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## **PART 1. GENERAL**

### **1.1 PRECEDENCE**

- .1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other divisions of this specification

### **1.2 WORK COVERED BY CONTRACT DOCUMENTS**

- .1 Work under this Contract comprises: Removal and replacement of existing 100 mm diameter fire water sprinkler mains, valves, connections to existing buildings, and restoration of landscape and site furnishings.

### **1.3 WORK SCHEDULE**

- .1 This project will be undertaken according to the following schedules:
- .2 Commence – After contract award
- .3 Completion – Nov 30, 2016
- .4 Construction equipment will operate only between 08:00 and 19:00 on weekdays 10:00-18:00 on Saturday, to minimize disturbance to the public. No work will be allowed on Sunday, holidays and long weekends.
- .5 No additional compensation will be provided to the Contractor for cold weather work or other weather-related delays or costs.
- .6 Within one week of contract award, the successful bidder will be required to provide a detailed project schedule to meet the above completion date for the Parks Canada Representative approval. When schedule has been approved by Parks Canada Representative, take necessary measures to complete work within scheduled time. No schedule changes will be permitted without Parks Canada Representative's approval.

### **1.4 CONTRACTOR USE OF PREMISES**

- .1 For the purpose of this contract, Contractor will not be permitted to set up a temporary residence at Fort St. James Historic Site.
- .2 Parks Canada regulations prohibit anyone working with/ for Parks Canada Agency from using campground facilities.

### **1.5 NATIONAL PARK REGULATIONS**

- .1 Contractor and all sub-contractors shall ensure that all work is performed in accordance with ordinances, laws, rules and regulations set out in the National Park Act.
- .2 Contractor and all sub-contractors shall obtain business licenses from Parks Canada Administration Office prior to commencement of work.
- .3 Contractor shall also be required to obtain a Town of Fort St. James business license as they will be working within the Town's boundaries as well.
- .4 Contractor and all sub-contractors shall comply with all laws and government regulations applicable to work under this contract.
- .5 All Contractor's and all sub-contractor's business and private vehicles are required to obtain vehicle passes from the Parks Canada Administration Office.
- .6 Contractor to equip all service vehicles and supervisory vehicles with Emergency Spill Kit DOT-E-10102 or equivalent.

- .7 Contractor is responsible to ensure all sub-contractors comply with the National Park Regulations in addition to the conditions of contract

## **1.6 EXISTING SERVICES**

- .1 Carry out work at times and in a way as directed by the Parks Canada Representative and governing authorities with minimum disturbance to public.
- .2 Notify Parks Canada Representative and utility companies of intended interruption of services and obtain required permission.
- .3 Where work involves breaking into or connecting to existing services, give Parks Canada Representative minimum 7 days' notice for necessary interruption of camp site services throughout course of work. Minimize duration of interruptions, the maximum time of interruption for any services will be not more than 3 hours.
- .4 Submit schedule to and obtain approval from Parks Canada Representative for any shut-down or closure of active service or facility for water. Adhere to approved schedule and provide notice to affected parties.
- .5 Provide adequate bridging over trenches which cross sidewalks or roads to permit normal traffic.
- .6 Where unknown services are encountered, immediately advise Parks Canada Representative and confirm findings in writing.
- .7 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by the Parks Canada Representative and authorities having jurisdiction.
- .8 Record locations of maintained, re-routed and abandoned service lines. This includes lines both abandoned in this project and previously abandoned lines which are encountered during the construction.

## **1.7 DOCUMENTS REQUIRED**

- .1 Maintain "one" copy of each of the following documents at the job site:
- .2 Contract Drawings.
- .3 Specifications.
- .4 Addenda.
- .5 Change Orders.
- .6 Other Modifications to Contract.
- .7 Field Test Reports.
- .8 Copy of Approved Work Schedule.
- .9 Health and Safety Plan and Other Safety Related Documents.
- .10 Building Permit
- .11 Business Licences
- .12 Other documents as specified.

**PART 2. PRODUCTS**

**2.1 NOT USED**

**PART 3. EXECUTION**

**3.1 NOT USED**

**END OF SECTION**

## PART 1. GENERAL

### 1.1 WATER

- .1 The unit price bid for "Remove and dispose existing 100mm fire sprinkler mains" shall be considered full compensation for all materials, labour and equipment required for the removal and disposal of existing water mains and fittings, including excavation, removal, loading, hauling, disposal offsite and all work and dump fees required for the complete removal and disposal of existing water mains.
  - .1 Pipe will be measured horizontally, along the top of the pipe for the full length of removal.
  - .2 Payment will be made for each field measured lineal metre of pipe removed.
  - .3 Trenching will be incidental to "Supply and install water main" for sizes specified.
- .2 The unit price bid for "Remove and dispose existing 100 mm dia. water valves" shall be considered full compensation for all materials, labour and equipment required for the complete removal and disposal of an existing valve, including: removal, loading, hauling, disposal offsite and all work incidental to the removal and disposal of an existing valve.
  - .1 Each water valve removed will be counted.
  - .2 Payment will be made for each valve successfully removed and disposed offsite.
  - .3 Cost of removal does not include trenching, excavation, backfilling, and compaction.
- .1 The unit price bid for "Supply and install 100 mm dia. PVC DR 18 Pipe (Blue Brute – AWWA C900)" shall be considered full compensation for all materials, labour and equipment required for the installation of water line; including, temporary water services; supply and delivery of pipe; subgrade preparation as described in 33 11 16; excavation and trenching to the required depth; supply and placement of granular bedding material; pipe installation to the specified line and grade; fittings; connections; thrust blocks; concrete thrust protection; bends; reducers; tees; couplings; plugs; backfilling to subgrade elevation; compaction; soil conditioning; dewatering; care of water; disposal of excess material off site; pressure testing; flushing; chlorinating; dechlorinating; and, all other work necessary to complete the Work to the satisfaction of the Parks Canada Representative.
  - .1 Pipe will be measured horizontally, along the top of the pipe, from centreline of connection to centreline of connection.
  - .2 Payment will be made for each field measured lineal metre of pipe installed, pending approval of pressure test, chlorination and bacterial testing results.
- .2 The unit price bid for "Tie in to existing 100mm cast iron fire sprinkler main inside building" shall be considered full compensation for all materials, labour and equipment required for tie-ins of new water line to existing water line including: excavation, trenching, cutting, draining, dewatering, connecting, backfilling to original subgrade elevation, compacting, disposal of excess material off site, coordination and notification required for water service interruption, and all work incidental to the completed tie-in.
  - .1 Each tie-in will be counted.
  - .2 Payment will be made for each completed connection to an existing water line.
- .3 The unit price bid for "Supply and install stabilizing drain rock for trench base in unstable ground c/w non-woven geotextile"
  - .1 Trench stabilization shall be measured by cubic meter.
  - .2 Prior approval for this work must be obtained from the Departmental Representative prior to installation. The volume of material placed will be as measured in place following placement using pre placement and post placement surveys. The quantity shall be determined through survey measurement of cross-sections and calculation of volume using average end area methods.

- .4 The unit price bid for "Supply and install Gate Valve, 100 mm dia." shall be considered full compensation for the supply of all materials, labour and equipment required for the installation of gate valves including: supply of valves, supports, operating rods, valve boxes, excavation and trenching to the required depth, supply and placement of granular bedding material, valve insertion to the specified line and grade, connections, thrust blocking, mechanical thrust protection, backfilling to plan subgrade, compactions, soil conditioning, dewatering, care of water, testing, flushing, chlorination, dechlorinating and all work incidental to the completed valve installation.
  - .1 Each valve will be counted.
  - .2 Payment will be made for each valve supplied and installed.

## 1.2 MISCELLANEOUS

- .1 The unit price bid for "Mobilization and demobilization" shall be considered full payment for all transportation of materials, equipment and labour forces to and from the jobsite, bonds and insurance, permits in accordance with Provincial and Federal Laws, clean-up and disposal of waste, temporary facilities such as site offices or equipment storage, etc.
  - .1 Measurement will be made in lump sum quantity.
  - .2 Payment will be made for percentage increments based on progress.
- .2 The unit price bid for "erosion and sediment control" will be considered full payment for all labour, equipment and materials required for to adequately prevent erosion and sediment transfer offsite for the duration of the contract until full revegetation and expiry of the warranty period. Erosion and sediment control must meet the requirements stated in the Development Permit and Model Class Screening Report for Routine Projects and Mitigation Measures.
  - .1 Measurement will be made in a lump sum quantity.
  - .2 Payment will be made for percentage increments completed based on progress.
- .3 The unit price bid for "Disposal of unsuitable materials shall be considered full compensation for all materials, labour and equipment required for the removal and off-site disposal of unsuitable material.
  - .1 Disposal of unsuitable material will be measured in cubic metres.
  - .2 The volume of disposal of unsuitable material will be as measured in place following removal using pre placement and post placement surveys. The quantity shall be determined through survey measurement of cross-sections and calculation of volume using average end area methods.
  - .3 Payment will be made per cubic metre as outlined in the schedule of quantities.
- .4 The unit price bid for "Stripping and stockpiling marginal topsoil" shall be considered full compensation for all materials, labour and equipment required for the removal and stockpiling of marginal topsoil.
  - .1 Stripping and stockpiling marginal topsoil will be measured in cubic metres.
  - .2 The volume of stripping and stockpiling will be as measured in place following removal using pre placement and post placement surveys. The quantity shall be determined through survey measurement of cross-sections and calculation of volume using average end area methods.
  - .3 Payment will be made per cubic metre as outlined in the schedule of quantities.
- .5 The unit price bid for "Remove and replace timber boardwalk" shall be considered full compensation for all materials, labour and equipment required for the construction of the disturbed sections of boardwalk: disconnecting, removing, loading, hauling, handling, installing, associated clean up and all items incidental to complete the work.
  - .1 Boardwalk shall be measured in lineal meter replacement.
  - .2 Payment will be made per linear meter of boardwalk constructed.
- .6 The unit price bid for "Remove, store and reuse picket fence" shall be considered full compensation for all materials, labour and equipment required for the construction of the disturbed sections of picket fence: disconnecting, removing, loading, hauling, handling,

installing, associated clean up and items incidental to complete the work.

- .1 Picket Fence shall be measured in the lineal meter replacement.
  - .2 Payment will be made per lineal meter of picket fence replaced.
- .7 The unit price bid for "Remove, store and reuse palisade fence" shall be considered full compensation for all materials, labour and equipment required for the construction of the disturbed sections of palisade fence: disconnecting, excavation to 3 meters in depth, removing, loading, hauling, handling, installing, associated clean up and all items incidental to complete the work.
  - .1 Palisade Fence shall be measured in the lineal meter replacement
  - .2 Payment will be made per lineal meter of palisade replaced
- .8 The Prime Cost Sum provided for in the Unit Price Table is not a sum due the Contractor. Rather, payment will be made against it for miscellaneous work not included in the unit price table under the General Conditions of the Contract.
  - .1 Do not include in the Contract Price additional contingency allowances, installation, overhead or profit.
  - .2 Such work may include, but not limited to:
    - modifying/disturbing the veranda on the Factor's House
    - modifying/disturbing other building elements to facilitate the work
  - .3 Payment for work under the Prime Cost Sum will be made using negotiated rates or by material, labour and equipment rates as per the following:
    - Equipment Rental Rates will be in accordance with current British Columbia Road Builders rate schedule, and will be all inclusive and fully operated. Hourly rental of equipment will be measured in actual working time and necessary travel time within the project limits. Transportation time to and from site to be reimbursed only if the equipment is used exclusively for additional work.
    - Labour Rate shall be the employee payroll costs plus a 10% mark-up for net profit.
    - Material costs shall be applied at the Contractor's cost, including transportation, plus a 10% mark-up for net profit.
- .9 The unit price bid for "Supply and install Imported Topsoil – 100mm depth" shall be considered full compensation for the supply and import of topsoil from a supplier approved by the Parks Canada Representative, mixing of imported topsoil with native topsoil stockpiled, supply and install of approved grass seed mix, all labour, materials, equipment, tools and incidentals necessary to complete the Work to the satisfaction of the Parks Canada Representative.
  - .1 Measurement of Imported Topsoil will in square meters.
  - .2 Payment for Imported Topsoil will be made at the unit price bid per square meter placed to 100mm depth minimum.
- .10 The unit price bid for "Restore Landscaped Area – 150 mm for Garden" shall be considered full compensation for the supply and import of topsoil from a supplier approved by the Parks Canada Representative, mixing of imported topsoil with native topsoil stockpiled, supply and install of approved grass seed mix, all labour, materials, equipment, tools and incidentals necessary to complete the Work to the satisfaction of the Parks Canada Representative.
  - .1 Measurement of Restore Landscaped Area will in square meters.
  - .2 Payment for Restore Landscape Area will be made at the unit price bid per square meter placed to 150mm depth minimum
- .11 The unit price bid for "Landscape maintenance for 1 year" shall be part of the warranty. No allowance will be paid for this item.

### **1.3 APPLICATIONS FOR PROGRESS PAYMENT**

- .1 Date applications for payment last day of agreed monthly payment period and ensure amount claimed is for value, proportionate to amount of contract, of work performed and products delivered to place of work at that date.
- .2 Support claims for products delivered to Place of Work but not yet incorporated into Work by such evidence as the Parks Canada Representative may reasonably require establishing value and delivery of products.

### **PART 2. PRODUCTS**

#### **2.1 NOT USED**

### **PART 3. EXECUTION**

#### **3.1 NOT USED**

**END OF SECTION**



## **PART 1. GENERAL**

### **1.1 ADMINISTRATIVE**

- .1 Submit to the Parks Canada 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 Do not proceed with Work affected by submittal until review is complete.
- .3 Present shop drawings, product data, samples and mock-ups in SI Metric units.
- .4 Where items or information is not produced in SI Metric units converted values are acceptable.
- .5 Review submittals prior to submission to the Parks Canada Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
- .6 Notify the Parks Canada Representative in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Verify field measurements and affected adjacent Work are co-ordinated.
- .8 Contractor's responsibility for errors and omissions in submission is not relieved by the Parks Canada Representative's review of submittals.
- .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by the Parks Canada Representative's review.
- .10 Keep one reviewed copy of each submission on site.

### **1.2**

#### **SHOP DRAWINGS AND PRODUCT DATA**

- .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 Submit drawings stamped and signed by Professional Engineer registered or licensed in British Columbia, Canada.
- .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 co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .4 Allow 7 days for the Parks Canada Representative's review of each submission.
- .5 Adjustments made on shop drawings by the Parks Canada Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Parks Canada Representative prior to proceeding with Work.
- .6 Make changes in shop drawings as Parks Canada Representative may require, consistent with Contract Documents. When resubmitting, notify the Parks Canada Representative in writing of revisions other than those requested.
- .7 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.
- .8 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 Capacities.
    - .4 Performance characteristics.
    - .5 Standards.
- .9 After the Parks Canada Representative's review, distribute copies.
- .10 Submit PDF copies of shop drawings for each requirement requested in specification Sections and as Parks Canada Representative may reasonably request.
- .11 Submit PDF of product data sheets or brochures for requirements requested in specification Sections and as requested by the Parks Canada Representative where shop drawings will not be prepared due to standardized manufacture of product.
  - .1 Submit PDF copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by the Parks Canada Representative
  - .2 Supplement standard information to provide details applicable to project.
  - .3 If upon review by the Parks Canada Representative no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

### **1.3 SAMPLES**

- .1 Submit for review samples in duplicates requested in respective specification Sections. Label samples with origin and intended use.
- .2 Deliver samples prepaid to the Parks Canada Representative's site office
- .3 Notify the Parks Canada Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .4 Where colour, pattern or texture is criterion, submit full range of samples.
- .5 Adjustments made on samples by the Parks Canada Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Parks Canada Representative prior to proceeding with Work.

- .6 Make changes in samples which Parks Canada Representative may require, consistent with Contract Documents.
- .7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

#### **1.4 PHOTOGRAPHIC DOCUMENTATION**

- .1 Submit electronic copy of colour digital photography in jpeg, standard resolution or PDF
- .2 Take daily photographs of all utility and underground work
- .3 Take photographs of site conditions before, during, and after construction. Take photographs of any unique or unusual items.
- .4 Photographs to be submitted on CD. All photographs to be labelled with meaningful titles.

#### **1.5 CERTIFICATES AND TRANSCRIPTS**

- .1 Immediately after award of Contract, submit Workers' Compensation Board status.
- .2 Submit transcription of insurance immediately after award of Contract.

### **PART 2. PRODUCTS**

#### **2.1 NOT USED**

### **PART 3. EXECUTION**

#### **3.1 NOT USED**

**END OF SECTION**

## **PART 1. GENERAL**

### **1.1 REFERENCES**

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations
- .2 Occupational Health and Safety Act, British Columbia.

### **1.2 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
  - .3 Results of site specific safety hazard assessment.
  - .4 Results of safety and health risk or hazard analysis for site tasks and operation.
    - .1 Submit 1 copy of Contractor's authorized representative's work site health and safety inspection reports to the Parks Canada Representative weekly, including minutes of safety toolbox meetings.
    - .2 Submit copies of reports or directions issued by health and safety inspectors.
    - .3 Submit copies of incident and accident reports.
    - .4 Submit WHMIS MSDS - Material Safety Data Sheets to the Parks Canada Representative.
    - .5 The Parks Canada Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 3 days after receipt of plan. Revise plan as appropriate and resubmit plan to the Parks Canada Representative within 3 days after receipt of comments from the Parks Canada Representative.
    - .6 Parks Canada Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
    - .7 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Parks Canada Representative.
    - .8 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.
  - .5 Emergencies: In the event of emergency call 911.

### **1.3 FILING OF NOTICE**

- .1 File Notice of Project with Provincial authorities prior to beginning of Work.

### **1.4 SAFETY ASSESSMENT**

- .1 Perform site specific safety hazard assessment related to project.

### **1.5 MEETINGS**

- .1 Schedule and administer Health and Safety meeting with the Parks Canada Representative prior to commencement of Work.

### **1.6 REGULATORY REQUIREMENTS**

- .1 Do Work in accordance with Section 01 41 00 - Regulatory Requirements.

## **1.7 GENERAL REQUIREMENTS**

- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .2 Parks Canada Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

## **1.8 RESPONSIBILITY**

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .2 Report all accidents to PCA immediately.
- .3 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

## **1.9 COMPLIANCE REQUIREMENTS**

- .1 Comply with Occupational Health, British Columbia.
- .2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

## **1.10 UNFORSEEN HAZARDS**

- .1 When unforeseen or peculiar safety-related factor, 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 the Parks Canada Representative verbally and in writing.

## **1.11 POSTING OF DOCUMENTS**

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with the Parks Canada Representative.

## **1.12 CORRECTION OF NON-COMPLIANCE**

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by the Parks Canada Representative.
- .2 Provide the Parks Canada Representative with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 The Parks Canada Representative may stop Work if non-compliance of health and safety regulations is not corrected.

## **1.13 WORK STOPPAGE**

- .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

**PART 2. PRODUCTS**

**2.1 NOT USED**

**PART 3. EXECUTION**

**3.1 NOT USED**

**END OF SECTION**

## **PART 1. GENERAL**

### **1.1 NATIONAL PARKS ACT**

- .1 Perform work in accordance with the ordinances and laws set out in the National Parks Act and Regulations.

### **1.2 CANADIAN ENVIRONMENTAL ASSESSMENT ACT**

- .1 Execution of work is subject to provisions within the Canadian Environmental Assessment Act, 2012.
- .2 Failure to comply with or observe environmental protection measures, as identified in these specifications, may result in work being suspended pending rectification of problem(s).

### **1.3 ACTIONS AND SUBMISSIONS**

- .1 Within 7 days of award submit an Environmental Management Plan that includes information on how the contractor will deal with the various environmental concerns included in this section.

### **1.4 MIGRATORY BIRDS ACT**

- .1 Avoid any construction activities which affect nesting birds.

### **1.5 RELICS AND ANTIQUITIES**

- .1 Give immediate notice to the Parks Canada Representative if evidence archaeological finds are encountered during construction, and await the Parks Canada Representative's written instructions before proceeding with work in this area.
- .2 Relics, antiquities, items of historical or scientific interest such as cornerstones and contents, commemorative plaques, inscribed tablets, and similar objects found on site shall remain Department's property. Protect such articles and request directives from the Parks Canada Representative.
- .3 Provide 48 hours' notice to the Parks Canada Representative prior to commencing any work that may interfere with or affect an identified historical or archaeological site. Commence work only upon written instructions from the Parks Canada Representative.

### **1.6 WILDLIFE**

- .1 Avoid or terminate activities on site that attract or harass wildlife.
- .2 Immediately notify the Parks Canada Representative who will notify the Parks Canada Environmental Surveillance Officer of any predator sightings. Bears, wolves, cougar's activity or encounters on or around site. Other wildlife encounters should be reported within 24 hours.

### **1.7 FIRES**

- .1 Fires and burning of rubbish on site is not permitted. Fire is only allowed by permit for disposal of unusable trees and woody material.

#### **DISPOSAL OF WASTE**

- .1 Disposal of waste shall be in accordance with Section 01 74 21: CONSTRUCTION DEMOLITIONS & WASTE MANAGEMENT.
- .2 All garbage must be stored and handled in conformance with National Parks Garbage Regulations.

- .3 All domestic garbage should be stored over the short term in wildlife-proof dumpsters. Domestic recycling should be put in appropriate facilities. Contaminated materials are to be taken out of the Park.
- .4 Do not bury rubbish and waste materials on site.
- .5 Maintain the site in a tidy condition, free of waste material, debris and litter.
- .6 All waste must be removed from the Park within a reasonable time as directed by the Parks Canada Representative

## **1.8 DRAINAGE**

- .1 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.
- .2 Dewatering of a construction site will require a special permit.
- .3 Do not pump water containing suspended materials into waterways, sewer or drainage systems.
- .4 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with Parks Canada requirements and in conformance with the Environmental Contaminants Act and applicable provincial regulations while observing the Code of Good Practice for Management of Hazardous and Toxic Wastes at Federal Establishments.
- .5 An Erosion and Sedimentation Control (ESC) plan will be required

## **1.9 SITE CLEARING AND PLANT PROTECTION**

- .1 Protect trees and plants on site and adjacent properties where indicated.
  - .1 Locations of all trees existing on site to be surveyed prior to construction and final decisions on tree removal to be made on a case-by-case basis in the field by the Parks Canada Representative.
  - .2 Trees identified as existing-to-remain within or adjacent to the limit of Work require a Tree Protection Zone (TPZ) during construction by means of a protective barrier or fencing by the contractor. Fencing may be standard snow fence 1200 mm height or equivalent to approval of the Parks Canada Representative.
  - .3 Approval of TPZs by the Parks Canada Representative is required prior to commencing work.
  - .4 Activities which are likely to injure or destroy the tree are not permitted within the TPZ including
    - .1 Parking of vehicles or machinery
    - .2 Travel or operation of vehicles or machinery
    - .3 Storage of equipment, materials, or stockpiles
  - .5 The Contractor is responsible for damages to trees or shrubs identified as existing-to-remain within the limits of Work. Damages may include the cost of repair, removal, and replacement (at the rate of three trees per tree removed) as determined by assessment of damages by the Parks Canada Representative. Species and installation locations for replacement trees to be approved by the Parks Canada Representative.
- .2 Where absolutely necessary to work adjacent to existing trees and shrubs, Contractor shall exercise all possible care to avoid injury to vegetation. Where roots or limbs over 25 mm in diameter and/or bark are damaged during operations, immediately inform the Parks Canada Representative for inspection and direction.



- .3 Permits are required from Parks Canada Environmental Surveillance Officer if a tree is to be removed.

#### **1.10 CONTRACTOR'S OPERATIONS**

- .1 Confine all operations to work limits as staked or designated by the Parks Canada Representative. No activities of any kind may be carried out beyond those work limits without the Parks Canada Representative's written permission.
- .2 Do not store or stockpile construction materials in trees bordering, or being preserved on site. Do not unreasonably encumber site with products.
- .3 Equipment maintenance shall only be carried out in designated areas or as approved by the Parks Canada Representative and Park Warden Service. Use of turnouts, campgrounds, picnic areas, work camps, etc., for equipment oil changes and other servicing will not be permitted.
- .4 Used oil, filter and grease cartridges, lubrication containers and other products of equipment maintenance shall be collected and disposed of at nearest industrial waste facility.
- .5 Leave machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.
- .6 Provide sufficient sanitary facilities and maintain site in a clean condition.
- .7 Obtain permit from Parks Canada Environmental Surveillance Officer for storage of fuel or other inflammable liquids. Observe all restrictions and conditions imposed by permit regarding special protection and berming to control spills and tank damage; fire protection considerations; provisions for disposal of fouled material and used petroleum products
- .8 Contractor will avoid any Ground Squirrels
- .9 Conduct operations at all times in such a manner as to preserve natural features and vegetation in area. Cut and fill slopes shall be blended with adjoining topography. Material from fill slopes will not be permitted to slough or roll into surrounding tree cover or to bury any plant material designated to be retained.
- .10 When, in opinion of the Parks Canada Representative, negligence on part of Contractor results in damage or destruction of vegetation, or other environmental or aesthetic features beyond staked or designated work areas, Contractor shall be responsible, at his expense, for complete restoration of trees including replacement of trees, shrubs, topsoil, grass, etc. to the Parks Canada Representative's satisfaction.
- .11 As no non-native vegetation is allowed in Park, all construction equipment shall be thoroughly washed before entering the National Park.

#### **1.11 CONTRACTOR'S EMPLOYEE BRIEFING**

- .1 Conduct briefing sessions for all employees and sub-contractor employees highlighting requirements of this section, including operation of equipment strictly.
- .2 Initial site meeting with Contractor, Parks Canada Representative, Park Project Manager and Parks Canada Environmental Surveillance Officer will occur prior to construction commencing.
- .3 Contract documents have been developed in accordance with Canadian Environmental Assessment Act screening requirements. Construction methods which are directly affected by CEAA screening will be reviewed at initial site meeting. Contractor will be expected to comply with and ensure construction practices meet the CEAA Standards. Failure to comply may lead to cessation of work.

**1.12 COMPLIANCE WITH PARKS CANADA DEVELOPMENT PERMIT**

- .1 Read, understand and comply with Parks Canada Building Permit and all stipulations provided therein.

**1.13 MEASUREMENT AND PAYMENT**

- .1 Cost of environmental and aesthetic protection will not be paid for directly, but shall be considered incidental to the contract tendered.

**PART 2. PRODUCTS**

**2.1 NOT USED**

**PART 3. EXECUTION**

**3.1 NOT USED**

**END OF SECTION**

## **PART 1. GENERAL**

### **1.1 REFERENCES AND CODES**

- .1 Perform Work in accordance with National Building Code of Canada (NBC) and British Columbia Building Code 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 Meet or exceed requirements of:
  - .1 Contract documents.
  - .2 Specified standards, codes and referenced documents.

### **1.2 WHMIS**

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of material safety data sheets acceptable to Labour Canada and Health and Welfare Canada.

### **1.3 BUILDING SMOKING ENVIRONMENT**

- .1 Comply with smoking restrictions and municipal by-laws.

### **1.4 NATIONAL PARKS ACT**

- .1 Perform Work in accordance with National Parks Act when projects are located within boundaries of National Park.

## **PART 2. PRODUCTS**

### **2.1 NOT USED**

## **PART 3. EXECUTION**

### **3.1 NOT USED**

**END OF SECTION**

## **PART 1. GENERAL**

- .1 The Contractor is totally responsible for quality of Material and Product which he/she provides for the Work.
- .2 The Contractor is responsible for quality control testing and shall perform such inspections and tests as are necessary to ensure that the Work conforms to the requirements of the Contract Documents.
- .3 During the progress of the Work, a sufficient number of tests shall be performed by the Contractor to determine that Material, Product and installation meet the specifications and standards requirements.
- .4 Minimum requirements regarding quality control are specified in various sections of the specifications, however, the Contractor shall perform as many inspections and tests as are necessary to ensure that the Work conforms to the requirements of the Contract Documents.
- .5 Testing shall be in accordance with pertinent codes and regulations and with selected standards of the American Society for Testing Materials (ASTM) and Canadian Standards Association (CSA).
- .6 Product testing, mill test and laboratory reports to demonstrate that Product and Material supplied by the Contractor meet the specifications are specified under various sections of the Contract Documents.

### **1.2 QUALITY CONTROL TESTING BY THE CONTRACTOR**

- .1 The Contractor shall retain the services of a licensed independent testing agency under supervision of a registered professional Engineer, and pay for the cost of testing services for quality control including, but not limited to, the following:
- .2 Sieve analysis of sands and aggregates to be supplied to the Work.
- .3 Concrete Testing
- .4 Backfill, subgrade, and base course.
- .5 Any product testing that is required and is specified under various sections of the specifications
- .6 The Contractor shall promptly process and distribute all required copies of test reports and test information and related instructions to all of his Subcontractors and Suppliers to ensure that all necessary retesting and replacement of construction can proceed without delay.

### **1.3 QUALITY ASSURANCE TESTING BY PARKS CANADA**

- .1 Parks Canada shall retain and pay for the services of an independent testing agency for testing for quality assurance, for Parks Canada's purposes.
- .2 Parks Canada's testing agency and the Parks Canada Representative shall inspect and test Materials, Products and the Work for conformance with the test requirements of the Contract Documents; however, they do not undertake to check the quality of the Work on behalf of the Contractor nor to provide quality control.
- .3 Inspections and test by Parks Canada's testing agency and by the Parks Canada Representative do not relieve the Contractor of his responsibility to supply Materials and Products and to perform the Work in accordance with the requirements of the Contract Documents.
- .4 The Parks Canada Representative, at his discretion, may order or perform any additional inspections and test for purposes of his own or for purposes of Parks Canada.

- .5 If tested material fails to meet the contract specifications, the contractor shall bear the cost of the tests and any additional tests required to confirm rejected material properties and suitability.
- .6 The Contractor shall coordinate with the Parks Canada Representative the scheduling of testing and inspection by Parks Canada's testing agencies or by the Parks Canada Representative, to enable testing to be done as necessary, without delay, and the Contractor shall notify in writing the Parks Canada Representative minimum one week in advance of operations to allow for such inspection and test by the Parks Canada Representative's testing agency. Coordination shall include providing equipment and safe access necessary to perform testing and inspections (i.e. trench box, loaded truck for proof roll, etc.)

#### **1.4 INSPECTION**

- .1 Allow the Parks Canada 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 written notice minimum one week in advance of operations requesting inspection if Work is designated for special tests, inspections or approvals by Parks Canada 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.

#### **1.5 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.

#### **1.6 PROCEDURES**

- .1 Notify appropriate agency and the Parks Canada Representative minimum one week 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.

#### **1.7 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 the Parks Canada Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
- .2 Make good other Contractor's work damaged by such removals or replacements promptly.
- .3 If in opinion of the Parks Canada 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 the Parks Canada Representative.

**1.8        REPORTS**

- .1    Submit 1 copy of inspection and test reports to the Parks Canada Representative.

**PART 2. PRODUCTS**

**2.1        NOT USED**

**PART 3. EXECUTION**

**3.1        NOT USED**

**END OF SECTION**

## **PART 1. GENERAL**

### **1.1 SECTION INCLUDES**

- .1 This schedules and procedures for systematic Waste Management Program for construction, deconstruction, demolition, and renovation projects, including:
  - .1 Diversion of Materials.
  - .2 Waste Audit (WA) - Schedule A.
  - .3 Waste Reduction Workplan (WRW) - Schedule B.
  - .4 Demolition Waste Audit (DWA) - Schedule C.
  - .5 Cost/Revenue Analysis Workplan (CRAW) - Schedule D.
  - .6 Materials Source Separation Program (MSSP).

### **1.2 DEFINITIONS**

- .1 Demolition Waste Audit (DWA): Relates to actual waste generated from project.
- .2 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.
- .3 Recyclable: Ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse by others.
- .4 Recycle: Process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.
- .5 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.
- .6 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.
- .7 Salvage: Removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.
- .8 Separate Condition: Refers to waste sorted into individual types.
- .9 Source Separation: Acts of keeping different types of waste materials separate beginning from first time they became waste.

### **1.3 MATERIALS SOURCE SEPARATION PROGRAM (MSSP)**

- .1 Prepare MSSP and have ready for use prior to project start-up.
- .2 Implement MSSP for waste generated on project in compliance with approved methods and as reviewed by authorities having jurisdiction.
- .3 Provide on-site facilities for collection, handling, and storage of anticipated quantities of reusable and recyclable materials.
- .4 Provide containers to deposit reusable and recyclable materials.
- .5 Locate containers in locations, to facilitate deposit of materials without hindering daily operations. Containers shall be clearly marked.
- .6 Locate separated materials in areas which minimize material damage.
- .7 Collect, handle, store on-site, and transport off-site, salvaged materials in separate condition.

- .1 Transport to recycling facility.

#### **1.4 STORAGE, HANDLING AND PROTECTION**

- .1 Unless specified otherwise, materials for removal become Contractor's property.
- .2 Protect, stockpile, store and catalogue salvaged items.
- .3 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to approved local facility.
- .4 Protect structural components not removed for demolition from movement or damage.
- .5 Support affected structures. If safety of building is endangered, cease operations and immediately notify Department having jurisdiction.
- .6 Protect surface drainage, mechanical and electrical from damage and blockage.
- .7 Separate and store materials produced during dismantling of structures in designated areas.
- .8 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated facilities.
  - .1 On-site source separation is recommended.

#### **1.5 DISPOSAL OF WASTES**

- .1 Do not bury rubbish or waste materials.
- .2 Do not dispose of any waste into waterways, storm, or sanitary sewers.
- .3 Remove materials from deconstruction as deconstruction/disassembly Work progresses.
- .4 Prepare project summary to verify destination and quantities on a material-by-material basis as identified in pre-demolition material audit.

#### **1.6 USE OF SITE AND FACILITIES**

- .1 Execute work with least possible interference or disturbance to normal use of premises.
- .2 Provide security measures approved by the Parks Canada Representative.

#### **1.7 SCHEDULING**

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

### **PART 2. PRODUCTS**

#### **2.1 NOT USED.**

### **PART 3. EXECUTION**

#### **3.1 APPLICATION**

- .1 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

#### **3.2 CLEANING**

- .1 Remove tools and waste materials on completion of Work, and leave work area in clean and



orderly condition.

- .2 Clean-up work area as work progresses.
- .3 Source separate materials to be reused/recycled into specified sort areas.

### 3.3 DIVERSION OF MATERIALS

- .1 From following list, separate materials from general waste stream and stockpile in separate piles or containers, as reviewed by Parks Canada Representative and consistent with applicable fire regulations.
  - .1 Mark containers or stockpile areas.
  - .2 Provide instruction on disposal practices.
- .2 On-site sale or distribution of salvaged materials to third parties is not permitted. Demolition Waste:

Demolition Waste		
Material Type	Recommended Diversion (%)	Actual Diversion %
Pipes	100	
Valves and fittings	100	
Rubble	100	
Wood (uncontaminated)	100	

Construction Waste		
Material Type	Recommended Diversion (%)	Actual Diversion %
Cardboard	100	
Plastic Packaging	100	
Rubble	100	
Steel	100	
Wood (uncontaminated)	100	
Other	100	

### SCHEDULE A - Waste Audit (WA)

Material Category	Material Quantity (unit)	Estimated Waste (%)	Total Waste Quantity (units)	Generation Point	Recycled %	Reused %
Wood and Plastics						
Material - Description						
Off cuts						
Warped pallets						
Forms						
Plastic Packaging						
Cardboard Packaging						
Wood						
Metals						
Others						

### SCHEDULE B – Waste Reduction Workplan (WRW)

Material Category	Person Responsible	Total Quantity of Waste (unit)	Actual Reused Amount (unit)	Actual Recycled Amount (unit)	Material Destination
Wood and Plastics					
Material					
Chutes					
Warped Pallets					
Plastic Packaging					
Forms					
Pallets					

Wood					
Metals					
Others					

### SCHEDULE C – Demolition Waste Audit (DWA)

Material Description	Quantity	Unit	Total	Volume	Weight	Remarks and Assumptions
Wood, Plywood						
Pipes						
Valves and fittings						
Metal						
Rubble						
Wood (uncontaminated)						
Others						

### SCHEDULE D – Cost / Revenue Analysis Workplan (CRAW)

Material Description	Quantity (unit)	Volume (cumulative)	Weight (cumulative)	Disposal Cost/Credit \$(+/-)	Category Sub Total \$(+/-)
Wood, Plywood					
Wood, Plywood					
Pipes					
Valves and fittings					
Metal					
Rubble					
Wood (uncontaminated)					
Others					

END OF SECTION

## **PART 1. GENERAL**

### **1.1 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 the Parks Canada Representative in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.
    - .2 Request the Parks Canada Representative's inspection.
  - .2 Parks Canada Representative's Inspection:
    - .1 Parks Canada 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 fully operational.
    - .4 Certificates required by Utility companies: submitted.
    - .5 Operation of systems: demonstrated to Owner's personnel.
    - .6 Work: complete and ready for final inspection.
  - .4 Final Inspection:
    - .1 When completion tasks are done, request final inspection of Work by the Parks Canada Representative, and Contractor.
    - .2 When Work is incomplete according to the Parks Canada Representative, complete outstanding items and request re-inspection.
  - .5 Declaration of Substantial Performance: when the Parks Canada Representative considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.
  - .6 Commencement of Lien and Warranty Periods: date of Owner's acceptance of submitted declaration of Substantial Performance to be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.
  - .7 Final Payment:
    - .1 When the Parks Canada Representative considers final deficiencies and defects corrected and requirements of Contract have been met, make application for final payment.
    - .2 Payment of Holdback: after issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount in accordance with contractual agreement.

**PART 2. PRODUCTS**

**2.1 NOT USED**

**PART 3. EXECUTION**

**3.1 NOT USED**

**END OF SECTION**

## **PART 1. GENERAL**

### **1.1 ADMINISTRATIVE REQUIREMENTS**

- .1 Pre-warranty Meeting:
  - .1 Convene meeting one week prior to contract completion with the Parks Canada Representative, to:
    - .1 Verify Project requirements.
    - .2 Review warranty requirements.
  - .2 Parks Canada 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 AS-BUILT DOCUMENTS AND SAMPLES**

- .1 Maintain, at site for the Parks Canada Representative one record copy of:
  - .1 Contract Drawings.
  - .2 Specifications.
  - .3 Addenda.
  - .4 Change Orders and other modifications to Contract.
  - .5 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.
  - .2 Label each document "PROJECT RECORD" in neat, large, printed letters.
- .3 Maintain record documents in clean, dry and legible condition.
  - .1 Do not use record documents for construction purposes.
  - .2 Keep record documents and samples available for inspection by the Parks Canada Representative.

### **1.4 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS**

- .1 Record information on set of drawings, provided by the Parks Canada Representative.
- .2 Record information concurrently with construction progress.

- .1 Do not conceal Work until required information is recorded.
- .3 Contract Drawings: mark each item to record actual construction, including:
  - .1 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
  - .2 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
  - .3 Field changes of dimension and detail.
  - .4 Changes made by change orders.
  - .5 Details not on original Contract Drawings.
  - .6 References to related shop drawings and modifications.
- .4 Specifications: mark each item to record actual construction, including:
  - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
  - .2 Changes made by Addenda and change orders.
- .5 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.
- .6 Provide digital photos, if requested, for site records.

## **PART 2. PRODUCTS**

### **2.1 NOT USED**

## **PART 3. EXECUTION**

### **3.1 NOT USED**

**END OF SECTION**

## **PART 1. GENERAL**

### **1.1 SAMPLES**

- .1 Inform the Parks Canada Representative of proposed source and provide samples or access for sampling at least 2 weeks prior to commencing production.
- .2 Install sampling facilities at discharge end of production conveyor, to allow the Parks Canada Representative to obtain representative samples of items being produced. Stop conveyor belt when requested by the Parks Canada Representative to permit full cross section sampling.
- .3 If, in opinion of the Parks Canada Representative, materials from proposed source do not meet, or cannot reasonably be processed to meet specified requirements, locate alternative source or demonstrate that material from source in question can be processed to meet specified requirements.
- .4 Acceptance of material does not preclude future rejection if it is subsequently found to lack uniformity, or if it fails to conform to requirements specified, or if its field performance is found to be unsatisfactory.
- .5 Special Requirements
  - .1 All works performed under this Section must comply with the requirements of the Soil Removal and Deposit Bylaw.

## **PART 2. PRODUCTS**

### **2.1 MATERIALS GENERAL**

- .1 Aggregate quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material, clay lumps or minerals, or other substances that would act in deleterious manner for use intended.
- .2 In absence of satisfactory performance records over a year period for a particular source of material, soundness to be tested according to ASTM C88.
  - .1 Flat and elongated particles of coarse aggregate: to ASTM D 4791.
    - .1 Greatest dimension to exceed five times the least dimension.
  - .2 Fine aggregates satisfying requirements of applicable section to be one, or blend of following:
    - .1 Natural sand.
    - .2 Manufactured sand.
    - .3 Screenings produced in crushing of quarried rock, boulders, gravel or slag.
  - .3 Coarse aggregates satisfying requirements of applicable section to be one, or blend of following:
    - .1 Crushed rock.
    - .2 Gravel and crushed gravel composed of naturally formed particles of stone.
    - .3 Light weight aggregate, including slag and expanded shale.



.4 Native Material or Type 3 Fill:

- .1 To be any workable soil free of organic or foreign matter. Any native material obtained within limits of Contract may be deemed granular material for purposes of payment if it meets specifications of granular material. Native material not acceptable if it is impracticable to control its water content or to compact to specified density.

.3 Granular Pipe Bedding and Surround Material

- .1 Crushed or graded gravels: to conform to following graduations:

<u>Sieve Designation</u>	<u>% Passing</u>
25.0 mm	100
19.0 mm	90 - 100
12.5 mm	65 - 85
9.5mm	50 - 75
4.75mmm	25 - 50
2.36mm	10 - 35
0.85mm	5 - 20
0.425mm	0 - 15
0.180mm	0 - 8
0.075mm	0 - 5

- .2 Other permissible materials: where shown on Contract Drawings or directed by Parks Canada Representative, drain rock, pit run sand or approved native material may be used for bedding and pipe surround.

.4 Granular Base

- .1 Use crushed and screened material, conforming to following Sieve gradation:

<u>Designation</u>	<u>% Passing</u>
4.75mm	40 - 80
2.36mm	27 - 65
1.18mm	18 8mm
0.600mm	12 - 35
0.300mm	8 300m
0.150mm	4 150m
0.075mm	2 - 8

- .2 Not less than 10% is to be retained between each pair of successive sieves.
- .3 Crushed particles: at least 60% of particles by mass within each of the following designation ranges to have at least one freshly fractured face.

## **PART 3. EXECUTION**

### **3.1 AGGREGATE SOURCE PREPARATION**

- .1 Comply with requirements of Soil Removal and Deposit Bylaw.
- .2 Prior to excavating materials for aggregate production, clear and grub area to be worked, and strip unsuitable surface materials.
- .3 Where clearing is required, leave screen of trees between cleared area and roadways as directed.
- .4 Strip area ahead of quarrying or excavating operation sufficient to prevent contamination of aggregate by deleterious materials.
- .5 When excavation is completed dress sides of excavation to nominal 2H:1V slope, and provide drains or ditches as required to prevent surface standing water.
- .6 Trim off and dress slopes of waste material piles and leave site in neat condition.

### **3.2 PROCESSING**

- .1 Process aggregates uniformly, using methods that prevent contamination, segregation, and degradation.
- .2 Blend aggregates, if required, to obtain gradation requirements, percentage of crushed particles, or particle shapes, as specified. Use methods and equipment approved by the Parks Canada Representative.
- .3 Wash aggregates, if required to meet specifications. Use only equipment approved by the Parks Canada Representative. Dispose of wash water in accordance with all Federal and Provincial regulations.
- .4 When operating in stratified deposits use excavation equipment and methods that produce uniform, homogeneous aggregate.

### **3.3 HANDLING**

- .1 Handle and transport aggregates to avoid segregation, contamination and degradation.
- .2 Do not use intermixed or contaminated materials. Remove and dispose of rejected materials as directed by the Parks Canada Representative within 48 hours of rejection.

### **3.4 STOCKPILING**

- .1 Stockpile aggregates on site in locations as approved by the Parks Canada Representative. Do not stockpile on completed pavement surfaces.
- .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 Except where stockpiled on acceptably stabilized areas, provide compacted sand base not less than 300 mm in depth to prevent contamination of aggregate. Stockpile aggregates on ground but do not incorporate bottom 300 mm of pile into work.
- .5 Separate different aggregates by strong, full depth bulkheads, or stockpile far enough apart to prevent intermixing.
- .6 Do not use intermixed or contaminated materials. Remove and dispose of rejected materials as directed by the Parks Canada Representative within 48 hours of rejection.
- .7 Stockpile materials in uniform layers of thickness as follows:

- .1 Maximum 1.5 meters for coarse aggregate and base course materials.
- .2 Maximum 1.5 meters for fine aggregate and sub-base materials.
- .3 Maximum 1.5 meters for other materials.
- .8 Uniformly spot-dump aggregates delivered to stockpile in trucks and build up stockpile as specified.
- .9 Do not cone piles or spill material over edges of piles.
- .10 Do not use conveying stackers.
- .11 During winter operations, prevent ice and snow from becoming mixed into stockpile or in material being removed from stockpile.

### **3.5 CLEANING**

- .1 Leave aggregate stockpile site in tidy, well drained condition, free of standing surface water.
- .2 Leave any unused aggregates in neat compact stockpiles as directed by the Parks Canada Representative.
- .3 For temporary or permanent abandonment of aggregate source, restore source to condition meeting requirements of Soil Removal and Deposit Bylaw.

**END OF SECTION**

## **PART 1. GENERAL**

### **1.1 DEFINITIONS**

- .1 Topsoil: The top layer of soil containing organic material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding or "A" horizon.
- .2 "Subsoil" means the portion of soil material that lies immediately beneath the Topsoil extending to root depth or "B" horizon. The upper portion of the parent material as defined by the Canadian System of Soil Classification.
- .3 "Unsuitable Organic Soils" means soils that contain organic materials and are not suitable for use as earthwork materials or as Topsoil and Subsoil. These soils would include soils that contain too much organic matter for earthwork materials, are contaminated, or do not meet the requirements.

## **PART 2. PRODUCTS**

- .1 The Contractor shall supply all labour, materials and equipment required for topsoil stripping.

## **PART 3. EXECUTION**

- .1 The Contractor shall excavate the minimum practical area of topsoil required for utility and/or concrete installation, or as required by the Parks Canada Representative.
- .2 Topsoil shall be stripped to a depth that will ensure complete removal of all organic materials. The topsoil shall be stockpiled in areas designated by the Parks Canada Representative in the field.
- .3 Special care must be taken to avoid mixing topsoil with the underlying soil. The Parks Canada Representative may require that the Contractor provide a separate stockpile for topsoil contaminated with common material.
- .4 Strip topsoil from the areas where common excavation and fill placement are required.
- .5 Strip topsoil and subsoil separately to prevent admixing.
- .6 Sequence, stagger, and conduct stripping and excavation operations so that undesirable mineral soil does not become mixed with topsoil or subsoil.
- .7 Suspend stripping operations during rain, snow, wet ground conditions, high winds, or other conditions that may result in contamination or loss of material.
- .8 Drain surface water away from the stripped areas to prevent ponding and infiltration in fill placement areas.
- .9 Stockpile topsoil at locations specified in the Contract Documents or as approved by the Parks Canada Representative
- .10 Maintain a minimum separation of 3 m between stockpiles of differing materials.
- .11 Use silt fences and other erosion control measures to prevent soil loss from the stockpiles due to wind or water erosion.
- .12 Do not interfere with drainage courses with stockpiled material. Keep stockpiles a minimum distance of 30 m from bodies of water or drainage course.
- .13 Do not stockpile material at slopes steeper than 3H:1V.
- .14 Maintain stockpiles in a condition meeting the above requirements

**END OF SECTION**

## PART 1. GENERAL

### 1.1 DEFINITIONS

- .1 Excavation classes: two classes of excavation will be recognized; common excavation and rock excavation
- .2 Rock: any solid material in excess of 1.0 m<sup>3</sup> and which cannot be removed by means of heavy duty mechanical excavating equipment having a 0.95 to 1.15 m<sup>3</sup> bucket. Frozen material will not be classified as rock.
- .3 Common Excavation: Excavation of materials of whatever nature, which are not included under definitions of rock excavation including dense tills, hardpan, partially cemented materials, clay or frozen materials which can be ripped and excavated with heavy construction equipment.
- .4 Waste material: excavated material unsuitable for use in work
- .5 Surplus material: excavated material that is suitable for use but surplus to project requirements.
- .6 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of work.
- .7 Subgrade elevation: the elevation immediately below the road pavement structure or the topsoil, or the elevation of the base of an excavation for a building foundation or other structure.
- .8 Unsuitable Materials:
  - .1 Weak and compressible materials including organics, peat, etc. under excavated areas.
  - .2 Frost susceptible materials under excavated areas.
- .9 Unshrinkable fill: weak mixture of Portland cement, concrete aggregates and water that resists settlement when placed in utility trenches, and capable of being readily excavated.

## PART 2. PRODUCTS

- .1 Type 1 and Type 2 Fill: properties to Section 31 05 16 – Aggregate Materials: General and the following requirements:
  - .1 Crushed, pit run or screened stone, gravel or sand.
  - .2 Gradations to be within limits specified when tested to ASTM C 136 and ASTM C 117. Sieve sizes to CAN/CGSB-8.1.
  - .3 Type 1 Fill to meet requirements for granular base material described in Section 31 05 16 – Aggregate Materials.
  - .4 Type 2 Fill to meet requirements for granular subbase material described in Section 31 05 16 – Aggregate Materials.
- .2 Type 3 Fill: selected material from excavation or other sources, approved by the Parks Canada Representative for use intended, unfrozen and free from rocks larger than 75 mm, cinders, ashes, sods, refuse or other deleterious materials.

## **PART 3. EXECUTION**

### **3.1 SITE PREPARATION**

- .1 Remove all top soil, stumps, brush, weeds, grasses and accumulated debris from site as specified in Section 31 14 13.
- .2 Remove obstructions, ice and snow from surfaces to be excavated within limits indicated.
- .3 Cut boardwalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly.
- .4 Strip topsoil after area has been cleared and stockpile in locations as shown on Contract Drawings or directed by the Parks Canada Representative. Stockpile height not to exceed 2 meters. Avoid mixing topsoil with subsoil. Dispose of unused topsoil as directed by the Parks Canada Representative. Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected.
- .5 Comply with requirements of Soil Removal and Deposit Bylaw.

### **3.2 STOCKPILING**

- .1 Stockpile fill materials in areas designated by the Parks Canada Representative. Stockpile granular materials in manner to prevent segregation.
- .2 Protect fill materials from contamination.

### **3.3 DEWATERING AND HEAVE PREVENTION**

- .1 Keep excavations free of water while work is in progress.
- .2 Submit for the Parks Canada Representative's review details of proposed dewatering or heave prevention methods, such as dikes, well points, and sheet pile cut-offs.
- .3 Avoid excavation below groundwater table if quick condition or heave is likely to occur. 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 a manner not detrimental to the environment, fish habitat, public and private property, or any portion of work completed or under construction.
- .6 Surface drainage: Provide suitable temporary ditches or other approved means of handling drainage prior to excavation and during construction to protect construction area, adjacent properties and other affected properties. Provide siltation controls to prevent erosion and to protect natural watercourses or existing municipal drainage facilities.

### **3.4 EXCAVATION**

- .1 Excavation to grade: excavate trenches to allow pipe to be laid to alignment and grades required with allowance for specified pipe bedding.
- .2 For trench excavation, unless otherwise authorized by the Parks Canada Representative in writing, do not excavate more than 30 m of trench in advance of installation operations and do not leave trench open at the end of a day's operation.
- .3 Dispose of surplus and unsuitable excavated material in approved location off site in accordance with the Section 01 74 21 – Construction Demolition Waste Management and Disposal.
- .4 Do not obstruct flow of surface drainage or natural watercourses.

- .5 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.
- .6 Notify the Parks Canada Representative when bottom of excavation is reached.
- .7 Obtain the Parks Canada Representative's approval of completed excavation.
- .8 Remove unsuitable material from trench bottom to extent and depth as directed by the Parks Canada Representative.

### **3.5 FILL TYPES AND COMPACTION**

- .1 Fill types and minimum compaction requirements for fill, trench backfill and backfill of excavations for works within roads, walkways and rights-of-way are provided below. With the approval of the Parks Canada Representative's recommended fill types and minimum compaction requirements. Compaction densities are percentages of maximum densities obtained from ASTM D698.
  - .1 Boulevards, rights-of-way and easements: Type 3 Fill to a minimum 95% to subgrade level.
  - .2 Roads, lanes, driveway restorations, shoulders, re-shaped ditches, sidewalks and walkways: Type 3 Fill or Type 2 Fill to a minimum 98% to subgrade level.
  - .3 Use caution in pipe zone to ensure no damage to pipe.
- .2 Fill types and minimum compaction requirements are specified below for various works and structures in the absence of site specific recommendations provided by the Parks Canada Representative. Compaction densities are percentages of maximum densities obtained from ASTM D698:
  - .1 Exterior side of perimeter building walls: unless otherwise indicated on construction drawings, use Type 3 Fill to subgrade level. Compact to 98%.
  - .2 Fences: unless indicated otherwise, use Type 2 Fill to subgrade level on high side for minimum 500 mm from wall and compact to 95%. For remaining portion, use Type 3 Fill compacted to 95%.

### **3.6 BEDDING AND SURROUND OF UNDERGROUND SERVICES**

- .1 Place bedding and surround material in unfrozen condition.
- .2 Concrete thrust blocks, encasement or protection: where specified or required by the Parks Canada Representative.
- .3 Thrust blocks: where specified or required by the Parks Canada Representative provide anchor blocks as shown on Contract Drawings. All concrete thrust blocks to be installed at least 150 mm into undisturbed ground on bottom and sides of trench.

### **3.7 BACKFILLING**

- .1 Do not proceed with backfilling operations until the Parks Canada Representative has inspected and approved installations.
- .2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .3 Do not use backfill material that is frozen or contains ice, snow or debris.
- .4 Place backfill material above excavation bottom or pipe surround zone in uniform layers not exceeding 300 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.

### **3.8 RESTORATION**

- .1 Upon completion of work, remove waste materials and debris, trim slopes, and correct defects as directed by the Parks Canada Representative.
- .2 Provide for sediment and erosion control on surface of backfilling. In boulevard areas prepare surface to receive vegetation and re-vegetate surface using a locally supplied seed mix.
- .3 Replace topsoil as indicated in Section 32 91 19.13 - Topsoil Placement.
- .4 Reinstate lawns, a n d boulevards surfaces to the elevation, dimensions and material type which existed before excavation.
- .5 Clean and reinstate areas affected by work as directed by the Parks Canada Representative.

**END OF SECTION**



## **PART 1. GENERAL**

### **1.1 NOT USED**

## **PART 2. PRODUCTS**

### **2.1 NOT USED**

## **PART 3. EXECUTION**

### **3.1 UNSTABLE SUBGRADE**

- .1 Where the subgrade is unstable, or where it contains materials such as ashes, cinders, refuse, vegetable or organic material, the Contractor shall excavate such material to the width, depth and length ordered by the Parks Canada Representative and dispose of the material as directed. The subgrade shall then be made by backfilling with approved Type 3 / native material or imported granular material as directed by the Parks Canada Representative. Material shall be placed in successive layers not exceeding 300 mm in depth and compacted to a minimum of 95% Standard Proctor Density or as specified.

### **3.2 SUBGRADE PREPARATION**

- .1 The subgrade of 300 mm depth shall be scarified and compacted to a minimum of 98% Standard Proctor Density at optimum moisture content (+, over the full width of the cross-section. The material shall be worked to ensure as much uniformity as possible in material.
- .2 Water shall be added or the material shall be aerated to bring the moisture content to optimum value. The supply of water shall be the responsibility of the Contractor.

### **3.3 COMPACTION**

- .1 Field tests for density and moisture content shall be taken by Parks Canada or his representative. Non-conformity with the specified density or moisture content shall constitute sufficient grounds for rejection of the work.
- .2 Trench backfill encountered in the preparation of the subgrade which has not been compacted sufficiently shall be excavated and re-compacted.

### **3.4 TESTING COMPACTION**

- .1 Quality Control Testing
  - .1 Compaction results shall be based on a minimum of one density test per 500 square meters daily. Additional tests may be called for by the Quality Control Agency or by the Parks Canada Representative as deemed necessary.
  - .2 Field density tests shall conform to ASTM D1556, ASTM D2167, or ASTM D6938 for comparison with a maximum density determined according to ASTM D698 Method A.
- .2 Quality Assurance Testing
  - .1 Compaction result shall be based on a minimum of two density tests. Additional tests may be called for by the Parks Canada Representative as deemed necessary.
  - .2 Field density tests shall conform to ASTM D1556, ASTM D2167, or ASTM D6938 for comparison with a maximum density determined according to ASTM D698 Method A.

**3.5 TOLERANCES**

- .1 The finished surface of the subgrade shall conform to grades approved by the Parks Canada Representative, and shall show no depression more than 15 mm under a straightedge 3.0 m long when placed parallel to the centreline. Subgrade higher than the approved grades shall be cut to the required grades.
- .2 The tolerance for boulevards shall be  $\pm 30$  mm.

**END OF SECTION**

## **PART 1. GENERAL**

### **1.1 SAMPLES**

- .1 At least 2 weeks prior to commencing work, inform Parks Canada Representative of proposed source of granular materials.
- .2 The Contractor shall provide a sieve analysis of the material for the Parks Canada Representative's review.
- .3 The gradation curve developed shall be free from acute changes.

### **1.2 SUBMISSIONS**

- .1 Granular base material shall be submitted to the Parks Canada Representative before being used.
- .2 Preliminary review of the material as represented in the test results shall not constitute general acceptance of all material in the deposit or source of supply. Materials may be considered unsuitable even though particle sizes are within the limits of the gradation sizes required, if particle shapes are thin or elongated or any other characteristic precludes satisfactory compaction or if the material fails to provide a roadway suitable for traffic. Rejected material will not be paid for. The Parks Canada Representative has the right to request additional testing if there are any concerns with the proposed aggregate.

## **PART 2. PRODUCTS**

### **2.1 GRANULAR BASE**

- .1 Material for the granular base shall consist of sound, hard, durable crushed rock or crushed gravel and shall not contain organic or soft, thin, elongated, or laminated materials, materials that break up when alternately frozen and thawed or wetted and dried, or other deleterious materials. When compacted near the optimum moisture content to not less than 100% of the maximum dry density corrected for the stone content as determined by ASTM D698, the material shall have a minimum bearing ratio as defined by ASTM D1883 of fifty-five percent (55%).
- .2 Granular base shall be as specified in Section 31 05 16 - AGGREGATE MATERIALS

## **PART 3. EXECUTION**

### **3.1 PLACING**

- .1 The base material shall not be placed until the underlying course has been accepted by the Parks Canada Representative. The granular material shall be placed in uniform layers not exceeding 300 mm in thickness before compaction. The material shall be placed by mechanical spreaders or deposited in windrows and levelled with suitable equipment.

### **3.2 COMPACTION**

- .1 Each layer of granular base shall be compacted near the optimum moisture (+/- 2%) content to not less than 100% of the maximum dry density corrected for the stone content as determined by ASTM D698 Method A for the material used.

- .2 During compaction, the moisture content shall be maintained at the optimum moisture content as determined by ASTM D698. If the moisture content exceeds the optimum moisture content the material shall be aerated by mechanical means until the material has dried sufficiently to reach the optimum moisture content. Water shall be added if the moisture content is below optimum.

### **3.3 TESTING COMPACTION**

- .1 Compaction results shall be based on a minimum of one density test per 500 square meters per each 300 mm lift. Additional tests may be called for by the Parks Canada Representative as deemed necessary.
- .2 Field density tests shall conform to ASTM D1556, ASTM D2167, or ASTM D2922 for comparison with a maximum density determined according to ASTM D698 Method A.
- .3 Perform compaction as specified in Section Section 31 23 33.01 - EXCAVATING, TRENCHING AND BACKFILLING.

### **3.4 SHAPING AND FINISHING**

- .1 The finished surface of the granular base shall conform to grades approved by the Parks Canada Representative, and shall show no depression more than 5 mm under a straight edge 3.0 m long placed parallel to the road centreline. Granular base higher than the approved grades shall be cut to the required grades.

### **3.5 INSPECTION**

- .1 Before acceptance by the Parks Canada Representative, the granular base surface shall be true to cross-section and grade, shall conform to the density and bearing ratio requirements specified.
- .2 Field density and moisture content tests will supplied by the contractor to the Parks Canada Representative or his representative to ensure that the material is satisfactory. Material not meeting the specification requirements will not be approved.

**END OF SECTION**

**PART 1. GENERAL**

**1.1 RELATED WORK**

- .1 All landscape development sections including Topsoil Placement (32 91 19.13) and Seeding (32 91 19.14).

**1.2 WARRANTIES**

- .1 The provisions of this Landscape Maintenance Specification are in addition to and in no way detract from or limit general warranty provisions of the Contract.

**PART 2. PRODUCTS**

**2.1 NOT USED**

**PART 3. EXECUTION**

**3.1 MAINTENANCE PERIOD**

- .1 Unless otherwise specified the Contractor shall be responsible for regular weekly maintenance of landscaped areas from the date of Substantial Performance unless otherwise stated in the tender documents:
  - .1 Seeded areas for a period of one year.

**3.2 SCHEDULING AND MONITORING**

- .1 Provide watering service within 24 hours, weeding service within 48 hours, and reseeding within five days of request by the Parks Canada Representative.
- .2 Contractor shall maintain a log noting dates, times, maintenance performed, condition of site, and any other related information. The Contractor shall notify the Parks Canada Representative of the time the Contractor proposes to commence each application.
- .3 The Contractor shall provide the updated maintenance log to the Parks Canada Representative once per month.

**3.3 CLEAN UP**

- .1 All areas shall be kept clean and free of refuse, debris, garbage, stones, bottles, etc.

**3.4 SEEDED AREAS**

- .1 The Contractor will not be responsible for supplying or installing grass seed.

**END OF SPECIFICATION**

## **PART 1. GENERAL**

### **1.1 MEASUREMENT PROCEDURES**

- .1 Preparation of sub-grade for placing of topsoil will not be measured for payment.
- .2 Topsoil Placement and grading will be measured in square metres.
- .3 Imported Topsoil will be measured in cubic metres.

## **PART 2. PRODUCTS**

### **2.1 EXAMINATION**

- .1 Report to the Parks Canada Representative, in writing, of any conditions or defects encountered on the site during or before construction on which work on this section depends and which may adversely affect its performance.
- .2 Do not commence work until such conditions have been investigated and corrected.
- .3 Commencement of work shall imply acceptance of surface and conditions and no claim for damages and extras resulting from such conditions or defects will be accepted thereafter, except in cases where such conditions cannot be known prior to construction.

### **2.2 ANALYSIS**

- .1 The Contractor shall submit representative samples of the imported topsoil to be used for the intended project to a professional soil laboratory for analysis and recommendations. A copy of the laboratory report shall be submitted to the Parks Canada Representative for review and approval.
- .2 The Parks Canada Representative shall provide written approval to the Contractor.
- .3 The soil analysis report will include the topsoil source and the recommendations for correction to meet the nutritional growing requirements of specified plant materials. Recommendations will clearly state the type and quantity of soil additives and application procedure to be used.
- .4 Topsoil analysis report to be submitted to the Parks Canada Representative prior to construction. Such analysis shall be performed on representative samples from each topsoil source, including site stockpile, and shall determine nitrogen, phosphorous, potash, soluble salt content, electrical conductivity, pH value, percentage sodium adsorption ratio, and values of sand, clay, and organic matter.
  - .1 Recommended soil composition:
    - .1 Sand: 35% ( $\pm 2\%$ ) by dry mass
    - .2 Clay: 30% ( $\pm 2\%$ ) by dry mass
    - .3 Silt: 35% ( $\pm 2\%$ ) by dry mass
    - .4 Organic Matter: 5% - 10% by dry mass
    - .5 Toxic Chemicals: None
    - .6 Electrical Conductivity: Maximum 1.5 mmhos/cm
    - .7 pH Value: 6.0 to 7.5
    - .8 Sodium Adsorption: less than 6.
- .5 When the original source of topsoil for which a sample has been submitted is exhausted, topsoil from a new source shall not be used until tested and approved by the Parks Canada Representative.

### **2.3 MATERIALS**

- .1 Stockpiled Topsoil: original topsoil stripped from site and stockpiled on site or in nearby location. Soil stored for longer than two (2) years shall be cleaned of all surface vegetation, shredded, spread, rototilled to a friable consistency, and amended as required.

- .2 Imported Field Topsoil: natural, fertile, friable, agricultural loam, or amended to contain not less than six (6%) percent or more than twenty (20%) percent organic material, a pH value ranging from 5.8 to 7.3, a nutrient content approaching 55 kg/ha actual N, 80 kg/ha actual P, 230 kg/ha actual K, sulphur content of not less than 3 nor greater than 12 ppm and a Na content not less than 200 ppm and electro conductivity of 1.5 mmhos/cm or less. Soil reasonably free from subsoil, slag, clay, stone, lumps, live plants, roots, sticks, quack-grass, weeds, and foreign matter. Soil free of all toxic substances.
- .3 Organic matter: shall be composted manure, completely decomposed, from friable animal litter free from clay, stone, lumps, live plants, roots, sticks, straw, quack-grass, weeds, field crop seed, and foreign matter, having a pH of 5.8 - 7.3 and conductivity less than 0.5 mmhos/cm.
- .4 Seed mix used will be approved prior by the Parks Canada Representative.

### **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.
- .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 Strip topsoil areas as indicated and remove to stockpile location approved by the Parks Canada Representative.
- .2 Avoid mixing topsoil with subsoil where textural quality will be moved outside acceptable range of intended application.
- .3 Stockpile height not to exceed 2 m.
- .4 Protect stockpiles from contamination and compaction.
- .5 If required, the contractor shall import topsoil to mix with stockpiled salvaged topsoil at the Upper Compound at a ratio of 1:2. The supplier source of the imported topsoil must be approved by the Parks Canada Representative prior to import into the Fort St. James National Historic Site.

#### **3.3 PREPARATION OF EXISTING GRADE**

- .1 Verify that grades are correct.
  - .1 If discrepancies occur, notify the Parks Canada Representative and do not commence work until instructed by the Parks Canada Representative.
- .2 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.
- .3 Remove debris, roots, branches, stones in excess of 50 mm diameter and other deleterious materials.
  - .1 Remove soil contaminated with calcium chloride, toxic materials and petroleum products.
  - .2 Remove debris which protrudes more than 75 mm above surface.
  - .3 Dispose of removed material off site.

### **3.4 PLACING AND SPREADING OF TOPSOIL/PLANTING SOIL**

- .1 Place topsoil after the Parks Canada Representative has accepted subgrade.
- .2 Replace topsoil to all stripped areas immediately following fine grading.
- .3 Amend topsoil per laboratory recommendations as approved. Mix stockpiled topsoil and imported topsoil as approved.
- .4 Spread topsoil in uniform layers not exceeding 100 mm.
- .5 Spread topsoil to following minimum depths after settlement.
  - .1 100 mm for seeded areas.
  - .2 300 mm for flower beds.
  - .3 500 mm for shrub beds.
- .6 Manually spread topsoil/planting soil around trees, shrubs and obstacles.
- .7 Do not place topsoil when either topsoil or subgrade is frozen, excessively wet or dry, or in a condition inhibiting proper grading, cultivation, or compaction.
- .8 Cultivate topsoil to a depth of 75mm, breaking down lumps. Remove stones larger than 50mm, weeds, roots, and other foreign matter.
- .9 Do not compact topsoil.

### **3.5 FINISH GRADING**

- .1 Grade to eliminate rough spots and low areas and ensure positive drainage.
  - .1 Prepare loose friable bed by means of cultivation and subsequent raking.
- .2 Consolidate topsoil to required bulk density using equipment approved by the Parks Canada Representative.
  - .1 Leave surfaces smooth, uniform and firm against deep foot printing.
- .3 Prepare and install seed mix as per suppliers instructions on areas designated by the Parks Representative

### **3.6 ACCEPTANCE**

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

### **3.7 SURPLUS MATERIAL**

- .1 Dispose of materials except topsoil not required outside of Fort St. James National Historic Site at an approved dumping facility.

### **3.8 CLEANING**

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

**END OF SECTION**



## **PART 1. GENERAL**

### **1.1 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Inform the Parks Canada Representative of proposed source of bedding materials and provide access for sampling at least 2 weeks prior to commencing work.
- .3 Submit manufacturer's test data and certification that pipe materials meet requirements of this section 2 weeks minimum prior to beginning work. Include manufacturer's drawings, information and shop drawings where pertinent.
- .4 Pipe certification to be listed on pipe.

### **1.2 CLOSEOUT SUBMITTALS**

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Submit data to produce record drawings, including directions for operating valves, list of equipment required to operate valves, and details of pipe material.
  - .1 Include top of pipe, horizontal location of fittings and type, valves, and valve boxes.

### **1.3 SCHEDULING OF WORK**

- .1 Submit schedule of expected interruptions for approval and adhere to interruption schedule as approved by the Parks Canada Representative.
- .2 Notify the Parks Canada Representative minimum of 7 days in advance of interruption in service with confirmation of time and duration minimum of 24 hours before.

## **PART 2. PRODUCTS**

### **2.1 PIPE, JOINTS AND FITTINGS**

- .1 Polyvinyl Chloride (PVC) Pressure Pipe
  - .1 All pipes and joints shall be to the latest revision AWWA C900, CSA certified as meeting latest revision CSA 3- B137.3-M86, SDR 18, working pressure rating 235 psi.
  - .2 All PVC pipe to be cast iron outside diameter, bell end, c/w SBR or NBR gaskets of a pressure actuated seal design.
  - .3 All PVC pipe to be capable of deflecting at a joint.
  - .4 All pipe shall be supplied with integral wall thickened bell ends and continuous gaskets.
- .2 Polyvinyl Chloride (PVC) Fittings
  - .1 For main sizes 300 mm and smaller, PVC Fittings to the latest revision AWWA C-900, CSA certified as meeting latest revisions CSA 3-B137.2, SDR 18, pressure class 150, bell ends, c/w 1MPa elastomeric gasket push-on joint.
- .3 Cast Iron Fittings
  - .1 Cast Iron Fittings to the latest revision AWWA C110-87 / ANSI A21.10, pressure class 150 minimum. Long body only. Exterior of fittings to be bituminous coated at factory.
  - .2 Joints for cast iron fittings to latest revision AWWA C111 / ANSI A21.11, pressure class 150 minimum, "Tyton Joint" or approved equal.

## 2.2 VALVES AND VALVE BOXES

- .1 Gate Valves
  - .1 Valves sized 100 mm diameter shall be resilient wedge gate valves, conforming to latest revision AWWA C509, and c/w fully rubber encapsulated solid wedge, non-rising stem, suitable for direct bury. Acceptable manufacturer: Clow
  - .2 Valves to open counter clockwise (Turn left to open).
  - .3 Valve body to be constructed of cast iron, in accordance with ASTM A126, Class "B". All nuts, bolts and washers to be stainless steel.
  - .4 Interior and exterior of valve to be epoxy coated, as per latest revision AWWA C550.
  - .5 Bronze valve stem to be operated by a 50 x 50 mm square operating nut. The valve stem (stuffing box) shall contain a double "O" ring seal.
  - .6 Valve ends to be push-on "Tyton Joint" conforming to latest revision of AWWA C111-85/ANSI A21.11.

## 2.3 CATHODIC PROTECTION

- .1 Exterior of buried valves and exterior of hydrant barrel below grade flange shall be factory coated with coal tar epoxy coating system conforming to AWWA C210 (latest issue).
- .2 Exterior of all fittings, exterior and interior of all valve boxes shall be factory coated with fusion bonded epoxy coating conforming to AWWA C213 (latest issue).
- .3 Interior of valves shall be coated in accordance with AWWA C550 (latest issue).
- .4 Zinc anodes shall conform to ASTM. B418 Type II (latest edition). Anodes shall have a minimum open circuit potential of -1.10 volts referenced to Cu/CuSO<sub>4</sub> and shall have the following composition:

Aluminum	0.005% maximum
Cadmium	0.003% maximum
Iron	0.0014% maximum
Lead	0.003% maximum
Copper	0.002% maximum
Zinc	remainder
- .5 Anode lead wires shall be a minimum of 2 metres long of AWG #10 type RWU, XLPE stranded copper conforming to CAN C22.2 No. 38. Lead wire connection shall be silver-soldered (brazed) to the steel core using a suitable filler material and flux.
- .6 All metallic buried fittings and valves shall be cathodically protected with 2.3 kilogram zinc anodes.

## 2.4 PIPE BEDDING AND SURROUND MATERIAL

- .1 Granular material to: Section 31 05 16 - Aggregate Materials and following requirements:
  - .1 Gradations to be within limits specified when tested to ASTM C 136 and ASTM C 117. Sieve sizes to CAN/CGSB-8.1.

## 2.5 BACKFILL MATERIAL

- .1 As indicated. Type 3, in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.

## 2.6 PIPE DISINFECTION

- .1 All new water mains and existing mains which are temporarily drained due to connections with the new mains shall be disinfected and flushed before being put into services in accordance with the latest edition of AWWA Standard C651 for Disinfecting Water Mains.

## **2.7 GEOTEXTILE**

- .1 Geotextile properties shall conform to the following:
  - .1 Non-woven synthetic fibre fabric, with properties described below, supplied in rolls.
  - .2 Composed of minimum 85% by mass of polypropylene or polyester with inhibitors added to base plastic to resist deterioration by ultra-violet and heat exposure for 60 days
  - .3 Thickness to: CAN/CGSB-148.1, No.3.
  - .4 Mass per unit area: to CAN/CGSB-148.1, No.2.
  - .5 Tensile strength and elongation (in any principal direction): to ASTM D 4595.

## **PART 3. EXECUTION**

### **3.1 PREPARATION**

- .1 Clean pipes, fittings, valves, and appurtenances of accumulated debris and water before installation.
  - .1 Inspect materials for defects to approval of the Parks Canada Representative.
  - .2 Remove defective materials from site.

### **3.2 TRENCHING**

- .1 Do trenching work in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.
- .2 Ensure trench depth allows coverage over pipe of 2.5 m minimum from finished grade or as indicated.
- .3 Trench alignment and depth require the Parks Canada Representative's approval prior to placing bedding material and pipe.

### **3.3 GRANULAR BEDDING**

- .1 Place granular bedding material in uniform layers not exceeding 150 mm compacted thickness.
- .2 Place bedding on surface free of standing water
- .3 Do not place material in frozen condition.
- .4 Shape bed true to grade to provide continuous uniform bearing surface for pipe.
- .5 Shape transverse depressions in bedding as required to suit joints.
- .6 Compact each layer full width of bed to 98% minimum of corrected maximum dry density.
- .7 Fill authorized or unauthorized excavation below design elevation of bottom of specified bedding in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.

### **3.4 PIPE INSTALLATION**

- .1 Lay pipes to ANSI/AWWA C600 ANSI/AWWA M-9 M-11 and manufacturer's standard instructions and specifications.
  - .1 Do not use blocks except as specified.
- .2 Join pipes in accordance with ANSI/AWWA C600 ANSI/AWWA C602 ANSI/AWWA C206 AWWA M-9 M-11 and manufacturer's recommendations.
- .3 Bevel or taper ends of PVC pipe to match fittings.
- .4 Handle pipe by methods approved by the Parks Canada Representative and recommended by pipe manufacturer. Do not use chains or cables passed through pipe bore so that weight of pipe bears on pipe ends.

- .5 Lay pipes on prepared bed, true to line and grade.
  - .1 Ensure barrel of each pipe is in contact with shaped bed throughout its full length.
  - .2 Take up and replace defective pipe.
  - .3 Correct pipe which is not in true alignment or grade or pipe which shows differential settlement after installation greater than 10 mm in 3 m.
- .6 Face socket ends of pipe in direction of laying. For mains on grade of 2% or greater, face socket ends up-grade
- .7 Do not exceed permissible deflection at joints as recommended by pipe manufacturer.
- .8 Keep jointing materials and installed pipe free of dirt and water and other foreign materials.
  - .1 Whenever work is stopped, install a removable watertight bulkhead at open end of last pipe laid to prevent entry of foreign materials.
- .9 Position and join pipes with equipment and methods approved by the Parks Canada Representative.
- .10 Cut pipes in approved manner as recommended by pipe manufacturer, without damaging pipe or its coating and to leave smooth end at right angles to axis of pipe.
- .11 Align pipes before jointing.
- .12 Install gaskets to manufacturer's recommendations. Support pipes with hand slings or crane as required to minimize lateral pressure on gasket and maintain concentricity until gasket is properly positioned.
- .13 Avoid displacing gasket or contaminating with dirt or other foreign material.
  - .1 Remove disturbed or contaminated gaskets.
  - .2 Clean, lubricate and replace before jointing is attempted again.
- .14 Complete each joint before laying next length of pipe.
- .15 Minimize deflection after joint has been made.
- .16 Apply sufficient pressure in making joints to ensure that joint is completed to manufacturer's recommendations.
- .17 Ensure completed joints are restrained by compacting bedding material alongside and over installed pipes or as otherwise approved by the Parks Canada Representative.
- .18 When stoppage of work occurs, block pipes in an approved manner to prevent creep during down time.
- .19 Recheck plastic pipe joints assembled above ground after placing in trench to ensure that no movement of joint has taken place.
- .20 Do not lay pipe on frozen bedding.
- .21 Do hydrostatic and leakage test and have results approved by the Parks Canada Representative before surrounding and covering joints and fittings with granular material.
- .22 Backfill remainder of trench.

### **3.5 GEOTEXTILE**

- .1 Geotextile shall be placed between prepared subgrade and granular base beneath boardwalk surfaces with minimum 300mm overlap.

### **3.6 CATHODIC PROTECTION**

- .1 Provide cathodic protection for cast iron fittings, valves, and metallic couplers.
- .2 Cadweld or thermoweld anode lead to each valve, metallic coupler and fitting as follows:
  - .1 Remove portion of coating on valve or fitting to be cadwelded or thermowelded.
  - .2 Thoroughly clean area and file metal until a shiny, roughened surface is obtained approximately 75 mm square.

- .3 Remove insulation and crimp copper sleeve over bared wire covering the length to be cadwelded or thermowelded.
- .4 Use crucible and weld metal as manufactured by Erico Products Inc., cadweld or thermoweld, or approved equal, and to manufacturer's recommendations.
- .3 Remove slag off completed weld and file smooth any sharp edges.
- .4 Thoroughly coat the weld and area adjacent that has had the coating removed with Polyken 927 primer with Polyken 930 tape.
- .1 Install anodes as follows:
  - .1 Install the number and size of anodes and at locations indicated.
  - .2 Remove anode from plastic bag, leaving cloth bag or cardboard tube intact. Do not lift anode by lead wire.
  - .3 Place anodes a minimum of 1 m from fitting in a horizontal position and at same elevation and parallel to the fitting.
  - .4 Ensure soil is tamped uniformly around each anode to eliminate voids of air pockets.
  - .5 Wrap anode wire once around appurtenance.
  - .6 Cadweld or thermoweld anode wire leads to fitting or valve.
- .5 Prior to coating and/or wrapping each cadwelded or thermowelded junction, the Contractor shall take a resistance measurement of all pairs of anode lead wires. This measurement shall be taken with an ohmmeter after installation has been completed. A resistance value of less than 0.5 ohms shall be considered satisfactory.

### **3.7 VALVE INSTALLATION**

- .1 Install valves to manufacturer's recommendations at locations as indicated.
- .2 Valves not to be supported by pipe.
- .3 Install underground post-type indicator valves as indicated.

### **3.8 THRUST BLOCKS AND RESTRAINED JOINTS**

- .1 Place concrete thrust blocks between valves, tees, plugs, caps, bends, changes in pipe diameter, reducers, and fittings and undisturbed ground.
- .2 Keep joints and couplings free of concrete.
- .3 Do not backfill over concrete within 24 hours after placing.
- .4 For restrained joints: only use restrained joints approved by the Parks Canada Representative.
- .5 Place thrust blocks against undisturbed soil.
- .6 Provide special design if required bearing can't be achieved.

### **3.9 HYDROSTATIC AND LEAKAGE TESTING**

- .1 Do tests in accordance with ANSI/AWWA C600.
- .2 System working pressure shall be taken as 100 psi.
- .3 Test system at 1.5 times the working pressure.
- .4 Provide labour, equipment and materials required to perform hydrostatic and leakage tests hereinafter described.
- .5 Notify the Parks Canada Representative at least 24 hours in advance of proposed tests.
  - .1 Perform tests in presence of Parks Canada Representative.
- .6 Where section of system is provided with concrete thrust blocks, conduct tests at least 5 days after placing concrete or 2 days if high early strength concrete is used.

- .7 Test pipeline in sections not exceeding 100 m in length, unless otherwise authorized by Parks Canada Representative.
- .8 Upon completion of pipe laying and after the Parks Canada Representative has inspected Work in place, surround and cover pipes between joints with approved granular material placed.
- .9 Leave valves, joints and fittings exposed.
- .10 When testing is done during freezing weather, protect valves, joints and fittings from freezing.
- .11 Strut and brace caps, bends, tees, and valves, to prevent movement when test pressure is applied.
- .12 Open Valves.
- .13 Expel air from main by slowly filling main with potable water.
  - .1 Install corporation stops at high points in main where no air-vacuum release valves are installed.
  - .2 Remove stops after satisfactory completion of test and seal holes with plugs.
- .14 Thoroughly examine exposed parts and correct for leakage as necessary.
- .15 Apply hydrostatic test pressure based on elevation of lowest point in main and corrected to elevation of test gauge, for period of 1 hour.
- .16 Examine exposed pipe, joints, fittings and appurtenances while system is under pressure.
- .17 Remove joints, fittings and appurtenances found defective and replace with new sound material and make watertight.
- .18 Repeat hydrostatic test until defects have been corrected.
- .19 Apply leakage test pressure after complete backfilling of trench, based on elevation of lowest point in main and corrected to elevation of gauge, for period of 2 hours.
- .20 Define leakage as amount of water supplied from water storage tank in order to maintain test pressure for 2 hours.
- .21 Do not exceed allowable leakage of 0.03 L/mm of pipe, including lateral connections.
- .22 Locate and repair defects if leakage is greater than amount specified.
- .23 Repeat test until leakage is within specified allowance for full length of water main.

### **3.10 PIPE SURROUND**

- .1 Upon completion of pipe laying and after the Parks Canada Representative has inspected Work in place, surround and cover pipes as indicated.
- .2 Hand place surround material in uniform layers not exceeding 300 mm compacted thickness as indicated.
  - .1 Do not dump material within 0.6 m of pipe.
- .3 Place layers uniformly and simultaneously on each side of pipe.
- .4 Do not place material in frozen condition.
- .5 Compact each layer from pipe invert to mid height of pipe to at least 95% of corrected maximum dry density.
- .6 Compact each layer from mid height of pipe to underside of backfill to at least 95% of corrected maximum dry density.

### **3.11 BACKFILL**

- .1 Place backfill material, above pipe surround, in uniform layers not exceeding 300 mm compacted thickness up to grades as indicated.
- .2 Do not place backfill in frozen condition.

- .3 Under Paving and walks, compact backfill to at least 98% corrected maximum dry density.
  - .1 In other areas, compact to at least 98% corrected maximum dry density.

### 3.12 FLUSHING AND DISINFECTING

- .1 Flushing in stages will be required to meet the continuity of water services to the areas specified in Section 01 14 00 Work Restrictions and tie in requirements with adjacent areas.
- .2 Flushing and disinfecting operations: witnessed by Parks Canada Representative.
  - .1 Notify Parks Canada Representative at least 7 days in advance of proposed date when disinfecting operations will begin.
- .3 Flush water mains through available outlets with a sufficient flow of potable water to produce velocity of 1.5 m/s, within pipe for minimum 10 minutes, or until foreign materials have been removed and flushed water is clear.
- .4 Flushing flows as follows:

Pipe Size NPS	Flow (L/s) Minimum
6 and below	38
8	75
10	115
12	150
- .5 Provide connections and pumps for flushing as required.
- .6 Open and close valves, hydrants and service connections to ensure thorough flushing.
- .7 When flushing has been completed to Parks Canada Representative approval, introduce strong solution of chlorine as approved by Parks Canada Representative into water main and ensure that it is distributed throughout entire system.
- .8 Disinfect water mains.
- .9 Rate of chlorine application to be proportional to rate of water entering pipe.
- .10 Chlorine application to be close to point of filling water main and to occur at same time.
- .11 Operate valves, hydrants and appurtenances while main contains chlorine solution.
- .12 Flush line to remove chlorine solution after 24 hours. De-chlorination required prior to any discharge unless otherwise approved by Parks Canada Representative. Provide de-chlorination methodology and procedure to Department Representative for approval.
- .13 Measure chlorine residuals at extreme end of pipe-line being tested.
- .14 Perform bacteriological tests on water main, after chlorine solution has been flushed out.
  - .1 Take samples daily for minimum of 2 days.
  - .2 Should contamination remain or recur during this period, repeat disinfecting procedure.
- .15 Take water samples at the farthest hydrants and service connections, in suitable sequence, to test for chlorine residual.
- .16 After adequate chlorine residual not less than 50 ppm has been obtained leave system charged with chlorine solution for 24 hours.
  - .1 After 24 hours, take further samples to ensure that there is still not less than 10 ppm of chlorine residual remaining throughout system.

### 3.13 SURFACE RESTORATION

- .1 After installing and backfilling over water mains, restore surface to original condition.

**END OF SECTION**