

RE-ISSUED FOR TENDER
For
Recapitalization of Point Wolfe Stormwater
System and Bank Stabilization
Parks Canada Agency

PCA Project No.: 1314
Date: May 30, 2017

Specifications
Issued for Tender

Parks Canada Agency

Recapitalization of Point Wolfe Stormwater
System and Bank Stabilization

Project No. 1314



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PART 1 GENERAL

1.1 Work Covered By
Contract Documents

- .1 The Work in this Contract comprises upgrades to the site drainage and stormwater system, and slope stabilization at the Point Wolfe area in Fundy National park, New Brunswick.

1.2 Contract Method

- .1 Construct Work under a unit price contract.

1.3 Work by Others

- .1 Other Contractors will not be working in the area.

1.4 Work Sequence

- .1 Work can be completed in two phases, Phase One is prior to the opening of Fundy National Park on June 15, 2017. Phase Two is following closure of the Park on October 15, 2017.

1.5 Contractor Use
of Premises

- .1 Limit use of premises for Work, to allow:
 - .1 Work by Parks Canada employees.
 - .2 Parks Canada will accommodate the Contractor with a location for their construction trailer.
- .2 Storage areas for Contractor's equipment and materials shall be located within the work area for the duration of the work. Locations for equipment and materials storage areas shall be approved by the Departmental Representative.
- .3 Disposal of waste materials shall be outside the Park Boundaries at an approved facility/site. Locations and costs associated with waste disposal shall be the responsibility of the Contractor.

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

1.6 Summary of Work

- .1 The tasks associated with the upgrade to the site drainage and Stormwater system and slope stabilization are summarized as follows. Details of the requirements are provided in the project technical specifications and drawings.
 - .1 Provide and implement designated controls for environmental aspects of the work.
 - .2 Clearing, grubbing and ditching.
 - .3 Upgrading the discharge points of several Stormwater pipes.
 - .4 Install perforated drains.
 - .5 Install new catch basins and new Stormwater pipes.
 - .6 Stabilize a slope.
 - .7 Complete all restoration.
 - .8 Protection of all cultural and archaeological resources.

1.7 Existing Services

- .1 Establish location and extent of service lines in area of work before starting Work. Notify Departmental Representative of findings.
- .2 Protect, relocate or maintain existing active services.

1.8 Documents Required

- .1 Maintain at job site, one copy each document as follows:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Reviewed Shop Drawings.
 - .5 List of Outstanding Shop Drawings.
 - .6 Change Orders.
 - .7 Other Modifications to the Contract.
 - .8 Field Test Reports.
 - .9 Copy of Approved Work Schedule.

- .10 Health and Safety Plan and Other Safety
Related Documents.
- .11 Other documents as specified.
- .12 Construction Schedule
- .13 Environmental Control Plan (ECP)

END -----

1.5 Special
Requirements

- .1 Work outside of normal working hours will require 48 hours written notice to the Departmental Representative. There are restrictions on working on nights, weekends or statutory holidays unless 48 hours written notice is given to the Departmental Representative and approved by Parks Canada.
- .2 Submit schedule in accordance with Section 01 32 16.07 - Construction Progress Schedule - Bar (GANTT) Chart.
- .3 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.
- .4 Keep within limits of work and avenues of ingress and egress.
- .5 No work, encroachment or construction vehicles are permitted outside of the work areas shown on the drawings.

1.6 National Parks
Act

- .1 The requirements and regulations made under the National Parks Act shall apply to this project.
- .2 A copy of this Act may be obtained by contacting the Departmental Representative.

PART 2 PRODUCTS

2.1

NOT USED

- .1 Not Used.

PART 3 EXECUTION

3.1

NOT USED

- .1 Not Used.

END OF SECTION

limits and at the locations indicated on the drawings.

- .10 Bid Item 11 - Section 32 11 23 - Aggregate Base Courses:
 - .1 Unit of Measurement: cubic metres in place.
 - .2 Method of Measurement: from site measurements.
 - .3 This item includes: supply, haulage, placement and compaction of granular materials to the limits and at the locations indicated on the drawings.

- .11 Bid Items 12- Section 32 01 13.02 - Flexible Paving Surface Treatment - Multiple Application; Section 32 12 16 - Asphalt Paving (Type D):
 - .1 Unit of Measurement: Square Metre in Place.
 - .2 Method of Measurement: The surface area shall be measured jointly with the Departmental Representative using a measuring wheel or approved alternative method.
 - .3 Adjustments will not be made for any increase in the cost of Performance Graded Asphalt Binder (PGAB)

- .12 Bid Item 13 - Section 32 91 21 - Topsoil Placement and Grading:
 - .1 Unit of Measurement: Square metres of surface area (horizontal measurement).
 - .2 Method of Measurement: The surface area shall be measured jointly with the Departmental Representative using a measuring wheel or approved alternative method.
 - .3 This item includes: Placement and grading topsoil on prepared areas to a thickness of 100 mm.
 - .4 There shall be no payment for areas topsoiled outside the construction limits unless approved by the Departmental Representative.

- .13 Bid Item 14 - Section 32 92 22 - Hydraulic Seeding:
 - .1 Unit of Measurement: Square metres of surface area (horizontal measurement).
 - .2 Method of Measurement: The surface area shall be measured jointly with the Departmental Representative using a measuring wheel or approved alternative method.
 - .3 This item includes: The application of hydraulic seeding and mulching.

- .4 There shall be no payment for areas hydroseeded and mulched outside the construction limits unless approved by the Departmental Representative.
- .14 Bid Item 15 - Section 32 93 10 - Trees, Shrubs and Ground Cover Planting.
 - .1 Unit of measurement: Each.
 - .2 Method of measurement: For each shrub planted.
 - .3 Payment for this item includes:
 - .1 Supply of shrubs and planting soil, as required.
 - .2 Supply of supporting stakes, grey wires, clamps, anchors, collars, and trunk protection materials.
 - .3 Supply of mulch, and fertilizer.
 - .4 Maintenance during warranty period.
- .15 Bid Item 16,17, and 18 - Section 32 05 14 - Manhole and Catch Basin structures:
 - .1 Unit of Measurement: Each.
 - .2 Unit of Measurement: for each structure installed.
 - .3 Excavation, supply and placement of bedding and backfill material, and disposal of all old fill and existing structure, as well as any extra excavated material required to install new structure.
 - .4 Supply and placement of new structure, including frame, grate, restraining straps, adjustment riser, outlet screen.
- .16 Bid Items 19, 20, 21, 22, 23, 24, and 25 - Section 33 41 00 - Storm Utility Drainage Piping (Various Sizes and Types, including Temporary Water Control Works):
 - .1 Unit of Measurement: metre (m) for each size and type of pipe.
 - .2 Method of Measurement: along centreline of new pipe, from end to end of pipe, as laid and as accepted by the Departmental Representative.
 - .3 Payment for this item includes:
 - .1 Dewatering of site.
 - .2 Supply and placement of bedding and backfill material, and disposal of all old fill and pipe material, as well as any extra excavated material required to install new pipe.
 - .3 Supply and placement of new pipe.
 - .4 Sediment Control Fence

PART 1 GENERAL

1.1 Administrative

- .1 The Contractor shall Schedule and administer project meetings throughout the progress of the work at the call of Departmental Representative.
- .2 The Contractor shall prepare agenda for meetings.
- .3 The Contractor shall Distribute written notice of each meeting four days in advance of meeting date to Departmental Representative.
- .4 The Contractor shall provide physical space or coordinate with the Departmental Representative use of Parks Canada meeting room and make arrangements for meetings.
- .5 The Contractor shall preside at meetings.
- .6 The Contractor shall record the meeting minutes using Parks Canada format. Include significant proceedings and decisions. Identify actions by parties.
- .7 The Contractor shall Reproduce and distribute copies of minutes within three days after meetings and transmit to meeting participants, affected parties not in attendance and the Departmental Representative.
- .8 Representatives of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

1.2 Preconstruction Meeting

- .1 Within 15 days after award of Contract, The Contractor shall request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.
- .2 Senior representatives of Departmental Representative, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.

- .3 The Contractor shall establish time and location of meeting and notify parties concerned minimum 5 days before 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: in accordance with NBDTI Standard Specification.
 - .3 Schedule of submission of shop drawings, samples. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
 - .4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 - Construction Facilities.
 - .5 Site security in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.
 - .6 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
 - .7 Material Deliveries.
 - .8 Record drawings in accordance with Section 01 78 00 - Closeout Submittals.
 - .9 Maintenance manuals in accordance with Section 01 78 00 - Closeout Submittals.
 - .10 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 - Closeout Submittals.
 - .11 Monthly progress claims, administrative procedures, photographs, hold backs.
 - .12 Appointment of inspection and testing agencies or firms.
 - .13 Insurances, transcript of policies.

1.3 Progress Meetings

- .1 During course of Work schedule progress meetings bi-weekly.
- .2 Contractor, major Subcontractors involved in Work and Departmental Representative are to be in attendance.

- .3 Notify parties minimum 7 days prior to meetings.
- .4 Record minutes of meetings using Parks Canada template and circulate to attending parties and affected parties not in attendance within 4 days after meeting.
- .5 Agenda to include the following:
 - .1 Review, approval of minutes of previous meeting.
 - .2 Review of Work progress since previous meeting.
 - .3 Field observations, problems, conflicts.
 - .4 Problems which impede construction schedule.
 - .5 Review of off-site fabrication delivery schedules.
 - .6 Corrective measures and procedures to regain projected schedule.
 - .7 Revision to construction schedule.
 - .8 Progress schedule, during succeeding work period.
 - .9 Review submittal schedules: expedite as required.
 - .10 Maintenance of quality standards.
 - .11 Review proposed changes for effect on construction schedule and on completion date.
 - .12 Other business.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not Used.

----- END -----

PART 1 GENERAL

1.1 Request for an
Alternate Product

- .1 After contract award, the Contractor is to prepare and submit any request for use of an alternate product to the Departmental Representative for review and approval. Submission request to include complete product data, including drawings, description of product, fabrication details and installation procedures.
- .2 The submission request is to include a detailed comparison of the proposed product with the specified product and outline the advantages, of the alternate product, to Parks Canada.
- .3 The submission request is to include any impacts to schedule and costs.

1.2 Administrative

- .1 Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 This section specifies general requirements and procedures for Contractor's submissions of shop drawings, product data, samples and mock-ups to the Departmental Representative for review. Additional specific requirements for submissions are specified in individual sections.
- .3 Do not proceed with Work until relevant submissions are reviewed by the Departmental Representative.
- .4 Present shop drawings, product data and samples in SI Metric units.
- .5 Where items or information is not produced in SI Metric units, converted values are acceptable.

- .6 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.
- .7 Notify the Departmental Representative, in writing, at the time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .8 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review of submission.
- .9 Make any changes which Departmental Representative may require consistent with Contract Documents and resubmit as directed by the Departmental Representative.
- .10 Notify the Departmental Representative, in writing, when resubmitting, of any revisions other than those requested by the Departmental Representative.

1.3 Submission Requirements

- .1 Coordinate each submission with requirements of work and Contract Documents. Individual submissions will not be reviewed until all related information is available.
- .2 Allow 7 days for Departmental Representative's review of each submission.
- .3 Adjustments made on submissions by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
- .4 Make changes in submissions as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.

- .5 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.
 - .6 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 Wiring diagrams.
 - .9 Single line and schematic diagrams.
 - .10 Relationship to adjacent work.
- .7 After Departmental Representative's review, distribute copies.

1.4 Shop Drawings

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

- .2 Where necessary or requested by the Departmental Representative, submit drawings stamped and signed by professional engineer registered or licensed in the Province of New Brunswick.
- .3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .4 Submit electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.
- .5 Cross-reference shop drawing information to applicable portions of Contract Documents.

1.5 Product Data

- .1 Product data: manufacturers catalogue sheets, brochures, literature, performance charts and diagrams, used to illustrate standard manufactured products.
 - .1 Submit electronic copies of product data.
 - .2 Sheet size: 215 x 280 mm, maximum of 3 modules.
 - .3 Delete information not applicable to project.
 - .4 Supplement standard information to provide details applicable to project.
 - .5 Cross-reference product data information to applicable portions of Contract Documents.

1.6 Samples

- .1 Samples: examples of materials, equipment, quality, finishes, workmanship.
- .2 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.7 Test Reports

- .1 Submit electronic copies of test reports for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product of system to be provided has been tested in accordance with specified requirements.
 - .2 Testing must have been within 3 years of contract award for project.

1.8 Certificates

- .1 Submit electronic copies of certificates for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
 - .2 Certificates must be dated after award of project contract complete with project name.

1.9 Manufacturer's Instructions

- .1 Submit electronic copies of manufacturer instructions.
 - .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.

1.10 Review

- .1 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor

corrections are made, electronic copies will be returned and fabrication and installation or 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.

- .2 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.

1.11 Photographic Documentation

- .1 Submit electronic copy of colour digital photography in jpg format, fine resolution, monthly with progress statement as directed by Departmental Representative.
- .2 Project identification: name and number of project and date of exposure indicated.
- .3 Number of viewpoints:
 - .1 Viewpoints and their location as determined by Departmental Representative.
- .4 Frequency of photographic documentation: as directed by Departmental Representative.

.1 Upon completion of: excavation, foundation,
grading services before concealment, or as
directed by Departmental Representative.

1.12 Certificates and
Transcripts

.1 Immediately after award of Contract, submit Letter of
Good Standing from Workers Compensation Board of
New Brunswick .

PART 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END

PART 1 - GENERAL

1.1 Related Requirements

- .1 Section 01 14 00 - Work Restrictions.
- .2 Section 01 56 00 - Temporary Barriers and Enclosures

1.2 Protection Of
Public Traffic

- .1 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.
- .2 When working on travelled way:
 - .1 Place equipment in position to minimize 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.
- .3 Close lanes of road only after receipt of written approval from Departmental Representative.
 - .1 Before re-routing traffic erect suitable signs and devices to Work Area Traffic Control Manual.
- .4 Provide signage at entry kiosk to inform public that campground is closed for construction work.
- .5 Provide and maintain road access and egress to property fronting along Work under Contract, except where other means of road access exist that meet approval of Departmental Representative.

1.4 Informational
And Warning Devices

- .1 Provide and maintain signs and other devices required to indicate construction activities or other temporary and unusual conditions resulting from Project Work which requires road user response.
- .2 Supply and erect signs, delineators, barricades and miscellaneous warning devices to Work Area Traffic Control Manual.
- .3 Place signs and other devices in locations recommended in Work Area Traffic Control Manual.
- .4 Meet with Departmental Representative prior to commencement of Work to prepare list of signs and other devices required for project. If situation on site changes, revise list to approval of Departmental Representative.
- .5 Continually maintain traffic control devices in use:
 - .1 Check signs daily for legibility, damage, suitability and location. Clean, repair or replace to ensure clarity and reflectance.
 - .2 Remove or cover signs which do not apply to conditions existing from day to day.

1.5 CONTROL OF
PUBLIC TRAFFIC

- .1 Provide competent flag personnel, trained in accordance with, and properly equipped to Work Area Traffic Control Manual for situations as follows:
 - .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 on travelled way over brow of hills, around sharp curves or at other 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 Delays to public traffic due to contractor's operators: 15 minutes maximum.

1.6 OPERATIONAL
REQUIREMENTS

- .1 Maintain existing conditions for traffic to access points of interest adjacent to the campground throughout period of construction.

PART 2 - PRODUCTS

- 2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

- 3.1 NOT USED .1 Not Used.

PART 1 GENERAL

1.1 References

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations
- .2 Province of New Brunswick.
 - .1 Occupational Health and Safety Act (most recent version).

1.2 Definitions

- .1 COSH: Canada Occupational Health and Safety Regulations made under Part II of the Canada Labour Code.
- .2 Competent Person: means a person 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, and;
 - .2 Knowledgeable about the provisions of occupational health and safety statutes and regulations that apply to the Work and;
 - .3 Knowledgeable about potential or actual danger to health or safety associated with the Work.
- .3 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 PPE: personal protective equipment
- .5 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.

1.3 Submittals

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

- .2 Submit site-specific Health and Safety Plan prior to commencement of Work.
 - .1 Submit within 10 work days of notification of Bid Acceptance. Provide 3 copies.
 - .2 Departmental Representative will review Health and Safety Plan and provide comments.
 - .3 Revise the Plan as appropriate and resubmit within 5 work days after receipt of comments.
 - .4 Departmental Representative's review and comments made of the Plan shall not be construed as an endorsement, approval or implied warranty of any kind by Canada and does not reduce Contractor's overall responsibility for Occupational Health and Safety of the Work.
 - .5 Submit revisions and updates made to the Plan during the course of Work.
- .3 Submit name of designated Health & Safety Site Representative and support documentation specified in the Safety Plan.
- .4 Submit building permit, compliance certificates and other permits obtained.
- .5 Submit copy of Letter in Good Standing from Provincial Workers Compensation or other department of labour organization.
 - .1 Submit update of Letter of Good Standing whenever expiration date occurs during the period of Work.
- .6 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .7 Submit copies of incident reports.
- .8 Submit WHMIS MSDS - Material Safety Data Sheets.

1.4 Compliance Requirements

- .1 Comply with Occupational Health and Safety Act for Province of New Brunswick, and Regulations made pursuant to the Act.

- .2 Comply with Canada Labour Code - Part II (entitled Occupational Health and Safety) and the Canada Occupational Health and Safety Regulations (COSH) as well as any other regulations made pursuant to the Act.
 - .1 The Canada Labour Code can be viewed at:
[www.http://laws.justice.gc.ca/en/L-2/](http://laws.justice.gc.ca/en/L-2/)
 - .2 COSH can be viewed at:
[www.http://laws.justice.gc.ca/eng/SOR-86-304/ne.html](http://laws.justice.gc.ca/eng/SOR-86-304/ne.html)
- .3 In case of conflict or discrepancy between above specified requirements, the more stringent 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.

1.5 Responsibility

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons and environment adjacent to the site to extent that they may be affected by conduct of Work.
- .2 Comply with and enforce compliance by all workers, sub-contractors and other persons granted access to Work Site with safety requirements of Contract Documents, applicable federal, provincial, and local by-laws, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.6 Site Control and Access

- .1 Control the Work and entry points to Work Site. Approve and grant access only to workers and authorized persons. Immediately stop and remove non-authorized persons.

- .1 Attend pre-construction health and safety meeting, convened and chaired by Departmental Representative, prior to commencement of Work, at time, date and location determined by Departmental Representative. Ensure attendance of:
 - .1 Superintendent of Work
 - .2 Designated Health & Safety Site Representative
 - .3 Subcontractors
- .2 Conduct regularly scheduled tool box and safety meetings during the Work in conformance with Occupational Health and Safety regulations.
- .3 Keep documents on site.

1.13 Health and Safety Plan

- .1 Prior to commencement of Work, develop written Health and Safety Plan specific to the Work. Implement, maintain, and enforce Plan for entire duration of Work and until final demobilization from site.
 - .1 Contractor to provide signed copy of Parks Canada form titled "Attestation and Proof of Compliance with Occupational Health and Safety (OHS)" as a condition of gaining access to the work place.
- .2 Health and Safety Plan shall include the following components:
 - .1 List of health risks and safety hazards identified by hazard assessment.
 - .2 Control measures used to mitigate risks and hazards identified.
 - .3 On-site Contingency and Emergency Response Plan as specified below.
 - .4 On-site Communication Plan as specified below.
 - .5 Name of Contractor's designated Health & Safety Site Representative and information showing proof of his/her competence and reporting relationship in Contractor's company.
 - .6 Names, competence and reporting relationship of other supervisory personnel used in the Work for occupational health and safety purposes.

- .3 On-site Contingency and Emergency Response Plan shall include:
 - .1 Operational procedures, evacuation measures and communication process to be implemented in the event of an emergency.
 - .2 Evacuation Plan: site plan layouts showing marshalling areas. Details on alarm notification methods, location of firefighting equipment and other related data.
 - .3 Name, duties and responsibilities of persons designated as Emergency Warden(s) and deputies.
 - .4 Emergency Contacts: name and telephone number of officials from:
 - .1 General Contractor and subcontractors.
 - .2 Pertinent Federal and Provincial Departments and Authorities having jurisdiction.
 - .3 Local emergency resource organizations.
 - .5 Harmonize Plan with Facility's Emergency Response and Evacuation Plan. Departmental Representative will provide pertinent data including name of PWGSC and Facility Management contacts.
- .4 On-site Communication Plan:
 - .1 Procedures for sharing of work related safety information to workers and subcontractors, including emergency and evacuation measures.
 - .2 List of critical work activities to be communicated with Facility Manager which have a risk of endangering health and safety of Facility users.
- .5 Address all activities of the Work including those of subcontractors.
- .6 Review Health and Safety Plan regularly during the Work. Update as conditions warrant to address emerging risks and hazards, such as whenever new trade or subcontractor arrive at Work Site.
- .7 Departmental Representative will respond in writing, where deficiencies or concerns are noted and may

request re-submission of the Plan with correction of deficiencies or concerns.

- .8 Post copy of the Plan, and updates, prominently on Work Site.

1.14 Safety Supervision

- .1 Employ Health & Safety Site Representative responsible for daily supervision of health and safety of the Work.
- .2 Health & Safety Site Representative may be the Superintendent of the Work or other person designated by Contractor and 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.
- .3 Health & Safety Site Representative must:
 - .1 Be qualified and competent person in occupational health and safety.
 - .2 Have site-related working experience specific to activities of the Work.
 - .3 Be on Work Site at all times during execution of the Work.
- .4 All supervisory personnel assigned to the Work shall also be competent persons.

- .2 Immediately report unsafe condition at site, near-miss accident, injury and damage.
- .3 Maintain site and storage areas in a tidy condition free of hazards causing injury.
- .4 Obey warning signs and safety tags.

- .2 Brief persons of disciplinary protocols to be taken for noncompliance. Post rules on site.

1.17 Correction of 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 noncompliance of health and safety issues identified.
- .3 Departmental Representative will stop Work if non-compliance of health and safety regulations is not corrected in a timely manner.

1.18 Incident Reporting

- .1 Investigate and report the following incidents to Departmental Representative:
 - .1 Incidents requiring notification to Provincial Department of Occupational Safety and Health, Workers Compensation Board or to other regulatory Agency.
 - .2 Medical aid injuries.
 - .3 Property damage in excess of \$10,000.00,
 - .4 Interruptions to Facility operations resulting in an operational loss to a Federal Department in excess of \$5000.00.
- .2 Submit report in writing.

1.19 Hazardous Products

- .1 Comply with requirements of Workplace hazardous Materials Information System (WHMIS).

- .2 Keep MSDS data sheets for all products delivered to site.
 - .1 Post on site.
 - .2 Submit copy to Departmental Representative.
- .3 For interior work in an occupied Facility, post additional copy in one or more publicly accessible locations.

1.20 Blasting

- .1 Blasting or other use of explosives is not permitted on site without prior receipt of written permission and instructions from Departmental Representative.

1.21 Confined Spaces

- .1 Abide by occupational health and safety regulations regarding work in confined spaces.
- .2 Obtain an Entry Permit in accordance with Part XI of the Canada Occupational Health and Safety Regulations for entry into an existing identified confined space located at the Facility or premises of Work.
 - .1 Obtain permit from Facility Manager
 - .2 Keep copy of permit issued.
- .3 Safety for Inspectors:
 - .1 Provide PPE and training to Departmental Representative and other persons who require entry into confined space to perform inspections.
 - .2 Be responsible for efficacy of equipment and safety of persons during their entry and occupancy in the confined space.

1.22 Site Records

- .1 Maintain on Work Site copy of safety related documentation and reports stipulated to be produced in compliance with Acts and Regulations of authorities having jurisdiction and of those documents specified herein.
- .2 Upon request, make available to Departmental Representative or authorized Safety Officer for inspection.

PART 1 GENERAL

1.1 Standard

- .1 All work of this section shall comply with the requirement of the most recent version of the New Brunswick Transportation and Infrastructure (NBDTI) Standard Specification Division 600, except as amended herein.

1.2 References

- .1 New Brunswick Department of Transportation and Infrastructure Standard Specifications (most recent version):
 - .1 NBDTI Standard Specification Division 600-Environmental.
 - .2 The New Brunswick Environment Act and Regulations pursuant to the Act.
 - .3 The Erosion and Sedimentation Control Handbook for Construction Sites.
 - .4 CWRs Erosion and Sediment Control Course and binder.
- .2 Canadian Environmental Assessment Act (most recent version).

1.3 Fires

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

1.4 Disposal of Wastes

- .1 Dispose of waste material in an approved designated waste disposal area outside the park.
- .2 Remove and dispose of containers and waste fluids associated with vehicle maintenance in a provincially approved waste disposal site outside the park.
- .3 Disposal of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers is prohibited. Dispose of all waste materials at provincially approved waste disposal site outside the park boundary. Littering is prohibited.

- .4 To the maximum extent possible, divert waste cardboard, plastic and metal products from landfill to appropriate recycling facilities.

1.5 Drainage

- .1 Provide temporary drainage and pumping required to keep excavations and site free from water.
- .2 Do not pump water containing suspended materials into waterways, sewer or drainage systems.
- .3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.6 Site Clearing and Plant Protection

- .1 Exercise special care to protect trees, shrubs and vegetation within contract limit lines outlined on drawings or as directed by Departmental Representative.
- .2 Protect roots of designated trees to drip line during excavation and site grading to prevent disturbance or damage.
 - .1 Avoid unnecessary traffic, dumping and storage of materials over root zones.
- .3 Minimize stripping of topsoil and vegetation, especially in the vicinity of stream banks
- .4 Restrict tree removal to areas indicated or designated by Departmental Representative.
- .5 When, in the opinion of the Departmental Representative Parks / Canada Environmental Assessment Officer, negligence on the part of the Contractor results in unnecessary damage or destruction of vegetation, or other environmental or aesthetic features within or beyond the staked or designated work area, the Contractor shall be responsible, at its expense, for the complete restoration including the replacement of trees,

shrubs, grass, etc. to the satisfaction of the Departmental Representative.

1.7 Erosion and Sediment Control

- .1 All measures necessary to minimize erosion and the mitigation of sediment shall be provided as required or as directed by the Departmental Representative.
- .2 Labour, equipment and materials to be provided and will be considered as incidental to the work, except for payment items specifically identified in the unit price table.

1.8 Work Adjacent To Waterways

- .1 The Contractor is required to install, inspect and maintain in good working order temporary erosion, siltation and pollution control features, as directed by Departmental Representative. These devices are to be removed in proper manner upon completion of project.
- .2 Do not use waterway beds for borrow material.
- .3 Do not dump excavated fill, waste material or debris.
- .4 Do not skid logs or construction materials across waterways.
- .5 Do not operate construction equipment in waterways.
- .6 Works performed in and around waterways will be carried out in accordance with regulations of authorities having jurisdiction.
- .7 Cuts and fills adjacent to waterways are to be stabilized, and ditch run-outs constructed to prevent entry of silt into waterways. In vicinity of stream banks, maintain as much of the existing vegetation as possible.
- .8 On conclusion of construction, debris must be disposed of to prevent its entry into waterways and stream beds returned to its original configuration.

1.9 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 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.
- .4 All equipment, vehicles and plant used on site must be in good operating condition and leak free. The Departmental Representative reserves the right to have the Contractor immediately remove from the site, any deficient equipment, vehicles, etc.
- .5 There will be a Parks Canada Environmental Assessment Officer on site to undertake overall environmental surveillance of this project.

1.10 Vehicular Movements

- .1 Restrict movement of vehicles and equipment to existing disturbed areas (access roads, borrow pits, disposal areas and right-of-ways).

1.11 Storage and Handling of Fuels And Dangerous Fluids

- .1 Locate fuel storage facility outside Park and minimum of 30 m from any water body. Any fuel storage tankage (s) used shall be of adequate double-walled safety construction and shall be enclosed by an impermeable containment dyking system with a volume capacity equal to at least 110% of fuel storage tank (s)' fuel storage capacity. Any spillage and/or ponded fuel shall be immediately recovered and placed in secure containers. When no longer required, the fuel storage area shall be cleaned up to satisfaction of the Departmental Representative and any fuel contaminated soil removed to the nearest approved industrial waste disposal site.

- .1 Fueling of vehicles or equipment will not be permitted within 30 m of any water body.
- .2 Exercise care in handling of fuels to minimize potential for fuel spills. Report immediately any fuel spills to Departmental Representative. Contractor is responsible for any cleanup or repair resulting from any spills.
- .3 Supply and maintain on site emergency response material to contain spills and minimize environmental damage, i.e. absorbent material, to the approval of Departmental Representative. Disposal of all contaminated material as per Clause 1.4 of this section.

1.12 Erosion Control

- .1 Sediment fences and ditch erosion control structures shall be constructed in roadside ditches or at culvert inverts prior to any excavation as directed by Departmental Representative.
- .2 To minimize run-off, work on slopes which may affect water bodies will be curtailed during periods of heavy rainfall, as directed by the Departmental Representative.
- .3 Provide and maintain a project and site specific Erosion and Sediment Control (ESC) Plan.

1.13 Environmental Protection Plan

- .1 The Contractor is required to submit a plan showing all pollution control measures and sediment control measures that will be used to fulfill the requirements of the Environmental Procedures Section and Parks Canada Environmental Impact Assessment for this project . This plan will be reviewed by the Departmental Representative and the Environmental Protection Officer prior to start of construction activities

END

PART 1 GENERAL

1.1 References and Codes

- .1 Perform Work in accordance with National Building Code of Canada (NBC) including amendments up to tender closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.
- .2 Perform Work in accordance with the EA for this project
- .3 Meet or exceed requirements of:
 - .1 Contract documents.
 - .2 Specified standards, codes and referenced documents.

1.2 National Parks Act

- .1 The requirements and regulations made under the National Parks Act shall apply to this project.
- .2 A copy of this Act may be obtained by contacting the Departmental Representative.

1.3 Archaeological Status

- .1 Parks Canada Project Manager assigned to this project shall have authority to suspend work on this project in the event that directions and specifications are not followed or when there is a threat to resources.

1.4 Pre-Construction Mitigation

- .1 The Contractor must be firmly aware that he/she are working in a National Park setting with its emphasis on cultural and natural resource protection.
- .2 Parks Canada will provide two sets of mitigation measures, one set for cultural resource protection and one set for natural resource protection. These are to be read

in entirety and mitigation will be followed as described.

- .3 Archaeological resources will be respected and maintained in accordance with Parks Canada Cultural Resource Management Policy.
- .4 Prior to construction, all Contractor employees and subcontractor employees will be required to attend an environmental briefing session. This session will highlight operating conditions, Archaeological mitigation and guidelines in the Environmental Impact Assessment and the Archaeological Impact Assessment.
- .5 The Contractor, will be responsible for briefing all subcontractors or crew about relevant portions of the Environmental Impact Assessment and the Archaeological Impact Assessment that pertain to their activity and ensuring their work conforms to this document.
- .6 Conditions presented in the Environmental Impact Assessment and the Archaeological Impact Assessment will be considered part of the Contract Document. Failure to comply with or observe these may result in the work being suspended pending rectification of the problem.
- .7 Parks Canada Environmental Assessment Officer assigned to the project is to ensure that the mitigative measures detailed in the Environmental Impact Assessment are adequately carried out and to provide additional mitigation for unforeseen impacts on site. Failure to respond to environmental concerns may result in a "stop work" order being issued by the Project Manager until such time the issue has been resolved.
- .8 In the event that cultural resources are discovered, Contractor to stop work in the vicinity of the cultural resources or

artifacts and contact the Departmental Representative for direction to follow.

- .9 The Contractor will adhere to all mitigation set out in Environmental Impact Assessment and Archaeological Impact Assessment.
- .10 Any artifacts or items of historical significance uncovered or found during construction or maintenance, and their associated archaeological records, shall revert back to Parks Canada.

1.5 Construction Mitigation

- .1 All construction equipment is restricted to the existing roadway surfaces and identified corridors, so that cultural resources outside of the construction area are not damaged.
- .2 No material will be spilt or left on the ground. (Ex., bolts, plastic, grease).
- .3 All landscape disturbed by construction will be returned to its preconstruction standards, unless otherwise advised.
- .4 All equipment and materials associated with the project will be removed after the job is completed. A final inspection will be done.
- .5 All supplies, material and equipment will be restricted to the identified corridor.
- .6 Stock piling (i.e. gravel, pipe, geotextile, plywood and associated materials) is restricted to approved locations.

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END

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

1.3 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.

1.4 Procedures

- .1 Notify appropriate agency and Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made.
- .2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in 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.

1.5 Rejected Work

- .1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or reexecute in accordance with Contract Documents.
- .2 Make good other Contractor's work damaged by such removals or replacements promptly.
- .3 If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Parks Canada will deduct from Contract Price difference in

PART 1 GENERAL

1.1 Access

- .1 Provide and maintain adequate access to project site.
- .2 Build and maintain temporary roads during period of work. PWGSC and Parks Canada must approve prior to their use, any proposed temporary roads within the Park.
- .3 Upon completion of contract work, rehabilitate any temporary roads to the satisfaction of the Departmental Representative.
- .4 If authorized to use existing roads for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractor's use of roads.
- .5 Clean roads and parking areas where used by Contractor's equipment or employees' vehicles.

1.2 Site Signs

- .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-Z321-77.
 - .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 Departmental Representative.
 - .2 No separate payment to be made for Project Identification Site Signs. Cost shall be deemed incidental to work.

1.3 Sanitary Facilities

- .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
 - .1 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.

Representative based upon requirements of Contract Documents.

- .5 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout work.
- .6 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.3 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 Store sheet materials on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .5 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.

1.4 Transportation

- .1 Pay costs of transportation of products required in performance of Work.
- .2 Transportation cost of products supplied by Parks Canada will be paid for by Departmental Representative. Unload, handle and store such products.

Part 1 General

- .1 Contractor to identify existing survey control points and property limits as identified on the drawings.

1.1 Qualifications of Surveyor

- .1 Qualified registered surveyor, licensed to practice in Place of Work, acceptable to Departmental Representative.

1.2 Survey Reference Points

- .1 Existing base horizontal and vertical control points are designated on drawings.
- .2 Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.
- .3 Make no changes or relocations without prior written notice to Departmental Representative.
- .4 Report to Departmental Representative when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
- .5 Require surveyor to replace control points in accordance with original survey control.

1.3 Survey Requirements

- .1 Establish two permanent bench marks on site, referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project Record Documents.
- .2 Establish lines and levels, locate and lay out, by instrumentation.
- .3 Stake for grading, fill and topsoil placement and landscaping features.
- .4 Stake slopes and berms.
- .5 Establish pipe invert elevations.

1.4 Existing Services

- .1 Before commencing work, establish location and extent of service lines in area of Work and notify Departmental Representative of findings.
- .2 Remove abandoned service lines within 2 m of structures. Cap or otherwise seal lines at cut-off points as directed by Departmental Representative.

1.5 Location of Equipment and Fixtures

- .1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.
- .2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.
- .3 Inform Departmental Representative of impending installation and obtain approval for actual location.
- .4 Submit field drawings to indicate relative position of various services and equipment when required by Departmental Representative.

1.6 Records

- .1 Maintain a complete, accurate log of control and survey work as it progresses.
- .2 Record locations of maintained, re-routed and abandoned service lines.

1.7 Action and Informational Submittals

- .1 Submit name and address of Surveyor to Departmental Representative.
- .2 On request of Departmental Representative, submit documentation to verify accuracy of field engineering work.

- .3 Submit certificate signed by surveyor certifying and noting those elevations and locations of completed Work that conform and do not conform to Contract Documents.

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

- .1 Not Used.

----- END -----

PART 1 GENERAL

1.1 References

- .1 NOT USED

1.2 Project
Cleanliness

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Parks Canada or other Contractors.
- .2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site, unless approved by Departmental Representative.
- .3 Clear snow and ice from access to site or facilities of the work, bank/pile snow in designated areas only.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Provide suitable on-site containers for collection of waste materials and debris.
- .6 Provide and use marked separate bins for recycling. Refer to Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .7 Dispose of waste materials and debris outside the limits of the National Park at a location/facility approved by the Authority having jurisdiction.
- .8 Store volatile waste in covered metal containers, and remove from premises 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.

1.3 Final Cleaning

- .1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .3 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .4 Remove waste products and debris other than that caused by Parks Canada or other Contractors.
- .5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site, unless approved by Departmental Representative.
- .6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .7 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
- .8 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
- .9 Remove dirt and other disfiguration from exterior surfaces.

1.4 Waste Management and Disposal

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

PART 2 PRODUCTS

2.1 NOT USED

----- END -----

PART 1 GENERAL

1.1 Waste Management Goals

- .1 Prior to start of Work conduct meeting with Departmental Representative to review and discuss PWGSC's waste management plan and goals.
- .2 Accomplish maximum control of solid construction waste.
- .3 Protect environment and prevent environmental pollution damage.

1.2 References

- .1 Definitions:
 - .1 Class III: non-hazardous waste - construction renovation and demolition waste.
 - .2 Cost/Revenue Analysis Workplan (CRAW): based on information from Waste Reduction Workplan, and intended as financial tracking tool for determining economic status of waste management practices.
 - .3 Demolition Waste Audit (DWA): relates to actual waste generated from project.
 - .4 Inert Fill: inert waste - exclusively asphalt and concrete.
 - .5 Materials Source Separation Program (MSSP): consists of series of ongoing activities to separate reusable and recyclable waste material into material categories from other types of waste at point of generation.
 - .6 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.
 - .7 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.
 - .8 Recycling: process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
 - .9 Reuse: repeated use of product in same form but not necessarily for same purpose. Reuse includes:
 - .1 Salvaging reusable materials from re-modelling projects, before demolition

stage, for resale, reuse on current project
or for storage for use on future projects.

- .2 Returning reusable items including pallets
or unused products to vendors.
- .10 Salvage: removal of structural and non-structural
materials from deconstruction/disassembly
projects for purpose of reuse or recycling.
- .11 Separate Condition: refers to waste sorted into
individual types.
- .12 Source Separation: act of keeping different types
of waste materials separate beginning from the
point they became waste.
- .13 Waste Audit (WA): detailed inventory of estimated
quantities of waste materials that will be
generated during construction, demolition,
deconstruction and/or renovation. Involves
quantifying by volume/weight amounts of materials
and wastes that will be reused, recycled or
landfilled. Refer to Schedule A.
- .14 Waste Management Co-ordinator (WMC): contractor
representative responsible for supervising waste
management activities as well as co-ordinating
required submittal and reporting requirements.
- .15 Waste Reduction Workplan (WRW): written report
which addresses opportunities for reduction,
reuse, or recycling of materials generated by
project. Specifies diversion goals,
implementation and reporting procedures,
anticipated results and responsibilities. Waste
Reduction Workplan information acquired
from Waste Audit.

1.3 Documents

- .1 Post and maintain in visible and accessible area at
job site, one copy of following documents:
 - .1 Waste Reduction Workplan.

1.4 Action and Informational Submittals

- .1 Submit in accordance with Section 01 33 00 - Submittal
Procedures.
- .2 Prepare and submit following prior to project start-up:
 - .1 1 copy and 1 electronic copy of completed Waste
Reduction Workplan (WRW).

- .3 Prepare and submit on weekly basis, throughout project or at intervals agreed to by Departmental Representative the following:
 - .1 Receipts, scale tickets, waybills, and/or waste disposal receipts that show quantities and types of materials reused, recycled, or disposed of.
 - .2 Written bi-weekly summary report detailing cumulative amounts of waste materials reused, recycled and landfilled, and brief status of ongoing waste management activities.

1.5 Waste Reduction Work Plan (WRW)

- .1 Prepare and submit WRW at least 10 days prior to project start-up.
- .2 WRW identifies strategies to optimize diversion through reduction, reuse, and recycling of materials and comply with applicable regulations.
- .3 WRW should include but not limited to:
 - .1 Applicable regulations.
 - .2 Specific goals for waste reduction, identify existing barriers and develop strategies to overcome them.
 - .3 Destination of materials identified.
 - .4 Methods to collect, separate, and reduce generated wastes.
 - .5 Location of waste bins on-site.
 - .6 Security of on-site stock piles and waste bins.
 - .7 Protection of personnel, sub-contractors.
 - .8 Clear labelling of storage areas.
 - .9 Details on materials handling and removal procedures
 - .10 Recycler and reclaimer requirements.
 - .11 Quantities of materials to be salvaged for reuse or recycled and materials sent to landfill.
 - .12 Requirements for monitoring on-site wastes management activities.
- .4 Structure WRW to prioritize actions and follow 3R's hierarchy, with Reduction as first priority, followed by Reuse, then Recycle.
- .5 Post WRW or summary where workers at site are able to review content.

- .6 Monitor and report on waste reduction by documenting total volume (in tonnes) and cost of actual waste removed from project.

1.6 Storage, Handling and Protection

- .1 Store, materials to be reused, recycled and salvaged in locations as directed by Departmental Representative.
- .2 Protect, stockpile, store and catalogue salvaged items.
- .3 Separate non-salvageable materials from salvaged items. Transport and deliver non salvageable items to licensed disposal facility.
- .4 Protect surface drainage, mechanical and electrical from damage and blockage.
- .5 Separate and store materials produced during project in designated areas.
- .6 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated processing facilities.
 - .1 On-site source separation is recommended.
 - .2 Remove co-mingled materials to off site processing facility for separation.
 - .3 Obtain waybills, receipts and/or scale tickets for separated materials removed from site.
 - .4 Materials reused on-site are considered to be diverted from landfill and as such are to be included in all reporting.

1.7 Disposal of Wastes

- .1 Do not bury rubbish or waste materials.
- .2 Do not dispose of waste, volatile materials, mineral spirits, oil, paint thinner into waterways, storm, or sanitary sewers.

1.8 Scheduling

- .1 Co-ordinate Work with other activities at site to ensure timely and orderly progress of Work.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END

PART 1 GENERAL

1.1 References

- .1 Canadian Environmental Protection Act (CEPA)
 - .1 SOR/2008-197, Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations.

1.2 Administrative Requirements

- .1 Acceptance of Work Procedures:
 - .1 Contractor's Inspection: Contractor: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
 - .1 Notify Departmental Representative in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.
 - .2 Request Departmental Representative inspection.
 - .2 Departmental Representative Inspection:
 - .1 Departmental Representative and Contractor to inspect Work and identify defects and deficiencies.
 - .2 Contractor to correct Work as directed.
 - .3 Completion Tasks: submit written certificates that tasks have been performed as follows:
 - .1 Work: completed and inspected for compliance with Contract Documents.
 - .2 Defects: corrected and deficiencies completed.
 - .3 Equipment and systems: tested, adjusted and balanced and fully operational.
 - .4 Operation of systems: demonstrated to Parks Canada personnel.
 - .5 Work: complete and ready for final inspection.
 - .4 Final Inspection:
 - .1 When completion tasks are done, request final inspection of Work by Departmental Representative, and Contractor.
 - .2 When Work incomplete according to Departmental Representative, complete outstanding items and request reinspection.

PART 1 GENERAL

1.1 Administrative
Requirements

- .1 Pre-warranty Meeting:
 - .1 Convene meeting one week prior to contract completion with contractor's representative and Departmental Representative, in accordance with Section 01 31 19 - Project Meetings to:
 - .1 Verify Project requirements.
 - .2 Review warranty requirements and manufacturer's installation instructions.
 - .2 Departmental Representative to establish communication procedures for:
 - .1 Notifying construction warranty defects.
 - .2 Determine priorities for type of defects.
 - .3 Determine reasonable response time.
 - .3 Contact information for bonded and licensed company for warranty work action: provide name, telephone number and address of company authorized for construction warranty work action.
 - .4 Ensure contact is located within local service area of warranted construction, is continuously available, and is responsive to inquiries for warranty work action.

1.2 Action and
Informational
Submittals

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Provide evidence, if requested, for type, source and quality of products supplied.

1.3 Format

- .1 Organize data as instructional manual.
- .2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.
- .3 When multiple binders are used correlate data into related consistent groupings.
 - .1 Identify contents of each binder on spine.

- .4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
- .5 Arrange content by systems, under Section numbers and sequence of Table of Contents.
- .6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .7 Text: manufacturer's printed data, or typewritten data.
- .8 Drawings: provide with reinforced punched binder tab.
 - .1 Bind in with text; fold larger drawings to size of text pages.

1.4 Contents -
Project Record
Documents

- .1 Table of Contents for Each Volume: provide title of project;
 - .1 Date of submission; names.
 - .2 Addresses and telephone numbers of Consultant and Contractor with name of responsible parties.
 - .3 Schedule of products and systems, indexed to content of volume.
- .2 For each product or system:
 - .1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
- .3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.
- .4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- .5 Typewritten Text: as required to supplement product data.
 - .1 Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Testing and Quality Control.

1.5 As -Built
Documents and
Samples

- .1 Maintain, in addition to requirements in General Conditions, at site for Departmental Representative one record copy of:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Change Orders and other modifications to Contract.
 - .5 Reviewed shop drawings, product data, and samples.
 - .6 Field test records.
 - .7 Inspection certificates.
 - .8 Manufacturer's certificates.
- .2 Store record documents and samples in field office apart from documents used for construction.
 - .1 Provide files, racks, and secure storage.
- .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual.
 - .1 Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition.
 - .1 Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by Departmental Representative.
- .6 As-Built information to be submitted to Departmental Representative within 30 days of project substantial completion.

1.6 Recording
Information on
Project Record
Documents

- .1 Record information on set of black line opaque drawings, provided by Departmental Representative.

- .2 Use felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .3 Record information concurrently with construction progress.
 - .1 Do not conceal Work until required information is recorded.
- .4 Contract Drawings and shop drawings: mark each item to record actual construction, including:
 - .1 Measured depths of elements of foundation in relation to finish first floor datum.
 - .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
 - .4 Field changes of dimension and detail.
 - .5 Changes made by change orders.
 - .6 Details not on original Contract Drawings.
 - .7 References to related shop drawings and modifications.
- .5 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.
- .6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.
- .7 Provide digital photos, if requested, for site records.

1.7 Equipment and Systems

- .1 For each item of equipment and each system include description of unit or system, and component parts.
 - .1 Give function, normal operation characteristics and limiting conditions.

- .2 Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
- .2 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences.
 - .1 Include regulation, control, stopping, shut-down, and emergency instructions
 - .2 Include summer, winter, and any special operating instructions.
- .3 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- .4 Provide servicing and lubrication schedule, and list of lubricants required.
- .5 Include manufacturer's printed operation and maintenance instructions.
- .6 Include sequence of operation by controls manufacturer.
- .7 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- .8 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- .9 Include test and balancing reports as specified in Section 01 45 00 - Testing and Quality Control.
- .10 Additional requirements: as specified in individual specification sections.

1.8 Materials and Finishes

- .1 Building products, applied materials, and finishes: include product data, with catalogue number, size, composition, and colour and texture designations.
 - .1 Provide information for re-ordering custom manufactured products.

- .2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .3 Moisture-protection and weather-exposed products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not Used.

----- END -----

PART 1 GENERAL

1.1 Related
Requirements

- .1 Section 32 11 16.01 - Granular Sub-base.
- .2 Section 32 11 23 - Aggregate Base Course
- .3 Section 32 12 16 - Asphalt Paving

1.2 References

- .1 New Brunswick Department of Transportation and
Infrastructure Renewal Standard
Specifications (most recent version):
 - .1 NBDTI Standard Specification Item 201
Production of Highway Aggregates.

1.3 Action and
Informational
Submittals

- .1 Submit in accordance with Section 01 33 00 -
Submittal Procedures.
- .2 Samples:
 - .1 Allow continual sampling by Departmental
Representative during production.
 - .2 Provide Departmental Representative with
access to source and processed
material for sampling.
 - .3 Install sampling facilities at discharge
end of production conveyor, to allow
Departmental Representative to obtain
representative samples of items being
produced. Stop conveyor belt when requested
by Departmental Representative to
permit full cross section sampling.
 - .4 Provide front end loader or other suitable
equipment including trained operator
for stockpile sampling as necessary.
 - .5 Provide area for Departmental
Representative lab trailer and make
necessary provisions for water and electric
power for the duration of the work.

PART 2 PRODUCTS

2.1 Materials

- .1 Aggregate quality: sound, hard, durable material
free from soft, thin, elongated or laminated
particles, organic material, clay lumps or

minerals, free from adherent coatings and injurious amounts of disintegrated pieces or other deleterious substances.

- .2 Fine aggregates satisfying requirements of applicable section to be one, or blend of following:
 - .1 Screenings produced in crushing of quarried rock or crushed gravel.
- .3 Coarse aggregates satisfying requirements of applicable section to be produced from crushed rock, crushed gravel or pit run gravel.

2.2 Source Quality Control

- .1 Inform Departmental Representative of proposed source of aggregates and provide access for sampling 2 weeks minimum before starting production.
- .2 If materials from proposed source do not meet, or cannot reasonably be processed to meet, NBDTI specified requirements, locate alternative source. Materials to be determined acceptable by sieve analysis testing
- .3 Advise Departmental Representative 2 weeks minimum in advance of proposed change of material source.
- .4 Acceptance of material at source does not preclude future rejection if it fails to conform to requirements specified, lacks uniformity, or if its field performance is found to be unsatisfactory.

PART 3 EXECUTION

3.1 Preparation

- .1 Aggregate source preparation:
 - .1 Prior to excavating materials for aggregate production, clear and grub area to be worked, and strip unsuitable surface materials. Dispose of cleared, grubbed and unsuitable materials as approved by authority having jurisdiction.

- .2 Where clearing is required, leave screen of trees between cleared area and roadways as directed.
 - .3 Clear, grub and strip area ahead of quarrying or excavating operation sufficient to prevent contamination of aggregate by deleterious materials.
 - .4 When excavation is completed dress sides of excavation to nominal 1.5:1 slope, and provide drains or ditches as required to prevent surface standing water.
 - .5 Trim off and dress slopes of waste material piles and leave site in neat condition.
 - .6 Provide silt fence or other means to prevent contamination of existing watercourse or natural wetland features.
- .2 Processing:
- .1 Process aggregate uniformly using methods that prevent contamination, segregation and degradation.
- .3 When operating in stratified deposits use excavation equipment and methods that produce uniform, homogeneous aggregate gradation.
- .4 Where necessary, screen, crush, wash, classify and process aggregates with suitable equipment to meet requirements.
- .5 Stockpiling:
- .1 Stockpile aggregates in accordance with the requirements of NBDTI Standard Specifications, Division 201, Item 201.4.5.
 - .2 Stockpile aggregates in sufficient quantities to meet project schedules.
 - .3 Stockpiling sites to be level, well drained, and of adequate bearing capacity and stability to support stockpiled materials and handling equipment.
 - .4 Do not use intermixed or contaminated materials.
 - .5 Remove and dispose of rejected materials as directed by Departmental Representative within 48 hours of rejection.
 - .6 Aggregate acceptance shall be based on sampling and testing in accordance with

the requirements of NBDTI Standard Specifications, Division 200, Item 201.4.5.

- .7 Handling of aggregates produced outside the specified requirements of NBDTI Standard Specifications, Division 200, Item 20.4.7 may be rejected at the departments discretion.
- .8 Stockpile locations are to be designated by Departmental Representative.

3.2 Cleaning

- .1 Leave Work area clean at end of each day.
- .2 Leave aggregate stockpile site in tidy, well drained condition, free of standing surface water.
- .3 Unused aggregates are the property of the Contractor.

----- END -----

PART 1 GENERAL

1.1 Related Requirements

- .1 Section 31 11 00 Clearing and Grubbing.

1.2 References

- .1 New Brunswick Department of Transportation and Infrastructure Standard Specifications (most recent version)

PART 2 PRODUCTS

2.1 Not Used

PART 3 EXECUTION

3.1 Temporary Erosion And Sedimentation Control

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction, sediment and erosion control drawings and sediment and erosion control plan, specific to site, that complies with the requirements of authorities having jurisdiction.
- .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 Stripping Of Topsoil

- .1 Ensure that procedures are conducted in accordance with applicable Provincial requirements.
- .2 Remove topsoil before construction procedures commence to avoid compaction of topsoil.
- .3 Handle topsoil only when it is dry and warm.

- .4 Remove vegetation from targeted areas by non-chemical means and dispose of stripped vegetation as directed by Departmental Representative.
- .5 Remove brush from targeted area by non-chemical means and dispose of as directed by Departmental Representative.
- .6 Strip topsoil to depths as directed by Departmental Representative
 - .1 Avoid mixing topsoil with subsoil.
- .7 Pile topsoil by mechanical hoe in berms in locations as directed by Departmental Representative.
 - .1 Stockpile height not to exceed 2 m.
- .8 Dispose of unused topsoil in location as indicated by Departmental Representative.
- .9 Protect stockpiles from contamination and compaction.
- .10 Cover topsoil that has been piled for long term storage, with hay or straw mulch or grass to maintain agricultural potential of soil.

3.3 Preparation of Grade

- .1 Verify that grades are correct and notify Departmental Representative if discrepancies occur. Do not begin work until instructed by Departmental Representative.
- .1 Grade area only when soil is dry to lessen soil compaction.
- .2 Grade soil establishing natural contours and eliminating uneven areas and low spots, ensuring positive drainage.

3.4 Cleaning

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END

PART 1 GENERAL

1.1 Related
Requirements

- .1 Section 31 23 33 Excavating, Trenching and Backfilling.

1.2 References

- .1 New Brunswick Department of Transportation and Infrastructure Standard Specification (most recent version).

PART 2 PRODUCTS

2.1 NOT USED

PART 3 EXCAVATION

3.1 Preparation

- .1 Temporary Erosion and Sedimentation Control:
 - .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil bearing water runoff or airborne dust.
 - .2 Insert, repair and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

3.2 Construction

- .1 The Contractor shall carry out the Work as indicated in the Contract Documents and/or as specifically directed by the Departmental Representative.
- .2 Ditching shall consist of removing vegetal matter and up to a maximum of 300 mm of soil from an existing ditch such that the width of the bottom of the ditch is not less than 1 m and the ditch has a continuous smooth grade providing positive gravity drainage, without ponding, in the specified flow direction.
 - .1 The tendered Quantity includes cleaning ends of driveway culverts and cross culverts as directed by Departmental Representative.
- .3 The Contractor shall not excavate or undermine the Foreslope during the course of the Work.

- .4 The Contractor shall shape ditches to a uniform cross section, with no gouges or ridges remaining in the finished Work.
- .5 The Contractor shall repair any damage, at his/her own expense, to adjacent property resulting from the Work.
- .6 The materials excavated from within the ditches shall become the property of the Contractor and shall be disposed of outside of the work site.
- .7 A driveway crossing designated to be removed and not replaced shall be excavated so that the ditch and Slopes remaining after excavation match the adjacent ditch and Slopes.
- .8 Driveways with a culvert designated for replacement shall be replaced in the same workday utilizing material excavated from the crossing wherever possible.
 - .1 Where excavation involves removal of driveway Culverts, the Contractor shall take care to ensure that any existing pipe is not damaged and is salvaged for re-use.
 - .1 The Contractor shall notify the Departmental Representative prior to exposing any existing pipe.
 - .2 Any pipe determined by the Departmental Representative to be salvageable shall remain the property of the Parks Canada.
 - .3 Salvageable pipe shall be re-used in the Work Site or transported, by the Contractor, and stockpiled as directed by the Departmental Representative.
 - .4 Unsalvageable pipe and waste shall become the property of the Contractor and shall be disposed of outside of the Work Site.
 - .5 If the pipe is damaged as a result of the Contractors actions, as determined by the Departmental Representative, the Contractor shall be responsible to replace the pipe.
- .9 Ditches shall be stabilized against erosion with hay or straw mulch at the end of each days ditching.

----- END -----

PART 1 GENERAL

1.1 Related Sections

- .1 Section 31 23 33 - Excavation, Trenching and Backfilling.
- .2 Section 32 91 21 - Topsoil Placement

1.2 References

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM 698-91 Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m).

1.3 Existing Conditions

- .1 Establish precise field location of underground services before commencing work.
- .2 Known underground and surface utility lines and buried objects are as indicated on site plan for guidance only.
- .3 Contractor is responsible to have all service located completed prior to any excavation on site.
- .4 Refer to dewatering in Section 31 23 33 - Excavating Trenching and Backfilling.
- .5 Refer to drainage requirements.

1.4 Protection

- .1 Protect existing fencing, trees, landscaping, natural features, bench marks, buildings, pavement, surface or underground utility lines which are to remain as directed by Departmental Representative. If damaged, restore to original or better condition unless directed otherwise.
- .2 Maintain access roads to prevent accumulation of construction related debris on roads.

PART 2 PRODUCTS

2.1 Materials

1. Fill material: in accordance with Section 31 23 33 - Excavating, Trenching and Backfilling.
- .2 Excavated or graded material existing on site may be suitable to use as fill for grading work if approved by Departmental Representative.

PART 3 EXECUTION

3.1 Grading

- .1 Rough grade to levels, profiles, and contours allowing for surface treatment as indicated.
- .2 Rough grade to follow depths indicated on details.
- .3 Prior to placing fill over existing ground, scarify surface to depth of 150mm. Maintain fill and existing surface at approximately same moisture content to facilitate bonding.
- .4 Compact filled and disturbed areas to as follows:
85% under landscaped areas.
As specified or detailed for other areas of site.
- .5 Do not disturb soil within branch spread of trees or shrubs to remain.

3.2 Testing

- .1 Inspection and testing of soil compaction will be carried out by testing laboratory. Costs of tests will be paid by Departmental Representative except as indicated under Section 01 45 00, Testing and Quality Control.

3.3 Surplus Material

- .1 Remove surplus material and material unsuitable for fill, grading or landscaping as directed by Departmental Representative.

----- END -----

2.2 Materials

- .1 Straw barriers: straw bales to be dry, firm, tightly tied in at least two places, show no evidence of straw or tie decay and be free of sediment. They are to be of standard agriculture dimensions, approximately 600mm x 600mm x 1200mm.
 - .1 Straw barriers
 - .1 Stakes: of sufficient strength to satisfy control measure performance and maintenance requirements. Stakes to be 1.2m in length.
- .2 Silt fence barriers: construct silt fence barriers of silt fence geotextile supported on stakes. Geotextile used for silt fence shall be woven Class 1 geotextile, having a minimum width of 900mm. The maximum filtration opening size (FOS) shall be 840µm.
 - .1 Stakes: of sufficient strength to satisfy control measure performance and maintenance requirements. Stakes to be 1.5m in length.
- .3 Erosion Control Blanket: Place erosion control blanket on stabilized slope. Blankets to be a rolled product made from natural fibres, bound together with photodegradable polypropylene netting.

PART 3 - EXECUTION

3.1 General

- .1 Supply, install and maintain temporary erosion and sedimentation control features where required and in accordance with Environmental Protection Plan. Do not remove control features until authorized by Departmental Representative.
- .2 Fires and burning of rubbish on site is not permitted.

3.2 SILT FENCE

- .1 Install silt fence in the locations directed.
- .2 Install extra 50 x 75 x 1200 mm long posts midpoints between supplied posts. Attach fence with roofing nails and roofing tins. Provide wood strapping along top of fence as shown.
- .3 Excavate 150 x 150 mm trench along length of fence as indicated. Lay fabric bottom in trench and

control items when and as directed by the
Departmental Representative.

- .3 Maintain vertical alignment of silt fence such that
it is always plumb and straight.
- .4 Remove sedimentation control features when directed
by the Departmental Representative. Take care to
avoid causing turbidity, and excessive re-suspension
of particles when removing sediment control features.

----- END -----

PART 1 GENERAL

1.1 Related
Requirements

- .1 Section 31 37 00 - Rip Rap

1.2 References

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM D 4491-99a, Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
 - .2 ASTM D 4595-86(2001), Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method.
 - .3 ASTM D 4751-99a, Standard Test Method for Determining Apparent Opening Size of a Geotextile.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-4.2 No. 11.2-M89 (April 1997), Textile Test Methods - Bursting Strength - Ball Burst Test (Extension of September 1989).
 - .2 CAN/CGSB-148.1, Methods of Testing Geotextiles and Complete Geomembranes.
- .3 New Brunswick Department of Transportation and Infrastructure Standard Specification (most recent version):
 - .1 NBDTI Standard Specification Division 600 - Environmental, Item 601- Geotextile.

1.3 Submittals

- .1 Submit to Departmental Representative following samples at least 2 weeks prior to beginning Work.
 - .1 Minimum length of 2 metres of roll width of geotextile.

1.4 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 Materials

- .1 Physical properties: Grab Tensile 600 N min, Tearing Strength (Trapezoid Method), 250 N min., filtration opening size 50 um min - 150 um max, Hydraulic conductivity 0.01 cm/sec.
- .2 Geotextile: woven synthetic fibre fabric, supplied in rolls.
 - .1 Width: 3.5 metres minimum
 - .2 Length: 79 metres 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.

PART 3 EXECUTION

3.1 Installation

- .1 Place geotextile material, as indicated on drawings and as directed by 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.
- .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 Departmental Representative.
- .8 Place and compact soil layers in accordance with Section 31 23 33 - Excavating, Trenching and Backfilling and 31 24 13 - Roadway Embankments.

3.2 Cleaning

- .1 Remove construction debris from project site and dispose of debris in an environmentally responsible and legal manner.

3.3 PROTECTION

- .1 Vehicular traffic not permitted directly on geotextile.

----- END -----

PART 1 GENERAL

1.1 Related
Requirements

- .1 Section 31 23 33 Excavating, Trenching and Backfilling.

1.2 References

- .1 New Brunswick Department of Transportation and Infrastructure Standard Specification (most recent version).
 - .1 NBDTI Standard Specification, Division 600, Environmental, Item 608 Random Rip Rap.

PART 2 PRODUCTS

2.1 General

- .1 All materials to be supplied by the contractor in quantities as indicated and specified.

2.2 STONE

- .1 Hard, durable, angular quarry stone, free from seams, cracks or other structural defects, to meet the size distribution for use intended, as shown below in the table.
- .2 Table: Random Rip Rap Grading Limits: (see next page)

NBDTI TABLE 608-1

Mass (kg)	Size (Note 1) (mm)	R-A (Note 2)	Finer by Mass (%)							
			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

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

2.3 Geotextile Filter

- .1 Geotextile: as indicated in drawings and in accordance with Section 31 32 19 - Geotextiles.

PART 3 EXECUTION

3.1 Placing

- .1 Where riprap is to be placed on slopes excavate trench at toe of slope as indicated.
- .2 Fine grade area to be riprapped to uniform, even surface. Fill depressions with suitable material and compact to provide firm bed.
- .3 Place geotextile on prepared surface in accordance with Section 31 32 19 - Geotextiles and as indicated. Avoid puncturing geotextile. Vehicular traffic over geotextile is not permitted.
- .4 Place riprap to thickness as indicated on the table.
- .5 Place stones in manner approved by Departmental Representative to secure surface and create a stable mass. Place larger stones at bottom of slopes.

END

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 01 33 00 - Submittal Procedures
- .2 Section 31 05 16 - Aggregate Materials

1.2 References

- .1 ASTM International
 - .1 ASTM C 88, Standard Test Method for Soundness of Aggregates by Use of Sodium Sulphate or Magnesium Sulphate.
 - .2 ASTM C 117, Standard Test Method for Materials Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.
 - .3 ASTM C 131, Standard Test Method for Resistance to Degradation of Small Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
 - .4 ASTM C 136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .5 ASTM D 140/D 140M, Standard Practice for Sampling Bituminous Materials.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1-[88], Sieves Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2-[M88], Sieves Testing, Woven Wire, Metric.
- .3 New Brunswick Department of Transportation and Infrastructure Standard Specifications, Division 200 Pavement Structure, Item 265-CHIP SEAL.

1.3 Action And Informational Submittals

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for asphalt material and include product characteristics, performance criteria, physical size, finish and limitations.

- .3 Samples:
 - .1 Submit for review and acceptance 1-10 kg clean, sealed, plastic container of asphalt material proposed for use to Departmental Representative 2 weeks prior to commencing work.
 - .2 Provide access on tank truck for Departmental Representative to sample asphalt material to be incorporated into work, in accordance with ASTM D 140.
- .4 Certifications: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .5 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures.

1.4 Quality Assurance

- .1 Upon request from Departmental Representative, submit manufacturer's test data and certification that asphalt surface treatment material meets requirements of this section.

1.5 Delivery, Storage And Handling

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 EQUIPMENT

- .1 Pressure distributor is:
 - .1 Designed, equipped, maintained, and operated to ensure asphalt material can be:
 - .1 Maintained at even temperature.
 - .2 Applied uniformly on variable widths of surface up to 5 m.
 - .3 Applied at controlled rates from 0.2 to 5.4 L/m², and with allowable variation from specified maximum rate of 0.1 L/m².
 - .4 Distributed in uniform spray

- without atomization at rate specified and at temperature required.
- .2 Equipped with meter registering metres of travel per minute, visibly located, to enable truck driver to maintain constant speed required for application at specified rate.
 - .3 Equipped with pump with flow meter graduated in units of 5 L maximum per minute passing through nozzles and readily visible to operator. Ensure pump power unit is independent of truck power unit.
 - .4 Equipped with an easily readable, accurate and sensitive device which registers temperature of liquid in reservoir.
 - .5 Equipped with accurate volume measuring devices or calibrated tank.
 - .6 Equipped with nozzles of same make and dimensions adjustable for fan width and orientation.
 - .7 Cleaned if previously used with incompatible asphalt material.
- .2 Mechanical aggregate spreader:
- .1 Equip with positive controls to allow aggregate to be deposited uniformly over full width of asphalt material.
 - .2 Self-propelled unit of design approved by Departmental Representative.
 - .3 Supported by 4 minimum wheels with pneumatic tires of 2 axles.
- .3 Rollers:
- .1 Self-propelled pneumatic tired rollers exerting force of 7 tonnes/m minimum of rolling width, equipped with seven wheels minimum staggered back and front, and tires inflated to 415 kPa.
 - .2 Tandem steel drum rollers and rubber-coated vibratory steel drum rollers as approved by Departmental Representative:
 - .1 Drum diameter: 1 m minimum.
 - .2 Static force: 4.3 tonnes/m minimum of rolling width.

- .4 Power broom: self-propelled pneumatic tired unit, capable of vertical and horizontal angular adjustment.

2.2 MATERIALS

- .1 Emulsified Asphalt Binder: As outlined in NBDTI Standard Specifications, Item 265, Chip Seal.
- .2 Aggregate: material to Section 31 05 16 - Aggregate Materials and following requirements:
 - .1 Crushed stone or gravel.
 - .2 Gradations to be within limits specified when tested to ASTM C 136 and ASTM C 117 Sieve sizes to CAN/CGSB-8.1.

Sieve Designation	Gradation 12.5 mm
19 mm	
12.5 mm	
9.5 mm	100
4.75 mm	
2.36 mm	0 - 5
0.075 mm	0 - 2

- .3 Los Angeles Degradation: to ASTM C 131, maximum percent loss by mass 25.
- .4 Magnesium sulphate soundness: to ASTM C 88, maximum percent loss by mass 15.
- .5 Crushed particles: at least 60 % of particles by mass within each of following sieve designation range to have at least 1 freshly fractured face. Material to be divided into ranges using methods of ASTM C 136.

Passing	Retained on
25 mm	to 12.5 mm
12.5 mm	to 4.75 mm

- .6 Flat and elongated particles, with length to thickness ratio greater than 5, maximum percent by mass 8.
- .3 Anti-stripping additive: heat stable adhesion agent approved by Departmental Representative.

PART 3 - EXECUTION

- 3.1 Examination .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's written instructions prior to flexible paving surface treatment installation.
- .1 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .2 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.
- 3.2 Preparation .1 Clean paved and primed surfaces of mud, dust and other foreign matter. Immediately before asphalt binder is applied broom or clean as necessary to remove foreign material.
- 3.3 Application .1 Obtain approval from Departmental Representative, of surface before applying asphalt surface treatment material.
- .2 Apply treatment only when existing surface is dry when atmospheric temperature in shade is above 10 degrees C and rising or above 15 degrees C if falling, and when weather is clear and dry.
 - .3 Schedule work to approval of Departmental Representative.
 - .4 Ensure pressure distributor follows string line parallel to centreline, or follows path as directed by Departmental Representative.
 - .5 Apply materials within following ranges. Departmental Representative will direct quantities of asphalt material and aggregate to be applied.
 - .1 Double Surface Treatment: Two layers of 12.5 mm chips.

Asphalt binder per square metre	Cover aggregate per square metre	
First Application	1.0 - 1.35 L	Gradation B 16 - 22 kg
Second Application	1.5 - 2.05 L	Gradation C 10 - 16 kg

- .6 Apply asphalt material at spraying temperature specified in applicable CGSB standard for type and grade used and at rate specified using pressure distributor.
- .7 Apply aggregate, in unfrozen condition, immediately following application of asphalt material. Aggregate spreader to be no more than 30 m behind distributor. Apply no more aggregate than can be thoroughly incorporated into and absorbed by asphalt material.
- .8 Ensure aggregate spreader tires do not contact uncovered and newly applied asphalt material.
- .9 Immediately after aggregate is spread, cover deficient areas with additional aggregate.
- .10 Adjust rates of application of asphalt and aggregate as directed by Departmental Representative.
- .11 Compact immediately after aggregate is spread using 2 rollers minimum.
 - .1 Ensure 1 rollers minimum are pneumatic tired type.
- .12 Apply at least 3 roller passes to entire surface treated area.
- .13 Apply subsequent layer of asphalt and aggregate when surface has set sufficiently to approval of Departmental Representative.
- .14 Maintain surface as directed by Departmental Representative for period of 4 day minimum after rolling.
 - .1 Ensure maintenance includes distribution of aggregate, to absorb free asphalt and covering areas deficient in aggregate material with additional aggregate.
- .15 Sweep excess material from entire surface by power

brooms at time directed by Departmental
Representative and at end of maintenance period.

.16 Conduct maintenance to contain embedded material.

3.4 Cleaning

.1 Progress Cleaning:

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

.2 Final Cleaning: upon completion remove surplus
materials, rubbish, tools and equipment.

.3 Sweep excess material from entire surface by
means of power brooms at times directed by
Departmental Representative and at end of
maintenance period.

END

**Table 201-2
 Grading Limits - Crushed Rock Base/Subbase**

ASTM Sieve Size	Aggregate Base		Aggregate Subbase	
	25 mm % passing	31.5 mm % passing	50 mm % passing	75 mm % passing
90.0 mm				100
75.0 mm				95 - 100
63.0 mm			100	85 - 100
50.0 mm			95 - 100	73 - 95
37.5 mm		100	76 - 100	58 - 87
31.5 mm	100	95 - 100		
25.0 mm	95 - 100	81 - 100	60 - 84	
19.0 mm	71 - 100	66 - 90	50 - 76	35 - 69
12.5 mm	56 - 82	50 - 77		
9.5 mm	47 - 74	41 - 70	32 - 61	25 - 54
4.75 mm	31 - 59	27 - 54	21 - 49	17 - 43
2.36 mm	21 - 46	17 - 43	15 - 40	12 - 35
1.18 mm	13 - 34	11 - 32	10 - 32	8 - 28
300 µm	5 - 18	4 - 19	4 - 18	4 - 16
75 µm	0 - 8	0 - 8	0 - 9	0 - 9

**Table 201-3
 Grading Limits - Crushed Gravel Base/Subbase**

ASTM Sieve Size	Aggregate Base		Aggregate Subbase		
	25 mm % passing	31.5 mm % passing	50 mm % passing	75 mm % passing	100 mm % passing
100 mm					100
90.0 mm				100	95 - 100
75.0 mm				95 - 100	80 - 100
63.0 mm			100	86 - 100	
50.0 mm			95 - 100	75 - 95	60 - 87
37.5 mm		100	79 - 100	61 - 87	50 - 81
31.5 mm	100	95 - 100			
25.0 mm	95 - 100	83 - 100	63 - 85		
19.0 mm	75 - 100	70 - 90	53 - 78	38 - 70	34 - 68
12.5 mm	60 - 82	55 - 78			
9.5 mm	52 - 75	45 - 72	35 - 62	28 - 56	25 - 58
4.75 mm	36 - 61	30 - 57	24 - 51	19 - 46	17 - 48
2.36 mm	25 - 48	20 - 46	17 - 42	13 - 37	13 - 39
1.18 mm	16 - 36	14 - 35	12 - 33	9 - 30	9 - 30
300 µm	5 - 16	5 - 19	5 - 18	4 - 16	4 - 17
75 µm	0 - 6	0 - 6	0 - 6	0 - 7	0 - 7

Table 201-4
Grading Limits - Pit Run Gravel Subbase

ASTM Sieve Size	% Passing
125 mm	100
100 mm	95 - 100
75 mm	82 - 100
50mm	62 - 100
37.5 mm	52 - 100
19 mm	30 - 90
9.5 mm	22 - 79
4.75 mm	16 - 66
2.36 mm	12 - 55
1.18 mm	9 - 44
300 µm	4 - 25
75 µm	0 - 7

PART 3 EXECUTION

3.1 Preparation

- .1 Temporary Erosion and Sedimentation Control:
 - .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust.
 - .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

3.2 Placing

- .1 Place Granular Sub-Base after subgrade is inspected and approved by Departmental Representative.
- .2 Construct Granular Sub-Base to depth and grade in areas indicated.
- .3 Ensure no frozen material is placed.
- .4 Place material only on clean unfrozen surface, free from snow or ice.

- .5 Begin spreading Granular Sub-Base material on crown line or high side of one-way slope.
- .6 Place Granular Sub-Base material using methods which do not lead to segregation or degradation.
- .7 Place Granular Sub-Base material to full width in uniform layers not exceeding 250 mm compacted thickness.
 - .1 Engineer may authorize thicker lifts if specified compaction can be achieved.
- .8 Shape each layer to smooth contours and compact to specified density before succeeding layer is placed.
- .9 Remove and replace portion of layer in which material has become segregated during spreading.

3.3 Compaction

- .1 Compaction equipment to be capable of obtaining required material densities.
- .2 Compact Granular Sub-Base to density of not less than 98% maximum dry density in accordance with ASTM D698.
- .3 Shape and roll alternately to obtain smooth, even and uniformly compacted sub-base.
- .4 Apply water as necessary during compaction to obtain specified density.
- .5 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Departmental Representative.
- .6 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.4 Site Tolerances

- .1 Finished Granular Sub-Base surface to be within ± 25 mm of established grades as indicated but not uniformly high or low.

3.5 PROTECTION

PART 1 GENERAL

1.1 Related Requirements

- .1 Section 31 05 16 - Aggregate Materials.
- .2 Section 01 33 00 - Submittal Procedures.

1.2 References

- .1 ASTM International, latest edition
 - .1 ASTM C117, Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .3 ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft³) (600kN-m/m³).
 - .4 ASTM D4318, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
Particles in Coarse Aggregate
- .2 New Brunswick Department of Transportation and Infrastructure Standard Specifications (most recent version):
 - .1 NBDTI Standard Specification Division 200 Pavement Structure, Item 201 - Production of Highway Aggregates.

PART 2 PRODUCTS

2.1 Materials

- .1 Granular Base Course material, 31.5 mm minus, in accordance with Section 31 05 16 - Aggregate Materials and following requirements:
 - .1 Crushed rock or crushed gravel. Refer to Table 201-2 and 201-3 in Section 32 11 16.01, Item 2.1 Materials.
 - .2 Granular Base Course shall not consist of sandstone.
 - .3 Gradations to be within limits specified in NBDTI Division 200, Item 201.2.4, Tables 201-2, 201-3 when tested to ASTM C136 and ASTM C117. Tables 201-2 and 201-3 are found in Section 32.11.16.01, Granular Subbase, 2.1 Materials.

- .2 Other properties in accordance with NBDTI, Division 200, Item 201.2.2, Table 201-1.:

PART 3 EXECUTION

3.1 Preparation

- .1 Temporary Erosion and Sedimentation Control:
 - .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust.
 - .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

3.2 PLACING

- .1 Place Granular Base Course after subgrade is inspected and approved by Departmental Representative.
- .2 Construct Granular Base Course to depth and grade in areas indicated.
- .3 Ensure no frozen material is placed.
- .4 Place material only on clean unfrozen surface, free from snow or ice.
- .5 Begin spreading Granular Base Course material on crown line or high side of one-way slope.
- .6 Place Granular Base Course material using methods which do not lead to segregation or degradation.
- .7 Place material to full width in uniform layers not exceeding 250 mm compacted thickness.
 - .1 Engineer may authorize thicker lifts if specified compaction can be achieved.
- .8 Shape each layer to smooth contours and compact to specified density before succeeding layer is placed.

- .9 Remove and replace portion of layer in which material has become segregated during spreading.
- .10 Shoulder material (Table 201-6) shall be placed as per NBDTI Standard Specification Division 200, item 204, Shoulder Material, and at other locations within the Park as directed by the Departmental Representative.

3.3 Compaction

- .1 Compaction equipment to be capable of obtaining required material densities.
- .2 Compact Granular Base Course to density of not less than 100% maximum dry density in accordance with ASTM D698.
- .3 Shape and roll alternately to obtain smooth, even and uniformly compacted sub-base.
- .4 Apply water as necessary during compaction to obtain specified density.
- .5 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Engineer.
- .6 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.4 Site Tolerances

- .1 Finished Granular Base Course surface to be within 10 mm of elevation as indicated but not uniformly high or low.

3.5 PROTECTION

- .1 Maintain finished Granular Base Course in condition conforming to this section until succeeding base is constructed, or until granular sub-base is accepted by Departmental Representative.

END

PART 1 GENERAL

1.1 Related
Requirements

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 31 05 16 - Aggregate Materials.

1.2 References

- .1 American Association of State Highway and
Transportation Officials (AASHTO), latest
edition
 - .1 AASHTO MP1, Standard Specification for
Performance Graded Asphalt Binder.
 - .2 AASHTO PP6, Standard Practice for
Grading or Verifying the Performance
Grade of an Asphalt Binder.
 - .3 AASHTO T245, Standard Method of Test for
Resistance to Plastic flow of Bituminous
Mixtures Using Marshall Apparatus.
 - .4 AASHTO T283, Resistance of Compacted
Bituminous Mixture to Moisture Induced
Damage.
 - .5 AASHTO M156, Requirements for Mixing Plants
for Hot-Mixed, Hot-Laid Bituminous Paving
Mixtures.
- .2 Asphalt Institute (AI)
 - .1 AI Manual Series 2 (MS-2), Seventh Edition,
Marshall Mix Design.
- .3 ASTM International, latest edition
 - .1 ASTM C88, Standard Test Method for
Soundness of Aggregates by Use of
Sodium Sulphate or Magnesium Sulphate.
 - .2 ASTM C117, Standard Test Method for
Material Finer Than 0.075mm (No.200)
Sieve in Mineral Aggregates by Washing.
 - .3 ASTM C123, Standard Test Method for
Lightweight Particles in Aggregate.
 - .4 ASTM C127, Standard Test Method for
Specific Gravity and Absorption of
Coarse Aggregate.
 - .5 ASTM C128, Standard Test Method for
Density, Relative Density (Specific
Gravity), and Absorption of Fine Aggregate.
 - .6 ASTM C131, Standard Test Method for
Resistance to Degradation of Small-Size

Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

- .7 ASTM C136, Standard Method for Sieve Analysis of Fine and Coarse Aggregates.
- .8 ASTM C207, Standard Specification for Hydrated Lime.
- .9 ASTM D2041, Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures.
- .9 ASTM D2419, Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
- .10 ASTM D2726, Test Method for Bulk Specific Gravity of Compacted Bituminous Mixtures Using Saturated Surface-Dry Specimens.
- .11 ASTM D3203, Standard Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures.
- .12 ASTM D4469, Method for Calculating Percent Asphalt Absorption by the Aggregate in an Asphalt Paving Mixture.
- .13 ASTM D4791, Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.
- .14 ASTM D6927, Standard Test Method for Marshall Stability and Flow of Bituminous Mixtures.
- .15 Environmental Protection Act.
- .16 Occupational Health and Safety Act.
- .17 New Brunswick Department of Transportation and Infrastructure Standard Specifications
(most recent version):
 - .1 NBDTI Standard Specification Division 200 Pavement Structure, Item 260, Asphalt Concrete.

1.3 Action and
Informational
Submittals

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit viscosity-temperature chart for asphalt cement to be supplied showing

Kinematic Viscosity in centistokes for a temperature range of 105 to 175 degrees C 2 weeks prior to beginning Work.

.3 Samples:

- .1 Inform Departmental Representative of proposed source of aggregates and provide access for sampling 4 weeks prior to beginning Work.
- .2 Submit samples of following materials proposed for use 2 weeks prior to beginning Work.
 - .1 One 5 L container of asphalt cement.
- .2 50 kg of each aggregate to be used in the asphalt mix.

.4 Test and Evaluation Reports:

- .1 Submit manufacturer's test data and certification that asphalt cement meets specification requirements.
- .2 Submit asphalt concrete mix design and trial mix test results to Departmental Representative for approval at least 2 weeks prior to beginning Work.

1.4 Delivery,
Storage and Handling

- .1 Deliver and stockpile aggregates in accordance with Section 31 05 16 - Aggregate Materials. Stockpile minimum 30 % of total amount of aggregate required before beginning asphalt mixing operation.
- .2 When necessary to blend aggregates from one or more sources to produce required gradation, do not blend in stockpiles.
- .3 Stockpile fine aggregate separately from coarse aggregate, although separate stockpiles for more than two mix components are permitted.
- .4 Provide approved storage, heating tanks and pumping facilities for asphalt cement.
- .5 Submit to Departmental Representative copies of freight and waybills for asphalt cement as shipments are received.

PART 2 PRODUCTS

2.1 Materials

- .1 Performance graded asphalt cement: to AASHTO MP1, grade PG 58-28 when tested to AASHTO PP6.
- .2 Aggregates: in accordance with Section 31 05 16 - Aggregate Materials and requirements as follows:
 - .1 Crushed stone or gravel.
 - .2 Asphalt aggregate properties in accordance with NBDTI Standard Specification Division 200, Item 260, Asphalt Concrete, Table 260-1 for Type B, C, and D.:
 - .3 When dryer drum plant or plant without hot screening is used, process fine aggregate through 5.0 mm sieve and stockpile separately from coarse aggregate.
 - .4 Do not use aggregates having known polishing characteristics in mixes for surface courses.
 - .5 Regardless of compliance with specified physical requirements, fine aggregates may be accepted or rejected on basis of past field performance.
- .4 Anti-stripping agent: As per NBDTI Standard Specifications, Division 200, Item 260, Table 260-2..

2.2 Equipment

- .1 Pavers: mechanical grade controlled self-powered pavers capable of spreading mix within specified tolerances, true to line, grade and crown indicated.
- .2 Rollers: sufficient number of type and weight to obtain specified density of compacted mix.
- .3 Vibratory rollers:
 - .1 Drum diameter: 1200 mm minimum.
- .4 Haul trucks: sufficient number and of adequate size, speed and condition to ensure orderly and continuous operation and as follows:
 - .1 Boxes with tight metal bottoms.

- .2 Covers of sufficient size and weight to completely cover and protect asphalt mix when truck fully loaded.
- .3 In cool weather or for long hauls, insulate entire contact area of each truck box.
- .4 Use only trucks which can be weighed in single operation on scales supplied.
- .5 Hand tools:
 - .1 Lutes or rakes with covered teeth for spreading and finishing operations.
 - .2 Tamping irons having mass 12 kg minimum and bearing area not exceeding 310 cm² for compacting material along curbs, gutters and other structures inaccessible to roller. Mechanical compaction equipment, when approved by Departmental Representative, may be used instead of tamping irons.
 - .3 Straight edges, 4.5 m in length, to test finished surface.
- .6 Plant testing facility: provide laboratory space at plant site for exclusive use of Departmental Representative, for performing tests, keeping records and making reports.

2.3 Mix Design

- .1 Mix design to be approved in writing by Departmental Representative.
- .2 Mix design to be developed by testing laboratory approved by Departmental Representative.
 - .1 Conform to the requirements of this specification and to the Special Provisions when tested in accordance with procedures provided in the latest edition of the Asphalt Institute Manual Series 2 (MS-2) with the exception of calculating asphalt absorption, ASTM D 4469 shall be followed.
- .3 The asphalt concrete physical requirements shall be as per NBDTI Standard Specifications.
- .4 Following acceptance of the Contractor's mix design, the Job Mix Formula (JMF) is determined by the Contractor producing one or more trial

asphalt concrete mixes using the plant proposed for the work.

PART 3 EXECUTION

3.1 Examination

- .1 Verification of Conditions: verify that conditions of substrate are acceptable for asphalt paving.
 - .1 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

3.2 Plant and Mixing Requirements

- .1 Batch and continuous mixing plants:
 - .1 To ASTM D995.
 - .2 Feed aggregates from individual stockpiles through separate bins to cold elevator feeders.
 - .1 Do not load frozen materials into bins.
 - .3 Feed cold aggregates to plant in proportions to ensure continuous operations.
 - .4 Calibrate bin gate openings and conveyor speeds to ensure mix proportions are achieved.
 - .5 Before mixing, dry aggregates to moisture content not greater than 0.5% by mass or to lesser moisture content if required to meet mix design requirements.
 - .6 Immediately after drying, screen aggregates into hot storage bins in sizes to permit recombining into gradation meeting job-mix requirements.
 - .7 Store hot screened aggregates in manner to minimize segregation and temperature loss.
 - .8 Heat asphalt cement and aggregate to mixing temperature. Do not heat asphalt cement above 160 degrees C.

- .9 Make available current asphalt cement viscosity data at plant.
- .10 Maintain temperature of materials within 5 degrees C of specified mix temperature during mixing.
- .11 Mixing time:
 - .1 In batch plants, continue wet mixing as long as necessary to obtain thoroughly blended mix but not less than 30s or more than 75s.
 - .2 In continuous mixing plants, mixing time to be not less than 45s.
- .2 Dryer drum mixing plant:
 - .1 To ASTM D995.
 - .2 Load aggregates from individual stockpiles to separate cold feed bins. Do not load frozen materials into bins.
 - .3 Feed aggregates to burner end of dryer drum by means of multi-bin cold feed unit and blend to meet job-mix requirements by adjustments of variable speed feed belts and gates on each bin.
 - .4 Where RAP is to be incorporated into mix, dryer drum mixer is to be designed to prevent direct contact of RAP with burner flame or with exhaust gases hotter than 180 degrees C.
 - .5 Feed RAP from separate cold feed bin designed to minimize reconsolidation of material.
 - .6 Meter total flow of aggregate and RAP using electronic weigh belt system with indicator that can be monitored by plant operator and which is interlocked with asphalt pump to ensure proportions of aggregate, RAP and asphalt entering mixer remain constant.
 - .7 Allow for easy calibration of weighing systems for aggregates and RAP without having material enter mixer.
 - .8 Calibrate bin gate openings and conveyor speeds to ensure mix proportions are achieved.
 - .1 Calibrate weigh bridge on charging conveyor by weighing amount of aggregate passing over weigh bridge in set amount of time.
 - .2 Difference between this value and amount shown by plant computer

system to differ by not more than
plus or minus 2 %.

- .9 Make provision for conveniently sampling full flow of materials from cold feed.
- .10 Provide screens or other suitable devices to reject oversize particles or lumps of aggregate and RAP from cold feed prior to entering drum.
- .11 Provide system interlock stop on feed components if either asphalt or aggregate from bin stops flowing.
- .12 Accomplish heating and mixing of asphalt mix in approved parallel flow dryer mixer in which aggregate enters drum at burner end and travels parallel to flame and exhaust gas stream.
 - .1 Control heating to prevent fracture of aggregate or excessive oxidation of asphalt.
 - .2 Equip system with automatic burner controls and provide for continuous temperature sensing of asphalt mixture at discharge, with printing recorder that can be monitored by plant operator.
 - .3 Submit printed record of mix temperatures at end of each day.
- .13 Ensure mixing period and temperature to produce uniform mixture in which particles are thoroughly coated, and moisture content of material as it leave mixer is 2 % maximum.
- .3 Temporary storage of hot mix:
 - .1 Provide mix storage of sufficient capacity to permit continuous operation and designed to prevent segregation.
 - .2 Do not store asphalt mix in storage bins in excess of 3 hour.
- .4 While producing asphalt mix for this Project, do not produce mix for other users unless separate storage and pumping facilities are provided for materials supplied to this project.
 - .1 Permissible variation of mix temperature at discharge from plant: 10 degrees C.

3.3 Preparation

- .1 Reshape granular roadbed as necessary to attain specified grades and slopes.

- .2 When paving over existing asphalt surface, clean pavement surface to approval of Departmental Representative.
- .3 Prior to laying mix, clean surfaces of loose and foreign material.

3.4 Transportation of Mix

- .1 The Contractor has the option of using a Material Transfer Vehicle (MTV) for the placement of all asphalt concrete.
 - .1 No unit cost adjustments will be applied to asphalt concrete placed using a material transfer vehicle.
 - .2 Material transfer vehicles shall be self-propelled equipment capable of transferring asphalt concrete from the hauling equipment into the paver, and shall have the following characteristics:
 - .1 Minimum storage capacity of 20 t;
 - .2 A conveyor system to transfer asphalt concrete from the hauling equipment to the paver hopper insert; and
 - .3 An auger system in the MTV or paddle mixers in the hopper insert to remix the asphalt concrete prior to discharge from the hopper insert.
- .2 Transport mix to job site in vehicles cleaned of foreign material.
- .3 Paint or spray truck beds with limewater, soap or detergent solution, or non-petroleum based commercial product, at least daily or as required.
 - .1 Raise truck bed and thoroughly drain, and ensure no excess solution remains in truck bed.
- .4 Schedule delivery of material for placing in daylight, unless Departmental Representative approves artificial light for night placing.
- .5 Deposit mix from surge or storage silo to trucks in multiple drops to reduce segregation.

- .1 Do not dribble mix into trucks.
- .6 Deliver material to paver at uniform rate and in an amount within capacity of paving and compacting equipment.
- .7 Deliver loads continuously in covered vehicles and immediately spread and compact.
 - .1 Deliver and place mixes at temperature not less than 135 degrees C.

3.5 Test Strip

- .1 Construct and test an asphalt test strip to approval of Departmental Representative.
- .2 Construct test strip with at least 500 tonnes of mix, and involving more than one lane, so that joint finishing techniques can be established.
- .3 During construction of test strip, the Contractor will establish optimum rolling pattern by taking nuclear densimeter readings and observations to:
 - .1 Determine sequence and number of passes.
 - .2 Determine correct operating characteristics of vibratory rollers.
 - .3 Determine maximum density of asphalt mix.
 - .4 Ensure smooth surface finish.
 - .5 Establish actual density achieved by coring in order to determine if additional or other rolling equipment is required to achieve density of not less than 93 % of laboratory maximum theoretical density from samples of mix being used.

3.6 Placing

- .1 Obtain Departmental Representative's approval of existing surface prior to placing asphalt.
- .2 Place asphalt concrete to thicknesses, grades and lines as directed by Departmental Representative.
- .3 Placing conditions:
 - .1 Place asphalt mixtures only when air temperature is 5 degrees C minimum. All asphalt must be installed no later than November 15, 2016.

- .2 When temperature of surface on which material is to be placed falls below 10 degrees C, provide extra rollers as necessary to obtain required compaction before cooling.
- .3 Do not place asphalt mix when pools of standing water exist on surface to be paved, during rain, or when surface is damp.
- .4 Place asphalt concrete in minimum compacted lifts of thickness as follows:
 - .1 Mix Type B in minimum 50mm layers.
 - .2 Mix Type D in minimum 40mm layers.
- .5 Where possible do tapering and levelling where required in lower lifts. Overlap joints by not less than 300 mm.
- .6 Place individual strips no longer than 500 m unless approved by the Departmental Representative.
- .7 Spread and strike off mixture with self-propelled mechanical finisher.
 - .1 Construct longitudinal joints and edges true to line markings.
 - .2 When using pavers in echelon, have first paver follow marks or lines, and second paver follow edge of material placed by first paver.
 - .1 Work pavers as close together as possible and in no case permit them to be more than 30 m apart.
 - .3 Maintain constant head of mix in auger chamber of paver during placing.
 - .4 If segregation occurs, immediately suspend spreading operation until cause is determined and corrected.
 - .5 Correct irregularities in alignment left by paver by trimming directly behind machine.
 - .6 Correct irregularities in surface of pavement course directly behind paver.
 - .1 Remove excess material forming high spots using shovel or lute.
 - .1 Fill and smooth indented areas with hot mix.
 - .2 Do not broadcast material over such areas.

- .7 Do not throw surplus material on freshly screeded surfaces.
- .8 When hand spreading is used:
 - .1 Use approved wood or steel forms, rigidly supported to assure correct grade and cross section.
 - .1 Use measuring blocks and intermediate strips to aid in obtaining required cross-section.
 - .2 Distribute material uniformly without broad casting material.
 - .3 During spreading operation, thoroughly loosen and uniformly distribute material by lutes or covered rakes.
 - .1 Reject material that has formed into lumps and does not break down readily.
 - .4 After placing and before rolling, check surface with templates and straightedges and correct irregularities.
 - .5 Provide heating equipment to keep hand tools free from asphalt.
 - .1 Control temperature to avoid burning material.
 - .2 Do not use tools at higher temperature than temperature of mix being placed.

3.7 Compacting

- .1 Roll asphalt continuously using established rolling pattern to density of not less than 92.5% of maximum theoretical density of mix samples. Determined according to ASTM D3203.
- .2 Do not change rolling pattern unless mix changes or lift thickness changes.
 - .1 Inform Departmental Representative prior to making changes to rolling pattern.
- .3 General:
 - .1 Provide at least 2 rollers and as many additional rollers as necessary to achieve

- specified pavement density. When more than 2 rollers are required, 1 roller must be pneumatic tired type.
- .2 Start rolling operations as soon as placed mix can bear weight of roller without excess displacement of material or cracking of surface.
 - .3 Operate roller slowly initially to avoid displacement of material. Do not exceed 5 km/h for breakdown and intermediate rolling for static steel-wheeled and pneumatic tired rollers. Do not exceed 9 km/h for finish rolling.
 - .4 For lifts 50 mm thick and greater, adjust speed and vibration frequency of vibratory rollers to produce minimum of 25 impacts per metre of travel. For lifts less than 50 mm thick, impact spacing not to exceed compacted lift thickness.
 - .5 Overlap successive passes of roller by minimum of 200 mm and vary pass lengths.
 - .6 Keep wheels of roller slightly moistened with water to prevent pick-up of material but do not over-water.
 - .7 Do not stop vibratory rollers on pavement that is being compacted with vibratory mechanism operating.
 - .8 Do not permit heavy equipment or rollers to stand on finished surface before it has been compacted and has thoroughly cooled.
 - .9 After traverse and longitudinal joints and outside edge have been compacted, start rolling longitudinally at low side and progress to high side.
 - .1 Ensure that all points across width of pavement receive essentially equal numbers of passes of compactors.
 - .10 When paving in echelon, leave unrolled 50 to 75 mm of edge which second paver is following and roll when joint between lanes is rolled.
 - .11 Where rolling causes displacement of material, loosen affected areas at once with lutes or shovels and restore to

original grade of loose material before re-rolling.

- .4 Breakdown rolling:
 - .1 Begin breakdown rolling with vibratory roller immediately following rolling of transverse and longitudinal joint and edges.
 - .2 Operate rollers as close to paver as necessary to obtain adequate density without causing undue displacement.
 - .3 Operate breakdown roller with drive roll or wheel nearest finishing machine. Use only experienced roller operators.

- .5 Intermediate rolling:
 - .1 Use pneumatic-tired, steel wheel or vibratory rollers and follow breakdown rolling as closely as possible and while paving mix temperature allows maximum density from this operation.
 - .2 Rolling to be continuous after initial rolling until mix placed has been thoroughly compacted.

- .6 Finish rolling:
 - .1 Accomplish finish rolling with two-axle or three-axle tandem steel wheeled rollers while material is still warm enough for removal of roller marks.
 - .1 If necessary to obtain desired surface finish, use pneumatic-tired rollers as directed by Departmental Representative.
 - .2 Conduct rolling operations in close sequence.

3.8 Joints

- .1 General:
 - .1 Remove surplus material from surface of previously laid strip.
 - .1 Do not deposit on surface of freshly laid strip.
 - .2 Transverse joints:
 - .1 Offset transverse joint in succeeding lifts by at least 600 mm.

- .2 Cut back to full depth vertical face and tack face with thin coat of hot asphalt prior to continuing paving.
- .3 Compact transverse joints to provide smooth riding surface. Use methods to prevent rounding of compacted surface at joints.
- .3 Longitudinal joints:
 - .1 Offset longitudinal joints in succeeding lifts by at least 150 mm.
 - .2 Cold joint is defined as joint where asphalt mix is placed, compacted and left to cool below 100 degrees C prior to paving of adjacent lane.
 - .1 All cold joints shall be painted with an application of tack coat prior to paving the adjacent lane.
 - .2 Overlap previously laid strip with spreader by 25 mm.
 - .3 Before rolling, carefully remove and discard coarse aggregate in material overlapping joint with lute or rake.
 - .4 Roll longitudinal joints directly behind paving operation.
 - .5 When rolling with static or vibratory rollers, have most of drum width ride on newly placed lane with remaining 150 mm extending onto previously placed and compacted lane.

3.9 Surface Defects

- .1 The finished surface of any pavement course shall have a uniform texture and be free of visible signs of poor workmanship and bumps and/or dips exceeding 3 mm as measure with a 3 m straight edge.
- .2 Any obvious defects, as determined by the Engineer, shall be cause for rejection of the pavement course.
 - .1 Multiple defects within a 10 metre section shall be considered as one defect.

.2 If a defect is continuous beyond 10 metres
it shall be considered as one defect.

- .3 Defects shall include but not necessarily be
limited to the following:
- .1 Segregated areas;
 - .2 Ravelling;
 - .3 Roller marks;
 - .4 Cracking or tearing;
 - .5 Improper matching of longitudinal and
transverse joints;
 - .6 Tire marks;
 - .7 Sampling locations not properly
reinstated;
 - .8 Improperly constructed patches;
 - .9 Contaminant on the mat;
 - .10 Flushed areas; and
 - .11 Pneumatic-tired roller pickup.

- .4 Correct irregularities which develop before
completion of rolling by loosening surface
mix and removing or adding material as required.
- .1 If irregularities or defects remain after
final compaction, remove asphalt course
promptly and lay new material to form true
and even surface and compact
immediately to specified density.

3.10 Finish Tolerances

- .1 Finished asphalt surface to be within 5 mm of
design elevation but not uniformly high or
low.

3.11 Cleaning

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

END

as necessary and costs for such measures will be deducted from the Contractor's final progress claim.

3.2 Application

- .1 Provide dust control on an on-going basis, including weekends and holidays, with equipment approved by Departmental Representative, at an appropriate rate to reduce dust as directed by the Departmental Representative.
- .2 Apply water and/or aqueous calcium chloride with distributors equipped with means of shut-off and with spray system to ensure uniform application.

----- END -----

PART 1 GENERAL

1.1 Related Requirements

- .1 Section 31 22 13 - Rough Grading

1.2 References

- .1 Agriculture and Agri-Food Canada
 - .1 The Canadian System of Soil Classification, Third Edition, 1998.
- .2 Canadian Council of Ministers of the Environment
PN1340-2005, Guidelines for Compost Quality.
- .3 U.S. Environmental Protection Agency (EPA)/Office of Water
 - .1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.
- .4 New Brunswick Department of Transportation and Infrastructure Renewal Standard Specification (most recent version):
 - .1 NBDTI Standard Specification - Division 600 - Environmental, Item 613 - Topsoil.

1.3 Definitions

- .1 Compost:
 - .1 Mixture of soil and decomposing organic matter used as fertilizer, mulch, or soil conditioner.
 - .2 Compost is processed organic matter containing 40% or more organic matter as determined by Walkley-Black or Loss On Ignition (LOI) test.
 - .3 Product must be sufficiently decomposed (i.e. stable) so that any further decomposition does not adversely affect plant growth (C:N ratio below 25, and contain no toxic or growth inhibiting contaminants.
 - .4 Composed bio-solids to: CCME Guidelines for Compost Quality, Category (A) (B).

1.4 Submittals

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Quality control submittals:
 - .1 Soil testing: submit certified test reports showing compliance with specified performance characteristics and physical properties as described in PART 2 - SOURCE QUALITY CONTROL.
 - .2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.5 Quality Assurance

- .1 Perform Work in accordance with the projects Erosion and Sedimentation Control Plan as specified in Section 01 35 43 - Environmental Procedures.
- .2 Pre-installation meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements in accordance with Division 1.

1.6 Waste Management and Disposal

- .1 Separate waste materials for reuse and recycling in accordance with Division 1.
- .2 Divert unused soil amendments from landfill to official hazardous material collections site approved by Departmental Representative.
- .3 Do not dispose of unused soil amendments into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

PART 2 PRODUCTS

2.1 Topsoil

- .1 Existing Topsoil: if available, to be used on all areas in amended form, salvaged topsoil to meet following criteria:

- .1 50% sand maximum and 3 to 10% organic content.
- .2 Fertility: major soil nutrients present in following ratios:
 - .1 Nitrogen (N): 20 to 40 micrograms of available N per gram of topsoil.
 - .2 Natural Phosphorus (P): 10 to 20 micrograms of phosphate per gram of topsoil.
 - .3 Potassium (K): 80 to 120 micrograms of potash per gram of topsoil.
 - .4 Calcium, magnesium, sulfur and micro-nutrients present in balanced ratios to support germination and/or establishment of intended vegetation.
- .3 Ph value: 6.0 - 7.5
- .4 Contain no toxic elements or growth inhibiting materials.
- .5 Free from:
 - .1 Debris and stones over 10 mm diameter.
 - .2 Coarse vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.
- .6 Consistence: friable when moist.
- .7 Double screen salvaged topsoil to remove all stones over 10 mm diameter.

2.2 Soil Amendments

- .1 Fertilizer:
 - .1 Fertility: major soil nutrients present in following amounts:
 - .2 Nitrogen (N): 20 to 40 micrograms of available N per gram of topsoil.
 - .3 Natural Phosphate products (P): 40 to 50 micrograms of phosphate per gram of topsoil.
 - .4 Potassium (K): 75 to 110 micrograms of potassium per gram of topsoil.
 - .5 Calcium, magnesium, sulfur and micro-nutrients present in balanced ratios to support germination and/or establishment of intended vegetation.
 - .6 Ph value: 5.5 to 7.5.
- .2 Peatmoss:
 - .1 Derived from partially decomposed species of Sphagnum Mosses.
 - .2 Elastic and homogeneous, brown in colour.

- .3 Free of wood and deleterious material which could prohibit growth.
- .4 Shredded particle minimum size: 5 mm.
- .3 Sand: washed coarse silica sand, medium to course textured.
- .4 Organic matter: compost Category A, B in accordance with CCME PN1340, unprocessed organic matter, such as rotted manure, hay, straw, bark residue or sawdust, meeting the organic matter, stability and contaminant requirements.
- .5 Limestone:
 - .1 Ground agricultural limestone.
 - .2 Gradation requirements: percentage passing by weight, 90% passing 1.0 mm sieve, 50% passing 0.125 mm sieve.
- .6 Fertilizer: industry accepted "phosphate free" standard medium containing nitrogen, phosphorous, potassium and other micro-nutrients suitable to specific plant species or application or defined by soil test.

2.3 Source Quality Control

- .1 Advise Departmental Representative of sources of topsoil and manufactured topsoil to be utilized with sufficient lead time for testing.
- .2 Contractor is responsible for amendments to existing topsoil and to supply topsoil as specified.
- .3 Soil testing by recognized testing facility for PH, P and K, and organic matter. Soil test to identify amendments necessary to meet requirements for topsoil as specified.
- .4 Testing of topsoil will be carried out by testing laboratory designated by Departmental Representative.
 - .1 Soil sampling, testing and analysis to be in accordance with Provincial standards.

PART 3 EXECUTION

3.1 Temporary Erosion and Sedimentation Control

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction sediment and erosion control drawings sediment and erosion control plan, specific to site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.2 Stripping of Topsoil

- .1 Begin topsoil stripping of areas as indicated after area has been cleared of brush weeds and grasses and removed from site.
- .2 Strip topsoil to depths as directed by Departmental Representative.
 - .1 Avoid mixing topsoil with subsoil where textural quality will be moved outside acceptable range of intended application.
- .3 Stockpile in locations as indicated.
Stockpile height not to exceed 2000-2500mm.
- .4 Disposal of unused topsoil is to be in an environmentally responsible manner but not used as landfill as directed by Departmental Representative.
- .5 Protect stockpiles from contamination and compaction.

3.3 Preparation of Existing Grade

- .1 Verify that grades are correct.
 - .2 If discrepancies occur, notify Departmental Representative and do not commence work until instructed by Departmental Representative.
- .3 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.
- .4 Remove debris, roots, branches, stones in excess of 25 mm diameter and other deleterious materials.
 - .1 Remove soil contaminated with calcium chloride, toxic materials and petroleum products.
 - .2 Remove debris which protrudes more than 50 mm above surface.
 - .3 Dispose of removed material off site.
- .5 Cultivate entire area which is to receive topsoil to minimum depth of 100 mm.
 - .1 Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.

3.4 Placing and Spreading of Topsoil/ Planting Soil

- .1 Place topsoil after Departmental Representative has accepted subgrade.
- .2 Spread topsoil in uniform layers not exceeding 150 mm.
- .3 For sodded areas keep topsoil 15 mm below finished grade.
- .4 Spread topsoil as indicated to following minimum depths after compaction to 85% Modified Proctor Density.
200 mm for sodded areas.
- .5 Manually spread topsoil/planting soil around trees, shrubs and obstacles.

3.5 Soil Amendments

- .1 Apply soil amendments with rules as specified and as determined by soil sample test.

3.6 Finish Grading

- .1 Grade to eliminate rough spots and low areas and ensure positive drainage.
 - .1 Prepare loose friable bed by means of cultivation and subsequent raking.
- .2 Consolidate topsoil to required bulk density using equipment approved by Departmental Representative.
 - .1 Leave surfaces smooth, uniform and firm against deep foot printing.

3.7 Acceptance

- .1 Departmental Representative will inspect and test topsoil in place and determine acceptance of material, depth of topsoil and finish grading.

3.8 Surplus Material

- .1 Dispose of materials except topsoil not required where directed by Departmental Representative.

3.9 Cleaning

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END

- .2 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .3 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .4 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements.

1.5 Scheduling

- .1 Schedule hydraulic seeding to coincide with preparation of soil surface.
- .2 Schedule hydraulic seeding using grass mixtures.

1.6 Waste Management and Disposal

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Divert unused fertilizer from landfill to official hazardous material collections site approved by Departmental Representative.
- .3 Do not dispose of unused fertilizer into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

PART 2 PRODUCTS

2.1 Materials

- .1 Seed: "Canada No. 1 Ground Cover Mixture" in accordance with Government of Canada Seeds Act and Regulations.

- .2 Type : NBDTI Roadside Mix with Mulch Contains:
 - .1 40% Creeping Red Fescue
 - .2 20% Hard Fescue
 - .3 15% Canada Bluegrass
 - .4 5% Alsike or White Clover
 - .5 15% Annual Rye Grass
 - .6 5% Red Top
- .3 Seed at a minimum rate of 125Kg/ha.
- .4 Mulch: specially manufactured for use in hydraulic seeding equipment, non-toxic, water activated, green colouring, free of germination and growth inhibiting factors with following properties:
 - .1 Type I mulch:
 - .1 Made from wood cellulose fibre.
 - .2 Organic matter content: 95% plus or minus 0.5%.
 - .3 Value of pH: 6.0.
 - .4 Potential water absorption: 900%.
 - .2 Type II mulch:
 - .1 Made from newsprint, raw cotton fibre and straw, processed to produce fibre lengths of 15 mm minimum and 25 mm maximum. Greater proportions of ingredients to be straw.
 - .3 Application rate at a minimum of 500 kg/ha.
- .6 Tackifier: Water dilutable, liquid dispersion.
- .7 Water: Free of impurities that would inhibit germination and growth.
- .8 Fertilizer:
 - .1 To Canada "Fertilizers Act" and "Fertilizers Regulations".
 - .2 Fertilizer shall be formulated 15-25-15 for seeding done April 15 to September 1st and 10-20-20 thereafter.
 - .3 The application rate for fertilizer shall be a minimum of 375 kg/ha.
- .9 Inoculants: inoculant containers to be tagged with expiry date.

PART 3 EXECUTION

3.1 Workmanship

- .1 Do not spray onto structures, signs, guide rails, fences, plant material, utilities and other than surfaces intended.
- .2 Clean-up immediately, any material sprayed where not intended, to satisfaction of Departmental Representative.
- .3 Do not perform work under adverse field conditions such as wind speeds over 10 km/h, frozen ground or ground covered with snow, ice or standing water.
- .4 Protect seeded areas from trespass until plants are established.

3.2 Preparation of Surfaces

- .1 Fine grade areas to be seeded free of humps and hollows. Ensure areas are free of deleterious and refuse materials.
- .2 Cultivated areas identified as requiring cultivation to depth of 25 mm.
- .3 Ensure areas to be seeded are moist to depth of 150 mm before seeding.
- .4 Obtain Departmental Representative approval of grade and topsoil depth before starting to seed.
- .5 Measure quantities of materials by weight or weight calibrated volume measurement satisfactory to Departmental Representative. Supply equipment required for this work.
- .6 Charge required water into seeder. Add material into hydraulic seeder under agitation. Pulverize mulch and charge slowly into seeder.
- .7 After all materials are in the seeder and well mixed, charge tackifier into seeder and mix thoroughly to complete slurry

3.4 Slurry Application

- .1 Hydraulic seeding equipment:
 - .1 Slurry tank.
 - .2 Agitation system for slurry to be capable of operating during charging of tank and during seeding, consisting of recirculation of slurry and/or mechanical agitation method.
 - .3 Capable of seeding by 50 m hand operated hoses and appropriate nozzles.
 - .4 Tank volume to be certified by certifying authority and identified by authorities "Volume Certification Plate".
- .2 Slurry mixture applied per hectare.

Seed: Highway Mix 250kg.
Mulch: Type I or II 1350 kg.
Tackifier: 300 kg.
Water: Minimum 30,000 L.
Fertilizer: 375 kg, ratio 10:20:20.
- .3 Apply slurry uniformly, at optimum angle of application for adherence to surfaces and germination of seed.

Using correct nozzle for application.
Using hoses for surfaces difficult to reach and to control application.
- .4 Blend application 300 mm into adjacent grass areas or sodded areas, previous applications to form uniform surfaces.
- .5 Re-apply where application is not uniform.
- .6 Remove slurry from items and areas not designated to be sprayed.
- .7 Protect seeded areas from trespass satisfactory to Departmental Representative.
- .8 Remove protection devices as directed by Departmental Representative.

3.5 Maintenance During Establishment Period

- .1 Perform following operations from time of seed application until acceptance by Departmental Representative.
- .2 Grass Mixture:
 - .1 Repair and reseed dead or bare spots to allow establishment of seed prior to acceptance.
 - .2 Mow grass to 70 mm whenever it reaches height of 90 mm. Remove clippings which will smother grass as directed by Departmental Representative.
 - .3 Fertilize seeded areas after first cutting 10 weeks after germination provided plants have mature true leaves in accordance with fertilizing program. Spread half of required amount of fertilizer in one direction and remainder at right angles; water in well.
 - .4 Control weeds by mechanical means utilizing acceptable integrated pest management practices.
 - .5 Water seeded area to maintain optimum soil moisture level for germination and continued growth of grass. Control watering to prevent washouts.

3.6 Acceptance

- .1 Seeded areas will be accepted by Departmental Representative, provided that:
 - .1 Plants are uniformly established. Seeded areas are free of rutted, eroded, bare or dead spots.
 - .2 Areas have been mown at least twice.
 - .3 Areas have been fertilized.
- .2 Areas seeded in fall will achieve final acceptance in following spring, one month after start of growing season provided acceptance conditions are fulfilled.

3.7 Maintenance
During
Warranty Period

- .1 Perform following operations from time of acceptance until end of warranty period:
 - .2 Repair and reseed dead or bare spots to satisfaction of Departmental Representative.
 - .3 Mow areas seeded, remove clippings, as directed by Departmental Representative.
 - .4 Fertilize seeded areas in accordance with fertilizing program. Spread half of required amount of fertilizer in one direction and remainder at right angles and water in well.

3.8 Cleaning

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

END

- 2.5 GUYING WIRE
- .1 Type 1: steel, 3 mm wire.
 - .2 Type 2: 1.5 mm diameter multi-wire steel cable.
 - .3 Type 3: 3 mm diameter multi-wire steel cable.
- 2.6 CLAMPS
- .1 U-bolt: galvanized, 13 mm diameter, c/w curved retaining bar and hex nuts.
 - .2 Crimp type.
- 2.7 ANCHORS
- .1 Wood:
 - .1 Type 1: 38 x 38 x 460 mm.
 - .2 Type 2: 38 x 67 x 600 mm.
 - .2 Drive-in type:
 - .1 Type 1: 13 mm diameter x 75 mm long, aluminum.
 - .2 Type 2: 18 mm diameter x 120 mm long, aluminum.
 - .3 Screw-in type:
 - .1 Type 1: 100 mm diameter steel disc.
- 2.8 GUYING COLLAR
- .1 Tube: plastic, 13 mm diameter, nylon reinforced.
- 2.9 TRUNK PROTECTION
- .1 Wire mesh: galvanized, electrically welded 1.4 mm wire with 25 x 25 mm mesh and fastener.
 - .2 Plastic: perforated spiralled strip.
 - .3 Burlap: clean 2.5 kg/m² minimum mass and 150 mm minimum wide, and twine fastener.
 - .4 Tar impregnated crepe paper and twine fastener.
- 2.10 MULCH
- .1 Bark chip: varying in size from 25 to 50 mm in diameter, from bark of coniferous trees.
 - .2 Wood chip: varying in size from 50 mm to 75 mm and 5 to 20 mm thick, free of bark, small branches and leaves.
 - .3 Shredded wood: varying in size from 25 to 125 mm in length, from coniferous trees.
 - .4 Synthetic or inorganic mulch.
- 2.11 FERTILIZER
- .1 Synthetic commercial type as recommended by supplier.
- 2.12 ANTI-DESICCANT
- .1 Wax-like emulsion.

- soil beneath roots.
- .1 Ensure stake is secure, vertical and unsplit.
- .3 Install 150 mm long guying collar 1500 mm above grade.
- .4 Thread Type 1 guying wire through guying collar tube.
 - .1 Twist wire to form collar and secure firmly to stake. Cut off excess wire.
- .3 Use 3 guy wires and anchors for deciduous trees greater than 3 m in height and evergreens greater than 2 m in height.
 - .1 Use Type 2 guying wire with clamps for trees less than 75 mm in diameter and Type 3 guying wire with clamps for trees greater than 75 mm in diameter.
 - .2 Use Type 1 anchors for trees less than 75 mm in diameter and Type 2 anchors for trees greater than 75 mm in diameter.
 - .3 Install guying collars above branch to prevent slipping at approximately 2/3 height for evergreens and 1/2 height for deciduous trees. Collar mounting height not to exceed 2.5 m above grade.
 - .4 Guying collars to be of sufficient length to encircle tree plus 50 mm space for trunk clearance. Thread guy wire through collar encircling tree trunk and secure to lead wire by clamp or multi-wraps; cut wire ends close to wrap. Spread lead wires equally proportioned about trunk at 120 degrees.
 - .5 Install anchors at equal intervals about tree and away from trunk so guy wire will form 45 degree angle with ground. Install anchor at angle to achieve maximum resistance for guy wire.
 - .6 Attach guy wire to anchors. Tension wire and secure by installing clamps.
 - .7 Install wire tightener ensuring that guys are secure and leave room for slight movement of tree.
 - .8 Saw tops off wooden anchors which extend in excess of 100 mm above grade or as directed by Departmental Representative.
 - .9 Install flagging tape to guys as indicated.
- .4 After tree supports have been installed, remove broken branches with clean, sharp tools.
- .1 Ensure soil settlement has been corrected prior to mulching.

3.7 MULCHING

PART 1 GENERAL

1.1 Related Requirements

- .1 Section 31 23 33 Excavating, Trenching and Backfilling.
- .2 Section 33 41 00 Storm Utility Drainage Piping.

1.2 Description

- .1 This Section Outline the materials and installation instructions for construction of new manholes and catch basins.

1.3 References

- .1 American Society for Testing and Materials (ASTM International)
 - .1 ASTM A 48/A48M-00, Standard Specification for Gray Iron Castings.
 - .2 ASTM C 139-99, Specification for Concrete Masonry Units for Construction of Catch Basins and Manholes.
 - .3 ASTM C 478M-97, Specification for Precast Reinforced Concrete Manhole Sections Metric.
 - .4 ASTM C 618-00, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.
 - .5 ASTM D 698-00a, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.
- .3 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-A3000-98 (April 2001), Cementitious Materials Compendium. Includes:
 - .1 CAN/CSA-A5-98, Portland Cement
 - .2 CAN/CSA-A8-98, Masonry Cement
 - .3 CAN/CSA-A23.5-98, Supplementary Cementing Materials

PART 1 GENERAL

1.1 Related Requirements

- .1 Section 31 23 33 Excavating, Trenching and Backfilling.
- .2 Section 31 37 00 Rip Rap.

1.2 Description

- .1 This section outlines the materials and installation for storm drainage piping.

1.3 References

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM C 14M-99, Standard Specification for Concrete Sewer, Storm Drain and Culvert Pipe (Metric).
 - .2 ASTM C 76M-02, Standard Specification for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe (Metric).
 - .3 ASTM C 117-95, Standard Test Method for Material Finer than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.
 - .4 ASTM C 136-01, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .5 ASTM C 144-02, Standard Specification for Aggregate for Masonry Mortar.
 - .6 ASTM C 443M-02, Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets (Metric).
 - .7 ASTM D 698-00a, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
 - .8 ASTM D 1248-02, Standard Specification for Polyethylene Plastics Extrusion Materials For Wire and Cable.
 - .9 ASTM F 667-97, Standard Specification for Large Diameter Corrugated Polyethylene Pipe and Fittings.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

- .3 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-A3000-98 (April 2001), Cementitious Materials Compendium (Consists of A5-98, A8-98, A23.5-98, A362-98, A363-98, A456.1-98, A456.2-98, A456.3-98).
 - .1 CAN/CSA-A5-98, Portland Cement.
 - .2 CAN/CSA-A257 Series-M92 (R1998), Standards for Concrete Pipe.
 - .3 CSA-G401-[01], Corrugated Steel Pipe Products.
 - .4 CAN/CSA-A257.2

- .4 New Brunswick Department of Transportation and Infrastructure Standard Specifications (most recent version):
 - .1 NBDTI Standard Specification Division 400, municipal, Item 401 - Storm Water Sewage Pipe.

PART 2 PRODUCTS

2.1 Materials

- .1 New Brunswick Department of Transportation and Infrastructure Standard Specifications (most recent version):
 - .1 NBDTI Standard Specification Division 400, Municipal, Item 401, Storm Sewer Pipe, Poly Vinyl Chloride(P.V.C.) and High Density Polyethylene(HDPE) pipe is acceptable.
 - .2 NBDTI Standard Specification Division 400, Municipal, Item 415, Pipe Zone Material.
 - .3 Gradation for pipe zone material, Type B.

ASTM Sieve Size	Bedding/Pipe Zone - Type B percent passing
37.5 mm	100
31.5 mm	
25 mm	95 - 100
19 mm	90 - 100
12.5 mm	
9.5 mm	60 - 100
4.75 mm	35 - 80
2.36 mm	15 - 60
300 µm	0 - 30
75 µm	0 -10

.4 Gradation for clean stone bedding:

Sieve Size, mm	% Passing
28.0	100
20.0	90 - 100
10.0	25 - 60
5.0	0 - 10
2.5	0 - 5

- .5 Pipe repair connector can be a Fernco-type rubber connection or approved equivalent.
- .6 Perforated drain pipe shall be PVC DR35 - meeting the requirements of CAN/CSA B182.1 AND 182.2. Perforations shall consist of two rows of 14 mm holes positioned at 120 degrees radially on the pipe. Joints shall be friction fit bell ends.

PART 3 EXECUTION

3.1 General

- .1 As per the requirements of the most recent version of the NBDTI Standard Specification.
- .2 Existing Storm Sewer Pipe or related materials, designated for removal shall be disposed at an approved disposal site, outside the Park.

3.2 Trenching

- .1 Do trenching work in accordance with Section 31 23 33 - Excavating, Trenching and Backfilling.
- .2 Obtain Departmental Representative's approval of trench line and depth prior to placing bedding material or pipe.

3.3 Bedding

- .1 Dewater excavation, as necessary, to allow placement of pipe bedding in dry condition.
- .2 For piping place minimum thickness of 150 mm of approved bedding material on bottom of excavation and compact to minimum 95% maximum density to ASTM D 698.
- .3 Bed pipes in accordance with NBDTI Standard Specifications, Division 400 Municipal, Item 415, pipe

zone material.

- .4 Shape bedding to fit lower segment of pipe exterior so that width of at least 50% of pipe diameter is in close contact with bedding and to camber as indicated or as directed by Departmental Representative, free from sags or high points.
- .5 Place bedding in unfrozen condition.

3.4 Laying Pipe

- .1 Begin at downstream end of pipe section with bell end of first pipe section facing upstream.
- .2 Ensure barrel of each pipe is in contact with shaped bed throughout its length.
- .3 Do not allow water to flow through pipes during construction except as permitted by Departmental Representative.
- .4 Joints to be made with rubber gaskets for new pipe. Where portions of existing pipes are to be replaced, firm castings can be used to join new to existing pipe.

3.5 Backfilling

- .1 Backfill around and over pipes in accordance with NBDTI Standard Specifications, Division 400 Municipal, Item 415, Pipe zone material.
- .2 Place approved granular backfill material, in 200 mm layers to full width, alternately on each side of culvert, so as not to displace it laterally or vertically.
- .3 Compact each layer to 95% maximum density to ASTM D 698 taking special care to obtain required density under haunches.
- .4 Protect installed pipe with minimum 1 metre cover of

compacted fill before heavy equipment is permitted to cross. During construction, width of fill, at its top, to be at least twice diameter or span of pipe and with slopes not steeper than 1:2.

- .5 Place backfill in unfrozen condition.

3.6 Flushing and Video Inspection

- .1 For existing storm pipe that has been repaired, pressure flush pipe and vacuum debris from manholes, as noted on drawing C2.
- .2 For existing storm pipe after pressure flushing, and new storm pipe after installation, the entire section of pipe shall be video inspected. If video indicates additional repair, video inspection shall be done to confirm suitability of work.
- .3 The video inspection report shall consist of a summary report and the video records on a DVD or a USB Flash Drive.

----- END -----

PART 1 GENERAL

1.1 Related Requirements

- .1 Section 01 35 43 - Environmental Procedures
- .2 Section 33 41 00 - Storm Utility Drainage Piping

1.2 Environmental Requirements

- .1 Operation of construction equipment in water is prohibited.
- .2 Design and construct temporary crossings to minimize environmental impact to watercourse.
- .3 Constructing temporary crossings of watercourses where spawning beds are indicated is prohibited.
- .4 Dumping excavated fill, waste material, or debris in watercourse or wetland is prohibited.

1.3 References

- .1 U.S. Environmental Protection Agency (EPA) / Office of Water.
 - .1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.4 Action and Informational Submittals

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Sustainable Design Submittals:
 - .1 Erosion and Sedimentation Control: submit copy of erosion and sedimentation control plan in accordance with EPA 832/R-92-2005 and authorities having jurisdiction.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not Used.

PART 3 EXECUTION

3.1 Existing Conditions

- .1 Maintain existing flow pattern in natural watercourse systems.
- .2 In natural systems maintain existing riffle pool and step pool patterns.

3.2 Site Clearing and Plant Protection

- .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 EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.
 - .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
 - .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- .2 Minimize disturbance to vegetated buffer zones and protect trees and plants on site and adjacent properties where indicated.
- .3 Wrap trees and shrubs adjacent to construction work, storage areas and trucking lanes in burlap.
- .4 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage.
 - .1 Avoid unnecessary traffic, dumping and storage of materials over root zones.

- .5 Leave cuttings from trees and other vegetation on site as brush piles to allow for natural degradation.
 - .1 Secure large piles with degradable materials to prevent interference with watercourse.
- .6 Remove only trees that may offer future blockage problems as instructed by Departmental Representative.
- .7 Leave roots mass and stumps in place.
- .8 Maintain temporary erosion and pollution control features installed under this contract.

3.3 Drainage

- .1 Pumping water containing suspended materials into watercourse is prohibited.
- .2 Establish rock chute spillways to accommodate safe surface water entry to watercourse as directed by Departmental Representative.

3.4 Site Restoration

- .1 Establish vegetated buffer zones with suitable vegetation to minimum 3 m along edge of watercourse banks as determined by Departmental Representative.
- .2 Plant vegetation natural to area, suitable for application without requirement for fertilizers, pesticides and other chemicals.
- .3 Control stream bank erosion in lower section of watercourse with irregular shaped riprap underlain with non-toxic filter cloth of size determined by Departmental Representative.
- .4 Control stream bank erosion in upper section of watercourse by planting suitable vegetation as directed by Departmental Representative].
 - .1 Ensure planting occurs within 7 days after work on watercourse is complete.

END

APPENDIX A



Parks Canada Basic Impact Analysis

1. PROJECT TITLE & LOCATION: Recapitalization of Point Wolfe Stormwater System and Bank Stabilization, Fundy National Park.

2. PROPONENT INFORMATION: Parks Canada – Doug Watson, Project Leader, doug.watson@pc.gc.ca & Annie Campeau, Project Manager, annie.campeau@pc.gc.ca

3. PROPOSED PROJECT DATES

Planned commencement: 2017-10-15

Planned completion: Most work to be completed in the fall of 2017 with full completion in the spring of 2018

4. INTERNAL PROJECT FILE #: NBSouth-2017-EIA-3

5. PROJECT DESCRIPTION: Point Wolfe Campground, located in Fundy National Park is one of five facilities providing camping accommodations to Fundy National park visitors (Appendix II). Constructed in 1959, the Point Wolfe Campground situated just west of the Point Wolfe River was consider modern in comparison to other campgrounds in the park at that time. Modern-day amenities such as kitchen shelters and washroom facilities with shower stalls attract park visitor looking for an outdoor experience with modern conveniences (Figure 1).



Figure 1: Location of Point Wolfe Campground Service Buildings





Recent improvements in the Point Wolfe Campground as enhanced the accommodation offer to visitors. In late fall of 2015, ten oTENTiks (Ready-to-Camp-Tents, Figure 2) were installed in the campground and open for rental during the 2016 operational season. In addition, a section of less used non-serviced sites were converted to two-way sites in 2016. In the same year, Fundy National Park participated in a Parks Canada pilot project to introduce alternative accommodation in ten different locations across the country. A Goutte d'Ô, a rain drop shaped tenting structure was erected and open for business in the Point Wolfe Campground (Figure 3). The first year of operation proved to be very successful for all three new camping accommodations. Currently, all service buildings in the campground are undergoing extensive upgrades and modifications to improve visitor experience, enjoyment and satisfaction.



Figure 2: oTENTik Accommodation



Figure 3: Goutte d'Ô Accommodation





The existing Point Wolfe Campground stormwater system infrastructure have remained largely unchanged since the early 1960's. Stormwater is collected through a system of 40 manholes connected by a network of pipes. Five discharge areas complete the system where collected stormwater is released into the natural environment (Figure 4).

Point Wolfe Campground Stormwater System

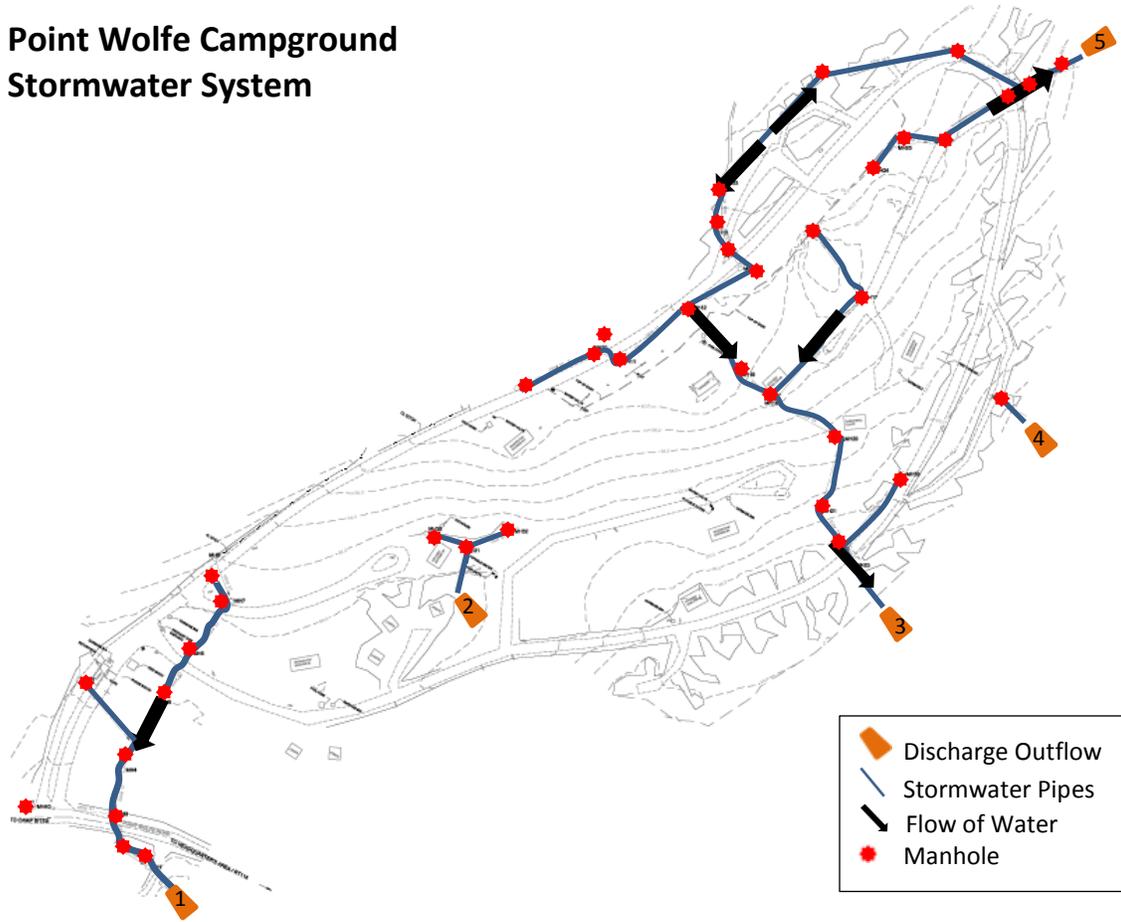


Figure 4: Point Wolfe Campground Stormwater System Layout

The number 3 discharge outflow areas shown in Figures 4 and 5 is located on a high bank adjacent to the Point Wolfe Campground approximately 190 m above the Point Wolfe River. Water released at this location flows down the steep embankment into a natural drainage channel located at the toe of the slope, through a culvert located underneath the parking lot and released at the mouth of the Point Wolfe River.

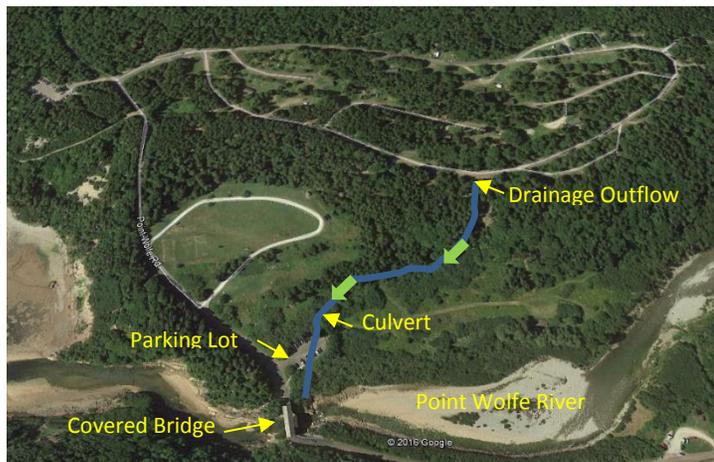
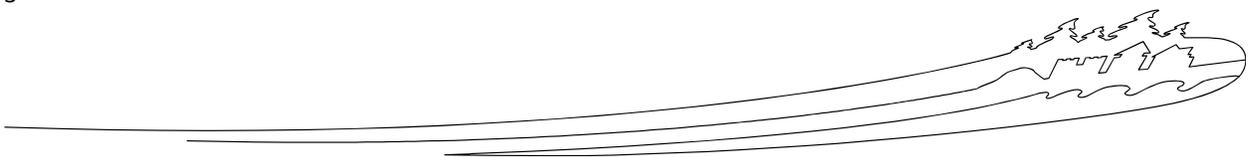


Figure 5: Drainage Flow from Discharge Outflow # 3





A failure of the number 3 discharge outflow during a large rainfall event in the early 2000's, resulted in significant erosion of the steep bank creating undercut ledges along the boundary of three campsites (Figure 6). Measures were taken in 2003 to secure the site by closing the three affected campsites and erected fencing to reduce the risk. However, little effort was taken at the time to reduce additional erosion.



Figure 6: Significant Erosion Downstream of Discharge Outflow Number 3

The erosion activity affected approximately 1000 m² and displaced some 3500 m³ of soil. In addition, organic materials and vegetation were also disrupted (Figure 7). Without rehabilitation, further undermining of the bank could result in more damages to the campground, increase visitor safety risk and negative impacts to the Point Wolfe River with the continued migration of sediment from the site.



Figure 7: Displacement of Vegetation, Organic Material and Soil





Scope of Work

The stormwater system is dated and does not follow modern best practices. Repairs and upgrades are necessary to facilitate an efficient system to manage stormwater removal in the Point Wolfe Campground. Required work include but not limited to: clearing, grubbing, excavation and supply and installation of materials. A brief description of required work for each component of the Recapitalization of Point Wolfe Campground Stormwater System and Bank Stabilization project is provided below.

1. Manhole / Catch Basin Repairs - Figure 8

- Remove debris from existing manholes.
- Replace manhole 1, comes with frame and grate. Remove existing 750 mm diameter concrete pipe. Leave existing sanitary pipe intact from manhole 1 to discharge area.
- Replacement of manhole 23 with a new 1200 mm diameter precast concrete manhole with a 600 mm diameter deep sump, come with new frame and grate.
- Install new 1200 mm diameter concrete catch basin (comes with frame and grate), piping and accessories (manhole numbers 41-48)
- Upgrade discharge areas below manhole 1.



Figure 8: Existing Manhole

2.0 Pipe Work

- Reconnect pipes by excavating existing pipe a minimum of 3 joints from specified manhole. Cut the existing pipe to allow the installation of a minimum of 1.22 m of new pipe that extends a minimum of 150 mm beyond the inside of the manhole. All joints to be water tight (flexible rubber couplings for pipe, parge joints on inside and outside of manhole). Fernco coupling to be used to connect new pipe to existing pipe.
- Replace 2.44 m of pipe downstream of manhole 11.
- Reconnect pipe to manhole 15.
- Replace 4.0 m of pipe downstream of manhole 16.
- Replace 12.0 m of pipe upstream of manhole 17.
- Reconnect pipe to manhole 17.
- Replace 4.0 m of pipe located 12.5 m from manhole 18
- Replace 4.0 m of pipe downstream of manhole 19
- Replace 6.0 m of pipe upstream of manhole 22.
- Replace 4.0 m of pipe up and downstream of manhole 25.
- Reconnect pipe to manhole 26 and manhole 27.





- Replace 4.0 m of pipe at 24 m upstream of manhole 27.
- Replace 4.0 m of pipe upstream of manhole 28.
- Adjacent to manhole 29, upgrade discharge area to be a R5 riprap lined pit, 1 m wide by 2 m long, thickness of riprap to be 300 mm.
- Replace existing pipe adjacent to manhole 29 with 250 mm diameter pipe.
- Replace pipe with 150 mm diameter pipe adjacent to manhole 31
- Replace 6 m of pipe downstream of manhole 35.
- Replace 6.0 m of pipe downstream of manhole 36. Remove large pieces of concrete located 11 m from manhole 36.
- Install 4 m of 250 mm diameter pipe from manhole 37 to end of new swale. In addition, install new 250 mm diameter pipe between manhole 37 and 43.
- At manhole 38 replace 8.0 m of pipe upstream of discharge point upgrade discharge area to be a R5 riprap lined pit, 1 m wide by 2 m long, thickness of riprap to be 300 mm.
- Reconnect pipe to manhole 40. In addition, install 4 m of 200 mm diameter pipe from manhole 40 to end of new swale.
- Clean debris from manhole 6.
- Clean pipe and confirm stability with video of pipe adjacent to manholes 10, 11, 13, 19 and 29.

3. Swale Construction

- Construct a swale between manholes 22 and 36, and 57 m beyond manhole 36 and install 1.0 m of 200 mm diameter pipe at manholes 22 and 36 to collect water from swales.
- Construct 30 m swale to drain to manhole 41.
- Construct 45 m swale between manhole 42 and 45 to drain manhole 42.

4. Subdrain

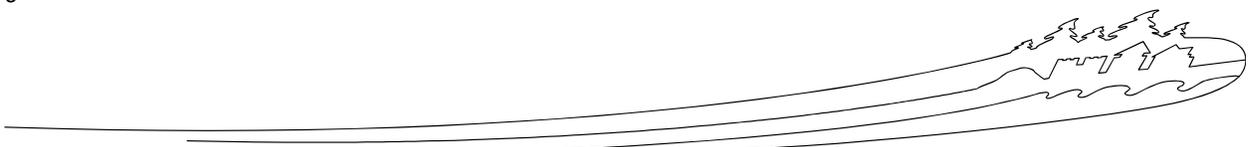
- Replace existing drain with new perforated subdrain.
- Downstream of manhole 31, replace existing drain with perforated subdrain for a buried discharge for approximately 12 m.

6. Access Path

- Construct new access lane between manhole 4 and 5.
- Construct a 3.66 wide access path from manhole 28 to existing discharge point of the pipe from manhole 29.
- Construct a 3.66 m wide lane to access manhole 2.

6. Bank Stabilization - Figure 9

- Install new stormwater piping.
- Install 4 concrete manhole (44,45,46 &47)
- Install stilling well (manhole 48)
- Connect all 5 manholes with 600 mm diameter pipe
- Install 600 mm diameter culvert underneath existing access road at outfall ditch.





- Install rock lined outfall ditch (swale) to accommodate water flow from manhole 48 to river bank. River bank will be stabilized with rip rap material.
- Stabilize slope through erosion control blankets and straw bale check dams.

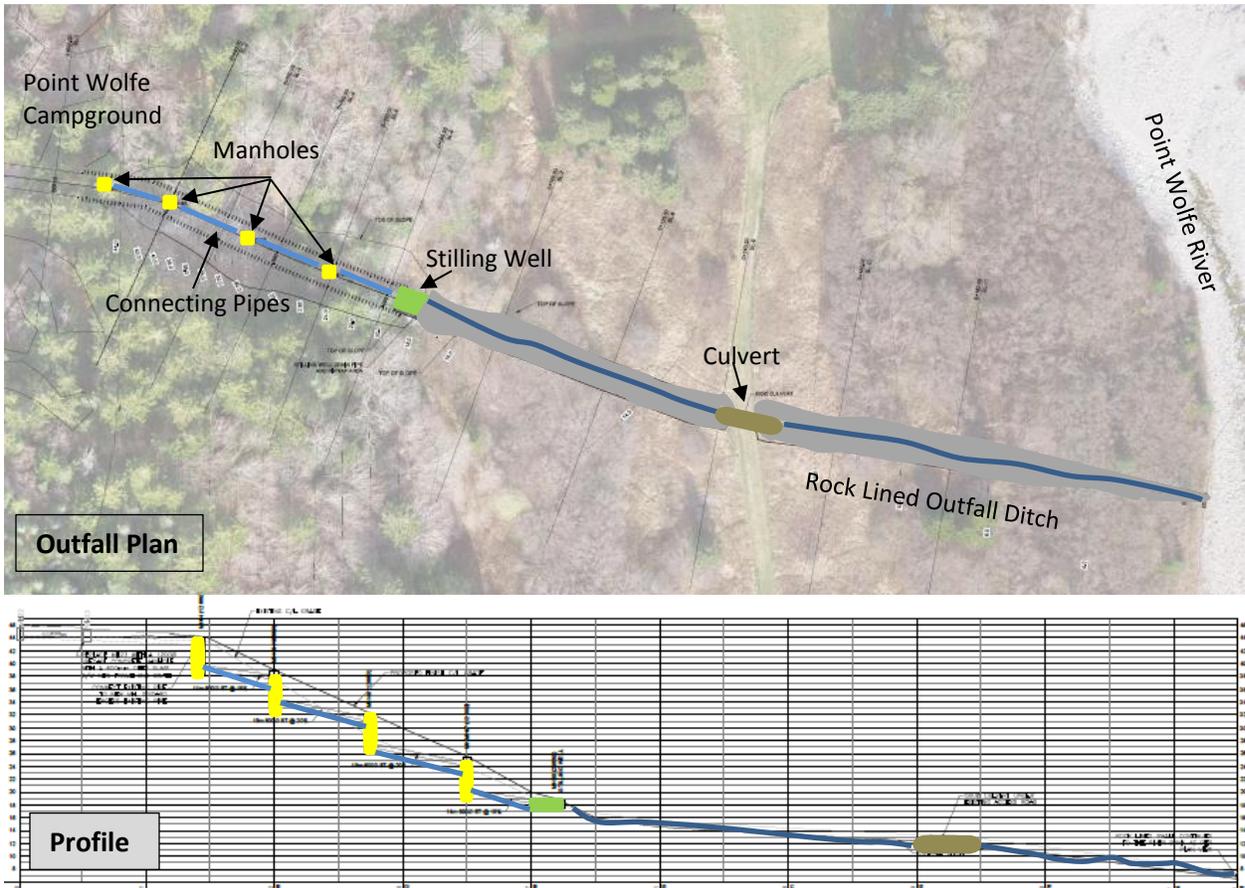


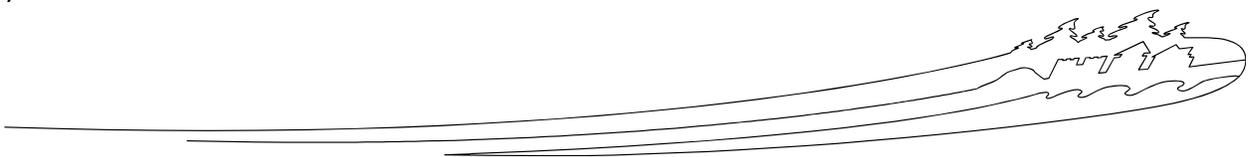
Figure 9: Bank Stabilization Area – Outfall Plan and Profile

6. VALUED COMPONENTS LIKELY TO BE AFFECTED

The Effects Identification Matrix located in Appendix I identifies environmental components likely to be affected by this project. The components most likely to be impacted include air, soil/landforms, water, flora, fauna, cultural resources and visitor experience.

Soil/Landforms

Located in the Maritime Acadian Highland Region of Canada, Fundy National Park encompasses seven different biophysical land classifications, a system used to differentiate ecologically significant segments of the land surface with similar patterns of landscape, vegetation and drainage (Hirvonen and Madill, 1978). The Point Wolfe Campground is located within the River Valleys land system. Soil material is primarily glaciofluvial, very coarse gravel, coarse sand and primarily well drained. General topography of the area is classified as scarp or terrace. Slopes in the area can be steep especially in deep ravines and coastal bluff areas. As elevation is 305 m above sea level, typical climatic conditions is cooler and moister than the rest of the park. Snow accumulation is less in the lower valleys because of lower altitude than on the plateau.





Flora

With new species being identified each year, Fundy National Park is now home to some 650 plus species of vascular plants (fern, clubmosses, flowering plants), 270 plus bryophytes species (mosses and liverworts), and more than 400 species of lichens. The park and project site is within the Maritime Acadian Highlands Natural Region and the Maritime Upland Ecoregion. The forest cover in the campground and adjacent area is composed of red spruce (*Picea rubens*), balsam fir (*Abies balsamea*), white birch (*Betula papyrifera*), yellow birch (*Betula alleghaniensis*), sugar maple (*Acer sacharum*), and american beech. Manicured lawn within the campground comprise of native and non-native species. In 2000, efforts were taken by the park to restore ecological integrity in the campground by reducing mowing activity between sites and allowing these areas to regenerate naturally. In addition, native plants, shrubs and tree species were planted in sections of the campground to enhance natural restoration and promote privacy between campsites.

A small population of reed canary grass (*Phalaris arundinacea*) is located near the Point Wolfe day use area approximately 250 m east of the campground (Figure 10). This plant is a non-native species and is considered invasive within Fundy National Park. Reed canary grass is currently being monitored by the park to determine the severity, distribution and spread of the species.

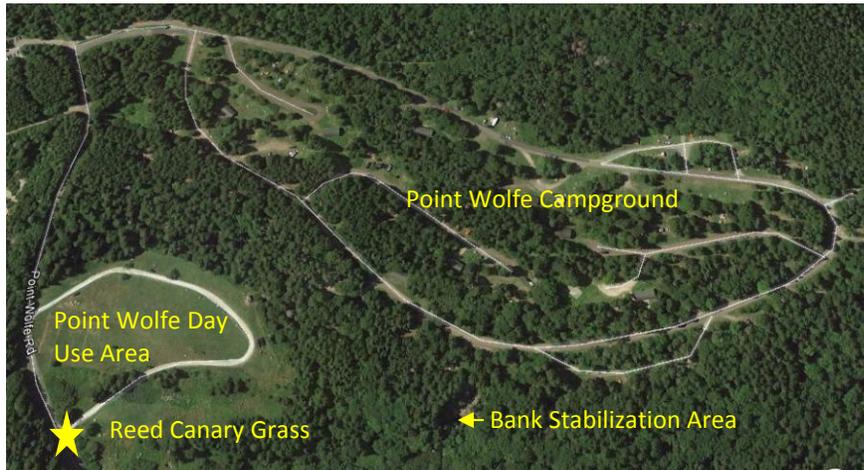
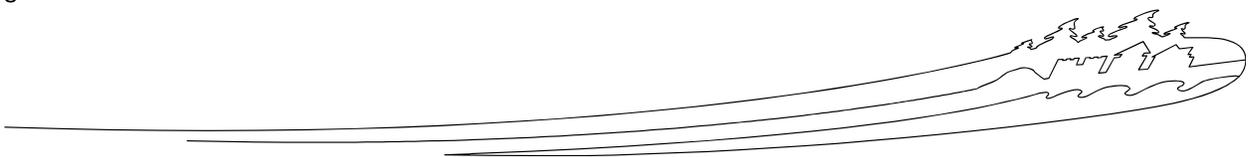


Figure 10: Reed Canary Grass Located in Point Wolfe Day Use Area

Fauna

Over 38 species of mammals reside in Fundy National Park. These mammal populations are diverse and are representative of the natural food chain, with animals ranging from top carnivores to lower herbivores and scavengers. The terrestrial animals that are most likely to be encountered include moose (*Alces alces*), coyote (*Canis latrans*), white-tailed deer (*Odocoileus virginianus*), black bear (*Ursus americanus*), beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*), marten (*Martes americana*), porcupine (*Erethizon dorsatum*), bobcat (*Lynx rufus*), mink (*Mustela vison*), and fisher (*Martes pennanti*). Additionally, Fundy National Park is well positioned on the Atlantic migration route, and over 260 bird species have been identified in the park or on the adjacent bay (Parks Canada, 2007), 95 of these species are known to nest in the park.





Water/Hydrology

The Point Wolfe Campground is situated approximately 200 m west of the Point Wolfe River. The Point Wolfe River is located within the Point Wolfe Watershed which drains an area of 130.3 km² (Figure 11). The river is one of two major rivers in the park which feature significant characteristics and have steep cut valleys. The total length of the main stem is approximately 29 km, with 12 km within the park boundary. Waters from Bennett, Wolfe, Chambers, Flagner, Keyhole and Tracey lakes flow into the Point Wolfe River and discharge into the Bay of Fundy.

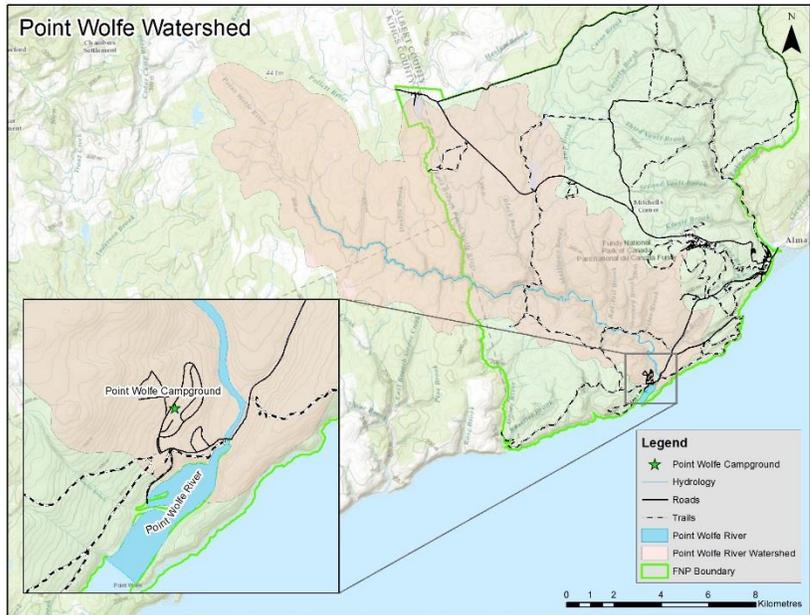


Figure 11: Point Wolfe Watershed

The Point Wolfe River provides habitat and food for a number of aquatic insects, invertebrates and fish. Inner Bay of Fundy Atlantic salmon (*Salmo salar*), an endangered species protected under the Species at Risk Act (SARA) is found in this river. In addition, American eel (*Anguilla rostrata*), listed as threatened by COSEWIC, is found in the Point Wolfe River. Point Wolfe Campground stormwater is channeled and released into natural drainage channels which flow into the Point Wolfe River and discharged into the Bay of Fundy (Figure 12).

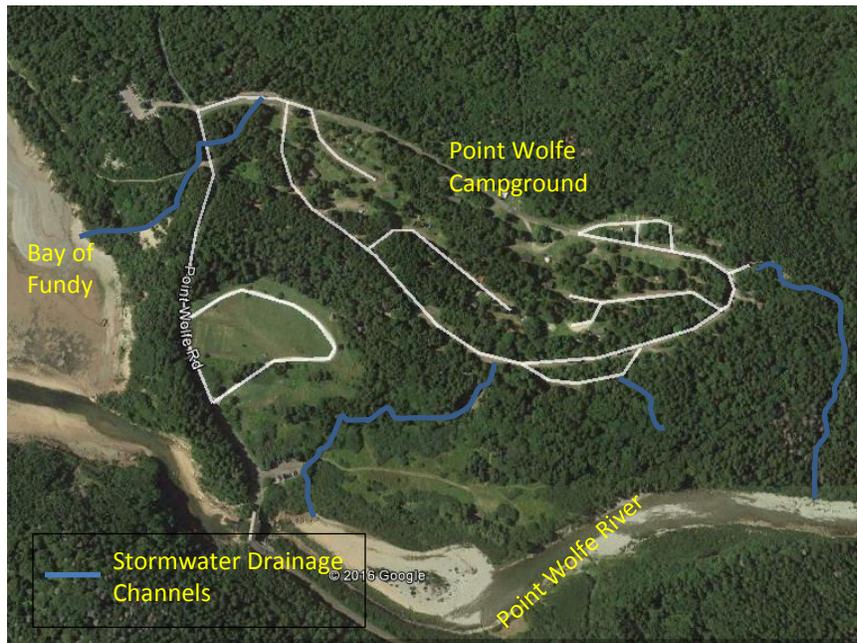
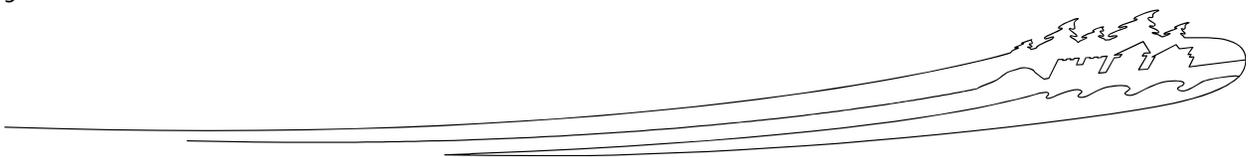


Figure 12: Stormwater Outflow Discharge Areas

Cultural/Aboriginal Resources

Although Fundy National Park is thought to fall within the traditional territory of both the Mi'kmaq and Wolastoqiyik (Maliseet) people, no physical evidence related to their use or occupation of the park has been found. The Mi'kmaq, Wolastoqiyik (Maliseet), and Passamaquoddy Aboriginal peoples have a long history in Fundy National Park and its greater ecosystem (Fundy Biosphere) region and consider the area





as part of their traditional territory, a landscape woven by a labyrinth of water, over which they travelled extensively on its rivers, lakes and coastlines. These people co-occupied the region in permanent villages and semi-permanent, seasonal encampments, for purposes such as salmon fishing. To date, little archaeological evidence of past aboriginal use has been found in the park perhaps largely due to the fact that the sites preferred for traditional encampments in this rugged landscape were also the same sites appropriated for construction of logging mills and modern communities whose activities have obliterated the archaeological record. In addition, other nearby locations, known to have been used until well within living memory, such as Indian Island near Mary's Point, are slowly being lost to coastal erosion and sea-level rise (Cook and McKay, 2010).

There are no records to indicate a previous archaeological survey in the Point Wolfe Campground and surrounding area. An Archaeological Overview Assessment (AOA) and a Cultural Resource Impact Assessment (CRIA) was requested for this project to evaluate the archaeological potential and the potential impacts of the proposed work on known or potential archaeological resources (Appendix III & Appendix IV). Currently, there are no known archaeological features situated in the proximity of the project area. A desktop review, completed in 2015 using land maps and aerial images, identified numerous high potential locations for archaeological features within the project limits. The proximity to the coast line and Bay of Fundy has the potential to impact directly on aboriginal resources that may exist within or adjacent to the project corridor.

While there are no known archaeological resources in this area, there is potential that excavation activities may yield Aboriginal and / or historical artifacts. Excavation and digging of soils will be required to facilitate the rehabilitation of the stormwater system and to provide stabilization of the eroded bank adjacent to the campground. Impacts on archaeological resources from these excavation activities can potentially be significant. With proposed unearthing and digging activities scheduled for this project there is a further requirement for an Archaeological Impact Assessment (AIA) to assess the potential for archaeological resources within the campground and embankment area. In this case the project will require an initial archaeological survey of the Point Wolfe Campground and associated area. Mitigation measures, including archaeological monitoring test pitting, are required to minimize impacts. This activity will be conducted by a consultant who will monitor the proposed excavation locations to determine if undisturbed areas of archaeological potential exist. Further to this, mitigation measures outlined in section 8 of this document must be implemented. The Contractor will be advised of all information and expected to follow all advice and mitigation measures identified in the Cultural Resource Impact Analysis and the Archaeological Impact Assessment.

During the early 1800's several areas within the park were settled by those seeking to carve a living from the rugged landscape. Logging operations and other activities such as fishing, farming and hunting became the way of life and brought settlement to locations along the coast and the interior. Sawmills were erected on many of the rivers and streams within the park area to facilitate the growing demands for lumber. By 1826 a fully operational sawmill was in place at the mouth of the Point Wolfe River. In later years, a smaller mill was constructed a short distance upstream adjacent to the Point Wolfe Village. The village was located approximately 200 m east of the existing Point Wolfe campground adjacent to the covered bridge and river. As the milling operation grew, so did the village. By 1915 there were several homes, bunkhouse, store and a post office in the village to support the growing operation (Figure 13).





Figure 13: Point Wolfe Village in 1915

Park staff compiled an inventory of physical remains for many of the historic properties that once delineated Fundy National Park. Details on foundations (homesteads, barns and outbuildings), dams, sawmill ruins, and bits and pieces of what once shaped settlements have been georeferenced and sketched. Cultural landscapes and other remnants of human settlement will not be maintained in their present state, but will continue to evolve under the influence of natural processes. Some landscape features, such as old fields or stone foundations, may eventually become obscured as ecosystem succession replaces former farmlands and homesteads with forest communities. Remnants of the Point Wolfe sawmill operation can still be found near the Point Wolfe covered bridge, however no physical evidence of the village exist. Any remaining cultural artifacts were likely disturbed, removed or buried under during the

construction of the Point Wolfe day use area and parking lot adjacent to the covered bridge in the early 1950's. Although the Point Wolfe Campground is located a short distance away from the former Point Wolfe village and milling operation, there is little evidence to suggest any historic activity linking the campground area to the sawmill or the settlement. A small open field and road are visible on a 1945 photo (Figure 14) indicating some activity in the vicinity of the current Point Wolfe Campground but no evidence of buildings or other structures.

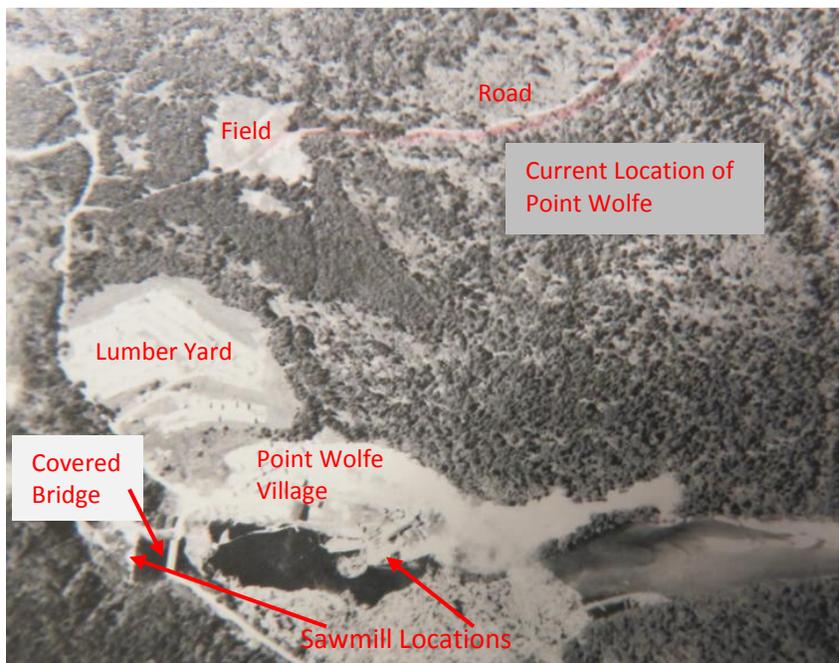
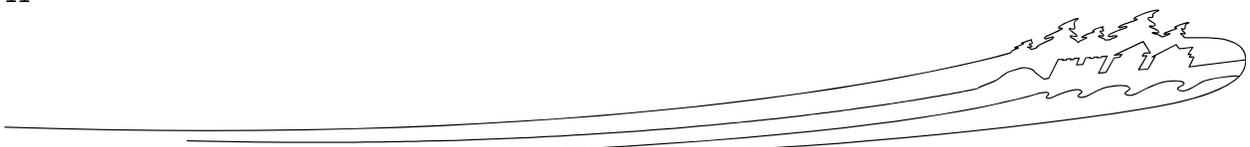


Figure 14: 1945 Aerial Photo of Point Wolfe Campground Area





Visitor experience

Fundy National Park receives approximately 250 000 visitors each year. Visitors engage in several activities including camping, hiking and cycling. The Point Wolfe Campground is located just far enough away to escape to some of Fundy’s most spectacular forest and coastal wilderness. Currently, the Point Wolfe Campground provides a variety of accommodations including primitive unserviced campsites, two-way sites (electrical and water), oTentiks and a Goutte d’Ô. Campers have access to washroom/shower facilities, kitchen shelters, individual site fire pits and campfire wood supply. In addition, the campground is located in close proximity to a number of hiking trails, Point Wolfe day use area and beach.

Historically, the operating season for this campground runs between the third weekend in June to Labor Day Monday. However, with the installation of the oTENTiks and the Goutte d’Ô, sections of the campground remained open until Thanksgiving Monday in 2016. Site night registration have shown a considerable increase in 2015 and 2016 (Table 1). It is anticipated that site night registrations will continue to increase with the Canada 150 celebration in 2017 and the additional improvements to the facilities will continue to attract visitors to this campground.

Table 1: Site Night Registration at Point Wolfe Campground

2016	2015	2014	2013	2012	2011	2010
8465	7204	5336	5352	5544	5420	5611

7. EFFECTS ANALYSIS

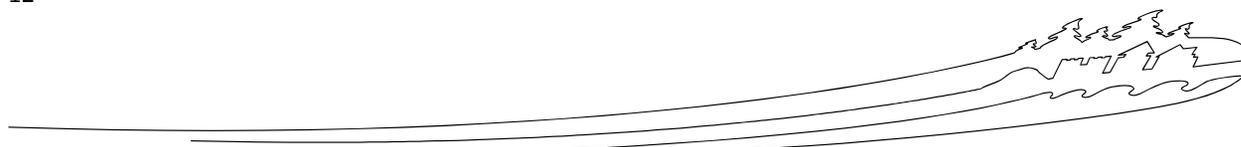
The following potential adverse environmental effects may be associated with the project components and associated undertakings. Given the nature and scope of the work to be performed, it is considered very unlikely that any adverse environmental effects of significance to aquatic or terrestrial habitats will occur with the application of specified mitigation measures listed in this report.

Air

- exhaust emissions from vehicles, equipment and small gas operated equipment during site preparation, construction and restoration could potentially have an effect on air quality
- dust particle pollution generated from excavation and backfilling activities

Soil/Landforms

- potential runoff, erosion, sedimentation and soil compaction from movement of machinery and excavation activities
- potential loss or damage of native flora
- potential loss or damage of native fauna
- possible disturbance or destruction to aquatic and terrestrial habitat
- potential damage or change to waterways
- potential impact to landscape and visual aesthetics
- dust particle pollution
- introduction of building materials potentially harmful to the environment





- potential soil and contamination with leakage, spills, or improper disposal from vehicles and equipment
- potential contamination of soil and/or water from sediment release
- introduction of non-native or invasive species

Water

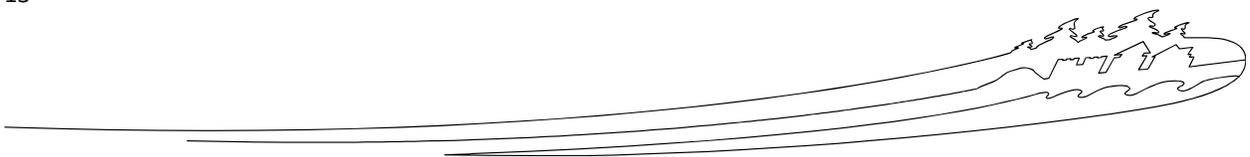
- potential runoff, erosion and sediment release into the Point Wolfe River and natural drainage channels
- potential contamination of groundwater during excavation activities
- potential contamination of water if vehicles and equipment leak fluids
- possible disturbance or destruction to aquatic and terrestrial habitat
- potential alteration or damage to the natural water flow or drainage
- introduction of dust particles and debris from construction activities
- potential ground water contamination with leakage, spills, or improper disposal from vehicles and equipment

Flora

- currently there are no plant species in the Point Wolfe Campground that are listed as being at risk under COSEWIC or SARA
- possible loss or damage of native flora during clearing of vegetation, excavation and the construction of infrastructure
- potential decrease in flora diversity
- possible disturbance, destruction or fragmentation to habitat
- introduction or spread of non-native or invasive species
- air pollution from exhaust or movement of dust particles
- potential contamination of soil and water
- potential impact to the landscape
- introduction of building materials that could be potentially deleterious to flora habitat
- potential runoff, erosion and release of sediment downstream

Fauna

- currently there is a very low probability of at risk animal species using this site
- possible damage or loss of native fauna during construction activities, excavation of soils and removal of vegetation and trees
- potential decrease in fauna diversity
- possible disturbance, destruction or fragmentation to aquatic and terrestrial habitat during excavation of soils and removal of vegetation and trees
- possible loss of food supply
- air pollution from exhaust or movement of dust particles
- noise disturbance from equipment
- wildlife corridor disruption





- potential runoff, erosion and release of sediment into Point Wolfe River
- introduction of building materials that could be potentially deleterious to fauna habitat
- possible disturbance, destruction or fragmentation to aquatic and terrestrial habitat
- possible damage or change to water drainage
- potential contamination of soil and water

Cultural/Aboriginal Resources

- There are no records to indicate previous archaeological work in the Point Wolfe Campground and surrounding area. Therefore, unidentified cultural/aboriginal resources could be directly impacted by construction activities.

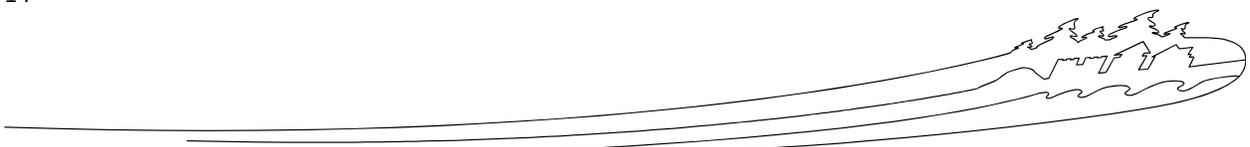
Visitor experience

- Construction activities in the campground, especially during peak season, can have an adverse effect on visitor experience
- Inadequate signage, alerting visitors of construction activities, can affect visitor experience and create safety concerns. Without barriers, visitors may wander into an active construction site without knowing the dangers and safety concerns.
- Scheduled work could cause some disruption in the normal availability of the campground or certain campsites. It may be necessary to close areas to public access during construction phases.

8. MITIGATION MEASURES

General

1. The Project Manager is responsible to ensure all parties receive a copy of this BIA prior to project start-up.
2. The conditions presented in this BIA will be considered part of the project. Failure to comply may result in work being suspended pending rectification of problem(s).
3. All activities pursuant to the project shall be governed by and carried out in accordance with the Canada National Parks Act and Regulations and with all other laws of Canada and the Province of New Brunswick.
4. All activities must conform to relevant Occupational Health and Safety Guidelines and to all relevant Municipal, Provincial and Federal regulations.
5. The Contractor is required to notify the Project Manager of the proposed work schedule at least one week in advance of potential start up.
6. A pre-construction meeting will be held on-site and attended by the Contractor, Project Manager, and the Environmental Assessment Officer. At this time, construction personnel will be informed of the environmental concerns for the project, laws, rules and regulations in Fundy NP.
7. Before commencing construction activities or delivery of materials to site, the contractor must submit an Environmental Protection Plan (EPP) for review and approval by Parks Canada. The EPP must include a comprehensive overview of known or potential environmental issues to be addressed during construction.



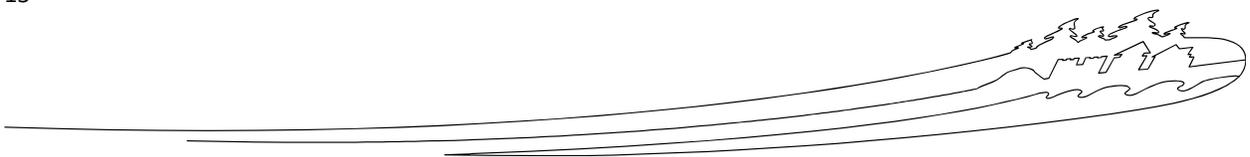


8. The Contractor is required to provide for approval ten (10) working days before start-up to PSPC and Parks Canada an erosion and sedimentation control plan, as part of the Environmental Protection Plan. The plan shall incorporate all necessary silt fences, silt traps, plastic lined trenches and ditches as approved by PSPC and Parks Canada. The plan must include appropriate measures to ensure there are no impacts to the Point Wolfe River from sediment.
9. Emergency contact list with phone numbers to be compiled and posted in a conspicuous location at the construction/project site.
10. Site access and the work area will be defined by the park representative prior to initiating project activities. Work will be confined to the identified disturbance footprint.
11. During construction phases, provide barricades, signs, and/or fencing as required to protect the public. Site access during construction must be restricted to authorized personnel only.
12. A designated Environmental Assessment Officer shall be kept informed of project scheduling and will be notified of changes at all times.
13. The Contractor must be aware that they are working in a National Park whose emphasis is on ecological/cultural integrity and resource protection.

Ecological Considerations

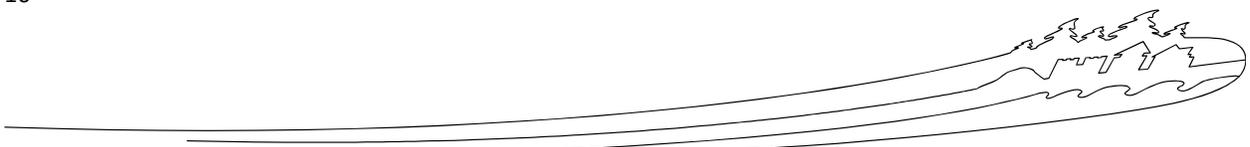
Vegetation & Soil

1. Equipment operators shall take extreme caution to avoid striking vegetation, including trees and tree bark that is outside of the construction corridor. Efforts will also be taken to minimize damage to tree roots. Equipment shall be stored within the project limits.
2. Tree removal will be limited to individuals within the construction site that have been identified by the park representative.
3. Disturbance of soil and vegetation must be kept to an absolute minimum. This will minimize disturbance and disruption to plants and wildlife communities and habitat.
4. All exposed soils must be stabilized as soon as possible in order to control sediment runoff during and after construction.
5. Clearing of riparian vegetation should be kept to a minimum: use existing trails, roads or cut lines wherever possible to avoid disturbance to the riparian vegetation and prevent soil compaction. When practicable, prune or top the vegetation instead of grubbing/uprooting.
6. Prune limbs close to the tree trunk. For a clean cut, make a shallow undercut first, then follow with the top cut. This prevents the limb from peeling bark off the tree as it falls. Do not use an ax for pruning.
7. If over half of a tree needs pruning, it is recommended to cut it down. Trees should be cut at ground level and do not leave pointed stumps.
8. Measures shall be taken to protect vegetation remaining on the site and not intended for removal. The park representative must be informed if there is a requirement to remove unmarked vegetation. Removal shall only commence with the approval of the park representative. Root systems shall be left intact whenever possible.
9. Any required re-planting for landscaping purposes must utilize native species approved by park representative.
10. Minimize equipment travel outside of construction corridor.





11. Slash generated from vegetation removal shall be disposed of in an appropriate manner. All work will be done with the goal of having a low aesthetic impact on the landscape.
12. Cover devegetated areas if heavy rains are expected in erosion prone locations.
13. Keep excavation to a minimum and reduce disturbance to ground surface and vegetation.
14. If soil becomes saturated during extreme wet weather, operations shall be suspended until soil conditions are more favourable.
15. To minimize the introduction of invasive species, all construction material must be clean and free of any contaminants and non-native species (refer to invasive plant section below).
16. Excavated soil that is suspected of or known to be contaminated (i.e. fuel, oil) is to be placed in covered bins or stockpiled and cover with plastic until the material can be transported to a provincially approved waste management facility.
17. Local vegetation and down woody debris adjacent to the eroded section of bank shall be used to naturalize and restore the eroded bank.
18. If borrow pits are required on site, save vegetation removed from the top of the pit. Place the salvaged vegetation in a secure shaded location and keep it moist by covering it with wet burlap. To rehabilitate, grade the pit area to the natural contour of the adjacent land before re-vegetating the site. Camouflage the area and access trails with boulders and dead wood.
19. Where planting is required, initiate as soon as possible after construction is completed to minimize erosion and the opportunity for non-native species to become established.
20. When planting an area to be restored, use only native species that are well suited to the environment (wild stock). Prepare the restoration site for planting before digging out the transplant material to reduce the time the plants remain out of the ground. Holes need to be refilled after transplants are removed.
21. Harvested plants and trees should be transplanted in the spring or fall of the year, or better, when the plant is fully dormant. Otherwise, transplant shock is likely.
22. When harvesting vegetation for transplant, ensure that enough soil is taken to contain the root mass.
23. Transplant material (plants, shrubs and trees) should be replanted shortly after harvest. If for some reason the transplanting cannot be done immediately, the vegetation should be kept in a shaded place and watered daily for maximum survival.
24. Mulch should be applied to transplanted vegetation to protect against cold, heat and drought.
25. If seeding is required, spread seed evenly across selected areas during a time when adequate soil moisture and site conditions allow for successful germination and growth.
26. Where restoration is required, reshape the existing area to the original contour.
27. Keep soils at their current location unless they are placed in an area that will be actively managed.
28. Side-casting of soil should be avoided whenever possible. If unavoidable, loose soil should be broadcasted downhill without creating piles. Broadcasted material should be evenly spread and no thicker than 35mm.
29. It may be necessary to place blast mats or mud mats to minimize damage to vegetation.
30. All exposed soils must be stabilized as soon as possible in order to control sediment runoff during and after construction.

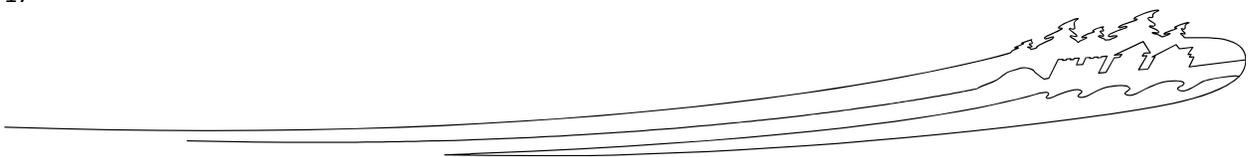




31. The project will not result in wasteful and inefficient use of non-renewable resources. Where practical, soils from the existing project shall be used in all aspects of trail construction or restoration.
32. Ensure fine materials being transported are covered with tarps or equivalent material.
33. Use appropriate sediment control materials including coverings tarps, polyethylene sheeting or vegetative cover to prevent erosion from rain or wind.

Hydrology / Water Quality

1. Existing (altered) drainage patterns will be restored to pre-disturbance patterns. In some cases where pre-disturbance patterns cannot be restored, restoration work may require the realignment of a stream segment. Consult with the Environmental Assessment Officer for thorough review of drainage systems.
2. No material should be removed from stream beds or below the normal high water mark.
3. Provide temporary drainage and pumping as necessary to keep excavations and site free from water.
4. Do not dump excavated fill, waste material, slash, vegetation or debris in watercourse.
5. Aquatic species and habitats can be greatly affected by runoff sediment. Protect exposed slopes and reduce surface erosion and release of sediment into waterways.
6. Cuts and fills near waterways are to be stabilized, and ditch run-outs constructed to prevent entry of silt into waterways. In the vicinity of stream banks, maintain and preserve as much of the existing vegetation as possible.
7. Clearing of riparian vegetation should be kept to a minimum: use existing trails, roads or cut lines wherever possible to avoid disturbance to the riparian vegetation and prevent soil compaction. When practicable, prune or top the vegetation instead of grubbing/uprooting.
8. Operate machinery on land above the high water mark, in a manner that minimizes disturbance to the banks and vegetation.
9. Cuts and fills near waterways are to be stabilized, and ditch run-outs constructed to prevent entry of silt into waterways. In the vicinity of stream banks, maintain and preserve as much of the existing vegetation as possible.
10. Do not skid logs or construction materials across waterways.
11. Do not operate construction equipment in waterways.
12. No rock, silt, cement, grout, asphalt, petroleum product, lumber, vegetation, domestic waste, or any deleterious substance shall be placed or allowed to disperse into any stream, river, pond, wetland, lake or other water course.
13. Minimize the removal of natural woody debris, rocks, sand or other materials from the banks and the shoreline.
14. Stream channels shall be restored to pre-disturbance conditions. Avoid disturbance to slopes, if unavoidable ensure adequate erosion protection measures are used.
15. Design and construct temporary crossings to minimize erosion to waterways.
16. Avoid indicated spawning beds when constructing temporary water crossings.
17. Installation of check dams may be necessary to stabilize steep sections. Check dams should be constructed of natural materials such as logs and rock. Ensure check dams are properly installed to avoid erosion issues.





18. Re-contour the stream bank edges and approach ways and prevent sedimentation by grading slopes in the direction away from the watercourse and never into the stream itself.
19. Explosives should not be detonated in or near fish habitat.

Mammals/Birds/Fish

1. Feeding wildlife is not permitted. All work sites must be kept free of edible and other garbage that could attract or harm wildlife.
2. To avoid the risk of nest destruction, the proponent shall avoid vegetation clearing during the most critical period of the migratory bird breeding season, which is May 1st through August 31st.
3. In the event that vegetation clearing is to take place inside the May 1st to August 31st window, a qualified biologist must inspect the area prior to potential disturbance or loss of habitat activities to ensure there will be no adverse impacts to birds and wildlife.
4. Before cutting of trees, especially dead stems, rap / tap the tree trunk repeatedly with a stick (or similar object) to awaken hibernating mammals.
5. All construction activities shall be designed to have minimum effect on fish and fish habitat.

Invasive Plants

1. Construction equipment may facilitate the movement and spread of invasive plants by moving invasive plant seeds from infested areas. Contractors/construction operators are responsible to pressure wash equipment before entering the park or moving from an infested area within the park.
2. Hand tools and footwear should be cleaned between work sites to prevent cross contamination and reduce the risk of invasive species introduction.
3. Materials to be used on construction projects should be stored in areas free of invasive plant species.
4. Freshly disturbed ground created by construction equipment during construction activities provide suitable habitat for invasive plants. Ensure that exposed soil is planted with native vegetation species as soon as feasible to reduce the risk of invasive species invasion.
5. Reduce the spread of invasive plants by prohibiting the movement of soil, vegetation and materials from infested areas.

Machinery / Storage and Handling of Fuels and Dangerous Fluids

1. Work associated with site preparation and construction will rely on the minimal amount of heavy machinery use and be fairly brief. Consequently, noise pollution will be minimized and will not significantly influence park visitors or wildlife.
2. All mechanical construction equipment should be properly maintained, in good operating order, and fitted with standard air emission control devices. Detection of leaks or exhaust issues shall be fixed immediately or work is suspended until repairs can be made.
3. Daylight operation of all mechanized equipment will be respected.
4. Gas or diesel operated equipment shall be shut down if not needed for a period greater than 5 minutes to reduce noise and emissions.
5. Operate machinery on land above the high water mark, in a manner that minimizes disturbance to the banks of the waterbody.
6. Supply and maintain on-site emergency spill contingency equipment and materials to contain spills and minimize environmental damage. Ensure all employees are trained in their use.





7. For all contractors, a Spill Response Kit (absorbent materials, etc.) must be on site at all times and the employees trained in its use.
8. In the event of a spill, the offending party (Parks Canada or Contractor) is required by law to report all toxic spills and petroleum spills >20 litres to Environmental Emergency / Canadian Coast Guard at 1-800-565-1633. In addition, for any spills, the Project Manager (506-887-6386) and/or the Environmental Assessment Officer (506-227-7428) must be notified immediately. If unavailable contact Jasper Dispatch (1-877-852-3100). Immediate action must be taken by the offending party to contain and clean the spill in accordance with the Provincial Spill Reporting Regulation.
9. Cleanup, repair and rehabilitation resulting from any spill shall be to the satisfaction of the Environmental Assessment Officer.
10. Fuel storage shall be located a minimum of 30 m away from any watercourse or critical habitat.
11. Fueling of vehicles or equipment will not be permitted within 30 m of any watercourse or critical habitat.
12. Refueling shall not take place in locations where runoff could carry contaminants into drainage pathways. An absorbent pad should be placed beneath the machine to capture small spills.
13. Minimize quantity of hazardous materials on site to that absolutely necessary to perform the work.
14. Disposal of debris or waste into any drain, and/or waterway, is strictly prohibited.
15. Any hazardous material/waste is to be stored, handled, transported and disposed of in compliance with Transportation of Dangerous Goods legislation and WHMIS labeling. Disposal shall be at an approved provincial waste management site and proof of disposal provided to the Project Manager.
16. Dispose of all waste materials at an appropriate provincial waste/recycle facility.

Cultural Resources

1. Archaeological monitoring will be conducted by a consultant who will examine the proposed trench locations to determine if undisturbed areas of archaeological potential exist. If found, these areas must be tested and depending on the result, may require additional excavation or mitigation work.
2. Consult with the Project Manager if there is a requirement to deviate from approved construction plans. Any changes in information or drawings must be submitted to Parks Canada's Terrestrial Branch for further review.
3. Vehicular access routes and staging areas will be restricted to present-day roadways, parking lots, and significantly disturbed areas. If this is not possible, the use of protective covering such as geotextile protective mats with a wood chip lift or granular "A" gravel is required. All protective measures employed must be removed following construction and the area restored to a pre-construction state. Excavation is not permitted during installation or removal of protective covering.
4. If significant features (i.e., structural remains and/or high artifact concentrations) are encountered during construction activities, excavation should cease in the immediate area, and the Parks Canada project manager must be informed. The project manager will contact Parks





Canada's Terrestrial Archaeology section for advice and assessment of significance, which will in turn determine the requirements to mitigate the find.

Erosion Control

1. Develop and implement an Erosion and Sediment Control Plan, as part of the Environmental Protection Plan for the site that minimizes risk of sedimentation of the waterbody during all phases of the project. Erosion and sediment control measures should be maintained until all disturbed ground has been permanently stabilized, suspended sediment has resettled to the bed of the waterbody or settling basin and runoff water is clear. The plan should, where applicable, include:
 - i. Installation of effective erosion and sediment control measures before starting work to prevent sediment from entering the water body.
 - ii. Measures for managing water flowing onto the site, as well as water being pumped/diverted from the site such that sediment is filtered out prior to the water entering a waterbody. For example, pumping/diversion of water to a vegetated area, construction of a settling basin or other filtration system.
 - iii. Regular inspection and maintenance of erosion and sediment control measures and structures during the course of construction. The structures should be maintained by repairing structural problems or damage and by removing accumulated sediment at regular intervals and disposing the sediment at an approved location.
 - iv. Removal of non-biodegradable erosion and sediment control materials once site is stabilized.
2. The Contractor will maintain a stockpile of appropriate erosion and environmental protection materials (e.g. silt fences, straw bales, wood chips, clean rock fill and aggregate base course) on site at all times.
3. Stabilize rehabilitated sections of road / trails to prevent further erosion.
4. On disturbed slopes where soil erosion is a greater concern, spread seeds, plant vegetation, spread mulch or use erosion control blankets for stabilization.
5. Areas that are not prone to erosion still need contouring and can be scarified to prepare the site for planting or natural regeneration.
6. Restabilize and revegetate exposed surfaces as soon as possible.
7. Minimize the amount of dust created by construction activities on adjacent vegetation and water bodies and reduce the impact to air quality. Use suppression methods to reduce dust in sensitive areas as required to control off-site migration of dust particles.

Access

1. Access for emergency response, fire suppression and site maintenance should be reflected in safety plan for the site.
2. Whenever possible, only existing roadways/trails or disturbed areas shall be used for site access and travel within the site to minimize damage to vegetation and reduce soil compaction or erosion.





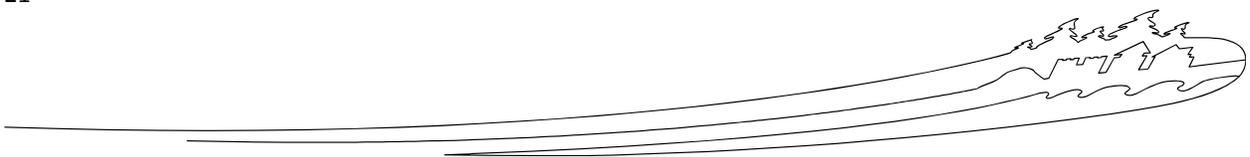
3. Consider transporting materials when the ground is still frozen to minimize compaction and damage to vegetation.
4. Minimize as much as possible new disturbances by locating equipment in previously disturbed areas.
5. Control access to the site before, during and after construction activities.
6. Post interpretive signage to educate the public of the construction project and to alert of safety concerns.
7. If necessary, place barriers to deter unnecessary traffic until the site stabilizes.

Facilities

1. Leave No Trace wilderness ethic principles shall be communicated to/observed by all of the construction crew.
2. During the construction phase, store food, garbage and other smelling products in sealed containers. Pack all garbage out form the site daily, unless permanent garbage facilities exist at the site. Garbage structures shall minimize the opportunity for wildlife to feed from the garbage.
3. Regular daily maintenance of the site shall be done to ensure that it is free from accumulations of waste, debris and garbage.
4. A complete site cleanup including restoration of exposed and damaged areas, shall be required to the satisfaction of the park representative, before the site is vacated after project completion.
5. Fires are only permitted in approved structures at designated sites within the park.
6. During the construction phase, temporary washroom facilities must be provided on the construction site.
7. Remove all construction materials from site upon project completion.
8. The Contractor shall be responsible for all restoration of existing roads, trails, driveways and landscaping which are damaged by the Contractor's operations.

Safety

1. Work crews on site must comply with all applicable health/safety regulations, including use of appropriate protective equipment.
2. A project safety plan must be in place before project commences.
3. The Contractor is responsible to take all necessary precautions to ensure there is no safety concerns related to public safety.
4. The contractor shall determine the exact location of all existing buried utilities before commencing work.
5. The contractor must provide and maintain signs, flashing warning lights and other devices required to indicate construction activities or other temporary and unusual conditions resulting from the project.
6. Care and appropriate measures must be taken to ensure dust and other air borne particulates do not reach a level that would compromise air quality or impact vegetation/wildlife.
7. Blasting is not permitted without authorization from the Project Manager.





9. PUBLIC/STAKEHOLDER ENGAGEMENT & ABORIGINAL CONSULTATION

9 a) Indicate whether public/stakeholder engagement was undertaken in relation to potential adverse effects of the proposed project:

- No
- Yes (describe the process to involve relevant parties and indicate how comments were taken into consideration).

9 b) Indicate whether Aboriginal consultation was undertaken in relation to potential adverse effects of the proposed project:

- No
- Yes (describe the process to involve relevant parties and how the results were taken into consideration).

10. SIGNIFICANCE OF RESIDUAL ADVERSE EFFECTS

If mitigation measures, described in this report, are followed and carried out, all environmental effects are likely to be minor in nature and have insignificant impact. Although the potential exist for short term environmental effects during the project, the level of disturbance is expected to be localized and of low magnitude. Parks Canada concludes that this project is not likely to contribute to significant adverse environmental effects in the short or long term.

11. SURVEILLANCE

- Surveillance is not required
- Surveillance is required (Surveillance inspections will range from daily to weekly depending on project activity and the potential treat to environmental components. Monitoring will focus on water protection, erosion control, cultural resource protection, flora and fauna protection, construction within the allowable footprint, equipment use and maintenance, impact to visitor experience, site condition and garbage disposal).

12. FOLLOW-UP MONITORING

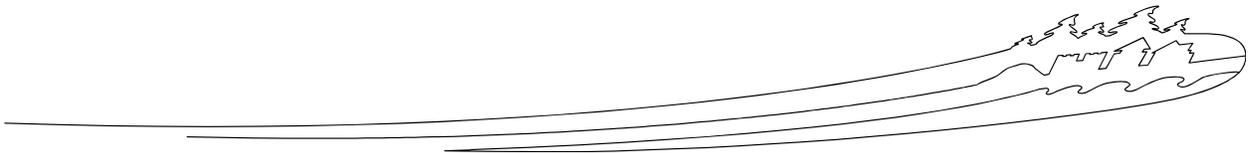
Follow-up monitoring is:

- not required
- legally required (e.g. under the *Species at Risk Act* or *Fisheries Act*)
- required in accordance with the *Parks Canada Cultural Resource Management Policy*

13. SARA NOTIFICATION

Notification is:

- not required
- required under the *Species at Risk Act* (outline the nature of and response to any notification).





14. EXPERTS CONSULTED

Department/Agency/Institution: Parks Canada	Date of Request: 2016-12-19
Expert's Name & Contact Information: Patrick McKinley patrick.mckinley@pc.gc.ca	Title: Visitor Experience Coordinator
Department/Agency/Institution: Parks Canada	Date of Request: 2017-03-06
Expert's Name & Contact Information: Brian Chevaire brian.chevaire@oc.gc.ca	Title: Technical Service Officer
Department/Agency/Institution: Parks Canada	Date of Request: 2017-03-07
Expert's Name & Contact Information: Edward Hoar Edward.hoar@pc.gc.ca	Title: Technical Coordinator
Department/Agency/Institution: Parks Canada	Date of Request: 2016-12-16
Expert's Name & Contact Information: Shirley Butland shirley.butland@pc.gc.ca	Title: A/Environmental Assessment Officer/Local Historic Information
Department/Agency/Institution: Parks Canada	Date of Request: 2016-12-19
Expert's Name & Contact Information: Neil Vinson neil.vinson@pc.gc.ca	Title: Resource Management Officer
Department/Agency/Institution: Parks Canada Agency	Date of Request: 2017-01-18
Expert's Name & Contact Information: Lisa Forbes Lisa.forbes@pc.gc.ca	Title: Policy Advisor, Cultural Resource Management, Indigenous Affairs and Cultural Heritage Directorate
Expertise Requested: 1) Visitor Information, 2) Design Details, 3) Underground Services Details, 4) Historical Information, 5) Environmental, 6) Invasive Plant Monitoring, 7) Cultural Resource Impact Analysis	
Response: 1) Visitor Information by PM, 2) Design Details by BC, 3) Underground Services by EH, 4) Historical Information by SB, 5) Environmental considerations and mitigation measures by SB, 6) Invasive Plant Monitoring by NV, 7) Cultural Resource Impact Analysis by LF.	

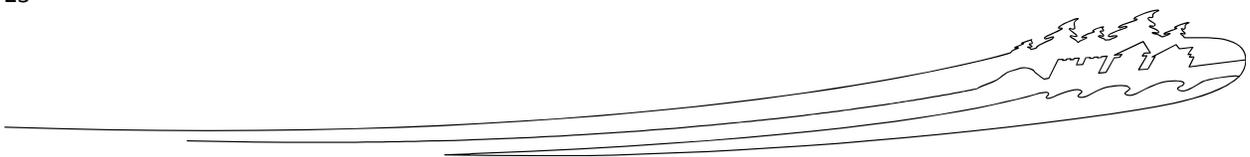
15. DECISION

Taking into account implementation of mitigation measures outlined in the analysis, the project is:

- not likely to cause significant adverse environmental effects.
- likely to cause significant adverse environmental effects.

FOR SARA REQUIREMENTS:

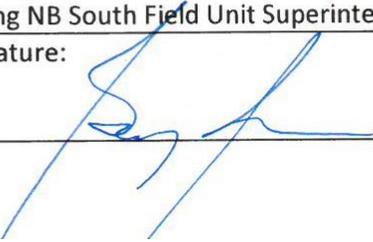
- There are no residual adverse effects to species at risk and therefore the SARA-Compliant Authorization Decision Tool was not required





16. RECOMMENDATION AND APPROVAL

(Add additional blocks as required)

Prepared by: Shirley Butland Acting Environmental Assessment Officer	Date: 2017-04-27
Recommended by: Ian McKim Project Manager	Date: 2017-04-11
Approved by: Beverly Boyd Acting NB South Field Unit Superintendent	Date: 2017-05-03
Signature: 	

17 ATTACHMENTS

- Appendix I: Environmental Impact Analysis Tools: Effects Identification Matrix
- Appendix II: Point Wolfe Campground, Fundy National Park
- Appendix III: Archaeological Overview Assessment
- Appendix IV: Statement of Cultural Resource Impact Analysis

18. NATIONAL IMPACT ASSESSMENT TRACKING SYSTEM

- Project registered in [tracking system](#)
- Not yet registered (*CEAA 2012 requires PCA submit a report to Parliament annually. EIAs must be entered in the tracking system **by the end of April** to enable reporting.*)

19. REFERENCES

Allardyce, G. MS 1994. The Salt and the Fir: Report on the History of the Fundy Park Area. Second edition. Unpublished manuscript of Parks Canada, Alma, N.B. Res. Notes of Fundy National Park No. FUN/94-03. Pp 212.

Burzynski, Michael. 1987. Man and Fundy Story Component Plan. Fundy national park. Canadian Parks Service - Environment Canada.Pp. 195.

Cook, Richard and Michelle McKay. 2010. Bennett Lake Dam Reconstruction. Environmental Assessment Screening Report. Fundy National Park. pp 47.

Miller, A. 2017. Archaeological Overview Assessment. Parks Canada Agency, Archaeology and History Branch, Indigenous Affairs and Cultural Heritage Directorate.

Parks Canada, Fundy National Park Management Plan, 2011.

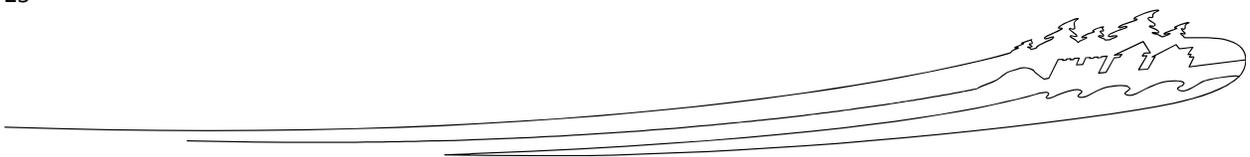




Parks Canada, Fundy National Park: Resource Description and Analysis, 1985

Parks Canada, Fundy National Park: Salt and Fir Visitor Guide, 2015.

Parks Canada Screening Form. 2003. Erosion Control – Point Wolfe Campground, Fundy National Park. FUN-03-04

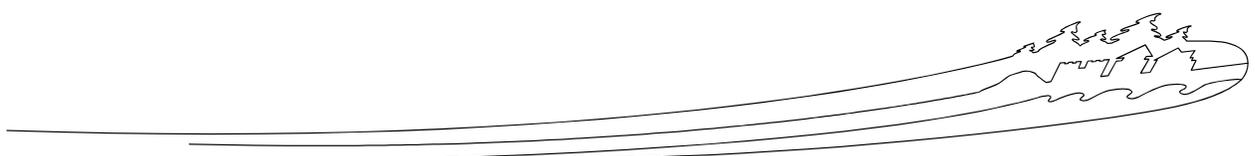




Appendix 1: Environmental Impact Analysis Tools: Effects Identification Matrix

Section A focuses on direct effects of the project and **Section B** on indirect effects that are caused by changes to the environment.

A. Direct Effects									
<p><i>You may wish to change the components listed under the headings to specify the natural or cultural resources that are priority considerations for your PCA site or for the specific project being reviewed.</i></p>		Valued components potentially directly affected by the proposed project							
		Natural Resources					Cultural Resources		
		Air	Soil & landforms	Water (surface, ground, crossings, etc.)	Flora (specify, including SAR)	Fauna (specify, including SAR)	Homestead Foundations	Cultural Resources with Local Value	
Phase	Examples of Associated Activities								
Project Components	Preparation / Construction / Operation / Decommissioning	Supply and storage of materials	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Burning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Clearing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Demolition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Disposal of waste	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Blasting/ Drilling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Dredging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Drainage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Excavation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Grading	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Backfilling	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Use of machinery	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Transport of materials/ equipment	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Building of fire breaks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Use of Chemicals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Set up of temporary facilities	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		





A. Direct effects continued									
		Valued components potentially affected by the proposed project							
		Natural Resources					Cultural Resources		
		Air	Soil & landforms	Water (surface, ground, crossings, etc.)	Flora (specify, including SAR)	Fauna (specify, including SAR)	Heritage values	Insert heritage values	
Phase	Examples of Associated Activities								
Project Components	Preparation / Construction / Operation / Decommissioning	Waste disposal	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Wastewater disposal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Use	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Use/Removal of temporary facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Use of Chemicals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Active fire stage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Prescribed burn cleanup	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Planting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Culling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Vehicle Traffic	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Other...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>





Section B of the matrix should be used to identify potential indirect effects that may result from impacts of the project to components of the environment you have identified on the preceding pages (see Section A - direct effects to natural resources). Consideration of indirect effects is required under CEAA 2012 Sections 5(1)(c) and 5(2)(b), and by the PCA mandate. For example:

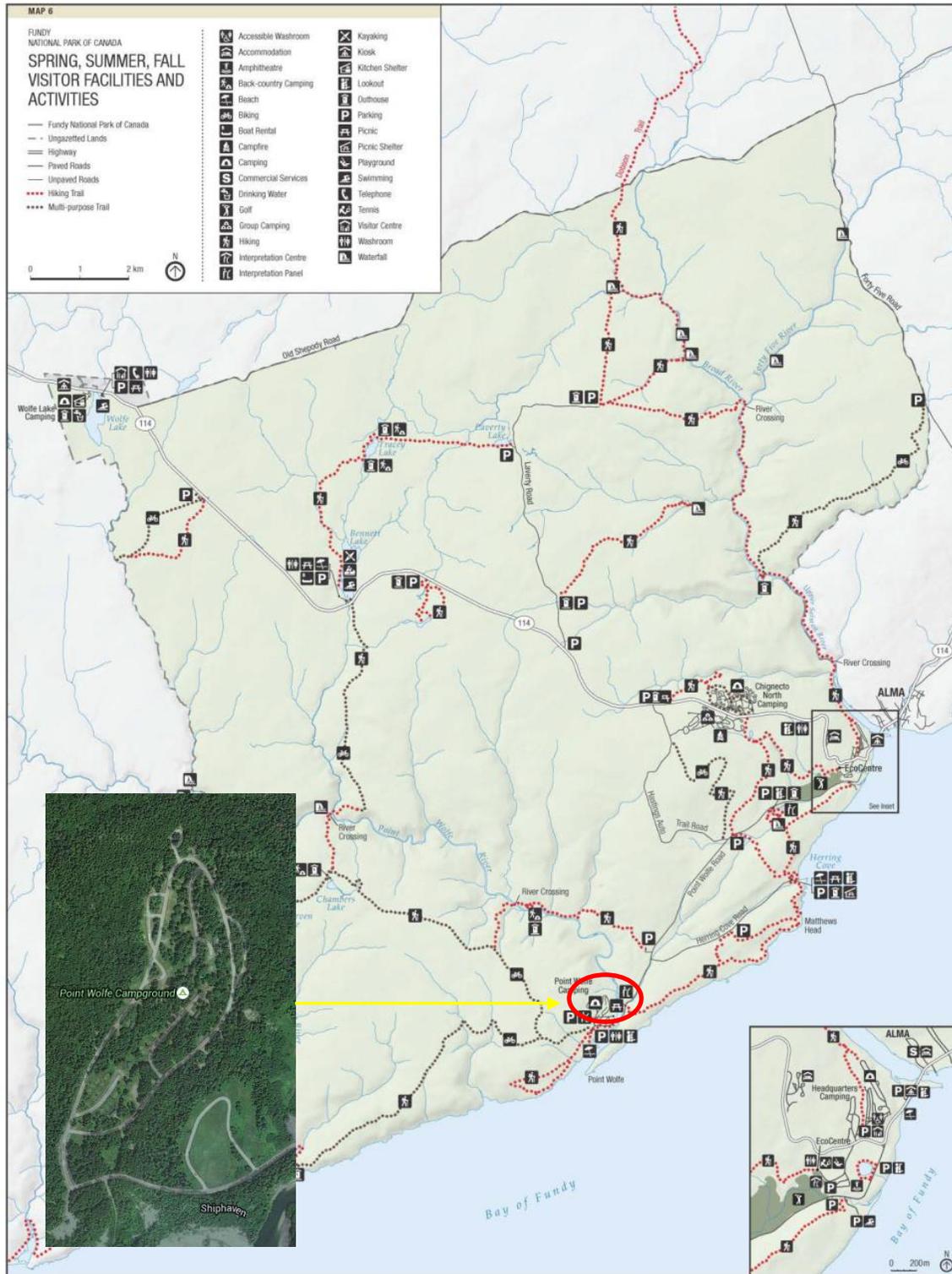
- if the proposed project could lead to adverse effects to water quality and quantity, could this then effect the quantity and quality of water resources (e.g. potable water) used by an Aboriginal community?
- could there also be adverse socio-economic effects to a community that relies on recreational fishing tourism?
- could changes to the environment (e.g. digging, clearing) affect visitor access, opportunities, or safety?

B. Indirect Effects (all phases)							
<p>You may wish to change the components listed under the headings to specify the natural or resources that are priority considerations for your PCA site or for the specific project being reviewed.</p>		Impacts as a result of changes to the environment					
		With respect to non-Aboriginal peoples:		With respect to Aboriginal peoples:		With respect to visitor experience	
		Health and socio-economic conditions	Health & socio-economic conditions	Current use of lands and resources for traditional purposes	Access & services	Recreation & accommod'n opportunities	Safety
Phase	Natural resource components affected by the project						
Preparation /construction operation/implementation/decommissioning	Could impacts to <u>air</u> lead to adverse effects on...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Could impacts to <u>soils and landforms</u> lead to adverse effects on...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Could impacts to <u>water</u> (e.g. surface, ground water and water crossings) lead to adverse effects on...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Could impacts to <u>flora</u> (including SAR) lead to adverse effects on...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Could impacts to <u>fauna</u> (including SAR) lead to adverse effects on...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Other...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>





Appendix II: Point Wolfe Campground, Fundy National Park





Appendix III: Archaeological Overview Assessment

**PARKS CANADA AGENCY
ARCHAEOLOGY AND HISTORY BRANCH
INDIGENOUS AFFAIRS AND CULTURAL HERITAGE DIRECTORATE**

**ARCHAEOLOGICAL OVERVIEW ASSESSMENT
FUNDY NATIONAL PARK
RECAPITALIZATION OF POINT WOLFE STORMWATER SYSTEM AND BANK STABILIZATION
FUNDY NATIONAL PARK - FII PROJECT RPA n° 1314.1**

André MILLER
FII Project Archaeologist, IAHC
National Office, Gatineau

ABSTRACT

Parks Canada Agency (PCA) and Fundy National Park (Fundy NP) are proposing the Recapitalization of Point Wolfe Campground Stormwater System and Bank Stabilization of Fundy National Park. We are assessing whether there are archaeological concerns as part of the CRIA. As part of this CRIA, Fundy NP are requesting an archaeological review to determine if there are potential archaeological impacts and, if so, how to mitigate them. The current stormwater infrastructure at Point Wolfe Campground has remained largely unchanged since the early 1960s. This project aims to identify the root cause of the Point Wolfe Campground stormwater system overflow that is causing rapid erosion of the steep bank at the outlet. The scope of the project will include a comprehensive mapping and usage study for the stormwater system and recommendations and implementation of remedial actions to address this problem. This Archaeological Overview Assessment (AOA) evaluate the archaeological potential of the project area and the potential impacts of the proposed work on known or potential archaeological resources. This AOA will determine if an Archaeological Impact Assessment and/or mitigation measures are required.

PROJECT INTRODUCTION

Point Wolfe Campground is located at the end of Point Wolfe Road in Fundy National Park (Figure 1). The stormwater outlet towards the Point Wolfe river valley is causing extensive bank failure resulting in potentially important impacts on critical habitat for endangered Atlantic salmon. By looking at the local vegetation regrowth patterns, an estimated 3,500 m³ of bank soil has eroded. The current condition has created a cliff with undercut edges near existing campsites which can pose risks to visitors, campers (Figure 2). The surface water through campsites, large puddles, erosion of roadway and various path throughout the campsite will have a negative implications for visitor experience. The project will provide comprehensive recommendations for repairing the current stormwater system and mitigate future bank erosion. The project will positively affect ecological integrity, visitor experience, visitor safety, and asset management operations.

ASSESSMENT METHODOLOGY

This assessment is based on a review of documentation provided by the Fundy NP Field Unit, online resources and existing documentation at PCA Terrestrial Archaeology Branch, National Office, Gatineau, Quebec. The documentation includes mapping, reports, and digital files.





BRIEF HISTORICAL BACKGROUND OF FUNDY NP

The park area has an extensive history of human use, dating to the early 1800s. Several small communities were located in the park prior to its establishment. Vestiges of these settlements remain in the form of old foundations and regenerating fields. Most of the forest in Fundy National Park has been cut in the past, and a number of dams were constructed to permit log driving and to provide power for saw mills. Areas were flooded on the East Branch, Point Wolfe and Upper Salmon rivers. Dams at Bennett and Wolfe lakes modified the surrounding landscape and continue to restrict the movement of resident fish populations. Numerous pools were modified and river beds and hydrology were altered through log driving activities. Lumber mills were constructed at the mouth of the Point Wolfe and Upper Salmon Rivers and were active in the 1800s and early 1900s. In addition, several portable mills operated in the interior in the early 1900s.

Areas immediately adjacent to the mills were so extensively logged that at one point, accessible stands of red spruce were almost entirely depleted in the Point Wolfe area. The crash of the lumber markets in 1921, followed by the establishment of Fundy National Park in 1948, concluded this phase of logging and river log driving in the area. Today, while native plant communities have been re-established in much of the park and natural successional stages are present, evidence of these historical activities persists.

The landscape surrounding the park is highly fragmented, due to past and present forest harvesting practices. Extensive clear-cutting has reached all of the park's three forested boundaries, and associated effects can be observed well within the park interior. A network of forest access roads has been created to facilitate forest harvesting. These roads are kept open to the general public and contribute to increased hunting pressure in the vicinity of the park. (Parks Canada 2005 Source: http://www.pc.gc.ca/docs/v-g/nb/fundy/pd-mp/plan-2005_5.aspx)

Fundy NP was established in 1948. It protects 206 km² of the Fundy Coastal and the Southern Uplands eco regions. This natural region is characterized by a rolling, hilly plateau cut by deep river valleys and cascading waterfalls. The park encompasses 12 kilometres of dramatic shoreline along the Bay of Fundy and more than 100 kilometres of hiking and biking trails that lead to thundering waterfalls, freshwater lakes, and scenic river valleys. Included in the park are multiple well equipped campgrounds, a variety of alternative accommodations including yurts and oTENTiks.

But this area is also well known for resources associated with human historic settlement and resources associated with harvesting such as Point Wolfe River Cultural Landscape.

Cultural landscapes and other remnants of human settlement will not be maintained in their present state, but will continue to evolve under the influence of natural processes. Some landscape features, such as old fields or stone foundations, may eventually become obscured as ecosystem succession replaces former farmlands and homesteads with forest communities. Important features will be thoroughly recorded and documented. The cultural resources will be interpreted, and will find more permanent expression in exhibits, brochures, slides, and other media that are used in the Heritage Presentation Program (Parks Canada 2005).

PREVIOUS ARCHAEOLOGICAL WORK AT FUNDY NATIONAL PARK

Although physical evidence of Indigenous use or occupation within Fundy NP has not been located to date, the area is within traditional territory of the Mi'kmaq, Wolastokiyik (Maliseet), and Passamaquoddy





peoples. Archaeological and historical research has identified many cultural resources related to European settlement and use of Fundy NP. These resources include:

- Features and contexts associated with human settlement such as abandoned farms and homesteads that include foundations, remnant fields and roads, stone fences and culverts, cemeteries, and archaeological artifacts,
- Features associated with resource harvesting within Fundy NP include remnants of saw mill sites and dams, the “Harry McManus” submerged canal, logging roads and lumber camps, and an abandoned copper mine,
- Features associated with Public works including the original Howe-truss covered bridge, circa 1914; a reconstructed replica Howe-truss covered bridge (1992) recognized by FHBRO for its form and function, and the associated dam and abutments of the original bridge; and lighthouse foundations. (PCA 2005).

Parks Canada must ensure that these cultural resources and newly discovered are recognized, managed and presented so that the public will learn about and better appreciate the park’s cultural heritage in ways that do not interfere with ecological processes and ecosystem management programs.

There are no records to indicate previous archaeological work done in the project area, the campground area. There is limited knowledge of the condition of the park’s cultural resources (further evaluations and inventories are required) and that cultural resource research and information has not been consolidated yet. The park has a fair understanding of the inventory of the cultural resources; however, a cultural resource management strategy and monitoring program for cultural resources in Fundy NP has not been developed to date. (Parks Canada 2011)

ARCHAEOLOGICAL POTENTIAL

Previously there was no archaeological investigations in the immediate area at Point Wolfe Campground for this recapitalization project: the Stormwater System and Bank stabilization at Fundy National Park (Figure 3). There is no known archaeological resources situated at proximity of the project, staging area and related works. But there is potential that excavation activities may yield Aboriginal and/or historical artifacts. That area is partially occupied by small buildings and current facilities, and the removal and replacement of Water and Stormwater system would be probably an issue, because presumably the area would have not been disturbed with previous constructions. The proximity of Point Wolfe River and the coastline of Bay of Fundy could led to the discovery of historic settlements, paleo-historic or historic Aboriginal group occupations in this area.

ASSESSMENT OF PROPOSED DEVELOPMENT IMPACT ON POTENTIAL ARCHAEOLOGICAL RESOURCES

The present AOA is based on a review of the 50% sketch drawings. There is archaeological concern with the 50% design concept of the Water and Wastewater system (Figure 4). Change to the current system will made a difference. Therefore planned construction of the new Water and Wastewater System will result in unearthing and digging in many places in the area.





Archaeological Mitigation Measures

Impacts on archaeological resources from excavation activities of this project at Point Wolfe Campground, as outlined in the 50% drawing, have the potential to be deemed significant. Mitigation measures, including archaeological monitoring and test pitting, are required to minimize these impacts.

Again, this area of the Fundy NP has not been subjected to archaeological tests or survey. With a high potential for the discovery of unknown archaeological resources, the proposed work activity will require an Archaeological Impact Assessment (AIA) to assess the potential for archaeological resources within the construction zones. This should be undertaken by a PCA-licenced archaeologist who will examine the proposed trench locations to determine if undisturbed areas of archaeological potential exist. If found, these areas must be tested and depending on the result, may require additional excavation or mitigation work. Archaeological Resources could be disturbed as a consequence of this work, resulting in a loss a data about past activities at the site. The AIA will be designed to assess potential buried resources.

Archaeological Survey and Monitoring

Given the potential for evidence of occupation at this site, a PCA-licenced archaeologist will do test pits and monitoring related areas. Findings from this survey will inform additional mitigation measures, if required.

Additional Mitigation Measures

The following additional mitigation measures have been identified to ensure the construction activities, as outlined in the 50% sketch drawings, will not have an impact on archaeological resources:

1. If there are any changes to the plans, all additional information and construction drawings must be submitted to Parks Canada's Terrestrial Branch for further review.
2. The 99% design concept plans for the project must be submitted to Parks Canada's Terrestrial Branch for further review.
3. If significant features (i.e., structural remains and/or high artifact concentrations) are encountered during construction activities, in the absence of an archaeologist, excavation should cease in the immediate area, and the Parks Canada project manager will be informed. The project manager should then contact Parks Canada's Terrestrial Archaeology section for advice and assessment of significance, which will in turn determine the requirements to mitigate the find.

REFERENCES

Parks Canada Agency (PCA)

2016 Request for Cultural Resource Impact Analysis (CRIA), Recapitalization of Point Wolfe Stormwater System and Bank Stabilization Fundy NP. Fundy National Park of Canada. On file at Parks Canada, Gatineau, Quebec.

2011 Fundy National Park of Canada, Management Plan. On file at Parks Canada, Gatineau, Quebec.

2005 Fundy National Park of Canada, Management Plan. On file at Parks Canada, Gatineau, Quebec.

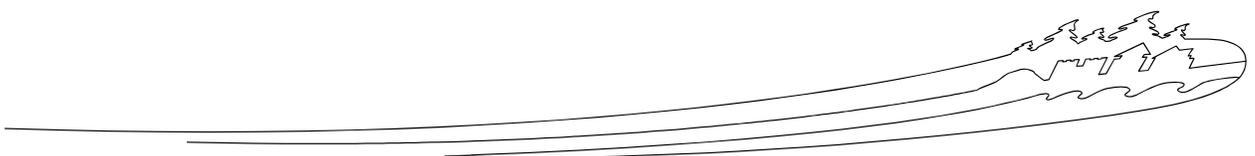




Figure 1. Location of Point Wolfe Campground for Recapitalization OF Point Wolfe Stormwater System and Bank Stabilization (Image Google Earth - PCA Digital Files).



Figure 2. An area of slope erosion at Point Wolfe Campground (Parks Canada - PCA Digital Files).



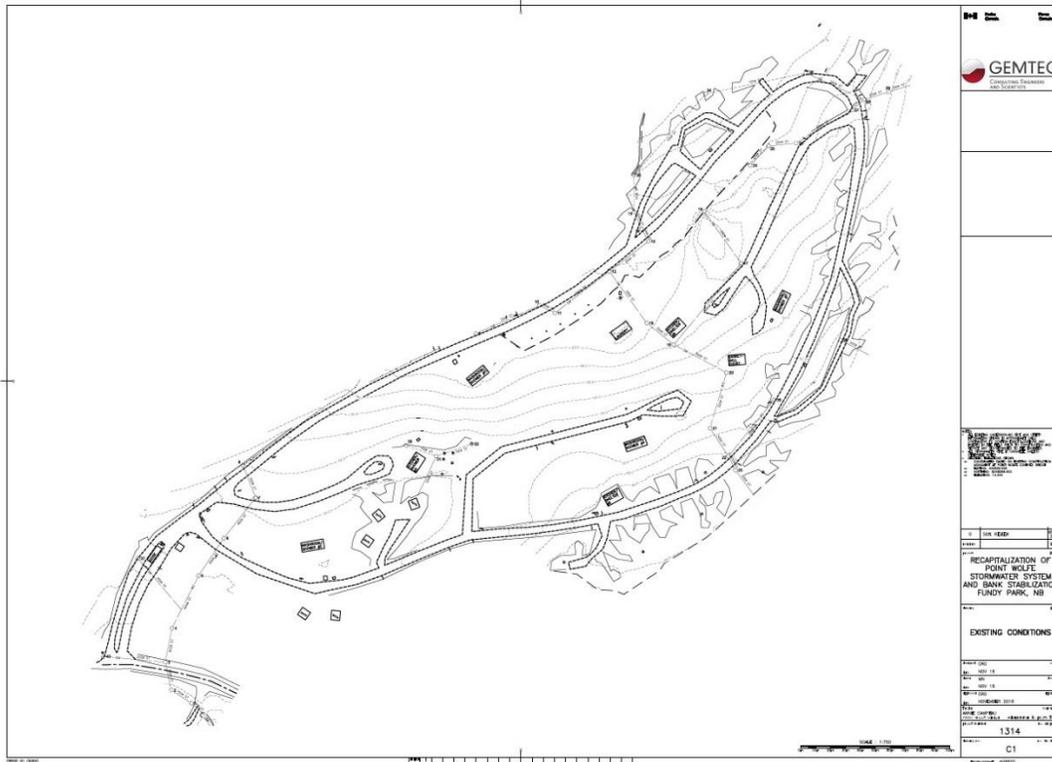


Figure 3. Existing conditions of Point Wolfe Campground (From PCA/GEMTEC 2016 - PCA Digital Files).

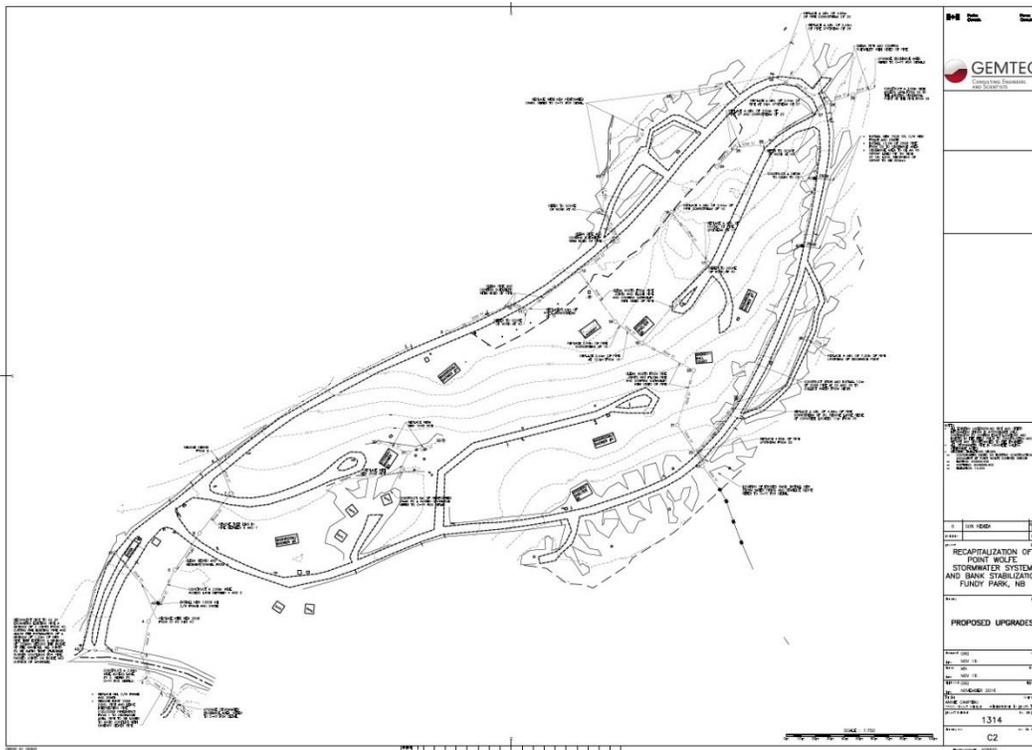
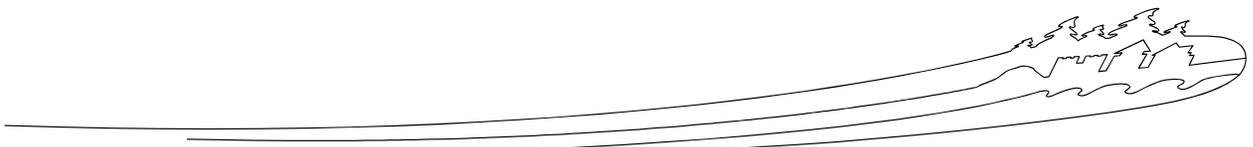


Figure 4. 50% Drawings of proposed upgrades at Point Wolfe Campground (Extract form Parks Canada/GEMTEC 2016 - PCA Digital Files).





Appendix IV: Statement of Cultural Resource Impact Analysis

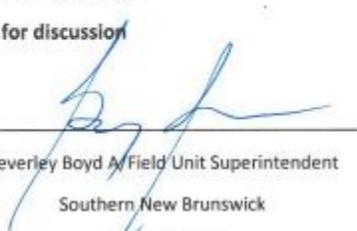
Statement of Cultural Resource Impact Analysis

There were no previous archaeological investigations in the immediate area of the Point Wolfe Campground that will be affected by this recapitalization project. While there are no known archaeological resources situated in proximity to the project, staging area or related works, there is the potential for excavation activities to yield Aboriginal and/or historical artifacts.

RECOMMENDATION to the FUS

We recommend that you approve the implementation of these mitigation measures.

I concur
 I do not concur
 for discussion



Beverley Boyd, Field Unit Superintendent
 Southern New Brunswick
 March 10, 2017

Date: March 9, 2017

Prepared by: Lisa Forbes, CRM Policy Advisor, 819-420-9233, lisa.forbes@pc.gc.ca; André Miller, Archaeologist, 819-420-5030, andre.miller@pc.gc.ca

The following aspects of the proposal respect or enhance the heritage value of the cultural resource for the following reasons:

The project aims to stabilize the current bank erosion, which would have positive impacts on any archaeological resources in the area.

The following aspects of the proposal could detrimentally impact on heritage significance. The reasons are explained as well as the mitigation measures to be taken to minimise impacts:

While there are no known archaeological resources in this area, there is potential that excavation activities may yield Aboriginal and/or historical artifacts. The area is partially occupied by small buildings and current facilities, and the removal and replacement of the water and stormwater system could be an issue, because presumably the area would have not been disturbed with previous constructions. The proximity of Point Wolfe River and the coastline of Bay of Fundy could lead to the discovery of historic settlements, paleo-historic or historic Aboriginal group occupations in this area.

Impacts to potential archaeological resources have the potential to be deemed significant so mitigation measures, including archaeological monitoring and test pitting, are required to minimize these impacts.

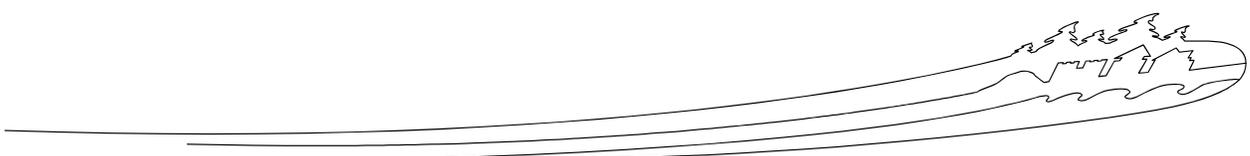
For:

Project Title: Recapitalization of Point Wolfe Stormwater System and Bank Stabilization

Project Number: 1314.1

Fundy National Park

The current stormwater infrastructure at Point Wolfe Campground has remained largely unchanged since the early 1960s. This project aims to identify the root cause of the Point Wolfe Campground stormwater system overflow that is causing the rapid erosion of the steep bank at the outlet. The scope of the project will include a comprehensive mapping and usage study for the stormwater system and the recommendation and implementation of remedial actions to address this problem.





The following solutions have been considered and discounted for the following reasons:

N/A

Recommendations:

1. With a high potential for the discovery of unknown archaeological resources, the proposed work activity will require an Archaeological Impact Assessment (AIA) to assess the potential for archaeological resources within the construction zones.
2. The AIA will be undertaken by a PCA-licensed archaeologist who will examine the proposed trench locations to determine if undisturbed areas of archaeological potential exist. If found, these areas must be tested and depending on the result, may require additional excavation or mitigation work.
3. If there are any changes to the plans, all additional information and construction drawings must be submitted to Parks Canada's Terrestrial Branch for further review.
4. If significant features (i.e., structural remains and/or high artifact concentrations) are encountered during construction activities, in the absence of an archaeologist, excavation must cease in the immediate area, and the Parks Canada project manager needs to be informed. The project manager must then contact Parks Canada's Terrestrial Archaeology section for advice and assessment of significance, which will in turn determine the requirements to mitigate the find.

References:

Gemtec

- 2017 Recapitalization of Point Wolfe Stormwater System and Bank Stabilization -- 99% design concept plans

Parks Canada Agency (PCA)

- 2016 Request for Cultural Resource Impact Analysis (CRIA), Recapitalization of Point Wolfe Stormwater System and Bank Stabilization Fundy NP. Fundy National Park of Canada. On file at Parks Canada, Gatineau, Quebec.
- 2011 Fundy National Park of Canada, Management Plan. On file at Parks Canada, Gatineau, Quebec.
- 2005 Fundy National Park of Canada, Management Plan. On file at Parks Canada, Gatineau, Quebec.

