



Parks Canada Agency

**Stanhope  
Campground  
Sanitary System  
Upgrades**

**Technical  
Specifications**

**ISSUED FOR  
TENDER**

October 10, 2017

PCA Project No: 1427

Stantec Project No: 133347759

Specifications  
Issued for Tender

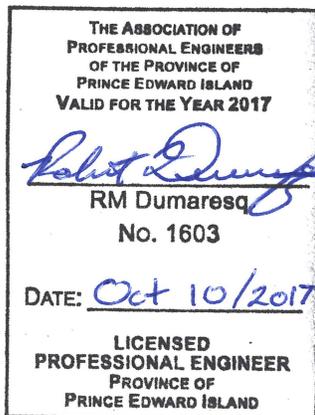
Parks Canada Agency

Sanitary System Upgrades  
Stanhope Campground  
Prince Edward Island National Park

Project No. 1427  
Stantec Consulting Limited



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**Part 1      General**

**1.1      DESCRIPTION OF WORK**

- .1      The work will be carried out at the Stanhope Campground within the boundaries of the Prince Edward Island National Park including decommissioning two (2) existing wastewater pumping stations and related infrastructure, installation of a new duplex submersible wastewater pumping station adjacent to Gulf Shore Parkway, installation of a gravity sanitary main, and replacement of the force main to the existing disposal field.
- .2      The Contractor shall restrict excavation to approved alignment and limits of construction.
- .3      At the end of each work day, the trench will be backfilled to surface and isolated with properly installed construction fencing.

Work on this project consists generally of the following:

- .1      Carry out a preconstruction survey, this is considered incidental to the Contract.
  - .2      The Contractor shall develop an Environmental Protection Plan for submission and approval prior to starting work based on the Basic Impact Analysis and Parks Canada's Best Management Practices document as shown in **Appendix A**.  
*(Parks Canada National Best Management Practices – Roadway, Highway, Parkway and Related Infrastructure (May 2015)).*
  - .3      Site erosion and sediment control measures, including check dams, silt fencing, silt curtain, hay/straw bales, vegetation stabilization and other measures as required, maintained for the duration of the Work.
  - .4      Removal of existing gravity and force main pipe material, valves, valve chambers, septic tanks, pumping stations and wet wells.
  - .5      Supply and installation of new pumping station, force main, valves, valve chambers, septic tank including connection to existing disposal field, installed along the alignment as shown on the Drawings.
  - .6      Construction including: clearing, grubbing, stripping, excavation, bedding of pipe, backfill, site restoration, site preparation and site access to the alignment of the new force main as shown on the Drawings.
  - .7      Supply, placement, and compaction of bedding and cover material for installation of the pipe.
  - .8      Supply and placement of hydroseeding and dry mulch on designated areas.
  - .9      Restoration of roads and trails to existing or better condition as impacted by construction.
  - .10     Protection of all cultural and archaeological resources.
- .4      All work to be carried out in accordance with applicable federal, provincial regulations for those agencies having jurisdiction for the work. The work is subject to the National Park Act and Regulations, Canadian Environmental Protection Act, and the Code of Practice of the Department of Labour, as it applies to the Temporary Workplace Traffic Control Manual.

- .5 The Contractor must be aware that other construction work may be performed at several different locations within the Park during the time frame of this contract and that coordination with other Contracts may be required. The Contractor must plan their work accordingly.

## **1.2 TERMS AND DEFINITIONS**

- .1 Project Limits: The limits of construction impact or clearing limits.
- .2 Mass: Term "tonne" means 1000 kg or 1 Mg or t.
- .3 Volume: Term "litre" means 1000 mL or L.

## **1.3 MAINTENANCE OF WORK DURING CONSTRUCTION**

- .1 Maintain work during construction. Undertake continuous and effective maintenance work day by day, with adequate equipment and forces so that the roadway or structures are continuously kept in a condition satisfactory to Departmental Representative:
- .1 The contractor shall ensure that the roads and trails are adequately covered with a minimum of 50 mm of Class A gravel, or isolated by construction fencing at the end of each work day.
- .2 The contractor shall be responsible to maintain dust control within the Work area at all times.

## **1.4 CODES**

- .1 Perform work in accordance with National Parks Act, Code of Practice of the Department of Labour, as it pertains to the Temporary Workplace Traffic Control Manual and any other code of federal, provincial, or local application provided that in any case of conflict or discrepancy, the more stringent requirements shall apply.
- .2 Materials and workmanship must conform to or exceed applicable standards of Canadian General Standards Board (CGSB), Canadian Standards Association (CSA), American Society for Testing and Materials (ASTM) and other standards organizations.
- .3 Conform to latest revision of any referenced standard as re-affirmed or revised to date of specification. Standards or codes not dated shall be deemed editions in force on date of tender advertisement.

## **1.5 WORK WITHIN PARK BOUNDARIES**

- .1 The project is within a National Park and it is essential that lands remain as undisturbed as possible. The Contractor will be expected to use standards and methods beyond those for normal construction in order to protect the environment and ensure the aesthetics of the work. Contract limits shall be strictly adhered to and every precaution shall be taken to minimize environmental damage and disruption to vegetation, wildlife habitat, and structures or existing services, both on construction and storage sites:

- .1 If any damage occurs during construction, the Contractor is responsible to bear the expense to immediately restore such damaged areas to the satisfaction of the Departmental Representative.
- .2 If Contractor fails to repair damage to the satisfaction of the Departmental Representative, the Departmental Representative may complete repairs at the Contractor's expense.
- .3 The Contractor shall ensure that contracted work meets the standards outlined in the contract specification and drawings.
- .4 All sources of aggregate and asphalt cement must be submitted to the Departmental Representative for approval at least two weeks prior to the start of any work.
- .5 The Contractor is responsible to follow the Provincial requirements regarding the following:
  - .1 Pit and Quarry Guidelines.
  - .2 Environmental Construction Practice specifications.
- .6 The Contractor will make arrangements with authorities or owners of private properties for quarrying and transporting materials and machinery over their properties and be responsible for obtaining and paying of fees.

#### **1.6 DOCUMENTS REQUIRED**

- .1 Maintain at job site, one copy each of following:
  - .1 Contract drawings.
  - .2 Specifications.
  - .3 Addenda.
  - .4 Reviewed Shop Drawings.
  - .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 Plan Locating Underground Telephone Lines.
  - .11 Other Documents as Specified.
  - .12 Construction Schedule.
  - .13 Environmental Control Plan.
  - .14 Flow Management Plan.
  - .15 Spill Management Plan.

#### **1.7 SITE CONDITIONS**

- .1 Before submitting a bid, it is recommended that bidders visit the site to review and verify the form, nature and extent of the work, materials needed, the means of access and the temporary facilities required to perform the Work.

- .2 Obtain prior permission from the Parks Canada Asset Manager before carrying out such site inspection.
- .3 All persons visiting the site are to review specification Section 01 35 29.06 – Health and Safety Requirements before arrival on site. Take all appropriate safety measures for any visit to site, either before or after acceptance of bid.
- .4 Promptly notify the Departmental Representative if subsurface conditions differ materially for those indicated in the Contract Documents or a reasonable assumption of probable conditions based on thereon.

### **1.8 WASTE DISPOSAL**

- .1 Waste material from common excavation may be disposed of at a location approved by the Departmental Representative. All other waste generated from this project will be disposed of outside of Park boundaries.

### **1.9 WORK SCHEDULE**

- .1 Provide to the Departmental Representative in writing and within 5 working days after Contract award, a detailed construction schedule and traffic control plan. The schedule shall show proposed work to be undertaken and anticipated completion dates for each category of work in the Unit Price Table.
- .2 After receiving the Contractor's plan and prior to start of construction, a meeting involving Contractor, Departmental Representative and Parks Canada will be held at a place and time to be determined by the Departmental Representative. This meeting will review implications of the contract, design, schedule of work, methods of construction, environment protection methods and traffic control.
- .3 Complete all cutting and patching areas within the Park prior to the operation.
- .4 The final completion date shall be May 31<sup>st</sup>, 2018
- .5 Interim reviews of work progress based on work schedule will be conducted as decided by Departmental Representative and schedule updated by Contractor in conjunction with and to approval of Departmental Representative.
- .6 No work will begin until the pre-construction meeting is held.
- .7 Following the pre-construction meeting and approval of the schedule and traffic control plan, the work will be so scheduled to meet the time restraints and have the project completed on time.

### **1.10 PARTIAL OCCUPANCY OR USE**

- .1 The Contractor shall provide and maintain sanitary facilities for the use of workers at locations specified by the Departmental Representative. Provision of sanitary facilities shall meet requirements of provincial government and municipal statutes and authorities.

**1.11 CONTRACTOR'S USE OF SITE**

- .1 Use of site: for execution of work within road/trail right of way and those areas specified by the Departmental Representative. Project Limits/Construction Limits are as follows:
  - .1 Clearing limits.
  - .2 Limits of existing trails and roads, Contractor to minimize disturbance to trees where clearing is not indicated.
  - .3 As indicated on the Construction Drawings.
- .2 The Departmental Representative will specify the areas for work and storage:
  - .1 Stockpile, disposal sites and borrow sources are available as follows:
    - .1 Long term material stockpile location to be approved by Departmental Representative.
    - .2 The material storage, stockpile and disposal sites are to be reinstated to pre-construction activities as directed by the Departmental Representative.

**1.12 PROJECT MEETINGS**

- .1 The Contractor will arrange project meetings at the call of the Departmental Representative and assume responsibility for setting times and recording and distributing minutes.

**1.13 SETTING OUT OF WORK**

- .1 Contractor shall carry out all layouts.
- .2 Contractor shall assume full responsibility for and execute complete layout of work to locations, lines and elevations indicated.
- .3 Contractor shall supply such devices as straight edges and templates required to facilitate Departmental Representative's inspection of work.
- .4 Contractor shall supply pre and post construction survey of the project so that it can be checked by the Departmental Representative including limits of clearing, top of grate elevation of valve chambers, lift stations, force main inverts, etc.

**1.14 EXISTING SEWAGE FORCE MAIN**

- .1 The existing sanitary system within the Campground and Beach facility is in operation until October 15, 2017. The Contractor must maintain flows by means of by-pass pumping if the system must be shut down prior to October 15. The systems are shut down after October 15 and flows will not need to be maintained after this point or as directed by the Departmental Representative.

**1.15 EXISTING SERVICES**

- .1 Cut and patch as required to make work fit.
- .2 Where new work connects with existing and where existing work is altered, cut, patch and make good to match existing work.
- .3 Carry out work at times directed by authorities having jurisdiction, with minimum of disturbance to pedestrian and vehicular traffic.
- .4 Before commencing work, establish location and extent of service lines in area of work and notify Departmental Representative of findings.
- .5 Submit schedule to and obtain approval from Departmental Representative for any shut-down or closure of active service or facility. Adhere to approved schedule and provide notice to affected parties.
- .6 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.
- .7 Record locations of maintained, re-routed and abandoned service lines.
- .8 Ensure that at least one lane of traffic is maintained at construction sites at all times.
- .9 Ensure pedestrian and other traffic is not unduly impeded, interrupted or endangered by execution or existence of work.
- .10 Maintain existing signs at all times. When it is necessary to temporarily remove a sign, it shall be dismantled and re-established on a temporary post or stand set back from construction area. The work is considered to be incidental and no separate payment will be made for maintaining or moving signs.
- .11 The Contractor shall obtain clearance reports from all utilities and ensure temporary lines are not disturbed during the duration of this project. The Contractor will be required to coordinate their work with utility companies and schedule the works accordingly.
- .12 The Contractor is responsible to locate all existing utilities in the field and protect them during construction.

**1.16 TRUCK MANAGEMENT PLAN**

- .1 Submit in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit site-specific Truck Management Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Truck Management Plan shall include, but not limited to:
  - .1 Speed and Unsafe Driving: Contractor shall outline how they will monitor and discipline trucks for any violations. The Plan must indicate the progressive steps that will be followed should violations occur.

- .2 Over Weight Loads: Departmental Representative will periodically spot check and divert loads (i.e. any material without weigh slips) to scales for random compliance check.
- .3 Tarping: All loads delivered to site shall be tarped. Loads delivered to site not tarped will not be paid for.
- .3 The Contractor shall be responsible to provide a Daily Weighers Report to the Departmental Representative to cross reference delivered material. The Report shall include, but not limited to:
  - .1 Driver name;
  - .2 Company;
  - .3 License plate number;
  - .4 Tare, including gross and net weight.
- .4 Any work days with missing Daily Weighers Reports or weigh slips will not be paid for.
- .5 Submit other data, information and documentation upon request as stipulated elsewhere in this Section.

#### **1.17 ADDITIONAL DRAWINGS**

- .1 Departmental Representative may furnish additional drawings for clarification. These additional drawings have same meaning and intent as if they were included with plans referred to in Contract documents.

#### **1.18 RELICS, ANTIQUES & WILDLIFE HABITAT**

- .1 Protect relics, antiquities, wildlife habitat, items of historical or scientific interest such as cornerstones and contents, animal nesting sites, commemorative plaques, inscribed tablets, and similar objects found during course of work.
- .2 Give immediate notice to Departmental Representative and await Departmental Representative's written instructions before proceeding with work in this area.
- .3 Relics, antiquities and items of historical or scientific interest remain her Majesty's property.
- .4 If nests or dens are found within the work sites, departmental representatives are to be consulted before work continues in these areas.

#### **1.19 MEASUREMENT OF QUANTITIES**

- .1 Linear: Items which are measured by metre or kilometre, such as pipe installation will be measured along centreline of installation unless otherwise shown on plans.

- .2 Area:
  - .1 Longitudinal and transverse measurements for areas to be measured horizontally.
  - .2 Longitudinal and transverse measurements for such items as hydroseeding and mulching to be made on actual flat or sloped surface seeded or sodded.
- .3 Volume:
  - .1 In computing volumes of excavation, average end area method will be used unless otherwise directed by Departmental Representative in writing.
  - .2 Term: Litre shall mean 1000 mL or L.
- .4 All volume measurements refer to in place measure unless specified elsewhere in specification.
- .5 Mass:
  - .1 Term "tonne" shall mean 1000 kg.
  - .2 Materials which are specified for measurement by mass shall be weighed on scales at a location determined by the Contractor. Units used to haul material being paid for by mass shall bear legible identification numbers plainly visible to scale person as it approaches and leaves scale-house.
- .6 Time:
  - .1 Unless otherwise provided for elsewhere or by written authority of Departmental Representative, hourly rental of equipment will be measured in actual working time and necessary travelling time of equipment within limits of project at an all-inclusive rate. Equip each unit of mobile equipment with an approved device to register hours of operation. Devices which only measure hours of running of motor will not be accepted.

#### **1.20 PERMITS/AUTHORITIES**

- .1 The Contractor shall obtain, and pay for, permits from authorities as required for all operations and construction. The Contractor shall also comply with all pertinent regulations of all authorities having jurisdiction over the work. The Contractor shall provide copies of all permits and approvals to the Owner prior to starting the work. The Contractor shall be responsible for obtaining all applicable permits, inspections and approvals required and shall pay all changes in connection therewith.
- .2 The Contractor will be required to obtain park permits for all vehicles that will access the Park. To be obtained from the Parks Canada – Prince Edward Island Field Unit. The Contractor is required to submit a list to the Field Unit of all vehicles that will require access to the Park.

#### **1.21 EQUIPMENT RENTAL RATES**

- .1 Upon written request, the Contractor will supply the Departmental Representative with a list of the rental equipment to be used on work beyond the scope of bid items.

**Part 2            Products**

**2.1                NOT USED**

.1            Not Used.

**Part 3            Execution**

**3.1                NOT USED**

.1            Not Used.

**END OF SECTION**

**Part 1 General**

**1.1 ACCESS AND EGRESS**

- .1 Design, construct and maintain temporary "access to" and "egress from" work areas, in accordance with relevant municipal, provincial, and other regulations.
- .2 Access route to the work site must be established prior to construction commencing and approved by the Departmental Representative. Any changes to the established access route by the Contractor must be approved in writing by the Departmental Representative.
- .3 Contractor will be required to maintain access to the work site including snow plowing if required. Existing infrastructure shall be marked and protected during snow plowing operations.

**1.2 USE OF SITE AND FACILITIES**

- .1 The Contractor shall provide survey layout of the gravity and forcemain installation.
- .2 The Contractor shall restrict excavation to alignment of pipe installation and the construction limits as established on the Drawings and approved by the Departmental Representative.
- .3 Maintain Road and Site Signage at all times during the Contract (dust control, no potholes, bumps, PVMS, etc.)
- .4 Any materials deemed salvageable such as pumps, valves, signage etc. The Contractor shall deliver these materials to the Park Compounds as directed by the Departmental Representative.
  - .1 The Contractor shall coordinate with Park staff:
    - .1 Stock pile and laydown locations.
    - .2 Required salvageable or recyclable material required to be stock piled.
- .5 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Departmental Representative to facilitate work as stated.
- .6 Water extraction within the Park is not permitted unless approved by Departmental Representative, and the Contractor has required permits.
- .7 Blasting is not permitted.
- .8 Maintenance work on Contractor/Sub-Contractor equipment is prohibited within the Park boundary.
- .9 Relics, Antiques, Artifacts and Wildlife Habitat encountered must be reported to Parks Canada and the Departmental Representative as per Contract.
- .10 Provide for personnel and vehicle access.
- .11 Special Move Permit (over weight and over dimension) from the Province shall be submitted to the Departmental Representative for review and approval prior to activity.
- .12 Where security is reduced by work provide temporary means to maintain security.

- .13 The Work shall be conducted in accordance with Parks Canada National Best Management Practices – Roadway, Highway, Parkway and Related Infrastructure (May 2015) and the Basic Impact Analysis Document.
- .14 The Contractor is required to record As-Built information and provide in digital and hard copy at the end of the project as per the Contract.
- .15 The Contractor will not have access to electricity, washroom facilities, or water services within the Park. The Contractor must make arrangements as required to service the work site and obtain approval from the Departmental Representative.

### **1.3 ALTERATIONS, ADDITIONS OR REPAIRS**

- .1 Execute work with least possible interference or disturbance to public and normal use of premises. Arrange with Departmental Representative to facilitate execution of work.
- .2 If native topsoil is encountered, the Contractor shall maintain so embankments and designated areas can be dressed at the end of the project prior to hydroseeding and dry mulch.

### **1.4 EXISTING SERVICES**

- .1 Notify Departmental Representative and utility companies of intended interruption of services and obtain required permission.
  - .1 The Contractor shall obtain clearance reports from all utilities and ensure temporary lines are not disturbed during the duration of this project, this information shall indicate depth, location, protection measures if required, etc. The Contractor will be required to coordinate their work with utility companies and schedule the works accordingly.
- .2 Provide for personnel, pedestrian and vehicular traffic. Provide for one lane traffic during working hours and provide two lane traffic at the end of each working day.

### **1.5 SPECIAL REQUIREMENTS**

- .1 Work outside of normal working hours will require 48 hours written notice to the Departmental Representative. Work on nights, weekends, or statutory holidays will require approval from the Departmental Representative prior to commencing.
- .2 Park guests will be present in higher numbers from September 1<sup>st</sup> until October 15<sup>th</sup>. After October 15<sup>th</sup> the Contractor may restrict access to the work site from pedestrian traffic. Pedestrian traffic must be protected during construction and public access maintained prior to October 15<sup>th</sup> or as approved by the Departmental Representative.
- .3 During the school year, minimize delays for school buses.
- .4 Submit schedule in accordance with Section 01 32 16.07 - Construction Progress Schedule - Bar (GANTT) Chart.
- .5 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.
- .6 Keep within limits of work and avenues of ingress and egress.

**Part 2            Products**

**2.1                NOT USED**

.1            Not Used.

**Part 3            Execution**

**3.1                NOT USED**

.1            Not Used.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1            Section 01 11 00 – Summary of Work.

**1.2                DESCRIPTION**

- .1            Mobilization and Demobilization consists of preparatory work and operations including, but not limited to, those necessary for the movements of personnel, equipment, supplies and incidentals to and from the project sites.
- .2            For those purposes of mobilization and demobilization, “project site” means the location.

**Part 2            Products**

**2.1                NOT USED**

- .1            Not Used.

**Part 3            Execution**

**3.1                NOT USED**

- .1            Not Used.

**END OF SECTION**

**Part 1      General**

**1.1      GENERAL REQUIREMENTS OF THE BID AND ACCEPTANCE FORM**

- .1      Unit prices and Lump Sum prices bid are full compensation for the work necessary to complete each item in the Contract and in combination for all work necessary to complete the Work as a whole.
- .2      All measurement shall be along a horizontal plane unless otherwise indicated.
- .3      Overhaul will not be paid for on this project.
- .4      The quantities listed in the Bid and Acceptance Form are approximate only and are for the purpose of tendering. Payment to the Contractor will be based on actual quantities of work completed in accordance with the Drawings and specifications.
- .5      The numbers of the items described below correspond to the items in the Bid and Acceptance Form.
- .6      There will be no measurement of payment for Work carried out beyond the limits defined on the Drawings.

**1.2      MEASUREMENT AND PAYMENT**

- .1      All items in this contract will be paid for as indicated in the bid items below:
- .2      Unit Price Item 1 - Section 33 31 13 – Sanitary Utility Sewerage Piping – 200 mm diameter excavated gravity main
  - .1      Unit of Measurement: lineal meters (m).
  - .2      Method of Measurement: Measurement to be lineal meters along the centerline of the installed pipe, and as accepted by the Departmental Representative.
  - .3      Payment to include all labour and materials required to supply and install the sanitary gravity pipe along alignment shown on the Drawings, including excavation, bedding, backfill and compaction, installation of polystyrene insulation where required, and removal of existing pipe material where alignment matches the proposed pipe alignment.
- .3      Unit Price Item 2 - Section 33 31 13 – Sanitary Utility Sewerage Piping – 200 mm diameter drilled gravity main
  - .1      Unit of Measurement: lineal meters (m).
  - .2      Method of Measurement: Measurement to be lineal meters along the centerline of the installed pipe, and as accepted by the Departmental Representative.
  - .3      Payment to include all labour and materials required to supply and install the sanitary gravity pipe along alignment shown on the Drawings, including excavation, horizontal drilling, carrier pipe, bedding, backfill and compaction,

- installation of polystyrene insulation where required, and removal of existing pipe material where alignment matches the proposed pipe alignment.
- .4 Unit Price Item 3 - Section 33 31 13 – Sanitary Utility Sewerage Piping – 100 mm diameter excavated gravity main
- .1 Unit of Measurement: lineal meters (m).
  - .2 Method of Measurement: Measurement to be lineal metres along the centerline of the installed pipe, and as accepted by the Departmental Representative.
  - .3 Payment to include all labour and materials required to supply and install the sanitary gravity pipe along alignment shown on the Drawings, including excavation, bedding, backfill and compaction, installation of polystyrene insulation where required, and removal of existing pipe material where alignment matches the proposed pipe alignment.
- .5 Unit Price Item 4 - Section 33 05 16 – Manholes and Valve Chamber– 1050 mm sanitary manhole base.
- .1 Unit of Measurement: each.
  - .2 Method of Measurement: Measurement to be the number of manhole bases supplied and installed in accordance with the drawings, and as accepted by the Departmental Representative.
  - .3 Payment to include all labour and materials required to supply and install the precast concrete manhole base, including excavation, bedding, backfill and compaction, installation of polystyrene insulation where required, and removal of existing pipe material where alignment matches the proposed pipe alignment.
- .6 Unit Price Item 5 - Section 33 05 16 – Manholes and Valve Chamber– 1050 mm sanitary manhole shafting.
- .1 Unit of Measurement: lineal metres
  - .2 Method of Measurement: Measurement to be the vertical distance from the invert of the outlet of the sanitary manhole, to the top of the cover at finish grade, supplied and installed in accordance with the drawings, and as accepted by the Departmental Representative.
  - .3 Payment to include all labour and materials required to supply and install the precast concrete manhole shafting, including excavation, bedding, backfill and compaction, installation of polystyrene insulation where required, and removal of existing pipe material where alignment matches the proposed pipe alignment.
- .7 Unit Price Item 6 - Section 33 05 16 – Manholes and Valve Chamber– 1050 mm sanitary manhole frame and cover.
- .1 Unit of Measurement: each.
  - .2 Method of Measurement: Measurement to be the number of manhole frames and covers supplied and installed in accordance with the drawings, and as accepted by the Departmental Representative.
  - .3 Payment to include all labour and materials required to supply and install the frame and cover, including excavation, bedding, backfill and compaction.

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- .8 Unit Price Item 7- Section 33 34 00 – Sanitary Utility Sewerage Force Mains – 75 mm diameter PVC SDR26 excavated sanitary forcemain
- .1 Unit of Measurement: lineal meters (m).
  - .2 Method of Measurement: Measurement to be lineal meters along the centerline of the installed pipe, and as accepted by the Departmental Representative.
  - .3 Payment to include all labour and materials required to supply and install the sanitary forcemain pipe along alignment shown on the Drawings, installation of mechanical restraints, installation of polystyrene insulation where required, and removal of existing pipe material where alignment matches the proposed pipe alignment.
- .9 Unit Price Item 8- Section 33 34 00 – Sanitary Utility Sewerage Force Mains – 75 mm diameter PVC SDR26 drilled sanitary forcemain
- .1 Unit of Measurement: lineal meters (m).
  - .2 Method of Measurement: Measurement to be lineal meters along the centerline of the installed pipe, and as accepted by the Departmental Representative.
  - .3 Payment to include all labour and materials required to supply and install the sanitary forcemain pipe along alignment shown on the Drawings, including horizontal drilling, carrier pipe, installation of mechanical restraints.
- .10 Unit Price Item 9 – Section 33 05 16 – Valve Chambers
- .1 Unit of Measurement: each.
  - .2 Method of Measurement: Measurement to be per the number of installed valve chamber structures, and as accepted by the Departmental Representative.
  - .3 Payment to include all labour and materials required to supply and install the pumping station valve chambers where shown on the Drawings, frames and lockable covers, drain piping, and connections to the proposed forcemain pipe entering and exiting the structure.
- .11 Unit Price Item 10 – Section 32 32 13.12 - Package Sewage Lift, Wet Well Type
- .1 Unit of Measurement: each.
  - .2 Method of Measurement: Measurement to be the number of installed pumping stations as shown on the drawings and specified, and as accepted by the Departmental Representative.
  - .3 Payment to include all labour and materials required to supply and install the pumping station and controls, including excavation, bedding, compaction and backfill, pre-cast concrete wet well, internal piping, pumps and control panel, lifting chain and davit, level control, frames and lockable covers, flow meter, forcemain between the wet well and valve chamber, check and plug valves, start up and commissioning.
- .12 Unit Price Item 11 – Section 33 36 00 – Utility Septic Tanks
- .1 Unit of Measurement: each.

- .2 Method of Measurement: Measurement to be per the number of installed septic tanks where shown on the drawings, and as accepted by the Departmental Representative.
  - .3 Payment to include all labour and materials required to supply and install the septic tank, including excavation, bedding, compaction and backfill, covers, internal baffle, effluent filter, concrete ballast and associated hardware, and connections to proposed sanitary piping.
- .13 Lump Sum Price Item 12 – Section 02 41 13 – Decommission Pumping station and tanks at Campground Site
- .1 Unit of Measurement: lump sum.
  - .2 Method of Measurement: Measurement to be the completion of all demolition and removal of all components slated for demolition, in order for the installation of the new piping and related infrastructure, as shown on the drawings, and as accepted by the Departmental Representative.
  - .3 Payment to include all labour and materials required to excavate and remove from the site the existing pumping station, valve chamber, septic tank(s), piping, and electrical and controls, including excavation, bedding, compaction and backfill, disposal of all hazardous materials.
- .14 Lump Sum Price Item 13 – Section 02 41 13 – Decommission Pumping station and tank at Beach Site
- .1 Unit of Measurement: lump sum.
  - .2 Method of Measurement: Measurement to be the completion of all demolition and removal of all components slated for demolition, in order for the installation of the new piping and related infrastructure, as shown on the drawings, and as accepted by the Departmental Representative.
  - .3 Payment to include all labour and materials required to excavate and remove from the site the existing pumping station, valve chamber, septic tank(s), piping, and electrical and controls, including excavation, bedding, compaction and backfill, disposal of all hazardous materials.
- .15 Unit Price Item 14 – Section 33 05 16 – Grit Removal Chamber
- .1 Unit of Measurement: each.
  - .2 Method of Measurement: Measurement to be the number of installed grit removal chamber structures, and as accepted by the Departmental Representative.
  - .3 Payment to include all labour and materials required to supply and install the grit removal chamber where shown on the Drawings, frames and lockable covers, and connections to the proposed gravity main entering and exiting the structure.
- .16 Unit Price Item 15 – Section 33 31 13 – Connection to Existing Main
- .1 Unit of Measurement: each.
  - .2 Method of Measurement: Measurement to be the number of connections made to the existing sanitary infrastructure to accommodate the new piping, as accepted by the Departmental Representative.

- .3 Payment to include all labour and materials required to supply and install all transition pipes, couplings and grout to make a watertight connection, and shall include all excavation, bedding, compaction and backfill necessary for the complete connection.
- .17 Unit Price Item 16 – Section 33 31 13 – Connection to existing Siphon Chamber
  - .1 Unit of Measurement: each.
  - .2 Method of Measurement: Measurement to be the connection to the existing siphon chamber to accommodate the new forcemain, as accepted by the Departmental Representative.
  - .3 Payment to include all labour and materials required to supply and install all transition pipes, couplings and grout to make a watertight connection, and shall include all excavation, bedding, compaction and backfill necessary for the complete connection.
- .18 Unit Price Item 17 – Section 33 31 13 – Connection to existing Shower Plumbing
  - .1 Unit of Measurement: each.
  - .2 Method of Measurement: Measurement to be the connection to the existing plumbing beneath the washroom facility at the Beach Site, to accommodate the gravity service and grit chamber, as accepted by the Departmental Representative.
  - .3 Payment to include all labour and materials required to supply and install all transition pipes, couplings concrete and grout to make a watertight connection, and shall include all excavation, bedding, compaction, backfill and access cover necessary for the complete connection.
- .19 Lump Sum Price Item 18 – Section 32 32 13.12 - 3-Phase Power to Package Sewage Lift Station
  - .1 Unit of Measurement: Lump Sum.
  - .2 Method of Measurement: Measurement to be the supply and installation of a buried 3 phase electrical service from the existing electrical building to the new pumping station, and as accepted by the Departmental Representative.
  - .3 Payment to include all labour and materials required to supply and install the underground electrical, including the connection at the existing electrical building, excavation, bedding, backfill, compaction, warning tape, and the connection to the new pumping station control panel.
- .20 Lump Sum Price Items 19 - Section 32 91 19.13 and 32 92 19.16 – Topsoil and Seed Excavated Areas
  - .1 Unit of Measurement: Lump Sum.
  - .2 Method of Measurement: Measurement to be lump sum for all disturbed areas, that require restoration due to construction impact with topsoil, and as accepted by the Departmental Representative.
  - .3 Payment to include the hauling, placement and grading of topsoil and the completion of hydroseeding, including hydroseed mix, erosion control agent, water and fertilizer as specified and maintenance.

- .21 Unit Price Item 20 - Section 31 05 16 - Gravel Access Road Construction
- .1 Unit of Measurement: square metres (m<sup>2</sup>)
  - .2 Method of Measurement: Measurement to be in square metres of completed surface, and as accepted by the Departmental Representative.  
Payment to include the import, placement, grading and compaction of common borrow, select borrow and class A granular to complete the gravel access road as shown on the drawings.
- .22 Unit Price Item 21- Section 33 42 13 – 600 mm HDPE Culvert
- .1 Unit of Measurement: lineal meters (m).
  - .2 Method of Measurement: Measurement to be lineal meters along the centerline of the installed pipe, and as accepted by the Departmental Representative.
  - .3 Payment to include all labour and materials required to supply and install the HDPE culvert along alignment shown on the Drawings, including excavation, bedding, compaction and backfill.
- .23 Unit Price Item 22 – Detail 06 Drawing C-05 – Bollards
- .1 Unit of Measurement: each.
  - .2 Method of Measurement: Measurement to be the number of installed bollards as per the drawings, and as accepted by the Departmental Representative.
  - .3 Payment to include all labour and materials required to supply and install the bollards where shown on the Drawings, or as directed by the Departmental Representative.
- .24 Unit Price Items 23 - Section 01 35 43 – Environmental Procedures – Type 1 Silt Control Fence
- .1 Unit of Measurement: lineal meters (m).
  - .2 Method of Measurement: Measurement to be lineal meters along the centerline of the installed silt fence, and as accepted by the Departmental Representative.
  - .3 Payment to include all labour and materials required to install the silt fence structures as indicated on the Drawings, where required by the Specifications, or where directed by the Departmental Representative, as shown on the Drawings.
- .25 Unit Price Item 24 – Section 01 35 43 – Environmental Procedures – Erosion Control Structures
- .1 Terms of Payment: each
  - .2 Method of Measurement: Measurement to be for each straw bale or other erosion control structure, as accepted by the Departmental Representative.
  - .3 Payment to include all labour and materials required to install the straw bales check dams as indicated on the Drawings, where required by the Specifications, or where directed by the Departmental Representative, as shown on the Drawings.
- .26 Unit Price Item 25 - Section 33 11 16 – 50 mm Water Main Replacement
- .1 Unit of Measurement: lineal metres (m).

- .2 Method of Measurement: Measurement to be lineal metres along the centerline of the removed and replaced pipe, and as accepted by the Departmental Representative.
  - .3 Payment to include all labour and materials required to replace the 50 mm water main, as necessary to allow for the installation of the new infrastructure, and shall include the removal of existing pipe material where alignment matches the proposed pipe alignment, installation of mechanical restraints, installation of polystyrene insulation where required.
- .27 Unit Price Item 26 - Section 33 11 16 – 19 mm Water Main Replacement
- .1 Unit of Measurement: lineal metres (m).
  - .2 Method of Measurement: Measurement to be lineal meters along the centerline of the removed and replaced pipe, and as accepted by the Departmental Representative.
  - .3 Payment to include all labour and materials required to replace the 19 mm water main, as necessary to allow for the installation of the new infrastructure, and shall include the removal of existing pipe material where alignment matches the proposed pipe alignment, installation of mechanical restraints, installation of polystyrene insulation where required.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**Part 1            General**

**1.1                ADMINISTRATIVE**

- .1    Contract Administrator will schedule and administer project meetings throughout the progress of the work.
- .2    Contract Administrator will prepare agenda for meetings.
- .3    Contract Administrator will distribute written notice of each meeting four days in advance of meeting date.
- .4    Contractor will provide physical space and make arrangements for meetings.
- .5    Contract Administrator will preside at meetings.
- .6    Records of the meeting minutes will be distributed in draft form within 4 days of the meeting, by the Contract Administrator, for review. The Contractor will provide any comments on the draft minutes in a timely manner.
- .7    Reproduce and distribute copies of minutes and transmit to meeting participants, affected parties not in attendance and the Departmental Representative.
- .8    Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

**1.2                PRECONSTRUCTION MEETING**

- .1    Within 15 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.
- .2    Senior representatives of Departmental Representative, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.
- .3    Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.
- .4    Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.
- .5    Agenda to include:
  - .1    Appointment of official representative of participants in the Work.
  - .2    Schedule of submission of shop drawings, samples, colour chips. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
  - .3    Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 - Construction Facilities.
  - .4    Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
  - .5    Owner provided products.
  - .6    Record drawings in accordance with Section 01 33 00 - Submittal Procedures.
  - .7    Maintenance manuals in accordance with Section 01 78 00 - Closeout Submittals.
  - .8    Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 - Closeout Submittals.

- .9 Monthly progress claims, administrative procedures, photographs, hold backs.
- .10 Appointment of inspection and testing agencies or firms.
- .11 Insurances, transcript of policies.

**1.3 PROGRESS MEETINGS**

- .1 During course of Work and two weeks prior to project completion, schedule progress meetings bi-weekly.
- .2 Contractor, major Subcontractors involved in Work, Contract Administrator and Departmental Representative are to be in attendance.
- .3 Notify parties minimum 7 days prior to meetings.
- .4 Records of the meeting minutes will be distributed in draft form within 4 days of the meeting, by the Contract Administrator, for review. The Contractor will provide any comments on the draft minutes in a timely manner.
- .5 Agenda to include the following:
  - .1 Review, approval of minutes of previous meeting.
  - .2 Review of Work progress since previous meeting.
  - .3 Field observations, problems, conflicts.
  - .4 Problems which impede construction schedule.
  - .5 Review of off-site fabrication delivery schedules.
  - .6 Corrective measures and procedures to regain projected schedule.
  - .7 Revision to construction schedule.
  - .8 Progress schedule, during succeeding work period.
  - .9 Review submittal schedules: expedite as required.
  - .10 Maintenance of quality standards.
  - .11 Review proposed changes for effect on construction schedule and on completion date.
  - .12 Other business.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

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**Part 1            General**

**1.1                DEFINITIONS**

- .1     Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.
- .2     Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.
- .3     Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.
- .4     Construction Work Week: Monday to Friday, inclusive, will provide five day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.
- .5     Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Usually expressed as workdays or work weeks.
- .6     Master Plan: summary-level schedule that identifies major activities and key milestones.
- .7     Milestone: significant event in project, usually completion of major deliverable.
- .8     Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.
  - .1     The Project Schedule shall include a breakdown of activities and planned dates for the culvert replacement work at Fishing Cove River.
- .9     Project Planning, Monitoring and Control System: overall system operated by Departmental Representative to enable monitoring of project work in relation to established milestones.

**1.2                REQUIREMENTS**

- .1     Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.
- .2     Plan to complete Work in accordance with prescribed milestones and time frame.
- .3     Limit activity durations to maximum of approximately 10 working days, to allow for progress reporting.
- .4     Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.

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**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit to Departmental Representative within 5 working days of Award of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.
- .3 Submit Project Schedule to Departmental Representative within 5 working days of receipt of acceptance of Master Plan.

**1.4 MASTER PLAN**

- .1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).
- .2 Departmental Representative will review and return revised schedules within 5 working days.
- .3 Revise impractical schedule and resubmit within 5 working days.
- .4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

**1.5 PROJECT SCHEDULE**

- .1 Develop detailed Project Schedule derived from Master Plan.

**1.6 PROJECT SCHEDULE REPORTING**

- .1 Update Project Schedule on weekly basis reflecting activity changes and completions, as well as activities in progress.
- .2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

**1.7 PROJECT MEETINGS**

- .1 Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.
- .2 Weather related delays with their remedial measures will be discussed and negotiated.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not used.

**Part 3            Execution**

**3.1                NOT USED**

.1            Not used.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1        Section 01 35 29.06 – Health and Safety Requirements.
- .2        Section 01 35 43 – Environmental Procedures.
- .3        Section 32 32 13.13 – Package Sewage Lift Station, Wet Well Type
- .4        Section 33 05 16 – Manholes and Valve Chambers
- .5        Section 33 34 00 – Sanitary Utility Sewerage Force Mains.

**1.2                ADMINISTRATIVE**

- .1        Submit to the Departmental Representative submittals listed for review in each specification section. 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 Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
- .6        Notify the Departmental 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 Departmental Representative's review of submittals.
- .9        Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by the Departmental Representative's review.
- .10      Keep one reviewed copy of each submission on site.

### 1.3 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 shop drawings bearing stamp and signature of qualified professional engineer registered or licensed in the Province of Prince Edward Island.
- .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 10 days for the Departmental Representative's review of each submission.
- .5 Adjustments made on shop drawings by the Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to the Departmental Representative prior to proceeding with Work.
- .6 Make changes in shop drawings as the Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify the Departmental Representative in writing of revisions other than those requested.
- .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 Setting or erection details.
  - .4 Capacities.
  - .5 Performance characteristics.
  - .6 Standards.
  - .7 Operating weight.
  - .8 Wiring diagrams.
  - .9 Single line and schematic diagrams.
  - .10 Relationship to adjacent work.
- .9 After the Departmental Representative's review, distribute copies.
  - .10 Submit a digital copy in PDF format of shop drawings for each requirement requested in specification sections and as the Departmental Representative may reasonably request.
  - .11 Submit a digital copy in PDF format of product data sheets or brochures for requirements requested in specification sections and as requested by the Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.
  - .12 Submit a digital copy in PDF format of test reports for requirements requested in specification sections and as requested by the Departmental Representative:
    - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
    - .2 Testing must have been within 3 years of date of contract award for project.
  - .13 Submit a digital copy in PDF format of certificates for requirements requested in specification sections and as requested by the Departmental Representative:
    - .1 Statements printed on Manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
    - .2 Certificates must be dated after award of project contract complete with project name.
  - .14 Submit a digital copy in PDF format of Manufacturer's instructions for requirements requested in specification sections and as requested by the Departmental Representative:
    - .1 Statements printed on Manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
    - .2 Certificates must be dated after award of project contract complete with project name.
  - .15 Submit a digital copy in PDF format of manufacturer's instructions for requirements requested in specification sections and as requested by Departmental Representative:

- .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
- .16 Submit a digital copy in PDF format of Manufacturer's Field Reports for requirements requested in specification sections and as requested by Departmental Representative:
  - .1 Documentation of the testing and verification of actions taken by manufacturer's representative to confirm compliance with Manufacturer's standards or instructions.
- .17 Submit a digital copy in PDF format of Operation and Maintenance Plan for requirements requested in specification sections and as requested by Departmental Representative.
  - .1 Contractor to submit Operations and Maintenance Plan in digital (pdf and editable text document formats) and hard copy to Departmental Representative.
- .18 Submit a digital copy in PDF format of Sewage Flows Management Plan for requirements to manage sewage levels in the existing lift station wet well and within the existing forcemain pipe, and as requested by Departmental Representative.
- .19 Supplement standard information to provide details applicable to project.
- .20 If upon review by the Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, the digital copy 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.
- .21 The review of shop drawings by Parks Canada is for sole purpose of ascertaining conformance with general concept:
  - .1 This review shall not mean that Parks Canada approve detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
  - .2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

#### **1.4 SAMPLES**

- .1 Submit for review samples in duplicate as requested in respective specification sections. Label samples with origin and intended use.
- .2 Deliver samples prepaid to the Departmental Representative's business address.
- .3 Notify the Departmental Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.

- .4 Where colour, pattern or texture is criterion, submit full range of samples.
- .5 Adjustments made on samples by the Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to the Departmental Representative prior to proceeding with Work.
- .6 Make changes in samples which the Departmental 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.

**1.5 CERTIFICATES AND TRANSCRIPTS**

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

**1.6 MEASUREMENT PROCEDURES**

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

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**Part 1      General**

**1.1      MEASUREMENT FOR PAYMENT**

- .1      See Section 01 29 00 - Payment Procedures
- .2      Payment for traffic control persons and traffic accommodation person(s) shall be considered incidental to the work, and will not be measured separately for payment.
- .3      Provision, installation, and maintenance of temporary traffic control devices, including detour signs, are considered incidental to the work, and will not be measured for payment.
- .4      Provision and maintenance of detours are considered incidental to work and will not be measured for payment.
- .5      No payment to be made for vehicles, equipment, supplies, and additional manpower required by traffic accommodations persons.

**1.2      REFERENCES**

- .1      Prince Edward Island Department of Transportation Infrastructure and Energy:
  - .1      Prince Edward Island – Temporary Workplace Traffic Control Manual (2016)
- .2      Manual of Uniform Traffic Control Devices for Canada (MUTCD-C) – (Latest Edition).

**1.3      DESCRIPTION**

- .1      This section specifies requirements and procedures for traffic regulation to ensure protection of work and safety of public to satisfaction of Departmental Representative.

**1.4      TRAFFIC CONTROL PERSONS TO BE INSTRUCTED**

- .1      Contractor shall ensure that only employees who are in possession of "Traffic Control Personnel Certificate" as per the Prince Edward Island – Temporary Workplace Traffic Control Manual (2016).

**Part 2      Products**

**2.1      TRAFFIC CONTROL DEVICES**

- .1      Barricades, signs, delineators, warning lights, traffic control person's paddles and other devices shall be in strict accordance with the Prince Edward Island – Temporary Workplace Traffic Control Manual (2016).
- .2      Signs, barricades, delineators and traffic control persons paddles shall be as new and reflectorized to show same shape and colour by night as by day.
- .3      Signs to be bilingual and symbolic.

- .4 All detour, lane restriction, traffic control and speed restriction signs required at an individual frost heave repair site must be in place before any road excavation at that site commences.

### **Part 3      Execution**

#### **3.1      GENERAL**

- .1 Conduct operations as to create a minimum of inconvenience to traffic and pedestrians.
- .2 Provide and maintain access to and from properties adjacent to work area.
- .3 Provide traffic control through use of either an approved traffic signal system or traffic control persons.
- .4 At least one week prior to commencing work; submit to Departmental Representative a traffic control signing plan. This layout shall indicate the quantity, spacing and detail of signs, to be used during construction for each work area site (including adjustments for various stages of work). Work shall not commence until Departmental Representative has approved layout.
- .5 Accommodating Traffic and hours of work:
  - .1 The Contractor may restrict traffic flow through the work site with approval from the Departmental Representative.
- .6 Take into account the effect of steep grades and curved alignment present in the work area when planning and executing traffic control measures.

#### **3.2      PROTECTION OF PUBLIC TRAFFIC**

- .1 Comply with requirements of Acts, Regulations and By-Laws in force for regulation of traffic or use of roadways upon or over which it is necessary to carry out Work or haul materials or equipment.
- .2 When working on travelled way:
  - .1 Place equipment in position to minimize interference and hazard to travelling public.
  - .2 Keep equipment units as close together as working conditions permit and preferably on same side of travelled way.
  - .3 Do not leave equipment on travelled way overnight.
- .3 Contractor to ensure that the travelled lanes are adequately covered with a minimum Aggregate Base (Class A) as specified in Section 01 11 00, subsection 1.4.1.1.
- .4 Close trails only after receipt of written approval from Departmental Representative.
- .5 Keep travelled way graded, free from pot holes and of sufficient width for required number of lanes of traffic.

**3.3            TRAFFIC INTERRUPTIONS**

- .1      Period and timing of any traffic interruptions greater than 10 minutes must have prior approval of the Departmental Representative.

**3.4            DETOURS**

- .1      Construct and maintain detour roads and trails as may be required, to the approval of the Departmental Representative.
- .2      Provide advanced warning of bike trail closures and detour routes.

**3.5            SIGNS AND BARRICADES**

- .1      Provide, erect and maintain necessary barricades, suitable and sufficient flashing warning lights, danger signals and other signs.
- .2      Placement and erection of signs, barricades, delineators and warning lights and other devices to be in strict accordance with the prince Edward Island – Temporary Workplace Traffic Control Manual (2016).
- .3      Remove or cover signs which do not apply to existing conditions.
- .4      Check devices daily for damage, legibility and correct positioning. Repair, replace or reposition as required or as directed by Departmental Representative.
- .5      For Work on existing bike trails, the Contractor shall install barricades and signage to indicate that the trail is closed to public access.

**END OF SECTION**

**Part 1            General**

**1.1                REFERENCES**

- .1        Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.
- .2        Province of Prince Edward Island:
  - .1        Occupational Health and Safety Act

**1.2                DEFINITIONS**

- .1        COSH: Canada Occupational Health and Safety Regulations made under Part II of the Canada Labour Code.
- .2        Competent Person means a person to who is:
  - .1        Qualified by virtue of personal knowledge, training and experience to perform assigned work in a manner that will ensure the health and safety of persons in the workplace.
  - .2        Knowledgeable about the provisions of occupational health and safety statutes and regulations that apply to the Work.
  - .3        Knowledgeable about potential or actual danger to health or safety associated with the Work.
- .3        Medical Aid Injury: any minor injury for which medical treatment was provided and the cost of which is covered by Workers' Compensation Board of the province in which the injury was incurred.
- .4        PPE: personal protective equipment.
- .5        Work Site: where used in this section shall mean areas, located at the premises where Work is undertaken, used by Contractor to perform all of the activities associated with the performance of the Work.

**1.3                SUBMITTALS**

- .1        Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2        Contractor to submit a completed Parks Canada OHE Form for the project. OHE Form is located in **Appendix D**.
- .3        Submit site-specific Health and Safety Plan prior to commencement of Work:
  - .1        Submit within ten (10) work days of notification of Bid Acceptance. Provide three (3) hard copies and one (1) electronic PDF file.
  - .2        Departmental Representative will review Health and Safety Plan and provide comments.

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

#### **1.4 COMPLIANCE REQUIREMENTS**

- .1 Comply with the Occupational Health and Safety Act for the Province of Prince Edward Island, and the Regulations made pursuant to the Act.
- .2 Comply with Canada Labour Code Part II, and the Canada Occupational Safety and Health Regulations made under Part II of the Canada Labour Code.
- .3 Observe and enforce construction safety measures required by:
  - .1 1995 National Building Code of Canada, Part 8.
  - .2 Provincial Worker's Compensation Board.
  - .3 Municipal statutes and ordinances.
  - .4 Comply with Occupational R.S.Q., c. S-2.1, an Act respecting Health and Safety Code for the Construction Industry.
- .4 In event of conflict between any provisions of above authorities the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, Departmental Representative will advise on the course of action to be followed.

- .5 A copy of the Canada Labour Code Part II may be obtained by contacting:  
  
Canadian Government Publishing  
Public Works & Government Services Canada  
Ottawa, Ontario K1A 0S9  
Tel: (819) 956-5800 (1-800-635-7943)  
Publication No. L31-85/2000 E or F
- .6 Observe construction safety measures of:
  - .1 Part 8 of National Building Code.
  - .2 Municipal by-laws and ordinances.
- .7 In case of conflict or discrepancy between above specified requirements, the more stringent shall apply.
- .8 Maintain Workers Compensation Coverage in good standing for duration of Contract. Provide proof of clearance through submission of Letter in Good Standing.
- .9 Medical Surveillance: Where prescribed by legislation or regulation, obtain and maintain worker medical surveillance documentation.

## **1.5 SITE CONTROL AND ACCESS**

- .1 Control the Work and entry points to Work Site. Approve and grant access only to workers and authorized persons. Immediately stop and remove non-authorized persons:
  - .1 Departmental Representative will provide names of those persons authorized by Departmental Representative to enter onto Work Site and will ensure that such authorized persons have the required knowledge and training on Health and Safety pertinent to their reason for being at the site, however, Contractor remains responsible for the health and safety of authorized persons while at the Work Site.
- .2 Isolate Work Site from other areas of the premises by use of appropriate means:
  - .1 Erect fences, hoarding, barricades and temporary lighting as required to effectively delineate the Work Site, stop non-authorized entry, and to protect pedestrians and vehicular traffic around and adjacent to the Work and create a safe environment. See Section 01 56 00 for minimum acceptable requirements.
  - .2 Post signage at entry points and other strategic locations indicating restricted access and conditions for access.
  - .3 Use professionally made signs with bilingual message in the two (2) official languages or international known graphic symbols.
- .3 Provide safety orientation session to persons granted access to Work Site. Advise of hazards and safety rules to be observed while on site.

- .4 Ensure persons granted site access wear appropriate PPE. Supply PPE to inspection authorities who require access to conduct tests or perform inspections.
- .5 Secure Work Site against entry when inactive or unoccupied and to protect persons against harm.

## **1.6 PROTECTION**

- .1 Give precedence to safety and health of persons and protection of environment over cost and schedule considerations for Work.
- .2 Should unforeseen or peculiar safety related hazard or condition become evident during performance of Work, immediately take measures to rectify situation and prevent damage or harm. Advise Departmental Representative verbally and in writing.

## **1.7 RESPONSIBILITY**

- .1 Be responsible for safety of persons and property on work site and for protection of building employees and general public circulating adjacent to work operations to extent that they may be affected by conduct of work.
- .2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

## **1.8 FILING OF NOTICE**

- .1 File Notice of Project and other Notices with Provincial authorities prior to commencement of Work.
- .2 Upon request, Departmental Representative will provide name and mailing address of provincial department to whom the Notice of Project must be sent.
- .3 Contractor shall agree to install proper site separation and identification in order to maintain time and space at all times throughout life of project.

## **1.9 PERMITS**

- .1 Obtain permits, licenses and compliance certificates, at appropriate times and frequency as stipulated by authorities having jurisdiction.
- .2 Contractor to obtain Park Permit from the Parks Canada – Prince Edward Island Field Unit for each vehicle that will require access to the Park.
- .3 Where particular permit or compliance certificate cannot be obtained at the required stage of work, notify Departmental Representative in writing and obtain Departmental Representative's approval to proceed prior to carrying out that portion of work.

- .4 Post all permits on site. Submit copies to Departmental Representative.

#### **1.10 SAFETY ASSESSMENTS**

- .1 Implement and carry out a health and safety hazard assessment program as part of the work. Program to include:
  - .1 Initial hazard assessment carried out immediately upon notification of contract award and prior to commencement of work.
  - .2 On-going hazard assessments performed during the progress of work identifying new or potential health risks and safety hazards not previously known. As a minimum hazard assessments shall be carried out when:
    - .1 New subtrade work, new subcontractor(s) or new workers arrive at the site to commence another portion of the work.
    - .2 The scope of work has been changed by Change Order.
    - .3 Potential hazard or weakness in current health and safety practices are identified by Departmental Representative or by an authorized safety representative.
  - .3 Hazard assessments to be project and site specific, based on review of contract documents, site and weather conditions.
  - .4 Each hazard assessment to be made in writing. Keep copies of all assessments on site for duration of work. Upon request, make available to Departmental Representative for inspection.

#### **1.11 PROJECT/SITE CONDITIONS**

- .1 The following are known or potential project related safety hazards at site:
  - .1 Work around traffic and pedestrians.
  - .2 Work by water body.
  - .3 Other construction contractors work on site.
- .2 Obtain from Departmental Representative, copy of MSDS Data sheets of existing hazardous materials stored on site or being used by Facility and Tenant personnel in the course of their operations.
- .3 Above lists shall not be construed as being complete and inclusive of safety and health hazards encountered as a result of Contractor's operations during the course of work. Include above items into the hazard assessment program specified herein.

**1.12 SAFETY MEETINGS**

- .1 Prior to commencement of work attend health and safety meeting conducted by Departmental Representative. Have Contractor's Site Superintendent in attendance. Departmental Representative will advise of time and location.
- .2 Provide site safety orientation session to all workers and other authorized persons prior to granting them access to work site. Brief persons on site conditions and on the minimum site safety rules in force at site.
- .3 Conduct site specific occupational health and safety meetings during the entire work as follows:
  - .1 Formal meetings on a minimum monthly basis.
  - .2 Informal tool box meetings on a regular basis from a predetermined schedule.
- .4 Keep workers informed of anticipated hazards, on safety practices and procedures to be followed and of other pertinent safety information related to:
  - .1 Progress of Work.
  - .2 New sub-trades arriving on site.
  - .3 Changes in site and project conditions.
- .5 Record and post minutes of meetings. Make copies available to Departmental Representative upon request.

**1.13 HEALTH AND SAFETY PLAN**

- .1 Develop written site-specific Project Health and Safety Plan, based on hazard assessments, prior to commencement of work. Submit plan to Departmental Representative within 7 calendar days of Contract Award date.
- .2 Health and Safety Plan shall contain the following three (3) parts:
  - .1 Part 1: List of individual health risks and safety hazards identified by hazard assessments.
  - .2 Part 2: List of specific measures to control or mitigate each hazard and risk identified in part one of Plan. Describe the engineering controls, personnel protective equipment and safe work practises to be implemented and followed when performing work related to each identified hazard or risk.
  - .3 Part 3: Emergency Measures and Communications Procedures as follows:
    - .1 Emergency Measures: on-site operating procedures, evacuation measures and emergency response to be implemented in the occurrence of an incident. Procedures to be specific and relevant to identified hazards. Measures to complement and be integrated with the facility and tenants Emergency Response Plans in place at site:
      - .1 Obtain information on existing emergency and evacuation plans from Departmental Representative and incorporate appropriate data.

- .2 Communication Procedures:
  - .1 List of names and telephone numbers of designated officials, to be contacted should an incident or emergency situation occur, including the following:
    - .1 General Contractor and all Subcontractors.
    - .2 Federal and Provincial Departments and local emergency resources organizations, as resources organizations, as applicable laws and regulations.
    - .3 Officials from Parks Canada. Departmental Representative will provide list of names to be included.
  - .2 Procedures implemented at site to communicate and share information between workers, subcontractors, and General Contractor on work activities.
  - .3 Prepare Health and Safety Plan in a three column format, addressing the three parts specified above, as follows:

<u>Column 1</u>	<u>Column 2</u>	<u>Column 3</u>
Identified	Control	Emergency Measures & Communications
Hazard	Measures	Implemented Procedures

- .4 Develop Health and Safety Plan in collaboration with all subcontractors. Address all work and activities of subcontractors as they arrive on site. Immediately update Plan and submit to Departmental Representative.
- .5 Implement, maintain and enforce compliance with requirements of the Health and Safety Plan until final completion of work and demobilization from site.
- .6 As work progresses, review and update Plan addressing additional health risks and safety hazards identified by on-going hazard assessments.
- .7 Submit revised versions of Plan to Departmental Representative.
- .8 Post a typed written copy, including all updates, of the Health and Safety Plan in a common visible location at work site.
- .9 Submission of the Health and Safety Plan, and updates, to the Departmental Representative is for review and information purposes only. It's submission shall not be construed to imply approval by Departmental Representative, be interpreted as a warranty of being

complete, accurate and legislative compliant and shall not relieve Contractor of his legal obligations for the provision Health and Safety on the construction project.

#### **1.14 SAFETY SUPERVISION AND INSPECTIONS**

- .1 Employ Health & Safety Site Representative responsible for daily supervision of health and safety of the Work.
- .2 Health & Safety Site Representative may be the Superintendent of the Work or other person designated by Contractor and will be assigned the responsibility and authority to:
  - .1 Implement, monitor and enforce daily compliance with health and safety requirements of the Work.
  - .2 Monitor and enforce Contractor's site-specific Health and Safety Plan.
  - .3 Conduct site safety orientation session to persons granted access to Work Site.
  - .4 Ensure that persons allowed site access are knowledgeable and trained in health and safety pertinent to their activities at the site or are escorted by a competent person while on the Work Site.
  - .5 Stop the Work as deemed necessary for reasons of health and safety.
- .3 Health & Safety Site Representative must:
  - .1 Be qualified and competent person in occupational health and safety.
  - .2 Have site-related working experience specific to activities of the Work.
  - .3 Be on Work Site at all times during execution of the Work.
- .4 All supervisory personnel assigned to the Work must also be competent persons.
- .5 Inspections:
  - .1 Conduct regularly scheduled safety inspections of the Work on a minimum weekly basis. Record deficiencies and remedial action taken.
  - .2 Conduct Formal Inspections on a minimum monthly basis. Use standardized safety inspection forms. Distribute to subcontractors.
  - .3 Follow-up and ensure corrective measures are taken.
- .6 Cooperate with Facility's Occupational Health and Safety representative should one be designated by Departmental Representative.
- .7 Keep inspection reports and supervision related documentation on site.

#### **1.15 TRAINING**

- .1 Use only skilled workers on Work Site who are effectively trained in occupational health and safety procedures and practices pertinent to their assigned task.
- .2 Maintain employee records and evidence of training received. Make data available to Departmental Representative upon request.

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

#### **1.16 MINIMUM SITE SAFETY RULES**

- .1 Notwithstanding the requirement to abide by federal and provincial health and safety regulations, the following safety rules shall be considered minimum requirements at the work site and obeyed by all persons granted access:
  - .1 Wear personnel protective equipment (PPE) appropriate to function and task on site; the minimum requirements being hard hat, safety footwear (and eye protection where appropriate).
  - .2 Immediately report unsafe activities, conditions, near-miss accidents, injuries and damages.
  - .3 Maintain site in tidy condition.
  - .4 Obey warning signs and safety tags.
- .2 Brief workers on site safety rules, and on the disciplinary measures to be taken for violation or non compliance of such rules. Post such information on site.

#### **1.17 CORRECTION OF NON-COMPLIANCE**

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.
- .2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Departmental Representative will stop Work if non-compliance of health and safety regulations is not corrected in a timely manner.

#### **1.18 INCIDENT REPORTING**

- .1 Investigate and report incidents and accidents as outlined in Provincial Occupational Safety and Health Act and Regulations.
- .2 Investigate and immediately report to Departmental Representative incidents and accidents which results, or has the potential of resulting in:
  - .1 Injuries requiring medical aid.
  - .2 Property damage in excess of \$10,000.00.
  - .3 Required notification to Workers Compensation Board or other regulatory agencies as stipulated by applicable regulations.
  - .4 Interruptions to Facility operations resulting in an operational lost to a Federal department in excess of \$5000.00.

- .3 Medical aid in above clause shall have the same meaning as the term "medical aid injury" as defined in the Canadian Dictionary of Safety Terms - 1987 issue, from the Canadian Society of Safety Engineers (C.S.S.E) as follows:

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

- .4 Submit report in writing.

### **1.19 TOOLS AND EQUIPMENT SAFETY**

- .1 Implement and follow a scheduled tool and equipment inspection / maintenance program at work site. Regularly check tools, equipment and machinery for safe operation and perform maintenance at pre-established time and frequency intervals as recommended by manufacturer. Include subcontractors' equipment as part of the inspection process.
- .2 Use standardized checklists to ensure established safety checks are stringently followed.
- .3 Immediately tag and remove items found faulty or defective off site.
- .4 Maintain written documentation on each inspection. Make available to Departmental Representative upon request.

### **1.20 HAZARDOUS PRODUCTS**

- .1 Comply with requirements of Workplace Hazardous Materials Information Systems (WHMIS).
- .2 Keep MSDS data sheets on site. Provide copies of all data sheets to Departmental Representative upon receipt of materials on site.
- .3 Post all MSDS data sheets on site, in a common area, visible to workers.
- .4 On building renovation projects where work is adjacent to occupied areas, locate data sheets in a public location accessible to tenant employees.

### **1.21 BLASTING**

- .1 Blasting or other use of explosives is not permitted without prior written instructions from Departmental Representative.
- .2 Do blasting operations in accordance with Section 31 23 16.26 - Rock Removal.

### **1.22 POWDER ACTUATED DEVICES**

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

**1.23 POSTING OF DOCUMENTS**

- .1 Post documents indicated herein and as required by Authority having jurisdiction.
- .2 Post other documents as specified herein, including:
  - .1 Site specific Health and Safety Plan.
  - .2 WHMIS data sheets.

**1.24 RECORDS ON SITE**

- .1 Maintain on site copy of safety documentation as specified in this section and other safety related reports and documents issued to or received from authorities having jurisdiction.
- .2 Make available to Departmental Representative, or authorized safety representative, for inspection upon request.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1            Section 31 25 05 – Erosion and Sedimentation Control.

**1.2                MEASUREMENT FOR PAYMENT**

- .1            See Section 01 29 00 - Payment Procedures

**1.3                REFERENCES**

- .1            Definitions:
  - .1            Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humans; or degrade environment aesthetically, culturally and/or historically.
  - .2            Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction.
- .2            Reference Standards:
  - .1            Parks Canada National Best Management Practices – Roadway, Highway, Parkway and Related Infrastructure (May 2015), and the Basic Impact Analysis Document. (**Appendix A**)
  - .2            U.S. Environmental Protection Agency (EPA)/Office of Water.
    - .1            EPA 832/R-92-005-92, Storm Water Management for Construction Activities, Chapter 3.
    - .2            EPA General Construction Permit (GCP) 2012.

**1.4                ACTION AND INFORMATIONAL SUBMITTALS**

- .1            Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2            Before commencing construction activities or delivery of materials to site, submit Environmental Protection Plan as per **Appendix A** and as per this section for review and approval by the Departmental Representative.
- .3            Ensure Environmental Protection Plan must include comprehensive overview of known or potential environmental issues to be addressed during construction.
- .4            Address topics at level of detail commensurate with environmental issue and required construction tasks.

- .5 Include in Environmental Protection Plan:
  - .1 Name of person responsible for ensuring adherence to Environmental Protection Plan.
  - .2 Name and qualifications of person responsible for manifesting hazardous waste to be removed from site.
  - .3 Name and qualifications of person responsible for training site personnel.
  - .4 Descriptions of environmental protection personnel training program.
  - .5 Environmental protection plan identifying type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations and EPA 832/R-92-005, Chapter 3 requirements.
  - .6 Drawings indicating locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.
  - .7 Traffic Control Plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather.
    - .1 Plans to include measures to minimize amount of mud transported onto paved public roads by vehicles or runoff.
  - .8 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use.
    - .1 Plans to include measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.
  - .9 Spill Control Plan including procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance including sewage material released during removal of existing force main.
  - .10 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
  - .11 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project site.
  - .12 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.
  - .13 Waste Water Management Plan identifying methods and procedures for management discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, and dewatering of ground water.
  - .14 Historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands.

**1.5 FIRES**

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

**1.6 DRAINAGE**

- .1 Develop and submit Environmental Protection Plan (EPP) identifying type and location of erosion and sediment controls provided. Plan to include monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations, EPA 832/R-92-005, Chapter 3 and US EPA General Construction Permit.
- .2 Storm Water Pollution Prevention Plan (SWPPP) to be substituted for erosion and sediment control plan.
- .3 Provide temporary drainage and pumping required to keep excavations and site free from water.
- .4 Pumped water shall be directed onto grassed or treed areas. Pump water shall not be directed into waterways, or drainage systems. Sediment control devices shall be used to minimize transport of suspended materials.
- .5 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

**1.7 SITE CLEARING AND PLANT PROTECTION**

- .1 Protect trees and plants on site and adjacent properties as indicated.
- .2 Protect trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2 m minimum.
- .3 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.
- .4 Minimize stripping of topsoil and vegetation.
- .5 Restrict tree removal to areas indicated or designated by the Departmental Representative. Trees or vegetation outside of designated excavation areas are not to be impacted or damaged.
- .6 Dispose of all harvested trees off-site or as directed by the Departmental Representative.

**1.8 WORK ADJACENT TO WATERWAYS**

- .1 No work is to take place directly adjacent to, or in any waterways or water bodies within the Park.

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**1.9 POLLUTION CONTROL**

- .1 Maintain temporary erosion and pollution control features installed under this Contract.
- .2 Control emissions from equipment and plant in accordance with local authorities' emission requirements.
- .3 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area:
  - .1 Provide temporary enclosures where directed by the Departmental Representative.
- .4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris.

**1.10 PARK REQUIREMENTS**

- .1 Work under this contract is to be carried out in a National Park, and environmental protection must be given a high priority by all staff involved with the work.
- .2 An Environmental Briefing will be held prior to work commencing at the site, which will outline environmental factors to be considered during the work. It is mandatory that all current staff of the Contractor attend this meeting with the Departmental Representative and Environmental Protection Officer (EPO).
- .3 Mitigation requirements are outlined in the Basic Impact Analysis Document appended to the Specifications. This document is not all-inclusive, and site adjustment of the mitigation methods for the work may be required. The Departmental Representative will advise the Contractor of any additional requirements as they arise.
- .4 Access to the work site(s) shall always be granted to the Environmental Protection officer with Parks Canada Agency.

**1.11 SITE SET-UP AND USE**

- .1 Confine all site activities related to construction within the defined project boundaries. Confine construction activities to as small an area as necessary to safely complete the project.
- .2 Garbage must be collected and removed daily from the work site. Garbage, other than construction waste, shall be put into animal proof containers to prevent animals becoming habituated to human refuse. Construction containers must be covered to prevent plastics and light waste materials from being blown out due to heavy winds.
- .3 Littering is prohibited.
- .4 Temporary storage, parking areas, and turn around facilities for Contractor-related equipment and vehicles will be limited to those areas agreed to and designated by the Departmental Representative.

**1.12 ENVIRONMENTAL PROTECTION PLAN**

- .1 Submit a plan showing all pollution control measures that will be used to fulfill the requirements of the Environmental Protection Section and Basic Impact Analysis attached to this document. This plan will be reviewed by the Departmental Representative and the Environmental Protection Officer prior to commencement of any work. Any deviation from this plan will require further approval by the Departmental Representative. Submit the protection plan prior to the pre-construction meeting.
- .2 The Environmental Plan will outline how the Contractor will address the environmental protection requirements, including removal and installation of culverts, and ensure pollution created by the construction is controlled. It must show sufficient detail on products to be used and physical placement on site to determine effectiveness of these items.

**1.13 ENVIRONMENTAL PERFORMANCE**

- .1 Comply with all mitigative measures as identified in the Environmental Impact Assessment for this project..
- .2 Confirm all necessary permits related to Environmental Protection have been obtained and that necessary documentation is available on-site.

**1.14 EROSION CONTROL**

- .1 Construct sediment fences and erosion control structures in roadside ditches or at culvert inlets prior to any excavation as directed by Departmental Representative.
- .2 To minimize run-off, curtain work on slopes which may affect water body during periods of heavy rainfall, as directed by the Departmental Representative.
- .3 Avoid trenching or excavation work prior to or during heavy precipitation events to reduce/avoid erosion and siltation.

**1.15 ENVIRONMENTAL INCIDENT OR EMERGENCY**

- .1 In the event of an environmental incident or emergency such as:
  - .1 Chemical spill or petroleum spill.
  - .2 Poisonous or caustic gas emission.
  - .3 Hazardous material spill.
  - .4 Sewage spill.
  - .5 Contaminated water into waterways.

- .2 The Contractor or his employees must:
  - .1 Notify the Contractor's job superintendent.
  - .2 Call the local emergency services and give type of emergency.
  - .3 Contact Jasper Dispatch at 1-877-852-3100, who will contact PEINP environmental representatives.
  - .4 Submit to Departmental Representative a copy of its Environmental/Spill Response Plan for approval.
  - .5 Submit a report of the incident, clean up and cause of the incident.

**1.16 NOTIFICATION**

- .1 The Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.
- .2 Contractor: after receipt of such notice, inform the Departmental Representative of proposed corrective action and take such action for approval by the Departmental Representative.
  - .1 Take action only after receipt of written approval by the Departmental Representative.
- .3 The Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.
- .4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

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**Part 1            General**

**1.1                REFERENCES AND CODES**

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

**1.2                HAZARDOUS MATERIAL DISCOVERY**

- .1    Asbestos: demolition of spray or trowel-applied asbestos is hazardous to health. Stop work immediately when material resembling spray or trowel-applied asbestos is encountered during demolition work. Notify Departmental Representative.
- .2    PCB: Polychlorinated Biphenyl: stop work immediately when material resembling Polychlorinated Biphenyl is encountered during demolition work. Notify Departmental Representative.
- .3    Mould: stop work immediately when material resembling mould is encountered during demolition work. Notify Departmental Representative.

**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 and Regulations when projects are located within boundaries of National Park.

**Part 2            Products**

**2.1                NOT USED**

- .1    Not Used.

**Part 3            Execution**

**3.1                Suspension of Work**

- .1    The Departmental Representative has the authority to suspend the Work if the Specifications, Health and Safety requirements, or Environmental requirements are not follow or if there is a threat to a natural resource.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1            Section 01 33 00 – Submittal Procedures.

**1.2                INSPECTION**

- .1            Allow the Departmental Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
- .2            Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by the Departmental Representative instructions, or law of Place of Work.
- .3            If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- .4            The Departmental Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction.

**1.3                INDEPENDENT INSPECTION AGENCIES**

- .1            An Inspection/Testing Agency will be engaged by the Departmental Representative for the purpose of inspecting and/or testing portions of Work.
- .2            Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .3            If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by the Departmental Representative at no cost to the Departmental Representative. Pay costs for retesting and re-inspection.

**1.4                ACCESS TO WORK**

- .1            Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.
- .2            Co-operate to provide reasonable facilities for such access.

## **1.5 PROCEDURES**

- .1 Notify appropriate agency and the Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made.
- .2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.
- .3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

## **1.6 REJECTED WORK**

- .1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by the Departmental 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 Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by the Departmental Representative.

## **1.7 REPORTS**

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

## **1.8 TESTS AND MIX DESIGNS**

- .1 Furnish test results and mix designs as requested.
- .2 Cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work will be appraised by the Departmental Representative and may be authorized as recoverable.

## **1.9 MEASUREMENT PROCEDURES**

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

<b>Part 2</b>	<b>Products</b>
<b>2.1</b>	<b>NOT USED</b>
.1	Not Used.
<b>2.2</b>	<b>Execution</b>
<b>2.3</b>	<b>NOT USED</b>
.1	Not Used.

**END OF SECTION**

**Part 1            General**

**1.1                ACCESS**

- .1    Provide and maintain adequate access to project site. The proposed access route must be submitted to the Departmental Representative prior to construction for approval. Any changes to the approved access route by the Contractor must be approved by the Departmental Representative.
- .2    The Contractor must maintain access to the site, including snow plowing if required. Existing features must be marked and protected during plowing activities.
- .3    The Contractor will be required to submit a list of all vehicles requiring access to the Park to the Departmental Representative to obtain necessary permits.
- .4    Build and maintain temporary roads during period of work if required. Parks Canada must approve prior to their use, any proposed temporary roads within the Park.
- .5    Upon completion of contract work, rehabilitate any temporary roads to the satisfaction of the Departmental Representative.
- .6    If authorized to use existing roads or trails for access to project site, maintain such roads and trails for duration of Contract and make good damage resulting from Contractor's use of roads.
- .7    Clean roads and parking areas where used by Contractor's equipment or employees' vehicles.

**1.2                SANITARY FACILITIES**

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

**1.3                PARKING**

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

**1.4                REMOVAL OF TEMPORARY FACILITIES**

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

**1.5 ELECTRICITY AND WATER**

- .1 The Contractor will not have access to water or electrical services within the park and shall plan to provide these services to the work site as required.

**Part 2 Materials**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

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**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1            Section 01 35 29.06 – Health and Safety Requirements

**1.2                REFERENCE STANDARDS**

- .1            Canadian General Standards Board (CGSB)
  - .1            CGSB 1.59-[97], Alkyd Exterior Gloss Enamel.
  - .2            CAN/CGSB 1.189-[00], Exterior Alkyd Primer for Wood.
- .2            Canadian Standards Association (CSA International)
  - .1            CSA-O121-[M1978(R2003)], Douglas Fir Plywood.

**1.3                INSTALLATION AND REMOVAL**

- .1            Provide temporary controls in order to execute Work expeditiously.
- .2            Remove from site all such work after use.

**1.4                HOARDING**

- .1            Temporary enclosures:
  - .1            Allowable areas for storage of equipment and materials are shown on the drawings. Contractor shall be responsible for all material and equipment stored in these areas.
- .2            Temporary snow fencing site enclosures:
  - .1            Erect temporary site enclosure using new 1.2 m high snow fence wired to rolled steel "T" bar fence posts spaced at 2.4 m on centre. Provide one lockable truck gate. Maintain fence in good repair.
- .3            Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

**1.5                ACCESS TO SITE**

- .1            Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.

**1.6                PUBLIC TRAFFIC FLOW**

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

**1.7                FIRE ROUTES**

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

**1.8 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY**

- .1 Protect surrounding private and public property from damage during performance of Work.
- .2 Be responsible for damage incurred.

**1.9 WASTE MANAGEMENT AND DISPOSAL**

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

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

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**Part 1            General**

**1.1                REFERENCES**

- .1        Within text of each specifications section, reference may be made to reference standards. Conform to these reference standards, in whole or in part as specifically requested in specifications.
- .2        If there is question as to whether products or systems are in conformance with applicable standards, Departmental Representative reserves right to have such products or systems tested to prove or disprove conformance.
- .3        Cost for such testing will be born by Departmental Representative in event of conformance with Contract Documents or by Contractor in event of non-conformance.

**1.2                QUALITY**

- .1        Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
- .2        Procurement policy is to acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work.
- .3        Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
- .4        Should disputes arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.
- .5        Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.
- .6        Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

**1.3                STORAGE, HANDLING AND PROTECTION**

- .1        Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- .2        Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.
- .3        Store products subject to damage from weather in weatherproof enclosures.

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

#### **1.4 TRANSPORTATION**

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

#### **1.5 MANUFACTURER'S INSTRUCTIONS**

- .1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.
- .2 Notify Departmental Representative in writing, of conflicts between specifications and manufacturer's instructions, so that Departmental Representative will establish course of action.
- .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Departmental Representative to require removal and re-installation at no increase in Contract Price or Contract Time.

#### **1.6 QUALITY OF WORK**

- .1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Departmental Representative if required Work is such as to make it impractical to produce required results.
- .2 Do not employ anyone unskilled in their required duties. Departmental Representative reserves right to require dismissal from site, workers deemed incompetent or careless.
- .3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Departmental Representative, whose decision is final.

#### **1.7 CO-ORDINATION**

- .1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.
- .2 Be responsible for coordination and placement of openings, sleeves and accessories.

#### **1.8 REMEDIAL WORK**

- .1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Co-ordinate adjacent affected Work as required.
- .2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

**1.9            EXISTING UTILITIES**

- .1        When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, and/or building occupants and pedestrian and vehicular traffic.
- .2        Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

**Part 2        Products**

**2.1        NOT USED**

- .1        Not Used.

**Part 3        Execution**

**3.1        NOT USED**

- .1        Not Used.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1            Section 01 78 00 – Closeout Submittals.

**1.2                REFERENCES**

**1.3                QUALIFICATIONS OF SURVEYOR**

- .1            Qualified registered land surveyor, licensed to practice in Prince Edward Island and acceptable to the Departmental Representative.

**1.4                SURVEY REFERENCE POINTS**

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

**1.5                SURVEY REQUIREMENTS**

- .1            Establish at minimum two permanent benchmarks on site, referenced to the established survey control network. Record locations, with horizontal and vertical data in Project Record Documents.
- .2            Establish lines and levels, locate and layout, by instrumentation.
- .3            Stake for all grading, fill placement, granular materials, and culvert placements.
- .4            Stake slopes and berms.
- .5            Establish pipe invert elevations and location of any exposed pipe not being removed under this contract.

**1.6                EXISTING SERVICES**

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

- .2 The Contractor is responsible for the locates of all existing utilities and the protection of utilities during construction.
- .3 Remove abandoned service lines as directed by the Departmental Representative.

#### **1.7 LOCATION OF EQUIPMENT AND FIXTURES**

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

#### **1.8 RECORDS**

- .1 Maintain a complete, accurate log of control and survey work as it progresses.
- .2 On completion of foundations and major site improvements, prepare a certified survey showing dimensions, locations, angles and elevations of Work.
- .3 Record locations of maintained, re-routed and abandoned service lines.
- .4 Contractor to provide hard copies along with .pdf and .dwg (editable) records.

#### **1.9 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit name and address of Surveyor to the Departmental Representative.
- .2 On request of the Departmental Representative, submit documentation to verify accuracy of field engineering work.
- .3 Submit certificate signed by surveyor certifying and noting those elevations and locations of completed Work that conform and do not conform with Contract Documents.

#### **1.10 SUBSURFACE CONDITIONS**

- .1 Promptly notify the Departmental Representative if subsurface conditions within project area differ materially from those indicated in Contract Documents, or a reasonable assumption of probable conditions based thereon.

- .2 After prompt investigation, should the Departmental Representative determine that conditions do differ materially, instructions will be issued for changes in Work as provided in Changes and Change Orders.

**1.11 MEASUREMENT PROCEDURES**

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

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**Part 1            General**

**1.1                REFERENCES**

- .1        Not used

**1.2                PROJECT CLEANLINESS**

- .1        Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Owner or other Contractors.
- .2        Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site, unless approved by Departmental Representative.
- .3        Clear snow and ice from access to site or facilities of the work, bank/pile snow in designated areas only.
- .4        Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5        Provide suitable on-site containers for collection of waste materials and debris.
- .6        Provide and use marked separate bins for recycling.
- .7        Dispose of waste materials and debris outside the limits of the National Park at a location/facility approved by the Authority having jurisdiction.
- .8        Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .9        Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

**1.3                FINAL CLEANING**

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

- .8 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
- .9 Remove dirt and other disfiguration from exterior surfaces.

**1.4 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate waste materials for reuse and recycling.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**Part 1 General**

**1.1 WASTE MANAGEMENT GOALS**

- .1 Prior to start of Work conduct meeting with Departmental Representative to review and discuss PCA's waste management goal and Contractor's proposed Waste Reduction Workplan for Construction, Renovation and /or Demolition (CRD) waste to be project generated.
- .2 PCA's waste management goal: to divert recyclable and reusable Project Waste from landfill sites. Prior to project completion provide Departmental Representative documentation certifying that waste management, recycling, reuse of recyclable and reusable materials have been extensively practiced.
- .3 Minimize amount of non-hazardous solid waste generated by project and accomplish maximum source reduction, reuse and recycling of solid waste produced by CRD activities.
- .4 Protect environment and prevent environmental pollution damage.

**1.2 RELATED REQUIREMENTS**

- .1 Section 01 35 43 – Environmental Procedures
- .2 Section 02 41 13 – Selective Site Demolition

**1.3 REFERENCE STANDARDS**

- .1 Prince Edward Island Department of Communities, Land and Environment
  - .1 Island Waste Management Commission
- .2 Canadian Construction Association (CCA)
  - .1 CCA 81-2001: A Best Practices Guide to Solid Waste Reduction.
- .3 Public Works and Government Services Canada (PSPC)
  - .1 2002 National Construction, Renovation and Demolition Non-Hazardous Solid Waste Management Protocol.
  - .2 CRD Waste Management Market Research Report (available from PSPC's Environmental Services).
  - .3 Sustainable Development Strategy 2007-2009: Target 2.1 Environmentally Sustainable Use of Natural Resources.
    - .1 Real Property projects over \$1 million and in communities where industrial recycling is supported, implementation of CRD waste management practices will be completed, with waste materials being reused or recycled.
    - .2 Contractually ensure resources used in construction or maintenance are consumed and recovered in a sustainable manner.

## 1.4 DEFINITIONS

- .1 Approved/Authorized recycling facility: waste recycler approved by applicable provincial authority or other users of material for recycling approved by the Departmental Representative.
- .2 Class III: non-hazardous waste - construction renovation and demolition waste.
- .3 Construction, Renovation and/or Demolition (CRD) Waste: Class III solid, non-hazardous waste materials generated during construction, demolition, and/or renovation activities
- .4 Cost/Revenue Analysis Workplan (CRAW): based on information from Waste Reduction Workplan, and intended as financial tracking tool for determining economic status of waste management practices (Schedule E).
- .5 Inert Fill: inert waste - exclusively asphalt and concrete.
- .6 Waste Source Separation Program (WSSP): implementation and co-ordination of ongoing activities to ensure designated waste materials will be sorted into pre-defined categories and sent for recycling and reuse, maximizing diversion and potential to reduce disposal costs.
- .7 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.
- .8 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.
- .9 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.
- .10 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.
- .11 Salvage: removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.
- .12 Separate Condition: refers to waste sorted into individual types.
- .13 Source Separation: act of keeping different types of waste materials separate beginning from the point they became waste.
- .14 Waste Audit (WA): detailed inventory of estimated quantities of waste materials that will be generated during construction, demolition, deconstruction and/or renovation. Involves quantifying by volume/weight amounts of materials and wastes that will be reused, recycled or landfilled. Refer to Schedule A.
- .15 Waste Diversion Report: detailed report of final results, quantifying cumulative weights and percentages of waste materials reused, recycled and landfilled over course of project. Measures success against Waste Reduction Workplan (WRW) goals and identifies lessons learned.

- .16 Waste Management Co-ordinator (WMC): contractor representative responsible for supervising waste management activities as well as co-ordinating required submittal and reporting requirements.
- .17 Waste Reduction Workplan (WRW): written report which addresses opportunities for reduction, reuse, or recycling of materials generated by project. Specifies diversion goals, implementation and reporting procedures, anticipated results and responsibilities. Waste Reduction Workplan (Schedule B) information acquired from Waste Audit.

## **1.5 DOCUMENTS**

- .1 Post and maintain in visible and accessible area at job site, one copy of following documents:
  - .1 Waste Audit (Schedule A).
  - .2 Waste Reduction Workplan (Schedule B).
  - .3 Waste Source Separation Program.
  - .4 Schedules B and A completed for project.

## **1.6 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prepare and submit following prior to project start-up:
  - .1 1 copy and 1 electronic copy of completed Waste Audit (WA): Schedule A.
  - .2 1 copy and 1 electronic copy of completed Waste Reduction Workplan (WRW): Schedule B.
  - .3 1 copy and 1 electronic copy of Cost/Revenue Analysis Workplan (CRAW): Schedule E.
  - .4 1 copy and 1 electronic copy of Waste Source Separation Program (WSSP).
- .3 Prepare and submit on bi-weekly basis, throughout project or at intervals agreed to by Departmental Representative the following:
  - .1 Receipts, scale tickets, waybills, and/or waste disposal receipts that show quantities and types of materials reused, recycled, or disposed of.
  - .2 Updated Waste Materials Tracking form (Schedule D).
  - .3 Written monthly summary report detailing cumulative amounts of waste materials reused, recycled and landfilled, and brief status of ongoing waste management activities.
- .4 Submit prior to final payment the following:
  - .1 Waste Diversion Report, indicating final quantities in tones by material types salvaged for reuse, recycling or disposal in landfill and recycling centres, re-use depots, landfills and other waste processors that received waste materials (See Schedule C).
  - .2 Provide receipts, scale tickets, waybills, waste disposal receipts that confirm quantities and types of materials reused, recycled or disposed of and destination.

**1.7 WASTE AUDIT (WA)**

- .1 Departmental Representative will prepare WA prior to project start-up. WA will be provided with bid documentation (see Schedule A).
- .2 WA provides detailed inventory, estimated quantities and types of waste materials that will be generated as well as their potential to be reused and/or recycled and project's waste diversion goals and objectives.
- .3 After award of contract, contractor to review WA and confirm that anticipated quantities of waste generated are accurate and goals achievable.
- .4 If after review, contractor determines that indicated quantities or opportunities in WA are not accurate or achievable, contractor to provide written details of discrepancies and revised quantities for areas of concern. Contractor to meet with Departmental Representative to review and justify revisions.
- .5 Post on-site WA where contractor and sub-contractors are able to review content.

**1.8 WASTE REDUCTION WORKPLAN (WRW)**

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

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

### **1.9 COST/REVENUE ANALYSIS WORKPLAN (CRAW)**

- .1 Prepare CRAW (see Schedule E) and include the following:
  - .1 Cost of current waste management practices.
  - .2 Implementation cost of waste diversion program.
  - .3 Savings and benefits resulting from waste diversion program.

### **1.10 WASTE SOURCE SEPARATION PROGRAM (WSSP)**

- .1 As part of Waste Reduction Workplan, prepare WSSP prior to project start-up.
- .2 WSSP will detail methodology and planned on-site activities for separation of reusable and recyclable materials from waste intended for landfill.
- .3 Provide list and drawings of locations that will be made available for sorting, collection, handling and storage of anticipated quantities of reusable and recyclable materials.
- .4 Provide sufficient on-site facilities and containers for collection, handling, and storage of anticipated quantities of reusable and recyclable materials.
- .5 Locate containers to facilitate deposit of materials without hindering daily operations.
- .6 Provide training for workers, sub-contractors in handling and separation of materials for reuse and/or recycling.
- .7 Locate separated material(s) in area(s) which minimizes material damage.
- .8 Clearly and securely label containers to identify types/conditions of materials accepted and assist sub-contractors and workers in separating materials accordingly.
- .9 Monitor on-site waste management activities by conducting periodic site inspections to verify: state of signage, contamination levels, bin locations and condition, personnel participation, use of waste tracking forms and collection of waybills, receipts and invoices.
- .10 On-site sale of salvaged materials is not permitted unless authorized in writing by Departmental Representative and provided that site safety regulations and security requirements are adhered to.

### **1.11 USE OF SITE AND FACILITIES**

- .1 Execute Work with minimal interference and disturbance to normal use of premises.
- .2 Maintain security measures established by facility provide temporary security measures approved by Departmental Representative.

### **1.12 WASTE PROCESSING SITES**

- .1 Contractor is responsible to research and locate waste diversion resources and service providers. Salvaged materials are to be transported off site to approved and/or authorized recycling facilities or to users of material for recycling.

### **1.13 QUALITY ASSURANCE**

- .1 After award of Contract, a mandatory site examination will be held for this Project for Contractor and/or sub-contractors responsible for construction, renovation demolition/deconstruction waste management.
  - .1 Date, time and location will be arranged by Departmental Representative.
- .2 Waste Management Meeting: Waste Management Co-ordinator is to provide an update on status of waste diversion and management activities at each meeting. Written monthly Waste Diversion Report summary to be provided by Waste Management Coordinator (refer to the Waste Diversion Report form in Schedule C and Waste Materials Tracking form in Schedule D).

### **1.14 STORAGE, HANDLING AND PROTECTION**

- .1 Store, materials to be reused, recycled and salvaged in locations as directed by Departmental Representative.
- .2 Unless specified otherwise, materials for removal become Contractor's property.
- .3 Protect, stockpile, store and catalogue salvaged items.
- .4 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.
- .5 Protect structural components not removed and salvaged materials from movement or damage.
- .6 Protect surface drainage, mechanical and electrical from damage and blockage.
- .7 Provide on-site facilities and containers for collection and storage of reusable and recyclable materials.
- .8 Separate and store materials produced during project in designated areas.
- .9 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated processing facilities.
  - .1 On-site source separation is recommended.
  - .2 Remove co-mingled materials to off site processing facility for separation.
  - .3 Obtain waybills, receipts and/or scale tickets for separated materials removed from site.
  - .4 Materials reused on-site are considered to be diverted from landfill and as such are to be included in all reporting.

### **1.15 DISPOSAL OF WASTES**

- .1 Do not bury rubbish or waste materials.
- .2 Do not dispose of mineral spirits, paint thinner, oil, volatile materials, waste into waterways, storm, or sanitary sewers.
- .3 Keep records of construction waste including:
  - .1 Number and size of bins.

- .2 Waste type of each bin.
- .3 Total tonnage generated.
- .4 Tonnage reused or recycled.
- .5 Reused or recycled waste destination.
- .4 Remove materials on-site as Work progresses.
- .5 Prepare project summary to verify destination and quantities on a material-by-material basis as identified in the waste audit.

### **1.16 SCHEDULING**

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

## **Part 2 Products**

### **2.1 NOT USED**

- .1 Not Used.

## **Part 3 Execution**

### **3.1 APPLICATION**

- .1 Do Work in compliance with WRW and WSSP.
- .2 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

### **3.2 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for recycling and reuse in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.
  - .2 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 Departmental Representative, and consistent with applicable fire regulations.
  - .1 Mark containers or stockpile areas.

- .2 Provide instruction on disposal practices.
- .2 On-site sale of salvaged, recyclable, reusable material is not permitted.

**3.4 WASTE DIVERSION REPORT**

- .1 At completion of Project, prepare written Waste Diversion Report indicating quantities of materials reused, recycled or disposed of as well as the following:
  - .1 Identify final diversion results and measure success against goals from Waste Reduction Workplan.
  - .2 Compare final quantities/percentages diverted with initial projections in Waste Audit and Waste Reduction Workplan and explain variances.
    - .1 Supporting documentation.
    - .2 Waybills and tracking forms.
    - .3 Description of issues, resolutions and lessons learned.

**3.5 WASTE AUDIT (WA)**

- .1 Schedule A - Waste Audit (WA)

(1) Material Category	(2) Material Quantity Unit	(3) Estimated Waste %	(4) Total Quantity of Waste (unit)	(5) Generation Point	(6) % Recycled	(7) % Reused
Wood and Plastics Material Description						
Off-cuts						
Warped Pallet Forms						
Plastic Packaging						
Cardboard Packaging						
Other						
Doors and Windows Material Description						
Painted Frames						
Glass						
Wood						
Metal						
Other						

**3.6 WASTE REDUCTION WORKPLAN (WRW)**

.1 Schedule B

(1) Material Category	(2) Person(s) Respon- sible	(3) Total Quantity of Waste (unit)	(4) Reused Amount (units) Projected	Actual	(5) Recycled Amount (unit) Projected	Actual	(6) Material(s) Destina- tion
Wood and Plastics Material Description							
Chutes							
Warped Pallet Forms							
Plastic Packag ing							
Card- board Packag ing							
Other							
Doors and Windows Material Description							
Painted Frames							
Glass							
Wood							
Metal							
Other							

**3.7 COST/REVENUE ANALYSIS WORKPLAN (CRAW)**

.1 Schedule E - Cost/Revenue Analysis Workplan (CRAW)

(1) Material Description	(2) Total Quantity (unit)	(3) Volume (cum)	(4) Weight (cum)	(5) Disposal Cost/Credit \$(+/-)	(6) Category Sub-Total \$(+/-)
Wood					
Wood Stud					
Plywood					
Baseboard - Wood					
Door Trim - Wood					
Cabinet					\$
Doors and Windows					
Panel Regular					
Slab Regular					
Wood Laminate					
Byfold - Closet					
Glazing					\$
		(7) Cost (-) / Revenue (+)			\$

**3.8 CANADIAN GOVERNMENTAL DEPARTMENTS CHIEF RESPONSIBILITY FOR THE ENVIRONMENT**

.1 Schedule G - Government Chief Responsibility for the Environment:

Prince Edward Island	Department of Communities, Land and Environment 11 Kent Street, 4th Floor, PO Box 2000 Charlottetown PE C1A 7N8	902-368-5000	902-368-5830
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**3.9 SCHEDULES**

.1 Following Schedules are attached to this Specification:

- .1 Waste Audit - Schedule A.
- .2 Waste Reduction Workplan Form - Schedule B.
- .3 Waste Diversion Report Form - Schedule C.
- .4 Waste Materials Tracking Form - Schedule D.
- .5 Cost/Revenue Analysis Workplan - Schedule E.

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

**1.2                FINAL CLEANING**

- .1    Clean in accordance with Section 01 74 11 – Cleaning:
  - .1    Remove surplus materials, excess materials, rubbish, tools and equipment.
- .2    Waste Management: separate waste materials for reuse and recycling.

**Part 2            Products**

**2.1                NOT USED**

- .1    Not Used.

**Part 3            Execution**

**3.1                NOT USED**

.1            Not Used.

**END OF SECTION**

**Part 1 General**

**1.1 REFERENCES**

- .1 Canadian Environmental Protection Act (CEPA).

**1.2 ADMINISTRATIVE REQUIREMENTS**

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

**1.3 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.

**1.4 FORMAT**

- .1 Organize data as instructional manual.
- .2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.
- .3 When multiple binders are used correlate data into related consistent groupings:
  - .1 Identify contents of each binder on spine.
- .4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
- .5 Arrange content by systems under Section Numbers and Sequence of Table of Contents.

- .6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .7 Text: manufacturer's printed data, or typewritten data.
- .8 Drawings: provide with reinforced punched binder tab:
  - .1 Bind in with text; fold larger drawings to size of text pages.
- .9 Provide 1:1 scaled CAD files in dwg format on CD.

## **1.5 CONTENTS - PROJECT RECORD DOCUMENTS**

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

## **1.6 AS -BUILT DOCUMENTS AND SAMPLES**

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

- .2 Store record documents and samples in field office apart from documents used for construction:
  - .1 Provide files, racks, and secure storage.
- .3 Label record documents and file in accordance with Section Number Listings in List of Contents of this Project Manual:
  - .1 Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition:
  - .1 Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by the Departmental Representative.

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

- .1 Record information on set of black line opaque drawings, and in copy of Project Manual, provided by the Departmental Representative.
- .2 Use felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .3 Record information concurrently with construction progress:
  - .1 Do not conceal Work until required information is recorded.
- .4 Contract Drawings and shop drawings: mark each item to record actual construction, including:
  - .1 Measured 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.
- .5 Specifications: mark each item to record actual construction, including:
  - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
  - .2 Changes made by Addenda and change orders.
- .6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specification sections.
- .7 Provide digital photos, if requested, for site records.

**1.8 FINAL SURVEY**

- .1 Submit final site survey certificate in accordance with Section 01 71 00 - Examination and Preparation, certifying that elevations and locations of completed Work are in conformance, or non-conformance with Contract Documents.

**1.9 WARRANTIES AND BONDS**

- .1 Develop warranty management plan to contain information relevant to Warranties.
- .2 Submit warranty management plan, 30 days before planned pre-warranty conference, to the Departmental Representative approval.
- .3 Warranty management plan to include required actions and documents to assure that the Departmental Representative receives warranties to which it is entitled.
- .4 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.
- .5 Submit, warranty information made available during construction phase, to the Departmental Representative for approval prior to each monthly pay estimate.
- .6 Assemble approved information in binder, submit upon acceptance of work and organize binder as follows:
  - .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
  - .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
  - .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.
  - .4 Verify that documents are in proper form, contain full information, and are notarized.
  - .5 Co-execute submittals when required.
  - .6 Retain warranties and bonds until time specified for submittal.
- .7 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.
- .8 Conduct joint 10 month warranty inspection, measured from time of acceptance, by the Departmental Representative.
- .9 Include information contained in warranty management plan as follows:
  - .1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractors, subcontractors, manufacturers or suppliers involved.

- .2 Provide list for each warranted equipment, item, feature of construction or system indicating:
  - .1 Name of item.
  - .2 Model and serial numbers.
  - .3 Location where installed.
  - .4 Name and phone numbers of manufacturers or suppliers.
  - .5 Names, addresses and telephone numbers of sources of spare parts.
  - .6 Warranties and terms of warranty: include one-year overall warranty of construction. Indicate items that have extended warranties and show separate warranty expiration dates.
  - .7 Cross-reference to warranty certificates as applicable.
  - .8 Starting point and duration of warranty period.
  - .9 Summary of maintenance procedures required to continue warranty in force.
  - .10 Cross-Reference to specific pertinent Operation and Maintenance manuals.
  - .11 Organization, names and phone numbers of persons to call for warranty service.
  - .12 Typical response time and repair time expected for various warranted equipment.
- .3 Contractor's plans for attendance at 10 month post-construction warranty inspections.
- .4 Procedure and status of tagging of equipment covered by extended warranties.
- .5 Post copies of instructions near selected pieces of equipment where operation is critical for warranty and/or safety reasons.
- .10 Respond in timely manner to oral or written notification of required construction warranty repair work.
- .11 Written verification to follow oral instructions:
  - .1 Failure to respond will be cause for the Departmental Representative to proceed with action against Contractor.

**1.10 MEASUREMENT PROCEDURES**

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

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3            Execution**

**3.1                NOT USED**

.1            Not Used.

**END OF SECTION**

**Part 1 General**

**1.1 SUMMARY**

- .1 Section Includes:
  - .1 Methods and procedures for demolishing, salvaging, recycling and removing sitework items designated to be removed in whole or in part, and for backfilling resulting trenches and excavations.
  - .2 Related Sections:
    - .1 Section 01 00 01 – Project Specific General Requirements
    - .2 Section 01 35 43 - Environmental Procedures.
    - .3 Section 01 35 30 - Health and Safety Requirements.
    - .4 Section 02 82 00.01 – Asbestos Abatement
    - .5 Section 31 23 33.01 - Excavating, Trenching and Backfilling.

**1.2 REFERENCES**

- .1 Canadian Council of Ministers of the Environment (CCME):
  - .1 PN1326, Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products.
- .2 Department of Justice Canada (Jus):
  - .1 Canadian Environmental Assessment Act (CEAA), 1995, c. 37.
  - .2 Canadian Environmental Protection Act, 1999 (CEPA), c. 33.
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS):
  - .1 Material Safety Data Sheets (MSDS).
- .4 Transport Canada (TC):
  - .1 Transportation of Dangerous Goods Act, 1992 (TDGA), c. 34.

**1.3 DEFINITIONS**

- .1 Demolition: rapid destruction of building following removal of hazardous materials.
- .2 Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, may include but not limited to: asbestos PCB's, CFC's, HCFC's poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or other material that can endanger human health or well-being or environment if handled improperly.
- .3 Waste Audit (WA): detailed inventory of materials in building. Indicates quantities of reuse, recycling and landfill:

- .1 Involves quantifying by volume/weight amounts of materials and wastes generated during construction, demolition, deconstruction, or renovation project.
- .2 Indicates quantities of reuse, recycling and landfill.
- .4 Waste Management Coordinator (WMC): contractor representative responsible for supervising waste management activities as well as coordinating related, required submittal and reporting requirements.
- .5 Waste Reduction Workplan (WRW): written report which addresses opportunities for reduction, reuse, or recycling of materials. WRW is based on information acquired from WA.

#### **1.4 SUBMITTALS**

- .1 Submittals in accordance with Section 01 00 01 – Project Specific General Requirements.
- .2 Product Data: submit WHMIS MSDS - Material Safety Data Sheets.
- .3 Shop drawings:
  - .1 Submit for approval drawings, diagrams or details showing sequence of demolition work and supporting structures and underpinning, where required by authorities having jurisdiction.
  - .2 Submit drawings stamped and signed by qualified professional engineer registered or licensed in Province of Prince Edward Island, Canada.
- .4 Hazardous Materials: provide description of Hazardous Materials and Notification of Filing with proper authorities prior to beginning of Work as required.
- .5 Waste Reduction Workplan: prior to beginning of Work on site submit detailed Waste Reduction Workplan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal and indicate:
  - .1 Descriptions of and anticipated quantities in percentages of materials to be salvaged, reused, recycled and landfilled.
  - .2 Schedule of selective demolition.
  - .3 Number and location of dumpsters.
  - .4 Anticipated frequency of tippage.
  - .5 Name and address of haulers waste facilities waste receiving organizations.
- .6 Certificates: submit copies of certified weigh bills of lading receipts from authorized disposal sites and reuse and recycling facilities for material removed from site on weekly monthly basis upon request of Departmental Representative:

- .1 Written authorization from the Departmental Representative is required to deviate from haulers facilities receiving organizations listed in Waste Reduction Workplan.

## **1.5 QUALITY ASSURANCE**

- .1 Regulatory Requirements: ensure Work is performed in compliance with CEPA, CEAA, TDGA and applicable Provincial regulations.
- .2 Site Meetings:
  - .1 Arrange for site visit with the Departmental Representative to examine existing site conditions adjacent to demolition work, prior to start of Work.
- .3 Reporting Requirements: WMC to complete.
- .4 WMC must provide written report on status of waste diversion activity at each meeting.
- .5 Health and Safety:
  - .1 Do construction occupational health and safety in accordance with Section 01 35 30 - Health and Safety Requirements.

## **1.6 DELIVERY, STORAGE AND HANDLING**

- .1 Perform Work in accordance with Section 01 35 43 - Environmental Procedures.
- .2 Store and manage hazardous materials in accordance with applicable regulatory requirements.
- .3 Store and manage materials identified in the specifications or by the Departmental Representative to be salvaged. Stock pile areas to be as identified on the Drawings or as approved by the Departmental Representative.
- .4 Storage and Protection:
  - .1 Protect in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.
  - .2 Protect existing items designated to remain and items designated for salvage. In event of damage to such items, immediately replace or make repairs to approval of the Departmental Representative and at no cost to the Owner.
  - .3 Remove and store materials to be salvaged, in manner to prevent damage.
  - .4 Store and protect in accordance with requirements for maximum preservation of material.
  - .5 Handle salvaged materials as new materials.

- .5 Waste Management and Disposal:
  - .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .2 Divert excess materials from landfill to site approved by the Departmental Representative.
  - .3 Separate for reuse and recycling and place in designated containers Steel Metal Plastic waste in accordance with Waste Management Plan.
  - .4 Place materials defined as hazardous or toxic in designated containers.
  - .5 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal regulations.
  - .6 Label location of salvaged material's storage areas and provide barriers and security devices.
  - .7 Ensure emptied containers are sealed and stored safely.
  - .8 Source separate for recycling materials that cannot be salvaged for reuse including wood, metal, concrete and asphalt, and gypsum.
  - .9 Remove materials that cannot be salvaged for reuse or recycling and dispose of in accordance with applicable codes at licensed facilities.

## **1.7 SITE CONDITIONS**

- .1 Site Environmental Requirements:
  - .1 Perform work in accordance with Section 01 35 43 - Environmental Procedures.
  - .2 Ensure that selective demolition work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.
  - .3 Do not dispose of waste of volatile materials including but not limited to, mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers:
    - .1 Ensure proper disposal procedures are maintained throughout the project.
  - .4 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers or onto adjacent properties.
  - .5 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authorities and as indicated by the Departmental Representative.
  - .6 Protect trees, plants and foliage on site and adjacent properties where indicated.

.7 Existing Conditions:

- .1 Remove contaminated or hazardous materials listed as hazardous as defined by authorities having jurisdiction from site, prior to start of demolition Work, and dispose of at designated disposal facilities in safe manner in accordance with TDGA and other applicable regulatory requirements.

**1.8 SCHEDULING**

- .1 Employ necessary means to meet project time lines without compromising specified minimum rates of material diversion:
  - .1 Notify the Departmental Representative in writing when unforeseen delays occur.

**Part 2 Products**

**2.1 EQUIPMENT**

- .1 Leave machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.

**Part 3 Execution**

**3.1 PREPARATION**

- .1 Inspect site with the Departmental Representative and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.
- .2 Locate and protect utilities. Preserve active utilities traversing site in operating condition.
- .3 Notify and obtain approval of utility companies before starting demolition.
- .4 Existing sanitary main:
  - .1 All abandoned mains and manholes to be removed and disposed off site.
  - .2 Existing sanitary main is asbestos cement (AC), follow procedures in Section 02 82 00 01 Asbestos Abatement.
- .5 Other Underground Services: remove and dispose of as indicated as directed by the Departmental Representative.
- .6 Existing Septic Tanks and Pumping Stations:
  - .1 If the structure is within the footprint of the new system, remove the entire structure and return to subgrade elevation with structural fill, compacted in 300 mm lifts to 98% Standard Proctor maximum dry density.

- .2 If the existing structure is not within the footprint of the new system, remove the top 1500 mm of the structure, disinfect the remaining structure, infill the void with common borrow compacted in maximum 300 mm lifts at 95% Standard Proctor maximum dry density, restore existing surface.

### 3.2 REMOVAL OF HAZARDOUS WASTES

- .1 Remove contaminated or dangerous materials defined by authorities having jurisdiction, relating to environmental protection, from site and dispose of in safe manner to minimize danger at site or during disposal.
- .2 Removal of contaminated or dangerous materials to be completed by a qualified contractor and proper protective and disposal measures are to be implemented.

### 3.3 REMOVAL OPERATIONS

- .1 Remove items as indicated.
- .2 Do not disturb items designated to remain in place.
- .3 Excavate at least 300 mm below pipe invert, when removing pipes under existing or future pavement area.
- .4 Remove existing pipe and maintenance hole structures where the proposed alignment matches that of the existing. For areas where the proposed pipe alignment deviates from the existing, remove the existing pipe and maintenance hole structure material as directed by the Departmental Representative.
- .5 Remove as many trees as required designated trees during demolition:
  - .1 Obtain written approval of the Departmental Representative prior to removal of trees not designated.
- .6 Sell disposed of trees designated for removal and identified by the Departmental Representative to be healthy and marketable:
  - .1 Grind, chip, or shred other vegetation for mulching and composting, or use as mill pulp or process fuel.
- .7 Stockpile topsoil for final grading and landscaping:
  - .1 Provide erosion control and seeding if not immediately used.
- .8 Salvage:
  - .1 Dismantle items containing materials for salvage and stockpile salvaged materials at locations as indicated.
- .9 Disposal of Material:

- .1 Dispose of materials not designated for salvage or reuse on site as instructed by the Departmental Representative at authorized facilities approved in Waste Reduction Workplan.
- .2 Trim disposal areas to approval of the Departmental Representative.
- .10 Backfill:
  - .1 Backfill in areas as indicated and in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.

### **3.4 STOCKPILING**

- .1 Label stockpiles, indicating material type and quantity.
- .2 Stock pile locations to be approved by the Departmental Representative prior to commencing stock piling activities.
- .3 Stock piles to be managed with proper erosion and sediment control devices per Section 01 35 43.
- .4 Designate appropriate security resources/measures to prevent vandalism, damage and theft.
- .5 Locate stockpiled materials convenient for use in new construction to eliminate double handling wherever possible.
- .6 Stockpile materials designated for alternate disposal in location which facilitates removal from site and examination by potential end markets, and which does not impede disassembly, processing, or hauling procedures.

### **3.5 REMOVAL FROM SITE**

- .1 Remove stockpiled material as directed by the Departmental Representative, when it interferes with operations of project.
- .2 Remove stockpiles of like materials by alternate disposal option once collection of materials is complete.
- .3 Transport material designated for alternate disposal using approved haulers facilities receiving organizations listed in Waste Reduction Workplan and in accordance with applicable regulations:
  - .1 Written authorization from the Departmental Representative is required to deviate from haulers facilities receiving organizations listed in Waste Reduction Workplan.
- .4 Dispose of materials not designated for alternate disposal in accordance with applicable regulations:
  - .1 Disposal Facilities: approved and listed in Waste Reduction Workplan.

- .2 Written authorization from the Departmental Representative is required to deviate from disposal facilities listed in Waste Reduction Workplan.

### **3.6 RESTORATION**

- .1 Restore areas and existing works outside areas of demolition to conditions that existed prior to beginning of Work match condition of adjacent, undisturbed areas.
- .2 Use soil treatments and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.

### **3.7 FIELD QUALITY CONTROL**

- .1 Verification requirements in accordance with applicable regulatory requirements, include:
  - .1 Materials and resources.
  - .2 Storage and collection of recyclables.
  - .3 Construction waste management.
  - .4 Resource reuse.
  - .5 Recycled content.
  - .6 Local/regional materials.
  - .7 Wood.
  - .8 Low-emitting materials.

### **3.8 CLEANING**

- .1 Remove debris, trim surfaces and leave work site clean, upon completion of Work.
- .2 Use cleaning solutions and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.

**END OF SECTION**

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**Part 1            General**

**1.1                SUMMARY**

- .1 Comply with requirements of this Section when performing the following work:
  - .1 Removing non-friable asbestos-containing materials if the material is being removed without being broken, cut, drilled, abraded, ground, sanded or vibrated.
  - .2 Break, cut, grind, sand, drill, scrape, vibrate or abrade non-friable asbestos containing materials using non-powered hand-held tools, and the material is wetted to control the spread of dust or fibres.

**1.2                RELATED REQUIREMENTS**

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

**1.3                REFERENCES**

- .1 Department of Justice Canada (Jus)
  - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .2 Transport Canada (TC)
  - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).

**1.4                DEFINITIONS**

- .1 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.
- .2 Asbestos-Containing Materials (ACMs): materials that contain 0.5 per cent or more asbestos by dry weight and are identified under Existing Conditions including fallen materials and settled dust.
- .3 Asbestos Work Area: area where work takes place which will, or may, disturb ACMs.
- .4 Authorized Visitors: Engineer[s], Consultant[s] or designated representative[s], and representative[s] of regulatory agencies.
- .5 Competent worker: in relation to specific work, means a worker who:
  - .1 Is qualified because of knowledge, training and experience to perform the work.
  - .2 Is familiar with the provincial / federal laws and with the provisions of the regulations that apply to the work.
  - .3 Has knowledge of all potential or actual danger to health or safety in the work.
- .6 Friable material: means material that:
  - .1 When dry, can be crumbled, pulverized or powdered by hand pressure, or
  - .2 is crumbled, pulverized or powdered.

- .7 Non-Friable Material: material that when dry cannot be crumbled, pulverized or powdered by hand pressure.
- .8 Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must have appropriate capacity for work.

## 1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit proof satisfactory to Departmental Representative that suitable arrangements have been made to dispose of asbestos-containing waste in accordance with requirements of authority having jurisdiction.
- .3 Submit Provincial and/or local requirements for Notice of Project Form.
- .4 Submit proof of Contractor's Asbestos Liability Insurance.
- .5 Submit to Departmental Representative necessary permits for transportation and disposal of asbestos-containing waste and proof that asbestos-containing waste has been received and properly disposed.
- .6 Submit proof that all asbestos workers and/or supervisor have received appropriate training and education by a competent person in the hazards of asbestos exposure, good personal hygiene and work practices while working in Asbestos Work Areas, and the use, cleaning and disposal of respirators and protective clothing.
- .7 Submit proof satisfactory to Departmental Representative that employees have respirator fitting and testing. Workers must be fit tested (irritant smoke test) with respirator that is personally issued.

## 1.6 QUALITY ASSURANCE

- .1 Regulatory Requirements: comply with Federal, Provincial/Territorial, and local requirements pertaining to asbestos, provided that in case of conflict among these requirements or with these specifications, more stringent requirement applies. Comply with regulations in effect at time Work is performed.
- .2 Health and Safety:
  - .1 Perform construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.
  - .2 Safety Requirements: worker protection.
    - .1 Protective equipment and clothing to be worn by workers while in Asbestos Work Area include:
      - .1 Air purifying half-mask respirator with N-100, R-100 or P-100 particulate filter, personally issued to worker and marked as to efficiency and purpose, suitable for protection against asbestos and acceptable to Provincial Authority having jurisdiction. The respirator to be fitted so that there is an effective seal between the respirator and the worker's face, unless the respirator is equipped with a hood or helmet. The respirator to be cleaned, disinfected and inspected after use on each shift, or more often if necessary, when issued for the exclusive use of one worker, or

after each use when used by more than one worker. The respirator to have damaged or deteriorated parts replaced prior to being used by a worker; and, when not in use, to be stored in a convenient, clean and sanitary location. The employer to establish written procedures regarding the selection, use and care of respirators, and a copy of the procedures to be provided to and reviewed with each worker who is required to wear a respirator. A worker not to be assigned to an operation requiring the use of a respirator unless he or she is physically able to perform the operation while using the respirator.

- .2 Disposable-type protective clothing that does not readily retain or permit penetration of asbestos fibres. Protective clothing to be provided by the employer and worn by every worker who enters the work area, and the protective clothing shall consist of a head covering and full body covering that fits snugly at the ankles, wrists and neck, in order to prevent asbestos fibres from reaching the garments and skin under the protective clothing to include suitable footwear, and to be repaired or replaced if torn.
- .2 Eating, drinking, chewing, and smoking are not permitted in Asbestos Work Area.
- .3 Before leaving Asbestos Work Area, the worker can decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing, or, if the protective clothing will not be reused, place it in a container for dust and waste. The container to be dust tight, suitable for asbestos waste, impervious to asbestos, identified as asbestos waste, cleaned with a damp cloth or a vacuum equipped with a HEPA filter immediately before removal from the work area, and removed from the work area frequently and at regular intervals.
- .4 Facilities for washing hands and face shall be provided within or close to the Asbestos Work Area.
- .5 Ensure workers wash hands and face when leaving Asbestos Work Area.
- .6 Ensure that no person required to enter an Asbestos Work Area has facial hair that affects seal between respirator and face.

## **1.7 WASTE MANAGEMENT AND DISPOSAL**

- .1 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .2 Place materials defined as hazardous or toxic in designated containers.
- .3 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.
- .4 Fold up metal banding, flatten and place in designated area for recycling.
- .5 Disposal of asbestos waste generated by removal activities must comply with Federal, Provincial, Territorial and Municipal regulations. Dispose of asbestos waste in sealed double thickness [6] mils bags or leak proof drums. Label containers with appropriate warning labels.

- .6 Provide manifests describing and listing waste created. Transport containers by approved means to licensed landfill for burial.

## **1.8 EXISTING CONDITIONS**

- .1 The existing sanitary piping is made of asbestos cement fibres. The new gravity main and forcemain will be installed adjacent to the existing sanitary main as shown as shown on the drawings. This work is not to proceed until Departmental Representative has verified that all required personal protection is in place.

## **1.9 PERSONNEL TRAINING**

- .1 Before beginning Work, provide Departmental Representative satisfactory proof that every worker has had instruction and training in hazards of asbestos exposure, in personal hygiene and work practices, and in use, cleaning, and disposal of respirators and protective clothing.
- .2 Instruction and training related to respirators includes, following minimum requirements:
  - .1 Fitting of equipment.
  - .2 Inspection and maintenance of equipment.
  - .3 Disinfecting of equipment.
  - .4 Limitations of equipment.
- .3 Instruction and training must be provided by a competent, qualified person.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Wetting Agent: water to be used while cutting or breaking the existing asbestos cement water main to minimize the spread of ACM's.
- .2 Waste Containers: contain waste in two separate containers.
  - .1 Inner container: 0.15 mm thick sealable polyethylene waste bag.
  - .2 Outer container: sealable metal or fibre type where there are sharp objects included in waste material; otherwise outer container may be sealable metal or fibre type or second 0.15 mm thick sealable polyethylene bag.
  - .3 Labelling requirements: affix pre-printed cautionary asbestos warning in both official languages that is visible when ready for removal to disposal site.
- .3 Slow - drying sealer: non-staining, clear, water - dispersible type that remains tacky on surface for at least 8 hours and designed for purpose of trapping residual asbestos fibres.
- .4 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under both dry conditions and wet conditions using amended water.

**Part 3 Execution**

**3.1 PROCEDURES**

- .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .2 Before beginning work, inform all other non-essential personnel to exit the surrounding area or remain in a sealed environment (inside construction equipment) and ensure air is on recirculation mode and not drawing from the outside if equipment is located within 30m of the asbestos work area.
- .3 Before beginning Work, isolate Asbestos Work Area using, minimum, preprinted cautionary asbestos warning signs in both official languages that are visible at access routes to Asbestos Work Area.
  - .1 Remove visible dust from surfaces in the work area where dust is likely to be disturbed during course of work.
  - .2 Use HEPA vacuum or damp cloths where damp cleaning does not create a hazard and is otherwise appropriate.
  - .3 Do not use compressed air to clean up or remove dust from any surface.
- .4 Prevent spread of dust from Asbestos Work Area using measures appropriate to work to be done.
- .5 Wet materials containing asbestos to be cut, ground, abraded, scraped, drilled, or otherwise disturbed unless wetting creates hazard or causes damage.
  - .1 Use garden reservoir type low - velocity fine - mist sprayer.
  - .2 Perform Work to reduce dust creation to lowest levels practicable.
  - .3 Work will be subject to visual inspection and air monitoring.
  - .4 Contamination of surrounding areas indicated by visual inspection or air monitoring will require complete enclosure and clean-up of affected areas.
- .6 Cleanup:
  - .1 Place dust and asbestos containing waste in sealed dust-tight waste bags. Treat drop sheets and disposable protective clothing as asbestos waste; wet and fold these items to contain dust, and then place in plastic bags.
  - .2 Clean exterior of each waste-filled bag using damp cloths or HEPA vacuum and place in second clean waste bag immediately prior to removal from Asbestos Work Area.
  - .3 Seal waste bags and remove from site. Dispose of in accordance with requirements of Provincial/Territorial and Federal Authority having jurisdiction. Supervise dumping and ensure that dump operator is fully aware of hazardous nature of material to be dumped and that the appropriate guidelines and regulations for asbestos disposal are followed.

**END OF SECTION**

Part 1        **GENERAL**

**1.1        RELATED REQUIREMENTS**

- .1        Not used.

**1.2        REFERENCE STANDARDS**

- .1        Prince Edward Island Department of Transportation, Infrastructure and Energy standard specifications (Most recent version).
- .2        ASTM International.
  - .1        ASTM D4791-[10], Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.

**1.3        ACTION AND INFORMATIONAL SUBMITTALS**

- .1        Submit in accordance with Section 01 00 01 – Project Specific General Requirements.
- .2        Product Data:
  - .1        Submit manufacturer's instructions, printed product literature and data sheets for aggregate materials and include product characteristics, performance criteria, physical size, finish and limitations.
- .3        Samples:
  - .1        Allow continual sampling by Departmental Representative during production.
  - .2        Provide Departmental Representative with access to source and processed material for sampling.
  - .3        Install sampling facilities at discharge end of production conveyor, to allow Departmental Representative to obtain representative samples of items being produced. Stop conveyor belt when requested by Departmental Representative to permit full cross section sampling.
  - .4        Provide front end loader or other suitable equipment including trained operator for stockpile sampling as necessary. Move samples to storage place as directed by Departmental Representative.
  - .5        Supply new or clean sample bags or containers according appropriate to aggregate materials.
  - .6        Pay cost of sampling and testing of aggregates which fail to meet specified requirements.
  - .7        Provide water, electric power and propane to Departmental Representative laboratory trailer at production site.

**1.4        DELIVERY, STORAGE AND HANDLING**

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

- .2 Transportation and Handling: handle and transport aggregates to avoid segregation, contamination and degradation.
- .3 Storage: store washed materials or materials excavated from underwater 24 hours minimum to allow free water to drain and for materials to attain uniform water content.

Part 2

**PRODUCTS**

**2.1**

**MATERIALS**

- .1 Aggregate materials shall conform to the requirements of Prince Edward Island Department of Transportation, Infrastructure and Energy (PEITIE) standard specifications.
- .2 Aggregate quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material, clay lumps or minerals, free from adherent coatings and injurious amounts of disintegrated pieces or other deleterious substances.
- .3 Flat and elongated particles of coarse aggregate: to ASTM D4791.

**2.2**

**SOURCE QUALITY CONTROL**

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

Part 3

**EXECUTION**

**3.1**

**EXAMINATION**

- .1 Verification of Conditions: verify that conditions are acceptable for topsoil stripping.
  - .1 Visually inspect substrate in presence of Departmental Representative.
  - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
  - .3 Proceed with topsoil stripping. only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

**3.2**

**PREPARATION**

- .1 Topsoil stripping to be done in accordance with Section 31 14 13 – Soil Stripping and Stockpiling.

- .2 Aggregate source preparation:
  - .1 Prior to excavating materials for aggregate production, clear and grub area to be worked, and strip unsuitable surface materials. Dispose of cleared, grubbed and unsuitable materials as approved by authority having jurisdiction and directed by Departmental Representative.
  - .2 Where clearing is required, leave screen of trees between cleared area and roadways as directed.
  - .3 Clear, grub and strip area ahead of quarrying or excavating operation sufficient to prevent contamination of aggregate by deleterious materials.
  - .4 When excavation is completed dress sides of excavation to nominal 1.5:1 slope, and provide drains or ditches as required to prevent surface standing water.
  - .5 Trim off and dress slopes of waste material piles and leave site in neat condition.
  - .6 Provide silt fence or other means to prevent contamination of existing watercourse or natural wetland features.
- .3 Processing:
  - .1 Process aggregate uniformly using methods that prevent contamination, segregation and degradation.
- .4 When operating in stratified deposits use excavation equipment and methods that produce uniform, homogeneous aggregate gradation.
- .5 Where necessary, screen, crush, wash, classify and process aggregates with suitable equipment to meet requirements.
- .6 Stockpiling:
  - .1 Stockpile aggregates in accordance with the requirements of PEITIE standard specifications.
  - .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 Separate different aggregates by strong, full depth bulkheads, or stockpile far enough apart to prevent intermixing.
  - .5 Do not use intermixed or contaminated materials. Remove and dispose of rejected materials as directed by Departmental Representative within 48 hours of rejection.
  - .6 Aggregate acceptance shall be based on sampling and testing in accordance with the requirements of PEITIE standard specifications.
  - .7 Handling of Aggregates produced outside the specified limits and the aggregate rejection criteria shall be in accordance with the requirements of PEITIE standard specifications.
  - .8 During winter operations, prevent ice and snow from becoming mixed into stockpile or in material being removed from stockpile.

**3.3 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Leave aggregate stockpile site in tidy, well drained condition, free of standing surface water.
- .4 Leave any unused aggregates in neat compact stockpiles as directed by Departmental Representative.
- .5 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

**END OF SECTION**

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**Part 1          General**

**1.1          STANDARD**

- .1          All work of this section shall comply with the requirements of the most recent version of the PEITIE Standard specifications Items 201 and 202.

**1.2          REFERENCES**

- .1          Prince Edward Island Department of Transportation, Infrastructure and Energy Standard Specifications (most recent version):
  - .1          PEITIE Standard Specification Item 201 – Clearing.
  - .2          PEITIE Standard Specification Item 202 – Grubbing.

**1.3          DEFINITIONS**

- .1          Clearing consists of cutting off trees and brush vegetative growth to not more than specified height above ground and disposing of felled trees, previously uprooted trees and stumps, and surface debris.
- .2          Close cut clearing consists of cutting off standing trees, brush, scrub, roots, stumps and embedded logs, removing at, or close to, existing grade and disposing of fallen timber and surface debris.
- .3          Clearing isolated trees consists of cutting off to not more than specified height above ground of designated trees, and disposing of felled trees and debris.
- .4          Underbrush clearing consists of removal from treed areas of undergrowth, deadwood, and trees smaller than 50 mm trunk diameter and disposing of fallen timber and surface debris.
- .5          Grubbing consists of excavation and disposal of stumps and roots boulders and rock fragments of specified size to not less than specified depth below existing ground surface.

**1.4          SUBMITTALS**

- .1          Provide submittals in accordance with Section 01 00 01 – Project Specific General Requirements.
- .2          Samples:
  - .1          Submit 3 samples of each material listed below for approval prior to delivery of materials to project site.
  - .2          Tree wound paint: one liter can with manufacturer's label.
- .3          Submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

- .4 Submit manufacturer's installation instructions.

## **1.5 QUALITY ASSURANCE**

- .1 Do construction occupational health and safety in accordance with Section 01 35 30 - Health and Safety Requirements.
- .2 Safety Requirements: worker protection:
  - .1 Workers must wear gloves, respirators, dust masks, long sleeved clothing, eye protection, and protective clothing when applying herbicide materials.
  - .2 Workers must not eat, drink or smoke while applying herbicide material.
- .3 Clean up spills of preservative materials immediately with absorbent material and safely discard to landfill.

## **1.6 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Consider felled timber from which saw logs, pulpwood, posts, poles, ties, or fuel wood can be produced as saleable timber.

## **Part 2 Execution**

### **2.1 Clearing and Grubbing**

- .1 Clearing and grubbing work to be completed in accordance with the requirements of the most recent version of the PEITIE Standard specifications Items 201 and 202.
- .2 Clearing and grubbing must only take place within flagged areas as designated by Departmental EPO.

### **2.2 FINISHED SURFACE**

- .1 Leave ground surface in condition suitable for immediate grading operations stripping of topsoil to approval of the Consultant.

### **2.3 CLEANING**

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

**END OF SECTION**

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**Part 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- .1 All work of this section shall comply with the requirements of the most recent version of the PEITIE Standard specifications Item 203 and 204, except as amended herein.

**1.2 REFERENCE STANDARDS**

- .1 Prince Edward Island Department of Transportation, Infrastructure and Energy Standard Specifications (most recent version).
- .1 PEITIE Specification Item 203 – Excavation.
- .2 PEITIE Specification Item 204 – Topsoil Removal and Reinstatement

**Part 2 PRODUCTS**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 EXECUTION**

**3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL**

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

**3.2 STRIPPING OF TOPSOIL**

- .1 Ensure that procedures are conducted in accordance with applicable Municipal/Federal requirements.
- .2 Remove topsoil before construction procedures commence to avoid compaction of topsoil.
- .3 Handle topsoil only when it is dry and warm.
- .4 Remove vegetation from targeted areas by non-chemical means and dispose of stripped vegetation as directed by Departmental Representative.
- .5 Remove brush from targeted area by non-chemical means and dispose of as directed by Departmental Representative.

- .6 Strip topsoil by scraper to depths as directed by Departmental Representative.
  - .1 Avoid mixing topsoil with subsoil.
- .7 Pile topsoil by mechanical hoe in berms in locations as directed by Departmental Representative.
  - .1 Stockpile height not to exceed 2.5 - 3 m.
- .8 Dispose of unused topsoil in location as indicated by Departmental Representative.
- .9 Protect stockpiles from contamination and compaction.
- .10 Cover topsoil that has been piled for long term storage, with trefoil or grass to maintain agricultural potential of soil.

### **3.3 PREPARATION OF GRADE**

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

### **3.4 PLACING OF TOPSOIL**

- .1 Place topsoil only after Departmental Representative has accepted subgrade.
- .2 Spread topsoil during dry conditions by mechanical hoe in uniform layers not exceeding 150 mm, over unfrozen subgrade free of standing water.
- .3 Establish traffic patterns for equipment to prevent driving on topsoil after it has been spread to avoid compaction.
- .4 Cultivate soil following spreading procedures.

### **3.5 SUB-SOILING**

- .1 Apply sub-soil, following spreading and cultivating procedures to designated areas to improve drainage and agricultural potential of soil.
- .2 Work sub-soil area following natural grade contour lines, with vibrating sub-soiler to depth of 40 cm.
- .3 Cross sub-soil the area following the first pass.
- .4 Cultivate the soil with a chain harrow to de-clod the soil.

### **3.6 CLEANING**

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

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1        Section 01 33 00 – Submittal Procedures.
- .2        Section 01 35 29.06 - Health and Safety Requirements.
- .3        Section 31 23 33.01 – Excavating, Trenching and Backfilling.

**1.2                MEASUREMENT FOR PAYMENT**

- .1        See Section 01 29 00 – Payment Procedures.

**1.3                REFERENCES**

- .1        Definitions:
  - .1        Rock: any solid material in excess of 1.00 m<sup>3</sup> and which cannot be removed by means of heavy duty mechanical excavating equipment with 0.95 to 1.15 m<sup>3</sup> bucket. Frozen material not classified as rock.
  - .2        PPV: peak particle velocity.
  - .3        Rock Embankment: Large stone material installed along shoreline embankment.

**1.4                ACTION AND INFORMATIONAL SUBMITTALS**

- .1        Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2        Sustainable Standards Certification:
  - .1        Construction Waste Management: submit copy of Waste Management Plan for project highlighting recycling and salvage requirements.
  - .2        Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 75% of construction wastes were recycled or salvaged.
  - .3        Erosion and Sedimentation Control: submit copy of Environmental Protection Plan for project highlighting implementation measures.

**1.5                DELIVERY, STORAGE AND HANDLING**

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

**1.6                WASTE MANAGEMENT AND DISPOSAL**

- .1        Collect and separate plastic packaging corrugated cardboard in accordance with Waste Management Plan.
- .2        Place materials defined as hazardous or toxic in designated containers.
- .3        Ensure emptied containers are sealed and stored safely.

**Part 2 Products**

**2.1 MATERIALS**

- .1 Not used.

**Part 3 Execution**

**3.1 ROCK REMOVAL**

- .1 Perform excavation in accordance with Environmental Protection Plan.
- .2 Co-ordinate this section with Section 01 35 29.06 - Health and Safety Requirements.
- .3 Remove rock to alignments, profiles, and cross sections as indicated.
- .4 Use rock removal procedures to produce uniform and stable excavation surfaces. Minimize overbreak, and to avoid damage to adjacent structures.
- .5 Excavate rock to horizontal surfaces with slope not to exceed 5%.
- .6 Prepare rock surfaces which are to bond to concrete, by scaling, pressure washing and broom cleaning surfaces.
- .7 Excavate trenches to lines and grades to minimum of 300 mm below pipe invert indicated. Provide recesses for bell and spigot pipe to ensure bearing will occur uniformly along barrel of pipe.
- .8 Cut trenches to widths as indicated.
- .9 Use pre-shearing or other smooth wall drilling unless specified otherwise or directed by Departmental Representative.
- .10 Remove boulders and fragments which may slide or roll into excavated areas.
- .11 Correct unauthorized rock removal at no extra cost, in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.

**3.2 CLEANING**

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

**3.3 PROTECTION**

- .1 Prevent damage to surroundings and injury to persons.

**END OF SECTION**

**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 Section 01 00 01 – Project Specific General Requirements
- .2 Section 01 35 43 - Environmental Procedures
- .3 Section 02 41 23 - Selective Site Demolition.
- .4 Section 31 05 17 - Aggregate Materials.

**1.2 GENERAL REQUIREMENTS**

- .1 The Work under this section shall include the supply of labour, supervision, materials, equipment, and transportation necessary to complete excavation and backfill as shown on the Contract Drawings, per the Specifications, and as directed by the Departmental Representative complete in every respect.
- .2 Generally, the Work includes but is not necessarily limited to the following:
  - .1 Excavation of pipe trench, manhole, pumping station and septic tank installation.
  - .2 Dewatering.
  - .3 Backfilling of select materials.
  - .4 Compacting fill materials.
  - .5 Removal from site all excavated materials except for material required for backfilling and grading.

**1.3 MEASUREMENT PROCEDURES**

- .1 Excavated materials will be measured in cubic metres in their original location:
  - .1 Common Unclassified excavation quantities measured will be actual volume removed within following limits:
    - .2 Width for trench excavation as indicated.
    - .3 Width for excavation for structures as indicated.
    - .4 Depth from ground elevation and surface of pavement surface of sidewalk immediately prior to excavation, to elevation as indicated as directed by Departmental Representative.
- .2 Rock quantities measured will be actual volume removed within following limits:
  - .1 Width for trench excavation as indicated.

- .2 Width for excavation for structures to be bounded by vertical planes up to 500 mm outside of and parallel to neat lines of footings as indicated.
- .3 Depth from rock surface elevations immediately prior to excavation, to elevation as indicated.
- .3 Where design elevation is less than 300 mm below original rock surface, depth will be considered to be 300 mm below original rock surface.
- .4 Volume of individual boulders and rock fragments will be determined by measuring three maximum mutually perpendicular dimensions.
- .5 Shoring, bracing, cofferdams, underpinning and de-watering of excavation will not be measured separately for payment.
- .6 Backfilling to authorized excavation limits will be measured in cubic metres compacted in place for each type of material specified.
- .7 Placing and spreading of topsoil will be measured for payment in cubic metres calculated from cross sections taken in area of excavation from original location.
- .8 If double handling of topsoil is directed by Departmental Representative (stockpiling and later placing), then quantities will be measured twice; on excavation from original location and on excavation from stockpile.

#### **1.4 REFERENCES**

- .1 Prince Edward Island Department of Transportation, Infrastructure and Energy Standard Specifications (most recent version):
  - .1 PEITIE Standard Specification Item 217 – Trench Excavation and Backfilling
  - .2 PEITIE Standard Specification Item 402 – Bedding Material

#### **1.5 DEFINITIONS**

- .1 Excavation classes: two classes of excavation will be recognized; common excavation and rock excavation:
  - .1 Rock: solid material in excess of 1.00 m ; and which cannot be removed by means of heavy duty mechanical excavating equipment with 0.95 to 1.15 m ; bucket. Frozen material not classified as rock.
  - .2 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.
- .2 Unclassified excavation: excavation of deposits of whatever character encountered in Work.
- .3 Waste material: excavated material unsuitable for use in Work or surplus to requirements.

- .4 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.
- .5 Recycled fill material: material, considered inert, obtained from alternate sources and engineered to meet requirements of fill areas.
- .6 Unsuitable materials:
  - .1 Weak, chemically unstable, and compressible materials.
  - .2 Frost susceptible materials:
  - .3 Fine grained soils with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to ASTM D422 and ASTM C136: Sieve sizes to CAN/CGSB-8.1 CAN/CGSB-8.2.

.1 Table:

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

- .4 Coarse grained soils containing more than 20% by mass passing 0.075 mm sieve.
- .7 Unshrinkable fill: very weak mixture of cement, concrete aggregates and water that resists settlement when placed in utility trenches, and capable of being readily excavated.

## 1.6 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Make submittals in accordance with Section 01 00 01 – Project Specific General Requirements.
- .2 Quality Control: in accordance with Section 01 45 00 - Quality Control:
  - .1 Submit condition survey of existing conditions as described in EXISTING CONDITIONS article of this Section.
- .3 Submit for review by the Departmental Representative proposed dewatering and heave prevention methods as described in PART 3 of this Section.
- .4 Submit to the Departmental Representative written notice at least 7 days prior to excavation work, to ensure cross sections are taken.
- .5 Submit to the Departmental Representative written notice when bottom of excavation is reached.
- .6 Submit to the Departmental Representative testing inspection results and report as described in PART 3 of this Section.

- .7 Preconstruction Submittals:
  - .1 Submit construction equipment list for major equipment to be used in this section prior to start of Work.
  - .2 Submit records of underground utility locates, indicating: location plan of existing utilities as found in field clearance record from utility authority location plan of relocated and abandoned services, as required.
- .8 Samples:
  - .1 Submit samples in accordance with Section 01 00 01 – Project Specific General Requirements.
  - .2 Inform the Departmental Representative at least 4 weeks prior to beginning Work, of proposed source of fill, unshrinkable fill materials, and provide access for sampling.
  - .3 Submit 70 kg samples of type of fill unshrinkable fill specified including representative samples of excavated material.
  - .4 Ship samples prepaid to the Departmental Representative, in tightly closed containers to prevent contamination and exposure to elements.

## **1.7 QUALITY ASSURANCE**

- .1 Submit design and supporting data at least 2 weeks prior to beginning Work.
- .2 Design and supporting data submitted to bear stamp and signature of qualified professional engineer registered or licensed in Province of Prince Edward Island, Canada.
- .3 Keep design and supporting data on site.
- .4 Engage services of qualified professional Engineer who is registered or licensed in Province of Prince Edward Island, Canada in which Work is to be carried out to design and inspect cofferdams, shoring, bracing and underpinning required for Work.
- .5 Do not use soil material until written report of soil test results are reviewed and approved by the Departmental Representative.
- .6 Health and Safety Requirements:
  - .1 Do construction occupational health and safety in accordance with Section 01 35 30 - Health and Safety Requirements.

## **1.8 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Divert excess aggregate materials from landfill to local quarry recycling facility for reuse as directed by Departmental Representative.

## 1.9 EXISTING CONDITIONS

- .1 Buried services:
  - .1 Before commencing work, Contractor shall verify and establish location of buried services on and adjacent to site.
  - .2 Arrange with appropriate authority for relocation of buried services that interfere with execution of work: pay costs of relocating services.
  - .3 Remove obsolete buried services within 2 m of foundations: cap cut-offs.
  - .4 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.
- .2 Prior to beginning excavation Work, notify Departmental Representative and authorities having jurisdiction, establish location, and state of use of buried utilities and structures. Authorities having jurisdiction to clearly mark such locations to prevent disturbance during Work.
- .3 Confirm locations of buried utilities by careful test excavations/soil hydrovac methods.
- .4 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered as indicated.
- .5 Where utility lines or structures exist in area of excavation, obtain direction of Departmental Representative before removing/re-routing.
- .6 Record location of maintained, re-routed and abandoned underground lines.
- .7 Confirm locations of recent excavations adjacent to area of excavation.
- .8 Existing buildings and surface features:
  - .1 Conduct, with Departmental Representative, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, rail tracks, pavement, survey bench marks and monuments which may be affected by Work.
  - .2 Protect existing buildings and surface features from damage while Work is in progress. In event of damage, immediately make repair as directed by Departmental Representative.
- .9 Where required for excavation, cut roots or branches as directed by Departmental Representative.

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**Part 2 Products**

**2.1 MATERIALS**

- .1 Fill: properties to Section 31 05 16 - Aggregate Materials and the following requirements:
  - .1 PEITIE Standard Specification Item 402 – Bedding Material
  - .2 Other fill material: selected material from excavation or other sources, approved by Departmental 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 TEMPORARY EROSION AND SEDIMENTATION CONTROL**

- .1 Submit environmental protection plan to Departmental Representative for approval.
- .2 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 sediment and erosion control plan, specific to site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.
- .3 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .4 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

**3.2 SITE PREPARATION**

- .1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.
- .2 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly in accordance with Section 02 41 13 - Selective Site Demolition.

**3.3 PREPARATION/PROTECTION**

- .1 Protect existing features in accordance with applicable local regulations.
- .2 Keep excavations clean, free of standing water, and loose soil.
- .3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to the Departmental Representative approval.
- .4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction.

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

### **3.4 STOCKPILING**

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

### **3.5 COFFERDAMS, SHORING, BRACING AND UNDERPINNING**

- .1 Maintain sides and slopes of excavations in safe condition by appropriate methods and in accordance with Section 01 35 30 - Health and Safety Requirements and Health and Safety Act for the Province of Prince Edward Island:
  - .1 Where conditions are unstable, Departmental Representative to verify and advise methods.
  - .2 Obtain permit from authority having jurisdiction for temporary diversion of water course.
  - .3 Construct temporary Works to depths, heights and locations indicated
- .2 Upon completion of substructure construction:
  - .1 Remove cofferdams, shoring and bracing.
- .3 Remove excess materials from site and restore watercourses as indicated and as directed by Departmental Representative.

### **3.6 DEWATERING AND HEAVE PREVENTION**

- .1 Keep excavations free of water while Work is in progress.
- .2 Provide for the Departmental Representative's review approval details of proposed dewatering or heave prevention methods, including dikes, well points, and sheet pile cut-offs.
- .3 Avoid excavation below groundwater table if quick condition or heave is likely to occur:
  - .1 Prevent piping or bottom heave of excavations by groundwater lowering, or other means.
- .4 Protect open excavations against flooding and damage due to surface run-off.
- .5 Dispose of water in accordance with Section 01 35 43 - Environmental Procedures to approved collection runoff areas and in manner not detrimental to public and private property, or portion of Work completed or under construction:

- .1 Provide and maintain temporary drainage ditches and other diversions outside of excavation limits.
- .6 Provide flocculation tanks, settling basins, or other treatment facilities to remove suspended solids or other materials before discharging to storm sewers, water courses or drainage areas.

### 3.7 EXCAVATION

- .1 Advise Departmental Representative at least 7 days in advance of excavation operations for initial cross sections to be taken. Excavate to lines, grades, elevations and dimensions as indicated.
- .2 Remove concrete masonry/paving walks/demolished foundations, and rubble and other obstructions encountered during excavation in accordance with Section 02 41 13 - Selective Site Demolition.
- .3 Excavation must not interfere with bearing capacity of adjacent foundations.
- .4 Do not disturb soil within branch spread of trees or shrubs that are to remain:
  - .1 If excavating through roots, excavate by hand and cut roots with sharp axe or saw.
- .5 For trench excavation, unless otherwise authorized by the Departmental Representative in writing, do not excavate more than 30 m of trench in advance of installation operations and do not leave open more than 15 m at end of day's operation.
- .6 Keep excavated and stockpiled materials safe distance away from edge of trench as directed by the Departmental Representative.
- .7 Restrict vehicle operations directly adjacent to open trenches.
- .8 Dispose of surplus and unsuitable excavated material in approved location off site.
- .9 Do not obstruct flow of surface drainage or natural watercourses. Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.
- .10 Notify the Departmental Representative when bottom of excavation is reached.
- .11 Obtain the Departmental Representative approval of completed excavation.
- .12 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth as directed by the Departmental Representative.
- .13 Correct unauthorized over-excavation as follows:
  - .1 Fill with PEITIE Item 207 – Granular Base compacted to not less than 98 % of corrected Standard Proctor maximum dry density.
- .14 Hand trim, make firm and remove loose material and debris from excavations:

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

### **3.8 FILL TYPES AND COMPACTION**

- .1 Use types of fill as indicated on drawings, or specified below. Compaction densities are percentages of maximum dry densities obtained from ASTM D698:
  - .1 Fill with PEITIE Item 207 – Granular Base compacted to not less than 98 % of corrected Standard Proctor maximum dry density

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

- .1 Place and compact granular material for bedding and surround of underground services as indicated and as specified in Section 33 34 00 – Sanitary Utility Sewerage Force Mains and Section 33 42 13 – Pipe Culverts.
- .2 Place bedding and surround material in unfrozen condition.

### **3.10 BACKFILLING**

- .1 Do not proceed with backfilling operations until completion of following:
  - .1 Departmental Representative has inspected and approved installations.
  - .2 Departmental Representative has inspected and approved of construction below finish grade.
  - .3 Inspection, testing, approval, and recording location of underground utilities.
  - .4 Removal of concrete formwork.
  - .5 Removal of shoring and bracing; backfilling of voids with satisfactory soil material.
- .2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .3 Do not use backfill material which is frozen or contains ice, snow or debris.
- .4 The lift thickness should not exceed approximately 300 mm for mass filling and 200 mm for backfilling of foundations and services.
- .5 Backfilling around installations:
  - .1 Place bedding and surround material as specified elsewhere.
  - .2 Place layers simultaneously on both sides of installed Work to equalize loading. Difference not to exceed 0.3 m.

**3.11 RESTORATION**

- .1 Upon completion of Work, remove waste materials and debris in accordance to Section 01 74 21 - Construction/Demolition Waste Management and Disposal, trim slopes, and correct defects as directed by the Departmental Representative.
- .2 Replace topsoil as directed by the Departmental Representative.
- .3 Reinstate lawns to elevation which existed before excavation.
- .4 Reinstate pavements and sidewalks disturbed by excavation to thickness, structure and elevation which existed before excavation.
- .5 Clean and reinstate areas affected by Work as directed by the Departmental Representative.
- .6 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1    Section 31 23 33.01    Excavation, Trenching and Backfilling
- .2    Section 33 31 13        Public Sanitary Sewerage Piping

**1.2                REFERENCE STANDARDS**

- .1    American National Standards Institute (ANSI)/American Water Works Association (AWWA)
- .2    ASTM International
  - .1    ASTM C 478M-11, Standard Specification for Precast Reinforced Concrete Manhole Sections-Metric.
- .3    Canadian Standards Association (CSA)
  - .1    CSA C22.1-15, Canadian Electrical Code, Part 1 (23rd Edition), Safety Standard for Electrical Installations.

**1.3                ADMINISTRATIVE REQUIREMENTS**

- .1    Scheduling:
  - .1    Schedule Work to minimize interruptions to existing services.
  - .2    Submit schedule of expected interruptions and adhere to schedule approved by Departmental Representative.
  - .3    Notify Departmental Representative a minimum of 24 hours in advance of interruption in service.

**1.4                ACTION AND INFORMATIONAL SUBMITTALS**

- .1    Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2    Product Data:
  - .1    Submit manufacturer's instructions, printed product literature and data sheets for packaged sewage lift and include product characteristics, performance criteria, physical size, finish and limitations.
- .3    Shop Drawings:
  - .1    Submit drawings stamped and signed by professional engineer registered or licensed in Prince Edward Island, Canada.
  - .2    Submit drawings for civil, structural, hydraulic, mechanical, and electrical elements.

## **1.5 CLOSEOUT SUBMITTALS**

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for sewage lift station for incorporation into manual.
- .3 Include information as follows:
  - .1 Record drawings, wiring diagrams, electrical schematics of equipment as installed.
  - .2 Interconnections with numbers and wire sizes.
  - .3 Pump characteristic curves.
  - .4 Detailed operation and maintenance instructions.
  - .5 Parts list comprising complete schedule clearly identified to facilitate re-ordering.

## **1.6 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials in accordance with manufacturer's recommendations.
  - .2 Store and protect pipes from damage.
  - .3 Replace defective or damaged materials with new.

## **Part 2 Materials**

### **2.1 DESCRIPTION**

- .1 Reinforced concrete enclosure.
  - .1 Pumping system: factory assembled and disassembled for shipment with mating components clearly identified.
  - .2 Principal items of equipment to include 2 submersible sewage pumping units, internal piping and valves, liquid level controls, lifting chains, guide bars, debris screen, vents complete with screens, cover, electrical wiring, control panel with circuit breakers and motor starters.
- .2 Equipment and installation including as follows:
  - .1 Installation of excavation protection.
  - .2 Excavation for sewage lift station.
  - .3 Placement of bedding material.
  - .4 Connection of power to control panel as indicated.
  - .5 Connections to septic tank, valve chamber and force main.

- .6 Supply and installation of packaged sewage lift station in accordance with manufacturer's recommendations.
- .3 Wet well sewage lift station:
  - .1 Fully automatic, consisting of duplex submersible pump mounted on lift station bottom.
  - .2 Locate control panel above wet well.

## 2.2 WET WELL STRUCTURE

- .1 Structure: leak free, precast, reinforced concrete with access opening, ladder and designed for following forces:
  - .1 Dead load of station and components, dynamic and kinetic forces of rotating equipment.
  - .2 Dead load from soil over structure.
  - .3 Hydrostatic uplift forces.
- .2 Waterproof exterior surfaces below grade in accordance with manufacturer specifications
- .3 Materials:
  - .1 Precast concrete to CAN/CSA-A257.

## 2.3 ACCESS HATCH

- .1 Aluminum gratings and covers to bear evenly on frames.
- .2 Frame with grating or cover to constitute one unit.
- .3 Recessed lockable hasp
- .4 Integral safety grate
- .5 Min opening 1000 mm by 780 mm, or to facilitate removal of pump, whichever is greater
- .6 Hinge to allow for securing in open position
- .7 Two hatches required, one for each pump.

## 2.4 PUMPS

- .1 Non-clog, heavy duty, explosion-proof, totally submersible centrifugal pumps, direct connected to motor by solid stainless steel shaft and fitted with thrust bearings.
- .2 Characteristics:
  - .1 Capacity: 3.4 L/s minimum.
  - .2 Total dynamic head: 14.3 m.
  - .3 Maximum speed: 3300 rpm.
  - .4 Discharge diameter: 40 mm
- .3 Volute casing: cast iron, minimum grade Class 30, close coupled.
- .4 Impeller: cast iron, semi-open multi channel with integral cutter. All fasteners to be stainless steel.

- .5 Acceptable product: Xylem MP 3068 or approved alternate.

## **2.5 PUMP LIFTING SYSTEM**

- .1 Ensure pumps are complete with sliding guide and brackets, chains and quick leak-proof disconnect to discharge piping, all allowing for withdrawal of pumps.
- .2 Include galvanized lifting chain or stainless steel cable for each pump accessible from roof access hatches.
- .3 Use galvanized steel pipe as quick rails for pump.

## **2.6 SUBMERSIBLE MOTORS**

- .1 Motors:
  - .1 600V, 3 phase, 2.0 kW (2.7hp).
  - .2 Capable of operating pump at any point on selected impeller curve without exceeding motor nominal rating.
  - .3 Fully overload protected.
  - .4 Assembly capable of operating continuously in air without overheating.
  - .5 Complete with NEMA approved winding temperature sensor.
- .2 Motor speed: maximum 3300 rpm.
- .3 Motor enclosure and seal housing: corrosion resistant, completely watertight, cast iron.
- .4 Bearing: anti-friction type, greaseable, with lubrication lines and fittings, 50,000 hours minimum.
- .5 Terminal box: watertight, with waterproof cable entry glands mounted at motor.
- .6 Shaft seals: double mechanical seals with tungsten/carbide faces.
- .7 Complete with motor leads with sufficient length to reach from submersible motor to control panel. Motor leads and power cords with to be sealed and locked in place using strain bushings. All cables to be waterproof, and sized per CEC 22.1-15.

## **2.7 PUMP CONTROL SYSTEM**

- .1 Liquid level to be controlled submersible hydrostatic level transducer, suitable for raw wastewater (explosion proof) environment.
  - .1 316SS housing
  - .2 4-20mA analog output
  - .3 Level range: 0-8 m H<sub>2</sub>O
  - .4 Complete with sufficient ETFE cable from wet well to control panel
  - .5 KPSI 700 or approved alternate
- .2 Provide following independently adjustable control levels:
  - .1 Lead pump start level.
  - .2 Lead pump stop level.
  - .3 Lag pump start level.

- .4 Lag pump stop level.
- .5 High water alarm.
- .3 Pump controls to include alternating function to provide automatic pump alteration for each pumping cycle when pump sequence selection switch is in Automatic.  
  
Two (2) float switches shall be installed as emergency backup; one placed above the high water alarm, and the other placed below the pump stop. Complete with sufficient cable length to reach from wet well to control panel. Acceptable product: Xylem ENM-10.

## **2.8 PIPING AND VALVES**

- .1 Schedule 80 PVC pipe fittings and joints.
- .2 Plug valves to ANSI B1611, lever operated. Acceptable product Valmatic.
- .3 Check valves: Class 125, flapper type, suitable for horizontal application, acceptable product Valmatic.

## **2.9 CONTROL PANEL**

- .1 Use only CSA approved components, and provide CSA certified control panel.
- .2 Electrical equipment in station in accordance with requirements for Hazardous Locations, Class 1, Group D, Division 1.
- .3 Panel to be NEMA 4X. SS enclosure c/w inner swing panel, mounting plate and wall brackets
- .4 Ensure panel is complete with required components including (but not limited to):
  - .1 Main fusible disconnect switch, interlocked to control panel door.
  - .2 Motor circuit interrupter with toggle handle for each pump motor with adjustable instantaneous trip.
  - .3 Control transformer, 600V primary.
  - .4 Magnetic full voltage starter with overload relay for each pump.
  - .5 Time delay-relay, 2 - 50 second range, 10 amp minimum resistive contacts to prevent concurrent starting of pumps after power restoration.
  - .6 Dry contacts, normally open, on high water alarm relay for remote indication.
- .5 Mount following switches and instrumentation on door of panel:
  - .1 Pump mode illuminated selector switches for hands-off-automatic operation of each pump.
  - .2 Pump sequence selector switch to permit override of automatic pump alternation and selection of either pump to run as lead pump.
  - .3 Pump runtimes and Fault status lights
  - .4 1 high level alarm complete with alarm relay and red light on panel door.
- .6 Terminals in circuit of start float switch of lag pump.
- .7 Ground connection lug.
- .8 Labels: all components on and inside panel to indicate operating routine.

- .9 Schematic wiring diagram: mounted inside panel door, varnish protected.
- .10 Conductors: copper.
- .11 Control wiring: number 14 AWG minimum, stranded type TEW.
- .12 Power wire: number 12 AWG minimum, type RW 90.
- .13 Wire:
  - .1 Numbered with printed permanent indelible identifying plastic tapes to correspond to schematic diagram.
  - .2 Terminated for external control connections by tubular screw type terminal blocks with barrier and labels.
  - .3 Equipped with grommet and shields for mechanical protection.
  - .4 Adequately supported and installed in accordance with written approval of Departmental Representative.
- .14 IS Relays for 2 float switches
- .15 Battery back up and charger for controller or UPS (Uninterruptible Power Supply)
- .16 Sufficient room in panel to mount flowmeter display
- .17 HMI with adjustable set points, Unitronics Vision 570 or approved alternate
- .18 Cellular modem (Elpro 455U-D) for integration with Owner's existing VTS SCADA system
- .19 Manual transfer switch and bottom mounted service receptacle connection to Owner supplied portable emergency generator
- .20 Acceptable product: Multismart 3PC2, Unitronics V570 or approved alternate

## **2.10 FLOW METER**

- .1 50 mm, flanged, ANSI Class 150.
- .2 Caron Steel body, NBR hard rubber liner.
- .3 120V power supply
- .4 4-20mA output, min accuracy 0.4%
- .5 Complete with sufficient cable for meter in valve chamber, and display mounted in control panel.
- .6 Siemens MAG5100W c/w MAG 5000 converter, or approved alternate

## **2.11 SOURCE QUALITY CONTROL**

- .1 Perform operational tests on pumps at factory to check for excessive vibration, for leaks in piping or seals and for correct operation of automatic control system and auxiliary equipment. Pump suction and discharge lines to be coupled to reservoir and pumps to recirculate water for minimum of 1 hour under simulated service conditions.

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**Part 3 Execution**

**3.1 EXAMINATION**

- .1 Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts are acceptable for pipe installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Departmental Representative.
  - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

**3.2 EXCAVATION BACKFILLING AND COMPACTION**

- .1 Excavate, backfill and compact in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling and as indicated.

**3.3 EQUIPMENT INSTALLATION**

- .1 Install equipment, piping and controls in accordance with manufacturers' recommendations.
- .2 Electrical installation to meet the requirements of C22.1-15.

**3.4 WATERPROOFING**

- .1 Waterproof exterior of pumping station wet well with self adhesive waterproofing membrane, Bakor Blueskin or approved alternate.

**3.5 FIELD QUALITY CONTROL**

- .1 After completion of installation, demonstrate functional operation of systems, including sequence of operation, to approval of Departmental Representative.
- .2 Test in presence of Departmental Representative and representative from equipment supplier.
- .3 Provide labour and ancillary equipment necessary to fulfill tests.
- .4 Test to demonstrate that:
  - .1 Pumps and equipment run free from heating, or vibration.
  - .2 Operation meets requirements of these specifications.
  - .3 Pumps and pumping are free and clear of debris and obstructions.
- .5 Replace equipment found defective.
  - .1 Repeat test until equipment is accepted by Departmental Representative.

**3.6 DEMONSTRATION**

- .1 Operating Personnel Training

- .1 Provide on site training by qualified personnel for designated operating personnel prior to final commissioning.
  - .1 Schedule and deliver training in accordance with training plan approved in writing by Departmental Representative.
- .2 Include training for 2 designated personnel on routine maintenance procedures, minor repairs, replacement of parts, including disassembly of major components.
- .3 Include training on operation and set point adjustments of the control system.
- .4 Include safety precaution procedures for systems.

### **3.7 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

**END OF SECTION**

**Part 1            General**

**1.1                STANDARD**

- .1            All work of this section shall comply with the requirements of the most recent version of the PEITIE standard specifications.

**1.2                REFERENCE STANDARDS**

- .1            Prince Edward Island Department of Transportation, Infrastructure and Energy Standard Specifications (most recent version):
  - .1            PEITIE Standard Specification Item 208 – Fine Grading
  - .2            PEITIE Standard Specification Item 212 – Topsoil and Landscaping

**Part 2            Products**

**2.1                MATERIAL**

- .1            Per the most recent version of the PEITIE Standard Spec item 212.
- .2            Topsoil must be free from invasive species/noxious weeds. Inspection of topsoil with weed cover shall take place prior to stripping topsoil from a source location by park EPO.

**Part 3            Execution**

**3.1                GENERAL**

- .1            As per the most recent version of the PEITIE Standard Spec and in conformance with the contract documents.

**END OF SECTION**

**Part 1 GENERAL**

**1.1 STANDARD**

- .1 All work of this section shall comply with the requirement of the most recent version of the PEITIE Standard Specification Item 803, except as amended herein.

**1.2 REFERENCES**

- .1 Prince Edward Island Department of Transportation, Infrastructure and Energy Standard Specifications (most recent version):
  - .1 PEITIE Standard Specification Item 803 – Hydro Seeding

**Part 2 Products**

**2.1 MATERIALS**

- .1 As per the most recent version of the PEITIE Standard Specification Item 803 – Hydro Seeding
- .2 Mix shall be:
  - .1 40% Kentucky Bluegrass
  - .2 40% Creeping Red Fescue
  - .3 20% Perennial Ryegrass

**Part 3 Execution**

**3.1 GENERAL**

- .1 As per the PEITIE Standard Specification Item 803 – Hydro Seeding, and in conformance with the Contract Documents.

**END OF SECTION**

**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 Section 01 35 43 - Environmental Procedures
- .2 Section 02 41 23 - Selective Site Demolition.
- .3 Section 31 05 17 - Aggregate Materials.
- .4 Section 33 34 00 – Sanitary Utility Sewerage Force Mains

**1.2 REFERENCE STANDARDS**

- .1 ASTM International
  - .1 ASTM A48/A48M-[03(2012)], Standard Specification for Grey Iron Castings.
  - .2 ASTM A123/A123M-[2012], Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  - .3 ASTM C117-[13], Standard Test Method for Materials Finer than 75-mm (No. 200) Sieve in Mineral Aggregates by Washing.
  - .4 ASTM C136-[06], Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  - .5 ASTM C139-[11], Standard Specification for Concrete Masonry Units for Construction of Catch Basins and Manholes.
  - .6 ASTM C478M-[13], Standard Specification for Precast Reinforced Concrete Manhole Sections (Metric).
  - .7 ASTM D698-[12], Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup>(600 kN-m/m<sup>3</sup>)).
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-8.1-[88], Sieves, Testing, Woven Wire, Inch Series.
  - .2 CAN/CGSB-8.2-[M88], Sieves, Testing, Woven Wire, Metric.
- .3 CSA Group
  - .1 CSA A23.1/A23.2-[09], Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
  - .2 CAN/CSA-A165 Series-[04(R2009)], CSA Standards on Concrete Masonry Units (Consists of A165.1, A165.2 and A165.3).
  - .3 CAN/CSA-A3000-[08], Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
  - .4 CSA G30.18-[09], Carbon Steel Bars for Concrete Reinforcement.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for each manhole and valve chamber and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Prince Edward Island, Canada.

**1.4 QUALITY ASSURANCE**

- .1 Submit in accordance with Section 01 45 00 - Quality Control.
- .2 Certifications:
  - .1 Submit manufacturer's test data and certification at least 4 weeks prior to beginning Work. Include manufacturer's drawings, information and shop drawings where pertinent.
  - .2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
  - .3 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures and protection.

**1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions and Section 01 61 00 - Common Product Requirements.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect structures from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.
- .4 Develop Construction Waste Management Plan related to Work of this Section.
- .5 Packaging Waste Management: remove for reuse and return by manufacturer of padding, crates, packaging materials, pallets, as specified in Construction Waste Management Plan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

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**Part 2            Products**

**2.1                MATERIALS**

- .1    Precast units: to ASTM C478M, circular or oval.
  - .1        Top sections eccentric cone or flat slab top type with opening offset for vertical ladder installation (valve chamber only).
  - .2        Monolithic bases to be approved by Departmental Representative and set on concrete slabs cast in place.
- .2    Joints: made watertight using manufacturers rubber ring gaskets, bituminous compound, epoxy resin cement or cement mortar.
- .3    Mortar:
  - .1        Aggregate in accordance with Section 04 05 12 - Mortar and Masonry Grout.
  - .2        Masonry cement to CAN/CSA-A3000.
- .4    Ladder rungs: to CSA G30.18, No.25M billet steel deformed bars, hot dipped galvanized to ASTM A123/A123M.
  - .1        Rungs to be safety pattern (drop step type).
- .5    Adjusting rings: to ASTM C478M.
- .6    Concrete Brick: to CAN/CSA-A165 Series.
- .7    Galvanized iron sheet: approximately 2 mm thick.
- .8    Steel gratings, I-beams and fasteners: as indicated.
- .9    Frames, gratings, covers as indicated and following requirements:
  - .1        Valve Chamber and Grit Chamber
    - .1            Aluminum gratings and covers to bear evenly on frames.
    - .2            Frame with grating or cover to constitute one unit.
    - .3            Recessed lockable hasp
    - .4            Integral safety grate
    - .5            Min opening 1000 mm by 780 mm
    - .6            Hinge to allow for securing in open position
  - .2        Sanitary Manholes
    - .1            heavy duty cast iron.
    - .2            Minimum weight for frame plus cover is 115 kg.
    - .3            IMP R-10 with two perforations.
- .10   Granular bedding and backfill: in accordance with Section 31 05 16 - Aggregate Materials.

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**Part 3 Execution**

**3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Departmental Representative.
  - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

**3.2 EXCAVATION AND BACKFILL**

- .1 Excavate and backfill in accordance with Section 31 23 33.01 - Excavating Trenching and Backfilling and as indicated.
- .2 Obtain approval of Departmental Representative before installing valve chambers.

**3.3 INSTALLATION**

- .1 Construct units in accordance with details indicated, plumb and true to alignment and grade.
- .2 Complete units as pipe laying progresses.
  - .1 Maximum of 3 units behind point of pipe laying will be allowed.
- .3 Dewater excavation to approval of Departmental Representative and remove soft and foreign material before placing concrete base.
- .4 Set precast concrete base on 150 mm minimum of granular bedding compacted to 98% corrected maximum dry density.
- .5 Precast units:
  - .1 Make each successive joint watertight with Departmental Representative's approved rubber ring gaskets, bituminous compound, cement mortar, epoxy resin cement, or combination of these materials.
  - .2 Clean surplus mortar and joint compounds from interior surface of unit as work progresses.
  - .3 Plug lifting holes with precast concrete plugs set in cement mortar or mastic compound.
- .6 For sewers:
  - .1 Place stub outlets and bulkheads at elevations and in positions indicated.
  - .2 Bench to provide a smooth U-shaped channel. Side height of channel to be 0.75 times full diameter of sewer.
  - .3 Slope adjacent floor at 1 in 20. Curve channels smoothly. Slope invert to establish sewer grade.

- .7 Compact granular backfill to 98% corrected maximum dry density.
- .8 Place unshrinkable backfill in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.
- .9 Installing units in existing systems:
  - .1 Where new unit is installed in existing run of pipe, ensure full support of existing pipe during installation, and carefully remove that portion of existing pipe to dimensions required and install new unit as specified.
  - .2 Make joints watertight between new unit and existing pipe.
  - .3 Where deemed expedient to maintain service around existing pipes and when systems constructed under this project are ready for operation, complete installation with appropriate break-outs, removals, redirection of flows, blocking unused pipes or other necessary work.
- .10 Set frame and cover to required elevation on no more than 4 courses of brick.
  - .1 Make brick joints and join brick to frame with cement mortar.
  - .2 Parge and make smooth and watertight.
- .11 Place frame and cover on top section to elevation as indicated.
  - .1 If adjustment required use concrete ring.
- .12 Clean units of debris and foreign materials.
  - .1 Remove fins and sharp projections.
  - .2 Prevent debris from entering system.
- .13 Install safety platforms in valve chambers having depth of 5 m or greater, as indicated.

### **3.4 TESTING FOR SANITARY MANHOLES**

- .1 The contractor is to ensure that the manholes are water tight.
- .2 Contractor is to follow manufacturers and Engineers instructions for testing manholes.
- .3 Backfill prior to testing.
- .4 Notify Engineer 24 hours in advance of proposed test. Do test in presence of Engineer.
- .5 Vacuum Test:
  - .1 Plug all inlet and outlet pipes with secured, braced, watertight plugs.
  - .2 Place vacuum tester on top of the structure and draw a vacuum of 10" Hg.
  - .3 The length of time for testing will be no less than:
    - .1 60 seconds for structures up to and including 1,250 mm.
    - .2 75 seconds for 1500 mm structures.
    - .3 90 seconds for 1800 mm structures.
  - .4 The allowable vacuum drop shall not be greater than the 1" Hg over the specified time period.

- .5 If the structure fails the initial test, the contractor shall locate and make any repairs with an Engineer approved non-shrink quick setting material and then retest the structure. Only grouting of seams is permitted. If grouting of interior surface of concrete is required, then the engineer reserves the right to have the structure removed and replaced at no additional cost.
- .6 Repair visible leaks regardless of test results

### **3.5 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 – Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

**END OF SECTION**

**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 Not used.

**1.2 REFERENCE STANDARDS**

- .1 American National Standards Institute/American Water Works Association  
ANSI/AWWA
  - .1 ANSI/AWWA B301, Standard for Liquid Chlorine.
  - .2 ANSI/AWWA C651, Standard for Disinfecting Water Mains.
  - .3 ANSI/AWWA C800, Standard for Underground Service Line Valves and Fittings.
  - .4 ANSI/AWWA C900, Standard for Polyvinyl Chloride (PVC) Pressure Pipe, and Fabricated Fittings, 4 Inch through 12 Inch (100 mm - 300 mm), for Water Transmission and Distribution.
- .2 CSA International
  - .1 CAN/CSA-B137 Series, Thermoplastic Pressure Piping Compendium. Consists of B137.0, B137.1, B137.2, B137.3, B137.4, B137.4.1, B137.5, B137.6, B137.8, B137.9, B137.10, B137.11 and B137.12.
    - .1 CAN/CSA-B137.1, Polyethylene Pipe, Tubing, and Fittings for Cold-Water Pressure Services.
    - .2 CAN/CSA-B137.3, Rigid Polyvinyl Chloride (PVC) Pipe for Pressure Applications.

**1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for distribution piping materials and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Pipe certification to be on pipe.
- .3 Shop Drawings:
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Prince Edward Island, Canada.
  - .2 Submit complete drawings and construction schedule for water mains [600] mm diameter and larger. Include method for installation of water main.

**1.4 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, details of pipe material, location of air and vacuum release valves, hydrant details.
  - .1 Include top of pipe, horizontal location of fittings and type, valves, valve boxes, valve chambers and hydrants.
- .3 Operation and Maintenance Data: submit operation and maintenance data for pipe, valves, valve boxes, valve chambers and hydrants for incorporation into manual.

## **1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect water distribution piping from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.

## **1.6 SCHEDULING OF WORK**

- .1 Schedule Work to minimize interruptions to existing services.
- .2 Submit schedule of expected interruptions for approval and adhere to interruption schedule as approved by Departmental Representative.
- .3 Notify Departmental Representative minimum of 24 hours in advance of interruption in service.
- .4 Notify fire department of planned or accidental interruption of water supply to hydrants.
- .5 Provide and post "Out of Service" sign on hydrant not in use.
- .6 Advise local police department of anticipated interference with movement of traffic.

## **Part 2 Products**

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

- .1 Polyvinyl chloride pressure pipe: to ANSI/AWWA C900, pressure class 150, DR 18, 1 MPa gasket bell end.
  - .1 CAN/CSA-B137.3, PVC series 160, 1.1 MPa elastomeric gasket coupling.
- .2 Polyethylene pressure pipe:
  - .1 NPS 1/2 to NPS 6: to ASTM F714, DR 11 CAN/CSA-B137.1 type 160.
  - .2 Polyethylene fittings: to CAN/CSA-B137.1, for pipe sizes NPS 4 and less.

## **2.2 VALVES AND VALVE BOXES**

- .1 Gate valves: to ANSI/AWWA C500, standard iron body, brass mounted wedge valves with non-rising stems, suitable for 1 Pa with flanged joints.
- .2 Cast iron valve boxes: three piece sliding type adjustable over minimum of 450 mm complete with valve operating extension rod, 150 mm below cover.
  - .1 Top of box to be marked "WATER"/"EAU".

## **2.3 PIPE BEDDING AND SURROUND MATERIAL**

- .1 Granular material to: Section 31 05 16 - Aggregate Materials and following requirements:
  - .1 Crushed or screened stone, gravel or sand.

## **2.4 BACKFILL MATERIAL**

- .1 As indicated.

## **2.5 PIPE DISINFECTION**

- .1 Liquid chlorine to ANSI/AWWA B301 to disinfect water mains.
- .2 Disinfect water mains in accordance with ANSI/AWWA C651.

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for distribution piping installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Departmental Representative.
  - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

### **3.2 PREPARATION**

- .1 Clean pipes, fittings, valves, hydrants, and appurtenances of accumulated debris and water before installation.
  - .1 Inspect materials for defects to approval of DCC Representative.
  - .2 Remove defective materials from site as directed by Departmental Representative.

### 3.3 TRENCHING

- .1 Do trenching work in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.

### 3.4 GRANULAR BEDDING

- .1 Place granular bedding material in uniform layers not exceeding 150 mm compacted thickness to depth of 150 mm below bottom of pipe.
- .2 Do not place material in frozen condition.
- .3 Shape bed true to grade to provide continuous uniform bearing surface for pipe.
- .4 Shape transverse depressions in bedding as required to suit joints.
- .5 Compact each layer full width of bed to 95 % maximum density to ASTM D698.
- .6 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 with compacted bedding material.

### 3.5 PIPE INSTALLATION

- .1 Lay pipes manufacturer's standard instructions and specifications.
  - .1 Do not use blocks except as specified.
- .2 Join pipes in accordance manufacturer's recommendations.
- .3 Bevel or taper ends of PVC pipe to match fittings.
- .4 Handle pipe by methods 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 1] 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 Departmental 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 Departmental 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 Departmental Representative before surrounding and covering joints and fittings with granular material.
- .22 Backfill remainder of trench.

### **3.6 RESTRAINED JOINTS**

- .1 For restrained joints: only use restrained joints approved by Departmental Representative.

### **3.7 HYDROSTATIC AND LEAKAGE TESTING**

- .1 Do tests in accordance with ANSI/AWWA C600.
- .2 Provide labour, equipment and materials required to perform hydrostatic and leakage tests hereinafter described.
- .3 Notify Consultant Departmental Representative at least 24 hours in advance of proposed tests.
  - .1 Perform tests in presence of Departmental Representative.
- .4 Test pipeline in sections not exceeding 365 m in length, unless otherwise authorized by Departmental Representative.

- .5 Upon completion of pipe laying and after Departmental Representative has inspected Work in place, surround and cover pipes between joints with approved granular material placed as directed by DCC Representative.
- .6 Leave hydrants, valves, joints and fittings exposed.
- .7 When testing is done during freezing weather, protect hydrants, valves, joints and fittings from freezing.
- .8 Strut and brace caps, bends, tees, and valves, to prevent movement when test pressure is applied.
- .9 Open valves.
- .10 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.
- .11 Thoroughly examine exposed parts and correct for leakage as necessary.
- .12 Apply hydrostatic test pressure of 2 hours.
- .13 Examine exposed pipe, joints, fittings and appurtenances while system is under pressure.
- .14 Remove joints, fittings and appurtenances found defective and replace with new sound material and make watertight.
- .15 Repeat hydrostatic test until defects have been corrected.
- .16 Apply leakage test pressure of 2 hours.
- .17 Define leakage as amount of water supplied from water metre in order to maintain test pressure for 2 hours.
- .18 Do not exceed allowable leakage as indicated in AWWA C600.
- .19 Locate and repair defects if leakage is greater than amount specified.
- .20 Repeat test until leakage is within specified allowance for full length of water main.

### **3.8 PIPE SURROUND**

- .1 Upon completion of pipe laying and after Departmental Representative has inspected Work in place, surround and cover pipes as indicated.
- .2 Hand place surround material in uniform layers not exceeding 150 mm compacted thickness as indicated.
- .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 [underside of backfill to at least 95 % maximum density to ASTM D698.

**3.9 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 Compact to at least 95 % maximum density to ASTM D698.

**3.10 FLUSHING AND DISINFECTING**

- .1 Flushing and disinfecting operations: witnessed by Departmental Representative .
  - .1 Notify Departmental Representative at least 4 days in advance of proposed date when disinfecting operations will begin.
- .2 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.
- .3 Flushing flows as follows:

Pipe Size NPS	Flow (L/s) Minimum
6 and below	38
8	75
10	115
12	150

- .4 Provide connections and pumps for flushing as required.
- .5 Open and close valves, hydrants and service connections to ensure thorough flushing.
- .6 When flushing has been completed to Departmental Representative approval, introduce strong solution of chlorine as approved by Departmental Representative into water main and ensure that it is distributed throughout entire system.
- .7 Rate of chlorine application to be proportional to rate of water entering pipe.
- .8 Chlorine application to be close to point of filling water main and to occur at same time.
- .9 Operate valves, hydrants and appurtenances while main contains chlorine solution.
- .10 Flush line to remove chlorine solution after 24 hours.
- .11 Measure chlorine residuals at extreme end of pipe-line being tested.
- .12 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.
  - .3 Specialist contractor to submit certified copy of test results.
- .13 Take water samples at hydrants and service connections, in suitable sequence, to test for chlorine residual.

.14 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.

### **3.11 SURFACE RESTORATION**

.1 After installing and backfilling over water mains, restore surface to original condition as directed Departmental Representative.

### **3.12 CLEANING**

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

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

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

**END OF SECTION**

**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 Not used.

**1.2 MEASUREMENT AND PAYMENT**

- .1 Measure excavation and backfill under Section 31 23 33.01 - Excavating Trenching and Backfilling.
- .2 Measure supply and installation of sanitary sewer including testing and including excavation and backfilling and granular bedding and surround.

**1.3 REFERENCE STANDARDS**

- .1 American National Standards Institute/American Water Works Association (ANSI/AWWA)
  - .1 ANSI/AWWA C111/A21.11-[07], Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
- .2 ASTM International
  - .1 ASTM C12-[09], Standard Practice for Installing Vitrified Clay Pipe Lines.
  - .2 ASTM C14M-[07], Standard Specification for Non-reinforced Concrete Sewer, Storm Drain and Culvert Pipe (Metric).
  - .3 ASTM C76M-[10a], Standard Specification for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe (Metric).
  - .4 ASTM C117-[04], Standard Test Method for Material Finer Than 75 [MU] m (No. 200) Sieve in Mineral Aggregates by Washing.
  - .5 ASTM C136-[06], Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  - .6 ASTM C425-[09], Standard Specification for Compression Joints for Vitrified Clay Pipe and Fittings.
  - .7 ASTM C428-[05(2006)], Standard Specification for Asbestos-Cement Nonpressure Sewer Pipe.
  - .8 ASTM C443M-[07], Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets (Metric).
  - .9 ASTM C663-[98(2008)], Standard Specification for Asbestos Cement Storm Drain Pipe.
  - .10 ASTM C700-[09], Standard Specification for Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated.
  - .11 ASTM C828-[06], Standard Test Method for Low-pressure Air Test of Vitrified Clay Pipe Lines.
  - .12 ASTM D698-[07e1], Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft<sup>4</sup>-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>)).

- .13 ASTM D1869-[95(2005)e1], Standard Specification for Rubber Rings for Asbestos Cement Pipe.
  - .14 ASTM D2680-[01(2009)], Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Composite Sewer Piping.
  - .15 ASTM D3034-[08], Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
  - .16 ASTM D3350-[10], Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.
- .3 CSA International
- .1 CSA A3000-[08], Cementitious Materials Compendium.
  - .2 CSA A257 Series-[09], Standards for Concrete Pipe and Manhole Sections.
  - .3 CAN/CSA-B70-[06], Cast Iron Soil Pipe, Fittings, and Means of Joining.
  - .4 CSA B1800-[11], Thermoplastic Non-pressure Pipe Compendium.
    - .1 CSA B182.1-[11], Plastic Drain and Sewer Pipe and Pipe Fittings.
    - .2 CSA B182.2-[11], PSM Type Polyvinylchloride PVC Sewer Pipe and Fittings.
    - .3 CSA B182.6-[11], Profile Polyethylene (PE) Sewer Pipe and Fittings for Leak-Proof Sewer Applications.
    - .4 CSA B182.11-[11], Standard Practice for the Installation of Thermoplastic Drain, Storm, and Sewer Pipe and Fittings.

#### **1.4 ADMINISTRATIVE REQUIREMENTS**

- .1 Scheduling:
  - .1 Schedule Work to minimize interruptions to existing services and maintain existing sewage flows during construction.
  - .2 Submit schedule of expected interruptions for approval and adhere to approved schedule.
  - .3 Notify Departmental Representative and building manager 24 hours minimum in advance of any interruption in service.

#### **1.5 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for pipes, and backfill and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Prince Edward Island, Canada.

- .2 Indicate on drawings proposed method for installing carrier pipe for under crossings.
- .4 Samples:
  - .1 Inform Departmental Representative at least 4 weeks prior to beginning Work, of proposed source of bedding materials and provide access for sampling.
- .5 Certificates:
  - .1 Certification to be marked on pipe.
- .6 Test and Evaluation Reports:
  - .1 Submit manufacturer's test data and certification 2 weeks minimum before beginning Work.
- .7 Sustainable Design Submittals:
  - .1 Erosion and Sedimentation Control: submit copy of erosion and sedimentation control plan in accordance with authorities having jurisdiction.
- .8 Construction Waste Management:
  - .1 Submit project Waste Management Plan highlighting recycling and salvage requirements.

## **1.6 DELIVERY, STORAGE AND HANDLING**

- .1 Storage and Handling Requirements:
  - .1 Store materials in accordance with manufacturer's recommendations.
  - .2 Store and protect pipes from damage.
  - .3 Replace defective or damaged materials with new. Develop Construction Waste Management Plan related to Work of this Section.

## **Part 2 Materials**

### **2.1 PLASTIC PIPE**

- .1 Gravity Pipe: Type PSM Polyvinyl Chloride (PVC): to ASTM D3034 CSA B182.2.
  - .1 Standard Dimensional Ratio (SDR): 35.
  - .2 Locked-in Separate gasket and integral bell system.
  - .3 Nominal lengths: 4m.
- .2 Pressure Pipe: Polyvinyl chloride (PVC) pipe: to ASTM D2241, ANSI/AWWA C900, CSA B137.
  - .1 DR: 18.
  - .2 Gasket bell end.
  - .3 Pipe joints: bell and spigot with rubber gaskets solvent welded joints or mechanical joints to ANSI/AWWA C111/A21.11, with transition gaskets to pipe manufacturers specifications.

- .4 Rubber gaskets: to ANSI/AWWA C111/A21.11. Gaskets for mechanical joints to be duck-tipped transition gaskets for PVC.

## **2.2 SERVICE CONNECTIONS**

- .1 Type PSM Poly (Vinyl) Chloride: to CSA B182.2.
- .2 Plastic pipe: to CSA B182.1, with push-on joints.

## **2.3 CEMENT MORTAR**

- .1 Portland cement: to CSA A3000, normal type 10.
- .2 Mix mortar 1 part by volume of cement to two parts of clean, sharp sand mixed dry.
  - .1 Add only sufficient water after mixing to give optimum consistency for placement.
  - .2 Do not use additives.

## **2.4 PIPE BEDDING AND SURROUND MATERIAL**

- .1 Granular material to following requirements:
  - .1 Crushed or screened stone, gravel, or sand.
  - .2 Gradations to be within limits specified in PEITIE Standard Specifications Item 402 – Bedding Material
  - .3 Concrete mixes and materials for cradles, encasement, supports: to Section 03 30 00 - Cast-in-Place Concrete.

## **2.5 BACKFILL MATERIAL**

- .1 As indicated.
- .2 In accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.
- .3 Unshrinkable fill: to Section 31 23 33.01 - Excavating, Trenching and Backfilling.

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts are acceptable for pipe installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Departmental Representative.
  - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

### **3.2 PREPARATION**

- .1 Temporary Erosion and Sedimentation Control:
  - .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to sediment and erosion control drawings and sediment and erosion control plan, specific to site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent 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.
- .2 Clean pipes and fittings of debris and water before installation, and remove defective materials from site to approval of Departmental Representative.
- .3 Clean and dry pipes and fittings before installation.
- .4 Obtain Departmental Representative's approval of pipes and fittings prior to installation.

### **3.3 TRENCHING**

- .1 Do trenching Work in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.
- .2 Protect trench from contents of sewer or sewer connection.
- .3 Trench alignment and depth require approval of Departmental Representative prior to placing bedding material and pipe.

### **3.4 CONCRETE BEDDING AND ENCASEMENT**

- .1 Place concrete to details as indicated by Departmental Representative.
- .2 Position pipe on concrete blocks to facilitate placing of concrete.
  - .1 When necessary, rigidly anchor or weight pipe to prevent flotation when concrete is placed.
- .3 Do not backfill over concrete within 24 hours after placing.

### **3.5 GRANULAR BEDDING**

- .1 Place bedding in unfrozen condition.
- .2 Place granular bedding materials in uniform layers not exceeding 150mm compacted thickness to depth as indicated.
- .3 Shape bed true to grade and to provide continuous, uniform bearing surface for pipe.
  - .1 Do not use blocks when bedding pipe.
- .4 Shape transverse depressions as required to suit joints.
- .5 Compact each layer full width of bed to at least 95% corrected maximum dry density.

- .6 Fill excavation below bottom of specified bedding adjacent to manholes or structures with compacted bedding material.

### 3.6 INSTALLATION

- .1 Lay and join pipes to: ASTM C12.
- .2 Lay and join pipes in accordance with manufacturer's recommendations and to approval of Departmental Representative.
- .3 Handle pipe using methods approved by Departmental Representative.
  - .1 Do not use chains or cables passed through rigid pipe bore so that weight of pipe bears upon pipe ends.
- .4 Lay pipes on prepared bed, true to line and grade, with pipe invert smooth and free of sags or high points.
  - .1 Ensure barrel of each pipe is in contact with shaped bed throughout its full length. Tolerances: 10mm.
- .5 Begin laying at outlet and proceed in upstream direction with socket ends of pipe facing upgrade.
- .6 Joint deflection permitted within limits recommended by pipe manufacturer.
- .7 Water to flow through pipe during construction, only as permitted Departmental Representative.
- .8 Whenever Work is suspended, install removable watertight bulkhead at open end of last pipe laid to prevent entry of foreign materials.
- .9 Install plastic pipe and fittings in accordance with CSA B182.11.
- .10 Pipe jointing:
  - .1 Install gaskets in accordance with manufacturer's written recommendations.
  - .2 Support pipes with hand slings or crane as required to minimize lateral pressure on gasket and maintain concentricity until gasket is properly positioned.
  - .3 Align pipes before joining.
  - .4 Maintain pipe joints free from mud, silt, gravel and foreign material.
  - .5 Avoid displacing gasket or contaminating with dirt or foreign material. Gaskets so disturbed to be removed, cleaned and lubricated and replaced before joining is attempted.
  - .6 Complete each joint before laying next length of pipe.
  - .7 Minimize joint deflection after joint has been made to avoid joint damage.
  - .8 At rigid structures, install pipe joints not more than 1.2m from side of structure.
  - .9 Apply sufficient pressure in making joints to ensure that joint is complete as outlined in manufacturer's recommendations.
- .11 When stoppage of Work occurs, block pipes as directed by Departmental Representative to prevent creep during down time.

- .12 Plug lifting holes with pre-fabricated plugs approved by Departmental Representative, set in shrinkage compensating grout.
- .13 Cut pipes as required for special inserts, fittings or closure pieces as recommended by pipe manufacturer, without damaging pipe or its coating and to leave smooth end at right angles to axis of pipe.
- .14 Make watertight connections to manholes.
  - .1 Use shrinkage compensating grout when suitable gaskets are not available.
- .15 Use prefabricated saddles or field connections approved by Departmental Representative, for connecting pipes to existing sewer pipes.
  - .1 Joints to be structurally sound and watertight.

### 3.7 PIPE SURROUND

- .1 Place surround material in unfrozen condition.
- .2 Upon completion of pipe laying, and after Departmental Representative has inspected pipe joints, surround and cover pipes as indicated.
  - .1 Leave joints and fittings exposed until field testing is completed.
- .3 Hand place surround material in uniform layers not exceeding 150 mm compacted thickness as indicated.
  - .1 Do not dump material within 3m of pipe.
- .4 Place layers uniformly and simultaneously on each side of pipe.
- .5 Compact each layer from pipe invert to mid height of pipe to at least 95% corrected maximum dry density.
- .6 Compact each layer from mid height of pipe to underside of backfill to at least 90% corrected maximum dry density.
- .7 When field test results are acceptable to Departmental Representative, place surround material at pipe joints.

### 3.8 BACKFILL

- .1 Place backfill material in unfrozen condition.
- .2 Place backfill material, above pipe surround in uniform layers not exceeding 150 mm compacted thickness up to grades as indicated.
- .3 Under paving and walks, compact backfill to at least 95% corrected maximum dry density.
  - .1 In other areas, compact to at least 90% corrected maximum dry density.
- .4 Place unshrinkable fill in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.

### 3.9 FIELD TESTING AND COMMISSIONING

- .1 Repair or replace pipe, pipe joint or bedding found defective.

- .2 When directed by Departmental Representative, draw tapered wooden plug with diameter of 50 mm less than nominal pipe diameter through sewer to ensure that pipe is free of obstruction.
- .3 Remove foreign material from sewers and related appurtenances by flushing with water.
- .4 Perform infiltration and exfiltration testing as soon as practicable after jointing and bedding are complete, and service connections have been installed.
- .5 Do infiltration and exfiltration test to ASTM C828.
- .6 Do infiltration and exfiltration testing as specified herein and as directed by Departmental Representative.
  - .1 Perform tests in presence of Departmental Representative.
  - .2 Notify Departmental Representative 24 hours minimum in advance of proposed tests.
- .7 Carry out tests on each section of sewer between successive manholes including service connections.
- .8 Install watertight bulkheads in suitable manner to isolate test section from rest of pipeline.
- .9 Exfiltration test:
  - .1 Fill test section with water to displace air in line. Maintain under nominal head for 24 hours to ensure absorption in pipe wall is complete before test measurements are begun.
  - .2 Immediately prior to test period add water to pipeline until there is head of 1m over interior crown of pipe measured at highest point of test section above static ground water level.
  - .3 Duration of exfiltration test: 2 hours.
  - .4 Water loss at end of test period: not to exceed maximum allowable exfiltration over any section of pipe between manholes.
- .10 Infiltration test:
  - .1 Conduct infiltration test in lieu of exfiltration test where static ground water level is 750 mm or more above top of pipe measured at highest point in line to be used.
  - .2 Do not interpolate a head greater than 750 mm to obtain an increase in allowable infiltration rate.
  - .3 Install watertight plug at upstream end of pipeline test section.
  - .4 Discontinue pumping operations for at least 3 days before test measurements are to begin and during this time, keep thoroughly wet at least one third of pipe invert perimeter.
  - .5 Prevent damage to pipe and bedding material due to flotation and erosion.
  - .6 Measure rate of flow over minimum of 1 hour, with recorded flows for each 5-minute interval.
- .11 Infiltration and exfiltration: not to exceed following limits in L per hour per 100 m of pipe, including service connections.

Nominal Pipe diameter in mm	PVC pipe
Values shown are in litres per hour per 100 metres of pipe.	
100	3.88
125	4.62
150	5.51
200	7.45
250	9.39
300	11.33
350	13.27
400	14.91
450	16.84
500	18.78
550	20.72
600	22.80
700	26.53
800	30.11
900	33.69
1000	37.56
1100	41.29
1200	45.01

- .12 Leakage: not to exceed following limits in liters per hour per mm of diameter per 100 m of sewer including service connections:
  - .1 Exfiltration, based on 600 mm head: 0.175 L.
  - .2 Infiltration: 0.150 L.
- .13 Repair and retest sewer line as required, until test results are within limits specified.
- .14 Repair visible leaks regardless of test results.
- .15 Television and photographic inspections:
  - .1 Carry out inspection of installed sewers by video camera, digital camera or by other related means.
  - .2 Provide means of access to Departmental Representative to do inspections.
- .16 Payment for inspection services and retesting of failed test are not considered additional to the contract. No additional payment will be made for CCTV inspection, testing or retesting of the line(s).

### 3.10 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

- .3      Waste Management: separate waste materials for recycling reuse in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1      Remove recycling containers and bins from site and dispose of materials at appropriate facility.

**END OF SECTION**

**Part 1 General**

**1.1 RELATED REQUIREMENTS**

**1.2 MEASUREMENT AND PAYMENT**

- .1 Measure trenching and backfilling under Section 31 23 33.01 - Excavating, Trenching and Backfilling.
- .2 Measure supply and installation of sewage force main and granular bedding and surround including excavating and backfilling in metres of each type and size of pipe installed.
  - .1 Measurement will be made of actual length in place, through valves and fittings, after work has been completed.
- .3 Measure granular bedding and surround material in cubic metres compacted in place.
- .4 Measure concrete thrust blocks in units in place concrete for thrust blocks in cubic metres in place.

**1.3 REFERENCE STANDARDS**

- .1 American National Standards Institute/American Water Works Association (ANSI/AWWA)
  - .1 ANSI/AWWA C104/A21.4-[08], Standard for Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
  - .2 ANSI/AWWA C111/A21.11-[06], Standard for Rubber Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
  - .3 ANSI/AWWA C151/A21.51-[09], Standard for Ductile-Iron Pipe, Centrifugally Cast.
  - .4 ANSI/AWWA C207-[07], Standard for Steel Pipe Flanges for Waterworks Service, Sizes 4-inch through 144-inch (100 mm through 3,600 mm).
  - .5 ANSI/AWWA C600-[10], Standard for Installation of Ductile-Iron Water Mains and Their Appurtenances.
  - .6 ANSI/AWWA C900-[07], Standard for Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4-inch through 12-inch (100 mm-300 mm), for Water Transmission and Distribution.
- .2 ASTM International
  - .1 ASTM C136-[06], Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  - .2 ASTM C117-[04], Standard Test Method for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.
  - .3 ASTM D698-[07e1], Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort ((12,400 ft-lbf/ft<sup>3</sup>) (600kN-m/m<sup>3</sup>)).
  - .4 ASTM D2241-[09], Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series).

- .5 ASTM D2310-[06], Standard Classification for Machine-Made "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe.
- .6 ASTM D2992-[06], Standard Practice for Obtaining Hydrostatic or Pressure Design Basis for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting Resin) Pipe and Fitting.
- .7 ASTM D2996-[01(07)e1], Standard Specification for Filament-Wound "Fiberglass" (Glass-Fiber- Reinforced Thermosetting Resin Pipe).
- .8 ASTM D3034-[08], Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- .3 CSA International
  - .1 CAN/CSA-B70-[06], Cast Iron Soil Pipe, Fittings, and Means of Joining.
  - .2 CSA B137 Series-[09], Thermoplastic Pressure Piping Compendium.

#### 1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Scheduling:
  - .1 Schedule Work to minimize interruptions to existing services.
  - .2 Submit schedule of expected interruptions and adhere to schedule approved by Departmental Representative.
  - .3 Notify Departmental Representative a minimum of 24 hours in advance of interruption in service.

#### 1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Contractor to submit a Sewage Flow Management Plan, which will detail the equipment and procedures to be used to manage sewage levels in the existing lift stations wet well, and flows received when disconnecting the existing sanitary forcemain.
- .3 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for for pipes and backfill and include product characteristics, performance criteria, physical size, finish and limitations.
- .4 Shop Drawings:
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Prince Edward Island, Canada.
  - .2 Submit shop drawings showing proposed method of installation for sewage force main in undercrossing.
- .5 Samples:
  - .1 Submit 4 weeks minimum before beginning Work, with proposed source of bedding materials and provide access for sampling.
  - .2 Submit for testing 2 weeks before beginning Work, samples of materials proposed for use.

- .6 Certification to be marked on pipe.
- .7 Test and Evaluation Reports: submit manufacturer's test data and certification at least 2 weeks prior to beginning Work.
- .8 Manufacturer's Instructions: submit to Departmental Representative copy of manufacturer's installation instructions.

## **1.6 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials in accordance with manufacturer's recommendations.
  - .2 Store and protect pipes from damage.
  - .3 Replace defective or damaged materials with new.
- .4 Packaging Waste Management: remove for reuse by manufacturer and return of crates, pallets, padding, packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Polyvinyl chloride (PVC) pipe: to ASTM D2241, ANSI/AWWA C900, CSA B137.
  - .1 SDR: 26.
  - .2 Gasket bell end.
  - .3 Pipe joints: bell and spigot with rubber gaskets solvent welded joints or mechanical joints to ANSI/AWWA C111/A21.11, with transition gaskets to pipe manufacturers specifications.
  - .4 Rubber gaskets: to ANSI/AWWA C111/A21.11. Gaskets for mechanical joints to be duck-tipped transition gaskets for PVC.
- .2 Mechanical Joint Restraint
  - .1 Ductile iron split ring restraint, to ASTM A536
  - .2 Connecting rods to AWWA C111
  - .3 Suitable for PVC pipe and fittings, minimum pressure rating equal to pipe rating, with minimum 2:1 safety factor.

## **2.2      PIPE BEDDING AND SURROUND MATERIALS**

- .1 Granular material to PEITIE Standard Specification (Latest Edition) – Section 402, Bedding Material.
  - .1 Crushed or screened stone, gravel or sand.
  - .2 Gradations within limits specified when tested to ASTM C117, ASTM C136. Sieve sizes to CAN/CGSB-8.2, CAN/CGSB-8.1.

## **2.3      BACKFILL MATERIAL**

- .1 Excavated material if suitable for reuse and approved by Departmental Representative.
- .2 Type 3, in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.
- .3 Unshrinkable fill in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.

## **Part 3      Execution**

### **3.1      EXAMINATION**

- .1 Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts are acceptable for pipe installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Departmental Representative.
  - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

### **3.2      PREPARATION**

- .1 Temporary Erosion and Sedimentation Control:
  - .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to sediment and erosion control drawings and sediment and erosion control plan, specific to site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent 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.
- .2 Pipes and fittings to be clean and dry.
- .3 Prior to installation, obtain Departmental Representative's approval of pipes and fittings.

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**3.3            TRENCHING**

- .1    Do trenching Work, in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.
- .2    Trench alignment and depth require approval from Departmental Representative prior to placing bedding material or pipe.

**3.4            GRANULAR BEDDING**

- .1    Place granular bedding in unfrozen condition.
- .2    Place granular bedding material in uniform layer[s] not exceeding 150 mm compacted thickness to depth as indicated.
- .3    Shape bed true to grade and to provide continuous, uniform bearing surface for pipe.
- .4    Shape transverse depressions as required to suit joints.
- .5    Compact each layer full width of bed to at least 95% corrected maximum dry density.
- .6    Fill excavation below design elevation of bottom of specified bedding with compacted bedding material.

**3.5            INSTALLATION**

- .1    Lay pipes in accordance with manufacturer's recommendations.
- .2    Join pipes in accordance with manufacturer's recommendations.
- .3    Avoid damage to machined ends of pipes in handling and moving pipe.
- .4    Maintain grade and alignment of pipes.
- .5    Align pipes carefully before jointing.
- .6    Joint deflection permitted within limits in accordance with pipe manufacturer's written recommendations.
- .7    Support pipe firmly over entire length, except for clearance necessary at couplings.
  - .1    Do not use blocks to support pipe.
- .8    Keep pipe and pipe joints free from foreign material.
- .9    Avoid bumping gasket and knocking it out of position, or contaminating with dirt or other foreign material. Remove disturbed gaskets clean, lubricate and replace before jointing is attempted.
- .10   Support pipes using hand slings or crane as required to minimize lateral pressure on gasket and maintain concentricity until gasket is properly positioned.
- .11   Apply sufficient pressure in making joint to ensure that joint is complete to manufacturer's recommendations.
- .12   Apply restraint to pipe to ensure that joints when completed are held in place, by tamping fill material under and alongside pipe, or otherwise as approved by Departmental Representative.

- .13     When stoppage of Work occurs, block pipe as directed by Departmental Representative to prevent creep during downtime.

### **3.6            MECHANICAL RESTRAINTS**

- .1     Restrain bends, tees and fittings using mechanical restraints as indicated.
- .2     Mechanical restraints to be per this specification, the Drawings and approved by the Departmental Representative.

### **3.7            PIPE SURROUND**

- .1     Place surround material in unfrozen condition.
- .2     Upon completion of pipe laying, and after Departmental Representative has inspected pipe joints, surround and cover pipes as indicated. Leave joints and fittings exposed until field testing is completed.
- .3     Hand place surround material in uniform layers simultaneously on each side of pipe not exceeding 150 mm compacted thickness as indicated.
  - .1        Do not dump material within 3m.
- .4     Compact each layer from pipe invert to mid height of pipe to at least 95% corrected maximum dry density.
- .5     Compact each layer from mid height of pipe to underside of backfill to at least 90% corrected maximum dry density.
- .6     When field test results are acceptable to Departmental Representative, place surround material at pipe joints.

### **3.8            BACKFILL**

- .1     Place backfill material in unfrozen condition.
- .2     Place backfill material, above pipe surround in uniform layers not exceeding 150 mm compacted thickness up to grades as indicated.
- .3     Under paving and walks, compact backfill to at least 95 % corrected maximum dry density. In other areas, compact to at least 90 % corrected maximum dry density.
- .4     Place unshrinkable fill in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.

### **3.9            FIELD TESTING AND COMMISSIONING**

- .1     Testing of force main to be carried out in presence of Departmental Representative.
- .2     Strut and brace caps, bends and tees, to prevent movement when test pressure is applied.
- .3     Expel air from force main, by slowly filling main with water.
  - .1        Drill and tap high points and install suitable cocks to vent air and to be shut when pressure is applied.
  - .2        Remove cocks after satisfactory completion of test and seal holes with tight fitting plugs.

- .4     Apply hydrostatic test pressure of 100 psi (690 kPa).
- .5     Apply pressure for 1 hour for pressure test and 2 hours for leakage test.
- .6     Examine exposed pipe, joints and fittings while system is under pressure.
- .7     Remove defective joints, pipe and fittings and replace with new sound material.
- .8     Define leakage as amount of water supplied from water storage tank in order to maintain test pressure for 2 hours.
- .9     Do not exceed allowable leakage of 1 litre per 100 m tested.
- .10    Locate and repair defects if leakage is greater than amount specified.
- .11    Repeat test until leakage is within specified allowance for full length of force main.
- .12    Contractor to exercise and operate all valves in the presence of the Departmental Representative to confirm the system is operational.
- .13    Contractor to provide notice of completed commissioning and turn over system to the Owner after approval by the Departmental Representative.

### **3.10            CLEANING**

- .1     Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1     Leave Work area clean at end of each day.
- .2     Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3     Waste Management: separate waste materials for recycling reuse in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1     Remove recycling containers and bins from site and dispose of materials at appropriate facility.

**END OF SECTION**

**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 Section 31 23 33.01 - Excavating, Trenching and Backfilling.
- .2 Section 32 32 13.13 - Package Sewage Lift, Wet Well Type.
- .3 Section 33 05 16 - Valve Chamber
- .4 Section 33 31 13 – Public Sanitary Utility Sewage Piping
- .5 Section 33 34 00 – Sanitary Utility Sewage Force Mains.

**1.2 REFERENCES**

- .1 ASTM International
  - .1 ASTM C117-04, Standard Test Method for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.
  - .2 ASTM C136-06, Standard Method for Sieve Analysis of Fine and Coarse Aggregates.
  - .3 ASTM D698-07e1, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup>(600 kN-m/m<sup>3</sup>)).
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
  - .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.
- .3 CSA International
  - .1 CSA A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
  - .2 CSA A23.4-09, Precast Concrete-Materials and Construction.
  - .3 CSA B66-10, Design, Material and Manufacturing Requirements for Prefabricated Septic Tanks and Sewage Holding Tanks.
- .4 Underground Water Tanks in Canada
  - .1 American Concrete Institute (ACI) standard ACI 318, Building Code Requirements for Structural Concrete.
  - .2 ANSI/AWWA D120 - Thermosetting Fiberglass-Reinforced Plastic Tanks.
  - .3 Tank manufacturer shall be recognized by Underwriters Laboratories of Canada as a manufacturer of tanks listed to the ULC S615 standard.
  - .4 Tank manufacturer shall be recognized by Underwriters Laboratories of Canada as a manufacturer of tanks listed to CSA B-66 Prefabricated Septic and Sewage Holding Tanks.

### **1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for concrete/FRP tanks and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
- .4 Submit drawings stamped and signed by professional engineer registered or licensed in Prince Edward Island, Canada. Shop Drawings: to CSA A23.4. Indicate on drawings:
  - .1 Design calculations for items designed by manufacturer.
  - .2 Tables and bending diagrams of reinforcing steel (if using pre-cast concrete).
  - .3 Camber.
  - .4 Formwork (if using pre-cast concrete).
  - .5 Finishing schedules.
  - .6 Methods of handling and erection.
  - .7 Storage facilities.
  - .8 Openings, sleeves, inserts and related reinforcement.

### **1.4 QUALITY ASSURANCE**

- .1 Manufacturers of precast concrete elements are to be certified by CSA as meeting requirements of CAS A23.4.

### **1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect Materials.
  - .3 Replace defective or damaged materials with new.

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**Part 2 Products**

**2.1 DESIGN REQUIREMENTS**

- .1 Design septic tank in accordance with CSA B66, and to carry handling stresses and service loads. Tank may be pre-cast reinforced concrete or FRP.
- .2 Tank to be complete with effluent filter.
- .3 Tank Anchoring:
  - .1 Anchor straps shall be as supplied by tank manufacturer and designed for a maximum load of 25,000 lbs (11,340 kg).
  - .2 Galvanized turnbuckles shall be supplied by the tank manufacturer.
  - .3 Prefabricated concrete anchors shall be supplied by the tank manufacturer, designed to the ACI 318 standard, manufactured with 4,000 psi concrete and shall have adjustable anchor points.
- .4 Piping and Fittings for FRP tank:
  - .1 Tank shall be equipped with factory-installed threaded fittings, or pipe stubs.
  - .2 PVC piping shall at a minimum meet the requirements of ANSI Schedule 40.
  - .3 All flanged nozzles shall be flanged and flat-faced, and conform to Class 150 bolting patterns as specified in ANSI/ASME/ B16.5.
  - .4 Carbon steel and stainless steel NPT fittings shall withstand a minimum of 150 foot-pounds (203 NM) of torque and 1,000 foot-pounds (1356 NM) of bending, both with a 2:1 safety factor.
- .5 Baffles and Partitions:
  - .1 Baffles and Partitions shall be capable of withstanding hydrostatic loads occurring when one compartment is empty and the remaining compartment(s) is full.

**2.2 MANUFACTURE**

- .1 If using pre-cast concrete, manufacture units in accordance to CSA A23.4.
- .2 If FRP, manufacture in accordance with the following:
  - .1 ANSI/AWWA D120 - Thermosetting Fiberglass-Reinforced Plastic Tanks.
  - .2 Tank manufacturer shall be recognized by Underwriters Laboratories of Canada as a manufacturer of tanks listed to the ULC S615 standard.
  - .3 Tank manufacturer shall be recognized by Underwriters Laboratories of Canada as a manufacturer of tanks listed to CSA B-66 Prefabricated Septic and Sewage Holding Tanks.
- .4

**2.3 FINISHES**

- .1 If using pre-cast concrete, finish tanks to CSA A23.4, commercial grade.

## **2.4 ACCESS**

- .1 Include vandal proof access holes to surface to facilitate cleaning and inspection.
- .2 Access Openings:
  - .1 All access openings shall have a diameter of 24 inches or 30 inches (610 mm or 762 mm), complete with riser, lid and necessary hardware.
- .3 Attached Access Risers for FRP tank:
  - .1 Attached access risers shall be PVC or FRP as supplied by tank manufacturer.
  - .2 Attached access risers shall be a 24 inches or 30 inches (610 mm or 762 mm) diameter
  - .3 Access risers shall be attached to access openings during installation utilizing adhesive or FRP bonding kits as supplied by the tank manufacturer.

## **2.5 TANK BEDDING AND SURROUND MATERIAL**

- .1 Granular material in accordance with the following requirements:
  - .1 Crushed gravel or sand, gradation in accordance with Section 33 31 13, Public Sanitary Utility Sewer Piping.
  - .2 Obtain Department Representative's approval prior to use.

## **2.6 BACKFILL MATERIAL**

- .1 Selected excavated material, free from rocks larger than 25 mm and organic matter.
- .2 Obtain Department Representative's approval prior to use.

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for utility septic tank installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Departmental Representative.
  - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

### **3.2 INSTALLATION**

- .1 Place bedding and surround material in unfrozen condition.
- .2 Do excavation in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.
- .3 Place tank bedding material in accordance with details as indicated.
  - .1 Compact to 95% maximum dry density to ASTM D698.

- .4 Make inlet and outlet joints of tank watertight.
- .5 Conduct leakage test on tank in presence Departmental Representative, before backfilling.
  - .1 Fill tank to level of effluent pipe, and allow to stand for 24 hours.
  - .2 Allowable leakage is zero.
  - .3 If leakage occurs, remove seal materials and reseal as directed by Departmental Representative.
- .6 Do backfilling in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.
  - .1 Compact to 95% maximum dry density to ASTM D698.

### **3.3 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 – Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 – Cleaning.

### **3.4 TESTING**

- .1 Tank shall be tested according to the tank manufacturer's Installation Manual and Operating Guidelines in effect at time of installation.

**END OF SECTION**

**Part 1      General**

**1.1      SUMMARY**

- .1      The Work in this section includes the supply of all labour, supervision, materials, plant, equipment, and transportation necessary for the installation of pipe culverts as shown on the Drawings, per the Specifications, and as directed by the Departmental Representative, complete in every respect. All new culverts shall be HDPE.

**1.2      SECTION INCLUDES**

- .1      Materials and installation for pipe culverts.

**1.3      RELATED REQUIREMENTS**

- .1      Section 01 33 00 - Submittal Procedures.
- .2      Section 31 05 16 - Aggregate Materials.
- .3      Section 31 23 33.01 - Excavating, Trenching and Backfilling.

**1.4      MEASUREMENT FOR PAYMENT**

- .1      See Section 01 29 00 - Payment Procedures

**1.5      REFERENCES**

- .1      American Society for Testing and Materials International, (ASTM):
  - .1      ASTM C117-95, Standard Test Method for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.
  - .2      ASTM C136-01, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  - .3      ASTM D698-00a, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m<sup>3</sup>).
- .2      Prince Edward Island Department of Transportation, Infrastructure and Energy - Standard Specification – (Latest Edition) – Section 301 – Storm Sewer Pipe.

**1.6      SUBMITTALS**

- .1      Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2      Inform the Departmental Representative at least 4 weeks prior to beginning Work, of proposed source of bedding materials and provide access for sampling.
- .3      Submit to Departmental Representative for testing, at least 4 weeks prior to beginning Work, samples of materials proposed for use.

- .4 Submit manufacturer's test data and certification at least 4 weeks prior to beginning Work.
- .5 Certification to be marked on pipe.

### **1.7 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in suitable locations as to not interfere with the work and protect it from damage.

### **1.8 WASTE MANAGEMENT AND DISPOSAL**

- .1 Divert unused metal materials from landfill to metal recycling facility as approved by Departmental Representative.
- .2 Divert unused concrete materials from landfill to local facility as approved by Departmental Representative.
- .3 Divert unused aggregate materials from landfill to facility for reuse as approved by Departmental Representative.
- .4 Fold up metal banding, flatten and place in designated area for recycling.

## **Part 2 Products**

### **2.1 HIGH DENSITY POLYETHYLENE (HDPE) PIPE**

- .1 HDPE pipe: to CAN/CSA-B182.8.

### **2.2 GRANULAR BEDDING**

- .1 Granular bedding and backfill material to Section 31 05 16 - Aggregate Materials.

## **Part 3 Execution**

### **3.1 TRENCHING**

- .1 Do trenching Work in accordance with the contract drawings and Section 31 23 33.01.
- .2 Obtain the Departmental Representative's approval of trench line and depth prior to placing bedding material or pipe.

### **3.2 BEDDING**

- .1 Place bedding in accordance with the contract drawings, PEITIE Standard Specifications or the manufacturer specifications; whichever is the most stringent.

- .2 Dewater excavation, as necessary, to allow placement of culvert bedding in dry condition.
- .3 Place minimum thickness of 300 mm of approved granular material on bottom of excavation and compact to minimum 95% maximum density to ASTM D698.
- .4 Place and compact bedding in maximum 150 mm lifts, to a minimum of 300 mm over the culvert.
- .5 Place bedding in unfrozen condition.

### **3.3 LAYING HDPE PIPE CULVERTS**

- .1 Begin at downstream end of culvert with spigot end of first pipe section facing upstream.
- .2 Ensure first and last pipe sections are properly positioned and secured in cut-off wall.
- .3 Ensure barrel of each pipe is in contact with shaped bed throughout its length.
- .4 Allow water to flow through pipes during construction only as permitted by the Departmental Representative.

### **3.4 JOINTS: CONCRETE PIPE CULVERTS**

- .1 Joints may be made with rubber gaskets:
  - .1 Install in accordance with manufacturer's written recommendations.
  - .2 Ensure that tapered ends are fully entered into flanged ends.

### **3.5 BACKFILLING**

- .1 Place backfill in accordance with contract drawings, Section 31 23 33.01 and to the Approval of the Departmental Representative.
- .2 Backfill around and over culverts as indicated or as directed by the Departmental Representative.
- .3 Place backfill material, approved by the Departmental Representative in 150 mm layers to full width, alternately on each side of culvert, so as not to displace it laterally or vertically.
- .4 Compact each layer to 95% maximum density to ASTM D698 taking special care to obtain required density under haunches.
- .5 Protect installed culvert with minimum 600 mm cover (or as recommended by the Manufacturer) of compacted fill before heavy equipment is permitted to cross. During construction, width of fill, at its top, to be at least twice diameter or span of pipe and with slopes not steeper than 1:2.

.6 Place backfill in unfrozen condition.

**3.6 CLEANING**

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

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

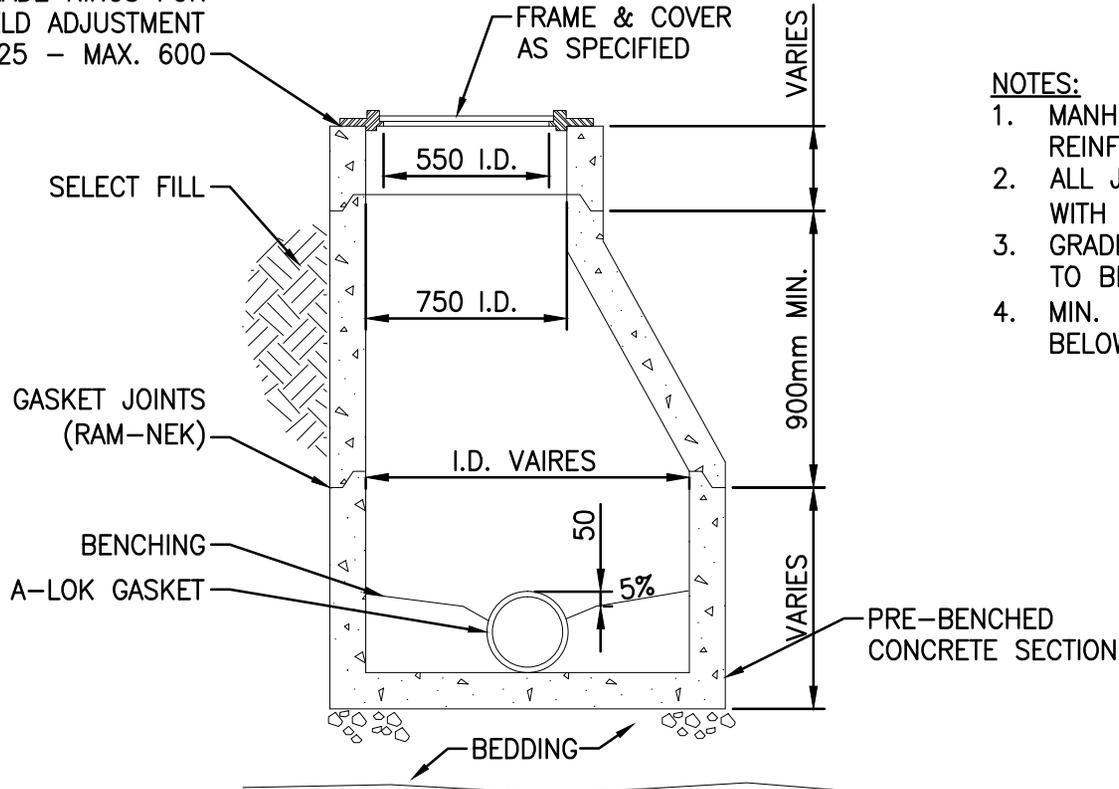
.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

**END OF SECTION**

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ORIGINAL SHEET - ANSI A

USE GRADE RINGS FOR  
FIELD ADJUSTMENT  
MIN. 225 - MAX. 600



**NOTES:**

1. MANHOLE SECTIONS TO BE PRECAST REINFORCED CONCRETE.
2. ALL JOINTS TO BE MADE WATERTIGHT WITH RAM-NEK OR "O" RING GASKETS.
3. GRADE RINGS MIN. TO BE 225mm, MAX. TO BE 600mm.
4. MIN. 150mm BEDDING (AS SPECIFIED) BELOW MANHOLE BASE

Client/Project

TYPICAL DETAILS

Figure No.

D-1

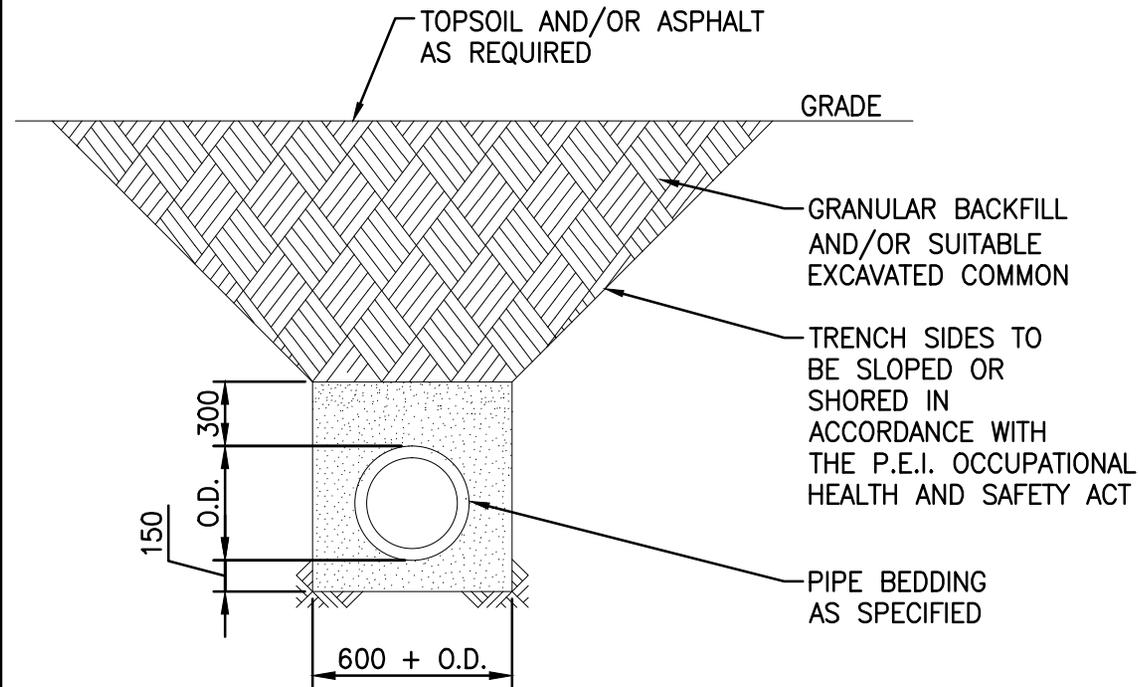
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SANITARY MANHOLE



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**NOTES:**

1. HAND PLACE PIPE BEDDING MATERIAL TO A MINIMUM OF 300mm OVER THE TOP OF PIPE.
2. COMPACTION TO 100% STANDARD PROCTOR
3. USE 100mm OF TOPSOIL WHERE REQUIRED
4. WHERE ASPHALT IS REQUIRED USE:
  - 300mm SELECT BORROW
  - 150mm CLASS "A" GRAVEL
  - 60mm ASPHALT BASE
  - 40mm ASPHALT SEAL
5. USE 25mm OF STYROFOAM SM INSULATION FOR EVERY 300mm LESS THAN 1830mm OF COVER OVER PIPE (HI60 UNDER TRAFFIC AREAS)

ORIGINAL SHEET - ANSI A

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TYPICAL DETAILS

Figure No.

D-2

Title

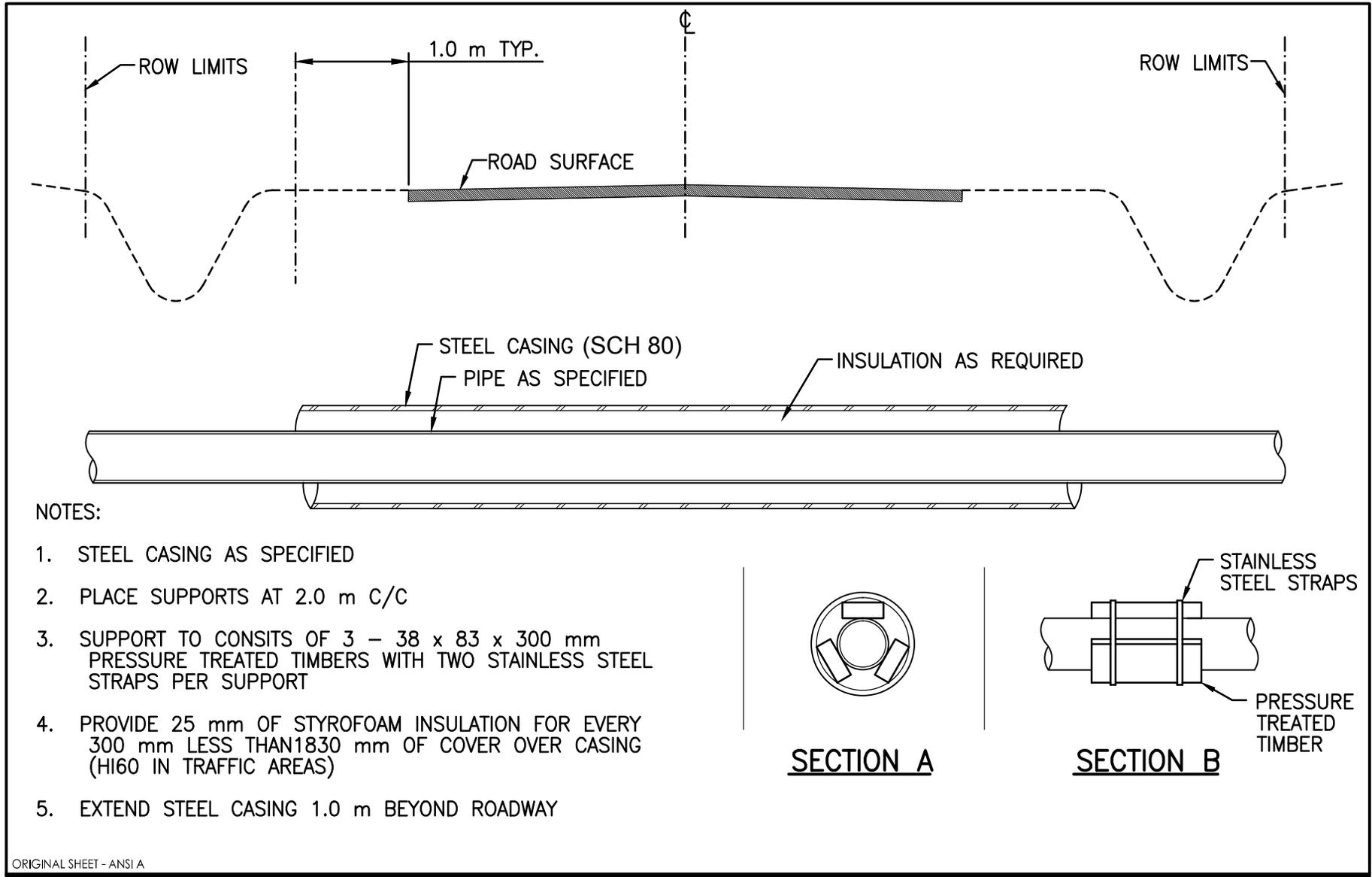
TRENCH DETAIL FOR PVC  
SEWER MAIN AND LATERAL



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TYPICAL DETAILS

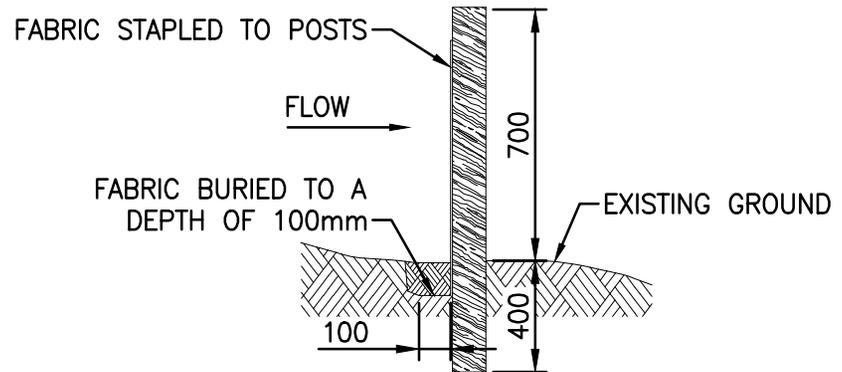
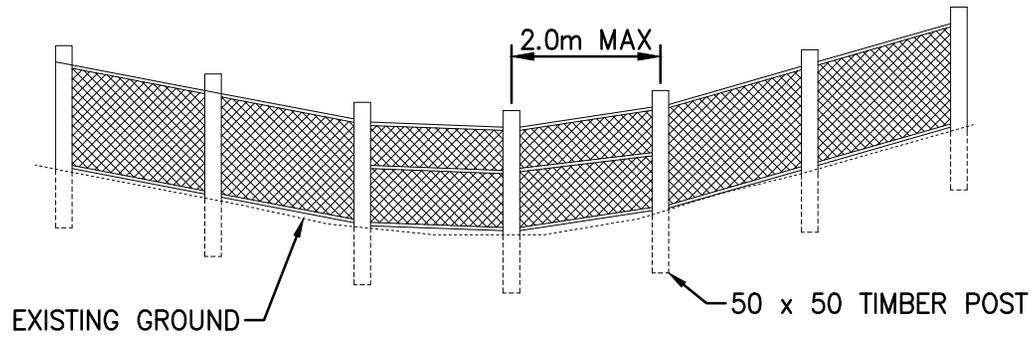
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CASED PIPE DETAIL

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TYPICAL DETAILS

Figure No.

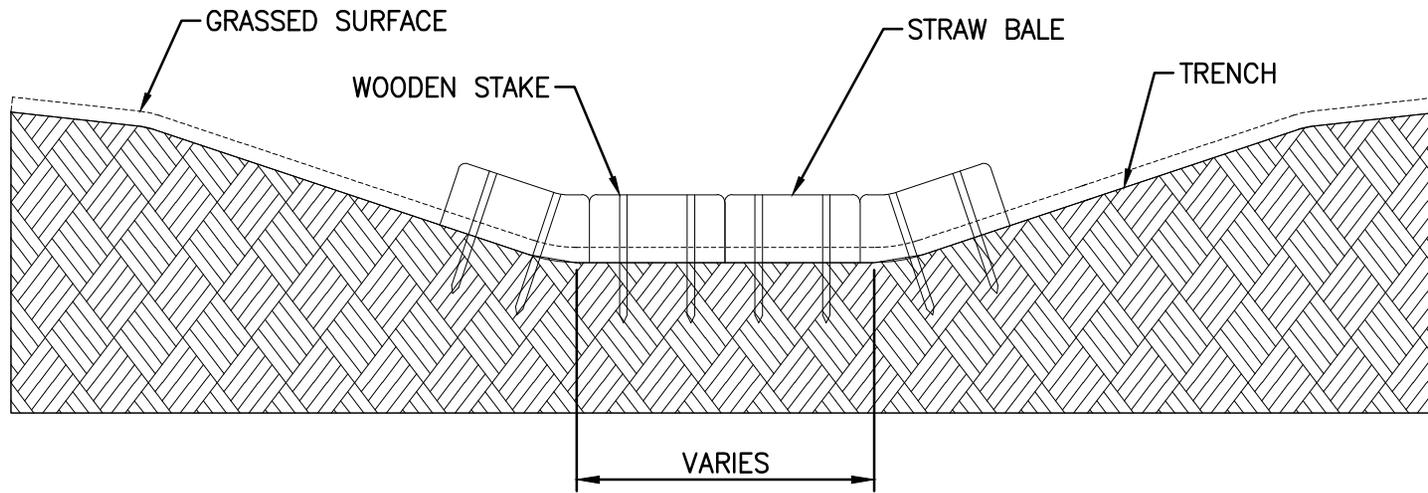
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Title

TYPE 1 SILT FENCE DETAIL

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ORIGINAL SHEET - ANSI A



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TYPICAL DETAILS

Figure No.

D-27A

Title

TYPICAL STRAW BALE  
CHECK DAM DETAIL



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