Parks Canada Agency

Asphalt Resurfacing – Chalet Road and Service Road

CBCL LIMITED
Consulting Engineers

Issued for Tender

March 26, 2021

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END OF SECTION

1.1 DESCRIPTION OF WORK

.1 The work covered by the Plans and Specifications prepared by the Consultant includes, but is not limited to:
- .1 Milling and removal of existing asphalt, base and subbase.
- .2 Removal of existing street lighting.
- .3 Subgrade preparation for new road construction
- .4 Subbase, base and new asphalt
- .5 Adjustments to existing underground infrastructure.
- .6 Landscaping reinstatements.

.2 The sequencing of work shall be as follows:
- .1 Construction begins as soon as possible after award.
- .2 Site Preparation – site safety, erosion control & signage.
- .3 Road construction work.
- .4 Reinstatement work.

1.2 FAMILIARIZATION WITH SITE

.1 Records of existing geotechnical reports are available in Appendix A.

1.3 CODES AND STANDARDS

.1 Perform work in accordance with the 2015 National Building Code of Canada and any other code of provincial or local application, including all amendments up to bid closing date, provided that in any case of conflict or discrepancy, the more stringent requirement shall apply.

.2 Materials and workmanship must meet or exceed requirements of specified standards, codes and referenced documents.

1.4 INTERPRETATION OF DOCUMENTS

.1 Supplementary to the Order of Precedence article of the General Conditions of the Contract, the Division 01 sections take precedence over the technical specification sections in other Divisions of the Specification Manual

1.5 TERM ENGINEER

.1 Unless specifically stated otherwise, the term Engineer where used in the Specifications and on the Drawings shall mean the Departmental Representative as defined in the General Conditions of the Contract.

1.6 SETTING OUT OF WORK

.1 Survey control points set during design are indicated on the drawings and Contractor is to use the same control points to lay out the work.

.2 Set grades and lay out work in detail from control points and grades established by Departmental Representative.

.3 Provide devices needed to lay out and construct work.

.4 Supply such devices as straight edges and templates required to facilitate Departmental Representative's inspection of work.

.5 Supply stakes and other survey markers required for laying out work.

1.7 COST BREAKDOWN

.1 Before submitting first progress claim submit breakdown of Contract price in detail as directed by Departmental Representative and aggregating contract price. Required forms will be provided for application of progress payment.

.2 List items of work numerically following the same division/section number system of the specification manual and thereafter sub-divide into major work components and building systems as directed by Departmental Representative.

.3 Upon approval, cost breakdown will be used as basis for progress payment.

1.8 DOCUMENTS REQUIRED

.1 Maintain at job site, one copy each of the following:
.1 Contract Drawings
.2 Specifications
.3 Addenda
.4 Reviewed Shop Drawings
.5 List of outstanding shop drawings
.6 Change Orders
.7 Other modifications to 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 stipulated elsewhere in the Contract Documents.

1.9 PERMITS

.1 In accordance with the the General Conditions, obtain and pay for building permit, certificates, licenses and other permits as required by municipal, provincial and federal authorities.

.2 Provide appropriate notifications of project to municipal and provincial inspection authorities.

.3 Obtain compliance certificates as prescribed by legislative and regulatory provisions of municipal, provincial and federal authorities as applicable to the performance of work.

.4 Submit to Departmental Representative, copy of application forms and approval documents received from above referenced authorities.

1.10 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

.1 Execute work with least possible interference or disturbance to public and normal use of premises. Arrange with Departmental Representative to facilitate execution of work. Work activities that are reducing regular access must be maintained through all roadways unless a pre-determined scheduled road closure is approved.

.2 Where security has been reduced by work of Contract, provide temporary means to maintain security.

1.11 CUTTING, FITTING AND PATCHING

.1 Ensure that cutting and patching required by all trades is included in total bid price submitted for the work.

.2 Execute cutting including excavation, fitting and patching required to make work fit properly.

.3 Where new work connects with existing and where existing work is altered, cut, patch and make good to match existing work. This includes patching of openings in existing work resulting from removal of existing services.

.4 Do not cut, bore, or sleeve load-bearing members, except where specifically approved by Departmental Representative.

.5 Make cuts with clean, true, smooth edges. Make patches inconspicuous in final assembly.

1.12 LOCATION OF FIXTURES

.1 Location of fixtures, shown or specified shall be considered as approximate. Actual location shall be as required to suit conditions at time of installation and as is reasonable.

.2 Inform Departmental Representative when impending installation conflicts with other new or existing components. Follow directives for actual location.

1.13 EXISTING SERVICES

.1 Where work involves breaking into or connecting to existing services, carry out work at times directed by governing authorities, with minimum of disturbance to pedestrian, vehicular traffic, and Park operations.

.2 Before commencing work, establish location and extent of service lines in area of work and notify Departmental Representative of findings.

.3 Submit schedule to and obtain approval from Departmental Representative for any shut-down or closure of active service or facility. This includes disconnection of electrical power and communication services to tenant's operational areas. Adhere to approved schedule and provide notice to affected parties.

.4 Provide temporary services to maintain critical building and tenant systems.

.5 Provide adequate bridging over trenches which cross sidewalks or roads to permit normal traffic.

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

.7 Protect, relocate or maintain existing active services as required. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction over service. Record locations of maintained, re-routed and abandoned service lines.

1.14 BUILDING SMOKING ENVIRONMENT

.1 Comply with smoking restrictions.

1.15 ASBESTOS DISCOVERY

.1 Demolition of spray or trowel-applied asbestos can be hazardous to health. Should material resembling spray or trowel-applied asbestos be encountered in course of work, stop work and notify Departmental Representative immediately. Do not proceed with relevant work until written instructions have been received from Departmental Representative.

1.16 CONTRACTOR’S USE OF SITE

.1 Co-operate with the public and anyone accessing the site as per direction of the Departmental Representative.

.2 Should interferences occur, take directions from Departmental Representative.

.3 Do not unreasonably encumber site with materials or equipment.

.4 Move stored products or equipment which interfere with operations of Departmental Representative or other Contractors.

.5 Obtain and pay for use of additional storage or work areas needed for operations.

.6 Comply with all regulations and authorities having jurisdiction over the work, whether on land or on water.

.7 Ensure no damage occurs to existing structures as a result of operations. Any said damage will be repaired at Contractor's expense.

.8 Provide temporary barriers and warning signs in location where work is adjacent to areas used by public.

1.17 CONTRACT DOCUMENTS

.1 Contract Drawings:
.1 LIST OF DRAWINGS:

CIVIL

-	Cover Page
C01	SERVICE ROAD STA 0+000-0+110 (EAST BRANCH)
C02	SERVICE ROAD STA 0+000-0+140 (WEST BRANCH)
C03	SERVICE ROAD STA 0+140-0+216 (WEST BRANCH)
C04	CHALET ROAD STA 0+000-0+260
C05	CHALET ROAD STA 0+260-0+413
C06	SECTIONS & DETAILS

.2 Departmental Representative may furnish additional drawings to assist in proper execution of work. These drawings will be issued for clarification only. Such drawings will have same meaning and intent as if they were included with plans referred to in Contract Documents.

.3 The drawings indicate the extent and general dimensions of the work. Make all necessary measurements to ensure that the result of the work is in accordance with the intent.

.4 Verify all existing conditions in field prior to proceeding with work.

.2 Contract Specifications:
.1 The general requirements and technical specifications are written solely for the General Contractor. They are organized into the NMS format of separate divisions and sections.

.2 Specification language is the "Short Form Type", for example, where the word "provide" occurs, interpret it to mean "the Contractor shall furnish all labour, material and equipment necessary to complete the work".

.3 These Specifications and accompanying drawings are intended to describe and provide for a finished project. They are intended to be complementary, and what is called for by either will be as binding as if called for by both. The Contractor shall understand that the work herein described will be complete in every detail, notwithstanding that every item necessarily involved is not particularly mentioned, and Contractor will be held to provide all labour, materials and equipment necessary for the entire completion of the work and will not avail himself of any errors or omissions.

1.18 RECORD OF CONSTRUCTION

.1 As work progresses, maintain accurate records to show all deviations from the contract drawings, with particular reference to work which will be concealed. Prior to the inspection of the work for the issuance of the Final Certificate of Completion, provide the Departmental Representative with one set of white prints of the drawings with all deviations shown neatly thereon.

.2 Provide "as built" cross sections of any excavation or fill work.

1.19 PAYMENT

.1 No separate payment will be made for work specified under General Conditions, Supplementary Conditions or any sections of Specification under Division 01. The cost of this work is to be considered as overhead and to be included in the Contract.

.2 Dimensional changes are directed by the Departmental Representative to suit existing conditions, but not resulting in additional work or materials, will not be considered as extra to the Contract.

1.20 CONTRACTOR'S REPRESENTATIVE

.1 Continuously maintain on the site an authorized representative to whom communication may be addressed and who will be competent to speak for the Contractor in discussing work methods.

1.21 WORKER'S COMPENSATION

.1 Contractor and all sub-contractors must be registered under the Workers Compensation Act and provide evidence of good standing.

.2 At completion of Contract and before final payment is made, the Contractor will present to the Departmental Representative a Letter of Certification from the Workers Compensation Board, showing that all required assessments are paid in connection with all trades.

1.22 LAWS, STANDARDS, TAXES AND FEES

.1 Comply with all laws and standards governing all or any part of the work, pay all applicable taxes and pay for all permits and certificates required in respect of the execution of the work. Where variances exist between the requirements of agencies governing all or any part of the work, the most restrictive will govern, but in no instance will the standards established by the drawings and this Specification, which exceed such requirements, be reduced.

1.23 PROTECTION AND REPAIR

.1 Repair any damage resulting from operations under this contract.

1.24 INSPECTION AND TESTING

.1 The Departmental Representative may employ an Inspector and/or Testing Company to ensure work conforms with contracts.

1.25 EXISTING SOILS CONDITIONS

.1 Any information pertaining to soils and all boreholes logs are furnished by the Departmental Representative as a matter of general information only and borehole descriptions or logs are not to be interpreted as descriptive of conditions at locations other than those described by the boreholes themselves.

END OF SECTION

1.1 SUBMITTALS

.1 Upon award of contract and prior to commencement of work, submit to Departmental Representative the following work management documents:
- .1 Work Schedule as specified herein.
- .2 Environmental Protection Plan
- .3 Shop Drawing Submittal Schedule specified in section [01 33 00]
- .4 Health and Safety Plan specified in section [01 35 29]
- .5 Waste Management and Disposal Plan specified in section [01 74 21]

1.2 WORK SCHEDULE

.1 Upon notification of tender acceptance submit:
- .1 Detailed work schedule submitted within [5] calendar days of contract award.

.2 Schedule to indicate all calendar dates from commencement to completion of all work within the time stated in the accepted tender.

.3 Provide sufficient details in schedule to clearly illustrate entire implementation plan, depicting efficient coordination of tasks and resources, to achieve completion of work on time and permit effective monitoring of work progress in relation to established milestones.

.4 Detailed work schedule content to include as a minimum the following:
- .1 Bar (GANTT) Charts, indicating all work activities, tasks and other project elements, their anticipated durations, planned dates for achieving key activities and major project milestones supported with;
- .2 Written narrative on key elements of work illustrated in bar chart, providing sufficient details to demonstrate a reasonable implementation plan for completion of project within designated time.
- .3 Generally Bar Charts derived from commercially available computerized project management system are preferred but not mandatory.

.5 Work schedule must take into consideration and reflect the work phasing, required sequence of work, and operational restrictions.

.6 Schedule work in cooperation with the Departmental Representative. Departmental Representative's decision is final in regards to time and order of work. Incorporate within Detailed Work Schedule, items identified by Departmental Representative during review of schedule.

.7 Completed schedule shall be to the Departmental Representative's approval. When schedule has been approved by Departmental Representative, take necessary measures to complete work within scheduled time. Do not change schedule without Departmental Representative's approval.

.8 Ensure all sub-trades and sub-contractors are made aware of the work

restraints and operational restrictions specified.

.10 Schedule Updates:
.1 Submit on a monthly basis or when requested by Departmental Representative.
.2 Provide information and pertinent details explaining reasons for necessary changes to implementation plan.
.3 Identify problem areas, anticipated delays, impact on schedule and proposed corrective measures to be taken.
.4 Schedule should be aligned with budget and planned progress payment schedule. Progress Payment schedule must be updated in alignment with changes to the work schedule and must include updates in regards to change orders issued during the course of the work.

.11 Departmental Representative will make interim reviews and evaluate progress of work based on approved schedule. Frequency of such reviews will be as decided by Departmental Representative. Address and take corrective measures on items of work as identified by reviews and as directed by Departmental Representative. Update schedule accordingly.

.12 In every instance, change or deviation from work scheduling, no matter how minimal the risk or impact on safety or inconvenience to the client or public might appear, will be subject to prior review and approval by the Departmental Representative.

1.3 PROJECT PHASING

.1 Be aware that the park must be kept operational for the full duration of work of this contract. Building services and parking lots to areas under use by the public must also be maintained at all times.

1.4 OPERATIONAL RESTRICTION

.1 The Contractor must recognize that the Park users will be affected by implementation of this contract. The Contractor must perform the work with utmost regard to the safety and convenience of Park users. All work activities must be planned and scheduled with this in mind. The Contractor will not be permitted to disturb any portion of the Park without providing temporary facilities as necessary to ensure safe and direct passage through disturbed or otherwise affected areas.

.2 Off Hours: for the purposes of this contract, "off-hours" are defined as follows:
.1 Weeknight Hours: between the hours of [18:00] and [07:00] for each weekday Monday to Thursday inclusive.
.2 Weekend Hours: between the hours of [18:00] Friday evening to [07:00] Monday morning.
.3 Dependent on the nature and location of the construction activity, the day of the week and the time of the year, "off-hours" could be subject to redefinition to start or end at adjusted time periods. Scheduling of "off-hours" work will be subject to approval by the Departmental Representative.

.3 Circulation maintained:
.1 Ensure that facility entrances, roadways, trail exits and other circulation or walkway routes outside of the designated work area are maintained free and clear of construction and provide safe and uninterrupted passage for the public at all times for duration of work.

.4 Departmental Representative reserves the right to stop certain daytime work activities, if the nature of that activity generates excessive noise or dust and have Contractor re-schedule that particular work to be performed during the Off-Hour period.

.5 No extra cost will be paid by Parks Canada Agency due to failure by General Contractor or his sub-contractors to recognize work restriction requirements specified herein and to include all necessary allowances within their prices.

.6 Safety Signage:
.1 Provide on-site, and erect as required during progress of work, proper bilingual signage, mounted on self-supporting stands, warning the public of construction activities in progress and alerting need to exercise caution in proceeding through disturbed areas, and directing the public through any detours which may be required.
.2 Signage to be professionally printed and mounted on wooden backing, coloured and to express messages as directed by the Departmental Representative.
.3 Generally maximum size of sign should be in the order of 1.0 square meters. Number of signs required will be dependent on size of area affected.
.4 Include costs for the supply and installation of these signs in the tender price.

.7 Dust and Dirt Control:
.1 Effectively plan and implement dust control measures and cleaning activities as an integral part of all construction activities.
.2 Do not allow demolition debris and construction waste to accumulate and contribute to the propagation of dust.
.3 As work progresses, maintain construction areas in a tidy condition at all times.

.8 Ensure that all sub-trades are made aware of and abide by the contents of this section and in particularly the work restrictions specified herein.

1.5 PROJECT MEETINGS

.1 Schedule and administer project meetings, held on a minimum bi-weekly basis, for entire duration of work and more often when directed by

Departmental Representative as deemed necessary due to progress of work or particular situation.

.2 Prepare agenda for meetings.

.3 Hold meetings at project site or where approved by Departmental Representative.

.4 Preside at meetings and record minutes.
- .1 Indicate significant proceedings and decisions. Identify action items by parties.
- .2 Distribute to participants by mail within [3] calendar days after each meeting.
- .3 Make revisions as directed by Departmental Representative.

1.6 WORK COORDINATION

.1 The General Contractor is responsible for coordinating the work of the various trades and predetermining where the work of such trades interfaces with each other.
- .1 Designate one person from own employ having overall responsibility to review contract documents and shop drawings, plan and manage such coordination.

.2 The General Contractor shall convene meetings between trades whose work interfaces and ensure that they are fully aware of the areas and the extent of where interfacing is required.
- .1 Provide each trade with the plans and specs of the interfacing trade, as required, to assist them in planning and carrying out their respective work.
- .2 Develop coordination drawings when deemed required illustrating potential interference between works of various trades and distribute to all affected parties.
  - .1 Pay particularly close attention to overhead electrical lines.
  - .2 Coordination drawings to identify all construction elements, services lines, and indicate from where various services are coming.
- .3 Review coordination drawings at purposely called meetings. Have sub-contractors sign-off on drawings and publish minutes of each meeting.
- .4 Plan and coordinate work in such a way to minimize quantity of service line offsets.
- .5 Submit copy of coordination drawings and meeting minutes to Departmental Representative for information purposes.

.3 Submission of shop drawings and ordering of prefabricated equipment or prebuilt components shall only occur once coordination meeting for such items has taken place between trades and all conditions affecting the work of the interfacing trades has been made known and accounted for.

.4 Work Cooperation:

.1 Ensure cooperation between trades in order to facilitate the general progress of the work and avoid situations of spatial interference.

.2 Ensure that each trade provides all other trades reasonable opportunity for the completion of the work and in such a way as to prevent unnecessary delays, cutting, patching and the need to remove and replace completed work.

.5 Parks Canada Agency will not be responsible for or held accountable for any extra costs incurred as a result of the failure to carry out coordination work. Disputes between the various trades as a result of their not being informed of the areas and extent of interface work shall be the sole responsibility of the General Contractor and shall be resolved by him at no extra cost to the Contract.

1.6 OTHER CONTRACTS

.1 Further contracts may be let during the period that this contract is in progress.

.2 Cooperate with other Contractors in carrying out their respective works and carry out all instructions from the Departmental Representative in this regard.

.3 Connect properly and coordinate work with that of other Contractors. If any part of the work under this Contract depends for its proper execution or result upon the work of another Contractor, report promptly to the Departmental Representative, in writing, any defects in the work of such other Contractors as may interfere with the proper execution of this work.

END OF SECTION

1.1 GENERAL

.1 Submit to Departmental Representative, for review, shop drawings, product data, samples and other information specified or required for the completion of the work.

.2 Until submission is reviewed, work involving relevant product may not proceed.

1.2 SHOP DRAWINGS

.1 Drawings to be originals prepared by contractor, subcontractor, supplier or distributor, which illustrate appropriate portion of work, showing fabrication, layout, setting or erection details as specified in appropriate sections.

.2 Identify details by reference to sheet and detail numbers shown on Contract Drawings.

.3 Maximum sheet size 860mm X 1120 mm.

.4 The term "shop drawings" means fabrication drawings, erection drawings, diagrams, illustrations, schedules, performance charts, technical product data, brochures, specifications, test reports installation instructions and other data which are to be provided by Contractor to illustrate compliance with specified materials and details of a portion of work..

.5 Adjustments or corrections made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, advise Departmental Representative in writing prior to proceeding with Work.

.6 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections and comments are made, fabrication and installation may proceed upon receipt of shop drawings. If shop drawings are rejected and noted to be Resubmitted, do not proceed with that portion of work until resubmission and review of corrected shop drawings, through same submission procedures indicated above.

.7 Be advised that costs and expenses incurred by Departmental Representative to conduct more than one review of incorrectly prepared shop drawing submittal for a particular material, equipment or component of work may be assessed against the Contractor in the form of a financial holdback to the Contract.

1.4 SAMPLES

.1 Submit samples in sizes and quantities specified.

.2 Construct field samples and mock-ups at locations acceptable to Departmental Representative.

.3 Accepted samples will become standards of workmanship and material against which, installed work will be checked on project.

1.5 MISCELLANEOUS DATA

.1 Provide certificates, methodologies, design and test results as required.

1.6 COORDINATION OF SUBMISSIONS

.1 Review shop drawings, product data, samples and miscellaneous data prior to submissions.
.2 Verify:
.1 Field Measurements.
.2 Field Construction Criteria.
.3 Catalogue numbers and similar data.

.3 Coordinate each submission with requirements of work and contract documents. Individual submissions will not be reviewed until all related information is available.

.4 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submissions.

.5 Contractor's responsibility for deviations in submission from requirements in Contract documents is not relieved by Departmental Representative's review of submission, unless Departmental Representative gives written acceptance of specified deviations.

.6 Notify Departmental Representative, in writing at time of submission, of deviations from requirements of contract documents stating reasons for deviations.

.7 After Departmental Representative's review, distribute copies.

1.7 SUBMISSION REQUIREMENTS

.1 Schedule submissions at least 5 days before dates reviewed submissions will be needed.

.2 Submit shop drawings, product data which Contractor requires for distribution, plus two (2) copies which will be retained by Departmental Representative.

.3 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 submitted.
.5 Other pertinent data.

.4 Submissions shall include:
.1 Date and revision dates.
.2 Project title and number.
.3 Name and address of:
.1 Subcontractor.
.2 Supplier.
.3 Manufacturer.
.4 Separate details when pertinent.
.4 Identification of product or material.
.5 Relation to adjacent structure or materials.
.6 Field dimensions, clearly identified as such.
.7 Specification Section Number.
.8 Applicable standards such as CSA or CGSB numbers.
.9 Contractor's stamp, initialed or signed, certifying review of submission, verification of field measurements and compliance with contract documents.

1.8 SHOP DRAWINGS

.1 The review of shop drawings by Parks Canada Agency or its authorized consultant, is for the sole purpose of ascertaining conformance with the general concept. This review shall not mean that Parks Canada Agency approves the detail design inherent in the shop drawings, responsibility for which shall remain with the Contractor submitting same, and such review shall not relieve the Contractor of responsibility for errors or omissions in the shop drawings or of responsibility for meeting all requirements of the construction and contract documents. Without restricting the generality of the foregoing, the Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of the work of all sub-trades.

1.9 OTHER REVIEWS

.1 As for shop drawings above, other reviews are for the sole purpose ascertaining the general concept.

END OF SECTION

1.1 RELATED WORK

.1 Section 01 35 43: Environmental Requirements.

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.

.2 Submit site-specific Health and Safety Plan prior to commencement of Work.
.1 Submit within 5 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 3 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 the following web address: www.http://laws-lois.justice.gc.ca/eng/acts/L-2fulltest.html
.2 Canadian Occupational Health and Safety Regulations can be viewed at: http://laws-lois.juctice.gc.ca/eng/regulations/SOR-86-304/index.html.
.3 A copy may be obtained by contacting: Canadian Government Publishing Public Works & Government Services Canada Ottawa, Ontario, K1A 0S9 Tel: (819) 956-4800 (1-800-635-7943) Publication No. L31-85/2000 E or F)

.3 Observe and enforce construction safety measures of:
.1 Part 8 of National Building Code.
.2 Provincial Workers Compensation Board.

.4 In case of conflict or discrepancy between above specified requirements, the more stringent shall apply. Should a dispute arise in determining the most stringent requirement, Departmental Representative will advise on the course of action to be followed.

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

.6 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 Departmental Representative will provide names of those persons authorized by Departmental Representative to enter onto Work Site and will ensure that such authorized persons have the required knowledge and training on Health and Safety pertinent to their reason for being at the site, however, Contractor remains responsible for the health and safety of authorized persons while at the Work Site.

.2 Isolate Work Site from other areas of the park by use of appropriate means.

.1 Erect fences, hoarding, barricades and temporary lighting as required to effectively delineate the Work Site, stop non-authorized entry, and to protect pedestrians and vehicular traffic around and adjacent to the Work and create a safe environment. See Section 01 51 00 for minimum acceptable requirements.

.2 Post signage at entry points and other strategic locations indicating restricted access and conditions for access.

.3 Use professionally made signs with bilingual message in the 2 official languages or international known graphic symbols.

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

.4 Ensure persons granted site access wear appropriate PPE. Supply PPE to inspection authorities who require access to conduct tests or perform inspections.

.5 Secure Work Site against entry when inactive or unoccupied and to protect persons against harm. Provide security guard where adequate protection cannot be achieved by other means.

1.7 PROTECTION

.1 Give precedence to safety and health of persons and protection of environment over cost and schedule considerations for Work.

.2 Provide temporary facilities for protection and safe passage of public pedestrians and vehicular traffic adjacent to work site.

.3 Provide safety barricades, lights and signage on work site as required to provide a safe working environment for workers.

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

1.8 FILING OF NOTICE

.1 File Notice of Project with pertinent provincial health and safety authorities prior to beginning of Work.
.1 Upon request, Departmental Representative will assist in locating address if needed.

1.9 PERMITS

.1 Post permits, licenses and compliance certificates, specified in section 01 10 10, at Work Site. Submit copies to Departmental Representative.

.2 Where a particular permit or compliance certificate cannot be obtained, notify Departmental Representative in writing and obtain approval to proceed before carrying out applicable portion of work.

1.10 HAZARD ASSESSMENTS

.1 Perform site specific health and safety hazard assessment of the Work prior to commencement of work.

.2 Carry out initial assessment prior to commencement of Work with further assessments as needed during progress of work, including when new trades and subcontractors arrive on site, the scope of work has been changed by Change Order or when a potential hazard or weakness in current health and safety practices are identified by Departmental Representative or by an authorized safety representative.

.3 Record results and address in Health and Safety Plan.

.4 Keep documentation on site for entire duration of the Work.

1.11 PROJECT/SITE CONDITIONS

.1 Following are potential health, environmental and safety hazards at the site for which Work may involve contact with:
.1 Existing hazardous substances or contaminated materials:
.1 Pressure treated timber.
.2 Known latent site and environmental conditions:
.1 Wildlife activity.
.2 Electrical work.
.3 Trench work.
.4 Live pressure pipe work.
.3 Facility on-going operations:
.1 Continued pedestrian adjacent to the work site.
.2 Continued vehicular use adjacent to the work site.

.2 Above items shall not be construed as being complete and inclusive of potential health and safety hazard encountered during Work.

.3 Include above items in the hazard assessment of the Work.

.4 MSDS data sheets of pertinent hazardous and controlled products stored on site can be obtained from Departmental Representative.

1.12 MEETINGS

.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.

.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 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 escape routes. Details on alarm notification methods, fire drills, 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 Parks Canada 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.

.9 Submission of the Health and Safety Plan, and updates, to the Departmental Representative is for review and information only. Its submission shall not be construed to imply approval by Departmental Representative, be interpreted as a warranty of being complete, accurate and legislative compliant and shall not relieve Contractor of their legal obligations for the provision of Health and Safety on the construction project.

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.

.5 Inspections:
.1 Conduct regularly scheduled safety inspections of the Work on a minimum bi-weekly basis. Record deficiencies and remedial action taken.
.2 Follow up and confirm corrective measure are taken.

.6 Cooperate with Parks Occupational Health and Safety representative should one be designated by Departmental Representative.

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

1.15 TRAINING

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

.2 Ensure that workers, subcontractors and other authorized persons granted access to site are trained and have been fully instructed by a competent instructor, on:
.1 Safe operation of tools and equipment.
.2 Proper wearing and use of personal protective equipment (PPE) as applicable to the purpose and activities to be conducted on site.
.3 Safe work practices and procedures to be followed during the performance of their given work tasks or function on site.
.4 Site conditions and minimum site safety rules provided through site orientation sessions.

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

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

1.16 MINIMUM SITE SAFETY RULES

.1 Notwithstanding requirement to abide by federal and provincial health and safety regulations; ensure the following minimum safety rules are obeyed by persons granted access to Work Site:
.1 Wear appropriate PPE pertinent to the Work or assigned task; minimum being hard hat, safety footwear, safety glasses and hearing protection.

.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 workers on site safety rules, and on the disciplinary measures to be taken for violation or non-compliance of such rules. Post such information on site.

1.17 CORRECTION OF NON-COMPLIANCE

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

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

.3 Departmental Representative 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 lost to a Federal department in excess of $5,000.00.

.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.

1.20 BLASTING

.1 Blasting or other use of explosives is not permitted on site

1.21 POWDER ACTUATED DEVICES

.1 Use powder actuated fastening devices only after receipt of written permission from Departmental Representative.

1.22 CONFINED SPACES

.1 Abide by occupational health and safety regulations regarding work in confined spaces.

1.23 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.

1.24 POSTING OF DOCUMENTS

.1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on Work Site in accordance with Acts and Regulations of Province having jurisdiction.

.2 Maintain on site copy of safety documentation as specified in this section and other safety related reports and documents issued to or received from authorities having jurisdiction, including:
.1 Site specific Health and Safety Plan.
.2 WHMIS data sheets.

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

END OF SECTION

1.1 REFERENCES

.1 Canadian Environmental Assessment Act, 2012, amended 2013-11-25

.2 Canadian Environmental Protection Act, 1999, amended on 2014-03-28

.3 Migratory Birds Convention Act, 1994, Environment Canada, amended 2010-12-10

.4 New Brunswick - Environment Act

.5 Species at Risk Act, 2002, amended 2013-03-08

.6 The Federal Policy on Wetland Conservation, 1991, Environment Canada

.7 Transportation of Dangerous Goods Act, 1992, Transport Canada, amended 2009-06-16

.8 Workplace Hazardous Materials Information System, Health Canada.

1.2 DEFINITIONS

.1 Archaeological resources: all tangible evidence of human activity that is of historical, cultural or scientific interest. Examples include features, structures, archaeological objects or remains at or from an archaeological site, or an object recorded as an isolated archaeological find.

.2 Buffer zone: a vegetated land that protects watercourses from adjacent land uses. It refers to the land adjacent to watercourses, such as streams, rivers, lakes, ponds, oceans, and wetlands, including the floodplain and the transitional lands between the watercourse and the drier upland areas.

.3 Deleterious substance: (a) any substance that, if added to any water, would degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water, or (b) any water that contains a substance in such quantity or concentration, or that has been so treated, processed or changed, by heat or other means, from a natural state that it would, if added to any other water, degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water.

.4 Fish habitat: spawning grounds and any other areas, including nursery, rearing, food supply and migration areas, on which fish depend directly or indirectly in order to carry out their life processes.

.5 Hazardous material: Product, substance, or organism that is used for its original purpose; and that is either dangerous goods or a material that may cause adverse impact to the environment or adversely affect health of persons, animals, or plant life when released into the environment.

.6 Invasive or alien species: refers to a species or subspecies introduced outside its normal distribution whose establishment and spread threaten ecosystems, habitats or species with economic or environmental harm.

.7 Navigable water: any body of water that is deep, wide, and slow enough for a vessel to pass.

.8 Surface watercourse: refers to the bed and shore of a river, stream, lake, creek, pond, marsh, estuary or salt-water body that contains water for at least part of each year.

.9 Wetlands: land where the water table is at, near or above the surface or which is saturated for a long enough period to promote such features as wet-altered soils and water tolerant vegetation. Wetlands include organic wetlands or "peatlands," and mineral wetlands or mineral soil areas that are influenced by excess water but produce little or no peat.

1.3 TRANSPORTATION

.1 Parks Canada Agency should be considered the primary reference for environmental requirements and any conflicting requirements that exist the Parks Canada Agency primary reference takes precedent.

.2 Transport hazardous materials and hazardous waste in compliance with the Transportation of Dangerous Goods Act.

.3 Eliminate free board spillage when excavating, loading and hauling excavated material.

.4 Trucks transporting excavated material will have watertight boxes.

.5 Do not overload trucks when hauling excavated material.

.6 Maintain trucks clean and free of mud, dirt and other foreign matter.

.7 Secure contents against spillage. Avoid potential release of contents and of any foreign matter onto highways, roads and access routes used for the work. Immediately clean any ground spills and soils to extent as directed by authority having jurisdiction.

.8 Prior to commencement of work, advise and seek approval from the Departmental Representative of the existing roads and temporary routes/roads proposed to be used to access work areas and to haul material to and from the site, including roads to the excavated material disposal site.

.9 Construction material and debris is not to become waterborne.

.10 Any tools, equipment, vehicles, temporary structures or parts thereof used or maintained for the purpose of the work are not to remain in place after the completion of the project.

1.4 OPERATION OF MACHINERY

.1 Ensure that machinery arrives on site in a clean condition and is maintained free of fluid leaks, invasive species and noxious weeds.

.2 Wash, refuel and service machinery and store fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering the water.

1.5 STOCKPILED REMOVALS

.1 Store stockpiled excavated material on site. Stockpile location will be approved by Departmental Representative prior to stockpiling activities. Obtain approval from Departmental Representative prior to any the reuse and disposal of stockpiled material.

.2 The Departmental Representative will be given access to the stockpiled material to conduct sampling once the removals have been completed. The cost of sampling will be incurred by the Departmental Representative.

.3 The Contractor is responsible for:
.1 Constructing berms to contain the material.
.2 Implementing erosion and sediment controls.

.4 Water that decants from the stockpiles shall not enter any freshwater waterways or wells.

.5 Control runoff of water containing suspended materials or other harmful substances in accordance with requirements of all federal, provincial and municipal authorities having jurisdiction.

.6 Excess stockpiled removals must be disposed of prior to the end of the Work.

1.6 DISPOSAL OF EXCESS STOCKPILE REMOVALS

.1 If soil sampling conducted by the Departmental Representative indicates that the excess removals remaining in the stockpile exceeds applicable guidelines the contractor will be required to coordinate with New Brunswick Department of Environment to identify an appropriate disposal site.

.2 The disposal activities of excess excavated material exceeding applicable guidelines will require approval from the Departmental Representative.

1.7 CONTAINMENT AND SPILL MANAGEMENT

.1 Comply with Federal (CEPA Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations) and Provincial regulations, codes, standards and guidelines for the storage of fuel and allied petroleum products on site.

.2 Do not dump petroleum products or any other deleterious substances on ground or in the water.

.3 Be diligent and take all necessary precautions to avoid spills and contaminate the soil and water (both surface and subsurface) when handling petroleum products on site and during fueling and servicing of vehicles and equipment.

.4 Maintain on site appropriate emergency spill response equipment consisting of at least one 250-litre (55 gallon) over pack spill kit for containment and cleanup of spills.

.5 Maintain vehicles and equipment in good working order to prevent leaks on site.

.6 In the event of a petroleum spill, immediately notify the Departmental Representative. Perform clean-up in accordance with all regulations and procedures stipulated by authority having jurisdiction.

.7 Materials such as paint, primers, blasting abrasives, rust solvents, degreasers, grout, or other chemicals are not to enter the watercourse.

.8 Develop a response plan that is to be implemented immediately in the event of a sediment release or spill of a deleterious substance.

1.8 HAZARDOUS MATERIAL HANDLING

.1 Store and handle hazardous materials in accordance with applicable federal and provincial laws, regulations, codes and guidelines. Store in location that will prevent spillage into the environment

.2 Label containers to WHMIS requirements and keep MSDS data sheets on site for all hazardous materials.

.3 Maintain inventory of hazardous materials and hazardous waste stored on site. List items by product name, quantity and date when storage began.

.4 Store and handle flammable and combustible materials in accordance with National Fire Code.

.5 Transport hazardous materials in accordance with federal Transportation of Dangerous Goods Regulations and applicable Provincial regulations.

1.9 DISPOSAL OF WASTES

.1 Do not bury rubbish, construction and demolition debris (i.e., concrete, creosote timbers, steel, impacted soil materials etc.) and waste materials on site.

.2 Dispose and recycle construction and demolition debris and waste materials in accordance with Provincial Waste Management Regulations and the project waste management requirements specified in section 02 41 23 – Selective Site Demolition.

.3 Do not dispose of hazardous waste, volatile materials (such as mineral spirits, paints, thinners etc.) and petroleum products into waterways, storm or sanitary sewers or in waste landfill sites.

.4 Dispose of hazardous waste in accordance with applicable federal and provincial, regulations, codes, standards and guidelines.

.5 Concrete waste:
- .1 Do not discharge residual or rejected concrete on site.
- .2 Immediately clean any accidental release of concrete on site prior to solidification.
- .3 Do not wash and clean concrete vehicles on site.
- .4 Perform dumping of residual material and truck cleaning operations only at the concrete plant. Follow environmental regulations and good practices as approved by the Provincial Department of the Environment and other authorities having jurisdiction.

1.10 BIRD AND BIRD HABITAT

.1 Become knowledgeable with and abide by the Migratory Birds Convention Act (MBCA) in regards to the protection of migratory birds, their eggs, nests and their young encountered on site and in the vicinity.

.2 Minimize disturbance to all birds on site and adjacent areas during the entire course of the Work.

.3 Do not approach concentrations of birds.

.4 During night time work, shield and position flood lights downwards and the in opposite direction of nearby bird nesting habitat.

.5 Should nests of migratory birds be encountered during work, immediately notify Departmental Representative for directives to be followed.
- .1 Do not disturb nest site and neighbouring vegetation until nesting is completed.
- .2 Minimize work immediately adjacent to such areas until nesting is completed.
- .3 Protect these areas by following recommendations of Canadian Wildlife Service.

1.11 AIR QUALITY

.1 Keep airborne dust and dirt resulting from the work on site to an absolute minimum.

.2 Dust suppression by the application of water must be employed, when required. Apply dust control measures to roads, parking lots and work areas. The Departmental Representative shall determine locations where water is to be applied, the amount of water to be applied, and the times at which it shall be applied. Waste oil must not to be used for dust control under any circumstances.

.3 Spray surfaces with water or other environmentally approved product. Use purposely suited equipment or machinery and apply in sufficient quantity and frequency to provide effective result and continued dust control during the entire course of the work.

.4 Do not use oil or any other petroleum products for dust control.

1.12 FIRES

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

1.13 ARCHAEOLOGICAL

.1 All construction personnel are responsible for reporting any unusual materials unearthed during construction to the construction supervisor. If the find is believed to be an archaeological resource, the construction supervisor will immediately stop work in the vicinity of the find and notify his / her immediate supervisor.

.2 If an archaeological and/or historically significant item is discovered during excavation, work in the area will be stopped immediately and the Departmental Representative will be contacted as well as the provincial Archaeological Services unit:

.1 New Brunswick - NB Department of Communities, Culture and Heritage, Special Places Program, telephone: (506) 453-2738

.3 Work can only resume in the vicinity of the find when authorized by the PWGSC Project Manager and Construction Supervisor, after approval has been granted by the New Brunswick Department of Communities, Culture and Heritage.

.4 In the event of the discovery of human remains or evidence of burials, the excavation work will immediately cease and nearest law enforcement agency will be contacted immediately by the PWGSC Project Manager and/or the Construction Supervisor.

1.14 DRAINAGE

.1 Provide temporary drainage and pumping as necessary 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 governing regulations and requirements.

.4 Provide control devices such as filter fabrics, sediment traps and settling ponds to control drainage and prevent erosion of adjacent lands. Maintain in good order for duration of work.

1.15 SITE AND PLANT SELECTION

.1 Protect trees and plants on site and adjacent properties where indicated.

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

.3 Minimize stripping of topsoil and vegetation.

.4 Restrict tree removal to areas indicated or designated by Departmental Representative.

END OF SECTION

1.1 INSPECTION

.1 Give timely notice requesting inspection of Work designated for special tests, inspections or approvals by Departmental Representative or by inspection authorities having jurisdiction.

.2 In accordance with the General Conditions, Departmental Representative may order any part of Work to be examined if Work is suspected to be not in accordance with Contract Documents.

.3 If Contractor covers or permits to be covered Work designated for special tests, inspections or approvals before such is made, uncover Work until particular inspections or tests have been fully and satisfactorily completed and until such time as Departmental Representative gives permission to proceed.

.4 Pay costs to uncover and make good work disturbed by inspections and tests.

1.2 TESTING

.1 Tests on materials, equipment and building systems as specified in various sections of the Specifications is the responsibility of the Contractor except where stipulated otherwise.
  .1 Provide all necessary instruments, equipment and qualified personnel to perform tests.

.2 At completion of tests, turn over 2 sets of fully documented tests reports to the Departmental Representative. Submit in accordance with Section 01 33 00.
  .1 Obtain additional copies for inclusion of a complete set in each of the maintenance manuals specified in Section 01 78 00.

.3 Unspecified tests may also be made by Departmental Representative, at the discretion of the Departmental Representative. The costs of these tests will be paid for by the Departmental Representative.

.4 Where tests or inspections reveal work not in accordance with contract requirements, Contractor shall pay costs for additional tests and inspections incurred by Departmental Representative as required to verify acceptability of corrected work.

1.3 INDEPENDENT INSPECTION AGENCIES

.1 Departmental Representative will engage and pay for service of Independent Inspection and Testing Agencies for purpose of inspecting and testing portions of Work except for the following which remain part of Contractor's responsibilities:
  .1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
  .2 Inspection and testing performed exclusively for Contractor's convenience.
  .3 Water system disinfection testing.

.4 Tests as specified within various sections designated to be carried out by Contractor under the supervision of Departmental Representative.

.2 Provide sufficient advance notice to Departmental Representative of time when the Work will be ready for testing by designated Testing Agency in order for Departmental Representative to make attendance arrangements with such Agency. When directed by Departmental Representative notify the Agency directly.

.3 When specified or directed, submit Representative samples of materials, in required quantities, to Testing Agency for testing purposes. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in Work.

.4 Provide labour and facilities to obtain, handle and deliver samples.

.5 Provide sufficient space on site for Testing Agency's exclusive use to store equipment and cure test samples.

.6 Employment of Independent Inspection and Testing Agencies by Departmental Representative does not relax responsibility to perform Work in accordance with Contract Documents.

1.4 ACCESS TO WORK

.1 Facilitate Departmental Representative's access to Work. If part of Work is being fabricated at locations other than construction site, make preparations to allow access to such Work whenever it is in progress.

.2 Furnish labour and facility to provide access to the work being inspected and tested.

.3 Co-operate to facilitate such inspections and tests.

1.5 REJECTED WORK

.1 Remove and replace defective Work, whether result of poor workmanship, use of defective or damaged products and whether incorporated in Work or not, which has been identified by Departmental Representative as failing to conform to Contract Documents.

.2 Make good damages to [new] [and] [existing] construction and finishes resulting from removal or replacement of defective work.

END OF SECTION

1.1 SITE AND PARKING

.1 The Departmental Representative will designate Contractor's access to project site as well as parking facilities for equipment and workers.

.2 The Contractor is advised that while parking facilities for his workers and subcontractors will be on property, such parking facilities may be remote from the actual site of the work. In any case, follow all instructions from the Departmental Representative in regards to parking facilities.

.3 Parking facilities at site is limited and cannot be used by Contractor. Make arrangements elsewhere for Contractor's vehicles including those of subcontractors and workers.

.4 Maintain [new] and [existing] roads and parking areas at site, where used by Contractor, for duration of contract.
  .1 Keep clean and free of mud and dirt by washing on a regular basis.
  .2 Provide snow removal in areas located within construction site or enclosed by work.
  .3 Make good and repair damage resulting from Contractor's use of existing roads, asphalted areas and lawns on site.

1.2 STORAGE

.1 Provide adequate weather tight sheds with raised floors, for storage of materials, tools and equipment which are subject to damage by weather. Sea can or trailer are acceptable alternates for storage.

.2 Make arrangements with the Departmental Representative for location of on-site storage areas.

1.3 SANITARY FACILITIES

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

.2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition and are not to use public facilities within the National Park.

1.4 POWER

.1 Arrange, pay for and maintain temporary electrical power supply in accordance with governing regulations and ordinances.

1.5 WATER SUPPLY

.1 Arrange and pay for water supply. Use of on-site water can be authorized by the Departmental Representative.

1.6 BARRICADES

.1 Provide and maintain sufficient barricades, fencing, notices, warning signs, light signals, etc. for the protection of adjoining property

and to warn others and workmen engaged on the job of the dangers caused by the work.

.2 Types and location of barricades, etc. to be in accordance with local regulations and to the satisfaction of Departmental Representative.

.3 The presence of such barricades, lights, etc. will not relieve the Contractor of the responsibility for any damages.

1.7 SECURITY

.1 Contractor is solely responsible for security of equipment and materials on the work site and is responsible for all damages resulting from fire and theft.

1.8 SITE SIGNS AND NOTICES

.1 Only Project Identification and Consultant/ Contractor signboards and notices for safety or instruction are permitted on site.

.2 Format, location and quantity of site signs and notices to be accepted by Departmental Representative.

.3 Signs and notices for safety or instruction to be in English and French languages, or commonly understood graphic symbols.

.4 Install sign plumb and level in neat wood framework and securely anchor in ground by posts to withstand wind pressure of 160 km/h.

.5 Contractor or subcontractor advertisement signboards are not permitted on site.

.6 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.

1.9 REMOVAL OF TEMPORARY FACILITIES

.1 Remove temporary facilities from site when directed by Departmental Representative.

.2 When project is closed down for a period of time, keep temporary facilities operational until no longer required by Departmental Representative.

END OF SECTION

1.1 GENERAL

.1 Use new material and equipment unless otherwise specified.

.2 Submit following information for any or all materials and products proposed for supply within seven (7) days of request by Departmental Representative:
- .1 name and address of manufacturer
- .2 trade name, model and catalogue number
- .3 performance, descriptive and test data
- .4 manufacturer's installation or application instructions.
- .5 evidence of arrangements to procure.

.3 Provide material and equipment of specified design and quality, performing to published ratings and for which replacement parts are readily available.

.4 Use products of one manufacturer for equipment or material of same type or classification unless otherwise specified.

1.2 MANUFACTURER'S INSTRUCTIONS

.1 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods.

.2 Notify Departmental Representative in writing of any conflict between these specifications and manufacturers' instructions. Departmental Representative will designate which document is to be followed.

1.3 DELIVERY AND STORAGE

.1 Deliver, store and maintain packaged material and equipment with manufacturer's seal and labels intact.

.2 Prevent damage, adulteration and soiling of material and equipment during delivery, handling and storage. Immediately remove rejected material and equipment from site.

.3 Store material and equipment in accordance and Storage with supplier's instructions.

1.4 CONFORMANCE

.1 When material or equipment is specified by standard or performance specifications, upon request of Departmental Representative, obtain from manufacturer an independent testing laboratory report, stating that material or equipment meets or exceeds specified requirements.

1.5 SUBSTITUTION

.1 Proposals for substitution may be submitted only after award of Contract. Such requests must include statements of respective costs of items originally specified and proposed substitutions.

.2 Proposals will be considered by Departmental Representative if:
.1 Products selected by tenderer from those specified, are not available, or
.2 Delivery date of products from those specified would unduly delay completion of Contract, or
.3 Alternative products to those specified, which are brought to attention of, and considered by Departmental Representative as equivalent to those specified and will result in a credit to Contract amount.

.3 Should proposed substitution be accepted either in part or in whole, assume full responsibility and costs when substitution affects other work on project. Pay for design or drawing changes required as result of substitution.

.4 Amounts of all credits arising from approval of substitutions will be determined by Departmental Representative and Contract price will be reduced accordingly. No substitutions will be permitted without prior written approval of Departmental Representative.

.5 Owner reserves the right for acceptance or rejection of substitution of materials.

1.6 CONSTRUCTION EQUIPMENT AND PLANT

.1 On request, prove to the satisfaction of Departmental Representative that the construction equipment and plant are adequate to manufacture, transport, place and finish work to quality and production rates specified. If inadequate, replace or provide additional equipment or plant as directed.

.2 Maintain construction equipment and plant in good operating order.

1.7 DAMAGED AND REJECTED MATERIALS

.1 Immediately replace, repair or otherwise make good any material damaged, broken or defaced during construction to the satisfaction of Departmental Representative.

.2 Remove rejected materials from site.

END OF SECTION

1.1 GENERAL

.1 All equipment is to be pressure washed and free from any debris or vegetation before entering Fundy National Park boundaries.

.2 Store volatile waste in covered metal containers, and remove from premises at end of each working day.

.3 Prevent accumulation of waste which creates hazardous conditions.

1.2 CLEANING DURING CONSTRUCTION

.1 Maintain the work site tidy and free from accumulations of waste material and debris.

.2 Provide on-site containers for collection of waste materials, and debris, unless debris are removed from site daily.

1.3 FINAL CLEANING

.1 In preparation for acceptance of the project on an interim or final certificate of completion perform final cleaning.

END OF SECTION

1.1 SECTION INCLUDES

.1 Administrative procedures preceding inspection and acceptance of Work by Departmental Representative.

1.2 RELATED SECTIONS

.1 Section 01 78 00 - Closeout Submittals.

1.3 INSPECTION AND DECLARATION

.1 Contractor's Inspection: Coordinate and perform, in concert with subcontractors, an inspection and check of all Work. Identify and correct deficiencies, defects, repairs and perform outstanding items as required to complete work in conformance with Contract Documents.

.1 Notify Departmental Representative in writing when deficiencies from Contractor's inspection have been rectified and that Work is deemed to be complete and ready for Departmental Representative's Inspection and Acceptance.

.2 Departmental Representative's Inspection: Accompany Departmental Representative during all interim and final inspections of Work. Address defects, faults and outstanding items of work identified by such inspections. Notify Departmental Representative when all deficiencies have been rectified.

.3 At completion of project, in company with the Architect/Departmental Representative, make a check of all work and correct all discrepancies and defects. Be aware that the Certificate of Substantial Performance will not be issued until such time that Contractor has fully completed and turned over all specified as-built project record documents, training, maintenance manuals, test results and any guarantee certificate as issued by particular manufacturer.

.4 Correct all discrepancies before final inspection and acceptance of Work.

END OF SECTION

1.1 SECTION INCLUDES

.1 Project Record Documents as follows:
- .1 As-built drawings;
- .2 As-built specifications;
- .3 Reviewed shop drawings.

.2 Operations and Maintenance data as follows:
- .1 Not applicable

1.2 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

1.3 PROJECT RECORD DOCUMENTS

.1 Departmental Representative will provide two white print sets of contract drawings and two copies of Specifications Manual specifically for "as-built" purposes.

.2 Maintain at site one set of the contract drawings and specifications to record actual as-built site conditions.

.3 Maintain up-to-date, real time as-built drawings and specifications in good condition and make available for inspection by the Departmental Representative at any time during construction.

.4 As-Built Drawings:
- .1 Record changes in red ink on the prints. Mark only on one set of prints and at completion of project and prior to interim inspection, neatly transfer notations to second set (also by use of red ink). Submit both sets to Departmental Representative. All drawings of both sets shall be stamped "As-Built Drawings" and be signed and dated by Contractor.
- .2 Show all modifications, substitutions and deviations from what is shown on the contract drawings or in specifications.
- .3 Record following information:
  - .1 Horizontal and vertical location of exterior underground utilities and appurtenances referenced to permanent surface improvements.
  - .2 Horizontal and vertical location of various elements in relation to Geodetic Datum;
  - .3 Location of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of structure;
  - .4 Field changes of dimension and detail;
  - .5 Location of all capped or terminated services and utilities.
  - .6 Any details produced in the course of the contract by the Departmental Representative to supplement or to

change existing design drawings must also be marked-up and dimensioned to reflect final as-built conditions and appended to the as-built drawing document;

.7 All change orders issued over the course of the contract must be documented on the finished as-built documents, accurately and consistently depicting the changed condition as it applies to all affected drawing details.

.5 As-built Specifications; legibly mark in red each item to record actual construction, including:

.1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly items substituted from that specified.

.2 Changes made by Addenda and Change Orders.

.3 Mark up both copies of specifications; stamp "as-built", sign and date similarly to drawings as per above clause.

.6 Maintain As-built documents current as the contract progresses. Departmental Representative will conduct reviews and inspections of the documents on a regular basis. Frequency of reviews will be subject to Departmental Representative's discretion. Failure to maintain as-builts current and complete to satisfaction of the Departmental Representative shall be subject to financial penalties in the form of progress payment reductions and holdback assessments.

1.4 REVIEWED SHOP DRAWINGS

.1 Compile full set of shop drawings and product data reviewed on project and incorporate into Operations and Maintenance Manual. Supply number of shop drawing sets equal to the required number of final Operations and Maintenance manuals.

.2 Submit shop drawing sets at same time and as part of the contents of the Operation and Maintenance manuals specified in this section.

1.5 UPDATING OF DIGITAL DRAWINGS

Section Not Used.

1.6 OPERATIONS & MAINTENANCE MANUAL

.1 Not applicable.

1.7 SPARE PARTS, TOOLS AND MAINTENANCE MATERIALS

.1 Not applicable.

END OF SECTION

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

.1 This Section includes but is not limited to the following:

.1 All normal removals as required to complete the work. All items to be verified by a site visit prior to submission of a tender.

1.2 SUBMISSIONS

.1 When requested provide methodology for carrying out the work.

.2 Provide submission in accordance with Section 01 33 00.

1.3 PROTECTION

.1 Prevent movement, settlement or damage of adjacent structures. Provide bracing and shoring as required. In event of damage, immediately replace such items or make repairs to approval of Departmental Representative and at no additional cost to Departmental Representative.

.2 Prevent debris from migrating off site.

.3 Repair all damage to existing structures, roadways, pipelines, electrical systems not specified for removal at no additional cost to the Contract and to the satisfaction of the Departmental Representative.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

3.1 PREPARATION

.1 Inspect site and verify with Departmental Representative items designated for removal and items to be preserved.

.2 Locate and protect utility lines. Preserve in operating condition active utilities traversing site.

.3 Existing fill and underground infrastructure to be protected from any damages. All repairs to damages as a result of Contractor's operations to be at his/her cost and to the satisfaction of the Departmental Representative.

3.2 REMOVAL

.1 Remove items indicated.

.2 Do not disturb adjacent structures designated to remain in place.

.3 At end of each day's work, leave work in safe condition so no part is in danger of falling or a danger to the public.

3.3 DISPOSAL OF MATERIALS

.1 Dispose of materials not designated for salvage or re-use in work and dispose of off-site.

3.4 RESTORATION

.1 Upon completion of work, remove debris and leave work site clean.

.2 Reinstate areas and existing works outside areas of demolition to conditions that existed prior to commencement of work. Match condition of adjacent, undisturbed areas.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

.1 This Section specifies requirements for performing all operations necessary to complete site excavation and filling, to bring the site to sub-grade elevations.

.2 The Work generally includes, but is not necessarily limited to, the following items:
- .1 Excavation for new structures and roadway(s) including common and rock excavation and placing to grades indicated.
- .2 Excavation of fill material unsuitable for engineered structural fill and disposal of unsuitable material offsite in areas approved by Departmental Representative at no additional cost to the Contract.
- .3 Supply, placing, and compaction of engineered structural fill.
- .4 Control of water by dewatering.
- .5 Environmental protection.
- .6 Sheeting, shoring, tracing.
- .7 Protection of stock-piled materials and excavation surfaces from disturbance by water and freezing.

1.2 REFERENCES

.1 ASTM D698-07ael, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft - 1 lb f/ft3 (600 KN- m/m3)).

.2 New Brunswick Department of Transportation and Infrastructure (NBDTI formally NBDOT) Standard Specifications, latest edition.

1.3 DEFINITIONS

.1 Unsuitable material: all organic, peat, silt, or other material, which is not suitable for use in the Work.

.2 Subgrade: is the surface of mass excavation and embankment finished to lines and elevations indicated on Drawings.

1.4 EXISTING CONDITIONS

.1 Geotechnical Investigation has been carried out at the Site.

.2 Information from Geotechnical Report No. 6596.01-R01 dated November 19 2012, prepared by GEMTEC is available for viewing upon request to the Departmental Representative.

.3 Any interpretations shall be at the Tenderer's own risk and the Departmental Representative shall not be held responsible for the content or interpretation of this document.

.4 Known underground and surface utility lines and buried objects are indicated on the Drawings. Locations are approximate from record

drawings.

1.5 PROTECTION

.1 Prevent damage to structures, fencing, natural features, bench marks, or surface or underground utility lines which are to remain. If damaged, restore to original or better condition.

.2 Protect stock-piles of excavated materials, excavation faces and the surface of mass excavations from disturbance by water and freezing.

.3 Protect completed gravels and granular fill in all areas from contamination by traffic and construction operations on site. Make good any areas contaminated by use as haul roads or other activities at no additional cost to the Departmental Representative.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Common Borrow: Departmental Representative approved, off-site borrow that meet the requirements of NBDTI Standard Specification for Borrow A1, Item 121.2.2.2.

.2 Engineered fill: Departmental Representative approved, off-site borrow that meet the requirements of NBDTI Standard Specifications for pit run gravel subbase or crushed sandstone subbase per Item No. 201.2.4.3 and 201.2.4.4, respectively.

PART 3 - EXECUTION

3.1 GENERAL

.1 Work from area of lowest elevation to area of highest elevation.

.2 Once subgrade elevations are attained, do not let construction equipment or vehicles cross finished areas.

.3 Before starting site grading operations, agree with Departmental Representative as to ground surface elevations to be cut and filled.

.4 No standing water is to be left on site except for structures designed to retain or infiltrate water.

.5 Compact subgrade to 98% maximum dry density and proof roll to satisfaction of departmental representative to show there are no soft areas.

3.2 TOPSOIL EXCAVATING

.1 Strip topsoil to limits and depth indicated and as required to satisfy road side reinstatement for new grades, or Excavation directed by the Engineer.

.2 Stockpile in designated areas or dispose as directed. Minimize loss and wastage. Work from area of lowest elevation to area of highest elevation.

.2 Once subgrade elevations are attained, do not let construction equipment or vehicles cross finished areas.

3.2 EXCAVATING

.1 Prior to commencing cut and fill operations, agree with Departmental Representative as to ground surface elevations to be cut and filled.

.2 Notify Departmental Representative whenever unsuitable materials are encountered and remove unsuitable materials to depth and extent directed.

.3 Excavate in all kinds of material including rock encountered on the site and make own computations of amount and nature of excavation required.

.4 Perform all excavation within plus or minus 75mm of the lines, grades and dimensions shown on the Drawings, or as established by the Departmental Representative. During the progress of the Work, the Departmental Representative may vary the lines, grades and dimensions of the excavations from those specified in this Section.

.5 Take necessary precautions to preserve the material below and beyond the lines of all excavation in the soundest possible condition.

.6 Do not stockpile excavation spoils within 2m or 1.5 times trench depth, whichever is greater, of edge trench.

.7 Do not obstruct existing drainage ditches and natural watercourses unless indicated on the drawings.

.8 Reduce steepness of slopes wherever possible, and expose smallest practical area of land for shortest possible time.

.9 During construction direct surface runoff to sediment control facilities installed and maintained to the requirements of the drawings.

3.4 EMBANKMENTS

.1 Do not place frozen material or place material on frozen surfaces.

.2 Maintain a sloped surface during construction to ensure ready run-off of surface water.

.3 Place and compact embankment material to full width in uniform layers not exceeding 150 mm compacted thickness. Departmental

Representative may authorize thicker lifts if specified compaction can be achieved.

.4 Compact material to a density of not less than 95% maximum dry density in accordance to ASTM D698.

3.5 ENGINEERED FILL

.1 Compact engineered structural fill material to 98% maximum dry density.

3.6 FINISHING

.1 Remove soft or other unstable material that will not compact properly and fill resulting depressions with approved material. Grade to eliminate rough spots and low areas to ensure positive drainage.

.2 Shape and compact entire subgrade to within 25mm of design elevations but not uniformly high or low.

.3 Do scarifying, blading, compacting or other methods of work as necessary to provide a thoroughly compacted site shaped to grades indicated or directed.

.4 Finish side slopes to a neat condition, true to lines and grades indicated.
.1 Remove boulders encountered and fill resulting cavities.
.2 Hand finish slopes that cannot be finished satisfactorily by use of machine.

3.7 SURPLUS MATERIAL

.1 Dispose of surplus approved embankment material not required for placement in fills off site in areas approved by Departmental Representative at no additional cost to the Contract. Surplus selected backfill and Engineered Structural fill is to be disposed of offsite in areas approved by Departmental Representative at no additional cost to the Contract.

3.8 UNSUITABLE MATERIAL

.1 Dispose of unsuitable material offsite in areas approved by Departmental Representative at no additional cost to the Contract.

3.9 TESTING

.1 Inspection and testing of soil compaction will be carried out by testing laboratory designated by Departmental Representative.

3.10 MAINTENANCE

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

.2 Contractor shall notify Departmental Representative 24 hrs prior to

being ready for testing.

.3 Contractor shall facilitate and allow access to work to be inspected or tested.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

.1 This Section specifies requirements for furnishing all materials, labour, tools and equipment and performing all operations necessary to excavate all types of material encountered, placing of suitable excavated material as backfill, disposal of unsuitable and surplus material on-site at designated disposal area, and furnishing and placing structural fill, and imported backfill material as specified below, all as shown on the Drawings and as specified herein.

.2 The Work generally includes, but is not necessarily limited to, the following items:
- .1 Trench excavation and backfilling for pipelines and appurtenances.
- .2 Structure excavation and backfilling for manholes, catch basins and structures.
- .3 Supply and placing pipe bedding material where required.
- .4 Compaction of bedding and backfill.
- .5 Control of water by dewatering.
- .6 Removal and disposal of surplus and/or unsuitable material.
- .7 Sheeting, shoring and bracing to support trench walls, sides of excavations or utilities.
- .8 Reinstatement of existing asphalt surfaces.

1.2 REFERENCE STANDARDS

.1 CAN/ULC S701-2011, Thermal Insulation, Polystyrene, Boards and Pipe Covering.

.2 ASTM D698-07ael, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft- lbf/ft3 (600 kN-m/m3)).

.3 New Brunswick Department of Transportation and Infrastructure (NBDTI formally NBDOT) Standard Specifications, latest edition.

1.3 DEFINITIONS

.1 Unsuitable Material: all organic or other excavated material, which is not suitable for use in Work.

.2 Subgrade: the surface of mass excavation and embankment finished to lines and elevations indicated.

1.4 PROTECTION OF EXISTING FEATURES

.1 Existing buried utilities:
- .1 Size, depth and location of existing utilities as indicated are for guidance only. Completeness and accuracy are not guaranteed.
- .2 Prior to commencing excavation Work, notify Departmental Representative and establish location and state of use of buried utilities. Clearly mark such locations to prevent disturbance

during work.

.3 Confirm locations of buried utilities by careful test excavations.

.4 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities encountered. It is the Contractor's responsibility to have these utilities field located.

.5 Where utility lines or structures exist in area of excavation, obtain direction of Departmental Representative before removing or re-routing. Advise Departmental Representative of existing lines in area of excavation that require removal or relocation and cost for such work.

.6 Record location of maintained, re-routed and abandoned underground lines.

.2 Existing surface features:

.1 Conduct, with Departmental Representative condition survey of trees and other plants, lawns, service poles, wires, pavement, survey bench marks and monuments which may be affected by work.

1.5 SHORING, BRACING AND UNDERPINNING

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

.2 Engage services of qualified professional engineer who is registered or licensed in province of New Brunswick, in which work is to be carried out to design and inspect shoring, bracing and underpinning required for work.

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

1.6 SUPPORT OF EXCAVATION

.1 Suitably slope or properly shore sides of excavations according to site conditions, all in accordance with the New Brunswick Occupational Health and Safety Act.

.2 The choice of any method of support shall be the responsibility of the Contractor. However, drawings and calculations for the method of support selected, designed by a qualified professional engineer licensed to practice in New Brunswick in accordance with the Provincial safety requirements, are to be submitted to the Departmental Representative for review before its use.

.3 If it is desirable that any support, other than that which may be shown on the Drawings, be left in the excavations, then the Departmental Representative will issue instructions accordingly.

.4 Take every precaution against slips or falls, but if any should occur, at once make good the same. If any such slip or fall affects or may

affect the stability of the permanent work, execute such remedial work as necessary, including filling up of any space left by the slip or fall with approved granular material. Submit proposed remedial work to Departmental Representative for review.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Selected Backfill material: material approved from site excavation or borrow pits. Such material shall be free from stumps, trees, roots, sod, muck or other deleterious material, and shall not contain rock or boulders larger than 150mm. The material shall be free from frost, and shall not be placed on frozen ground or in water. It must have a moisture content that will allow compaction to the specified densities.

.2 Engineered Fill: as specified in Section 31 22 13.

.3 Clear stone: crushed and screened, hard, durable stone, free from clay and organic matter, and graded as follows:

.1 Clear Stone, 25mm (if required):

Sieve Designation	% Passing
25mm	100
19mm	15-85
12.5mm	0-53
9.5mm	0-30
4.75mm	0-4
1.18mm	0-2

.2 100mm Clear Stone (if required):

Sieve Designation	% Passing
100mm	100
50mm	25-60
25mm	0-5

.4 Surge Rock (if required): 150mm maximum crushed quarry-run material free from shale, clay, friable materials, roots and vegetable matter.

.5 Gravels: as specified in Section 32 11 19.

.6 Granular bedding material: Aggregate Base as specified in Section 32 11 19.

PART 3 - EXECUTION

3.1 SITE PREPARATION

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

3.2 SHORING AND BRACING

.1 Construct temporary works to depths, heights and locations as approved by Departmental Representative

.2 During backfill operation:
- .1 Unless otherwise as indicated or as directed by Departmental Representative, remove sheeting and shoring from excavations.
- .2 Do not remove bracing until backfilling has reached respective levels of such bracing.
- .3 Upon completion of substructure construction:
  - .1 Remove shoring and bracing.
  - .2 Remove excess materials from site as directed by Departmental Representative.

3.3 ASPHALT REMOVAL

.1 Always cut asphalt with a cutting saw in order to facilitate removal and prevent lifting or damage to adjacent pavement, concrete or structures during excavation.

.2 Under no circumstances will the cutting of pavement be allowed by the use of excavators or backhoe buckets, etc.

.3 In full depth removal, care must be taken not to contaminate the reclaimed asphalt pavement with the underlying aggregate base material. All loose material remaining after cold milling shall be swept.

.4 At all transverse vertical cuts milled in the existing pavement the Contractor shall immediately construct a temporary smooth taper with RAP (Recycled Asphalt Pavement) or hot-mix asphalt concrete to a minimum slope of 25:1.

.5 Work, in such a manner that the structures are not damaged, and the area after removal matches the grade of the adjacent removal area. Any RAP that falls into structures shall be removed.

3.4 EXCAVATION - GENERAL

.1 Excavate in all kinds of materials including rock encountered on Site and make own computations of amounts and nature of excavation required.

.2 Select method of excavation, support and dewatering suitable for the works. Submit proposed method to Departmental Representative for review.

.3 Protect property or structures above or below ground in accordance with the Contract.

.4 Bear foundations or underside of all structures including pipe surrounds on the material as shown on the Drawings and neatly finish all bearing surfaces to the required levels and grades.

.5 If the excavated surface is unsuitable, the Departmental Representative will determine what work is required. If such work is due solely to the nature of the ground, then Departmental Representative will measure the work, but if such work is due to any act or default of the Contractor in carrying out of the Works, resulting in disturbance of natural ground conditions, then the Contractor shall execute such work at no additional cost to the Contract.

.6 Pile excavated material a safe distance away from sides of trench so it will not endanger personnel and the work, reduce sight distances, and obstruct roadways.

.7 Leave existing utility controls unobstructed and accessible at all times.

.8 Do not obstruct drainage ditches and natural watercourses.

.9 Departmental Representative reserves the right to require surplus material to be placed for embanking, general grading or other improvement or use on site, for the general benefit of Departmental Representative.

.10 Control grading so that the surface of the ground will be properly sloped to prevent water from running into excavated areas. Promptly remove any water, which accumulates in excavations.

.11 Place excavated soil to be re- used as backfill in stockpiles properly graded and protected from all sources of moisture and freezing.

.12 Reduce steepness of slopes wherever possible, and expose smallest practical area of land for shortest possible time.

.13 Dispose of surplus materials off site at approved disposal site.

3.5 DRAINING, PUMPING AND THAWING

.1 Keep excavations and trenches free of water. Control excavations to prevent surface water running into excavated areas.

.2 Do work in connection with dewatering and supply and maintain on the worksite pumps in a number and capacity sufficient to keep bottom of excavations dry and free from water so placing of pipe, manholes, and concrete will be done in the dry. Operate equipment for as long as necessary.

.3 Dispose of water removed from excavations in a manner that will prevent injuries to public health or private property or to any operation of the work completed or under construction. Do not pump water containing silt or other material in suspension into streams or drainage courses or water bodies.

.4 Ensure that sub-drains, sump holes, wells or the like required for dewatering shall not endanger the stability of the Works. On completion of the work completely backfill and consolidate excavations.

.5 Excavate, remove or thaw out frozen ground as necessary.

3.6 TRENCH EXCAVATION

.1 Trenches for piping and related excavations shall be of sufficient width and depth at all points to allow pipes to be laid, joints to be formed, and appurtenant structures to be built in a workmanlike manner, and when needed, to allow for sheeting and shoring, pumping, draining, and for removing and replacing all materials unsuitable for foundations.

.2 Excavate trenches so pipe can be laid to the alignment and depth required. Excavation length to be not more than pipe length that can be laid and backfilled in one day. Brace and drain trench so workers may work safely and efficiently.

.3 Remove organic material and soft deposits to a depth where medium dense to dense materials are encountered as designated by the Departmental Representative.

.4 Do not stockpile excavated materials alongside trench if the bearing soil will cause trench side failure or bottom uplift and affect pipe alignment.

3.7 UNSUITABLE MATERIAL EXCAVATION

.1 Notify Departmental Representative when materials unsuitable for use in the work are encountered and remove to depth and extent as directed by Departmental Representative.

.2 Dispose of unsuitable material off site at an approved disposal site.

3.8 GRANULAR BEDDING

.1 Place granular bedding material in uniform layers not exceeding 150mm compacted thickness to depth as indicated.

.2 Shape bed true to grade to provide continuous uniform bearing surface for pipe. Do not use blocks when bedding pipe.

.3 Shape transverse depressions in bedding as required to suit joints.

.4 Carry bedding material across actual trench width. Mounding bedding shall not be permitted.

.5 Compact each layer full width of bed to at least 95% of corrected maximum dry density.

.6 After pipe installation, place and compact bedding to haunch line of pipe. Place and compact bedding material from haunch line of pipe to top of pipe in maximum 150mm layers. Place remaining bedding material to 300mm above top of pipe before further compaction.

.7 Compact granular bedding to ASTM D4254, 98% relative density for Aggregate Base Gravel.

3.9 BACKFILLING - GENERAL

.1 Do not proceed with backfilling operations until Departmental Representative has inspected and approved installations.

.2 After pipelines, and structures have been built, backfill trenches and other excavated areas with materials shown on Drawings or as specified. Remove timber and debris from excavation before backfilling is commenced. Do not cover up or put out of view any work until it has been examined and approved by the Departmental Representative. If any work is covered without approval of the Departmental Representative it must, if requested, be uncovered for examination.

.3 Do not backfill around or over cast-in-place concrete within 24 hours after placing.

.4 Where temporary unbalanced earth pressures are liable to develop on walls or other structures, permit concrete to cure minimum 14 days or until it has sufficient strength to withstand earth and compaction pressure.

3.10 BACKFILLING TRENCHES

.1 Backfill trench from top of pipe bedding elevations indicated using materials shown on Drawings.

.2 Place backfill in 300mm layers and compact to 98% maximum dry density.

.3 During backfilling, keep trenches free of water at all times and controlled so as to prevent surface water running into excavated areas. Remove silty materials, which become wetted and subsequently liquid or extremely plastic.

.4 Leave surface of backfill initially high and repair settlement of trench backfilling.

3.11 INSULATION

.1 Place rigid insulation in trench where indicated on drawings. Do not disturb or break boards during backfilling.

3.12 MARKER TAPE

.1 Place marker tape in trenches where indicated.

3.13 REINSTATEMENT

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

.2 Reinstate disturbed areas to conditions, elevation and thickness equal to or better than that which existed before excavation.

.3 Clean and reinstate areas affected by work as directed by Departmental Representative.

END OF SECTION

PART 1 - GENERAL

1.1 DESCRIPTION

.1 This section specifies requirements for supplying, transporting and placing granular base and subbase material to lines, grades and typical cross-sections indicated on the Drawings or as indicated by the Departmental Representative.

1.2 REFERENCE STANDARDS

.1 ASTM D698-07ae1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).

.2 New Brunswick Department of Transportation and Infrastructure (NBDTI formally NBDOT) Standard Specifications, latest edition.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Aggregate base materials: Departmental Representative approved, off-site material that meets the requirements of NBDTI Standard Specification for 31.5mm Crushed Rock Aggregate Base, Item 201.2.4.1 and Item 201.2.2 or 31.5mm Crushed Gravel Aggregate Base, Item 201.2.4.2 and Item 201.2.2.

.1 Also labeled as: Type 1 gravel/fill and class A gravel/fill

.2 Aggregate subbase materials: Departmental Representative approved, off-site material that meets the requirements of NBDTI Standard Specification for 75mm Crushed Rock Aggregate Subbase, Item 201.2.4.1 and Item 201.2.2 or 75mm Crushed Gravel Aggregate Subbase, Item 201.2.4.2 and Item 201.2.2.

.1 Also labeled as: Type 2 gravel/fill and class B gravel/fill

.3 Compacted Sand: Material shall be free of ice, clay, organic matter or other objectionable material, and shall conform to the following standards:

.1 Gradation per ASTM C136:

Sieve Designation	% Passing
9.5mm	100
4.75mm	90-100
300µm	10-40
150µm	3-15
75µm	0-7

.2 The material shall be compacted in accordance with NBDTI Standard Specification Item 936 to a minimum of 95% of the maximum dry density.

PART 3 - EXECUTION

3.1 INSPECTION OF UNDERLYING SUBGRADE

.1 Do not place granular subbase until finished subgrade surface is inspected and approved by Departmental Representative.

3.2 PLACING

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

.2 Place using methods which do not lead to segregation or degradation of aggregates.

.3 Place base and subbase gravel in uniform layers not exceeding 150mm and 225mm, respectively, to compacted depth shown on Drawings. Grade intermediate gravel courses to within 25mm of elevations and cross-sections indicated, but not uniformly high or low. Compact to 100% maximum dry density.

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

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

3.3 COMPACTING

.1 Compact to density not less than 100% maximum dry density, corrected for oversized particles.

.2 Shape and roll alternately to obtain a smooth, even and uniformly compacted layer.

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

.4 In areas not accessible to rolling equipment, compact to specified density with approved mechanical tampers.

3.4 FINISH TOLERANCES

.1 Finished base surface shall be within plus or minus 12mm of established grade but not uniformly high or low.

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

3.5 MAINTENANCE

.1 Maintain finished base in a condition conforming to this section until

succeeding material is applied.

END OF SECTION

PART 1 - GENERAL

1.1 Description

.1 This section specifies requirements for supplying, transporting and placing granular base and subbase material to lines, grades and typical cross-sections indicated on the drawings or as indicated by the Consultant.

1.2 Related Sections

.1 Section 31 22 13 Site Grading

.2 Section 31 23 10 Excavating, Trenching and Backfilling

.3 Section 32 11 19 Aggregate Materials

.4 Section 32 98 00 Reinstatement

1.3 References

.1 New Brunswick Department of Transportation and Infrastructure (NBDTI) Standard Specifications, 2019

PART 2 - PRODUCTS

2.1 Materials

.1 Aggregate base materials as specified in section 31 11 19.

.2 Aggregate subbase materials as specified in section 31 11 19.

PART 3 - EXECUTION

3.1 Inspection of Underlying Subgrade

.1 Do not place granular subbase until finished subgrade surface is inspected and approved by a Geotechnical Engineer.

3.2 Placing

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

.2 Place using methods which do not lead to segregation or degradation of aggregates.

.3 Place base and subbase gravel in uniform layers not exceeding 150mm and 225mm, respectively, to compacted depth shown on drawings. Grade intermediate gravel courses to within 25mm of elevations and cross-sections indicated, but not uniformly high or low. Compact to 100% maximum dry density.

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

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

3.3 Compacting

.1 Compact to density not less than 100% maximum dry density, corrected for oversized particles.

.2 Shape and roll alternately to obtain a smooth, even and uniformly compacted layer.

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

.4 In areas not accessible to rolling equipment, compact to specified density with approved mechanical tampers.

3.4 Finish Tolerance

.1 Finished base surface shall be within plus or minus 12mm of established grade but not uniformly high or low.

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

3.5 Maintenance

.1 Maintain finished base in a condition conforming to this section until succeeding material is applied.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 This section specifies the requirements for performing all operations necessary to complete placing and compaction of hot mix asphalt to lines and elevations indicated on the drawings.

1.2 Related Sections

.1 **Section 31 23 10 – Excavating, Trenching and Backfilling**

1.3 References

.1 ASTM D3203/D3203M-17, Standard Test Method for Percent Air Voids in Compacted Asphalt Mixtures

.2 New Brunswick Department of Transportation and Infrastructure Standard Specifications, latest edition

1.4 Samples

.1 At least two (2) weeks prior to commencing work inform Owner of proposed source of aggregates, liquid asphalt and asphalt cement and provide access for sampling.

.2 Preliminary approval of any sample or samples of any material shall not constitute a final approval of the material or its source of supply.

.3 All materials to be incorporated into the work shall be continuously and regularly sampled and tested in the field and in the laboratory and shall comply with the requirements of the material specification.

1.5 Material Certification

.1 At least four (4) weeks prior to commencing work submit viscosity-temperature chart for asphalt cement to be supplied showing either Saybolt Furol viscosity in seconds or Kinematic Viscosity in centistokes, temperature range 105°C to 175°C.

.2 Upon request, submit manufacturer's test data and certification that asphalt cement meets requirements of this section.

PART 2 – PRODUCTS

2.1 Material

.1 Asphalt concrete: Hot mixed, hot-laid combination of mineral aggregates, uniformly coated and mixed with an asphaltic binder in a suitable mixing plant. Asphalt materials and aggregates shall meet the requirements of the NBDTI Item 260, mix Type C as indicated on drawings.

.2 Bituminous tack coat: to meet the requirements of the NBDTI Item 259.

PART 3– EXECUTION

3.1 Equipment

.1 Pavers: Mechanical self-powered pavers capable of spreading mix within specified tolerances, true to line, grade and crown indicated.

.2 Rollers: Sufficient number of rollers of type and weight to obtain specified density of compacted mix.

.3 Haul trucks 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 Suitable hand tools.

3.2 Placing

.1 Obtain Owner’s approval of aggregate base prior to placing asphalt.

.2 Before placing asphalt, clean surface of loose and foreign material. Apply bituminous tack coat on asphalt surfaces to receive new asphalt, to meet the requirements of the NBDTI Item 259. Application rate: 1.0 l/m^2.

.3 Place asphalt concrete to thicknesses, grades and lines as indicated or as directed by Owner.

.4 Placing conditions:

.1 Place asphalt mixtures only when air temperature is above 5°C.

.2 When temperature of surface on which material is to be placed falls below 10°C, provide extra rollers as necessary to obtain required compaction before cooling.

.3 Do not place hot-mix asphalt when pools of standing water exist on surface to be paved, during rain, or when surface is damp.

.5 Place asphalt concrete in compacted lifts of thickness as indicated.

.6 Place, roll and compact asphalt concrete in accordance with the NBDTI Item 260.

.7 The minimum density acceptable shall be 93% of the theoretical maximum relative density determined according to ASTM D3203/D3203M.

3.3 Finish Tolerances

.1 Finish asphalt surface to be within 12mm of design elevation but not uniformly high or low.

.2 Finished asphalt surface not to have irregularities exceeding 12mm when checked with a 3m straight edge placed on any direction.

3.4 Protection

.1 Restrict traffic during setting period to prevent damage as directed by the Owner.

3.5 Defective Work

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

.2 Repair areas showing checking or ripping.

.3 Adjust roller operation and screed settings on paver to prevent further defects such as rippling and checking of pavement.

.4 If, at any time before the work is finally accepted, any raveling, shoving or other fault develops in the pavement as laid, remove all mixed materials in such places, cut edges of joints square and paint with tack coat. Place fresh asphalt mixture and compact. All such removal and replacement of unsatisfactory material shall be done at the expense of the Contractor.

END OF SECTION

PART 1 - GENERAL

1.1 REFERNCES

.1 Agriculture and Agri-Food Canada

.1 The Canadian System of Soil Classification, Third Edition, 1998.

.2 Canadian Council of Ministers of the Environment

.1 PN1340-2005, Guidelines for Compost Quality.

1.2 WASTE MANAGEMENT AND DISPOSAL

.1 Divert unused soil amendments from landfill to official hazardous material collections site approved by Departmental Representative.

.2 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 Topsoil for seeded areas and planting beds: mixture of particulates, micro organisms and organic matter which provides suitable medium for supporting intended plant growth.

.1 Soil texture based on The Canadian System of Soil Classification, to consist of 20 to 70 % sand, minimum 7 % clay, and contain 2 to 10 % organic matter by weight.

.2 Contain no toxic elements or growth inhibiting materials.

.3 Finished surface free from:

.1 Debris and stones over 50 mm diameter.

.2 Course vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.

.4 Consistence: friable when moist.

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 Phosphorus (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: 6.5 to 8.0.

.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 Use composts meeting Category B requirements for land fill reclamation and large scale industrial applications.

.6 Limestone:

.1 Ground agricultural limestone.

.2 Gradation requirements: percentage passing by weight, 90% passing 1.0 mm sieve, 50% passing 0.125 mm sieve.

.7 Fertilizer: industry accepted 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 supply topsoil as specified.

.3 Soil testing by recognized testing facility for PH, P and K, and organic matter.

.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

.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 trees, brush, weeds, and grasses.

.2 Stockpile in locations as directed by Departmental Representative.

.1 Stockpile height not to exceed 2 m.

.3 Disposal of unused topsoil is to be in an environmentally responsible manner but not used as landfill as directed by Departmental Representative.

.4 Protect stockpiles from contamination and compaction.

3.3 PREPARATION OF EXISTING GRADE

.1 Verify that grades are correct.

.1 If discrepancies occur, notify Departmental Representative and do not commence work until instructed by Departmental Representative.

.2 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.

.3 Remove debris, roots, branches, stones in excess of 50 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 75 mm above surface.

.3 Dispose of removed material off site.

.4 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 settlement.

.1 150 mm for seeded areas.

.2 135 mm for sodded areas.

.3 300 mm for flower beds.

.4 500 mm for shrub beds.

.5 Manually spread topsoil/planting soil around trees, shrubs and obstacles.

3.5 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 footprinting.

3.6 ACCEPTANCE

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

3.7 SURPLUS MATERIAL

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

3.8 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 OF SECTION

PART 1 - GENERAL

1.1 ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data.
.1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
.2 Provide product data for:
.1 Seed.
.2 Mulch.
.3 Tackifier.
.4 Fertilizer.

1.2 QUALITY ASSURANCE

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

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

1.3 SCHEDULING

.1 Schedule hydraulic seeding to coincide with preparation of soil surface.

.2 Schedule hydraulic seeding using grass mixtures between dates recommended by the Provincial Agricultural Department.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And

.2 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 pedigreed grade" in accordance with Government of Canada Seeds Act and Regulations.
.1 Grass mixture: "Certified", "Canada No. 1 or 2 Lawn Grass Mixture" in accordance with Government of Canada "Seeds Act" and "Seeds Regulations".

.1 Mixture composition:
.1 60% by weight - Kentucky bluegrass (minimum 3 varieties).
.2 20 % by weight - Fescues (80% creaping red, 20% tall).
.3 20 % by weight - perennial rye.

.2 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 Tackifier: water dilutable, liquid dispersion water soluble vegetable carbohydrate powder.

.4 Water: free of impurities that would inhibit germination and growth.

.5 Fertilizer:
.1 To Canada "Fertilizers Act" and "Fertilizers Regulations".
.2 Complete synthetic, slow release with 35% of nitrogen content in water-insoluble form.

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 Ensure areas to be seeded are moist to depth of 150 mm before seeding.

.3 Obtain Departmental Representative approval of grade and topsoil depth before starting to seed.

3.3 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.
.1 Seed: Grass Legume mixture 81.65 kg or as recommended by seed supplier.
.2 Mulch: Type I or II 1000 kg.
.3 Tackifier: 300 kg or as recommended by supplier.
.4 Water: Minimum 1000 L.
.5 Fertilizer: 50 kg of nitrogen.
.6 Lime as determined by soil analysis.

.3 Apply slurry uniformly, at optimum angle of application for adherence to surfaces and germination of seed.
.1 Using correct nozzle for application.
.2 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.

3.4 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 50 mm whenever it reaches height of 70 mm. Remove

clippings which will smother grass as directed by Departmental Representative.
.3 Fertilize seeded areas after first cutting.
.4 Control weeds by mechanical means utilizing acceptable practices.
.5 Water seeded area to maintain optimum soil moisture level for germination and continued growth of grass. Control watering to prevent washouts.

3.5 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.
.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.

3.6 MAINTENANCE DURING WARRANTY PERIOD

.1 Perform following operations from time of acceptance until end of warranty period:
.1 Repair and reseed dead or bare spots to satisfaction of Departmental Representative.
.2 Mow areas seeded, remove clippings, as directed by Departmental Representative.

3.7 CLEANING

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

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

.1 The Work to be done under this Section consists of furnishing all materials, labour, tools and equipment and performing all operations necessary for the complete reinstatement of surfaces and structures disturbed by work of this Contract.

.2 Repair damage or disturbance to surfaces, properties and structures, within limits of the Site or elsewhere on other properties occupied, traversed or otherwise used by the Contractor during the Contract period to a condition equal to or better than that before work began, at no additional cost to the Contract.

1.2 REFERENCE STANDARDS

.1 New Brunswick Department of Transportation and Infrastructure (NBDTI formally NBDOT) Standard Specifications, latest edition.

1.3 MAINTENANCE

.1 Contractor shall take care and maintain all reinstated areas until final acceptance of the work.

.2 Repair damaged areas to the approval of the Departmental Representative.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Aggregate material: as specified in Section 32 11 19.

.2 Asphalt material: as specified in Section 32 12 16.

.3 topsoil Placement & Grading: as specified in Section 32 12 16.13.

.4 Hydraulic Seeding: as specified in Section 32 92 19.16.

PART 3 - EXECUTION

3.1 GENERAL

.1 Reinstate all surfaces to lines, elevations and dimensions which existed prior to construction.

.2 Raise manhole covers and valve boxes to suit grade.

3.2 GRAVEL SURFACES

.1 Reinstate gravel surfaces by placing 200mm compacted thickness of gravel at an elevation such that gravel surface is smooth and even

with adjacent surfaces.

.2 Place and compact gravel for surfaces in accordance with the requirements of Section 32 11 19.

3.3 ASPHALT SURFACES

.1 Keep surface of asphalt paved roads and surfaces in good condition by repairing settlement of trench backfilling as described in Section 31 23 10.

.2 Carry out final reinstatement of asphalt surfaces as follows:

.1 Cut back broken edges of original pavement to full depth, in straight lines. Cut back 300mm minimum from edge of excavation to eliminate tension cracks. Clean contact surfaces and apply tack coat before placing asphalt concrete.

.2 Before placing final surface material, remove existing gravel to a depth indicated over disturbed area, grade and re- compact. Add gravel to compacted depths indicated. Compact to not less than 98% maximum dry density.

.3 Supply, place, roll and compact asphalt mixture in accordance with NBDTI Standard Specifications.

.4 Compact asphalt concrete in lifts not exceeding 50mm in thickness.

.5 Ensure finished surface is even, dense and matches grade of existing road or surface, as approved by the Departmental Representative.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

.1 This section specifies requirements for constructing precast concrete manholes, catch basins and headwalls. Work includes supply and installation of precast sections and metal castings for structure adjustments.

1.2 REFERENCES

.1 ASTM A48/A48M-03 (R2008), Specification for Gray Iron Castings.

.2 ASTM C478M-08, Specification for Precast Reinforced Concrete Manhole Sections.

.3 ASTM C 76 Reinforced concrete, cement, aggregate, mixture, and concrete test.

.4 ASTM D698-07ae1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).

.5 CAN/CSA-A23.1-04/A23.2-04(R2009), Concrete Materials and Methods for Concrete Construction.

.6 CSA A179-04(R2009), Mortar and Grout for Unit Masonry.

.7 CAN/CSA A3000-08, Cementitious Materials Compendium.

1.3 MATERIAL CERTIFICATION

.1 At least four (4) weeks prior to commencing work, submit manufacturer's test data and certification that materials meet requirements of this section. Include manufacturer's drawings, information and shop drawings where pertinent in accordance with Section 01 33 00 - Submittal Procedures.

1.4 SHOP DRAWINGS

.1 Not required.

1.5 HANDLING AND STORAGE

.1 Handle and store pipe and fittings in such manner as to avoid shock and damage. Do not use chains or cables passed through pipe bore.

.2 Store gaskets in cool location, out of direct sunlight, and away from petroleum products.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Precast manhole and catch basin sections: to ASTM C478M, circular. Top sections flat slab top type with opening offset for vertical ladder installation. Precast concrete bases to be approved by Departmental Representative.

.2 Joints:
.1 To be made watertight using rubber O-ring in wall or bituminous gaskets.
.2 Interlocking synthetic rubber links shaped to continuously fill the outer space between pipe and wall opening.

.3 Mortar:
.1 Aggregate: to CSA A179.
.2 Cement: to CAN/CSA-A3000.

.4 Adjusting rings: precast concrete to ASTM C478M.

.5 Frames, gratings, covers to dimensions as indicated and following requirements:
.1 Metal gratings and covers to bear evenly on frames. A frame with grating or cover to constitute one unit. Assemble and mark unit components before shipment.
.2 Gray iron castings: to ASTM A48.
.3 Bearing surfaces to be ground to eliminate surface imperfections.
.4 Manhole frames and covers: heavy duty municipal type for road service and as indicated on the Drawings. Cover cast without perforations and complete with two (2) 25mm square lifting holes for sanitary sewer applications.
.5 Catch basin frames and covers: minimum 400 lb. per set.

PART 3 - EXECUTION

3.1 EXCAVATION AND BACKFILL

.1 Excavate and backfill in accordance with Section 31 23 10.

.2 Obtain approval of Departmental Representative before installing, manholes, catch basins, or headwalls.

3.2 INSTALLATION

.1 Carefully inspect products for defects and remove defective products from site.

.2 Construct units in accordance with details indicated, plumb and true to alignment and grade.

.3 Complete units as pipe laying progresses.

.4 Dewater excavation as directed by Departmental Representative and remove soft and foreign material before placing concrete base.

.5 Set precast concrete base on 150mmm minimum of granular bedding compacted to 98% maximum dry density to ASTM D698.

.6 Set first ring section on precast base and make joint watertight with O-ring gaskets. Grout joints inside and out with non-shrink grout.

.7 Install gaskets as per manufacturer's instructions.

.8 Plug lifting holes with non- shrink grout.

.9 Place stub outlets at elevations and in position indicated. Provide type of gasket connection as indicated.

.10 Install benching where shown on the Drawings using concrete suitable for exposure classification C-2 as specified in CSA-A23.1.

.11 Place frame and cover or grating on top section to elevation as indicated. If adjustment required, use concrete ring. Secure frame in place with cement grout.

.12 Clean units of debris and foreign materials. Remove fins and sharp projections. Prevent debris from entering system.

3.3 TESTING

.1 Test sanitary sewer manholes and structures by performing either water testing or vacuum testing.

.2 Provide labour, equipment and materials required to perform testing.

.3 Backfill prior to testing.

.4 Notify Departmental Representative 24 hours in advance of proposed test. Do test in presence of Departmental Representative.

.5 Water testing: perform test as follows:
- .1 Plug all inlet and outlet pipes with watertight plugs.
- .2 Fill with water to top of precast sections.
- .3 Allow time for initial absorption.
- .4 Measure and record volume of water required to maintain level for one hour.
- .5 Leakage not to exceed 0.3% per hour per volume unit.
- .6 Locate and repair defects if test fails. Retest.
- .7 Repair visible leaks regardless of test results.

.6 Vacuum testing: perform test as follows:

.1 Plug all inlet and outlet pipes. Restrain plugs.
.2 Place and seal vacuum tester head on the manhole frame.
.3 Draw vacuum of 10 inches Hg on the manhole and measure the time for the vacuum to drop to 225mm Hg.
.4 Time to be not less than 45, 50, 65, and 80 seconds for manhole diameters of 1.0m, 1.25m, 1.5m and 1.8m, respectively.
.5 For manholes deeper than 6.1m, increase test times by two (2) seconds per 300mm of additional manhole depth.
.6 Locate and repair defects if test fails. Retest.
.7 Repair visible leaks regardless of test results.

END OF SECTION

1.1 List of Geotechnical Reports Available:

.1 Geotechnical Investigation Report – Asphalt Resurfacing – Fundy National Park, Alma, NB, issued by Conquest Engineering, file #20M054.01, dated January 15, 2021.

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January 15, 2021

Proposal No.: 20M054.01

Marty Thériault, P.Eng.
CBCL Limited
Via email: mtheriault@cbcl.ca

Marty;

Re: Soils Investigation – Asphalt Resurfacing – Fundy National Park, Alma, NB

At the request of CBCL Limited, Conquest Engineering (CE) a division of CBCL Limited has performed a soils investigation along the existing Service Road and Chalet Road at the Fundy National Park in Alma, NB. The purpose of the investigation was to obtain information on the subsurface conditions at the site and to provide recommendations for the reconstruction of the road.

The field investigation was carried out on November 27, 2020. A total of six (6) boreholes were drilled with a track mounted drill rig to depths ranging between 0.2 m and 1.8 m below the existing ground surface.

CBCL Limited laid out the borehole locations and picked up the coordinates in the field once drilling was completed. Borehole locations are shown on the enclosed Borehole Location Plans (Figure 1A – Service Road & Figure 1B – Chalet Road).

A CE engineer supervised the drilling and sample collection activities and logged the subsurface conditions encountered at each borehole. The boreholes were advanced vertically using 100 mm diameter solid stem augers. Soil samples were collected continuously within the overburden material using a 50 mm outside diameter split-spoon sampler. Standard Penetration Tests (SPT's) were performed and N-values recorded for each split-spoon sample obtained. The performance of the Standard Penetration Tests was based on the test method described in ASTM D1586-84. The determination of the compactness of granular soils and consistency of cohesive soils, as indicated on the Table 1, is based primarily on the results of Standard Penetration Testing.

Soil samples were returned to our laboratory for further engineering review. All remaining samples will be kept in storage for a period of two (2) months from the date of issue of this report. After this time the samples will be discarded unless we are instructed otherwise.

The principal soil strata encountered at the site are described in detail on the enclosed Borehole Records. Soil classification was based on the procedures described in ASTM D2488 (Standard Practice for Description and Identification of Soils, Visual-Manual Procedure) and limited laboratory testing. For an explanation of the descriptions used on the Borehole Records, reference should be made to the enclosed Symbols and Terms used on Borehole and Test Pit Records.

In general, the principal strata encountered at the site are as follows:

1. ASPHALT
2. Sand with silt and gravel: FILL
3. Silty/clayey SAND with gravel: (Boreholes BH-01, BH-03, BH-04, BH-05 & BH-06)
4. SAND and GRAVEL: (Boreholes BH-01, BH-03, BH-04, BH-05 & BH-06)
5. Probable bedrock: (Boreholes BH-01, BH-02, BH-03, BH-04 & BH-05)

Groundwater was not observed within the borehole depth at the time of drilling. It should be expected that the groundwater level will fluctuate due to site construction activity, seasonal weather trends or from the effects of a particular precipitation event.

For the reconstruction of Service Road (Boreholes BH-01 to BH-03) and Chalet Road (Boreholes BH-04 to BH-06), we recommend the following pavement structure options for a design traffic Equivalent Single Axial Load (ESAL) of 100,000 and over a period of 20 years.

PAVEMENT STRUCTURE – SERVICE ROAD (Boreholes BH-01 to BH-03)

Excavate down to accommodate the Pavement Structure as shown in Table 1.

Table 1: Pavement Structure – Service Road

Material	Standard Duty Pavement
Asphaltic Concrete, NBDTI Type C	60 mm
Aggregate Base (31.5 mm Minus)	150 mm
Aggregate Subbase (75 mm Minus)	300 mm

- Due to the presence of shallow bedrock, raising the grade or bedrock excavation should be considered to accommodate the proposed pavement structure. The proposed subbase layer will increase the expected life of the pavement structure by reducing the damage caused by saturated soils trapped on top of uneven bedrock surface and within the depth of influence of the traffic loads.
- Following excavation to the subgrade level we recommend that a proof-rolling operation of the subgrade take place in the presence of geotechnical personnel to identify any potential weak or yielding zones.
- Proof-rolling should be carried out with a loaded tandem truck. Any soft or yielding zones should be over-excavated as directed by geotechnical personnel and the material reinstated with approved subgrade material or the proposed subbase aggregate (75 mm minus crushed rock).
- The excavated native material (free of organics) encountered on site may be reused within the subgrade zone provided that compaction of at least 95% of the standard Proctor maximum dry density (ASTM D698) can be achieved within ±2% of the optimum moisture content.

PAVEMENT STRUCTURE – CHALET ROAD (BoreholesBH-04 to BH-06)

Excavate down to accommodate the Pavement Structure as shown in Table 2.

Table 2: Pavement Structure – Chalet Road

Material	Standard Duty Pavement
Asphaltic Concrete, NBDTI Type C	60 mm
Aggregate Base (31.5 mm Minus)	150 mm
Aggregate Subbase (75 mm Minus)	450 mm

- Following excavation to the subgrade level we recommend that a proof-rolling operation of the subgrade take place in the presence of geotechnical personnel to identify any potential weak or yielding zones.
- Proof-rolling should be carried out with a loaded tandem truck. Any soft or yielding zones should be over-excavated as directed by geotechnical personnel and the material reinstated with approved subgrade material or the proposed subbase aggregate (75 mm minus crushed rock).
- The excavated native material (free of organics) encountered on site may be reused within the subgrade zone provided that compaction of at least 95% of the standard Proctor maximum dry density (ASTM D698) can be achieved within ±2% of the optimum moisture content.

General Comments

- The subbase material should consist of 75 mm minus Crushed Rock meeting the NBDTI gradation limits as shown on Table 3.
- The base material should consist of 31.5 mm minus Crushed Rock meeting the NBDTI gradation limits as shown on Table 3.
- The base and subbase materials should be placed in lifts and compacted to a minimum of 98% of the standard Proctor corrected maximum dry density (ASTM D698).
- The lift thickness used during placement of backfill materials should be compatible with the compaction equipment and material type to ensure proper compaction throughout each lift. Generally, the maximum lift thickness should be limited to about 300 mm.
- Materials should meet the durability requirements of NBDTI Standard Specification as per Table 201-1 – Properties of Rock and Gravel Aggregate.
- The soil strata encountered at the site contain relatively high percentages of fines and, as such, these soils will be easily disturbed by construction equipment and may degrade when subjected to construction traffic or other disturbance in wet conditions. All excavations and exposed subgrades should, therefore, be maintained in a dry condition throughout construction. Any soils that become disturbed/softened during construction should be over-excavated and replaced with approved material.

Table 3: Aggregate Grading Specification
Crushed Rock Aggregates

Sieve Size	Percent Passing	
	31.5 mm minus	**75mm minus**
90 mm	-	100
75 mm	-	95 - 100
63 mm	-	85 - 100
50 mm	-	73 - 95
37.5 mm	100	58 - 87
31.5 mm	95 - 100	-
25 mm	81 - 100	-
19 mm	66 - 90	35 - 69
12.5 mm	50 - 77	-
9.5 mm	41 - 70	25 - 54
4.75 mm	27 - 54	17 - 43
2.36 mm	17 - 43	12 - 35
1.18 mm	11 - 32	8 - 28
300 µm	4 - 19	4 - 16
75 µm	0 - 7	0 - 8

Closing

This report has been prepared for the sole benefit of the Client. All information, documentation or other material contained in, attached to, or forming part of this report reflects Conquest's opinion and best judgment based on the information available to us at the time of preparation. Any use or reliance on this report by the Client in circumstances where there has been a change in site conditions or for any purpose not expressly intended by or delineated in this report shall be the sole responsibility of the Client and Conquest accepts no liability for such use or reliance. Any use or reliance on this report by any third party, without Conquest's prior express written consent, shall be the sole responsibility of that third party. Conquest accepts no liability whatsoever for such use or reliance.

The information and conclusions contained in this report are generally consistent with professional standards for engineering and scientific professionals providing similar services at the same time, in similar locations and under similar circumstances.

A geotechnical field investigation is a limited sampling of a site. Some variation between sampling locations should be expected. The conclusions presented in this report represent the technical judgment of Conquest, based on the data obtained from the work and on Conquest's understanding of the project. The data obtained by Conquest is specific to the time the work was performed at the specific testing and/or sampling locations, and can only be extrapolated to an undefined limited area surrounding these locations. The extent of the limited area depends on the soil and groundwater conditions, as well as the

history of the site reflecting natural, construction and other activities. Due to the nature of the investigation and the limited data available, Conquest cannot and does not warrant that undiscovered environmental liabilities and/or undetected subsurface conditions may not arise.

If any conditions become apparent that differ significantly from our understanding of conditions as presented in this report, we require that we be notified immediately to allow for reassessment of the conclusions provided herein. Further, if there are changes to Client's design we require that we be notified to allow for review and possible changes to our recommendations.

We trust this is the information you require at this time. If you have any questions or if we can be of any further assistance, please feel free to contact us.

Respectfully submitted,
CONQUEST ENGINEERING LTD.

Robert Y. Cyr, M.A.Sc., P.Eng.
Senior Geotechnical Engineer

Enclosed: Symbols and Terms used on Borehole and Test Pit Records
Borehole Records
Borehole Location Plans
Figure 1A - Service Road
Figure 1B - Chalet Road
Laboratory Testing – Sieve Analysis Results

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SYMBOLS AND TERMS USED ON BOREHOLE AND TEST PIT RECORDS

SOIL DESCRIPTION

Terminology describing common soil genesis:

Topsoil	variable mixture of mineral particles and organic matter
Peat	decomposing vegetative matter having fibrous and/or amorphous structure
Till	unstratified glacial deposit which may range from clay to boulders
Fill	any materials below the surface identified as placed by humans (excluding buried services)

Terminology describing soil structure:

Desiccated	having visible signs of weathering by oxidation of clay minerals, shrinkage cracks, etc.
Fissured	having cracks, and hence a blocky structure
Varved	composed of regular alternating layers of silt and clay
Stratified	composed of alternating successions of different soil types, e.g. silt and sand
Layer	>75 mm
Seam	2 mm to 75 mm
Parting	< 2 mm
Well Graded	having wide range in grain sizes and substantial amounts of all intermediate particle sizes
Uniformly Graded	predominantly of one grain size

Terminology describing soils on the basis of grain size and plasticity is based on the ASTM D2488 – Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). The classification excludes particles larger than 76 mm (3 inches). This system provides a group symbol (e.g. SM) and group name (e.g. silty sand) for identification.

Terminology describing materials outside the USCS, (e.g. particles larger than 76 mm, visible organic matter, construction debris) is based upon the proportion of these materials present:

Trace, or occasional	Less than 10%
Some	10-20%
Frequent	Greater than 20%

The standard terminology to describe cohesionless soils includes the compactness as determined by laboratory test or by the Standard Penetration Test 'N' – value.

Relative Density	'N' Value	Compactness %
Very Loose	<4	<15
Loose	4-10	15-35
Compact	10-30	35-65
Dense	30-50	65-85
Very Dense	>50	>85

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The standard terminology to describe cohesive soils includes the consistency, which is based on undrained shear strength as measured by in-situ vane tests, penetrometer tests, unconfined compression tests, or occasionally by standard penetration tests.

Consistency	Undrained Shear Strength (Su)		'N' Value
	Kips/sq.ft.	KPa	
Very Soft	< 0.25	< 12.5	< 2
Soft	0.25 – 0.5	12.5 – 25	2 – 4
Firm	0.5 – 1.0	25 – 50	4 – 8
Stiff	1.0 – 2.0	50 – 100	8 – 15
Very Stiff	2.0 – 4.0	100 – 200	15 – 30
Hard	> 4.0	> 200	> 30

ROCK DESCRIPTION

Rock Quality Designation (RQD)

The classification is based on a modified core recovery percentage in which all pieces of sound core over 100 mm long are counted as recovery. The smaller pieces are considered to be due to close shearing, jointing, faulting, or weathering in the rock mass and are not counted. RQD was originally intended to be done on N-size (45 mm) core; however, it can be used on different core sizes if the bulk of the fractures caused by drilling stresses are easily distinguishable from in situ fractures.

RQD	ROCK QUALITY
90 – 100	Excellent, intact, very sound
75 – 90	Good, massive, moderately jointed or sound
50 – 75	Fair, blocky and seamy, fractured
25 – 50	Poor, shattered and very seamy or blocky, severely fractured
0 – 25	Very poor, crushed, very severely fractured

Terminology describing rock mass:

Spacing (mm)	Bedding, Laminations, Bands	Discontinuities
2000 – 6000	*Very Thick*	*Very Wide*
600 – 2000	*Thick*	*Wide*
200 – 600	*Medium*	*Moderate*
60 – 200	*Thin*	*Close*
20 – 60	*Very Thin*	*Very Close*
< 20	*Laminated*	*Extremely Close*
< 6	*Thinly Laminated*	

Strength Classification	Uniaxial Compressive Strength (MPa)
Very Weak	1 – 5
Weak	5 – 25
Medium Strong	25 – 50
Strong	50 – 100
Very Strong	100 – 250
Extremely Strong	> 250

Terminology describing weathering:

Slight - Weathering limited to the surface of major discontinuities. Typically iron stained.
Moderate - Weathering extends throughout rock mass. Rock is not friable.
High - Weathering extends throughout rock mass. Rock is friable.

STRATA PLOT

Strata plots symbolize the soil or bedrock description. They are combinations of the following basic symbols:

Boulders Cobbles Gravel | Sand | Silt | Clay | Organics | Asphalt | Concrete | Fill | Igneous Bedrock | Metamorphic Bedrock | Sedi-mentary

WATER LEVEL MEASUREMENT

Borehole or Standpipe

Piezometer

SAMPLE TYPE AND/OR FIELD TESTS

SS	Split Spoon Sample (obtained by performing the Standard Penetration Test)	AS	Auger Sample
		BS	Bulk Sample
		WS	Wash Sample
ST	Shelby Tube or Thin Wall Tube	HQ, NQ, BQ, etc. Rock Core Samples (obtained with the use of standard size diamond drilling bits)	
PS	Piston sample		
DC	Dynamic Cone Penetration		
FSV	Field Shear Vane		

N- VALUE

Numbers in this column are the results of the SPT (Standard Penetration Test): the number of blows of a 140 pound (64kg) hammer falling 30 inches (760 mm), required to drive a 2 inch (50.8 mm) O.D. split spoon sampler one foot (305 mm) into the soil. For split spoon samples where insufficient penetration was achieved and 'N' values cannot be presented, the abbreviation SSR (Split Spoon Refusal) will appear in place of a numerical value.

OTHER TESTS

Symbols in this column indicate that the following laboratory tests have been carried out and the results are presented separately.

S	Sieve analysis	H	Hydrometer analysis
G_s	Specific gravity of soil particles	γ	Unit weight
k	Permeability	C	Consolidation
	Single packer permeability test; test interval from depth shown to bottom of borehole	CD	Consolidated drained triaxial
		CU	Consolidated undrained triaxial with pore pressure measurements
	Double packer permeability test; Test interval as indicated	UU	Unconsolidated undrained triaxial
		DS	Direct shear
	Falling head permeability test using casing	Q_u	Unconfined compression
		I_p	Point Load Index (I_p on Borehole Records equals I_p (50); the index corrected to a reference diameter of 50 mm)
	Falling head permeability test using well point or piezometer	MSV	Laboratory Miniature Shear Vane

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BOREHOLE RECORD

Project Name: Asphalt Resurfacing - Fundy National Park
Project No.: 20M054.01
Client: CBCL Limited
Location: Alma, NB
Water Level: Not observed at the time of drilling

BH - 01
Date Drilled: Nov. 27, 2020
Page: 1 of 1
Datum: Geodetic

Depth (m)	Water Level (m)	Sample Type	Sample Number	N Value or RQD %	Recovery (mm)	Symbols	SOIL AND/OR ROCK DESCRIPTION	Elevation/Depth (m)	SPT N-Value ■Blows/300mm ■ 10 20 30 40	Moisture Content (%) ○Wp |---O---| WL○ 20 40 60 80
ft m								39.9		
0 0							40 mm thick ASPHALT layer	0.0		
							Compact grey sand with silt and gravel: FILL			
1		SS	1	22	350				■22	
								39.5		
							Loose to compact brown silty/clayey SAND with gravel	0.4		
2		SS	2	SRR	200					
								39.0		
3							Compact grey SAND and GRAVEL	0.9		
1								38.9		
							End of Borehole Practical refusal to further penetration of the splitspoons Probable bedrock	1.0		
4										
5										
6										

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BOREHOLE RECORD

Project Name: Asphalt Resurfacing - Fundy National Park
Project No.: 20M054.01
Client: CBCL Limited
Location: Alma, NB
Water Level: Not observed at the time of drilling

BH - 02
Date Drilled: Nov. 27, 2020
Page: 1 of 1
Datum: Geodetic

Depth (m)	Water Level (m)	Sample Type	Sample Number	N Value or RQD %	Recovery (mm)	Symbols	SOIL AND/OR ROCK DESCRIPTION	Elevation/Depth (m)	SPT N-Value ▪Blows/300mm ▪ 10 20 30 40	Moisture Content (%) ○Wp |---O---| WL○ 20 40 60 80
ft m								42.2		
0 0							40 mm thick ASPHALT layer	0.0		
		SS	1	SSR	150		Compact grey sand with silt and gravel: FILL	42.0		
							End of Borehole Practical refusal to further penetration of the augers Probable bedrock	0.2		
1										
2										
3										
1										
4										
5										
6										

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BOREHOLE RECORD

Project Name: Asphalt Resurfacing - Fundy National Park
Project No.: 20M054.01
Client: CBCL Limited
Location: Alma, NB
Water Level: Not observed at the time of drilling

BH - 03
Date Drilled: Nov. 27, 2020
Page: 1 of 1
Datum: Geodetic

Depth (m)	Water Level (m)	Sample Type	Sample Number	N Value or RQD %	Recovery (mm)	Symbols	SOIL AND/OR ROCK DESCRIPTION	Elevation/Depth (m)	SPT N-Value ▪Blows/300mm ▪ 10 20 30 40	Moisture Content (%) ○Wp |---O---| WL○ 20 40 60 80
ft m								40.6		
0 0							50 mm thick ASPHALT layer	0.0		
							Compact grey sand with silt and gravel: FILL			
1		SS	1	27	400				27	
								40.2		
							Loose to compact brown silty/clayey SAND with gravel	0.4		
2										
								39.9		
							Very dense grey SAND and GRAVEL	0.7		
		SS	2	94	180					
3										
1								39.6		
							End of Borehole Practical refusal to further penetration of the augers Probable bedrock	1.0		
4										
5										
6										

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BOREHOLE RECORD

Project Name: Asphalt Resurfacing - Fundy National Park
Project No.: 20M054.01
Client: CBCL Limited
Location: Alma, NB
Water Level: Not observed at the time of drilling

BH - 04
Date Drilled: Nov. 27, 2020
Page: 1 of 1
Datum: Geodetic

Depth (m)	Water Level (m)	Sample Type	Sample Number	N Value or RQD %	Recovery (mm)	Symbols	SOIL AND/OR ROCK DESCRIPTION	Elevation/Depth (m)	SPT N-Value ▪Blows/300mm ▪ 10 20 30 40	Moisture Content (%) ○Wp |---O---| WL○ 20 40 60 80
ft m								39.4		
0 0							20 mm thick ASPHALT layer	0.0		
							Compact grey sand with silt and gravel: FILL			
1		SS	1	6	350			39.1	6	
							Loose reddish brown silty/clayey SAND with gravel	0.3		
2								38.8		
		SS	2	SSR	50		Compact grey SAND and GRAVEL	0.6		
								38.6		
							End of Borehole Practical refusal to further penetration of the augers Probable bedrock	0.8		
3 1										
4										
5										
6										

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BOREHOLE RECORD

Project Name: Asphalt Resurfacing - Fundy National Park
Project No.: 20M054.01
Client: CBCL Limited
Location: Alma, NB
Water Level: Not observed at the time of drilling

BH - 05
Date Drilled: Nov. 27, 2020
Page: 1 of 1
Datum: Geodetic

Depth (m)	Water Level (m)	Sample Type	Sample Number	N Value or RQD %	Recovery (mm)	Symbols	SOIL AND/OR ROCK DESCRIPTION	Elevation/Depth (m)	SPT N-Value ▪Blows/300mm ▪ 10 20 30 40	Moisture Content (%) ○Wp |---O---| WL○ 20 40 60 80
ft m								39.8		
0 0							40 mm thick ASPHALT layer	0.0		
							Compact grey sand with silt and gravel: FILL			
1		SS	1	19	330				19	
								39.3		
							Loose to compact reddish brown silty/clayey SAND with gravel	0.5		
2										
		SS	2	50	250				50	
								38.9		
3							Compact grey SAND and GRAVEL	0.9		
1								38.7		
							End of Borehole Practical refusal to further penetration of the augers Probable bedrock	1.1		
4										
5										
6										

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BOREHOLE RECORD

Project Name: Asphalt Resurfacing - Fundy National Park
Project No.: 20M054.01
Client: CBCL Limited
Location: Alma, NB
Water Level: Not observed at the time of drilling

BH - 06
Date Drilled: Nov. 27, 2020
Page: 1 of 1
Datum: Geodetic

Depth (m)	Water Level (m)	Sample Type	Sample Number	N Value or RQD %	Recovery (mm)	Symbols	SOIL AND/OR ROCK DESCRIPTION	Elevation/Depth (m)	SPT N-Value ▪Blows/300mm ▪ 10 20 30 40	Moisture Content (%) ○Wp |---O---| WL○ 20 40 60 80
ft m								39.5		
0 0							50 mm thick ASPHALT layer	0.0		
							Compact grey sand with silt and gravel: FILL			
1		SS	1	16	200				16	
								39.1		
							Loose reddish brown silty/clayey SAND with gravel	0.4		
2										
3		SS	2	7	150				7	
1										
4								38.1		
							Compact grey SAND and GRAVEL	1.4		
5		SS	3	23	350				23	
								37.7		
6							End of Borehole	1.8		

BOREHOLE LOCATION PLAN
SURFACE RESURFACING
SERVICE ROAD
FUNDY NATIONAL PARK, ALMA, NB

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Moncton
Fredericton
Bedford

DATE:	SCALE:
2021-01-07	NTS
PROJECT No.:	**FIGURE:**
20M054.01	1-A

BOREHOLE LOCATION PLAN
SURFACE RESURFACING
CHALET ROAD
FUNDY NATIONAL PARK, ALMA, NB

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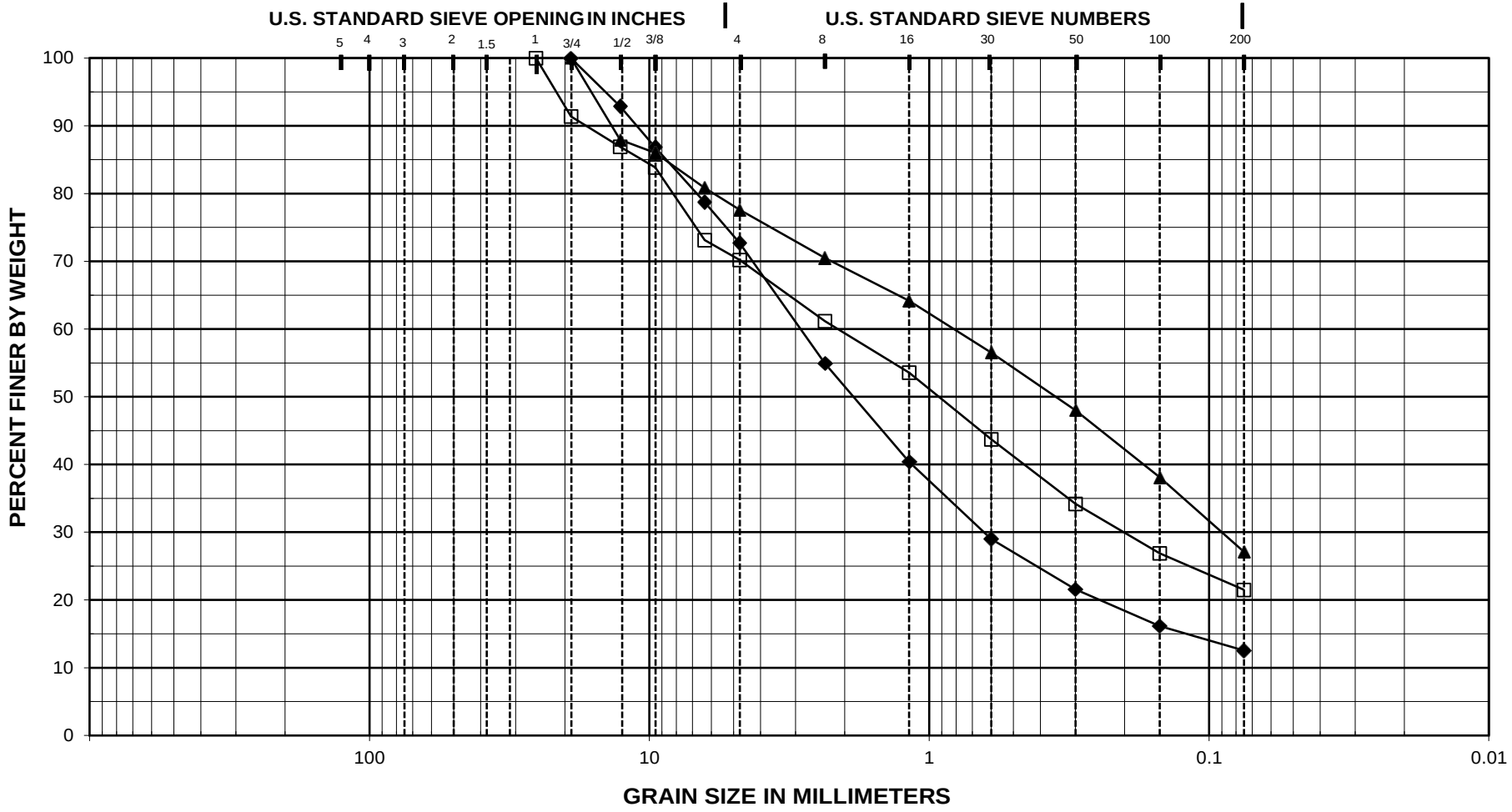
Bedford

DATE:	SCALE:
2021-01-07	NTS
PROJECT No.:	**FIGURE:**
20M054.01	1-B



	Sample No.	Depth (m)	Classification	w%	Cu	Cc	% Gravel	% Sand	% Silt and Clay
◆	BH3-1A	0.2	sand with silty and gravel: FILL	3%	NA	NA	27.3	60.3	12.5%
□	BH4-1B	0.4	Silty/clayey SAND with gravel	26%	NA	NA	29.8	49.0	21.2%
▲	BH 6-2	0.9	Silty/clayey SAND with gravel	21%	NA	NA	22.4	51.0	26.6%
■									
○									

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Project: Asphalt Resurfacing - Fundy National Park, Alma, NB

Job No.: 20M054.01 **Location:**

Date: December 2, 2020 **Notes:**

SIEVE ANALYSIS

1.1 List of Environmental Reports Available:

.1 Geotechnical Investigation Report – Preapproved Routine Impact Assessment Geotechnical and Environmental Investigations, Parks Canada National Office, IAA 2019.