ISSUED FOR TENDER

For

Recapitalization of Point Wolfe Stormwater System and Bank Stabilization

Parks Canada Agency

PCA Project No.: 1314
Date: March 2017

Specifications
Issued for Tender

Parks Canada Agency

Recapitalization of Point Wolfe Stormwater System and Bank Stabilization

Project No. 1314

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GEMTEC Limited

DRAWING LIST

END

PART 1 GENERAL

1.1 Work Covered By Contract Documents

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

1.2 Contract Method

.1 Construct Work under a unit price contract.

1.3 Work by Others

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

1.4 Work Sequence

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

1.5 Contractor Use of Premises

.1 Limit use of premises for Work, to allow:
.1 Work by Parks Canada employees.
.2 Parks Canada will accommodate the Contractor with a location for their construction trailer.

.2 Storage areas for Contractor’s equipment and materials shall be located within the work area for the duration of the work. Locations for equipment and materials storage areas shall be approved by the Departmental Representative.

.3 Disposal of waste materials shall be outside the Park Boundaries at an approved facility/site. Locations and costs associated with waste disposal shall be the responsibility of the Contractor.

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

1.6 Summary of Work

.1 The tasks associated with the upgrade to the site drainage and Stormwater system and slope stabilization are summarized as follows. Details of the requirements are provided in the project technical specifications and drawings.

.1 Provide and implement designated controls for environmental aspects of the work.
.2 Clearing, grubbing and ditching.
.3 Upgrading the discharge points of several Stormwater pipes.
.4 Install perforated drains.
.5 Install new catch basins and new Stormwater pipes.
.6 Stabilize a slope.
.7 Complete all restoration.
.8 Protection of all cultural and archaeological resources.

1.7 Existing Services

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

.2 Protect, relocate or maintain existing active services.

1.8 Documents Required

.1 Maintain at job site, one copy each document as follows:

.1 Contract Drawings.
.2 Specifications.
.3 Addenda.
.4 Reviewed Shop Drawings.
.5 List of Outstanding Shop Drawings.
.6 Change Orders.
.7 Other Modifications to the Contract.
.8 Field Test Reports.

.9 Copy of Approved Work Schedule.
.10 Health and Safety Plan and Other Safety Related Documents.
.11 Other documents as specified.
.12 Construction Schedule
.13 Environmental Control Plan (ECP)

END

PART 1 GENERAL

1.1 Access and Egress

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

1.2 Use of Site and Facilities

.1 Execute work with least possible interference or disturbance to of premises. Make arrangements with Departmental Representative to facilitate work as stated.

.2 Provide for personnel and vehicle access.

1.3 Alterations, Additions or Repairs

.1 Execute work with least possible interference or disturbance to premises. Arrange with Departmental Representative to facilitate execution of work.

.2 Any pavement removed in 2017 shall be replaced in 2017, otherwise the Contractor will bear the cost to maintain these areas outside of paving cut-off dates until paving can resume in 2018.

.3 All asphalt restoration must be completed no later than November 15, 2017.

1.4 Existing Services

.1 Notify Departmental Representative and utility companies of intended interruption of services and obtain required permission.

.2 Provide for Parks Canada personnel, pedestrian and vehicular traffic.

.3 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

1.5 Special Requirements

.1 Work outside of normal working hours will require 48 hours written notice to the Departmental Representative. There are restrictions on working on nights, weekends or statutory holidays unless 48 hours written notice is given to the Departmental Representative and approved by Parks Canada.

.2 Submit schedule in accordance with Section 01 32 16.07 - Construction Progress Schedule - Bar (GANTT) Chart.

.3 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.

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

.5 No work, encroachment or construction vehicles are permitted outside of the work areas shown on the drawings.

1.6 National Parks Act

.1 The requirements and regulations made under the National Parks Act shall apply to this project.

.2 A copy of this Act may be obtained by contacting the Departmental Representative.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 GENERAL

1.1 Measurement

.1 All measurement shall be along a horizontal plane unless otherwise indicated.

1.2 Pay Items

.1 All items in this contract will be paid for by costs included in the unit prices and one Lump Sum Payment for costs not included in these items.

.2 Bid Item 1 – Sections 01 35 00.06, 01 35 43, 01 52 00, 31 25 00, and 35 42 19.
- .1 Terms of Payment: Lump Sum
- .2 This Item includes:
  - .1 Mobilization and Demobilization for the project.
  - .2 Construction Facilities.
    - .1 Construction Site Trailer.
  - .3 Common Contract Requirements:
    - .1 Insurance & Bonding
    - .2 Municipal Fees, Permits, etc.
    - .3 Inspection & Testing
    - .4 Commissioning
    - .5 Protection of all cultural and archaeological resources.

.3 Bid Item 2 – Section 01 35 43 – Environmental Procedures
- .1 Terms of Payment: Lump Sum
- .2 This Item includes:
  - .1 Environmental Procedures.
    - .1 Installation and general maintenance of all erosion control measures or as directed by Departmental Representative.

.4 Bid Items 3 and 4 - Section 31 11 00 – Clearing and Grubbing

.1 Clearing will be measured in hectares by plan area within limits indicated or as directed by Departmental Representative.

.2 Grubbing will be measured in hectares by plan area within the limits indicated or as directed by the Departmental Representative.

.5 Bid Item 5 - Section 31 23 10 - Ditching:

.1 Unit of Measurement: Linear metre.

.2 Method of Measurement: The length shall be measured jointly with the Departmental Representative using a measuring wheel or approved alternative method.

.3 This item includes all equipment, labour and incidentals necessary to complete the ditching and swale construction as is dictated on the drawings.

.6 Bid Item 6 - Section 31 32 19 - Geotextiles:

.1 Unit of Measurement: Square metre in place.

.2 This item includes: supply and installation of geotextile and shall include all equipment, labour and incidentals necessary to complete the work as indicated on the drawings.

.7 Bid Items 7 and 8 - Section 31 37 00 – Rip Rap:

.1 Unit of Measurement: Square metres in place.

.2 This item includes: supply and installation of Rip Rap and shall include all equipment, labour and incidentals necessary to complete the work as indicated on the drawings.

.8 Bid Item 9 – Section 31 23 33 – Excavating, Trenching, and Backfilling – Common Back Fill

.1 Unit of measure: cubic metres in place.

.2 Method of Measurement: from site measurements.

.3 This item includes: supply, haulage, placement and compaction of granular materials to the limits and at the locations indicated on the drawings.

.9 Bid Item 10 - Section 32 11 16.01 – Granular Sub-base:

.1 Unit of Measurement: cubic metres in place.

.2 Method of Measurement: site measurements.

.3 This item includes: supply, haulage, placement and compaction of granular materials to the

limits and at the locations indicated on the drawings.

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

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

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

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

.4 There shall be no payment for areas hydroseeded and mulched outside the construction limits unless approved by the Departmental Representative.

.14 Bid Item 15 – Section 32 93 10 – Trees, Shrubs and Ground Cover Planting.
.1 Unit of measurement: Each.
.2 Method of measurement: For each shrub planted.
.3 Payment for this item includes:
.1 Supply of shrubs and planting soil, as required.
.2 Supply of supporting stakes, grey wires, clamps, anchors, collars, and trunk protection materials.
.3 Supply of mulch, and fertilizer.
.4 Maintenance during warranty period.

.15 Bid Item 16,17, and 18 - Section 32 05 14 – Manhole and Catch Basin structures:
.1 Unit of Measurement: Each.
.2 Unit of Measurement: for each structure installed.
.3 Excavation, supply and placement of bedding and backfill material, and disposal of all old fill and existing structure, as well as any extra excavated material required to install new structure.
.4 Supply and placement of new structure, including frame, grate, restraining straps, adjustment riser, outlet screen.

.16 Bid Items 19, 20, 21, 22, 23, 24, and 25 - Section 33 41 00 – Storm Utility Drainage Piping (Various Sizes and Types, including Temporary Water Control Works):
.1 Unit of Measurement: metre (m) for each size and type of pipe.
.2 Method of Measurement: along centreline of new pipe, from end to end of pipe, as laid and as accepted by the Departmental Representative.
.3 Payment for this item includes:
.1 Dewatering of site.
.2 Supply and placement of bedding and backfill material, and disposal of all old fill and pipe material, as well as any extra excavated material required to install new pipe.
.3 Supply and placement of new pipe.
.4 Sediment Control Fence

.5 Straw bale Flow Checks
.6 Dewatering
.7 Inlet or outlet grates.
.8 All other costs not included with other units in this contract.
.1 Communications Conduit within the Period Site (100mm).

.17 Bid Item 26 – Section 33 41 00 – Storm Utility Drainage Piping – Flushing, Cleaning, Video Inspection:
.1 Unit or Measurement: Hour for time span of service.
.2 Method of Measurement: Time as accepted by the Departmental Representative.
.3 Payment for this item includes:
.1 All equipment required to complete the work of cutting roots, flushing and cleaning of pipes and catch basins/manholes
.2 All equipment to provide video inspection including reports and data storage devices.
.3 Pressure flushing of existing storm drain, vacuuming of debris from manholes and confirmation of removal with a video inspection.
.4 Video inspection of new storm pipe after installation.

.18 All and any items not specifically included in the Measurement for Payment and Pay Item List are considered incidental to the work and are to be included in the tendered price for related work.

PART 2

Products 2.1

NOT USED

PART 3

Execution 3.1

NOT USED

END

PART 1 GENERAL

1.1 Administrative

.1 The Contractor shall Schedule and administer project meetings throughout the progress of the work at the call of Departmental Representative.

.2 The Contractor shall prepare agenda for meetings.

.3 The Contractor shall Distribute written notice of each meeting four days in advance of meeting date to Departmental Representative.

.4 The Contractor shall provide physical space or coordinate with the Departmental Representative use of Parks Canada meeting room and make arrangements for meetings.

.5 The Contractor shall preside at meetings.

.6 The Contractor shall record the meeting minutes using Parks Canada format. Include significant proceedings and decisions. Identify actions by parties.

.7 The Contractor shall Reproduce and distribute copies of minutes within three days after meetings and transmit to meeting participants, affected parties not in attendance and the Departmental Representative.

.8 Representatives of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

1.2 Preconstruction Meeting

.1 Within 15 days after award of Contract, The Contractor shall request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

.2 Senior representatives of Departmental Representative, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.

.3 The Contractor shall establish time and location of meeting and notify parties concerned minimum 5 days before meeting.

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

.5 Agenda to include:

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

1.3 Progress Meetings

.1 During course of Work schedule progress meetings bi-weekly.

.2 Contractor, major Subcontractors involved in Work and Departmental Representative are to be in attendance.

.3 Notify parties minimum 7 days prior to meetings.

.4 Record minutes of meetings using Parks Canada template and circulate to attending parties and affected parties not in attendance within 4 days after meeting.

.5 Agenda to include the following:

- .1 Review, approval of minutes of previous meeting.
- .2 Review of Work progress since previous meeting.
- .3 Field observations, problems, conflicts.
- .4 Problems which impede construction schedule.
- .5 Review of off-site fabrication delivery schedules.
- .6 Corrective measures and procedures to regain projected schedule.
- .7 Revision to construction schedule.
- .8 Progress schedule, during succeeding work period.
- .9 Review submittal schedules: expedite as required.
- .10 Maintenance of quality standards.
- .11 Review proposed changes for effect on construction schedule and on completion date.
- .12 Other business.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END

PART 1 GENERAL

1.1 Definitions

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

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

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

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

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

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

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

.8 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and

controlling activities and is used as basis for decision making throughout project life cycle.

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

1.2 Requirements

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

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

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

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

1.3 Action and Informational Submittals

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

.2 Submit to Departmental Representative within 10 working days of Award of Contract, Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.

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

1.4 Master Plan

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

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

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

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

1.5 Project Schedule

.1 Develop detailed Project Schedule derived from Master Plan.

1.6 Project Schedule Reporting

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

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

1.7 Project Meetings

.1 Contractor to provide hard and electronic copies of updated schedule a minimum of two (2) days prior to meeting.

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

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

PART 2 PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 Execution

3.1 NOT USED

END

PART 1 GENERAL

1.1 Request for an Alternate Product

.1 After contract award, the Contractor is to prepare and submit any request for use of an alternate product to the Departmental Representative for review and approval. Submission request to include complete product data, including drawings, description of product, fabrication details and installation procedures.

.2 The submission request is to include a detailed comparison of the proposed product with the specified product and outline the advantages, of the alternate product, to Parks Canada.

.3 The submission request is to include any impacts to schedule and costs.

1.2 Administrative

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

.2 This section specifies general requirements and procedures for Contractor’s submissions of shop drawings, product data, samples and mock-ups to the Departmental Representative for review. Additional specific requirements for submissions are specified in individual sections.

.3 Do not proceed with Work until relevant submissions are reviewed by the Departmental Representative.

.4 Present shop drawings, product data and samples in SI Metric units.

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

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

.7 Notify the Departmental Representative, in writing, at the time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

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

.9 Make any changes which Departmental Representative may require consistent with Contract Documents and resubmit as directed by the Departmental Representative.

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

1.3 Submission Requirements

.1 Coordinate each submission with requirements of work and Contract Documents.
Individual submissions will not be reviewed until all related information is available.

.2 Allow 7 days for Departmental Representative's review of each submission.

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

.4 Make changes in submissions as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.

.5 Accompany submissions with transmittal letter, in duplicate, containing:
- .1 Date.
- .2 Project title and number.
- .3 Contractor's name and address.
- .4 Identification and quantity of each shop drawing, product data and sample.
- .5 Other pertinent data.
- .6 Submissions include:
  - .1 Date and revision dates.
  - .2 Project title and number.
  - .3 Name and address of:
    - .1 Subcontractor.
    - .2 Supplier.
    - .3 Manufacturer.
    - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
    - .5 Details of appropriate portions of Work as applicable:
      - .1 Fabrication.
      - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
      - .3 Setting or erection details.
      - .4 Capacities.
      - .5 Performance characteristics.
      - .6 Standards.
      - .7 Operating weight.
      - .8 Wiring diagrams.
      - .9 Single line and schematic diagrams.
      - .10 Relationship to adjacent work.

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

1.4 Shop Drawings

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts,

brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

.2 Where necessary or requested by the Departmental Representative, submit drawings stamped and signed by professional engineer registered or licensed in the Province of New Brunswick.

.3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.4 Submit electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.

.5 Cross-reference shop drawing information to applicable portions of Contract Documents.

1.5 Product Data

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

1.6 Samples

.1 Samples: examples of materials, equipment, quality, finishes, workmanship.

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

1.7 Test Reports

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

1.8 Certificates

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

1.9 Manufacturer’s Instructions

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

1.10 Review

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

corrections are made, electronic copies will be returned and fabrication and installation or Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

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

.1 This review shall not mean that Departmental Representative approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.

.2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

1.11 Photographic Documentation

.1 Submit electronic copy of colour digital photography in jpg format, fine resolution, monthly with progress statement as directed by Departmental Representative.

.2 Project identification: name and number of project and date of exposure indicated.

.3 Number of viewpoints:

.1 Viewpoints and their location as determined by Departmental Representative.

.4 Frequency of photographic documentation: as directed by Departmental Representative.

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

1.12 Certificates and Transcripts

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

PART 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END

PART 1 - GENERAL

1.1 Related Requirements

.1 Section 01 14 00 – Work Restrictions.

.2 Section 01 56 00 – Temporary Barriers and Enclosures

1.2 Protection Of Public Traffic

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

.2 When working on travelled way:
- .1 Place equipment in position to minimize interference and hazard to travelling public.
- .2 Keep equipment units as close together as working conditions permit and preferably on same side of travelled way.
- .3 Do not leave equipment on travelled way overnight.

.3 Close lanes of road only after receipt of written approval from Departmental Representative.
- .1 Before re-routing traffic erect suitable signs and devices to Work Area Traffic Control Manual.

.4 Provide signage at entry kiosk to inform public that campground is closed for construction work.

.5 Provide and maintain road access and egress to property fronting along Work under Contract, except where other means of road access exist that meet approval of Departmental Representative.

1.4 Informational And Warning Devices

.1 Provide and maintain signs and other devices required to indicate construction activities or other temporary and unusual conditions resulting from Project Work which requires road user response.

.2 Supply and erect signs, delineators, barricades and miscellaneous warning devices to Work Area Traffic Control Manual.

.3 Place signs and other devices in locations recommended in Work Area Traffic Control Manual.

.4 Meet with Departmental Representative prior to commencement of Work to prepare list of signs and other devices required for project. If situation on site changes, revise list to approval of Departmental Representative.

.5 Continually maintain traffic control devices in use:

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

.2 Remove or cover signs which do not apply to conditions existing from day to day.

1.5 CONTROL OF PUBLIC TRAFFIC

.1 Provide competent flag personnel, trained in accordance with, and properly equipped to Work Area Traffic Control Manual for situations as follows:

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

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

.3 When workmen or equipment are employed on travelled way over brow of hills, around sharp curves or at other locations where oncoming traffic would not otherwise have adequate warning.

.4 Where temporary protection is required

while other traffic control devices are being erected or taken down.

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

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

.7 Delays to public traffic due to contractor's operators: 15 minutes maximum.

1.6 OPERATIONAL REQUIREMENTS

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

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

PART 1 GENERAL

1.1 References

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

.2 Province of New Brunswick.
.1 Occupational Health and Safety Act (most recent version).

1.2 Definitions

.1 COSH: Canada Occupational Health and Safety Regulations made under Part II of the Canada Labour Code.

.2 Competent Person: means a person who is:
.1 Qualified by virtue of personal knowledge, training and experience to perform assigned work in a manner that will ensure the health and safety of persons in the workplace, and;
.2 Knowledgeable about the provisions of occupational health and safety statutes and regulations that apply to the Work and;
.3 Knowledgeable about potential or actual danger to health or safety associated with the Work.

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

.4 PPE: personal protective equipment

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

1.3 Submittals

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

.2 Submit site-specific Health and Safety Plan prior to commencement of Work.

.1 Submit within 10 work days of notification of Bid Acceptance. Provide 3 copies.

.2 Departmental Representative will review Health and Safety Plan and provide comments.

.3 Revise the Plan as appropriate and resubmit within 5 work days after receipt of comments.

.4 Departmental Representative's review and comments made of the Plan shall not be construed as an endorsement, approval or implied warranty of any kind by Canada and does not reduce Contractor's overall responsibility for Occupational Health and Safety of the Work.

.5 Submit revisions and updates made to the Plan during the course of Work.

.3 Submit name of designated Health & Safety Site Representative and support documentation specified in the Safety Plan.

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

.5 Submit copy of Letter in Good Standing from Provincial Workers Compensation or other department of labour organization.

.1 Submit update of Letter of Good Standing whenever expiration date occurs during the period of Work.

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

.7 Submit copies of incident reports.

.8 Submit WHMIS MSDS - Material Safety Data Sheets.

1.4 Compliance Requirements

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

.2 Comply with Canada Labour Code - Part II (entitled Occupational Health and Safety) and the Canada Occupational Health and Safety Regulations (COSH) as well as any other regulations made pursuant to the Act.

.1 The Canada Labour Code can be viewed at: www.http://laws.justice.gc.ca/en/L-2/

.2 COSH can be viewed at: www.http://laws.justice.gc.ca/eng/SOR-86-304/ne.html

.3 In case of conflict or discrepancy between above specified requirements, the more stringent shall apply.

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

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

1.5 Responsibility

.1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons and environment adjacent to the site to extent that they may be affected by conduct of Work.

.2 Comply with and enforce compliance by all workers, sub-contractors and other persons granted access to Work Site with safety requirements of Contract Documents, applicable federal, provincial, and local by-laws, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.6 Site Control and Access

.1 Control the Work and entry points to Work Site. Approve and grant access only to workers and

authorized persons. Immediately stop and remove non-authorized persons.

.1 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 premises 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.

.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 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 Departmental Representative will assist in locating address if needed.

1.9 Permits

.1 Post permits, licenses and compliance certificates, at Work Site.

.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 and its site.

.2 Carryout 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.

.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 Known latent site and environmental conditions:

.1 Working near watercourse.

.2 Working on steep or uneven ground.

.3 Electrical safety required.

.4 Working with adverse weather conditions.

.5 Working near trench excavations.

.6 Working near Public traffic.

.7 Working near trees and overhead obstructions.

.8 Working near buried utilities.

.9 Working near heavy moving machinery.

.2 Facility on-going operations:

.1 The Contractor will co-operate with users of existing facilities. Maintain access to the existing park facilities and consult with the Departmental Representative for site access limitations.

.3 Should interference occur, take directions from Departmental Representative.

.4 Do not unreasonably encumber site with materials.

.5 Move stored products or equipment which interfere with operations.

.6 Comply with all regulations and authorities having jurisdiction over the work.

.2 Above items shall not be construed as being complete and inclusive of potential health and safety hazards 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.

.1 Contractor to provide signed copy of Parks Canada form titled “Attestation and Proof of Compliance with Occupational Health and Safety (OHS)” as a condition of gaining access to the work place.

.2 Health and Safety Plan shall include the following components:

.1 List of health risks and safety hazards identified by hazard assessment.

.2 Control measures used to mitigate risks and hazards identified.

.3 On-site Contingency and Emergency Response Plan as specified below.

.4 On-site Communication Plan as specified below.

.5 Name of Contractor's designated Health & Safety Site Representative and information showing proof of his/her competence and reporting relationship in Contractor's company.

.6 Names, competence and reporting relationship of other supervisory personnel used in the Work for occupational health and safety purposes.

.3 On-site Contingency and Emergency Response Plan shall include:

.1 Operational procedures, evacuation measures and communication process to be implemented in the event of an emergency.

.2 Evacuation Plan: site plan layouts showing marshalling areas. Details on alarm notification methods, location of firefighting equipment and other related data.

.3 Name, duties and responsibilities of persons designated as Emergency Warden(s) and deputies.

.4 Emergency Contacts: name and telephone number of officials from:

.1 General Contractor and subcontractors.

.2 Pertinent Federal and Provincial Departments and Authorities having jurisdiction.

.3 Local emergency resource organizations.

.5 Harmonize Plan with Facility's Emergency Response and Evacuation Plan. Departmental Representative will provide pertinent data including name of PWGSC and Facility Management contacts.

.4 On-site Communication Plan:

.1 Procedures for sharing of work related safety information to workers and subcontractors, including emergency and evacuation measures.

.2 List of critical work activities to be communicated with Facility Manager which have a risk of endangering health and safety of Facility users.

.5 Address all activities of the Work including those of subcontractors.

.6 Review Health and Safety Plan regularly during the Work. Update as conditions warrant to address emerging risks and hazards, such as whenever new trade or subcontractor arrive at Work Site.

.7 Departmental Representative will respond in writing, where deficiencies or concerns are noted and may request re-submission of the Plan with correction of deficiencies or concerns.

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

1.14 Safety Supervision

.1 Employ Health & Safety Site Representative responsible for daily supervision of health and safety of the Work.

.2 Health & Safety Site Representative may be the Superintendent of the Work or other person designated by Contractor and shall be assigned the responsibility and authority to:

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

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

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

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

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

.3 Health & Safety Site Representative must:

.1 Be qualified and competent person in occupational health and safety.

.2 Have site-related working experience specific to activities of the Work.

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

.4 All supervisory personnel assigned to the Work shall also be competent persons.

.5 Inspections:
.1 Conduct regularly scheduled safety inspections of the Work on a minimum biweekly basis. Record deficiencies and remedial action taken.
.2 Conduct Formal Inspections on a minimum monthly basis. Use standardized safety inspection forms. Distribute to subcontractors.
.3 Follow-up and ensure corrective measures are taken.

.6 Cooperate with Facility's 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 Maintain employee records and evidence of training received. Make data available to Departmental Representative upon request.

.3 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 persons of disciplinary protocols to be taken for noncompliance. Post rules on site.

1.17 Correction of Compliance

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

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

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

1.18 Incident Reporting

.1 Investigate and report the following incidents to Departmental Representative:

.1 Incidents requiring notification to Provincial Department of Occupational Safety and Health, Workers Compensation Board or to other regulatory Agency.

.2 Medical aid injuries.

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

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

.2 Submit report in writing.

1.19 Hazardous Products

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

.2 Keep MSDS data sheets for all products delivered to site.
.1 Post on site.
.2 Submit copy to Departmental Representative.

.3 For interior work in an occupied Facility, post additional copy in one or more publicly accessible locations.

1.20 Blasting

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

1.21 Confined Spaces

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

.2 Obtain an Entry Permit in accordance with Part XI of the Canada Occupational Health and Safety Regulations for entry into an existing identified confined space located at the Facility or premises of Work.
.1 Obtain permit from Facility Manager
.2 Keep copy of permit issued.

.3 Safety for Inspectors:
.1 Provide PPE and training to Departmental Representative and other persons who require entry into confined space to perform inspections.
.2 Be responsible for efficacy of equipment and safety of persons during their entry and occupancy in the confined space.

1.22 Site Records

.1 Maintain on Work Site copy of safety related documentation and reports stipulated to be produced in compliance with Acts and Regulations of authorities having jurisdiction and of those documents specified herein.

.2 Upon request, make available to Departmental Representative or authorized Safety Officer for inspection.

1.23 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 Post other documents as specified herein, including:
.1 Site specific Health and Safety Plan
.2 WHMIS data sheets

.3 Fire and Safety Requirements
.4 Special Procedures on Lockout Requirements

END

PART 1 GENERAL

1.1 Standard

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

1.2 References

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

.1 NBDTI Standard Specification Division 600- Environmental.

.2 The New Brunswick Environment Act and Regulations pursuant to the Act.

.3 The Erosion and Sedimentation Control Handbook for Construction Sites.

.4 CWRS Erosion and Sediment Control Course and binder.

.2 Canadian Environmental Assessment Act (most recent version).

1.3 Fires

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

1.4 Disposal of Wastes

.1 Dispose of waste material in an approved designated waste disposal area outside the park.

.2 Remove and dispose of containers and waste fluids associated with vehicle maintenance in a provincially approved waste disposal site outside the park.

.3 Disposal of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers is prohibited. Dispose of all waste materials at provincially approved waste disposal site outside the park boundary. Littering is prohibited.

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

1.5 Drainage

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

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

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

1.6 Site Clearing and Plant Protection

.1 Exercise special care to protect trees, shrubs and vegetation within contract limit lines outlined on drawings or as directed by Departmental Representative.

.2 Protect roots of designated trees to drip line during excavation and site grading to prevent disturbance or damage.

.1 Avoid unnecessary traffic, dumping and storage of materials over root zones.

.3 Minimize stripping of topsoil and vegetation, especially in the vicinity of stream banks

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

.5 When, in the opinion of the Departmental Representative Parks / Canada Environmental Assessment Officer, negligence on the part of the Contractor results in unnecessary damage or destruction of vegetation, or other environmental or aesthetic features within or beyond the staked or designated work area, the Contractor shall be responsible, at its expense, for the complete restoration including the replacement of trees,

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

1.7 Erosion and Sediment Control

.1 All measures necessary to minimize erosion and the mitigation of sediment shall be provided as required or as directed by the Departmental Representative.

.2 Labour, equipment and materials to be provided and will be considered as incidental to the work, except for payment items specifically identified in the unit price table.

1.8 Work Adjacent To Waterways

.1 The Contractor is required to install, inspect and maintain in good working order temporary erosion, siltation and pollution control features, as directed by Departmental Representative. These devices are to be removed in proper manner upon completion of project.

.2 Do not use waterway beds for borrow material.

.3 Do not dump excavated fill, waste material or debris.

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

.5 Do not operate construction equipment in waterways.

.6 Works performed in and around waterways will be carried out in accordance with regulations of authorities having jurisdiction.

.7 Cuts and fills adjacent to waterways are to be stabilized, and ditch run-outs constructed to prevent entry of silt into waterways. In vicinity of stream banks, maintain as much of the existing vegetation as possible.

.8 On conclusion of construction, debris must be disposed of to prevent its entry into waterways and stream beds returned to its original configuration.

1.9 Pollution Control

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

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

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

.4 All equipment, vehicles and plant used on site must be in good operating condition and leak free. The Departmental Representative reserves the right to have the Contractor immediately remove from the site, any deficient equipment, vehicles, etc.

.5 There will be a Parks Canada Environmental Assessment Officer on site to undertake overall environmental surveillance of this project.

1.10 Vehicular Movements

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

1.11 Storage and Handling of Fuels And Dangerous Fluids

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

contaminated soil removed to the nearest approved industrial waste disposal site.

.1 Fueling of vehicles or equipment will not be permitted within 30 m of any water body.

.2 Exercise care in handling of fuels to minimize potential for fuel spills. Report immediately any fuel spills to Departmental Representative. Contractor is responsible for any cleanup or repair resulting from any spills.

.3 Supply and maintain on site emergency response material to contain spills and minimize environmental damage, i.e. absorbent material, to the approval of Departmental Representative. Disposal of all contaminated material as per Clause 1.4 of this section.

1.12 Erosion Control

.1 Sediment fences and ditch erosion control structures shall be constructed in roadside ditches or at culvert inverts prior to any excavation as directed by Departmental Representative.

.2 To minimize run-off, work on slopes which may affect water bodies will be curtailed during periods of heavy rainfall, as directed by the Departmental Representative.

.3 Provide and maintain a project and site specific Erosion and Sediment Control (ESC) Plan.

1.13 Environmental Protection Plan

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

END

PART 1 GENERAL

1.1 References and Codes

.1 Perform Work in accordance with National Building Code of Canada (NBC) including amendments up to tender closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.

.2 Perform Work in accordance with the EA for this project

.3 Meet or exceed requirements of:

.1 Contract documents.

.2 Specified standards, codes and referenced documents.

1.2 National Parks Act

.1 The requirements and regulations made under the National Parks Act shall apply to this project.

.2 A copy of this Act may be obtained by contacting the Departmental Representative.

1.3 Archaeological Status

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

1.4 Pre-Construction Mitigation

.1 The Contractor must be firmly aware that he/she are working in a National Park setting with its emphasis on cultural and natural resource protection.

.2 Parks Canada will provide two sets of mitigation measures, one set for cultural resource protection and one set for natural resource protection. These are to be read

in entirety and mitigation will be followed as described.

.3 Archaeological resources will be respected and maintained in accordance with Parks Canada Cultural Resource Management Policy.

.4 Prior to construction, all Contractor employees and subcontractor employees will be required to attend an environmental briefing session. This session will highlight operating conditions, Archaeological mitigation and guidelines in the Environmental Impact Assessment and the Archaeological Impact Assessment.

.5 The Contractor, will be responsible for briefing all subcontractors or crew about relevant portions of the Environmental Impact Assessment and the Archaeological Impact Assessment that pertain to their activity and ensuring their work conforms to this document.

.6 Conditions presented in the Environmental Impact Assessment and the Archaeological Impact Assessment will be considered part of the Contract Document. Failure to comply with or observe these may result in the work being suspended pending rectification of the problem.

.7 Parks Canada Environmental Assessment Officer assigned to the project is to ensure that the mitigative measures detailed in the Environmental Impact Assessment are adequately carried out and to provide additional mitigation for unforeseen impacts on site. Failure to respond to environmental concerns may result in a “stop work” order being issued by the Project Manager until such time the issue has been resolved.

.8 In the event that cultural resources are discovered, Contractor to stop work in the vicinity of the cultural resources or

artifacts and contact the Departmental Representative for direction to follow.

.9 The Contractor will adhere to all mitigation set out in Environmental Impact Assessment and Archaeological Impact Assessment.

.10 Any artifacts or items of historical significance uncovered or found during construction or maintenance, and their associated archaeological records, shall revert back to Parks Canada.

1.5 Construction Mitigation

.1 All construction equipment is restricted to the existing roadway surfaces and identified corridors, so that cultural resources outside of the construction area are not damaged.

.2 No material will be spilt or left on the ground. (Ex., bolts, plastic, grease).

.3 All landscape disturbed by construction will be returned to its preconstruction standards, unless otherwise advised.

.4 All equipment and materials associated with the project will be removed after the job is completed. A final inspection will be done.

.5 All supplies, material and equipment will be restricted to the identified corridor.

.6 Stock piling (i.e. gravel, pipe, geotextile, plywood and associated materials) is restricted to approved locations.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END

PART 1 GENERAL

1.1 Inspection

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

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

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

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

1.2 Independent Inspection Agencies

.1 Independent Inspection/Testing Agencies will be engaged, as required, by Departmental Representative for purpose of inspecting and/or testing portions of Work for Quality Assurance (QA) testing only. Cost of such services (QA testing) will be borne by Departmental Representative. The contractor shall be responsible for Quality Control (QC) testing to ensure that all materials used meet the physical, production and placement requirements of this specification. Cost of such services will be borne by Contractor.

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

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

1.3 Access to Work

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

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

1.4 Procedures

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

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

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

1.5 Rejected Work

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

.2 Make good other Contractor's work damaged by such removals or replacements promptly.

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

1.6 Reports

.1 Submit 4 copies of inspection and test reports to Departmental Representative.

.2 Provide copies to subcontractor of work being inspected or tested or manufacturer or fabricator of material being inspected or tested.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END

PART 1 GENERAL

1.1 Access

.1 Provide and maintain adequate access to project site.

.2 Build and maintain temporary roads during period of work. PWGSC and Parks Canada must approve prior to their use, any proposed temporary roads within the Park.

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

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

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

1.2 Site Signs

.1 Safety and Instruction Signs and Notices:
  .1 Signs and notices for safety and instruction shall be in both official languages Graphic symbols shall conform to CAN3-Z321-77.
  .2 Maintenance and Disposal of Site Signs:
    .1 Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project or earlier if directed by Departmental Representative.
    .2 No separate payment to be made for Project Identification Site Signs. Cost shall be deemed incidental to work.

1.3 Sanitary Facilities

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

1.4 Parking

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

1.5 Removal of Temporary Facilities

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

1.6 Contractor’s Camp

.1 The Contractor will not be permitted to set up a camp within the park.

1.7 Measurement for Payment

.1 Unless specifically stated otherwise, items under this section not to be measured for payment but are considered incidental to Contract.

END

PART 1 GENERAL

1.1 Installation and Removal

.1 Provide temporary controls in order to execute Work expeditiously.

.2 Remove from site all such work after use.

1.2 Hoarding

.1 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

1.3 Guard Rails and Barricades

.1 Provide secure, rigid guard rails and barricades around deep excavations.

.2 Provide as required by governing authorities.

1.4 Access to Site

.1 Provide and maintain access roads, as may be required for access to Work.

1.5 Public Traffic Flow

.1 Provide and maintain competent signal flag operators, traffic signals, signage, barricades and flares, lights, or lanterns as required to perform Work and protect public.

1.6 Fire Routes

.1 Maintain access to property including overhead clearances for use by emergency response vehicles.

1.7 Protection for Off-Site and Public Property

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

.2 Be responsible for damage incurred.

1.8 Waste Management and Disposal

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

PART 2 PRODUCTS

2.1 NOT USED

PART 3 EXECUTION

3.1 NOT USED

END

PART 1 GENERAL

1.1 References

.1 Within text of each specifications section, reference may be made to reference standards. Conform to these reference standards, in whole or in part as specifically requested in specifications.

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

.3 Cost for such testing will be born by Departmental Representative in event of conformance with Contract Documents or by Contractor in event of non-conformance.

1.2 Quality

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

.2 Procurement policy is to acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable, consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work.

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

.4 Should disputes arise as to quality or fitness of products, decision rests strictly with Departmental

Representative based upon requirements of Contract Documents.

.5 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout work.

.6 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.3 Storage, Handling and Protection

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

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

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

.4 Store sheet materials on flat, solid supports and keep clear of ground. Slope to shed moisture.

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

1.4 Transportation

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

.2 Transportation cost of products supplied by Parks Canada will be paid for by Departmental Representative. Unload, handle and store such products.

1.5 Manufacturer's Instructions

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

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

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

1.6 Quality of Work

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

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

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

1.7 Co-ordination

.1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.

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

1.8 Remedial Work

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

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

1.9 Existing Utilities

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

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

PART 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END

Part 1 General

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

1.1 Qualifications of Surveyor

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

1.2 Survey Reference Points

.1 Existing base horizontal and vertical control points are designated on drawings.

.2 Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.

.3 Make no changes or relocations without prior written notice to Departmental Representative.

.4 Report to Departmental Representative when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

.5 Require surveyor to replace control points in accordance with original survey control.

1.3 Survey Requirements

.1 Establish two permanent bench marks on site, referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project Record Documents.

.2 Establish lines and levels, locate and lay out, by instrumentation.

.3 Stake for grading, fill and topsoil placement and landscaping features.

.4 Stake slopes and berms.

.5 Establish pipe invert elevations.

1.4 Existing Services

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

.2 Remove abandoned service lines within 2 m of structures. Cap or otherwise seal lines at cut-off points as directed by Departmental Representative.

1.5 Location of Equipment and Fixtures

.1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.

.2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.

.3 Inform Departmental Representative of impending installation and obtain approval for actual location.

.4 Submit field drawings to indicate relative position of various services and equipment when required by Departmental Representative.

1.6 Records

.1 Maintain a complete, accurate log of control and survey work as it progresses.

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

1.7 Action and Informational Submittals

.1 Submit name and address of Surveyor to Departmental Representative.

.2 On request of Departmental Representative, submit documentation to verify accuracy of field engineering work.

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

PART 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END

PART 1 GENERAL

1.1 References

.1 NOT USED

1.2 Project Cleanliness

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Parks Canada or other Contractors.

.2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site, unless approved by Departmental Representative.

.3 Clear snow and ice from access to site or facilities of the work, bank/pile snow in designated areas only.

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

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

.6 Provide and use marked separate bins for recycling. Refer to Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.7 Dispose of waste materials and debris outside the limits of the National Park at a location/facility approved by the Authority having jurisdiction.

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

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

1.3 Final Cleaning

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

.2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.

.3 Prior to final review remove surplus products, tools, construction machinery and equipment.

.4 Remove waste products and debris other than that caused by Parks Canada or other Contractors.

.5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site, unless approved by Departmental Representative.

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

.7 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.

.8 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.

.9 Remove dirt and other disfiguration from exterior surfaces.

1.4 Waste Management and Disposal

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

PART 2 PRODUCTS

2.1 NOT USED

.

END

PART 1 GENERAL

1.1 Waste Management Goals

.1 Prior to start of Work conduct meeting with Departmental Representative to review and discuss PWGSC's waste management plan and goals.

.2 Accomplish maximum control of solid construction waste.

.3 Protect environment and prevent environmental pollution damage.

1.2 References

.1 Definitions:

.1 Class III: non-hazardous waste - construction renovation and demolition waste.

.2 Cost/Revenue Analysis Workplan (CRAW): based on information from Waste Reduction Workplan, and intended as financial tracking tool for determining economic status of waste management practices.

.3 Demolition Waste Audit (DWA): relates to actual waste generated from project.

.4 Inert Fill: inert waste - exclusively asphalt and concrete.

.5 Materials Source Separation Program (MSSP): consists of series of ongoing activities to separate reusable and recyclable waste material into material categories from other types of waste at point of generation.

.6 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.

.7 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.

.8 Recycling: process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

.9 Reuse: repeated use of product in same form but not necessarily for same purpose. Reuse includes:

.1 Salvaging reusable materials from re-modelling projects, before demolition

stage, for resale, reuse on current project or for storage for use on future projects.
.2 Returning reusable items including pallets or unused products to vendors.

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

1.3 Documents

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

1.4 Action and Informational Submittals

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

.2 Prepare and submit following prior to project start-up:
.1 1 copy and 1 electronic copy of completed Waste Reduction Workplan (WRW).

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

1.5 Waste Reduction Work Plan (WRW)

.1 Prepare and submit WRW at least 10 days prior to project start-up.

.2 WRW identifies strategies to optimize diversion through reduction, reuse, and recycling of materials and comply with applicable regulations.

.3 WRW should include but not limited to:
- .1 Applicable regulations.
- .2 Specific goals for waste reduction, identify existing barriers and develop strategies to overcome them.
- .3 Destination of materials identified.
- .4 Methods to collect, separate, and reduce generated wastes.
- .5 Location of waste bins on-site.
- .6 Security of on-site stock piles and waste bins.
- .7 Protection of personnel, sub-contractors.
- .8 Clear labelling of storage areas.
- .9 Details on materials handling and removal procedures
- .10 Recycler and reclaimer requirements.
- .11 Quantities of materials to be salvaged for reuse or recycled and materials sent to landfill.
- .12 Requirements for monitoring on-site wastes management activities.

.4 Structure WRW to prioritize actions and follow 3R's hierarchy, with Reduction as first priority, followed by Reuse, then Recycle.

.5 Post WRW or summary where workers at site are able to review content.

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

1.6 Storage, Handling and Protection

.1 Store, materials to be reused, recycled and salvaged in locations as directed by Departmental Representative.

.2 Protect, stockpile, store and catalogue salvaged items.

.3 Separate non-salvageable materials from salvaged items. Transport and deliver non salvageable items to licensed disposal facility.

.4 Protect surface drainage, mechanical and electrical from damage and blockage.

.5 Separate and store materials produced during project in designated areas.

.6 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated processing facilities.

.1 On-site source separation is recommended.

.2 Remove co-mingled materials to off site processing facility for separation.

.3 Obtain waybills, receipts and/or scale tickets for separated materials removed from site.

.4 Materials reused on-site are considered to be diverted from landfill and as such are to be included in all reporting.

1.7 Disposal of Wastes

.1 Do not bury rubbish or waste materials.

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

1.8 Scheduling

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

PART 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END

PART 1 GENERAL

1.1 References

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

1.2 Administrative Requirements

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

1.3 Final Cleaning

.1 Clean in accordance with Section 01 74 11 - Cleaning.
.1 Remove surplus materials, excess materials, rubbish, tools and equipment.

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

PART 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END

PART 1 GENERAL

1.1 Administrative Requirements

.1 Pre-warranty Meeting:
  .1 Convene meeting one week prior to contract completion with contractor's representative and Departmental Representative, in accordance with Section 01 31 19 - Project Meetings to:
    .1 Verify Project requirements.
    .2 Review warranty requirements and manufacturer's installation instructions.

.2 Departmental Representative to establish communication procedures for:
  .1 Notifying construction warranty defects.
  .2 Determine priorities for type of defects.
  .3 Determine reasonable response time.

.3 Contact information for bonded and licensed company for warranty work action: provide name, telephone number and address of company authorized for construction warranty work action.

.4 Ensure contact is located within local service area of warranted construction, is continuously available, and is responsive to inquiries for warranty work action.

1.2 Action and Informational Submittals

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

.2 Provide evidence, if requested, for type, source and quality of products supplied.

1.3 Format

.1 Organize data as instructional manual.

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

.3 When multiple binders are used correlate data into related consistent groupings.
  .1 Identify contents of each binder on spine.

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

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

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

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

.8 Drawings: provide with reinforced punched binder tab.
.1 Bind in with text; fold larger drawings to size of text pages.

1.4 Contents - Project Record Documents

.1 Table of Contents for Each Volume: provide title of project;
.1 Date of submission; names.
.2 Addresses and telephone numbers of Consultant and Contractor with name of responsible parties.
.3 Schedule of products and systems, indexed to content of volume.

.2 For each product or system:
.1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

.3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.

.4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.

.5 Typewritten Text: as required to supplement product data.
.1 Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Testing and Quality Control.

1.5 As -Built Documents and Samples

.1 Maintain, in addition to requirements in General Conditions, at site for Departmental Representative one record copy of:
- .1 Contract Drawings.
- .2 Specifications.
- .3 Addenda.
- .4 Change Orders and other modifications to Contract.
- .5 Reviewed shop drawings, product data, and samples.
- .6 Field test records.
- .7 Inspection certificates.
- .8 Manufacturer's certificates.

.2 Store record documents and samples in field office apart from documents used for construction.
- .1 Provide files, racks, and secure storage.

.3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual.
- .1 Label each document "PROJECT RECORD" in neat, large, printed letters.

.4 Maintain record documents in clean, dry and legible condition.
- .1 Do not use record documents for construction purposes.

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

.6 As-Built information to be submitted to Departmental Representative within 30 days of project substantial completion.

1.6 Recording Information on Project Record Documents

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

.2 Use felt tip marking pens, maintaining separate colours for each major system, for recording information.

.3 Record information concurrently with construction progress.
.1 Do not conceal Work until required information is recorded.

.4 Contract Drawings and shop drawings: mark each item to record actual construction, including:
.1 Measured depths of elements of foundation in relation to finish first floor datum.
.2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
.3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
.4 Field changes of dimension and detail.
.5 Changes made by change orders.
.6 Details not on original Contract Drawings.
.7 References to related shop drawings and modifications.

.5 Specifications: mark each item to record actual construction, including:
.1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
.2 Changes made by Addenda and change orders.

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

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

1.7 Equipment and Systems

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

.2 Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.

.2 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences.
.1 Include regulation, control, stopping, shut-down, and emergency instructions
.2 Include summer, winter, and any special operating instructions.

.3 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

.4 Provide servicing and lubrication schedule, and list of lubricants required.

.5 Include manufacturer's printed operation and maintenance instructions.

.6 Include sequence of operation by controls manufacturer.

.7 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

.8 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

.9 Include test and balancing reports as specified in Section 01 45 00 - Testing and Quality Control.

.10 Additional requirements: as specified in individual specification sections.

1.8 Materials and Finishes

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

.2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

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

PART 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END

PART 1 GENERAL

1.1 Related Requirements

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

1.2 References

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

1.3 Action and Informational Submittals

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

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

PART 2 PRODUCTS

2.1 Materials

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

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

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

.3 Coarse aggregates satisfying requirements of applicable section to be produced from crushed rock, crushed gravel or pit run gravel.

2.2 Source Quality Control

.1 Inform Departmental Representative of proposed source of aggregates and provide access for sampling 2 weeks minimum before starting production.

.2 If materials from proposed source do not meet, or cannot reasonably be processed to meet, NBDTI specified requirements, locate alternative source. Materials to be determined acceptable by sieve analysis testing

.3 Advise Departmental Representative 2 weeks minimum in advance of proposed change of material source.

.4 Acceptance of material at source does not preclude future rejection if it fails to conform to requirements specified, lacks uniformity, or if its field performance is found to be unsatisfactory.

PART 3 EXECUTION

3.1 Preparation

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

.2 Where clearing is required, leave screen of trees between cleared area and roadways as directed.
.3 Clear, grub and strip area ahead of quarrying or excavating operation sufficient to prevent contamination of aggregate by deleterious materials.
.4 When excavation is completed dress sides of excavation to nominal 1.5:1 slope, and provide drains or ditches as required to prevent surface standing water.
.5 Trim off and dress slopes of waste material piles and leave site in neat condition.
.6 Provide silt fence or other means to prevent contamination of existing watercourse or natural wetland features.

.2 Processing:
.1 Process aggregate uniformly using methods that prevent contamination, segregation and degradation.

.3 When operating in stratified deposits use excavation equipment and methods that produce uniform, homogeneous aggregate gradation.

.4 Where necessary, screen, crush, wash, classify and process aggregates with suitable equipment to meet requirements.

.5 Stockpiling:
.1 Stockpile aggregates in accordance with the requirements of NBDTI Standard Specifications, Division 201, Item 201.4.5.
.2 Stockpile aggregates in sufficient quantities to meet project schedules.
.3 Stockpiling sites to be level, well drained, and of adequate bearing capacity and stability to support stockpiled materials and handling equipment.
.4 Do not use intermixed or contaminated materials.
.5 Remove and dispose of rejected materials as directed by Departmental Representative within 48 hours of rejection.
.6 Aggregate acceptance shall be based on sampling and testing in accordance with

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

.7 Handling of aggregates produced outside the specified requirements of NBDTI Standard Specifications, Division 200, Item 20.4.7 may be rejected at the departments discretion.

.8 Stockpile locations are to be designated by Departmental Representative.

3.2 Cleaning

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

.2 Leave aggregate stockpile site in tidy, well drained condition, free of standing surface water.

.3 Unused aggregates are the property of the Contractor.

END

PART 1 GENERAL

1.1 Standard

.1 All work of this section shall comply with the requirements of the most recent version of the NBDTI Standard Specifications Division 100, Sections 101 and 102, except as amended herein.

1.2 References

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

.1 NBDTI Standard Specification Division 100, Item 101, Clearing.

.2 NBDTI Standard Specification Division 100, Item 102 Grubbing.

PART 2 EXECUTION

2.1 General

.1 Prior to clearing operation, trees to be salvaged will be identified by the Departmental Representative.

.2 As per the requirements of the most recent version of the NBDTI Standard Specification Division 100, Items 101 and 102, and in conformance with the Contract Documents.

2.2 Removal and Disposal

.1 Cleared and grubbed materials less than 75mm in diameter shall be chipped and spread evenly as mulch to thickness not greater than 75mm as approved.

.2 Cut timber greater than 75 mm diameter to 2400 mm lengths and stockpile as directed by Departmental Representative. Stockpiled timber becomes property of the Fundy National Park.

END

PART 1 GENERAL

1.1 Related Requirements

.1 Section 31 11 00 Clearing and Grubbing.

1.2 References

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

PART 2 PRODUCTS

2.1 Not Used

PART 3 EXECUTION

3.1 Temporary Erosion And Sedimentation Control

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

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

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

3.2 Stripping Of Topsoil

.1 Ensure that procedures are conducted in accordance with applicable Provincial requirements.

.2 Remove topsoil before construction procedures commence to avoid compaction of topsoil.

.3 Handle topsoil only when it is dry and warm.

.4 Remove vegetation from targeted areas by non-chemical means and dispose of stripped vegetation as directed by Departmental Representative.

.5 Remove brush from targeted area by non-chemical means and dispose of as directed by Departmental Representative.

.6 Strip topsoil to depths as directed by Departmental Representative
.1 Avoid mixing topsoil with subsoil.

.7 Pile topsoil by mechanical hoe in berms in locations as directed by Departmental Representative.
.1 Stockpile height not to exceed 2 m.

.8 Dispose of unused topsoil in location as indicated by Departmental Representative.

.9 Protect stockpiles from contamination and compaction.

.10 Cover topsoil that has been piled for long term storage, with hay or straw mulch or grass to maintain agricultural potential of soil.

3.3 Preparation of Grade

.1 Verify that grades are correct and notify Departmental Representative if discrepancies occur. Do not begin work until instructed by Departmental Representative.

.1 Grade area only when soil is dry to lessen soil compaction.

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

3.4 Cleaning

.1 Proceed in accordance with Section 01 74 11 - Cleaning.

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

END

PART 1 GENERAL

1.1 Related Requirements

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

1.2 References

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

PART 2 PRODUCTS

2.1 NOT USED

PART 3 EXCAVATION

3.1 Preparation

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

3.2 Construction

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

.2 Ditching shall consist of removing vegetal matter and up to a maximum of 300 mm of soil from an existing ditch such that the width of the bottom of the ditch is not less than 1 m and the ditch has a continuous smooth grade providing positive gravity drainage, without ponding, in the specified flow direction.
  .1 The tendered Quantity includes cleaning ends of driveway culverts and cross culverts as directed by Departmental Representative.

.3 The Contractor shall not excavate or undermine the Foreslope during the course of the Work.

.4 The Contractor shall shape ditches to a uniform cross section, with no gouges or ridges remaining in the finished Work.

.5 The Contractor shall repair any damage, at his/her own expense, to adjacent property resulting from the Work.

.6 The materials excavated from within the ditches shall become the property of the Contractor and shall be disposed of outside of the work site.

.7 A driveway crossing designated to be removed and not replaced shall be excavated so that the ditch and Slopes remaining after excavation match the adjacent ditch and Slopes.

.8 Driveways with a culvert designated for replacement shall be replaced in the same workday utilizing material excavated from the crossing wherever possible.

.1 Where excavation involves removal of driveway Culverts, the Contractor shall take care to ensure that any existing pipe is not damaged and is salvaged for re-use.

.1 The Contractor shall notify the Departmental Representative prior to exposing any existing pipe.

.2 Any pipe determined by the Departmental Representative to be salvageable shall remain the property of the Parks Canada.

.3 Salvageable pipe shall be re-used in the Work Site or transported, by the Contractor, and stockpiled as directed by the Departmental Representative.

.4 Unsalvageable pipe and waste shall become the property of the Contractor and shall be disposed of outside of the Work Site.

.5 If the pipe is damaged as a result of the Contractors actions, as determined by the Departmental Representative, the Contractor shall be responsible to replace the pipe.

.9 Ditches shall be stabilized against erosion with hay or straw mulch at the end of each days ditching.

END

PART 1 GENERAL

1.1 Related Sections

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

.2 Section 32 91 21 – Topsoil Placement

1.2 References

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

1.3 Existing Conditions

.1 Establish precise field location of underground services before commencing work.

.2 Known underground and surface utility lines and buried objects are as indicated on site plan for guidance only.

.3 Contractor is responsible to have all service located completed prior to any excavation on site.

.4 Refer to dewatering in Section 31 23 33 - Excavating Trenching and Backfilling.

.5 Refer to drainage requirements.

1.4 Protection

.1 Protect existing fencing, trees, landscaping, natural features, bench marks, buildings, pavement, surface or underground utility lines which are to remain as directed by Departmental Representative. If damaged,

restore to original or better condition unless directed otherwise.

.2 Maintain access roads to prevent accumulation of construction related debris on roads.

PART 2 PRODUCTS

2.1 Materials

1. Fill material: in accordance with Section 31 23 33 - Excavating, Trenching and Backfilling.

.2 Excavated or graded material existing on site may be suitable to use as fill for grading work if approved by Departmental Representative.

PART 3 EXECUTION

3.1 Grading

.1 Rough grade to levels, profiles, and contours allowing for surface treatment as indicated.

.2 Rough grade to follow depths indicated on details.

.3 Prior to placing fill over existing ground, scarify surface to depth of 150mm. Maintain fill and existing surface at approximately same moisture content to facilitate bonding.

.4 Compact filled and disturbed areas to as follows:
85% under landscaped areas.
As specified or detailed for other areas of site.

.5 Do not disturb soil within branch spread of trees or shrubs to remain.

3.2 Testing

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

3.3 Surplus Material

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

END

PART 1 GENERAL

1.1 Related Requirements

.1 Section 01 33 00 – Submittal Procedures.
.2 Section 01 35 43 – Environmental Procedures.
.3 Section 02 41 13 – Selective Site Demolition.
.4 Section 31 05 16 – Aggregate Materials.
.5 Section 33 41 00 – Storm Utility Drainage Piping

1.2 General Requirements

.1 The Work under this section shall include the supply of labour, supervision, materials, equipment, and transportation necessary to complete excavation and backfill as shown on the Contract Drawings, per the Specifications, and as directed by the Departmental Representative, complete in every respect.

.2 Generally, the Work includes but is not necessarily limited to the following:
.1 Foundation excavations.
.2 Dewatering.
.3 Backfilling of select materials.
.4 Compacting fill materials.
.5 Removal from site all excavated materials except for material required for backfilling and grading.

1.3 Measurement Procedures

.1 Work performed under this Section will be incidental to Work in other Sections.

1.4 References

.1 New Brunswick Department of Transportation and Infrastructure Standard Specifications (most recent version):
.1 NBDTI Standard Specification Division 100, Grading.

.2 Excavation limit as shown on the Plans.

1.5 Definitions

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

.1 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.

.2 Rock excavation: solid material in excess of 1.00 m^3 and which cannot be removed by means of heavy duty mechanical excavation equipment with 0.95 m^3 - 1.15 m^3 bucket.

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

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

.4 Pulverized asphalt and granular material obtained from existing road pavement structure. To be graded, and required for construction of fill areas or other portions of work.

.5 Unsuitable materials:
.1 Weak, chemically unstable, and compressible materials.
.2 Frost susceptible materials:
.1 Fine grained soils with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to ASTM D422 and ASTM C136: Sieve sizes to CAN/CGSB-8.1 CAN/CGSB-8.2.
.2 Table:

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

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

1.6 Action and Informational Submittals

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

.2 Quality Control: in accordance with Section 01 45 00 – Testing and Quality Control:
- .1 Submit to Departmental Representative written notice at least 7 days prior to excavation work, to ensure cross sections are taken.
- .2 Submit to Departmental Representative written notice when bottom of excavation is reached.

.3 Preconstruction Submittals:
- .1 Submit construction equipment list for major equipment to be used in this section prior to start of Work.
- .2 Submit records of underground utility locates, indicating: clearance record from utility authority.

.4 Samples:
- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Inform Departmental Representative at least 2 weeks prior to beginning Work, of proposed source of fill materials and provide access for sampling.
- .3 Submit 70 kg samples of type of fill specified including representative samples of excavated material.
- .4 Ship samples prepaid to Departmental Representative, in tightly closed containers to prevent contamination and exposure to elements.

1.7 Quality Assurance

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

1.8 Waste Management And Disposal

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

.2 Divert excess materials from landfill to local facility for reuse as directed by Departmental Representative.

1.9 Existing Conditions

.1 Buried services:

.1 Before commencing work establish location of buried services on and adjacent to site.

.2 Arrange with appropriate authority for relocation of buried services that interfere with execution of work: pay costs of relocating services.

.3 Remove obsolete buried services within 2 m of foundations: cap cut-offs.

.4 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.

.5 Prior to beginning excavation Work, notify applicable Departmental Representative and authorities having jurisdiction establish location and state of use of buried utilities and structures. Departmental Representative to clearly mark such locations to prevent disturbance during Work.

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

.7 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered as indicated.

.8 Where utility lines or structures exist in area of excavation, obtain direction of Departmental Representative before removing or re-routing. Costs for such Work to be paid by Departmental Representative.

.9 Record location of maintained, re-routed and abandoned underground lines.
.10 Confirm locations of recent excavations adjacent to area of excavation.

.2 Existing buildings and surface features:
.1 Conduct, with Departmental Representative, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, rail tracks, pavement, survey bench marks and monuments which may be affected by Work.
.2 Protect existing buildings and surface features from damage while Work is in progress. In event of damage, immediately make repair as directed by Departmental Representative.
.3 Where required for excavation, cut roots or branches as directed by Departmental Representative in accordance with Section 31 11 00 - Clearing and Grubbing.

1.10 Archaeological Definitions

.1 Archaeological Artifact: An object, a component of an object, a fragment, or shred of an object that was for or used by humans; a soil, botanical or other sample of archaeological investigation of a site.

.2 Archaeological Records: Notes, drawings, photographs, plans, computer databases, reports and any other audio-visual records related to the Archaeological investigation of a site.

.3 Archaeological Collection: Archaeological artifacts and associated archaeological records.

.4 Archaeological Resource: An archaeological site and its associated archaeological collection.

.5 All surface modifications are restricted to the identified corridors. Construction corridors to be accurately located by field survey by the Contractor prior to commencement of work operations.

1.11 Protection of Existing Features

.1 Existing buried utilities, services and structures:

.1 Size, depth and location of existing utilities, services and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.

.2 Prior to commencing any excavation work, notify Departmental Representative, establish location and state of use of buries utilities, services and structures. Clearly mark such locations to prevent disturbance during work.

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

.4 Maintain and protect from damage, water, sewer, electric, telephone and storm sewers, communications and other utilities, services and structures encountered as indicated. Obtain direction of Engineer before moving or otherwise disturbing utilities, services or structures.

.5 Submit plans and details to show how existing utilities and services are to be maintained and protected while completing trench excavations and installing new services and utilities in the immediate area.

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

.7 Repair all services, utilities and structures damaged during construction to the satisfaction of the Engineer using new materials equivalent in manufacture, class, size and shape to the existing. The cost of all repair work shall be borne by the Contractor.

.2 Existing buildings and surface features:

.1 Conduct, with Engineer, condition survey of existing buildings, lawns, sea wall, service poles, wires, pavement, survey bench marks and monuments which may be affected.

.2 Protect existing buildings and surface features which may be affected by work from damage while work is in progress. In the event of damage, immediately make repair to approval of Engineer.

.3 Where excavation necessitates root or branch cutting, do so only as approved by Engineer.

.4 All surface modifications are restricted to the identified corridors. Construction corridors to be accurately located by field survey by the Contractor prior to commencement of work operations.

.5 All vehicle traffic is restricted to existing roadways or as indicated in project plans. Any deviation from the identified corridor requires Archaeological review. A field visit will be scheduled with Contractor for locational confirmation and all areas of proposed construction will be marked in the field with orange flagging tape prior to commencement of work.

.6 The locational data for all encountered services and utilities that are to remain in service and all newly installed utilities and services must be provided in northing and easting (eg. N 5088673.329, E 734175.481) referenced to UTM Zone 20, vertical datum CGVD28, TO an accuracy of ± 2 cm. This locational information is to be provided on disk in a DWG and DXF format which is compatible with SPANS EXPLORER.

PART 2 PRODUCTS

2.1 Materials

.1 Backfill material: refer to Section 31 05 16 – Aggregate Materials.

.2 Backfill material to be suitable excavated material or borrow as defined by NBDTI Standard specification Item 121 - Borrow

PART 3 EXECUTION

3.1 Site Preparation

.1 Remove obstructions from surfaces to be excavated within limits indicated.

.2 Cut pavement neatly along limits of proposed excavation in order that surface may break evenly and cleanly

3.2 Preparation/ Protection

.1 Protect existing features in accordance with Section 01 56 00 - Temporary Barriers and Enclosures and applicable local regulations.

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

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

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

3.3 Stockpiling

.1 Stockpile fill materials in areas designated by Departmental Representative.
  .1 Stockpile granular materials in manner to prevent segregation.
  .2 Protect fill materials from contamination.
  .3 Implement sufficient erosion and sediment control measures to prevent sediment release off construction boundaries and into water bodies.

3.4 Dewatering and Heave Prevention

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

.2 Provide for Departmental Representative’s review and approval details of proposed dewatering or heave prevention methods, including dikes, well points, and sheet pile cutoffs.

.3 Avoid excavation below groundwater table if quick condition or heave is likely to occur.
.1 Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut-offs, or other means.

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

.5 Dispose of water in accordance with Section 01 35 43 - Environmental Procedures and in a manner not detrimental to public and private property, or portion of Work completed or under construction.
.1 Provide and maintain temporary drainage ditches and other diversions outside of excavation limits.

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

3.5 Excavation

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

.2 Excavate to lines, grades, elevations and dimensions as directed by Departmental Representative. Maintain sides and slopes of excavations in safe condition by appropriate methods and in accordance with Section 01 35 29.06 - Health and Safety Requirements and Health and Safety Act for the Province of New Brunswick

.3 Remove obstructions encountered during excavation.

.4 Excavation must not interfere with bearing capacity of adjacent foundations.

.5 Do not disturb soil within branch spread of trees or shrubs that are to remain.
.1 If excavating through roots, excavate by hand and cut roots with sharp axe or saw.

.6 For trench excavation, unless otherwise authorized by Departmental Representative in writing, do not excavate more than 30 m of trench in advance of installation operations and do not leave open more than 15 m at end of day's operation.

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

.8 Restrict vehicle operations directly adjacent to open trenches.

.9 Dispose of surplus and unsuitable excavated material as directed by the Departmental Representative.

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

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

.12 Notify Departmental Representative when bottom of excavation is reached.

.13 Obtain Departmental Representative approval of completed excavation.

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

.15 Correct unauthorized over-excavation as follows:

.1 Fill under areas with Gravel Borrow (NBDTI Standard Specification Division 100, Grading, Item 121, Borrow compacted to not less than 95 % of corrected Standard Proctor maximum dry density.

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

.1 Where material at bottom of excavation is disturbed, compact foundation soil to

density at least equal to undisturbed soil.

3.6 Backfilling

.1 Do not proceed with backfilling operations until completion of following:
  .1 Departmental Representative has inspected and approved installations.
  .2 Departmental Representative has inspected and approved of construction below finish grade.
  .3 Inspection, testing, approval, and recording location of underground utilities.
  .4 Removal of shoring and bracing; backfilling of voids with satisfactory soil material.

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

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

.4 Place backfill material in uniform layers not exceeding 150 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.

.5 Backfilling around installations:
  .1 Place bedding and surround material as specified elsewhere.
  .2 Place layers simultaneously on both sides of installed Work to equalize loading. Difference not to exceed 300mm.

3.7 Restoration

.1 Upon completion of Work, remove waste materials and debris in accordance to Section 01 74 21 - Construction/Demolition Waste Management and Disposal, trim slopes, and correct defects as directed by Departmental Representative.

.2 Replace topsoil as directed by Departmental Representative.

.3 Reinstate lawns to elevation which existed before excavation.

.4 Reinstate roadbed disturbed by excavation to thickness, structure and elevation which existed before excavation with aggregate material.

.5 Clean and reinstate areas affected by Work as directed by Departmental Representative.

.6 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

END

PART 1 GENERAL

1.1 Related Sections

.1 Section 01 33 00 - Submittal Procedures

.2 Section 01 35 43 - Environmental Procedures

.3 Section 31 23 10 – Ditching

.4 Section 31 23 33 – Excavating, Trenching and Backfilling

1.2 References

.1 New Brunswick Department of Transportation and Infrastructure, Standard Specifications.

.2 New Brunswick Watercourse Alteration Specifications.

1.3 Environmental Protection Plan

.1 Provide Environmental Protection Plan in accordance with Section 01 35 43 – Environmental Procedures.

1.4 Submittals

.1 Provide shop drawings, in accordance with Section 01 33 00 – Submittal Procedures.

PART 2 – PRODUCTS

2.1 General

.1 Use sediment barriers to keep sediment on site. Consider sediment barriers as temporary perimeter controls to intercept sediment laden sheet flow runoff before it enters the watercourse or as it leaves the construction site.

.2 Construct flow checks adjacent to inlets and outlets of culverts, and as directed by the Departmental Representative. Place flow checks to reduce the channel velocity, promote the deposition of suspended sediment, and to provide a trap for sediment material.

.3 Use erosion control blanket to minimize erosion on slopes.

2.2 Materials

.1 Straw barriers: straw bales to be dry, firm, tightly tied in at least two places, show no evidence of straw or tie decay and be free of sediment. They are to be of standard agriculture dimensions, approximately 600mm x 600mm x 1200mm.
.1 Straw barriers
.1 Stakes: of sufficient strength to satisfy control measure performance and maintenance requirements. Stakes to be 1.2m in length.

.2 Silt fence barriers: construct silt fence barriers of silt fence geotextile supported on stakes. Geotextile used for silt fence shall be woven Class 1 geotextile, having a minimum width of 900mm. The maximum filtration opening size (FOS) shall be 840µm.
.1 Stakes: of sufficient strength to satisfy control measure performance and maintenance requirements. Stakes to be 1.5m in length.

.3 Erosion Control Blanket: Place erosion control blanket on stabilized slope. Blankets to be a rolled product made from natural fibres, bound together with photodegradable polypropylene netting.

PART 3 – EXECUTION

3.1 General

.1 Supply, install and maintain temporary erosion and sedimentation control features where required and in accordance with Environmental Protection Plan. Do not remove control features until authorized by Departmental Representative.

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

3.2 SILT FENCE

.1 Install silt fence in the locations directed.

.2 Install extra 50 x 75 x 1200 mm long posts midpoints between supplied posts. Attach fence with roofing nails and roofing tins. Provide wood strapping along top of fence as shown.

.3 Excavate 150 x 150 mm trench along length of fence as indicated. Lay fabric bottom in trench and

backfill with selected backfill material.

3.3 Straw Barriers

.1 Where straw bale barriers are to be installed on earth surfaces, place the bale in a trench measuring 750mm wide by 150mm deep at the location specified for the barrier. The bales will then be staked and the remaining trench space backfilled and compacted to existing grade.

.2 Where straw bale barriers are to be installed on sod, erosion control blanket or existing turf, place so that there are no gaps between the bales and the underlying cover.

.3 Do not place straw bale ties in contact with the ground. The ends of adjacent bales are to be placed tightly against one another to prevent gaps.

.4 Firmly secure in place each bale by two (2) stakes spaced 150mm from the end of each bale. Drive stakes flush with the top of bale.

.5 Main straw barriers such that bales remain firm intact and without decay.

.6 Include at each end of the barrier a 2m to 3m section, angled upstream to direct runoff to the main section of the barrier.

.7 Replace bales when they are no longer functioning or as directed by the Departmental Representative.

3.4 Erosion Control Blanket

.1 Install erosion control blankets on the stabilized slope.

.2 Place the blankets after soil preparation and seeding by unrolling over the area and stapling to the ground, as per the manufacturer’s recommendations.

3.5 Maintenance

.1 Maintain erosion and sediment control features throughout the construction period. Repair damage to original condition.

.2 Remove accumulated sediment from behind sediment

control items when and as directed by the Departmental Representative.

.3 Maintain vertical alignment of silt fence such that it is always plumb and straight.

.4 Remove sedimentation control features when directed by the Departmental Representative. Take care to avoid causing turbidity, and excessive re-suspension of particles when removing sediment control features.

END

PART 1 GENERAL

1.1 Related Requirements

.1 Section 31 37 00 – Rip Rap

1.2 References

.1 American Society for Testing and Materials International, (ASTM)
  .1 ASTM D 4491-99a, Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
  .2 ASTM D 4595-86(2001), Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method.
  .3 ASTM D 4751-99a, Standard Test Method for Determining Apparent Opening Size of a Geotextile.

.2 Canadian General Standards Board (CGSB)

  .1 CAN/CGSB-4.2 No. 11.2-M89 (April 1997), Textile Test Methods - Bursting Strength - Ball Burst Test (Extension of September 1989).

  .2 CAN/CGSB-148.1, Methods of Testing Geotextiles and Complete Geomembranes.

.3 New Brunswick Department of Transportation and Infrastructure Standard Specification (most recent version):
  .1 NBDTI Standard Specification Division 600 - Environmental, Item 601– Geotextile.

1.3 Submittals

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

1.4 Delivery, Storage And Handling

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

PART 2 PRODUCTS

2.1 Materials

.1 Physical properties: Grab Tensile 600 N min, Tearing Strength (Trapezoid Method), 250 N min., filtration opening size 50 um min – 150 um max, Hydraulic conductivity 0.01 cm/sec.

.2 Geotextile: woven synthetic fibre fabric, supplied in rolls.
- .1 Width: 3.5 metres minimum
- .2 Length: 79 metres minimum
- .3 Composed of: minimum 85% by mass of polypropylene and/or polyester, with inhibitors added to base plastic to resist deterioration by ultra-violet and heat exposure for 30 days.

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

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

PART 3 EXECUTION

3.1 Installation

.1 Place geotextile material, as indicated on drawings and as directed by Departmental Representative, by unrolling onto graded surface and retain in position with securing pins or fill.

.2 Place geotextile material smooth and free of tension stress, folds, wrinkles and creases.

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

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

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

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

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

.8 Place and compact soil layers in accordance with Section 31 23 33 – Excavating, Trenching and Backfilling and 31 24 13 - Roadway Embankments.

3.2 Cleaning

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

3.3 PROTECTION

.1 Vehicular traffic not permitted directly on geotextile.

END

PART 1 GENERAL

1.1 Related Requirements

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

1.2 References

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

PART 2 PRODUCTS

2.1 General

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

2.2 STONE

.1 Hard, durable, angular quarry stone, free from seams, cracks or other structural defects, to meet the size distribution for use intended, as shown below in the table.

.2 Table: Random Rip Rap Grading Limits: (see next page)

NBDTI TABLE 608-1

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

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

2.3 Geotextile Filter

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

PART 3 EXECUTION

3.1 Placing

.1 Where riprap is to be placed on slopes excavate trench at toe of slope as indicated.

.2 Fine grade area to be riprapped to uniform, even surface. Fill depressions with suitable material and compact to provide firm bed.

.3 Place geotextile on prepared surface in accordance with Section 31 32 19 - Geotextiles and as indicated. Avoid puncturing geotextile. Vehicular traffic over geotextile is not permitted.

.4 Place riprap to thickness as indicated on the table.

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

END

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 – Submittal Procedures

.2 Section 31 05 16 – Aggregate Materials

1.2 References

.1 ASTM International
- .1 ASTM C 88, Standard Test Method for Soundness of Aggregates by Use of Sodium Sulphate or Magnesium Sulphate.
- .2 ASTM C 117, Standard Test Method for Materials Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.
- .3 ASTM C 131, Standard Test Method for Resistance to Degradation of Small Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
- .4 ASTM C 136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- .5 ASTM D 140/D 140M, Standard Practice for Sampling Bituminous Materials.

.2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-8.1-[88], Sieves Testing, Woven Wire, Inch Series.
- .2 CAN/CGSB-8.2-[M88], Sieves Testing, Woven Wire, Metric.

.3 New Brunswick Department of Transportation and Infrastructure Standard Specifications, Division 200 Pavement Structure, Item 265-CHIP SEAL.

1.3 Action And Informational Submittals

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

.2 Product Data:
- .1 Submit manufacturer's instructions, printed product literature and data sheets for asphalt material and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Samples:
.1 Submit for review and acceptance 1-10 kg clean, sealed, plastic container of asphalt material proposed for use to Departmental Representative 2 weeks prior to commencing work.
.2 Provide access on tank truck for Departmental Representative to sample asphalt material to be incorporated into work, in accordance with ASTM D 140.

.4 Certifications: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

.5 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures.

1.4 Quality Assurance

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

1.5 Delivery, Storage And Handling

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

PART 2 – PRODUCTS

2.1 EQUIPMENT

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

without atomization at rate specified and at temperature required.

.2 Equipped with meter registering metres of travel per minute, visibly located, to enable truck driver to maintain constant speed required for application at specified rate.

.3 Equipped with pump with flow meter graduated in units of 5 L maximum per minute passing through nozzles and readily visible to operator. Ensure pump power unit is independent of truck power unit.

.4 Equipped with an easily readable, accurate and sensitive device which registers temperature of liquid in reservoir.

.5 Equipped with accurate volume measuring devices or calibrated tank.

.6 Equipped with nozzles of same make and dimensions adjustable for fan width and orientation.

.7 Cleaned if previously used with incompatible asphalt material.

.2 Mechanical aggregate spreader:

.1 Equip with positive controls to allow aggregate to be deposited uniformly over full width of asphalt material.

.2 Self-propelled unit of design approved by Departmental Representative.

.3 Supported by 4 minimum wheels with pneumatic tires of 2 axles.

.3 Rollers:

.1 Self-propelled pneumatic tired rollers exerting force of 7 tonnes/m minimum of rolling width, equipped with seven wheels minimum staggered back and front, and tires inflated to 415 kPa.

.2 Tandem steel drum rollers and rubber-coated vibratory steel drum rollers as approved by Departmental Representative:

.1 Drum diameter: 1 m minimum.

.2 Static force: 4.3 tonnes/m minimum of rolling width.

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

2.2 MATERIALS

.1 Emulsified Asphalt Binder: As outlined in NBDTI Standard Specifications, Item 265, Chip Seal.

.2 Aggregate: material to Section 31 05 16 - Aggregate Materials and following requirements:

.1 Crushed stone or gravel.

.2 Gradations to be within limits specified when tested to ASTM C 136 and ASTM C 117 Sieve sizes to CAN/CGSB-8.1.

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

.3 Los Angeles Degradation: to ASTM C 131, maximum percent loss by mass 25.

.4 Magnesium sulphate soundness: to ASTM C 88, maximum percent loss by mass 15.

.5 Crushed particles: at least 60 % of particles by mass within each of following sieve designation range to have at least 1 freshly fractured face. Material to be divided into ranges using methods of ASTM C 136.

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

.6 Flat and elongated particles, with length to thickness ratio greater than 5, maximum percent by mass 8.

.3 Anti-stripping additive: heat stable adhesion agent approved by Departmental Representative.

PART 3 - EXECUTION

3.1 Examination

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's written instructions prior to flexible paving surface treatment installation.

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

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

3.2 Preparation

.1 Clean paved and primed surfaces of mud, dust and other foreign matter. Immediately before asphalt binder is applied broom or clean as necessary to remove foreign material.

3.3 Application

.1 Obtain approval from Departmental Representative, of surface before applying asphalt surface treatment material.

.2 Apply treatment only when existing surface is dry when atmospheric temperature in shade is above 10 degrees C and rising or above 15 degrees C if falling, and when weather is clear and dry.

.3 Schedule work to approval of Departmental Representative.

.4 Ensure pressure distributor follows string line parallel to centreline, or follows path as directed by Departmental Representative.

.5 Apply materials within following ranges. Departmental Representative will direct quantities of asphalt material and aggregate to be applied.

.1 Double Surface Treatment: Two layers of

12.5 mm chips.

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

.6 Apply asphalt material at spraying temperature specified in applicable CGSB standard for type and grade used and at rate specified using pressure distributor.

.7 Apply aggregate, in unfrozen condition, immediately following application of asphalt material. Aggregate spreader to be no more than 30 m behind distributor. Apply no more aggregate than can be thoroughly incorporated into and absorbed by asphalt material.

.8 Ensure aggregate spreader tires do not contact uncovered and newly applied asphalt material.

.9 Immediately after aggregate is spread, cover deficient areas with additional aggregate.

.10 Adjust rates of application of asphalt and aggregate as directed by Departmental Representative.

.11 Compact immediately after aggregate is spread using 2 rollers minimum.
.1 Ensure 1 rollers minimum are pneumatic tired type.

.12 Apply at least 3 roller passes to entire surface treated area.

.13 Apply subsequent layer of asphalt and aggregate when surface has set sufficiently to approval of Departmental Representative.

.14 Maintain surface as directed by Departmental Representative for period of 4 day minimum after rolling.
.1 Ensure maintenance includes distribution of aggregate, to absorb free asphalt and covering areas deficient in aggregate material with additional aggregate.

.15 Sweep excess material from entire surface by power brooms at time directed by Departmental Representative and at end of maintenance period.

.16 Conduct maintenance to contain embedded material.

3.4 Cleaning

.1 Progress Cleaning:
.1 Leave Work area clean at end of each day.

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

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

END

Part 1 General

1.1 Related Requirements

.1 Section 31 05 16 – Aggregate Materials.

.2 Section 01 33 00 - Submittal Procedures.

1.2 References

.1 ASTM International, latest edition
- .1 ASTM C117, Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.
- .2 ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- .3 ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft^3) (600kN-m/m^3).
- .4 ASTM D4318, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

.2 New Brunswick Department of Transportation and Infrastructure Standard Specifications (most recent version):
- .1 NBDTI Standard Specification Division 200 – Item 201, Production of Highway Aggregates.

PART 2 PRODUCTS

2.1 Materials

.1 Granular Sub-Base material:
- .1 Crushed rock, crushed gravel or pit run gravel, 75 mm minus.
- .2 Granular Sub-Base shall not consist of sandstone.
- .3 Gradations to be within limits specified in NBDTI Division 200, Item 201.2.4, Tables 201-2, 201-3.when tested to ASTM C136 and ASTM C117.
- .4 Other properties in accordance with NBDTI Division 200, Item 201.2.2, Table 201-1.

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

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

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

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

Table 201-4
Grading Limits – Pit Run Gravel Subbase

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

PART 3 EXECUTION

3.1 Preparation

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

3.2 Placing

.1 Place Granular Sub-Base after subgrade is inspected and approved by Departmental Representative.

.2 Construct Granular Sub-Base to depth and grade in areas indicated.

.3 Ensure no frozen material is placed.

.4 Place material only on clean unfrozen surface, free from snow or ice.

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

.6 Place Granular Sub-Base material using methods which do not lead to segregation or degradation.

.7 Place Granular Sub-Base material to full width in uniform layers not exceeding 250 mm compacted thickness.
   .1 Engineer may authorize thicker lifts if specified compaction can be achieved.

.8 Shape each layer to smooth contours and compact to specified density before succeeding layer is placed.

.9 Remove and replace portion of layer in which material has become segregated during spreading.

3.3 Compaction

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

.2 Compact Granular Sub-Base to density of not less than 98% maximum dry density in accordance with ASTM D698.

.3 Shape and roll alternately to obtain smooth, even and uniformly compacted sub-base.

.4 Apply water as necessary during compaction to obtain specified density.

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

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

3.4 Site Tolerances

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

3.5 PROTECTION

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

END

PART 1 GENERAL

1.1 Related Requirements

.1 Section 31 05 16 – Aggregate Materials.

.2 Section 01 33 00 - Submittal Procedures.

1.2 References

.1 ASTM International, latest edition
- .1 ASTM C117, Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.
- .2 ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- .3 ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft^3) (600kN-m/m^3).
- .4 ASTM D4318, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
  Particles in Coarse Aggregate

.2 New Brunswick Department of Transportation and Infrastructure Standard Specifications (most recent version):
- .1 NBDTI Standard Specification Division 200 Pavement Structure, Item 201 – Production of Highway Aggregates.

PART 2 PRODUCTS

2.1 Materials

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

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

PART 3 EXECUTION

3.1 Preparation

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

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

3.2 PLACING

.1 Place Granular Base Course after subgrade is inspected and approved by Departmental Representative.

.2 Construct Granular Base Course to depth and grade in areas indicated.

.3 Ensure no frozen material is placed.

.4 Place material only on clean unfrozen surface, free from snow or ice.

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

.6 Place Granular Base Course material using methods which do not lead to segregation or degradation.

.7 Place material to full width in uniform layers not exceeding 250 mm compacted thickness.
.1 Engineer may authorize thicker lifts if specified compaction can be achieved.

.8 Shape each layer to smooth contours and compact to specified density before succeeding layer is placed.

.9 Remove and replace portion of layer in which material has become segregated during spreading.

.10 Shoulder material (Table 201-6) shall be placed as per NBDTI Standard Specification Division 200, item 204, Shoulder Material, and at other locations within the Park as directed by the Departmental Representative.

3.3 Compaction

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

.2 Compact Granular Base Course to density of not less than 100% maximum dry density in accordance with ASTM D698.

.3 Shape and roll alternately to obtain smooth, even and uniformly compacted sub-base.

.4 Apply water as necessary during compaction to obtain specified density.

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

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

3.4 Site Tolerances

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

3.5 PROTECTION

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

END

PART 1 GENERAL

1.1 Related Requirements

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 31 05 16 - Aggregate Materials.

1.2 References

.1 American Association of State Highway and Transportation Officials (AASHTO), latest edition
- .1 AASHTO MP1, Standard Specification for Performance Graded Asphalt Binder.
- .2 AASHTO PP6, Standard Practice for Grading or Verifying the Performance Grade of an Asphalt Binder.
- .3 AASHTO T245, Standard Method of Test for Resistance to Plastic flow of Bituminous Mixtures Using Marshall Apparatus.
- .4 AASHTO T283, Resistance of Compacted Bituminous Mixture to Moisture Induced Damage.
- .5 AASHTO M156, Requirements for Mixing Plants for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures.

.2 Asphalt Institute (AI)
- .1 AI Manual Series 2 (MS-2), Seventh Edition, Marshall Mix Design.

.3 ASTM International, latest edition
- .1 ASTM C88, Standard Test Method for Soundness of Aggregates by Use of Sodium Sulphate or Magnesium Sulphate.
- .2 ASTM C117, Standard Test Method for Material Finer Than 0.075mm (No.200) Sieve in Mineral Aggregates by Washing.
- .3 ASTM C123, Standard Test Method for Lightweight Particles in Aggregate.
- .4 ASTM C127, Standard Test Method for Specific Gravity and Absorption of Coarse Aggregate.
- .5 ASTM C128, Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Fine Aggregate.
- .6 ASTM C131, Standard Test Method for Resistance to Degradation of Small-Size

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

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

.8 ASTM C207, Standard Specification for Hydrated Lime.

.9 ASTM D2041, Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures.

.9 ASTM D2419, Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.

.10 ASTM D2726, Test Method for Bulk Specific Gravity of Compacted Bituminous Mixtures Using Saturated Surface-Dry Specimens.

.11 ASTM D3203, Standard Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures.

.12 ASTM D4469, Method for Calculating Percent Asphalt Absorption by the Aggregate in an Asphalt Paving Mixture.

.13 ASTM D4791, Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.

.14 ASTM D6927, Standard Test Method for Marshall Stability and Flow of Bituminous Mixtures.

.15 Environmental Protection Act.

.16 Occupational Health and Safety Act.

.17 New Brunswick Department of Transportation and Infrastructure Standard Specifications (most recent version):

.1 NBDTI Standard Specification Division 200 Pavement Structure, Item 260, Asphalt Concrete.

1.3 Action and Informational Submittals

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

.2 Product Data:

.1 Submit viscosity-temperature chart for asphalt cement to be supplied showing

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

.3 Samples:

.1 Inform Departmental Representative of proposed source of aggregates and provide access for sampling 4 weeks prior to beginning Work.

.2 Submit samples of following materials proposed for use 2 weeks prior to beginning Work.

.1 One 5 L container of asphalt cement.

.2 50 kg of each aggregate to be used in the asphalt mix.

.4 Test and Evaluation Reports:

.1 Submit manufacturer's test data and certification that asphalt cement meets specification requirements.

.2 Submit asphalt concrete mix design and trial mix test results to Departmental Representative for approval at least 2 weeks prior to beginning Work.

1.4 Delivery, Storage and Handling

.1 Deliver and stockpile aggregates in accordance with Section 31 05 16 – Aggregate Materials. Stockpile minimum 30 % of total amount of aggregate required before beginning asphalt mixing operation.

.2 When necessary to blend aggregates from one or more sources to produce required gradation, do not blend in stockpiles.

.3 Stockpile fine aggregate separately from coarse aggregate, although separate stockpiles for more than two mix components are permitted.

.4 Provide approved storage, heating tanks and pumping facilities for asphalt cement.

.5 Submit to Departmental Representative copies of freight and waybills for asphalt cement as shipments are received.

PART 2 PRODUCTS

2.1 Materials

.1 Performance graded asphalt cement: to AASHTO MP1, grade PG 58-28 when tested to AASHTO PP6.

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

.4 Anti-stripping agent: As per NBDTI Standard Specifications, Division 200, Item 260, Table 260-2..

2.2 Equipment

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

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

.3 Vibratory rollers:
- .1 Drum diameter: 1200 mm minimum.

.4 Haul trucks: sufficient number and of adequate size, speed and condition to ensure orderly and continuous operation and as follows:
- .1 Boxes with tight metal bottoms.

.2 Covers of sufficient size and weight to completely cover and protect asphalt mix when truck fully loaded.
.3 In cool weather or for long hauls, insulate entire contact area of each truck box.
.4 Use only trucks which can be weighed in single operation on scales supplied.

.5 Hand tools:
.1 Lutes or rakes with covered teeth for spreading and finishing operations.
.2 Tamping irons having mass 12 kg minimum and bearing area not exceeding 310 cm2 for compacting material along curbs, gutters and other structures inaccessible to roller. Mechanical compaction equipment, when approved by Departmental Representative, may be used instead of tamping irons.
.3 Straight edges, 4.5 m in length, to test finished surface.

.6 Plant testing facility: provide laboratory space at plant site for exclusive use of Departmental Representative, for performing tests, keeping records and making reports.

2.3 Mix Design

.1 Mix design to be approved in writing by Departmental Representative.

.2 Mix design to be developed by testing laboratory approved by Departmental Representative.
.1 Conform to the requirements of this specification and to the Special Provisions when tested in accordance with procedures provided in the latest edition of the Asphalt Institute Manual Series 2 (MS-2)with the exception of calculating asphalt absorption, ASTM D 4469 shall be followed.

.3 The asphalt concrete physical requirements shall be as per NBDTI Standard Specifications.

.4 Following acceptance of the Contractor’s mix design, the Job Mix Formula (JMF) is determined by the Contractor producing one or more trial

asphalt concrete mixes using the plant proposed for the work.

PART 3 EXECUTION

3.1 Examination

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

3.2 Plant and Mixing Requirements

.1 Batch and continuous mixing plants:
  .1 To ASTM D995.

  .2 Feed aggregates from individual stockpiles through separate bins to cold elevator feeders.
    .1 Do not load frozen materials into bins.

  .3 Feed cold aggregates to plant in proportions to ensure continuous operations.

  .4 Calibrate bin gate openings and conveyor speeds to ensure mix proportions are achieved.

  .5 Before mixing, dry aggregates to moisture content not greater than 0.5% by mass or to lesser moisture content if required to meet mix design requirements.

  .6 Immediately after drying, screen aggregates into hot storage bins in sizes to permit recombining into gradation meeting job-mix requirements.

  .7 Store hot screened aggregates in manner to minimize segregation and temperature loss.

  .8 Heat asphalt cement and aggregate to mixing temperature. Do not heat asphalt cement above 160 degrees C.

.9 Make available current asphalt cement viscosity data at plant.

.10 Maintain temperature of materials within 5 degrees C of specified mix temperature during mixing.

.11 Mixing time:

.1 In batch plants, continue wet mixing as long as necessary to obtain thoroughly blended mix but not less than 30s or more than 75s.

.2 In continuous mixing plants, mixing time to be not less than 45s.

.2 Dryer drum mixing plant:

.1 To ASTM D995.

.2 Load aggregates from individual stockpiles to separate cold feed bins. Do not load frozen materials into bins.

.3 Feed aggregates to burner end of dryer drum by means of multi-bin cold feed unit and blend to meet job-mix requirements by adjustments of variable speed feed belts and gates on each bin.

.4 Where RAP is to be incorporated into mix, dryer drum mixer is to be designed to prevent direct contact of RAP with burner flame or with exhaust gases hotter than 180 degrees C.

.5 Feed RAP from separate cold feed bin designed to minimize reconsolidation of material.

.6 Meter total flow of aggregate and RAP using electronic weigh belt system with indicator that can be monitored by plant operator and which is interlocked with
asphalt pump to ensure proportions of aggregate, RAP and asphalt entering mixer remain constant.

.7 Allow for easy calibration of weighing systems for aggregates and RAP without having material enter mixer.

.8 Calibrate bin gate openings and conveyor speeds to ensure mix proportions are achieved.

.1 Calibrate weigh bridge on charging conveyor by weighing amount of aggregate passing over weigh bridge in set amount of time.

.2 Difference between this value and amount shown by plant computer

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

.9 Make provision for conveniently sampling full flow of materials from cold feed.

.10 Provide screens or other suitable devices to reject oversize particles or lumps of aggregate and RAP from cold feed prior to entering drum.

.11 Provide system interlock stop on feed components if either asphalt or aggregate from bin stops flowing.

.12 Accomplish heating and mixing of asphalt mix in approved parallel flow dryermixer in which aggregate enters drum at burner end and travels parallel to flame and exhaust gas stream.

.1 Control heating to prevent fracture of aggregate or excessive oxidation of asphalt.

.2 Equip system with automatic burner controls and provide for continuous temperature sensing of asphalt mixture at discharge, with printing recorder that can be monitored by plant operator.

.3 Submit printed record of mix temperatures at end of each day.

.13 Ensure mixing period and temperature to produce uniform mixture in which particles are thoroughly coated, and moisture content of material as it leave mixer is 2 % maximum.

.3 Temporary storage of hot mix:

.1 Provide mix storage of sufficient capacity to permit continuous operation and designed to prevent segregation.

.2 Do not store asphalt mix in storage bins in excess of 3 hour.

.4 While producing asphalt mix for this Project, do not produce mix for other users unless separate storage and pumping facilities are provided for materials supplied to this project.

.1 Permissible variation of mix temperature at discharge from plant: 10 degrees C.

3.3 Preparation

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

.2 When paving over existing asphalt surface, clean pavement surface to approval of Departmental Representative.

.3 Prior to laying mix, clean surfaces of loose and foreign material.

3.4 Transportation of Mix

.1 The Contractor has the option of using a Material Transfer Vehicle (MTV) for the placement of all asphalt concrete.
  .1 No unit cost adjustments will be applied to asphalt concrete placed using a material transfer vehicle.
  .2 Material transfer vehicles shall be self-propelled equipment capable of transferring asphalt concrete from the hauling equipment into the paver, and shall have the following characteristics:
    .1 Minimum storage capacity of 20 t;
    .2 A conveyor system to transfer asphalt concrete from the hauling equipment to the paver hopper insert; and
    .3 An auger system in the MTV or paddle mixers in the hopper insert to remix the asphalt concrete prior to discharge from the hopper insert.

.2 Transport mix to job site in vehicles cleaned of foreign material.

.3 Paint or spray truck beds with limewater, soap or detergent solution, or non-petroleum based commercial product, at least daily or as required.
  .1 Raise truck bed and thoroughly drain, and ensure no excess solution remains in truck bed.

.4 Schedule delivery of material for placing in daylight, unless Departmental Representative approves artificial light for night placing.

.5 Deposit mix from surge or storage silo to trucks in multiple drops to reduce segregation.

.1 Do not dribble mix into trucks.

.6 Deliver material to paver at uniform rate and in an amount within capacity of paving and compacting equipment.

.7 Deliver loads continuously in covered vehicles and immediately spread and compact.
.1 Deliver and place mixes at temperature not less than 135 degrees C.

3.5 Test Strip

.1 Construct and test an asphalt test strip to approval of Departmental Representative.

.2 Construct test strip with at least 500 tonnes of mix, and involving more than one lane, so that joint finishing techniques can be established.

.3 During construction of test strip, the Contractor will establish optimum rolling pattern by taking nuclear densimeter readings and observations to:
.1 Determine sequence and number of passes.
.2 Determine correct operating characteristics of vibratory rollers.
.3 Determine maximum density of asphalt mix.
.4 Ensure smooth surface finish.
.5 Establish actual density achieved by coring in order to determine if additional or other rolling equipment is required to achieve density of not less than 93 % of laboratory maximum theoretical density from samples of mix being used.

3.6 Placing

.1 Obtain Departmental Representative's approval of existing surface prior to placing asphalt.

.2 Place asphalt concrete to thicknesses, grades and lines as directed by Departmental Representative.

.3 Placing conditions:
.1 Place asphalt mixtures only when air temperature is 5 degrees C minimum. All asphalt must be installed no later than November 15, 2016.

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

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

.4 Place asphalt concrete in minimum compacted lifts of thickness as follows:

.1 Mix Type B in minimum 50mm layers.

.2 Mix Type D in minimum 40mm layers.

.5 Where possible do tapering and levelling where required in lower lifts. Overlap joints by not less than 300 mm.

.6 Place individual strips no longer than 500 m unless approved by the Departmental Representative.

.7 Spread and strike off mixture with self-propelled mechanical finisher.

.1 Construct longitudinal joints and edges true to line markings.

.2 When using pavers in echelon, have first paver follow marks or lines, and second paver follow edge of material placed by first paver.

.1 Work pavers as close together as possible and in no case permit them to be more than 30 m apart.

.3 Maintain constant head of mix in auger chamber of paver during placing.

.4 If segregation occurs, immediately suspend spreading operation until cause is determined and corrected.

.5 Correct irregularities in alignment left by paver by trimming directly behind machine.

.6 Correct irregularities in surface of pavement course directly behind paver.

.1 Remove excess material forming high spots using shovel or lute.

.1 Fill and smooth indented areas with hot mix.

.2 Do not broadcast material over such areas.

.7 Do not throw surplus material on freshly screeded surfaces.

.8 When hand spreading is used:

.1 Use approved wood or steel forms, rigidly supported to assure correct grade and cross section.

.1 Use measuring blocks and intermediate strips to aid in obtaining required cross-section.

.2 Distribute material uniformly without broad casting material.

.3 During spreading operation, thoroughly loosen and uniformly distribute material by lutes or covered rakes.

.1 Reject material that has formed into lumps and does not break down readily.

.4 After placing and before rolling, check surface with templates and straightedges and correct irregularities.

.5 Provide heating equipment to keep hand tools free from asphalt.

.1 Control temperature to avoid burning material.

.2 Do not use tools at higher temperature than temperature of mix being placed.

3.7 Compacting

.1 Roll asphalt continuously using established rolling pattern to density of not less than 92.5% of maximum theoretical density of mix samples. Determined according to ASTM D3203.

.2 Do not change rolling pattern unless mix changes or lift thickness changes.

.1 Inform Departmental Representative prior to making changes to rolling pattern.

.3 General:

.1 Provide at least 2 rollers and as many additional rollers as necessary to achieve

specified pavement density. When more than 2 rollers are required, 1 roller must be pneumatic tired type.

.2 Start rolling operations as soon as placed mix can bear weight of roller without excess displacement of material or cracking of surface.

.3 Operate roller slowly initially to avoid displacement of material. Do not exceed 5 km/h for breakdown and intermediate rolling for static steel-wheeled and pneumatic tired rollers. Do not exceed 9 km/h for finish rolling.

.4 For lifts 50 mm thick and greater, adjust speed and vibration frequency of vibratory rollers to produce minimum of 25 impacts per metre of travel. For lifts less than 50 mm thick, impact spacing not to exceed compacted lift thickness.

.5 Overlap successive passes of roller by minimum of 200 mm and vary pass lengths.

.6 Keep wheels of roller slightly moistened with water to prevent pick-up of material but do not over-water.

.7 Do not stop vibratory rollers on pavement that is being compacted with vibratory mechanism operating.

.8 Do not permit heavy equipment or rollers to stand on finished surface before it has been compacted and has thoroughly cooled.

.9 After traverse and longitudinal joints and outside edge have been compacted, start rolling longitudinally at low side and progress to high side.

.1 Ensure that all points across width of pavement receive essentially equal numbers of passes of compactors.

.10 When paving in echelon, leave unrolled 50 to 75 mm of edge which second paver is following and roll when joint between lanes is rolled.

.11 Where rolling causes displacement of material, loosen affected areas at once with lutes or shovels and restore to

original grade of loose material before re-rolling.

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

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

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

3.8 Joints

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

.2 Cut back to full depth vertical face and tack face with thin coat of hot asphalt prior to continuing paving.

.3 Compact transverse joints to provide smooth riding surface. Use methods to prevent rounding of compacted surface at joints.

.3 Longitudinal joints:

.1 Offset longitudinal joints in succeeding lifts by at least 150 mm.

.2 Cold joint is defined as joint where asphalt mix is placed, compacted and left to cool below 100 degrees C prior to paving of adjacent lane.

.1 All cold joints shall be painted with an application of tack coat prior to paving the adjacent lane.

.2 Overlap previously laid strip with spreader by 25 mm.

.3 Before rolling, carefully remove and discard coarse aggregate in material overlapping joint with lute or rake.

.4 Roll longitudinal joints directly behind paving operation.

.5 When rolling with static or vibratory rollers, have most of drum width ride on newly placed lane with remaining 150 mm extending onto previously placed and compacted lane.

3.9 Surface Defects

.1 The finished surface of any pavement course shall have a uniform texture and be free of visible signs of poor workmanship and bumps and/or dips exceeding 3 mm as measure with a 3 m straight edge.

.2 Any obvious defects, as determined by the Engineer, shall be cause for rejection of the pavement course.

.1 Multiple defects within a 10 metre section shall be considered as one defect.

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

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

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

3.10 Finish Tolerances

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

3.11 Cleaning

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

END

PART 1 GENERAL

1.1 Related Requirements

.1 Section 31 23 13 Rough Grading

.2 Section 32 11 16.01 Granular Subbase

.3 Section 32 11 23 Aggregate Base Courses

1.2 REFERENCES

.1 CAN/CGSB-15.1-92 Calcium Chloride

PART 2 PRODUCTS

2.1 Materials

.1 Supply water and calcium chloride in quantities and at times as directed by Departmental Representative.

.1 Water: to Departmental Representative's approval.

.2 Calcium chloride: Type I to CAN/CGSB-15.1, 35% aqueous solution.

PART 3 EXECUTION

3.1 General

.1 The Contractor shall use dust control throughout the construction site.

.2 Contractor is to use water as the primary method of dust control.

.3 Contractor is responsible for having proper equipment necessary for applying water to the area at all times throughout the contract.

.4 If the contractor fails to provide dust control to the satisfaction of the Departmental Representative, the Departmental Representative will provide such controls

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

3.2 Application

.1 Provide dust control on an on-going basis, including weekends and holidays, with equipment approved by Departmental Representative, at an appropriate rate to reduce dust as directed by the Departmental Representative.

.2 Apply water and/or aqueous calcium chloride with distributors equipped with means of shut-off and with spray system to ensure uniform application.

END

PART 1 GENERAL

1.1 Related Requirements

.1 Section 31 22 13 - Rough Grading

1.2 References

.1 Agriculture and Agri-Food Canada
  .1 The Canadian System of Soil Classification, Third Edition, 1998.

.2 Canadian Council of Ministers of the Environment PN1340-2005, Guidelines for Compost Quality.

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

.4 New Brunswick Department of Transportation and Infrastructure Renewal Standard Specification (most recent version):
  .1 NBDTI Standard Specification – Division 600 – Environmental, Item 613 – Topsoil.

1.3 Definitions

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

1.4 Submittals

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

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

1.5 Quality Assurance

.1 Perform Work in accordance with the projects Erosion and Sedimentation Control Plan as specified in Section 01 35 43 – Environmental Procedures.

.2 Pre-installation meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements in accordance with Division 1.

1.6 Waste Management and Disposal

.1 Separate waste materials for reuse and recycling in accordance with Division 1.

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

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

PART 2 PRODUCTS

2.1 Topsoil

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

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

2.2 Soil Amendments

.1 Fertilizer:

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

.2 Peatmoss:
  .1 Derived from partially decomposed species of Sphagnum Mosses.
  .2 Elastic and homogeneous, brown in colour.

.3 Free of wood and deleterious material which could prohibit growth.
.4 Shredded particle minimum size: 5 mm.

.3 Sand: washed coarse silica sand, medium to course textured.

.4 Organic matter: compost Category A, B in accordance with CCME PN1340, unprocessed organic matter, such as rotted manure, hay, straw, bark residue or sawdust, meeting the organic matter, stability and contaminant requirements.

.5 Limestone:
.1 Ground agricultural limestone.
.2 Gradation requirements: percentage passing by weight, 90% passing 1.0 mm sieve, 50% passing 0.125 mm sieve.

.6 Fertilizer: industry accepted “phosphate free” standard medium containing nitrogen, phosphorous, potassium and other micro-nutrients suitable to specific plant species or application or defined by soil test.

2.3 Source Quality Control

.1 Advise Departmental Representative of sources of topsoil and manufactured topsoil to be utilized with sufficient lead time for testing.

.2 Contractor is responsible for amendments to existing topsoil and to supply topsoil as specified.

.3 Soil testing by recognized testing facility for PH, P and K, and organic matter. Soil test to identify amendments necessary to meet requirements for topsoil as specified.

.4 Testing of topsoil will be carried out by testing laboratory designated by Departmental Representative.
.1 Soil sampling, testing and analysis to be in accordance with Provincial standards.

PART 3 EXECUTION

3.1 Temporary Erosion and Sedimentation Control

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

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

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

3.2 Stripping of Topsoil

.1 Begin topsoil stripping of areas as indicated after area has been cleared of brush weeds and grasses and removed from site.

.2 Strip topsoil to depths as directed by Departmental Representative.
.1 Avoid mixing topsoil with subsoil where textural quality will be moved outside acceptable range of intended application.

.3 Stockpile in locations as indicated.
Stockpile height not to exceed 2000-2500mm.

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

.5 Protect stockpiles from contamination and compaction.

3.3 Preparation of Existing Grade

.1 Verify that grades are correct.

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

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

.4 Remove debris, roots, branches, stones in excess of 25 mm diameter and other deleterious materials.
.1 Remove soil contaminated with calcium chloride, toxic materials and petroleum products.
.2 Remove debris which protrudes more than 50 mm above surface.
.3 Dispose of removed material off site.

.5 Cultivate entire area which is to receive topsoil to minimum depth of 100 mm.
.1 Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.

3.4 Placing and Spreading of Topsoil/ Planting Soil

.1 Place topsoil after Departmental Representative has accepted subgrade.

.2 Spread topsoil in uniform layers not exceeding 150 mm.

.3 For sodded areas keep topsoil 15 mm below finished grade.

.4 Spread topsoil as indicated to following minimum depths after compaction to 85% Modified Proctor Density.
200 mm for sodded areas.

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

3.5 Soil Amendments

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

3.6 Finish Grading

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

3.7 Acceptance

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

3.8 Surplus Material

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

3.9 Cleaning

.1 Proceed in accordance with Section 01 74 11 - Cleaning.

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

END

PART 1 GENERAL

1.1 Related Requirements

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 31 22 13 - Rough Grading.

.3 Section 32 91 21 - Topsoil Placement.

1.2 References

.1 New Brunswick Department of Transportation and Infrastructure Renewal Standard Specification (most recent version):
  .1 NBDTI Standard Specification, Division 600, Item 614, Hydroseeding.

1.3 Submittals

.1 Product Data.
  .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
  .2 Provide product data for:
    Seed
    Mulch
    Tackifier
    Fertilizer
  .3 Submit in writing to days prior to commencing work:
    .1 Volume capacity of hydraulic seeder in litres.
    .2 Amount of material to be used per tank based on volume.
    .3 Number of tank loads required per hectare to apply specified slurry mixture per hectare.

1.4 Quality Assurance

.1 Perform Work in accordance with the projects Erosion and Sedimentation Control Requirements in Section 01 35 43 Environmental Procedures.

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

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

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

1.5 Scheduling

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

.2 Schedule hydraulic seeding using grass mixtures.

1.6 Waste Management and Disposal

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

.2 Divert unused fertilizer from landfill to official hazardous material collections site approved by Departmental Representative.

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

PART 2 PRODUCTS

2.1 Materials

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

.2 Type : NBDTI Roadside Mix with Mulch Contains:
- .1 40% Creeping Red Fescue
- .2 20% Hard Fescue
- .3 15% Canada Bluegrass
- .4 5% Alsike or White Clover
- .5 15% Annual Rye Grass
- .6 5% Red Top

.3 Seed at a minimum rate of 125Kg/ha.

.4 Mulch: specially manufactured for use in hydraulic seeding equipment, non-toxic, water activated, green colouring, free of germination and growth inhibiting factors with following properties:
- .1 Type I mulch:
  - .1 Made from wood cellulose fibre.
  - .2 Organic matter content: 95% plus or minus 0.5%.
  - .3 Value of pH: 6.0.
  - .4 Potential water absorption: 900%.
- .2 Type II mulch:
  - .1 Made from newsprint, raw cotton fibre and straw, processed to produce fibre lengths of 15 mm minimum and 25 mm maximum. Greater proportions of ingredients to be straw.
- .3 Application rate at a minimum of 500 kg/ha.

.6 Tackifier: Water dilutable, liquid dispersion.

.7 Water: Free of impurities that would inhibit germination and growth.

.8 Fertilizer:
- .1 To Canada "Fertilizers Act" and "Fertilizers Regulations".
- .2 Fertilizer shall be formulated 15-25-15 for seeding done April 15 to September 1st and 10-20-20 thereafter.
- .3 The application rate for fertilizer shall be a minimum of 375 kg/ha.

.9 Inoculants: inoculant containers to be tagged with expiry date.

PART 3 EXECUTION

3.1 Workmanship

.1 Do not spray onto structures, signs, guide rails, fences, plant material, utilities and other than surfaces intended.

.2 Clean-up immediately, any material sprayed where not intended, to satisfaction of Departmental Representative.

.3 Do not perform work under adverse field conditions such as wind speeds over 10 km/h, frozen ground or ground covered with snow, ice or standing water.

.4 Protect seeded areas from trespass until plants are established.

3.2 Preparation of Surfaces

.1 Fine grade areas to be seeded free of humps and hollows. Ensure areas are free of deleterious and refuse materials.

.2 Cultivated areas identified as requiring cultivation to depth of 25 mm.

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

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

.5 Measure quantities of materials by weight or weight calibrated volume measurement satisfactory to Departmental Representative. Supply equipment required for this work.

.6 Charge required water into seeder. Add material into hydraulic seeder under agitation. Pulverize mulch and charge slowly into seeder.

.7 After all materials are in the seeder and well mixed, charge tackifier into seeder and mix thoroughly to complete slurry

3.4 Slurry Application

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

.2 Slurry mixture applied per hectare.
Seed: Highway Mix 250kg.
Mulch: Type I or II 1350 kg.
Tackifier: 300 kg.
Water: Minimum 30,000 L.
Fertilizer: 375 kg, ratio 10:20:20.

.3 Apply slurry uniformly, at optimum angle of application for adherence to surfaces and germination of seed.
Using correct nozzle for application.
Using hoses for surfaces difficult to reach and to control application.

.4 Blend application 300 mm into adjacent grass areas or sodded areas, previous applications to form uniform surfaces.

.5 Re-apply where application is not uniform.

.6 Remove slurry from items and areas not designated to be sprayed.

.7 Protect seeded areas from trespass satisfactory to Departmental Representative.

.8 Remove protection devices as directed by Departmental Representative.

3.5 Maintenance During Establishment Period

.1 Perform following operations from time of seed application until acceptance by Departmental Representative.

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

3.6 Acceptance

.1 Seeded areas will be accepted by Departmental Representative, provided that:
- .1 Plants are uniformly established. Seeded areas are free of rutted, eroded, bare or dead spots.
- .2 Areas have been mown at least twice.
- .3 Areas have been fertilized.

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

3.7 Maintenance During Warranty Period

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

3.8 Cleaning

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

END

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 01 35 43 – Environmental Procedures.

.2 Section 31 23 33 – Excavating, Trenching and Backfilling

.3 Section 31 25 00 – Erosion and Sediment Control.

1.2 REFERENCES

.1 Reference Standards:
- .1 Agriculture and Agri-Food Canada (AAFC).
  - .1 Plant Hardiness Zones in Canada-2000.
- .2 Canadian Nursery Landscape Association (CNLA)
  - .1 Canadian Standards for Nursery Stock-2006.
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Scheduling: obtain approval from Departmental Representative of schedule 7 days in advance of shipment of plant material.

.2 Schedule to include:
- .1 Quantity and type of plant material.
- .2 Shipping dates.
- .3 Arrival dates on site.
- .4 Planting Dates.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
- .1 Submit manufacturer's instructions, printed product literature and data sheets for, shrubs and include product characteristics, performance criteria, physical size, finish and limitations.

1.5 QUALITY ASSURANCE

.1 Qualifications:
- .1 Landscape Sub-Contractor: to be a Member in Good Standing of New Brunswick Horticultural Trades Association.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .1 Protect plant material from frost, excessive

heat, wind and sun during delivery.

.2 Protect plant material from damage during transportation:

.1 Delivery distance is less than 30 km and vehicle travels at speeds under 80 km/h, tie tarpaulins around plants or over vehicle box.

.2 Delivery distance exceeds 30 km or vehicle travels at speeds over 80 km/h, use enclosed vehicle where practical.

.3 Protect foliage and root balls using anti-desiccants and tarpaulins, where use of enclosed vehicle is impractical due to size and weight of plant material.

.3 Storage and Handling Requirements:

.1 Immediately store and protect plant material which will not be installed within 1 hour in accordance with supplier's written recommendations and after arrival at site in storage location approved by Departmental Representative.

.2 Protect stored plant material from frost, wind and sun and as follows:

.1 For bare root plant material, preserve moisture around roots by heeling-in or burying roots in sand or topsoil and watering to full depth of root zone.

.2 For pots and containers, maintain moisture level in containers.

.3 For balled and burlapped and wire basket root balls, place to protect branches from damage. Maintain moisture level in root zones.

.3 Store and manage hazardous materials in accordance with manufacturer's written instructions.

.4 Packaging Waste Management: remove pallets, crates, padding, and packaging materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.7 WARRANTY

.1 Plant material warranty period is 12 months.

.2 End-of-warranty inspection will be conducted by Departmental Representative.

.3 Departmental Representative reserves the right to extend Contractor's warranty responsibilities for an additional one year if, at end of initial

warranty period, leaf development and growth is not sufficient to ensure future survival.

PART 2 - PRODUCTS

2.1 PLANT MATERIAL

.1 Type of root preparation, sizing, grading and quality: comply to Canadian Standards for Nursery Stock.
  .1 Source of plant material: grown in Zone 5A or 5B in accordance with Plant Hardiness Zones in Canada.
  .2 Plant material must be planted in zone specified as appropriate for its species.
  .3 Plant material in location appropriate for its species.

.2 Plant material: free of disease, insects, defects or injuries and structurally sound with strong fibrous root system.

.3 Trees: with straight trunks, well and characteristically branched for species.

.4 Trees larger than 200 mm in caliper: half root pruned during each of two successive growing seasons, the latter at least one growing season before arrival on site.

.5 Bare root stock: nursery grown, in dormant stage, not balled and burlapped or container grown.

.6 Collected stock: maximum 40 mm in caliper, with well developed crowns and characteristically branched; no more than 40% of overall height may be free of branches.
  .1 During collection, ensure 10% maximum seed crop (or plants) are collected from healthy population of many individuals, and from several plants of same species.
  .2 Leave remainder for natural dispersal and as food for dependent organisms.

2.2 WATER

.1 Free of impurities that would inhibit plant growth.

2.3 STAKES

.1 Wood, pointed one end, 38 x 38 x 2300 mm.

2.4 WIRE TIGHTENER

.1 Type 1: galvanized steel, stamped plate type,.

.2 Type 2: turnbuckle, galvanized steel, 9.5 mm diameter with 27 mm open length.

2.5 GUYING WIRE

.1 Type 1: steel, 3 mm wire.

.2 Type 2: 1.5 mm diameter multi-wire steel cable.

.3 Type 3: 3 mm diameter multi-wire steel cable.

2.6 CLAMPS

.1 U-bolt: galvanized, 13 mm diameter, c/w curved retaining bar and hex nuts.

.2 Crimp type.

2.7 ANCHORS

.1 Wood:
- .1 Type 1: 38 x 38 x 460 mm.
- .2 Type 2: 38 x 67 x 600 mm.

.2 Drive-in type.
- .1 Type 1: 13 mm diameter x 75 mm long, aluminum.
- .2 Type 2: 18 mm diameter x 120 mm long, aluminum.

.3 Screw-in type:
- .1 Type 1: 100 mm diameter steel disc.

2.8 GUYING COLLAR

.1 Tube: plastic, 13 mm diameter, nylon reinforced.

2.9 TRUNK PROTECTION

.1 Wire mesh: galvanized, electrically welded 1.4 mm wire with 25 x 25 mm mesh and fastener.

.2 Plastic: perforated spiralled strip.

.3 Burlap: clean 2.5 kg/mý minimum mass and 150 mm minimum wide, and twine fastener.

.4 Tar impregnated crepe paper and twine fastener.

2.10 MULCH

.1 Bark chip: varying in size from 25 to 50 mm in diameter, from bark of coniferous trees.

.2 Wood chip: varying in size from 50 mm to 75 mm and 5 to 20 mm thick, free of bark, small branches and leaves.

.3 Shredded wood: varying in size from 25 to 125 mm in length, from coniferous trees.

.4 Synthetic or inorganic mulch.

2.11 FERTILIZER

.1 Synthetic commercial type as recommended by supplier.

2.12 ANTI-DESICCANT

.1 Wax-like emulsion.

2.13 FLAGGING TAPE

.1 Fluorescent orange colour.

2.14 SOURCE QUALITY CONTROL

.1 Obtain approval from Departmental Representative of plant material prior to planting.

.2 Imported plant material must be accompanied with necessary permits and import licenses. Conform to Federal, Provincial or Territorial regulations.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Plantings are to be placed in existing soils with improvements as needed to ensure growth.

3.2 PRE-PLANTING PREPARATION

.1 Proceed only after receipt of written acceptability of plant material from Departmental Representative.

.2 Remove damaged roots and branches from plant material.

.3 Apply anti-desiccant to conifers and deciduous trees in leaf in accordance with manufacturer's instructions.

.4 Locate and protect utility lines.

.5 Notify and acquire written acknowledgment from utility authorities before beginning excavation of planting pits for trees and shrubs.

.6 Temporary Erosion and Sedimentation Control:
.1 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

3.3 EXCAVATION AND PREPARATION OF PLANTING BEDS

.1 For individual planting holes:
.1 Stake out location and obtain approval from Departmental Representative prior to excavating.
.2 Excavate to depth and width to suit each plant.
.3 Remove rocks, roots, debris and toxic material from excavated material that will be used as planting soil for trees and individual shrubs. Dispose of excess material.
.4 Scarify sides of planting hole.
.5 Remove water which enters excavations prior to planting. Notify Departmental Representative if water source is ground water.

3.4 PLANTING

.1 For bare root stock, place 50 mm backfill soil in bottom of hole.
  .1 Plant trees and shrubs with roots placed straight out in hole.

.2 For jute burlapped root balls, cut away top one third of wrapping and wire basket without damaging root ball.
  .1 Do not pull burlap or rope from under root ball.

.3 For container stock or root balls in non-degradable wrapping, remove entire container or wrapping without damaging root ball.

.4 Plant vertically in locations as indicated.
  .1 Orient plant material to give best appearance in relation to structure, roads and walks.

.5 For trees and shrubs:
  .1 Backfill soil in 150 mm lifts.
    .1 Tamp each lift to eliminate air pockets.
    .2 When two thirds of depth of planting pit has been backfilled, fill remaining space with water.
    .3 After water has penetrated into soil, backfill to finish grade.
  .2 Form watering saucer as indicated.

.6 For ground covers, backfill soil evenly to finish grade and tamp to eliminate air pockets.

.7 Water plant material thoroughly.

.8 After soil settlement has occurred, fill with soil to finish grade.

3.5 TRUNK PROTECTION

.1 Install trunk protection on deciduous trees as required.

.2 Install trunk protection before installation of tree supports.

3.6 TREE SUPPORTS

.1 Install tree supports as required for support.

.2 Use single stake tree support for deciduous trees less than 3 m in height and evergreens less than 2 m in height.
  .1 Place stake on prevailing wind side and 150 mm minimum from trunk.
  .2 Drive stake 150 mm minimum into undisturbed

soil beneath roots.
.1 Ensure stake is secure, vertical and unsplit.
.3 Install 150 mm long guying collar 1500 mm above grade.
.4 Thread Type 1 guying wire through guying collar tube.
.1 Twist wire to form collar and secure firmly to stake. Cut off excess wire.

.3 Use 3 guy wires and anchors for deciduous trees greater than 3 m in height and evergreens greater than 2 m in height.
.1 Use Type 2 guying wire with clamps for trees less than 75 mm in diameter and Type 3 guying wire with clamps for trees greater than 75 mm in diameter.
.2 Use Type 1 anchors for trees less than 75 mm in diameter and Type 2 anchors for trees greater than 75 mm in diameter.
.3 Install guying collars above branch to prevent slipping at approximately 2/3 height for evergreens and 1/2 height for deciduous trees. Collar mounting height not to exceed 2.5 m above grade.
.4 Guying collars to be of sufficient length to encircle tree plus 50 mm space for trunk clearance. Thread guy wire through collar encircling tree trunk and secure to lead wire by clamp or multi-wraps; cut wire ends close to wrap. Spread lead wires equally proportioned about trunk at 120 degrees.
.5 Install anchors at equal intervals about tree and away from trunk so guy wire will form 45 degree angle with ground. Install anchor at angle to achieve maximum resistance for guy wire.
.6 Attach guy wire to anchors. Tension wire and secure by installing clamps.
.7 Install wire tightener ensuring that guys are secure and leave room for slight movement of tree.
.8 Saw tops off wooden anchors which extend in excess of 100 mm above grade or as directed by Departmental Representative.
.9 Install flagging tape to guys as indicated.

.4 After tree supports have been installed, remove broken branches with clean, sharp tools.

3.7 MULCHING

.1 Ensure soil settlement has been corrected prior to mulching.

.2 Spread mulch as indicated.

3.8 MAINTENANCE DURING ESTABLISHMENT PERIOD

.1 Perform following maintenance operations from time of planting to acceptance by Departmental Representative.
- .1 Water to maintain soil moisture conditions for optimum establishment, growth and health of plant material without causing erosion.
  - .1 For evergreen plant material, water thoroughly in late fall prior to freeze-up to saturate soil around root system.
  - .2 Remove weeds monthly.
  - .3 Replace or respread damaged, missing or disturbed mulch.
  - .4 For non-mulched areas, cultivate as required to keep top layer of soil friable.
  - .5 If required to control insects, fungus and disease, use appropriate control methods in accordance with Federal, Provincial and Municipal regulations. Obtain product approval from Departmental Representative prior to application.
  - .6 Remove dead or broken branches from plant material.
  - .7 Keep trunk protection and guy wires in proper repair and adjustment.
  - .8 Remove and replace dead plants and plants not in healthy growing condition. Make replacements in same manner as specified for original plantings.

3.9 MAINTENANCE DURING WARRANTY PERIOD

.1 From time of acceptance by Departmental Representative to end of warranty period, perform following maintenance operations.
- .1 Remove dead, broken or hazardous branches from plant material.
- .2 Keep trunk protection and tree supports in proper repair and adjustment.
- .3 Remove trunk protection, tree supports and level watering saucers at end of warranty period.
- .4 Remove and replace dead plants and plants not in healthy growing condition. Make replacements in same manner as specified for original plantings.

3.10 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
- .1 Leave Work area clean at end of each day.

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

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management.

END

PART 1 GENERAL

1.1 Related Requirements

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

.2 Section 33 41 00 Storm Utility Drainage Piping.

1.2 Description

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

1.3 References

.1 American Society for Testing and Materials (ASTM International)
- .1 ASTM A 48/A48M-00, Standard Specification for Gray Iron Castings.
- .2 ASTM C 139-99, Specification for Concrete Masonry Units for Construction of Catch Basins and Manholes.
- .3 ASTM C 478M-97, Specification for Precast Reinforced Concrete Manhole Sections Metric.
- .4 ASTM C 618-00, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.
- .5 ASTM D 698-00a, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3).

.2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
- .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

.3 Canadian Standards Association (CSA International)
- .1 CAN/CSA-A3000-98 (April 2001), Cementitious Materials Compendium. Includes:
  - .1 CAN/CSA-A5-98, Portland Cement
  - .2 CAN/CSA-A8-98, Masonry Cement
  - .3 CAN/CSA-A23.5-98, Supplementary Cementing Materials

.2 CSA-A23.1 / A23.2-00 (June 2001), Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete.
.3 CSA-A165 Series-94 (R2000), CSA Standards on Concrete Masonry Units.
.4 CAN/CSA-G30.18-M92 (R1998), Billet Steel Bars for Concrete Reinforcement.
.5 CAN/CSA-G164-M92 (R1998), Hot Dip Galvanizing of Irregularly Shaped Articles.
.6 CAN/CSA-A257.2.
.1 Submittal in accordance with Section 01 33 00 Submittal Procedures.

PART 2 PRODUCTS

2.1 Materials

.1 Precast catch basin sections:
.1 To ASTM C478M
.2 Design: CSA Standard A-23.1/23.2
.3 Joints: Use gaskets of dense homogeneous rubber ASTM C443/C361
.4 Piping Connections: Lock gasket
.5 Cement: Type 10 Portland Cement

.2 Joints: to be made watertight using rubber rings or bituminous compound.

.3 Mortar:
.1 Aggregate: to CSA A82.56
.2 Cement: to CAN/CSA-A8

.4 Adjusting Units for Circular Manholes:
.1 Grade Rings: To ASTM C478M.
.2 Precast concrete adjustment rings: to ASTM C478, interlocking design, with circular reinforcement of a continuous welded ring of 300 mm diameter cold drawn steel wire for adjustment greater than 150 mm.
.3 Rubber adjustment rings for adjustments less than 150 mm.
.4 Sealing compound between adjustment rings to be a Butyl sealant.

.5 Frame and grate to be cast iron, certified to ASTM C478m, Class 30, to NBDTI Standard Specification, Division 400 Municipal, Item 407-Frame with Grate or Cover. NBDTI Standard Drawing 407-1.

.6 Restraining straps and connectors to be stainless steel, Type 304.

PART 3 EXECUTION

3.1 General

.1 As per the requirements of the most recent version of the NBDTI Standard Specification.

.2 Existing Catch Basins shall be disposed of in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.

3.2 Trenching

.1 Do trenching work in accordance with Section 31 23 33 – Excavating, Trenching and Backfilling.

.2 Obtain Departmental Representative’s approval of trench line and depth prior to placing bedding material or pipe.

3.3 Bedding

.1 Dewater excavation, as necessary, to allow placement of bedding in dry condition.

.2 For manholes and catch basins place minimum thickness of 150 mm of approved sand bedding on bottom of excavation and compact to minimum 95% maximum density to ASTM D 698. If ground water is present, use clean stone bedding in lieu of sand. Refer to Section 33 41 00 for material gradations.

.3 Place bedding in unfrozen condition.

3.4 Installing Manholes and Catch Basins

.1 Set precast unit on approved bedding plumb and at the correct elevation.

.2 Plug lifting holes with precast concrete plugs set in

cement mortar.

.3 Place frame and cover on gate on top section to design elevation, as indicated. If adjustment required, use concrete or rubber rings.

.4 Place two(2)stainless steel restraining straps on manholes to prevent separation of sections.

.5 Clean units of debris and foreign materials. Prevent debris from entering system.

.6 Parge the circumference of connecting pipes, inside and outside the unit, to seal the pipe to the unit.

3.5 Backfilling

.1 Backfill around manholes and catch basin as indicated or as directed by Departmental Representative.

.2 Place granular backfill material, approved by Department of Supply and Services Representative, in 300 mm layers to full width, alternately on each side of the unit, so as not to displace it laterally or vertically.

.3 Compact each layer to 95% maximum density to ASTM D 698.

.4 Place backfill in unfrozen condition.

END

PART 1 GENERAL

1.1 Related Requirements

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

.2 Section 31 37 00 Rip Rap.

1.2 Description

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

1.3 References

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

.1 ASTM C 14M-99, Standard Specification for Concrete Sewer, Storm Drain and Culvert Pipe (Metric).

.2 ASTM C 76M-02, Standard Specification for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe (Metric).

.3 ASTM C 117-95, Standard Test Method for Material Finer than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.

.4 ASTM C 136-01, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.5 ASTM C 144-02, Standard Specification for Aggregate for Masonry Mortar.

.6 ASTM C 443M-02, Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets (Metric).

.7 ASTM D 698-00a, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).

.8 ASTM D 1248-02, Standard Specification for Polyethylene Plastics Extrusion Materials For Wire and Cable.

.9 ASTM F 667-97, Standard Specification for Large Diameter Corrugated Polyethylene Pipe and Fittings.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.

.2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

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

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

PART 2 PRODUCTS

2.1 Materials

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

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

.4 Gradation for clean stone bedding:

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

.5 Pipe repair connector can be a Fernco-type rubber connection or approved equivalent.

.6 Perforated drain pipe shall be PVC DR35 – meeting the requirements of CAN/CSA B182.1 AND 182.2. Perforations shall consist of two rows of 14 mm holes positioned at 120 degrees radically on the pipe. Joints shall be friction fit bell ends.

PART 3 EXECUTION

3.1 General

.1 As per the requirements of the most recent version of the NBDTI Standard Specification.

.2 Existing Storm Sewer Pipe or related materials, designated for removal shall be disposed at an approved disposal site, outside the Park.

3.2 Trenching

.1 Do trenching work in accordance with Section 31 23 33 – Excavating, Trenching and Backfilling.

.2 Obtain Departmental Representative’s approval of trench line and depth prior to placing bedding material or pipe.

3.3 Bedding

.1 Dewater excavation, as necessary, to allow placement of pipe bedding in dry condition.

.2 For piping place minimum thickness of 150 mm of approved bedding material on bottom of excavation and compact to minimum 95% maximum density to ASTM D 698.

.3 Bed pipes in accordance with NBDTI Standard

Specifications, Division 400 Municipal, Item 415, pipe zone material.

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

.5 Place bedding in unfrozen condition.

3.4 Laying Pipe

.1 Begin at downstream end of pipe section with bell end of first pipe section facing upstream.

.2 Ensure barrel of each pipe is in contact with shaped bed throughout its length.

.3 Do not allow water to flow through pipes during construction except as permitted by Departmental Representative.

.4 Joints to be made with rubber gaskets for new pipe. Where portions of existing pipes are to be replaced, firm castings can be used to join new to existing pipe.

3.5 Backfilling

.1 Backfill around and over pipes in accordance with NBDTI Standard Specifications, Division 400 Municipal, Item 415, Pipe zone material.

.2 Place approved granular backfill material, in 200 mm layers to full width, alternately on each side of culvert, so as not to displace it laterally or vertically.

.3 Compact each layer to 95% maximum density to ASTM D 698 taking special care to obtain required density under haunches.

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

.5 Place backfill in unfrozen condition.

3.6 Flushing and Video Inspection

.1 For existing storm pipe that has been repaired, pressure flush pipe and vacuum debris from manholes, as noted on drawing C2.

.2 For existing storm pipe after pressure flushing, and new storm pipe after installation, the entire section of pipe shall be video inspected. If video indicates additional repair, video inspection shall be done to confirm suitability of work.

.3 The video inspection report shall consist of a summary report and the video records on a DVD or a USB Flash Drive.

END

PART 1 GENERAL

1.1 Related Requirements

.1 Section 01 35 43 – Environmental Procedures

.2 Section 33 41 00 – Storm Utility Drainage Piping

1.2 Environmental Requirements

.1 Operation of construction equipment in water is prohibited.

.2 Design and construct temporary crossings to minimize environmental impact to watercourse.

.3 Constructing temporary crossings of watercourses where spawning beds are indicated is prohibited.

.4 Dumping excavated fill, waste material, or debris in watercourse or wetland is prohibited.

1.3 References

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

1.4 Action and Informational Submittals

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

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

PART 2 PRODUCTS

2.1 Not Used

.1 Not Used.

PART 3 EXECUTION

3.1 Existing Conditions

.1 Maintain existing flow pattern in natural watercourse systems.

.2 In natural systems maintain existing riffle pool and step pool patterns.

3.2 Site Clearing and Plant Protection

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

.2 Minimize disturbance to vegetated buffer zones and protect trees and plants on site and adjacent properties where indicated.

.3 Wrap trees and shrubs adjacent to construction work, storage areas and trucking lanes in burlap.

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

.5 Leave cuttings from trees and other vegetation on site as brush piles to allow for natural degradation.
.1 Secure large piles with degradable materials to prevent interference with watercourse.

.6 Remove only trees that may offer future blockage problems as instructed by Departmental Representative.

.7 Leave roots mass and stumps in place.

.8 Maintain temporary erosion and pollution control features installed under this contract.

3.3 Drainage

.1 Pumping water containing suspended materials into watercourse is prohibited.

.2 Establish rock chute spillways to accommodate safe surface water entry to watercourse as directed by Departmental Representative.

3.4 Site Restoration

.1 Establish vegetated buffer zones with suitable vegetation to minimum 3 m along edge of watercourse banks as determined by Departmental Representative.

.2 Plant vegetation natural to area, suitable for application without requirement for fertilizers, pesticides and other chemicals.

.3 Control stream bank erosion in lower section of watercourse with irregular shaped riprap underlain with non-toxic filter cloth of size determined by Departmental Representative.

.4 Control stream bank erosion in upper section of watercourse by planting suitable vegetation as directed by Departmental Representative].
.1 Ensure planting occurs within 7 days after work on watercourse is complete.

END