavation as follows:

- .1 Fill over excavated space with approved gravel borrow fill compacted to not less than 98% of Standard Proctor maximum dry density.
- .2 If excavating through roots, excavate by hand and cut roots with sharp axe or saw.

.15 Hand trim, make firm and remove loose material and debris from excavations:

- .1 Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.
- .2 Clean out rock seams and fill with concrete mortar or grout to approval of the Representative.

.16 Install geotextiles in accordance with Section 31 32 19.01 – Geotextiles.

.17 Requirements for the removal, haulage and disposal of rock slope debris from ditches (produced from scaling work and/or pre-existing) are provided in Section 31 23 16.

3.7 FILL TYPES AND COMPACTION

.1 Use types of fill as indicated or specified below. Compaction densities are percentages of maximum densities obtained from ASTM D698:

.1 Embankments: compact to 98%.

.2 Backfilling: compact to 98%.

3.8 BACKFILLING

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

.1 The Departmental Representative has inspected and approved installations.

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

.3 Inspection, testing, approval, and recording locations has been completed and approved.

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

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

.4 Place backfill material in uniform layers not exceeding 200 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.

.5 Place fill in areas as indicated.

3.9 RESTORATION

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

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 31 23 33.01 - Excavating, Trenching and Backfilling.

.2 Section 31 37 00 – Rip-Rap.

.3 Section 01 74 11 – Cleaning

.4 Section 31 23 19.01 – Geotextiles.

1.2 MEASUREMENT PROCEDURES

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

1.3 REFERENCES

.1 Definitions:

.1 Rock Excavation: excavation of:

.1 solid material in excess of 1.00 m^3 and which cannot be removed by means of heavy duty mechanical excavating equipment with 0.95 to 1.15 m^3 bucket. Frozen material not classified as rock.

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

.3 Unclassified Excavation: excavation of whatever character other than stripping encountered in the work.

.4 Free Haul: distance that excavated material is hauled without compensation. Free haul distance to be unlimited.

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

.6 Over Haul: authorized hauling in excess of free haul distance that excavated material is moved.

.7 Embankment: material derived from usable excavation and placed above original ground or stripped surface up to top of subgrade.

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

.9 Borrow Material: material obtained from areas outside right-of-way and required for construction of embankments or for other portions of work.

.2 Reference Standards:

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

.1 ASTM D698-07e1, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m^3).

.2 Nova Scotia Department of Transportation and Infrastructure Renewal - Standard Specification – (Latest Edition) - Division 2 – Earthworks, Section 3 – Roadway and Drainage Excavation.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

1.5 PROTECTION

.1 Protect excavations from freezing.

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

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

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

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

1.6 QUALITY ASSURANCE

.1 Regulatory Requirements:

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

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

Part 2 Products

2.1 MATERIALS

.1 Embankment materials require approval by the Departmental Representative.

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

.3 Borrow material:

.1 Obtain gravel borrow from sources such as quarry or borrow pit as approved by the Departmental Representative.

.2 The Plasticity Index, when tested as per ASTM D4318, shall not exceed 3.

.3 Material shall meet the following grading requirements.

Sieve Size (mm)	Percent Passing (by Mass)
125	100
19.0	20 - 65
0.600	7 - 25
0.075	3 - 10

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify that condition of substrate is acceptable for roadway embankment Work:

.1 Visually inspect substrate in presence of Departmental Representative.

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

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

3.2 COMPACTION EQUIPMENT

.1 Compaction equipment: vibratory rollers or vibrating plate compactors capable of obtaining required density in materials on project:

.1 Demonstrate compaction equipment effectiveness on specified material and lift thickness by documented performance of test-strip before start of Work.

.2 Replace or supplement equipment that does not achieve specified densities.

.2 Operate compaction equipment continuously in each embankment when placing material.

3.3 WATER DISTRIBUTORS

.1 Apply water with equipment capable of uniform distribution.

3.4 EXCAVATING

.1 General:

.1 Notify the Departmental Representative when waste materials are encountered and remove to depth and extent directed.

.2 Excavation limits as provided in contract drawings, unless directed otherwise directed by the Departmental Representative. In the event that undercut is required as directed by the Departmental Representative, compact top 150 mm below undercut to minimum 98% maximum dry density (ASTM D698). Replace with approved fill material and compact.

.3 Treat ground slopes, where subgrade is on transition from excavation to embankment, at grade points as directed by the Departmental Representative.

.2 Drainage:

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

.2 Provide ditches as work progresses to provide drainage.

.3 Construct interceptor ditches as indicated or as directed before excavating or placing embankment in adjacent area.

.3 Rock excavation:

.1 Notify the Departmental Representative, when material appearing to conform to classification for rock is encountered. Provide 12 hour notification.

.2 All rock excavation is to be completed by ripping or jack-hammering.

.4 Borrow Excavation:

.1 Obtain embankment materials from designated borrow areas:

.1 The Departmental Representative to designate extent of borrow areas and allowable depth of excavation.

.2 Remove waste and stripping material from borrow pits to designated locations.

.2 Slope edges of borrow areas to minimum 2:1 and provide drainage as directed.

.3 Trim and leave borrow pits in condition to permit accurate measurement of material removed.

3.5 EMBANKMENTS

.1 Scarify or bench existing slopes to ensure proper bond between new materials and existing surfaces in accordance with Nova Scotia Department of Transportation and Infrastructure Renewal - Standard Drawing – Benching of Embankment Slopes, File No. S-2009-016, located in **Appendix D.**

.1 Method and equipment used to be to be pre-approved in writing by Departmental Representative.

.2 Break up or scarify existing road surface prior to placing embankment material.

.3 Do not place material which is frozen nor place material on frozen surfaces except in areas authorized.

.4 Maintain crowned surface during construction to ensure ready run-off of surface water.

.5 Drain low areas before placing materials:

.1 Place and compact to full width in layers not exceeding 200 mm loose thickness. The Departmental Representative may authorize thicker lifts if specified compaction can be achieved and if material contains more than 25% by volume stone and rock fragments larger than 100 mm.

.6 Where material consists of rock:

.1 Place to full width in layers of sufficient depth to contain maximum sized rocks, but in no case is layer thickness to exceed 1 m.

.2 Distribute rock material to fill voids with smaller fragments to form compact mass.

.3 Fill surface voids at subgrade level with rock spalls or selected material to form earth-tight surface.

.4 Do not place boulders and rock fragments with dimensions exceeding 150 mm within 300 mm of subgrade elevation.

.7 Deductions from excavation will be made for overbuild of embankments.

3.6 SUBGRADE COMPACTION

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

.2 Compact each layer to minimum 95% maximum dry density (ASTM D698) except top 150 mm of subgrade. Compact top 150 mm to 98% maximum dry density.

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

3.7 FINISHING

.1 Shape entire roadbed to within 25 mm of design elevations.

.2 Finish slopes, ditch bottoms and borrow pits true to lines, grades and drawings where applicable. Scale slope by removing loose fragments, for cut slopes in bedrock steeper than 1:1.

.3 Remove rocks over 150 mm in dimension from slopes and ditch bottoms.

.4 Hand finish slopes that cannot be finished satisfactorily by machine.

.5 Round top of backslope 1.5 m both sides of top of slope.

.6 Run tractor tracks over slopes exceeding 3 m in height to leave tracks parallel to centreline of highway.

.7 Trim between constructed slopes and edge of clearing to provide drainage and free of humps, sags and ruts.

3.8 CLEANING

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

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

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

3.9 PROTECTION

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

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 – Submittal Procedures.

.2 Section 01 74 11 – Cleaning.

.3 Section 31 23 33.01 - Excavating, Trenching and Backfilling.

.4 Section 31 24 13 – Roadway Embankments.

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 American Society for Testing and Materials International, (ASTM), most recent edition:

.1 ASTM D 4355, Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus.

.2 ASTM D 4491, Standard Test Methods for Water Permeability of Geotextiles by Permittivity.

.3 ASTM D 4533, Standard Test Method for Trapezoid Tearing Strength of Geotextiles.

.4 ASTM D 4632, Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.

.5 ASTM D 4751, Standard Test Method for Determining Apparent Opening Size of a Geotextile.

.6 ASTM D 6241**,** Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe

.2 Canadian General Standards Board (CGSB), most recent edition:

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

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

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submit product information of proposed product a minimum of 2 weeks prior to beginning work.

1.5 DELIVERY, STORAGE AND HANDLING

.1 During delivery and storage, protect geotextiles from direct sunlight, ultraviolet rays, excessive heat, mud, dirt, dust, debris and rodents.

Part 2 Products

2.1 MATERIAL

.1 Material Properties as indicated in Table 1 – Requirements of Non-Woven Geotextiles

.2 Geotextile: non-woven synthetic fabric, supplied in rolls:

.1 Width: 3.5 m minimum.

.2 Length: 79 m minimum.

.3 Composed of: minimum 85% by mass of polypropylene and/or polyester, with inhibitors added to base plastic to resist deterioration by ultra-violet and heat exposure for 30 days.

.3 Securing pins and washers: to CAN/CSA-G40.21, Grade 300W, hot-dipped galvanized with minimum zinc coating of 600 g/m² to CAN/CSA G164.

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

Table 1- Requirements of Non-Woven Geotextiles

Property	Unit	ASTM	N2
Tearing Resistance (Trapezoid Method)	N	D4533	250 min.
Grab Tensile Strength (Both Directions)	N	D4632	700 min.
Elongation at Break	%	D4632	50 min.
Apparent Opening Size	µm	D4751	50 to 250
UV Stabilization @ 500 hrs	% Ret.	D4355	70 min.
Permittivity	sec^{-1}	D4491	1.25 to 2.75
Puncture CBR	N	D6241	1700 min.

Part 3 Execution

3.1 INSTALLATION

.1 Place geotextile material, at locations directed by the Departmental Representative, by unrolling onto graded surface and retain in position with securing pins or fill.

.2 Place geotextile material smooth and free of tension stress, folds, wrinkles and creases and as per the manufacturer's recommendations.

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

.4 Overlap each successive strip of geotextile 300 mm over previously laid strip.

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

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

.7 Replace damaged or deteriorated geotextile to approval of the Departmental Representative.

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

3.2 CLEANING

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

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

3.3 PROTECTION

.1 Vehicular traffic not permitted directly on geotextile.

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. The requirement for tensioned or un-tensioned anchors are as shown on the Contract Drawings.

.3 Tensioned anchors shall be two-stage grouted with the free length of the anchor fully grouted after tensioning and lock-off (no bond breaker). Required bond and free length size(s) are as shown on the Contract Drawings and will be determined by the Departmental Representative in the field for each anchor. 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.

.4 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. Required length(s) are as shown on the Contract Drawings and will be determined by the Departmental Representative in the field for each anchor. Design pull-out loads are shown on the Contract Drawings.

.5 Rock anchors shall be installed in the general areas as shown on the Contract Drawings at specific locations designated by the Departmental Representative in the field.. The required number, location, length, and orientation of the rock anchors will be determined by the Departmental Representative following scaling, and will depend on the conditions encountered during scaling.

.6 Allowances for each area in the project limits are estimates only. The total project allowance for rock anchors shall be transferable between all slope 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 200 mm by 200 mm by 32 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 Contract Drawings. This information 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 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 access and assess the slopes 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 RELATED REQUIREMENTS

.1 Section 31 32 19.01 - Geotextiles.

.2 Section 01 33 00 - Submittal Procedures.

1.2 MEASUREMENT FOR PAYMENT

.1 See Section 01 29 00 - Payment Procedures.

1.3 REFERENCES

.1 Nova Scotia Department of Transportation and Infrastructure Renewal - Standard Specification – (Latest Edition) – Division 3 – Granular Materials, Section 6 – Loose Laid Rip-Rap.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Place materials defined as hazardous or toxic in designated containers.

.2 Fold up metal banding, flatten and place in designated area for recycling.

.3 Divert left over aggregate materials from landfill to local facility for reuse as approved by Departmental Representative.

.4 Divert left over geotextiles to local plastic recycling facility as approved by Departmental Representative.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

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

Part 2 Products

2.1 STONE

.1 Random Rip-Rap:

.1 Hard, durable, angular quarry stone, free from seams, cracks or other structural defects, to meet the size distribution for use intended, as shown on contract drawings. (See table “Random Rip-Rap Grading Limits” next page.).

.2 Random Rip-Rap for each rock shall have both thickness and breadth greater than or equal to one-third of its length.

.3 Random Rip-Rap shall consist of clean, hard, sound, durable rock, having a density of not less than 2.6 t/m^3 and angular surfaces such that the rocks interlock when placed.

.4 Rock when tested by the Micro-Deval test method in accordance with MTO LS - 618, shall have a Micro-Deval loss not greater than 25%.

.5 Rock when tested by the Freeze/Thaw test method in accordance with MTO LS - 614, shall have a Freeze/Thaw loss not greater than 15%.

2.2 GEOTEXTILE FILTER

.1 Geotextile: as indicated on Plans and in accordance with Section 31 32 19.01 – Geotextiles, Type N2.

Part 3 Execution

3.1 PLACING

.1 Rip-Rap shall be machine placed.

.2 Where Rip-Rap is to be placed on slopes and at the ends of culverts, excavate trench at toe of slope to dimensions as indicated.

.3 Fine grade area to be rip-rapped to uniform, even surface. Fill depressions with suitable material and compact to provide firm bed.

.4 Place geotextile on prepared surface in accordance with Section 31 32 19.01 - Geotextiles and as indicated. Avoid puncturing geotextile. Vehicular traffic over geotextile not permitted.

.5 Place Rip-Rap to thickness as indicated.

.6 Place stones in manner approved by the Departmental Representative to secure surface and create a stable mass. Place larger stones at bottom of slopes.

Random Rip-Rap Grading Limits

Mass	Size (Note 1)	Finer by Mass (%)								
(kg)	(mm)	R-A (Note 2)	R-5	R-25	R-50	R-100	R-250	R-500	R-1000	R-2000
6000	1600									100
4000	1400									70 -90
3000	1300								100	
2000	1100								70 - 90	40 - 55
1500	1000							100		
1000	900							70 - 90	40 - 55	
750	820						100			
500	710						70 - 90	40 - 55		
300	600					100				
250	570						40 - 55			
200	530					70 - 90				0 - 15
150	480				100					
100	420				70 - 90	40 - 55			0 - 15	
75	380			100						
50	330			70 - 90	40 - 55			0 - 15		
25	260			40 - 55			0 - 15			
15	220	100	100							
10	190		70 - 90			0 - 15				
5	150		40 - 55		0 - 15					
2.5	120	0		0 -15						
0.5	70		0 -15							
Thickness (mm) (Note 3)		300	300	500	600	800	1100	1400	1600	2200

Note 1	Approximate diameter (for information only)
Note 2	Random riprap for abutment and slope protection
Note 3	Measured perpendicular to the prepared surface

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures

1.2 MEASUREMENT FOR PAYMENT

.1 See Section 01 29 00 - Payment Procedures.

1.3 DESCRIPTION

.1 This section specifies requirements for supplying, producing and placing crushed quarried stone as Type 1S Gravels (except for gradation adjustment), to lines, grades and typical cross sections indicated, or as directed by Departmental Representative.

1.4 REFERENCES

.1 Nova Scotia Transportation and Infrastructure Renewal:

.1 Nova Scotia Transportation and Infrastructure Renewal (NSTIR), Standard Specification Division 3 Section 2.

.2 American Society for Testing and Materials (ASTM) – Most recent edition:

.1 ASTM C117, Standard Test Methods for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.

.2 ASTM C131, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

.3 ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

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

.5 ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft^3) (600kN-m/m^3).

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

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

.8 ASTM D6938, Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)[1]Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods.

.3 Nova Scotia Environment and Labour:

.1 Pit and Quarry Guidelines.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

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

Part 2 Products

2.1 MATERIALS

.1 Shoulder Material:

.1 Shoulder material shall be Type 1S as per NSTIR Standard Specifications Division 3 – Granular Materials

Part 3 Execution

3.1 INSPECTION OF UNDERLYING SUB-BASE

.1 Place Shoulder Material after surface is inspected and approved by Departmental Representative.

3.2 PLACING

.1 Construct Granulars to depth and grade in areas indicated on the plans or as directed by the Departmental Representative.

.2 Ensure no frozen material is used in placing.

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

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

.5 Place Granular materials using methods which do not lead to segregation or degradation.

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

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

.8 Shoulder material (TYPE 1S) shall be placed as indicated on the Contract Drawings.

.9 Compacted shouldering to be flush with asphalt concrete surface.

3.3 COMPACTING

.1 Density of Granulars will be determined according to ASTM D6938.

.2 Compaction equipment must be capable of obtaining required material densities.

.3 Compact to density not less than 100% maximum dry density in accordance with ASTM D698.

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

.5 Apply water as necessary during compacting to obtain specified density. If aggregate is excessively moist, aerate by scarifying with suitable equipment until moisture content is corrected.

.6 In areas not accessible to rolling equipment, compact to specified density with vibratory mechanical tampers approved by the Departmental Representative.

.7 Equipment:

.1 Compaction equipment to be capable of obtaining required material densities.

.2 Efficiency of equipment not specified to be proved at least as efficient as specified equipment at no extra cost and written approval must be received from the Departmental Representative before use.

.3 Equipped with device that records hours of work, not motor running hours.

3.4 FINISH TOLERANCES

.1 Finished base surface to be within plus or minus 10 mm of established grade and cross section but not uniformly high or low.

.2 Density of Granular Base course will be determined according to ASTM D6938.

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

3.5 CLEANING

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

3.6 PROTECTION

.1 Maintain finished base in condition conforming to this section until succeeding material is applied or until acceptance by Departmental Representative.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 31 23 33.01 - Excavating, Trenching and Backfilling

.3 Section 31 24 13 - Roadway Embankments

1.2 MEASUREMENT PROCEDURES

.1 See Section 01 29 00 – Payment Procedures.

1.3 REFERNCES

.1 Nova Scotia Department of Transportation and Infrastructure Renewal (NSTIR) - Standard Specification – (Latest Edition) - Division 5 – Section 8 – Precast Portland Cement Concrete, Reinforced and Prestressed.

1.4 REQUIREMENTS

.1 Locate any buried utilities at the site prior to performing the work.

.2 Minimum sling angle to be 60 degrees unless noted otherwise.

.3 Contractor to handle precast units ensuring equal load distribution.

.4 Contractor responsible for ensuring all lifting rope, spreader beams, shackles, rope fittings and master links meet required safe working loads.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 The Contractor shall submit for approval, in advance of the work, the type of form coating proposed.

.3 The Contractor shall submit, in advance of the work, the manufacturer’s certification that the materials supplied meet the specified requirements.

.4 The Contractor shall submit concrete mix design proportions and appropriate mix design test data.

.5 Submittals are required in accordance with any cross-referenced Item forming part of this Item.

.6 Shop Drawings:

.1 Submit drawings stamped and signed by professional engineer registered or licensed in the Province of Nova Scotia.

.2 The shop drawings shall show concrete barrier shape, steel reinforcement size and placement details, bar bending schedule, barriers' connection system, anchorages of concrete barriers to the ground, and details of the lifting devices for removing the precast barrier element from the form and for installation of the precast concrete barriers.

Part 2 Products

2.1 MATERIALS

.1 Precast F-Shape Concrete Barriers shall meet NSTIR F-Shape Barrier specifications.

.2 Jersey barrier shall contain an ashlar finish on both faces as per project drawings, to be approved by Departmental Representative prior to fabrication.

.3 All reinforcing steel shall be grade 400W and conform to CAN/CSA G30.18.

.4 All welded wire mesh shall have a Fy = 485 MPa and conform to ASTM A1064-10.

.5 All reinforcing bars to be hot-dip galvanized after fabrication to the requirements of CSA G164/ ASTM A767, or epoxy-coated in accordance with ASTM A775/ASTM D3963.

.6 All interlocking devices and exposed steel hardware to be hot-dip galvanized after fabrication to the requirements of CSA G164/ ASTM A767, or an approved alternative.

.7 All reinforcing steel shall have a 50 mm minimum cover except where approved.

.8 Minimum concrete strength to be 21 MPa at time of stripping.

.9 Concrete materials and methods of construction to CAN/CSA A23.1 and methods of test for concrete to CAN/CSA A23.2.

.10 Concrete curing shall be in accordance with CAN/CSA A23.1.

.11 Concrete requirements:

.1 Concrete exposure class: C1

.2 28-day minimum compressive strength = 45 MPa.

.3 Air content: 5-8%

.4 Maximum water-to-cement materials ratio = 0.4

.5 Nominal aggregate size 13 mm.

Part 3 Execution

3.1 BARRIER CONNECTIONS

.1 The precast concrete barrier connections shall be JJ Hook system.

.1 The maximum joint gap between barrier sections shall be 25 mm.

.2 Where the joint gap exceeds the above tolerances, barrier sections shall be removed and reset to meet the specified tolerance, at the Contractor's expense.

3.2 FINISHING OF CONCRETE SURFACES

.1 The top of the precast section shall have a smooth wood float finish, and all permanently exposed surfaces shall be true and smooth.

.2 Small surface voids due to entrapped air shall be filled with an approved cement mixture. All ridges at junctions of form panels and all bottom edges shall be ground smooth.

.3 No patching of defects other than minor surface imperfections shall occur without the Departmental Representative's approval.

3.3 TOLERANCES

.1 Allowable tolerances for the concrete dimensions of the barriers shall be ±3 mm.

3.4 HANDLING, STORAGE AND SHIPPING

.1 Precast concrete units shall be handled and transported with care to avoid damage. Any damage to units resulting for handling, storage and shipping will not be accepted and must be replaced with new units at no additional cost. Lifting devices or holes shall be consistent with industry standards. Lifting shall be accomplished with methods or devices intended for this purpose as indicated on shop drawings.

.1 Upon request, the Contractor shall provide documentation on acceptable handling methods for the barriers.

.2 Precast concrete sections shall be stored in a manner that will minimize potential damage.

.3 Transportation and delivery of the barriers shall be in compliance with CSA A23.4 and CSA A251.

.1 The barriers shall be stored and transported in an upright position at all times and be lifted by the inserts or other approved devices

.2 Barriers shall not be shipped until the specified 28-Day compressive strength has been reached.

.3 During transportation, the barriers shall be supported on a dry firm base with truck bolsters or battens no less than 100 mm wide and padded with 50 mm of rubber to prevent chipping of the concrete.

3.5 GENERAL

.1 Where required, extend the roadway shoulder to the widths as indicated on the Contract Drawings in accordance with Section 31 23 33.01 and Section 31 24 13. All work shall be completed under the supervision of the Departmental Representative.

.2 Contractor shall ensure proper care during installation in not to damage the existing retaining wall during placement and anchorage.

.3 The Contractor shall install the barrier sections as indicated in the Contract Drawings and/or as directed by the Departmental Representative.

.4 Barrier sections in association with all connections shall be supplied by the Contractor.

.5 Barriers shall be joined together by JJ hook connection system. Connections shall be tight as practicable to limit deformation and rotation of the barriers.

.6 Barrier sections shall be installed level in the transverse direction to the specified alignments and joined together to form a continuous structure.

.7 Each precast concrete barrier sections shall be anchored to the roadway to prevent lateral movement of the barrier.

END OF SECTION

Appendix A

Parks Canada Agency's Preapproved Routine Impact Assessment - Roads and Related Infrastructure (May 2021)

Preapproved Routine Impact Assessment
Roads and Related Infrastructure

Parks Canada National Office
IAA 2019

Preapproved Routine Impact Assessments (PRIA) are pre-determined environmental management and mitigation measures for a defined class of routine, repetitive projects or activities with well understood and predictable effects. Approved PRIAs are an acceptable Impact Assessment pathway as they fulfill Parks Canada's obligations under the *Impact Assessment Act* (IAA) 2019 as a manager of federal lands.

This PRIA applies to the repair and modification of roads or related infrastructure. Routine maintenance with no beginning and end, such as ongoing vegetation maintenance or snow removal is not included in this PRIA. Environmental concerns from ongoing maintenance can be addressed in a Field Unit Standard Operating Procedure.

Incorporating conservation gains and environmental design in the project is encouraged for all Parks Canada projects. This and other proactive planning and design mitigations should be discussed at an early stage. Examples are:

- Impacts of design on wildlife mortality and connectivity (e.g., need for wildlife crossing structures or other mechanisms to reduce mortality at known hotspots).
- Conservation gains as a way to maintain habitat permeability.
- Greening Operations such as designing with materials that have a lower carbon footprint.
- Need for a Reclamation Plan that clearly identifies the goals and objectives, timelines, and budget for the project.

This PRIA shall not be used as is without input from the Parks Canada **Impact Assessment (IA) Practitioner**. The IA Practitioner will first review the PRIA to determine what mitigations apply and what additional information or mitigations are required for the project. This can be done by completing the site-specific tables and adding mitigations to module 1: Site-specific mitigations. Internal specialists (e.g., vegetation, fish, species at risk, reclamation) should be consulted as required. Modules or mitigations that do not apply to the project can only be deleted by the PC IA Practitioner.

Those responsible for project delivery (i.e., external proponents, Field Unit staff, Highway Engineering Services or their contractors) are responsible for implementing the PRIA mitigations and other permit conditions.

Definitions:

Cultural Resource is a human work, an object, or a place that is determined, on the basis of its heritage value, to be directly associated with an important aspect or aspects of human history and culture. The heritage value of a cultural resource is embodied in tangible and/or intangible character-defining elements.

Designated Parks Canada staff refers to a Parks Canada employee on the site that has decision making authority for the project (i.e., not a consultant or contractor). This person is responsible for contacting any Parks Canada specialists as required during the construction period, including the IA Practitioner.

Drainage structures include culverts, ditches, manholes, catch basins, curbs and drains.

Fish habitat means water frequented by fish and any other areas on which fish depend directly or indirectly to carry out their life processes, including spawning grounds and nursery, rearing, food supply and migration areas (subsection 2(1) of the Fisheries Act).

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 is used as the definition of high water mark in managed waterways.

Protected heritage place refers to federal land, submerged land and water, as well as buildings and structures administered by Parks Canada, including National Historic Sites of Canada and historic canals administered by Parks Canada, National Parks of Canada and National Park Reserves of Canada, National Marine Conservation Areas of Canada (including National Marine Conservation Area Reserves of Canada, Saguenay-St. Lawrence Marine Park and Fathom Five Marine Park) and any national urban parks or other places of heritage value identified in the future.

Qualified environmental professional is someone who has qualifications, certification and/or direct experience in the appropriate discipline of practice (e.g., designated professional status, knowledge and direct field experience in a specified skill or area of expertise relevant to the project).

Related infrastructure includes but is not limited to existing parking lots, existing gravel pits, pull-off and traffic ponding areas, bridges, retaining walls, avalanche control structures, signage, guardrails, concrete barrier (aka "Jersey barrier"), drainage structures or service lines. Sidewalks, boardwalks or their associate railings are not considered as roads and related infrastructure (refer to Frontcountry Areas PRIA).

Service lines include underground and aboveground service lines for water, sanitary waste, storm water, natural gas, power and communication. Utilities (water, sanitary sewer, storm water, natural gas) that are provided in pipes are usually located under or adjacent to roadways.

Subsoil is the layer of soil directly below the topsoil. It contains mainly mineral soils, with very little organic matter. It includes the 'B' horizon and sometimes 'C' horizon material. In this document, salvaging of subsoil refers to salvaging all or enough of the B horizon to help promote plant growth after reclamation.

Topsoil is the surface layer of soil, including 'O' horizon and 'A' horizon as defined by the Canadian System of Soil Classification. It contains the organic matter that provides an adequate medium for the germination and growth of plants. It contains the soil seed bank and the majority of soil microorganisms and is used in soil salvage.

Water body includes a lake, a canal, a reservoir, an ocean, a river and its tributaries and a wetland, up to the annual high water mark, but does not include sewage or waste treatment lagoon, a mine tailings pond, an artificial irrigation pond, a dugout or a ditch that does not contain fish habitat as defined in subsection 2(1) of the *Fisheries Act*.

Scope of Application

Scope of Application	This PRIA includes repair and modification of existing roads, parkways and related infrastructure.
	
	Activities included in this PRIA are:
	• Activities that most projects have in common, such as:
	  ○ The management of wildlife, invasive alien species, cultural resources, visitor experience, dust control and noise, work in or near water, erosion and sediment control, establishment and operation of staging and laydown sites, fuel storage and refuelling, emergency planning, site clean-up and waste management and site reclamation activities.
	
	• Specific activities such as:
	  ○ Asphalt production and handling
	  ○ Concrete handling and washout facilities
	  ○ Paving, resurfacing and grading
	  ○ Roadside vegetation removal
	  ○ Excavation, soil stripping and overburden removal
	  ○ Slope stabilization, drilling and blasting
	  ○ Demolition
	  ○ Drainage structures
	  ○ Bridge
	  ○ Water withdrawal and dewatering
	  ○ Fish, amphibian and reptile salvage

Conditions and Exceptions	This PRIA does NOT apply to the following: Location: • Project work in previously undisturbed areas[1] required to build and maintain the road and associated infrastructure (e.g., expansion of a parking lot or gravel pit). • The project results in residual adverse effects to sensitive natural or cultural resources (e.g., nests, dens and roosts, fish spawning areas, cultural resources, riparian areas, wildlife corridors, rare ecotypes, or areas of management concern).

[1] Some examples of disturbance are filling, excavating, stripping, grubbing, grading, bulldozing, compaction or blasting. Disturbance may extend only a few metres or tens of metres from the shoulder, depending on site history.

	General:
	• The project results in residual adverse effects on migratory birds or their nests.
	  ○ Refer to the draft- Parks Canada Guidance on Reducing Risk to Migratory Birds and associated draft- Conservation Measures to Minimize Impacts to Migratory Birds During the Nesting Period.
	
	• The project results in residual adverse effects on an individual, a residence or the critical habitat of a listed species listed under the *Species at Risk Act*.
	  ○ Determine if mitigations are needed to ensure no residual adverse effects to species at risk. Such mitigations should be included in the Supplementary Mitigations section.
	
	• The project is likely to require an approval[1] under the *Canadian Navigable Waters Act* (s. 5(1)).
	  ○ In cases where the project proposes to construct, place, alter, rebuild, remove or decommission works (including temporary work such as a cofferdam) that are in, on, under, through or across any navigable water, there may be a requirement to apply to Transport Canada, for scheduled waterways, or go through the public resolution process, for unscheduled waters. Verify if the project is a "major works" in any navigable water or "works" in Navigable Waters Listed on the Schedule.
	
	• The project is likely to require an authorization[2] under the *Fisheries Act* (s.35(1) or 36(3)).
	  ○ In cases where impacts to fish and fish habitat cannot be avoided, a request for review must be sent to Fisheries and Oceans Canada's Fish and Fish Habitat Protection Program Office.
	
	• The project involves the removal of or causes damage to cultural resources of heritage value, for example, heritage buildings designated by the Federal Heritage Buildings Review Office, archaeological sites, historical and archaeological objects, or cultural landscapes.
	
	• The project involves the removal of or causes damage to paleontological resources.

[1] Check if your project is a major works in any navigable water or works in navigable waters listed on the Schedule: https://www.tc.gc.ca/eng/programs-623.html

[2] DFO project review process to determine whether an authorization is required: https://www.dfo-mpo.gc.ca/pnw-ppe/reviews-revues/request-review-demande-d-examen-002-eng.html

	• The project adversely effects sites of significance to Indigenous peoples or current access and use of areas where hunting, fishing or gathering rights are exercised by Indigenous peoples.
Other considerations	Use of the PRIA may not be appropriate in circumstances where: • The project may adversely effect aquatic or terrestrial wildlife habitat connectivity. • The project results in loss of wetland function[1] as defined by the Federal Policy on Wetland Conservation (1991).
Approved geographic area of application	This PRIA may be used within all Parks Canada administered protected heritage places.
Parks Canada Specialists	Impact Assessment: If there are any questions on how to apply this PRIA, consult a member of the Impact Assessment Team. Species at Risk: If there is any uncertainty regarding potential adverse effects to species at risk, consult a member of the Species Conservation Team. Environmental Management: If there are questions on environmental management issues (e.g., treated wood, contaminated sites, hazardous materials or greening operations), consult a member of the Environmental Management Team. Cultural Resources: If there is any uncertainty regarding potential adverse effects to known or potential cultural resources (terrestrial and/or underwater), consult a member of the Cultural Management Team or, if applicable, the local Field Unit specialist.

[1] Wetland functions include the natural processes and derivation of benefits and values associated with wetland ecosystems, including economic production (e.g. peat, agricultural crops, wild rice, peatland forest products), fish and wildlife habitat, organic carbon storage, water supply and purification (groundwater recharge, flood control, maintenance of flow regimes, shoreline erosion buffering), and soil and water conservation, as well as tourism, heritage, recreational, educational, scientific and aesthetic opportunities.

Valued Components and Effects Analysis

Water Quality and Riparian/Fish Habitat	• Reduced water quality due to transportation of debris and contamination (e.g., from leaks and accidental spills) and introduction of fine sediments directly from activity in the waterbody. • Introduction of deleterious substances from structure maintenance (e.g., sediments, oils, de-icing chemicals, painted chips, treated wood debris, cement-based products, wood preservatives, epoxies, paints or sealants). • Localized changes to surface water hydrology. • Disruption of flow, habitat damage (including erosion), changes to stream channel or death of fish from maintenance and repairs.
Soil/Land Resources	• Soil contamination from wastes (e.g., garbage, litter, sewage, fuel). • Incidental increased disturbance footprint. • Soil compaction and rutting. • Soil erosion, loss of topsoil and exposure of subsoil. • Change in slopes, landforms and landscape.
Air/Noise Quality	• Short-term decreased ambient air quality (e.g., dust, aggregate from paved surfaces, asphalt plant, equipment emissions). • Increased ambient noise level. • Temporary increased levels of CO_2 and other pollutants. • Temporary increased localized temperatures from paving and equipment operation.
Wildlife and Vegetation	• Introduction of disease, invasive alien species (IAS), wildlife attractants, or expansion of existing IAS populations in disturbed areas. • Wildlife sensory disturbance causing displacement/preferred habitat avoidance. • Habitat destruction or alteration (e.g. loss of nests, dens, burrows, aquatic environments). • Wildlife habituation/attraction to artificial food sources. • Impeded/altered wildlife movement. • Damage to nests/disruption of nesting animals. • Injury or mortality from project activities. • Damage to and removal of vegetation, disturbance of adjacent natural areas, root exposure and physiological distress.
Cultural Resources	• Adverse effects to the heritage value or character-defining elements of a cultural resource or a heritage place. • Impacts to archaeological resources (known or potential: (terrestrial and/or underwater) from displacement, compaction or destruction, resulting in loss of heritage value. • Impacts to cultural landscapes, buildings, archaeological sites, engineering works, objects.
Visitor Experience and Safety	• Reduced quality of visitor experience due to noise, visual impacts and presence of construction equipment. • Reduced accessibility to portions of the site where work is taking place. • Hazard to visitors and staff due to construction activities.

Site Specific Valued Components

(to be completed by Parks Canada IA Practitioner)

Instruction to IA Practitioner: Identify site-specific valued components that require special consideration (e.g., waterbodies, sensitive habitats, species at risk or known cultural resources) or specific concerns such as aggressive invasive alien species.

The following is a list of site-specific valued components and areas of concern for this project:
site-specific valued component *site-specific concern (e.g., invasive alien species)*

Instruction to IA Practitioner: Complete this table and copy it to site-specific mitigation in module 1 given that restricted activity periods vary by species and site.

Site-specific Restricted Activity Periods			
Species	**Applicable**	**Date of Restricted Activity Period**	**Notes or Supplemental Mitigations**
Bird breeding and migration	☐	[….]	
Fish spawning and migration	☐	[….]	
Mammal maternity season or hibernation	☐	[….]	
Reptile migrations, nesting and hatching	☐	[….]	
Amphibian migrations, nesting and hatching	☐	[….]	
Other	☐	[….]	

*If useful, complete the Environmental Timing Windows Table (Appendix).

Instruction to IA Practitioner: Answer these questions to help identify missing site specific mitigations or information. If required, add all the supplemental mitigations in site-specific mitigations in module 1 and additional information in the Appendix.

Check list questions to identify site specific mitigations	Check when supplemental mitigation is added to module 1	Check when information is attached in an appendix
Planning		
Is wildlife awareness training required?	☐	☐
Are pre-construction surveys required?	☐	☐
Invasive alien species		
Are additional mitigations for invasive alien species required?	☐	☐
Are site specific invasive alien species protocols attached in the appendix?	☐	☐
Cultural resources		
Are additional mitigations for cultural resources required?	☐	☐
Are cultural resource documents attached in the appendix?	☐	☐
Is cultural resource awareness training required?	☐	☐
Work in or near water		
Are DFO measures to protect fish and fish habitat required? If so, attach in the appendix or add them in supplemental mitigations.	☐	☐
Is the Fish and Fish Habitat Protection Program letter of advice required? If so, attached in the appendix.	☐	☐
Are applicable DFO standards and codes of practice required? If so, attach in the appendix.	☐	☐
Are additional mitigations required for work in or near water (other than DFO information)? If so, add them in supplemental mitigations.	☐	☐
Is an Erosion and Sediment Control Plan required? If so, determine the scale and scope.	☐	☐
Is an in-stream work plan or specific in-water section in Environmental Protection Plan required?	☐	☐
Are additional site-specific mitigations required for drainage structures?	☐	☐
Is a site-specific dewatering plan required?	☐	☐
Are additional fish, amphibian or reptile salvage mitigations required?	☐	☐
Vegetation		
Are approved Reclamation or Environmental Protection Plans required?	☐	☐
Do Field Unit reclamation guidelines exist? If so, attach in the appendix.	☐	☐
Does an approved site-specific seed mix (es) and/or planting species list exist within the Field Unit? If so, attach in the appendix.	☐	☐

Do appropriate site-specific seed mix(es) and/or plantings[1] need to be determined?	☐	☐
Are there revegetation goals appropriate to the ecoregion existing, or required?[2]	☐	☐
Others		
Are there noise management considerations for this project?	☐	☐
Are additional site-specific mitigations for larger scale manual cement mixing activities required?	☐	☐
Are additional site-specific mitigations needed for drilling and blasting?	☐	☐
Are the applicable mitigations from the Geotechnical and Environmental Investigations PRIA attached in the appendix?	☐	☐

[1] If there is no approved species list within the Field Unit, consider the following conditions when selecting plant materials:

- Revegetation with native species is preferred unless otherwise directed by Parks Canada.
- Use species relatively common within local native plant communities.
- Source seeds from local growers to ensure local adaptation wherever possible (within the ecoregion, ecozone, province or as per *Principles and Guidelines for Ecological Restoration in Canada's Protected Natural Areas*).
- Avoid the use of cultivars unless there are no wild species available.
- Consider species' viability in proposed environment and climatic conditions.
- Use species that rapidly establish to effectively control erosion, where required.
- Consider palatability of some species to wildlife and avoid growing attractants in areas of increased risk to wildlife and visitors. Avoid palatable species for roadside reclamation. For additional information see the Parks Canada Guidance on Revegetation to Reduce Wildlife Risk. ADD LINK?

[2] As an example, general reclamation goals for Banff National Parks are:

- <20% Bare soil (>80% Native vegetative cover)
- No new IAS species present (does not include species that were present pre-disturbance)
- No increase in IAS present prior to disturbance (similar plant cover/m^2)
- >80% survival of live plantings
- No erosion issues.

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1. General Activities

Site-specific mitigations

Parks Canada IA Practitioner:

1.1. Add site-specific restricted activity periods and all supplementary mitigation(s) not mentioned in subsequent modules that are required to ensure all potential impacts are mitigated:

a) ...
b) ...

Delivery

1.2. Apply additional mitigation measures mentioned above or attached in protocol as identified the Parks Canada IA Practitioner.

Wildlife

Planning

1.3. Schedule work to avoid restricted activity periods. Refer to site-specific mitigation.
1.4. Provide wildlife awareness training to on-site workers if required by field unit policy or site-specific advice.
1.5. Prior to the commencement of structural work or vegetation removal, complete any pre-work surveys that are required (e.g., invasive alien species, species at risk, migratory birds). Develop a site and species specific mitigation strategy to be implemented in the event that survey results are positive.

Delivery

1.6. Conduct any vegetation clearing outside applicable restricted activity periods, unless otherwise directed.
1.7. If unexpected nests, species at risk or other wildlife are found, cease work in the immediate area and contact designated Parks Canada staff for further direction.
1.8. Control materials that might attract wildlife (e.g., petroleum products, human food and garbage) as part of the waste management plan.
1.9. Never approach or harass wildlife (e.g., feeding, baiting, luring). If wildlife is observed at or near the work site, allow the animal(s) the opportunity to leave the work area.
1.10. Immediately alert designated Parks Canada staff or emergency dispatch of any potential wildlife conflict (e.g., aggressive behaviour, persistent intrusion, etc.), encounters on or around the site or crew accommodation, distress or mortality.
1.11. Conduct activities during daylight hours and avoid critical foraging times (i.e., dusk and dawn) unless otherwise approved by designated Parks Canada staff.
1.12. Minimize the time excavations remain open. Slope the sides to no greater than 1:1 and ensure that wildlife and humans can safely exit it. Cover or fence smaller excavations when left unattended to reduce the potential for wildlife injury.

Invasive Alien Species (terrestrial and aquatic)

Planning

1.13. Develop an appropriate approach to mitigate the establishment and/or spread of invasive alien species (IAS) on the site. If IAS are a serious issue, more effective methods should be detailed in accordance with:
    - an approved integrated pest management plan; and
    - guidance from Parks Canada specific protocols (e.g., Whirling disease protocol).

Delivery

1.14. Wash all construction equipment from outside the Parks Canada protected heritage place prior to arrival to minimize risk of introducing IAS, noxious weeds and soils from off-site. Proof that equipment was washed outside the protected heritage place may be requested before equipment is permitted into the protected heritage place.
1.15. Control IAS in parking or staging areas as needed to reduce the spread of invasive plants or seeds.
1.16. Work in uninfested sites before moving to infested sites.
1.17. Ensure machinery already in the protected heritage place is in a clean condition and maintained free of IAS before moving to new sites, within or beyond the protected heritage place.
1.18. Use caution during loading of trucks and transport of any IAS and plant materials to minimize loss of materials (e.g., cover materials during transport).
1.19. Avoid mowing invasive plants after seed set if it is likely to spread seeds of non-native vegetation.
1.20. Soil, gravel, erosion and sediment control products or other applicable materials shall not be imported from outside the protected heritage place without approval from the designated Parks Canada staff.
1.21. If organic material cannot be used in the construction site, it may be used in other parts of the protected heritage place with approval by the designated Parks Canada staff.
1.22. Minimize ground disturbance, vegetation removal and bare soil exposure (e.g., cover stockpiled material with tarps, plant seeds or plants, cover with natural mulch/ground coverings).
1.23. Stabilize and revegetate disturbed areas as soon as possible. If there is insufficient time remaining in the growing season, stabilize the site to prevent erosion and vegetate the following spring.
1.24. Before and after the use of equipment in waterbodies, clean, drain and dry it on land, to prevent the introduction or spread of aquatic invasive/non-indigenous species.
1.25. If aquatic invasive species are found during dewatering activities, note their presence and abundance and contact the designated Parks Canada staff to ensure compliance with the *Aquatic Invasive Species Regulations*.

Cultural Resources

Planning

1.26. Work with a Cultural Resource Management Advisor and specialists (e.g., archaeologists, historians, and built heritage advisors) to assess the impact of the work/project to cultural resources and on cultural landscapes or character-defining viewscapes and identify necessary mitigation measures.
    - 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 may be required.

- Cultural Resource Identification may be necessary for resources that have the potential to be cultural resources but have not been evaluated yet.

1.27. Work with a Parks Canada archaeologist to compare excavation plans to local archaeological resource inventories if available.

Delivery

1.28. Apply additional mitigation measures as identified by a Parks Canada archaeologist and/or cultural resource management advisor for the immediate area of work.
1.29. Provide on-site workers with appropriate cultural resource awareness training if required.
1.30. Avoid cultural resources (including archaeological sites) unless authorized by designated Parks Canada staff.
1.31. If cultural resources (i.e., structural remains and/or artifact concentrations) are encountered, cease work in the immediate area, secure the site and contact the designated Parks Canada staff for further direction.

Visitor Experience

Planning

1.32. Ensure traffic accommodation plans are consistent with field unit standards, where they exist.
1.33. Consider minor additions to project scope to achieve benefits for visitor experience and safety associated with the road (e.g., including pullouts when paving the road).

Delivery

1.34. Close and mark the work site and safety hazards with appropriate signage while active construction, repair or maintenance is underway; consider temporary detours or reroutes as appropriate.
1.35. If closing the area is not possible, maintain a safe working distance between work activities and visitors. If traffic control is required, use flaggers or other standardized traffic management approaches to direct traffic through the construction/hazard area.
1.36. Keep visitor access trails and roads outside the construction area free of construction materials, waste, machinery and equipment.

In or Near Water Works

Planning

1.37. Determine if DFO measures to protect fish and fish habitat, a DFO Fish and Fish Habitat Protection Program letter of advice, or other water-related mitigations are needed. If so, add them either as supplemental mitigations, or as an appendix to the PRIA.
1.38. To protect aquatic habitat, a 30 m buffer zone is generally required from a waterbody, in which no activities[1] can occur. However, the appropriate buffer zone will be determined based on site-specific conditions by qualified Parks Canada staff or upon the advice of DFO. Where appropriate, the buffer should also apply to storm drain inlets and outlets.

[1] E.g., refueling; storage of hazardous products; long-term stockpiling of soil, aggregate or asphalt; establishment of concrete washout facilities; removal of vegetation.

1.39. Plan in-water work to respect site-specific restricted activity periods to protect fish, amphibians or reptiles, including their eggs, juveniles, spawning or migrating adults and/or the organisms upon which they feed or as directed by the designated Parks Canada staff.

1.40. When appropriate, an in-stream work plan, or a specific section for work in and around water in an Environmental Protection Plan can be developed by a qualified professional (see reference) and is subject to approval by the IA Practitioner.

Delivery

1.41. Work shall comply with *Fisheries Act* and, if provided, mitigations in the letter of advice from the DFO Fish and Fish Habitat Protection Program attached in Appendix.

1.42. Implement erosion and sediment control measures to protect waterbodies, wetlands and riparian environments.

Erosion and Sediment Control

Planning

1.43. A site specific Erosion and Sediment Control Plan[1] (ESCP) must be approved in advance of starting work in the vicinity of waterbodies, wetlands or riparian environments. It must cover all construction and reclamation periods.

1.44. The ESCP must be developed by a qualified environmental professional and is subject to approval by the PC IA Practitioner.

Note:
It is likely that the final details of the plan will be provided later in the process or be modified as each work site is encountered depending on timing of work, site condition, and equipment used. However, typical requirements should be stated early.
Potential considerations are:

- Project design and spatial concept of environmental sensitivities (e.g. waterbodies, riparian, wetlands, steep slopes);
- Erosion prevention (avoidance) procedures (e.g., project schedule, minimization of work area, site management, ground cover measures);
- Sediment control (minimization) measures (e.g., sediment fences, check dams, sediment traps) including specifications and typical drawings of sediment control structures;
- Detailed plans for in-water works including site isolation measures and project timelines;
- Water management plans including site control, equipment necessary and proposed dewatering locations;
- Location of erosion and sediment control measures;
- Monitoring of prevention and control measures and corrective actions (e.g., repairs);
- Removal of non-biodegradable materials once site is stabilized.

[1] Parks Canada AI practitioner has to determine the project risk and sensitivity of the environment and provide ESCP scale and scope, including whether the ESCP may be included within a general Environmental Protection Plan.

Delivery

1.45. Provide a briefing about the ESCP for all crew members on site and ensure they are aware of the mitigations.
1.46. Plan project activities to minimize soil handling and limit equipment movement over exposed soils and steep or unstable slopes prone to erosion.
1.47. If sediment ponds are required, ensure runoff that may reach streams meets CCME turbidity standards.
1.48. Avoid activities that contribute to soil compaction and use practices that roughen and decompact soils to promote infiltration.
1.49. Use erosion and sediment control products, including backing, that are made of 100% biodegradable materials (e.g., jute, sisal or coir fiber) when possible.
1.50. Erosion and sediment control products should be selected to reduce potential for wildlife entanglement/attraction and prevent introduction of invasive alien species.
1.51. Avoid straw-based erosion control unless authorized by designated Parks Canada staff. The use of hay is not permitted due to risk of introducing invasive species.
1.52. All products must be approved by designated Parks Canada staff and installed prior to commencement of work.
1.53. In the event of erosion and sediment control measure malfunction or of deleterious substance, including sediment, run off (current or impending), work shall stop until measures are adjusted to address the problem.
1.54. Minimize the length of time soils are exposed and complete work in one area before commencing work in another area.
1.55. If vegetation clearing is scheduled early due to restricted activity periods, maintain soil stability by delaying grubbing until just prior to construction activities.
1.56. Store excavated material and debris in a stable area above the high water mark or active floodplain and, where possible, 30 m from drainage features and/or the top of steep slopes.
1.57. Protect excavated material from entering a waterbody (e.g., cover with erosion blankets or tarps, seed, or plant with native vegetation).
1.58. Maintain effective sediment and erosion control measures until complete revegetation of disturbed areas is achieved unless directed otherwise by designated Parks Canada staff.

Staging and Laydown Sites

Planning

1.59. Identify key contacts and their respective roles and responsibilities prior to work starting, and communicate this to all on-site workers.

Parks Canada Key Contacts	Roles and Responsibilities	Contacts
Emergency Dispatch:		

Delivery

1.60. Ensure all on-site staff attend a briefing with designated Parks Canada staff before beginning work at the site to review and explain mitigations.
1.61. Delineate the work zone by clearly marking with stakes, flagging tape or other means to limit active construction and define access and egress locations. Remove completely when the project is completed.

1.62. Identify staging areas, material/equipment drop sites, and parking areas. Locate these areas within an existing disturbed footprint (e.g., roadways, gravel surface, previously disturbed areas with high resiliency) or other site as approved by designated Parks Canada staff.
1.63. Use existing roadways, trails, identified disturbed areas or other areas as approved by designated Parks Canada staff for site access.

Noise Management

Planning

1.64. Identify noise limits (e.g., location, time of year), especially near areas of high use by park visitors (e.g., campgrounds, picnic areas) or in vicinity to sensitive areas and wildlife and incorporate into plans and specifications.

Delivery

1.65. Maintain equipment and heavy machinery in good working order (e.g., adequate muffler, regular maintenance).
1.66. Use the noise attenuation devices provided with certain equipment or tools (e.g., compressor side panels).
1.67. Shut off motorized equipment if it is not used for an extended period of time (e.g., lunch break).
1.68. Whenever possible, locate stationary equipment away from noise-sensitive areas or in such a way as to reduce the impact on the ambient noise level.

Fuel Storage and spills

Planning

1.69. A Spill Contingency and Response Plan must be submitted and approved by designated Parks Canada staff prior to starting work.

Note:
The Spill Response Plan must, at minimum, include the following information:

- List of products and materials that are considered or defined as hazardous or toxic to the environment. Such products include, but are not limited to, waterproofing agents, grout, cement, concrete finishing agents, hot poured rubber membrane materials, asphalt cement, sand blasting agents, paint, solvents and hydrocarbons;
- Required equipment on site and location of spill kits;
- Spill prevention procedures (i.e., containment and storage of materials, security, handling, use and disposal of empty containers, surplus products or waste generated in the application of these products in accordance with all applicable federal and provincial legislation);
- Fueling and fuel storage procedures;
- Spill response procedures (i.e., containment, clean-up, disposal of contaminated materials, etc.);
- Spill reporting procedures; and
- Up-to-date emergency response contact list including contact information for reporting spills.

Delivery

1.70. Ensure drip trays are placed under equipment when not in use.

1.71. Retain spill kits sufficient to contain and clean up 110% of the site's largest possible fuel or chemical spill at each location of potential spills, including all sites where equipment is working.
1.72. Provide a briefing about the Spill Response Plan for all crew members on site and ensure they are aware of the location and use of spill kits and containment devices.
1.73. 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 waterbody or soils.
1.74. Take timely and effective action to stop, contain and clean-up all spills if the site is safe to enter. Immediately notify the designated Parks Canada staff of any spill. In the event of a major spill, stop all other work and devote all personnel to spill containment and clean-up. Remediate the site to pre-spill conditions.
1.75. Dispose of contaminants at an approved facility. A detailed receipt of delivery to an approved facility may be requested by the designated Parks Canada staff.

Dust Management

Delivery

1.76. For dust control from all project activities, use only water that is free of waste and organic matter. Chemical dust suppressants shall not be used unless directed otherwise by designated Parks Canada staff, in accordance with Parks Canada health and safety and environmental policies.
1.77. Dust control materials should be applied to pre-wetted surfaces.

Site Clean Up/General Waste Management

Delivery

1.78. Clean tools and equipment outside of protected heritage places to prevent the release of wash water that may contain deleterious substances, unless otherwise directed by designated Parks Canada staff.
1.79. Remove all salvageable, non-combustible and non-hazardous materials and reuse or recycle it to the greatest extent possible.
1.80. Contain and remove all waste in a timely and approved manner, and dispose of it at an approved disposal facility outside the protected heritage places unless otherwise directed.
1.81. Empty construction waste storage containers when 90% full. Provide lids for waste containers, ensure they are wildlife proof if there are attractants, and cover waste loads during transport (including waste containers and truck loads).
1.82. Separate on site any hazardous material[1] and pollutants such as fuels and solvents. Dispose of contaminated materials at provincially or territorially certified disposal sites.
1.83. If present, service portable sanitary facilities on a regular basis and dispose of accumulated waste at a sanitary waste disposal facility. Provide adequately sized portable facilities and manage them to ensure waste is not discharged to the environment.

[1] E.g., asphalt shingles, creosote treated wood, asbestos, lead paint, molds, animal excrement, paints, automotive products, electrical equipment...

1.84. Collect waste materials created during the application or removal of protective coatings (e.g., sandblasting abrasives, paint particles, rust and grease) and retain them for disposal at appropriate locations.

Site Reclamation

Planning

1.85. Post-construction reclamation activities must be detailed in an approved Reclamation Plan, Environmental Protection Plan or other project document prior to construction.

Note:

- Discuss reclamation early in the project scoping and design stage and include in project budget and contract specifications.
- Appropriate site-specific reclamation goals should be determined for the project, depending on the nature of the site and level of disturbance. For most road projects, a Reclamation Plan will outline revegetation methods to achieve a previous state. In certain cases, a Restoration Plan may outline methods to restore ecological integrity or realize additional conservation gains.
- Reclamation Plans should outline any plans for non-native vegetation management, topsoil management, plant materials, revegetation methods, monitoring and maintenance.
- Follow any Field Unit reclamation guidelines where they exist or set revegetation goals appropriate to the ecoregion. As an example, general reclamation goals for Banff National Parks are:
  - <20% Bare soil (>80% Native vegetative cover)
  - No new IAS species present (does not include species that were present pre-disturbance)
  - No increase in IAS present prior to disturbance (similar plant cover/m^2)
  - >80% survival of live plantings
  - No erosion issues.

Delivery

1.86. Implement Reclamation Plans for the disturbed area immediately following completion of construction. Long delays between vegetation removal and revegetation should be avoided. For some projects, revegetation in smaller phases should be considered to minimize soil exposure.

Subsoil and Topsoil Placement:

Planning

1.87. Assess methods of bioengineering such as terracing, willow staking, or live pole drain systems where soils are steeper or remain unstable.

1.88. Avoid use of fertilizer to limit non-native vegetation growth and allow for local species to use available nutrients. Any use of compost, foreign soils, fertilizers, locally sourced mycorrhizae compost and soil amendments must be approved by designated Parks Canada staff.

1.89. Place and grade topsoil before winter.

Delivery

1.90. Excavate, conserve, store and replace existing site topsoil unless otherwise directed by designated Parks Canada staff. Soil imports from other project sites or outside of the

protected heritage place is not generally recommended. However, if required, it must be approved by designated Parks Canada staff.

1.91. Salvage site topsoil using a "two lift" method and store topsoil and subsoil separately for improved reclamation success.
1.92. Compact backfill or allow it to settle to prevent depressions.
1.93. Replace topsoil to all areas immediately following fine grading.
1.94. Do not compact topsoil by driving repeatedly over the site. Keep topsoil "rough and loose" or as directed by designated Parks Canada staff.
1.95. Where remaining soils are unstable due to steepness or soil characteristics, install erosion controls immediately or apply a hydraulic erosion control product to the target areas.

Revegetation:

Planning

1.96. Determine the appropriate site-specific seed mix(es) and/or plantings.

Note:
If there is no approved species list within the Field Unit, consider the following conditions when selecting plant materials:

- Revegetation with native species is preferred unless otherwise directed by Parks Canada.
- Use species relatively common within local native plant communities.
- Source seeds from local growers to ensure local adaptation wherever possible (within the ecoregion, ecozone, province or as per *Principles and Guidelines for Ecological Restoration in Canada's Protected Natural Areas*).
- Avoid the use of cultivars[1] unless there are no wild species available.
- Consider species' viability in proposed environment and climatic conditions.
- Use species that rapidly establish to effectively control erosion, where required.
- Consider palatability of some species to wildlife and avoid growing attractants in areas of increased risk to wildlife and visitors. Avoid palatable species for roadside reclamation. For additional information see the Parks Canada Guidance on Revegetation to Reduce Risk to Wildlife.

1.97. Schedule construction so that seeding or planting can coincide with seasonal planting windows (i.e., spring or fall).
1.98. Salvage of native plants is preferred over purchase of commercial plugs or container stock where possible.

Delivery

1.99. Do not use seed that is coated (including "ultra-coating") unless approved by the designated Parks Canada staff.
1.100. Ensure seed certificates are approved by the designated Parks Canada staff prior to seeding.

[1] Cultivar: a cultivated plant variety that has been selectively bred for certain specific characteristics (hardiness, stature, colour, etc.), e.g. Big Bluestem 'Niagara' (*Andropogon gerardii* 'Niagara').

1.101. Ensure seed mix(es) and any species substitutions are approved by the designated Parks Canada staff.
1.102. Unless otherwise directed, seed certificates must include both the common and scientific name following the CANADENSYS nomenclature system; indicate if the seed is a cultivar, ecovar, or wild native species; geographic origin (seed source); date of collection; method of seed storage; germination, viability and vigour; and indicate all other species occurring including agronomic, weed, and native species; and date of the analysis. The contact information for the Seed Supplier shall be included.
1.103. Broadcast seeding is the preferred method of seeding native seeds, where terrain and soil conditions permit.
1.104. If using Hydraulic Erosion Control Products (HECP or hydromulch) apply over top of native seed already in place, where possible. Avoid using native seeds in tank mixes unless specified by the designated Parks Canada staff.
1.105. For hydroseeding and hydromulching, thoroughly clean and rinse tanks to remove any unwanted species. All tank additions (e.g., hydro-mulch, tackifier, soil amendments) must be pre-approved by the designated Parks Canada staff.
1.106. For hydroseeding or hydromulching, ensure that full coverage and minimum depth are attained for erosion protection, and depth is consistent across site. Trees and established existing vegetation are not to be covered with mulch.
1.107. Seed and stabilize 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, unless otherwise directed.
1.108. Do not perform seeding under adverse field conditions such as frozen soils, excessively wet or dry soil, ice or standing water, heavy rain, or high winds.
1.109. In cases where mulching is necessary to assist with seed establishment, apply it immediately after seeding.
1.110. Apply seed at a rate appropriate to the seed mixture, seeding method and existing vegetation conditions or as directed by the designated Parks Canada staff.
1.111. Do not seed on hardened (compacted), crusted or mechanically rutted surfaces.
1.112. Following broadcast seeding, rake soil to set seed in place and reduce foraging; this may be completed by hand or light harrow for larger areas.
1.113. Protect seeded area against erosion or damage as appropriate for the specific site (e.g., erosion control blanket, hydro-mulching, mulching).
1.114. Some seeding procedures may have to be completed or repeated in subsequent years as per the Reclamation Plan.
1.115. Ensure live plants (e.g., transplants, plugs, container stock) are watered-in well and receive sufficient moisture until established, and through any periods of extended drought. Provide regular watering unless there is sufficient rainfall.

Monitoring and Control:

1.116. Schedule site inspections to monitor reclamation progress for an appropriate timeframe following construction to ensure establishment of vegetation.
1.117. Vegetation and IAS establishment will be assessed and minimum standards met before Certificate of Completion is issued.

2. Asphalt Production and Handling

Operation of Asphalt Plants

Planning

2.1. Select low volatile organic compounds[1]-emitting asphalt products in paving activities or maintenance operations (e.g., emulsified asphalt) when appropriate.
2.2. Asphalt works should be undertaken during periods of dry weather whenever possible as this allows easier control of contaminated runoff and sediment.
2.3. If the work schedule requires working in the rain, install appropriate sediment and erosion controls 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. Stop paving if deleterious substances are running off (or are obviously going to run off).
2.4. Asphalt plant operation shall comply with all environmental pollution control regulations, including provincial regulations, and the plant operational plan.
2.5. Ensure asphalt plant emissions do not exceed the limits set by provincial emission regulation.
2.6. Asphalt plants should be located at least 500 m from buildings with human habitation.
2.7. Determine acceptable operating hours of operation and, if applicable, local noise standards.
2.8. Determine stockpile areas or disposal/re-use plans for rejected asphalt.

Delivery

2.9. Provide enough room between the stockpiles and the asphalt plant for a loader in the event of a spill at the asphalt plant.
2.10. Install a containment berm with an associated liner made of occlusive material (e.g., plastic of a thickness approved by the designated Parks Canada staff) and covered with absorbent sand or clay under the bitumen storage tank to ensure containment of 110% of the tank's capacity. Dyking and ponding may be required to control the rate and quality of runoff from the plant site.
2.11. If excess or reject new asphalt product is stockpiled during significant rainfalls, contain all runoff as directed by the designated Parks Canada staff.
2.12. Make every effort to recycle waste asphalt, either as a base course, or by recycling waste asphalt product through the asphalt plant according to engineering specifications. Old cured ground asphalt material shall be removed and recycled, or stored for future recycling at an approved operational gravel pit or asphalt plant site.
2.13. Protect containment/catchment areas and drip trays at the asphalt plant from rainfall. If contaminated, dispose of all collected water at an approved disposal facility.
2.14. Ensure that the water in the settling ponds remains clean of petroleum products. Dispose of any contaminated water at an approved disposal facility.
2.15. Contain sludge removed from the clarifier to prevent fine dust particles from becoming airborne during windy periods.

[1] VOC-emitting asphalt

Gravel Crushing and Washing

Planning

2.16. Where possible within engineering constraints, recycle asphalt materials to reduce the need for new gravel.

Delivery

2.17. If water for cleaning is extracted from a waterbody, refer to module 11: Water Withdrawal and Dewatering.

2.18. If gravel requires washing, wash water shall not be deposited directly into any waterbody.

2.19. Discharge water free from chemical contaminants onto the 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.

2.20. Contaminated water shall be treated to meet CCME guidelines or transported outside of the protected heritage place for disposal at an approved facility.

2.21. Ensure there are no vertical faces on gravel stockpiles, to prevent nesting by bank swallows or similar species.

Oiling of Truck Boxes

Planning

2.22. Ensure trucks used for hauling asphalt mixture have tight, clean, smooth metal boxes. Acceptable lubrication to prevent asphalt product from adhering include a minimum amount of thin fuel oil or, where oil is prohibited, a non-petroleum lubricant.

Delivery

2.23. Oil truck boxes only when absolutely necessary.

2.24. Oil truck boxes in a bermed area, consisting of a plastic underlay with 15 cm overlay of clean gravel. Hand-collect oil-contaminated gravel (to prevent tearing of the plastic) from the bermed area daily, and put through the asphalt plant.

Disposal and Clean Up of Other Waste Products

Planning

2.25. During the preconstruction meeting, establish a defined schedule to ensure regular clean-up of waste asphalt and petroleum spills.

Delivery

2.26. Refer to module 1: General Activities-Site Clean Up/General Waste Management.

2.27. Collect leaks in drip-trays. Remove the collected material from the protected heritage place and dispose of at appropriate facility, or recycle it through the asphalt plant.

2.28. Collect used oil, filters, grease cartridges, oil cans and other waste products of plant servicing, and dispose of them at the nearest, approved industrial waste facility.

3. Concrete Handling and Washout Facilities

Delivery

3.1. Prevent wash water, concrete, debris and sediment used in roads, barriers, guardrails or other-related infrastructure from directly or indirectly entering water by establishing and maintaining effective separation of the concrete work from the storm drain inlets, open drainage facilities, and waterbodies.

Onsite Temporary Concrete Washout Facility

Delivery

3.2. Ensure the size and number of pits or bermed areas used as concrete washout facilities are sufficient to contain liquid and concrete waste, are in flat areas, and are not in sensitive environments.

3.3. Wood stakes and sandbag materials may be used to construct temporary containment walls or "barriers." Products should also be selected to reduce potential for wildlife entanglement/attraction and prevent introduction of invasive alien species. Avoid straw bales unless authorized by designated Parks Canada staff.

3.4. Line the facility with polyethylene sheeting that is a minimum of 10 mil thick and free of holes, tears or other defects.

3.5. Ensure soil under the washout structure is free of rocks or other debris that may cause tears or holes in the plastic lining material.

3.6. Wash excess concrete from mixer trucks, chutes or bins into approved concrete washout facilities or collect in an impermeable bag for disposal. Return large quantities of excess concrete to the batch plant for disposal.

3.7. If concrete batching plants are located in the protected heritage place, they must be operated pursuant to applicable dust, air emission, and water quality control regulations.

3.8. Backfill and restore depressions or other ground disturbance caused by the removal of the temporary concrete washout facilities.

Concrete Washout Facilities

Delivery

3.9. Maintain temporary concrete washout facilities with adequate holding capacity, including a final freeboard of at least 100 mm.

3.10. Remove concrete from washout facilities when hardened. Dispose of it outside the park in compliance with provincial and federal regulations, or, where approved by designated Parks Canada staff, bury it in the grade or crush and mix it with aggregate.

3.11. Clean existing facilities, or ensure new facilities are ready for use, once the washout is 75% full.

3.12. Inspect temporary concrete washout facilities daily and after heavy rains to check for leaks, identify any damage to plastic linings and sidewalls (e.g., tears in PVC liner, missing sand bags) and determine whether they have been filled to over 75 percent capacity.

Concrete Application

Planning

3.13. Determine site specific mitigation measures for larger scale manual mixing activities (around >20 litres) including buffer zones, drip trays, and daily surveillance requirements.

Delivery

3.14. Perform concrete cutting operations in a way to pick up all saw cutting residue.
3.15. Collect wash water when cleaning areas and equipment used during concrete activities and dispose of wash water with slurry.
3.16. Do not dump unused wet concrete on bare ground to harden at construction sites.

Concrete Work In or Near Water

Delivery

3.17. During concrete delivery for works near water, where the 30 m buffer zone cannot be observed (e.g., bridge work), establish extra measures to prevent spills into the environment (e.g., collection/drip trays and berms lined with impervious material (such as plastic and a layer of sand), and double-lined fuel tanks).
3.18. Use anti-leaching concrete for projects that are likely in contact with a waterbody. Provide all workers with proper training on handling and application of anti-leaching concrete.
3.19. Maintain complete isolation of all cast-in-place concrete and grouting from fish-bearing waters until significantly cured.
3.20. If concrete materials are found to be entering waterbodies, monitor turbidity and pH and have a CO_2 diffusion system in place to neutralize pH levels.
3.21. If working below the water table without anti-leaching concrete, implement effective isolation, dewatering and other methods to keep the toxic product from entering the water.

4. Paving, Resurfacing and Grading

Grading

Delivery

4.1. Do not grade or allow material to spill outside of the delineated work area, within 1 m of the forest drip line, or in a stream, waterbody or wetland. Any material inadvertently falling outside the work limits will be removed promptly in a manner that does not damage vegetation or water quality.

4.2. Avoid grading following seed set if it is likely to spread seeds of non-native vegetation.

Paving and Resurfacing

Delivery

4.3. Paving should not be undertaken during steady rain to prevent entry of concrete, asphalt, or patching and sealing compounds directly or indirectly in water.

4.4. Minimize changes to the surface that could negatively affect infiltration and runoff characteristics and maintain effective surface drainage to limit direct runoff into surface waters.

4.5. Follow manufacturer guidelines and methods for proper use in the handling and application of sealants or other compounds.

4.6. Minimize application of seal coats or tack in wet conditions:

- Apply seal coats only to dry surfaces and not within 2 hr of rainfall
- Apply tack coats only if no rain is expected prior to covering the tack-coated surface with asphalt. If unforeseen rain arrives ensure runoff from recently seal coated surfaces are prevented from entering surface waters.

Pavement Marking and Barrier, Concrete Barrier and Guardrail Reinstatement

Delivery

4.7. If pressure treated wood is used, follow procedures in the Parks Canada Treated Wood Management Guidelines (Draft 2019).

4.8. Undertake pavement marking pursuant to standard methods applied in the protected heritage place for control of paint products, both in transport and handling.

4.9. A plan for the transport and control of paint and hazardous products (e.g., application of paint, cleaning of equipment, containment and disposal of waste paint and cleaning products) must be approved by designated Parks Canada staff.

5. Roadside Vegetation Removal

This module covers the occasional or project-specific (i.e., non-routine) cutting or removal of vegetation within the existing footprint of the roadway. Such vegetation often includes trees and large shrubs, and is typically done to prepare for construction. This work may also include deferred vegetation management (i.e., non-routine sightline maintenance). This PRIA does not include significant vegetation removal projects (e.g., kilometres of roadside tree removal or removing trees through the use of skidders) or routine roadside vegetation management activities.

General

Planning

5.1. Flag clearing areas. Clearing plans shall be approved by designated Parks Canada staff.
5.2. Do not clear vegetation during high or extreme fire weather index without the approval of designated Parks Canada staff. Work may be delayed to prevent risk of wildfire.
5.3. Identify and preserve trees with obvious wildlife use (e.g., snags with cavity nests, large trees with stick nests) unless assessed as hazard trees. If felling is unavoidable, designated Parks Canada staff consultation and approval is required.
5.4. Consider potential wildlife impacts (e.g., impacts of clearing Milkweed on Monarchs) when planning the extent of vegetation removal along roadways.
5.5. Identify individual trees to be salvaged for later use. Temporarily transplant trees for use following construction.

Delivery

5.6. Vegetation clearing should be conducted using methods that minimize ground disturbance, promote effective reclamation and minimize the potential for the establishment and spread of non-native vegetation.
5.7. Clear the minimum of area necessary; trees should be removed only if necessary for project completion or visitor/staff safety. Minimize full removal and retain vegetation when possible to reduce erosion.
5.8. If removal of riparian vegetation is unavoidable, use manual methods and directionally fall trees as far as possible from watercourses. Designated Parks Canada staff consultation and approval is required.
5.9. Protect roots of trees to drip line to prevent disturbance or damage. Avoid traffic, dumping and storage of materials over the root zone.
5.10. When felling trees, take precautions to minimize damage to surrounding vegetation.
5.11. When removing individual branches, employ pruning techniques to minimize risk of tearing the bark and harming the tree; ensure that only branch tissue is removed and stem or trunk tissue is left undamaged.
5.12. Cut stumps flush with the ground, and leave ground cover undisturbed to promote slope stability. If clearing operations are conducted during snow cover, revisit the site after snowmelt to flush cut stumps.
5.13. Grub only if the removal of stumps is required to achieve project goals.
5.14. Ensure grubbing and stripping do not damage trees and roots beyond clearing limits.
5.15. On steep slopes, avoid grubbing and stripping unless otherwise directed.
5.16. During grubbing, shake stumps, roots, imbedded logs and other non-soil debris free of loose soil and rocks before transport.

Disposal of Vegetation Debris

Planning

5.17. Adhere to all federal and provincial policies with regards to the transport of wood beyond park boundaries.
5.18. Set aside logs for use elsewhere if directed by the designated Parks Canada staff.
5.19. Where fire fuel loading is not a concern, consider placing limited amounts of vegetation debris in the forest to mimic natural tree fall, using it as a natural erosion control method along stream banks or large side slopes, or including it in site restoration. Such uses must be approved by designated Parks Canada staff.

Delivery

5.20. Debris shall not be disposed of in waterbodies.
5.21. Remove all vegetation debris as soon as possible from the work site, either by transporting off-site for disposal or as directed by the designated Parks Canada staff.
5.22. Convey logs and other salvage materials to storage sites without spreading debris or damaging standing trees or other features outside the marked clearing or storage limits. Do not skid material through wetlands, waterways or water bodies.
5.23. Any burning of debris must be approved by the designated Parks Canada staff. If approved:
    - Make burn piles where trees are felled or as directed by designated Parks Canada staff. Limit piles to 1.8 m in diameter and no more than 1.2 m high, or as directed by the designated Parks Canada staff.
    - Locate burn piles to prevent scorching of surrounding live trees. Adopt measures to ensure that fires do not spread (e.g., burn on snow or on mineral soil).
5.24. Mulch or chip vegetation only where the quantity of mulch will not cover underlying vegetation, prevent new native seedlings from sprouting, or cause soil or seed bank sterilization. Approval from designated Parks Canada staff for mulching/chipping will be determined based on reclamation objectives, non-native vegetation, and fire hazard mitigations.
5.25. If mulching is used to clear vegetation, rough mulching is the preferred option.

6. Excavations, Soil Stripping and Overburden Removal

Excavation

Planning

6.1. Trenches to be dug for service lines should follow an existing utility corridor where possible.

Delivery

6.2. Minimize changes to the ground surface that negatively affect infiltration and runoff characteristics and maintain or re-establish effective surface drainage on completion of the project.

6.3. Do not spill materials outside the work limits. If any material inadvertently falls outside the work limits, remove it promptly in a manner that does not damage trees or vegetation.

6.4. Backfill and compact excavations as soon as possible.

6.5. In the event of a work program shutdown during inclement weather (e.g., winter conditions unfavourable for construction, heavy rain events) establish sediment and erosion control and a contingency planning for bared soils or excavated material stockpiles.

Soil Salvage

Planning

6.6. Plan the topsoil and subsoil salvage to minimize handling and traffic on soils.

Delivery

6.7. Salvage topsoil and subsoil at all excavation sites in separate layers or lifts for reclamation purposes. Topsoil shall not be removed from the site unless otherwise directed.

6.8. Store topsoil separately from subsoil. Never pile subsoil on top of topsoil.

6.9. Stumps and woody debris should be removed from topsoil, but retained for restoration where applicable and at the direction of the designated Parks Canada staff.

6.10. Stabilize and repair all eroded areas prior to surface preparation, as determined by the designated Parks Canada staff, using local material where possible.

6.11. For multi-lift procedures, place the final layer of organic material containing the seed bank last.

6.12. Unless otherwise directed, apply topsoil at a depth of 30-50 mm, or at the depth of the original site conditions[1]. Topsoil depths can be increased on gentler slopes and the surface should remain rough.

6.13. Do not allow equipment to compact topsoil after replacement, which should be timed to coincide with seeding or other revegetation work.

[1] When sites were lacking of topsoil prior to construction, returning to that condition can be approved by the by the designated Parks Canada staff

Storage of Excavated Materials

Planning

6.14. Identify soil storage locations when developing construction plans. During the winter (when ground is frozen) soil storage can occur on undisturbed areas. When soil is thawed, soil storage should be located on previously disturbed areas (e.g., pull outs, roads, trails, campsite, and staging area) so that no soil compaction occurs outside of the construction area, unless otherwise directed.

6.15. Plan to 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.

Delivery

6.16. Store stockpiled material on flat ground, away from drainage areas, waterbodies, subsoil, spoil material, construction activity and day-to-day operations unless otherwise directed; follow Erosion and Sediment Control Plan or Environmental Protection Plan.

6.17. Limit soil stockpile height to 2 m unless approved by designated Parks Canada staff.

6.18. Avoid topsoil loss. For example:

- Do not store soil in areas prone to high winds.
- Surround soil with berms or construct barricades in areas with steeper slopes.
- Cover and anchor stockpile with dark geotextile when storage will exceed a week.
- Plant approved native seed over topsoil stockpiles instead of using covers if approved by the designated Parks Canada staff.

6.19. If surplus topsoil is available after site reclamation:

- it may be used to fill depressions around the project site with approval from designated Parks Canada staff; or,
- make arrangements for disposal or stockpiling for other projects in consultation with the designated Parks Canada staff.

7. Slope Stabilization, Drilling and Blasting

Slope Stabilization-Scaling

Delivery

7.1. If replacement rock reinforcement/armouring is required to stabilize eroding or exposed areas, ensure that appropriately-sized, clean rock is used, and rock is installed at a similar slope to maintain a uniform bank.

7.2. Direct concentrated surface water (runoff) away from cut and fill slopes.

Drilling and Blasting for Slope Stabilization

Planning

7.3. The designated Parks Canada staff will identify a magazine location for explosives should a factory site or "ready-to-use" explosive storage site be required.

7.4. The blasting supervisor shall plan the work to ensure no damage to infrastructure, people, surrounding vegetation or wildlife by mitigating risk of fly rock.

7.5. Refer to the National Geotechnical and Environmental Investigations PRIA for drilling boreholes and excavation of test pits.

Delivery

7.6. When possible, contain cuttings from all drilling so they can be removed entirely from the site. If the cuttings are contaminated dispose of them at an approved waste disposal facility.

8. Demolition

Planning

8.1. Before undertaking the partial or complete demolition of existing infrastructure, prepare a demolition plan or a written procedure for partial demolition. This is subject to approval and direction from the designated Parks Canada staff.

8.2. If water lines and wells are of no further use, remove, cap or decommission them according to the appropriate federal or provincial legislation. Consult with designated Parks Canada staff to determine whether full excavation and removal of all subsurface infrastructure (e.g., pipes, cement structures, wires) is required. Backfill any excavation with clean and authorized topsoil.

8.3. Prior to commencement of demolition activities, identify water and septic systems, lines and/or fields and take precautions during the operation of heavy equipment to avoid damaging them.

Delivery

8.4. If undocumented contamination is found, cease work immediately and contact designated Parks Canada staff.

9. Drainage Structures

Drainage Structures

Planning

9.1. Plan design of new drainage structures ahead and incorporate into the project scope. Proposed drainage structures should be designed or upgraded to facilitate habitat connectivity for fish, amphibians, reptiles and other wildlife. Consideration should also be given to incorporating wildlife crossing features into drainage structures as appropriate (e.g., ledges or pathways) or to designing culverts to reduce the ability of beavers to dam them.

9.2. Consider installing the new culvert offset from the old one to allow the waterbody to continue flowing in its original path during construction, then shunt the stream to the new culvert upon completion.

Delivery

9.3. Ensure compliance with current DFO standards and codes of practice[1] (e.g., Interim code of practice: Culvert maintenance or Interim code of practice: Temporary cofferdams and diversion channels).

9.4. When removal of debris is required within culverts and around bridge piers and abutments, implement the following:

- Remove materials by hand when feasible.
- Limit removal of accumulated material (e.g., branches, stumps, woody materials, garbage) to the area within the culvert, immediately upstream of the culvert and to that which is necessary to retain culvert function and water flow.

9.5. Adequately protect the culvert, inlet(s) and outlets(s) with rip rap to prevent erosion and scour around the culvert during high runoff events.

9.6. Maintain natural streambed material through fish-bearing drainage structures to allow continuous substrate that matches the streambed below and above the crossing, unless otherwise directed.

[1] Code of practice may be included in appendix.

10. Bridge

Bridge Repairs

Delivery

10.1. Use of untreated wood products is recommended when feasible. If there is no alternative to using treated wood, ensure it has been treated with a wood preservative appropriate for the project. Follow procedures in the Parks Canada Treated Wood Management Guidelines (Draft 2019).

10.2. Avoid use of toxic paints, primers, solvents, degreasers and rust inhibitors.

10.3. Prevent entry of deleterious substance[1] directly or indirectly in water. For example:

- Establish and maintain effective separation of the work from the waterbody.
- Attach drop cloths or tarps (supported by webbing or netting if necessary) to prevent materials from entering the water, and inspect regularly for signs of failure.
- Stop work if deleterious substances are running off (or are obviously going to run off).
- If treated timber must be cut to size, ensure cutting takes place away from the bridge and waterbody. Sawdust must be prevented from entering any waterbody and removed from the park or otherwise disposed of as directed by the designated Parks Canada staff.

Bridge Cleaning

Planning

10.4. Schedule bridge-cleaning activities (not in-water work) to coincide with spring freshet when possible. At freshet[2] or during periods of high flow a large waterbody will often have its highest background levels of sediment.

10.5. 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 the designated Parks Canada staff in consultation with the aquatic specialist/parks ecologist and add as a supplemental mitigation.

Delivery

10.6. Use only water for cleaning. If your cleaning activities require degreasers or any other chemical, approval is required by the designated Parks Canada staff.

10.7. Comply with allowable levels of silica when using abrasives, as specified in national/provincial regulations. To the extent possible, use an abrasive with a less significant impact than silica.

10.8. Adequately seal drains and any open joints on the bridge deck before sweeping or washing

10.9. Inspect tarps, drain blocks, and wash water runoff areas regularly to ensure they are functioning. Repair as required.

10.10. Use hydro blasting or manual techniques, where possible, when removing road dirt, soluble salts and loose paint.

---

[1] e.g., concrete, asphalt, paint, solvents, sandblast material, patching and sealing compounds

[2] Freshet: high water flow during spring thaw.

10.11. Dry sweep and collect loose material off bridge surfaces before washing the bridge.
10.12. If dry sweeping and preventing direct runoff to waterways is not a feasible way to clean the surface, alternate procedures shall be determined in consultation with the designated Parks Canada staff.
10.13. Contain any wash water or runoff to the bridge deck. Direct wash water towards the bridge approaches and away from the waterbody, then to a vegetated area or contained settling areas (e.g., dry ditch channels unconnected to a waterbody) where it can infiltrate.
10.14. 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 waterbody, or re-route runoff through temporary piping onto adjacent settling ponds or structure. Using a hydro vacuum would be another option.

11. Water Withdrawal and Dewatering

Water Withdrawal

Delivery

11.1. Select waterbodies than can sustain withdrawal without compromising sensitive species.
11.2. Follow the 10/90 rule for water withdrawal. This allows for up to 10% of the stream flow to be withdrawn, as long as the stream flow does not fall below the 90% exceedance flow.
11.3. If water withdrawal is approaching 10% of the stream flow, limit total take of water to less than 5 successive days and less than 10 days in any period of 30 days.
11.4. Ensure any flows are temporarily diverted around the portion of the ditch or waterbodies where work is being undertaken.
11.5. Ensure compliance with current DFO codes of practice (e.g., Interim code of practice: End-of-pipe fish protection screens for small water intakes in freshwater).

Dewatering and Rewatering

Planning

11.6. Develop a site-specific dewatering plan before commencing a pump-out sump to dewater excavation sites, with specific details on how and where the water will be discharged and how turbidity will be managed.
11.7. Site-specific mitigations may be required depending on the conditions of the discharge area (including erodibility of soils), freezing conditions operations, overflow avoidance, decanting and settlement pond reclamation.

Delivery

11.8. Ensure compliance with current DFO codes of practice (e.g., Interim code of practice: Temporary cofferdams and diversion channels or Interim code of practice: End-of-pipe fish protection screens for small water intakes in freshwater).
11.9. Capture and relocate any fish trapped within an isolated/enclosed work area and safely relocate them to an appropriate location in the same water body. See module 12: Fish, Amphibian and Reptile Salvage.
11.10. Dewater gradually to reduce the potential for stranding fish.
11.11. Monitor discharge water quality on a regular basis. Should there be any observable turbidity at the discharge point, work should halt until the source is determined and additional mitigation measures are applied.
11.12. Establish soil and vegetation erosion protection when water is pumped onto land.
11.13. Remove any excess sediment sources and cap with clean rock or gravel as appropriate.
11.14. Remove sediment control measures and exclusion fencing in a way that prevents the escape or re-suspension of sediments.

12. Fish, Amphibian and Reptile Salvage

Planning

12.1. A qualified environmental professional is required to do the salvage. The salvage protocol must be submitted and approved by Parks Canada.

12.2. Consider time of year for salvaging activities such as cold weather and ice which can make it very hard on animals, salvagers, labourers and equipment.

Delivery

12.3. Capture and relocate any animal trapped within an isolated/enclosed work area and safely relocate them to an appropriate location in the same water body /environment. Refer to Invasive Alien Species Management should any invasive species be found.

12.4. Relocate any fish as per applicable permits for capturing and relocating fish.

12.5. During amphibian salvage, try to move the object they are on.

12.6. Complete salvage before work starts and, if appropriate, repeat if flooding occurs or if isolation is lost.

12.7. If temporary exclusion fencing is installed to prevent salvaged individuals from returning to the work area during construction, remove it upon completion of the project.

Approval

Julie Tompa — May 6, 2021
Director, Natural Resource Management Branch

Kerry Buckley — May 6, 2021
Acting Executive Director, Asset Management and Project Delivery Branch

Bibliography

British Columbia Ministry of Forests and Environment Lands and Parks. 2000. *Provincial Wildlife Tree Policy and Management Recommendations*. Government of British Columbia.

British Columbia Ministry of Transportation and Infrastructure. 2018. *Environmental best practices for highway maintenance activities 3rd ed.* Government of British Columbia.

British Columbia. 2019. Ministry of Transportation & Infrastructure. Best Practices for Managing Invasive Plants on Roadsides. A Pocket Guide For British Columbia's Maintenance Contractors.

Canadian Council of Minister of the Environment. *Water Quality Guidelines for the Protection of Aquatic Life Freshwater, Marine*. Accessed February 2021. https://ccme.ca/en/summary-table?lang=en&factsheet=219

Coordinated Technology Implementation Program. 2011. *Current and Innovative Solutions to Roadside Revegetation Using Native Plants*. Federal Highway Administration U.S. Department of Transportation.

Environment and Climate Change Canada. General nesting periods of migratory birds. Accessed February 2021.

Environment and Climate Change Canada. *Avoiding Harm to Migratory Birds*. Accessed March 2021.

Environmental Protection Agency Office of Water. Nonpoint Source Pollution: Technical Guidance and Tools Guidance. Accessed February 2021. https://www.epa.gov/nps/nonpoint-source-pollution-technical-guidance-and-tools

Fisheries and Oceans Canada. *Measures to protect fish and fish habitat*. Accessed February 2021. https://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html

Fisheries and Oceans Canada. *Standards and codes of practice*. Accessed February 2021. https://www.dfo-mpo.gc.ca/pnw-ppe/practice-practique-eng.html

Government of Canada 1991 The Federal Policy on Wetland Conservation.

Parks Canada. 1994. Cultural Resource Management Policy. Government of Canada

Parks Canada. 2013. Best Management Practice for Roadside Vegetation Maintenance at Point Pelee National Park. Government of Canada.

Parks Canada. 2013. Best Management Practice for Routine Vegetation Trimming and Clearing Pukaskwa National Park. Government of Canada.

Parks Canada. 2015. National Best Management Practices. Roadway, Highway, Parkway and Related Infrastructure. Government of Canada.

Parks Canada. 2016. Waterton Lakes National Park. General Project Best Management Practices. Government of Canada.

Parcs Canada 2017. Remplacement de ponts et ponceaux sur la route de la promenade au Parc National de La Mauricie. Devis pour la protection de l'environnement. Habitat de niveaux 1, 2 et 3. Unité de gestion de la Mauricie et de l'Ouest du Québec. Gouvernement du Canada

Parks Canada 2017. Draft Guidance on Reducing Risk to Migratory Birds and associated Conservation Measures for Minimizing Impacts to Migratory Birds During the Nesting Period.

Parks Canada 2019. Parks Canada Directive on Impact Assessment. Government of Canada.

Parks Canada. 2019. Preapproved Routine Impact Assessment. Frontcountry Areas. Government of Canada.

Parks Canada. Draft 2019. Treated Wood Management Guidelines. Government of Canada.

Parks Canada. Draft. Reclamation guidelines. Banff National Park, Government of Canada.

Parks Canada and the Canadian Parks Council. 2008. Principles and Guidelines for Ecological Restoration in Canada's Protected Natural Areas. Government of Canada.

Soil Classification Working Group, 1998. The Canadian System of Soil Classification. 3rd Edition. Research Branch, Agriculture and Agri Food Canada, Publication 1646.

Appendix 1: Site-specific information

Example of Environmental Timing Windows Table

(to be deleted or adapted)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Fish	AVOID INSTREAM WORK					Least risk window for work in and around freshwater, June 15 – Sept 15				AVOID INSTREAM WORK		
Birds	Reduced risk for harm to birds			AVOID VEGETATION REMOVAL Bird Nesting Period: April - Mid August					Reduced risk for harm to birds			
Bats	Bat in Hibernacula				Bats Nursing Pups						Bat in Hibernacula	
Turtles	Hibernation		Road Mortality		Nesting -avoid disturbance		Road Mortality		Hatchlings – avoid disturbing	Road Mortality	Hibernation	
Snakes	Avoid disturbance of Hibernacula				Road Mortality		Peak : breeding, live young Mitigate road mortality			Migration Road mortality	Avoid disturbance of Hibernacula	
Others:												

Appendix 2: Regulatory Guidance

Jurisdictions

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

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

Canada National Parks Act - 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 contractors, 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 must avoid causing serious harm to fish in compliance with the *Fisheries Act*. Advice is available in on the Fisheries and Oceans Canada (DFO) website.

The complete list of DFO measures to protect fish and fish habitat must be reviewed and those that are applicable to the work, undertaking or activity shall be implemented. If measures to protect fish and fish habitat can be followed, a request for project review is **not** required.

Depending on the level of detail required for a review and DFO response, the Parks Canada IA Practitioner may need to consider another IA pathway.

Migratory Birds Convention Act – Environment and Climate Change Canada

The purpose of this Act is to protect and conserve migratory birds - as populations and as 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 the 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 and Climate Change Canada has published 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.

For more information, including refining the regional nesting period, refer to the draft Parks Canada Guidance on Reducing Risk to Migratory Birds and draft Conservation Measures for Minimizing Impacts to Migratory Birds During the Nesting Period.

Species at Risk Act - Parks Canada, Environment and Climate Change Canada

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 IAA 2019 or successor legislation. If the projects or activities to be addressed by the PRIA could affect a listed species or its critical habitat, the IA Practitioner may need to consider another IA pathway.

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:

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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)

Canada, Government of (Canada). 2004. An Invasive Alien Species Strategy for Canada (S.C. 2004).

Canada, Government of (Canada). 2002. Species at Risk Act (S.C. 2002, c. 29).

Canada, Government of (Canada). 1994. Migratory Birds Convention Act (S.C. 1994, c. 22).

Canadian Council of Ministers of the Environment (CCME). (1999). Canadian water quality guidelines for the protection of aquatic life. In Canadian Environmental Quality Guidelines, 1999. Canadian Council of Ministers of the Environment, Winnipeg.

Canadian Wildlife Service Advice to Industry on Migratory Bird Active Nest Surveys. 2008. Available at the following link: https://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=8D910CAC-1

Department of Fisheries and Oceans (DFO). 1995. Freshwater Intake End-of-Pipe Fish Screen Guideline. Communications Directorate, Department of Fisheries and Oceans. Ottawa, Ontario. 28 pp.

Fisheries and Oceans Canada et al, 2012. Fish-stream Crossing Guidebook: Revised Edition. Access via: http://wwww.for.gov.bc.ca/HFP/Fish/Fish-Stream%20Crossing%20Print.pdf

Fisheries and Oceans Canada, 2013. Measures to Avoid Causing Harm to Fish and Fish Habitat. Access via: http://www.dfo-mpo.gc.ca/pnw-ppe/measures-measures/index-eng.html

Wright, D.G. and G.E. Hopky, Department of Fisheries and Oceans. 1998. Guidelines for Use of Explosives in or Near Canadian Fisheries Waters. Access via:
http://www.dsao.net/Resources/DFO%20fact%20sheets/explos_e.pdf

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:

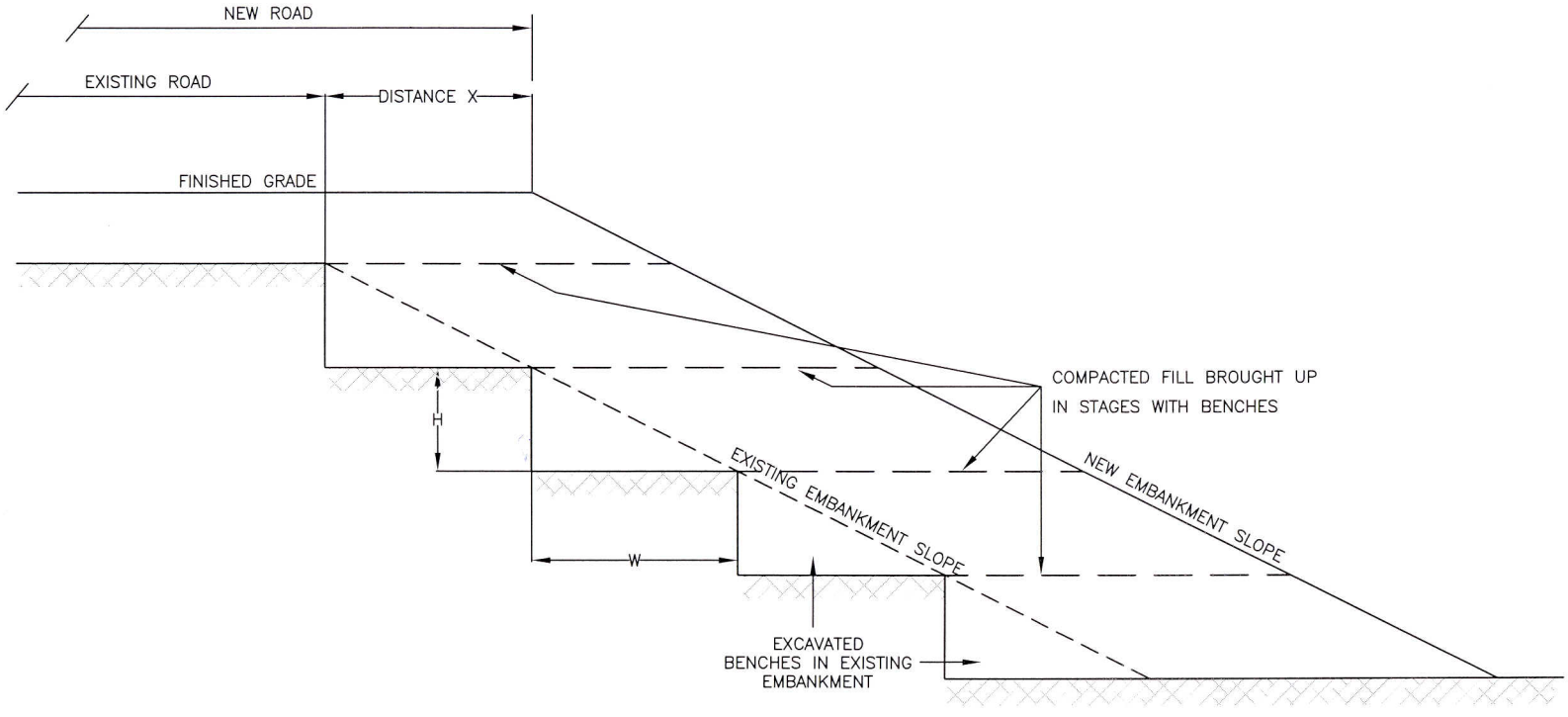
_____
Civic number, Road name, City/town/village, Postal Code

Location of Material Disposal: *(if different from resident's address)*

_____
Civic number, Road name, City/town/village, Postal Code

Appendix D

Nova Scotia Department of Transportation and Infrastructure Renewal - Standard Drawing, Benching of Embankment Slopes, File No. S-2009-016



MAXIMUM BENCH HEIGHT & WIDTH DIMENSIONS		
EXISTING SLOPES	FILLS >= 4.0m	FILLS < 4.0m
3:1 TO 2:1	W=2.5m H=VARIES	W=1.25m H=VARIES
2:1	W=VARIES H=1.25m	W=VARIES H=0.75m

NOTES:
1. THIS STANDARD APPLIES TO WIDENING OF EMBANKMENTS WHEN DISTANCE X >= 1.0m AT FINISHED GRADE LEVEL OF NEW ROADBED.
2. BENCHING NOT REQUIRED ON SLOPES FLATTER THAN 3:1 OR WHERE FIELD CONDITIONS SHOW IT UNNECESSARY AS DETERMINED BY THE ENGINEER.
3. BENCHES TO BE EXCAVATED ONE LEVEL AT A TIME AND COMPACTED FILL BROUGHT UP BEFORE NEXT LEVEL IS EXCAVATED.

Manager Highway Planning and Design

Director Highway Engineering Services

Executive Director Highway Engineering and Construction

NOVA SCOTIA
Transportation and Infrastructure Renewal

No.	REVISION

Scale : N.T.S.
Drawn by : M.LABRECHE
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Date of Plan : AUG2009
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BENCHING OF EMBANKMENT SLOPES